Appendix A

Memorandum of Understanding

Memorandum of Understanding
Southern Sierra Regional Entity
(Date of Signing) 2009

This Memorandum of Understanding (MOU) is entered into by and among the members of the Planning Committee with regard to the formation of the Southern Sierra Integrated Regional Water Management Plan (IRWMP). The overarching vision of the IRWMP is to meet the integrated water needs of the people and watersheds of the South Sierra IRWMP region now and into the future. The IRWMP will be developed in three phases: 1) a formation (launch) phase to develop and submit an application to the California Department of Water Resources (DWR) for a Planning Grant; 2) a planning phase to develop the Southern Sierra IRWMP and; 3) an implementation phase to implement the plan. The Southern Sierra Regional Water Management Group (hereinafter referred to as the "Southern Sierra Planning Committee" or "Planning Committee") will be realized through this MOU for the purpose of phases one and two of the IRWMP.

1 Purpose

This MOU is a statement of mutual understanding among the Planning Committee members to acknowledge the intentions of the parties and provide for cooperative action regarding:

- The roles and responsibilities of the parties in IRWMP formation, including the sources of funds and in-kind technical assistance
- The structure that will be used to exchange information with the Southern Sierra Planning Committee, Coordinating Committee, and other interested parties, and the public to provide for technical review and public support for formation of the IRWMP.
- The general work plan that Southern Sierra stakeholders will complete to form the IRWMP.

1.1 Duration of this Memorandum of Understanding

This MOU will remain in effect from the date of signing for 3 years or until replaced by another form of agreement by the Southern Sierra IRWMP Planning Committee.

1.2 Southern Sierra Preamble from the IRWMP

This IRWMP is not intended to, and it does not, impose legally binding requirements on the entities that adopt or participate in the IRWMP. The IRWMP's purpose is to summarize the process and the plan developed by the Southern Sierra Region stakeholders to meet their common goals of achieving sustainable water supplies and uses, improved water quality, environmental stewardship, efficient urban development, protection of agriculture, and a strong economy.

Although the IRWMP refers to many legally binding statutory and regulatory provisions—such as general plans, zoning ordinances, water quality plans, and various permits, licenses, and approvals; its purpose in doing so is to ensure that the IRWMP is consistent and compatible with those existing legal obligations. Rather than adding to or modifying the present legal and regulatory environment, the IRWMP is intended to streamline and improve

the stakeholders' ability to operate and succeed within that environment. Thus, the IRWMP provides guidance to, but does not impose any mandates upon, the water agencies, land use agencies, local governments, watershed organizations and others who adopt the IRWMP.

2 Background

2.1 IRWMP Formation

The Southern Sierra Planning Committee intends to launch an IRWMP Planning process, which will culminate in submitting a Planning Grant Proposal to DWR soon after final guidelines are released.

2.2 IRWMP Adoption

Any organizations, agencies or individuals that support the Southern Sierra IRWM Plan may adopt it. These include such organizations as water agencies, conservation groups, agriculture representatives, businesses, tribal groups, land use entities, and local, state, federal agencies and private entities with an interest in the Southern Sierra.

Southern Sierra IRWMP Geographic Boundaries

The Southern Sierra IRWMP boundaries will include the foothills and mountain headwaters regions of the Kern, Tule, Kaweah, Kings, and San Joaquin watersheds. These watersheds cover the Sierra Nevada portion of Madera, Fresno, Tulare, and Kern Counties. The primary boundary includes the Sierra Nevada Ecosystem Project (SNEP) boundaries, but is adapted to sync with neighboring IRWMP efforts.

- To the east, the Southern Sierra IRWMP boundary is defined by the Sierra Nevada crest.
  - Rationale: Waters flowing to the west from the Sierra crest are source waters for foothill uses and management. Precipitation falling west of the crest drain the western slope of the mountain range and are connected hydrologically with the Tulare and San Joaquin basins.
- To the north, the Southern Sierra IRWMP is defined by the Upper San Joaquin watershed.
  - Rationale: The upper San Joaquin River basin is split between Fresno and Madera Counties, but the river is managed across counties. The issues on either side of the county line are similar, but contrast sharply with downstream users in intensive agricultural areas outside of the Sierra Nevada Region. The San Joaquin watershed shares many of the same issues with watersheds further south in the region.
- To the west, the Southern Sierra IRWMP is considering a boundary including the foothill areas of the region's watersheds.
  - In the Kings River Area, the SSIRWMP boundary extends the District boundaries of the Tri Valley, Orange Cove, Hills Valley Water Districts east of the towns of Orange Cove, Orosi and East Orosi. East of the City of Fresno, the boundary extends to the boundaries of the Fresno Metropolitan Flood Control District, the International Water District and the Garfield Water District.
    - Rationale: This boundary was negotiated with the Upper Kings River Forum Regional Water Management Group to match UKRF boundaries.

- In the Kaweah Delta area, the SSIRWMP boundary extends to the Kaweah reservoir or the 600-foot contour in the Kaweah River Drainage. Further, the boundary follows the RWQCB Irrigated Lands Program and generally follows surface water-ground water usage boundaries. In the aquaculture/Lewis/Avocado area, the boundary will be the 600' elevation contour and squared to section lines; the agriculture north of Elderwood will be in the KDRWMG. In Davis Valley, the Westside has small, irrigated lands while the east and the north are rangeland. The boundary will follow section lines in these areas. In Dry Creek, the boundary will follow land use: irrigated lands will be part of the KDWMG and grazing land will be in the SSIRWMP. In Mehrten Valley, the 600' contour will be the guide, most of the valley will be in KDRWMG. In Yokohl Valley, most of the western valley will be in the KDRWMG while the eastern portion of the valley will be in the SSIRWMP. In Round Valley, east of Lindsay, the KDRWMG will include a few small areas east of the ILP, the boundary will again be based on land use and squared to the section lines.
    - Rationale: This boundary was negotiated with the Kaweah Delta Water Conservation District Regional Water Management Group to match KDWCD boundaries.
- In the Tule River Area, the SSIRWMP boundary includes the Tule River Indian Reservation and down to approximately the 600-foot contour in all forks of the Tule and squared to section lines. The Deer Creek Tule River Authority planning area will follow irrigated lands while the SSIRWMP will follow rangeland.
    - Rationale: This boundary was negotiated with the Deer Creek-Tule River Authority Regional Water Management Group to match that region's planning boundaries.

- To the south, the Southern Sierra IRWMP boundary is defined by the Tulare-Kern County line.
    - Rationale: the Kern watershed's water resources will be managed by both SSIRWMP and Kern County Water Agency IRWMP. The two entities will work collaboratively in the watershed across the county boundary.

2.3 Planning Horizon

The Southern Sierra planning and implementation horizon is approximately thirty years into the future, in the range of 2038-2040. However, many Southern Sierra discussions and actions will be guided by a longer time horizon of up to fifty years into the future.

2.4 Joining and Leaving the Southern Sierra IRWMP Planning Committee

Any water stakeholder organization may join the Southern Sierra IRWMP as part of the Planning Committee (see below for description). Water stakeholders could include, but are not limited to such organizations as: water agencies, conservation groups, agriculture representatives, businesses, tribal groups, land use entities, and local, state, federal agencies and private entities with an interest in the Southern Sierra. A group who wants to join the Southern Sierra IRWMP should notify the Planning Committee of their intent to join and sign this MOU to signify their good faith effort to join.

Any entity who would like to discontinue their participation in the Southern Sierra IRWMP may do so at any time. This MOU is non-binding and non-regulatory. The Southern Sierra IRWMP Planning Committee only asks that any member who wants to leave, notify the rest of the Planning Committee at which point they will no longer be a member of the Planning Committee of the Southern Sierra IRWMP.

3 Program Management Structure

3.1 Planning Committee

The Planning Committee is the decision-making body during the SSIRWMP formation process. In that context it will oversee and approve major programmatic decisions such as funding applications and performance measures. The Planning Committee will set the overall strategic direction for formation of the IRWMP. During the planning phase, the Planning Committee or its designated Work Groups will meet at least every other month.

3.1.1 Membership

The first Planning Committee membership will be comprised of those who sign this Memorandum of Understanding. These members will commit to approximately three years on the Planning Committee or until the SSIRWMP is complete.

The Planning Committee strives to ensure its membership represents a broad range of interests, including: water supply, water quality, environment/habitat, recreation, agriculture and ranching, resource management, hydropower, cities/counties, sanitation, other water resource management areas, economically disadvantaged local communities and individual local stakeholders interested and willing to participate. In order to cover these interests, members may include, but are not limited to: water agencies, resource agencies, conservation groups, tribes, agricultural and ranching interests, cities, counties, education organizations, disadvantaged community representatives, private landowners, and businesses.

Planning Committee membership will be comprised of those who sign this MOU before submission of the planning grant proposal. Planning Committee members must be committed to ensuring long-term ecosystem health of the areas watersheds, water supply, water quality, involvement of the local communities, especially disadvantaged communities; and the protection, preservation and restoration of natural resources of the Southern Sierra region; and agree to work constructively with others.

The Project Manager will check in with Planning Committee members on regular basis to reconfirm their intent to actively participate and their primary representative. This will not be binding or require the member to re-sign the MOU. This activity is merely intended to give the Project Manager and Planning Committee the most updated list of active Planning Committee members and primary and alternate representatives. Membership in the Planning Committee may change to accommodate evolving circumstances, such as changes in individual organizational capacity or participation.

Planning Committee members agree they will strive to support the Southern Sierra IRWMP through a variety of supporting activities, which may include in-kind contributions and/or funding.

3.1.2 Representation

Each member organization will identify their lead representative for the Planning Committee and will make their best effort to attend Planning Committee meetings to make decisions. Planning Committee members may choose to identify alternates but they are encouraged to have one representative attend the IRWMP Planning Committee meetings for consistency.

3.2 Coordinating Committee

The Coordinating Committee, appointed by the Planning Committee, is a smaller, representative group of the Planning Committee that meets between Planning Committee meetings to assist staff with process planning, recommendations for process modifications, communications, and other issues for which staff needs advice. The Coordinating Committee may also provide more consistent fiscal oversight in helping to manage the IRWMP with the fiscal sponsor. Ultimate decision-making still resides with the Planning Committee. Membership in the Coordinating Committee may change to accommodate evolving circumstances (such as changes in individual organizational capacity or participation history) by consensus of the Planning Committee. The Coordinating Committee meets every month during planning stages and then every other month thereafter. This schedule could change again during implementation planning.

The Coordinating Committee may play a role in developing substantive proposals and policy, at the request and subject to the approval of the Planning Committee, but has no decision-making authority.

4 Formation Funding

4.1 Funding

Funding for the launch and planning phases will come from grants. Southern Sierra IRWMP anticipates that financial support for the regional entity will ultimately come from projects funded through the Southern Sierra IRWMP, but during the formation period (the formation period will end with a planning grant from DWR or other organization) will come from a portion of the launch and planning grants.

The Planning Committee agrees they will strive to support the Southern Sierra IRWMP through variety of supporting activities during the formation period.

4.2 Fiscal Agent

<u>Fiscal Agent for IRWMP Launch</u>

Sequoia Riverlands Trust shall serve as Fiscal Agent for the Southern Sierra IRWMP Launch phase. Duties include administering grant funds, coordinating meetings for the Coordinating Committee and Planning Committee, making meeting notes and notices publicly available, maintaining a webpage where IRWMP documents can be accessed.

<u>Fiscal Agent for Planning Grant</u>

The Planning Committee will choose a Fiscal Agent for the Southern Sierra Planning Grant Proposal to DWR and the Planning Phase. This entity will have custody and responsibility for administering all funds of the Southern Sierra regional entity, including without limitation deposit and disbursement of said funds and accounting of all business transactions of the

regional entity. Fiscal oversight will still be performed by the Planning Committee and Coordinating Committee.

Any budget line item change over $1,000 should be considered by the Coordinating Committee, as the fiscal oversight of the IRWMP.

Any budget line item change over $10,000 must be reviewed and approved by the Planning Committee

Annual Financial Reporting
At the close of each calendar (or fiscal) year, the fiscal agent(s) and individual project partners shall provide a complete accounting of fiscal activity related to Southern Sierra IRWMP and associated projects to the Planning Committee.

5 Public Outreach and Participation

5.1 Planning Committee Meetings

The Planning Committee will meet at least every other month and schedule additional meetings if necessary to ensure effective planning of the SSIRWMP. All Planning Committee meetings are open to the public. Interested parties are welcome and encouraged to attend to share concerns about the Plan and learn about the IRWMP. Highlights from the Planning Committee meetings shall be distributed to the Southern Sierra Planning Committee and posted on the web for public viewing.

5.2 Public Forum / Interested Parties

The public forum refers to the general public and broad range of organizations interested in the Southern Sierra process that seek information about Southern Sierra activities either by attendance at meetings or through other means of communication. The Southern Sierra IRWMP maintains an interested party or stakeholder email list. Email list participants receive notice of all Southern Sierra meetings and all other announcements about the Southern Sierra planning process.

5.3 Public Noticing and Transparency

Southern Sierra meetings are noticed via an inclusive email list discussed above. In addition, Southern Sierra IRWMP will begin sending meeting announcements to all the public agencies involved in the process and encourage them to post Southern Sierra Planning Committee meetings on their web pages and to announce through agency noticing procedures. Planning Committee member entities are not responsible for compliance by Southern Sierra with public agency noticing requirements. The Southern Sierra IRWMP shall maintain a publicly accessible website displaying a calendar of meetings, agendas, meeting notes, list of participants, and when appropriate, a brief description of accomplishments, partners and overall mission of the IRWMP.

In preparation for Planning Committee meetings, which will involve decision-making, the Planning Committee will be noticed that there is a decision-making meeting 2 weeks in advance of the meeting. This notice can be by email with the agenda if available at that time.

5.4 Briefings and Outreach

Southern Sierra IRWMP stakeholders representing their own organizations regularly conduct briefings with local elected officials and other organizations interested in Southern Sierra or in which Southern Sierra IRWMP would like to extend its reach. Southern Sierra IRWMP periodically prepares briefings materials and makes presentations at conferences and meetings. Only the Project Manager or a designated representative may make public statements on behalf of the Southern Sierra IRMWP as an entity.

6 Planning Committee Decision Making

6.1 Decision Making Rule

6.1.1 Consensus as the Fundamental Principle

The Planning Committee shall base its decision-making on consensus (agreement among all members) in all of its decision-making. Working toward consensus is a fundamental principle of the Southern Sierra IRWMP process.

6.1.1.1 Definition of "Consensus"

In reaching consensus, some Planning Committee members may strongly endorse a particular proposal while others may accept it as "workable." Others may be only able to "live with it." Still others may choose to "stand aside" by verbally noting a disagreement, yet allowing the group to reach a consensus without them if the decision does not affect them or compromise their interests. Any of these actions still constitutes consensus.

Since the IRWMP has no regulatory authority, any decisions it makes cannot regulate or force another entity against its will to take an action not in its interest. All decisions and projects will be made and developed under the consensus rule except as noted in Section 6.1.1.2 below.

6.1.1.2 Workgroups

Workgroups give input and recommendations to the Planning Committee. But all decisions will be approved by the Planning Committee as a whole.

6.1.1.2 Less than 100% Consensus Decision Making

The Planning Committee shall not limit itself to strict consensus if 100% agreement among all participants cannot be reached after all interests and options have been thoroughly identified, explored, discussed and considered. Less-than-consensus decision-making shall not be undertaken lightly. If, after full exploration and discussion, the Planning Committee cannot come to 100% agreement, it will use the less-than-consensus decision-making protocols as described below. For proposals or the Plan to be endorsed by the Planning Committee, it must pass the test identified in (a) below.

a) Broad Support of the Planning Committee Membership

The Plan or proposal must be endorsed by 75% of the total number of *active* members of the Planning Committee. (In other words, the Plan cannot be opposed by more than 25% of the total number of *active* members of the Planning Committee.) *Active* participation is defined in Section 6.1.1.3.

6.1.1.3 Definition of Active Participation by Planning Committee Members

Active participation means regular attendance at Planning Committee meetings; regular participation in at least one Work Group or ensuring that a designee of the Planning Committee member's organization participates in a Work Group under the Planning Committee member's close guidance; and reviewing planning and other written documents before discussions or decisions will be made. It is understood that occasionally Planning Committee members may need to miss a Planning Committee or Work Group meeting, or both meetings. If there is a question as to whether a Planning Committee member should be considered "active" for purposes of decision-making, the Coordinating Committee will make that determination by communicating with the member or determining whether the stakeholder is active or not based on recent participation.

7 Revisions to the MOU

Any revisions to this MOU must be made through the decision-making process outlined in the section above on decision-making.

Signature Page

Date: _____

_____ _____
Name (Signature) Print Name

_____
Organization

Primary Representative:
Email: _____
Telephone: _____
Address: _____

Alternative Representative:
Email: _____
Telephone: _____
Address: _____

REFINEMENTS TO THE SSIRWMP M.O.U.

SOUTHERN SIERRA IRWMP

Adopted on May 10, 2012

The following materials are refinements and clarifications to the existing "Memorandum of Understanding, Southern Sierra Regional Entity," originally dated 2009. The materials do not replace the M.O.U., they merely provide additional details to eliminate ambiguity, and additional protocols on a few important topics that were not yet addressed. Together they form the governing documents of the Southern Sierra IRWMP's Regional Water Management Group.

1. Program Management Structure (Section 3)

3.3 Change of "Planning Committee" term to "Regional Water Management Group"

As of July 2012, the "Planning Committee" will be referred to as the "Regional Water Management Group" (RWMG). Per IRWM guidelines (August 2010, Section 4-A-1, Governance, page 19), the RWMG includes three or more local agencies, at least two of which have statutory authority over water supply or water management. These two agencies share decision-making authority with the other members of the RWMG. All other aspects of the Memorandum of Understanding apply.

3.4 Change of "fiscal agent" term to "grantee"

As of July 2012, the term "fiscal agent" will be replaced with "grantee," for consistency with IRWM guidelines (August 2010), which defines "grantee" as the grant recipient (page 32).

3.5 Additional RWMG Roles and Responsibilities

Per the existing M.O.U., the RWMG will continue to oversee and approve major programmatic decisions, such as funding applications and performance measures, and will continue to set the overall strategic direction for formation of the IRWMP. Additionally, members of the RWMG will (1) review in advance of meetings and provide feedback on draft work products; (2) adopt final work products; (3) contribute expertise, data, and information to clarify discussions, eliminate false assumptions, and advance innovation; (4) communicate information to and from their agencies, organizations, and/or constituencies; and (5) act in a manner that will enhance trust among all participants.

3.6 Additional Coordinating Committee Roles and Responsibilities

Per the existing M.O.U., the Coordinating Committee will continue to assist staff with

process planning, recommendations for process modifications, communications, and other issues for which staff needs advice; may also continue to provide more consistent fiscal oversight; and may also play a role in developing substantive proposals and policy, at the request and subject to the approval of the Planning Committee. Additionally, the Coordinating Committee will help to prepare for RWMG meetings by reviewing and helping to develop meeting materials, and by reviewing draft work products, as needed.

3.7 Additional Membership Requirement

Members of the RWMG must be part of a public agency, an organization, a business, a California Native American Tribe, or other group that represents a public interest and has signed the M.O.U. The M.O.U. identifies the primary representative and alternate; to keep information up to date, members are required to submit a letter written on letterhead indicating if their primary representative or alternate changes. Alternates are encouraged to attend as much as possible to maintain continuity of the discussions. A single person may represent more than one agency, organization, business, Tribe, or other group, so long as they have documentation of their role from each entity they represent. The RWMG does not include individual members of the public. Individual members of the public who are interested in and concerned about the Southern Sierra IRWMP are requested to join the list of interested parties (see section 5.2.1).

5.2.1 Additional Information on Public Forum / Interested Parties

[This section augments the existing 5.2 Public Forum / Interested Parties]

All interested parties are welcome to attend and participate in RWMG meetings and other Southern Sierra IRWMP events. As specified in the existing M.O.U., the RWMG maintains a list of interested parties for the purpose of noticing meetings and other public events, and sharing news and information. The list may also be used to solicit feedback to the RWMG at appropriate times. The list includes individual members of the public, as well as members of agencies, organizations, businesses, Tribes, or other groups that have an interested in or are concerned about the Southern Sierra IRWMP but do not sign the Memorandum of Understanding.

3.8 Work Group Designation

The RWMG may choose to create work groups to advance specific tasks outside of RWMG meetings. The RWMG will specific a clear purpose for any work group and, as applicable, also specify the tasks or work products and corresponding timeline for the work group. All work groups will provide a status update on their activities at the RWMG meetings. All work products will be submitted in draft to the RWMG for adoption. While the work groups may make day-to-day decisions to advance their efforts, the work groups have no

final decision-making authority (see Section 6.1.1.2).

3.9 Roles and Responsibilities of the Facilitators

The facilitators will provide impartial guidance regarding the planning and implementation process, and will manage meetings on behalf of the RWMG. The facilitators are content-neutral, which means they will not advocate for particular policy or technical outcomes; the facilitators will, however, advocate for a fair, transparent, effective, and credible dialog and decision-making process, including helping the RWMG uphold the elements of the M.O.U. Specific duties include (1) designing the work plan and meeting agendas in partnership with the Project Manager, Coordinating Committee, and other RWMG members as needed; (2) providing guidance on process options and decisions; (3) reviewing and providing feedback on draft meeting materials; (4) overseeing the preparation of meeting summaries, including action items, key points of discussion, and agreements and decisions; (5) serving as a confidant for members who wish to express concerns about content or process privately. The facilitator is in service of the RWMG and will provide equal support to all its members.

2. Public Outreach and Participation (section 5)

5.5 Media Protocol

Per the existing M.O.U., the Project Manager or other designated representatives may make public statements on behalf of the Southern Sierra IRWMP as an entity. The first point of contact for media or external inquiries should be the Project Manager or other designated representatives. Additionally, if contacted by the media or an external party, or in other sessions outside the meeting, members will:

a. Clarify that they are speaking only for themselves, not on behalf of the RWMG.
b. Express concerns and support in ways that are consistent with their expressions in RWMG meetings.
c. Represent other comments made in these meetings as general group concerns and support, rather than attributing statements to other people or characterizing the views of others.
d. Avoid using the press as a vehicle for negotiation.

Members reserve the right to express their own opinion to the media, but not the opinions of others. Members can refer media inquiries to other group members, who then can speak for themselves. The RWMG may periodically develop and approve lengthier consensus statements to keep the public and media informed of its work and progress, and associated decisions and agreements.

3. RWMG Decision-Making (Section 6)

6.1.1.4 Clarification of Less than 100% Consensus Decision-Making

Decision-making in the absence of consensus will follow the protocol in the existing M.O.U. For clarification of section 6.1.1.2 (a), decisions or agreements must be endorsed by 75% of the total number of active members of the RMWG who are present at the meeting (including via telephone) when a decision is made. Per the existing M.O.U., meetings that include decisions will be noticed two weeks in advance of the meeting. For clarification of section 6.1.1.3, "regular attendance" means that the member has attended at least half of the RWMG meetings in the past year, or in the case of new members, that the member has attended at least half of the RMWG meetings since signing the M.O.U. The RWMG will maintain a current list of RWMG members, including their primary representative and alternate, and track meeting attendance. The requirement for participation in a work group is only applicable insofar as three or more work groups are active.

6.2 Protocol for Notifying Members of an Upcoming Decision

Per section 5.3, Public Noticing and Transparency, meetings that involve decision-making will be noticed two weeks in advance of the meeting. Members will be requested to acknowledge receipt of the email notifying them of the upcoming decision. If no acknowledgment is received, the facilitator(s) will follow-up by telephone to ensure the member is aware of the upcoming decision.

6.3 Multiple Entities Represented by a Single Individual

In some cases a single individual serves as the designated representative of more than one member entity. In order for the RWMG to have consensus on a decision, each of the member entities represented by the single individual must be in consensus.

If less than 100% consensus decision-making is involved, the single individual must choose a single entity to represent; any additional entity represented by that individual must send their alternate representative to take part in decision-making. All alternates are required to be fully briefed on the group's historical deliberations and information and issues involved in the decision, to ensure continuity of the group's discussions and a timely decision-making process. All decisions will be noticed in advance as specified in sections 5.3 and 6.2.

If less than 100% consensus decision-making is involved, and one of the entities represented by the single individual has a financial interest in the outcome (e.g., one of the entities represented by the single individual is applying to be the grantee for a planning or implementation grant), the single individual will be permitted to participate in discussions and decisions regarding the steps, criteria, and information used for making

the decision (e.g., selection of a grantee). In this regard, they help to shape the decision-making process as a whole. During the deliberation of the decision and final less than 100% decision-making, however, this individual will be requested to leave the room, and the entity that has a financial interest in the outcome will not be part of the less than 100% consensus decision-making. Additionally, none of the other entities represented by the single individual will be permitted to be part of the deliberation of the decision and final less than 100% decision-making. This is to avoid a situation where a secondary entity, even though it has no financial interest in the outcome, sends an alternate representative to support the selection of the single individual that typically represents them out of solidarity. To ensure that it has a voice in such a circumstance, any member entity typically represented by a single individual can decide to regularly send their alternate to the series of meetings leading up to a financial decision, and thus avoid relying on the single individual to represent them during that period of the RWMG's work. The RWMG will identify the appropriate number of meetings to attend early enough in the process to allow such participation.

4. Joint Fact-Finding (new section – section 8)

8 Joint Fact-Finding Protocol

The RWMG may choose to conduct joint fact-finding when it needs to make a decision regarding a complex scientific or technical issue, but cannot readily reach agreement on how best to proceed. Joint fact-finding provides an approach to building consensus and making informed decisions in the face of uncertainty. It involves a subset of RWMG members working with the consultant and subject-matter experts to frame the questions to be answered, interpret existing information, and generate recommendations. Joint fact-finding conducted by the RWMG will include the following steps:

1. The facilitator or RWMG member develops a short Issue Summary that identifies key issues and questions in enough detail to clearly communicate concerns to all members.
2. The RWMG identifies a few members to form a joint fact-finding work group on the designated topic. The work group identifies additional expertise needed to understand and address the topic, and invites mutually agreed-upon individual subject-matter experts to support the work group.
3. At its first meeting, the work group discusses how existing information applies to the issues and questions identified in the Issue Summary. Members identify areas where they are in consensus, and if possible, recommend to the RWMG how to move forward on the issues and questions identified. If the work group desires more information, it identifies the immediate next steps for gathering this. If the

desired information does not exist, the work group decides whether it can be generated in a timeframe that is consistent with the RWMG's work plan; if not, the work group agrees to continue its joint fact-finding effort and ultimately make a recommendation the absence of ideal information.

4. At its second or subsequent meetings, the work group reviews new information and seeks consensus on what to recommend to the RWMG. If the work group makes a sincere effort but cannot reach consensus, it may provide more than one set of recommendations to the RWMG.
5. When recommendations are ready, the work group presents these to the RWMG and answers any substantive or procedural questions from RWMG members. The intent is to provide recommendations in an open, transparent, and educative way that supports informed decision-making. The RWMG in turn seeks consensus on what recommendation(s) to adopt. The RWMG may request the work group to conduct additional fact-finding and report back.
6. The final recommendation adopted by the RWMG is recorded in the Issue Summary, as well as the standard meeting summary that is made publicly available on the website.

During the joint fact-finding process, the work group will update the RWMG as to its progress during the RWMG's regular meetings.

Regional Water Management Group/Planning Committee

- IRWMP decision-making body
- Membership: water agencies, resource agencies, conservation groups, Counties, Tribes, etc. from geographic scope of IRWMP (open to those interested in water resources management)
- Decision-making: consensus-based with a default for supermajority vote with representation from major interests.
- Meetings open to the public

Coordinating Committee

- Provides recommendations and guidance to IRWMP staff and consultants for managing IRWMP, preparation for meetings, drafting proposed policies, and planning tools
- Membership: representation from major interests and geographic area of IRWMP. Must also be members of Planning Committee.
- Size: Keep this Committee at a small workable number. Suggest 8.
- Frequency of Meetings: Meets every month during Planning stages and every other month thereafter.
- Decision-making: No decision-making authority. Proposes ideas to the Planning Committee for decision-making.

Grantee (1 entity)

(DWR eligibility: Non-profit or public institution)

- Administration of grants and funds including contracting, reporting, invoicing
- Grants awarded to fiscal sponsor on behalf of the IRWMP
- Leader in region and for IRWMP
- Contractor with DWR

Legal Authority (3 entities)

(DWR criteria: 3 public agencies, 2 with authority over water.)

- One of three entities will be fiscal sponsor for DWR Planning Grant
- Members of Planning Committee/members of Coordinating Committee
- Decision-making: none, these entities will make consensus decisions as part of the Planning Committee.
- Frequency of meetings: none. Group members may be part of the Coordinating Committee to engage in IRWMP coordination.

Appendix B

Regional Water Management Group Resolution of Adoption

Regional Water Management Group
RESOLUTION TO ADOPT
SOUTHERN SIERRA INTEGRATED REGIONAL WATER MANGEMENT PLAN

This resolution establishes and affirms that the Southern Sierra Regional Water Management Group (RWMG) adopts by consensus the Southern Sierra Integrated Regional Water Management Plan (Plan). Formal RWMG adoption is required for the Plan to become a framework for implementation and be eligible for project funding.

This RWMG resolution is voluntary and non-binding in nature, and does not commit RWMG members to any specific course of action. Individual agencies and organizations will sign a formal resolution of adoption.

WHEREAS, the RWMG has developed the Plan for the Southern Sierra region, and pursuant thereto, published notice of intent to adopt such a plan in accordance with the requirements of the California Integrated Regional Water Management Planning Act; and

WHEREAS, the Plan includes chapters regarding water supply, water quality, a description of the Region, regional goals and objectives, data management, resource management strategies and others; and

WHEREAS, the Plan was developed through an inclusive process of stakeholder collaboration; and

WHEREAS, the Plan is not a "project" as defined by the California Environmental Quality Act (CEQA) because the plan is not likely to cause any significant physical change to the environment, given that it is simply a planning tool. The Plan is therefore exempt from CEQA pursuant to Section 15262 and Section 15306 of the CEQA Guidelines. The Plan is also exempt under Section 15262 because it involves planning studies for possible future actions that participating agencies have not yet approved. The Plan only consists of basic data collection that will not result in disturbance of any environmental resource.

NOW, THEREFORE, BE IT RESOLVED that the RWMG does hereby adopt the Plan.

ADOPTED this 13th day of November 2014.

Chris Moi, Project Manager

ATTEST:

Note taker

APPROVED AS TO FORM AND PROCEDURE:

Facilitator

Appendix C

Dams and Reservoirs in the Southern Sierra

Southern Sierra Regional Water Management Group
Dams and Reservoirs in the Southern Sierra

Watershed	Dam	Reservoir	Owner	Power Capacity (MW)
Kaweah River	Terminus Dam	Lake Kaweah	Corps of Engineers	
	Upper Monarch Lake Dam	Upper Monarch Lake	Southern CA. Edison	
	Lady Franklin Lake Dam	Franklin Lakes	Southern CA. Edison	
	Crystal Lake Dam	Crystal Lake	Southern CA. Edison	
	Sand Creek Dam		Tulare Co. Resource Management Agency	
Kings River	Giffen Reservoir Dam		Harris Farms Inc.	
	Pine Flat Dam	Pine Flat Lake	Corps of Engineers	165
	Sequoia Dam	Sequoia Lake	YMCA Inc.	
	Balch Afterbay Dam		PG&E	
	Balch Diversion Dam	Black Rock Reservoir	PG&E	
	Wishon Dam	Lake Wishon	PG&E	1,212
	Courtright Dam	Courtright Reservoir	PG&E	
	Hume Lake Dam	Hume Lake	United States Forrest Service	
San Joaquin River	Friant Dam	Millerton Lake	U.S. Bureau of Reclamation	25
	Shaver Lake Dam	Shaver Lake	Southern CA. Edison	
	Florence Dam	Florence Lake	Southern CA. Edison	
	Mammoth pool Dam	Mammoth Pool Reservoir	Southern CA. Edison	190
	Huntington Dams 1,2,3,&4	Huntington Lake	Southern CA. Edison	
	Balsam Meadow Dam	Balsam Forebay	Southern CA. Edison	11
	Vermilion Valley Dam	Lake Thomas A. Edison	Southern CA. Edison	
	Mono Creek Diversion	Mono Creek	Southern CA. Edison	
	Bear Creek Diversion	Bear Creek	Southern CA. Edison	
	Portal Powerhouse Forebay	Portal Forebay	Southern CA. Edison	
	Big Creek No. 4	Big Creek	Southern CA. Edison	100
	Big Creek No. 5	Dam 5	Southern CA. Edison	
	Big Creek No. 6	Dam Six Lake	Southern CA. Edison	
	Kerckhoff Diversion	Kerckhoff Lake	PG&E	
	Big Creek No. 7 Dam	Redinger Lake	Southern CA. Edison	
	Longley	Longley Lake	Southern CA. Edison	
	Bishop Creek Intake No. 2		Southern CA. Edison	
	Sabrina	Lake Sabrina	Southern CA. Edison	
South Western Creeks/Rivers	None			
Tule River	Larson Dam	Nativelands Lake	South Tule Independent Ditch Co.	
	Success Dam	Lake Success	Corps of Engineers	
Upper Kern River	None			
			Total	1703

Appendix D

Three Rivers Water Supply Study

Preliminary Evaluation of Water Resources Demand and Availability Three Rivers, Ca, Area

Southern Sierra Integrated Regional Water Management Group

August 15, 2014

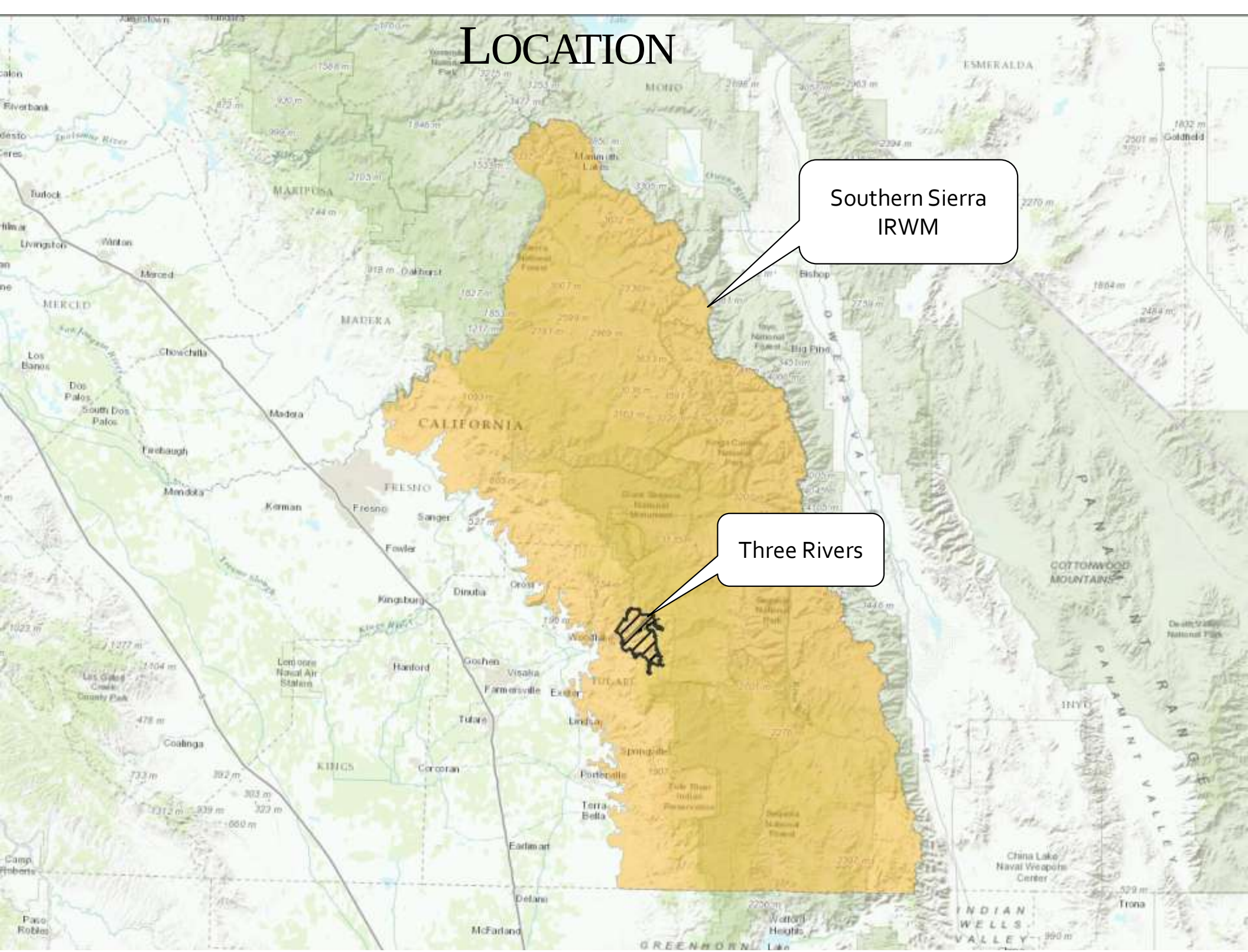
John Kirk
Department of Water Resources
Special Investigations and Planning Branch

Discussion Outline

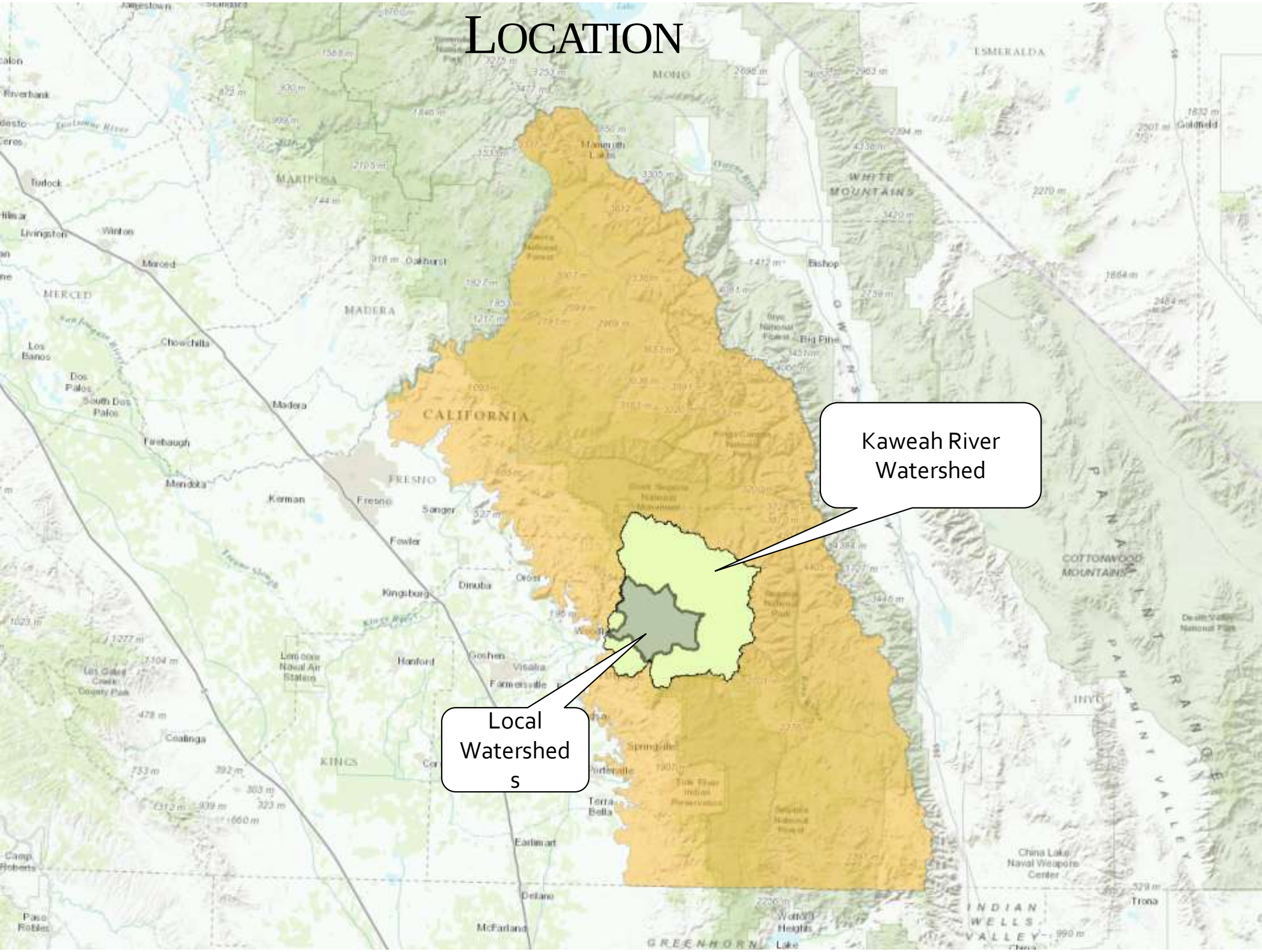
- Location and Land Use
- The Watersheds
  - Hydrology and Low Flow Conditions
- Water Demand
- Water Supply – Where does the water come from?
  - How much water is available?
  - What is the source of the supply?
- Aquifers – Nature of the aquifer(s) in the Three Rivers area
- Water Chemistry and Quality

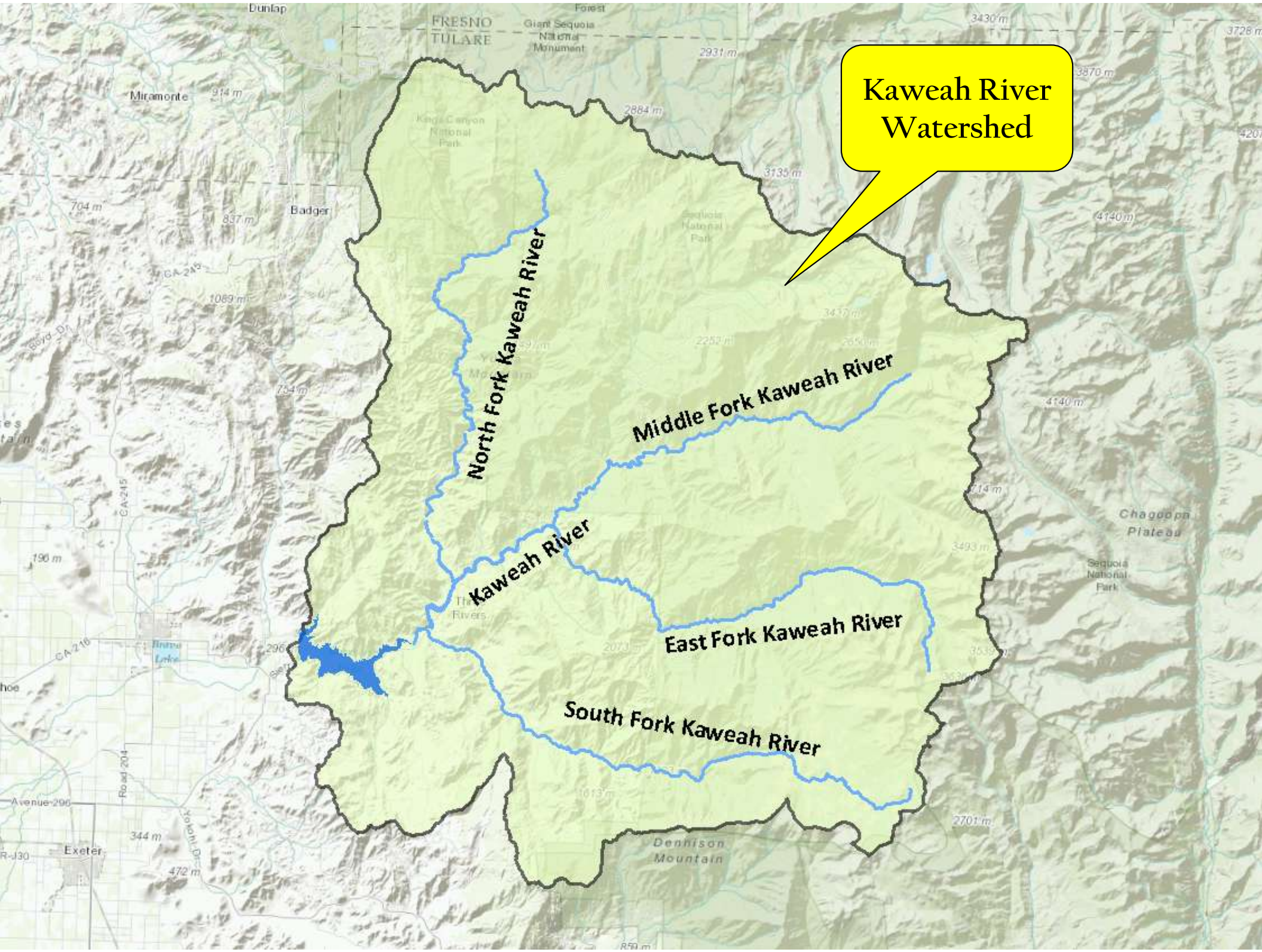
- LOCATION

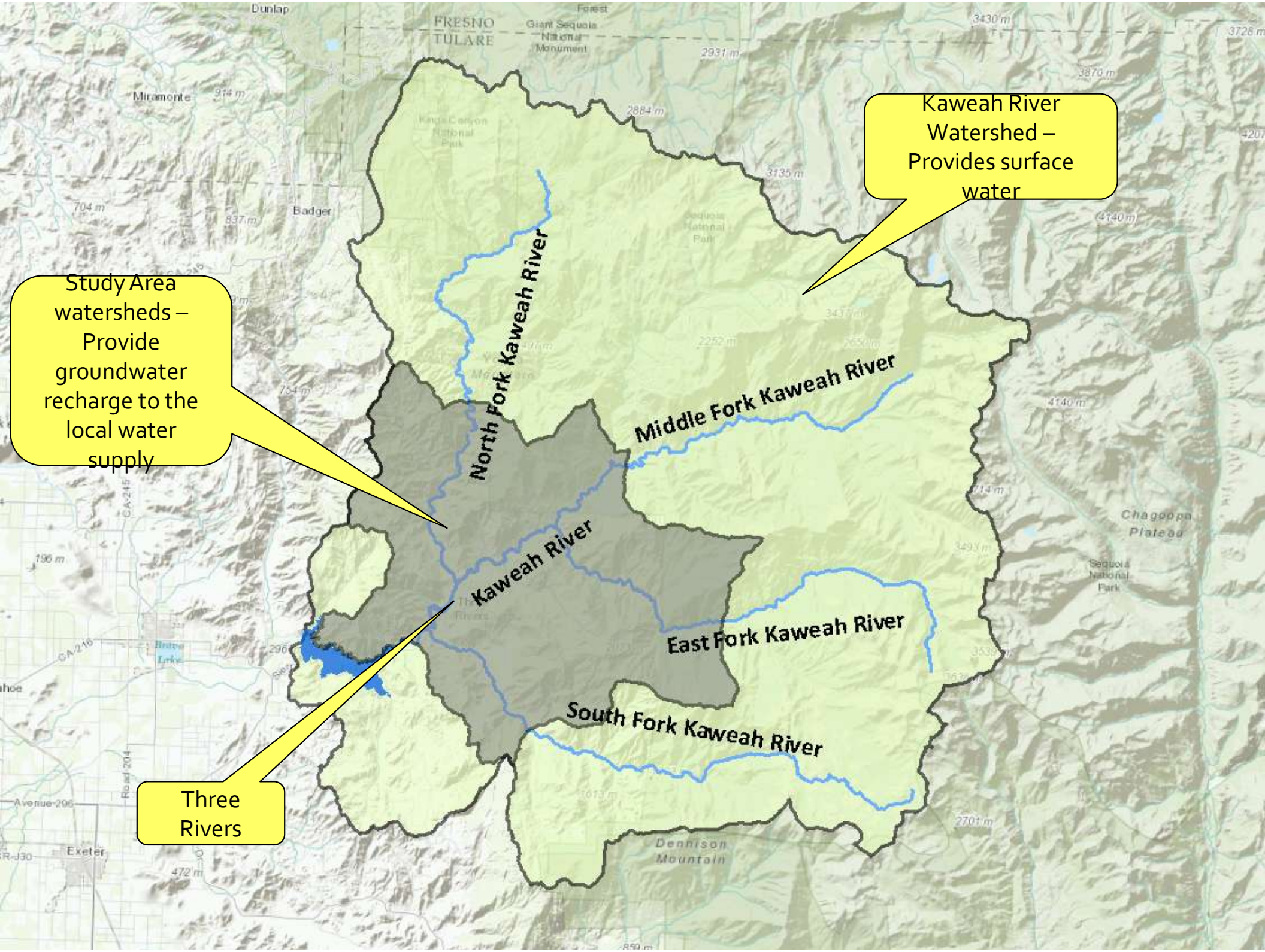
LOCATION


Southern Sierra IRWM
Three Rivers
CALIFORNIA
MADERA
FRESNO
KINGS
TULARE
INYO
MERCED
MARIPOSA
MONO
ESMERALDA
Fresno
Madera
Visalia
Tulare
Hanford
Bishop
Big Pine
Mammoth Lakes
Oakhurst
Chowchilla
Kingsburg
Sanger
Reedley
Dinuba
Fowler
Selma
Kerman
Firebaugh
Mendota
Los Banos
Dos Palos
South Dos Palos
Merced
Livingston
Turlock
Riverbank
Waterford
Oakdale
Lemoore Naval Air Station
Coalinga
Corcoran
Porterville
Exeter
Farmersville
Lindsay
Springville
Terra Bella
Earlimart
Delano
McFarland
Wasco
Paso Robles
Camp Roberts
China Lake Naval Weapons Center
Trona
Ridgecrest
Inyokern
Goldfield
Owens Valley
Panamint Valley
Death Valley National Park
Cottonwood Mountains
Indian Wells Valley
Greenhorn

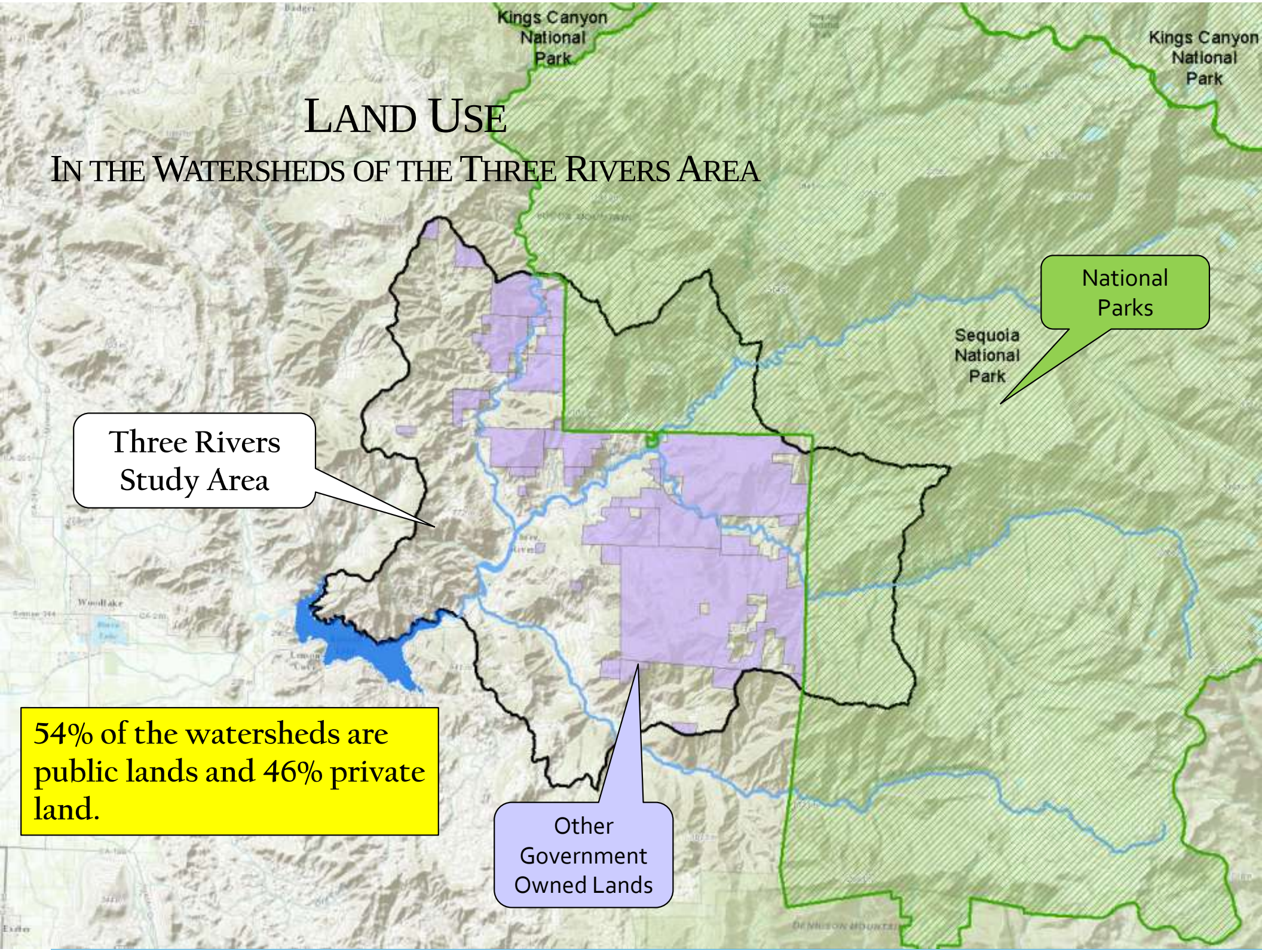
LOCATION




Kaweah River Watershed
North Fork Kaweah River
Middle Fork Kaweah River
Kaweah River
East Fork Kaweah River
South Fork Kaweah River
Lake Kaweah
Dunlap
Miramonte
Badger
Exeter
FRESNO
TULARE
Giant Sequoia National Monument
Kings Canyon National Park
Sequoia National Park
Chagoopa Plateau
Dennison Mountain
CA-245
CA-215
CA-216
Road 204
Avenue 296


Kaweah River Watershed – Provides surface water
Study Area watersheds – Provide groundwater recharge to the local water supply
Three Rivers
North Fork Kaweah River
Middle Fork Kaweah River
Kaweah River
East Fork Kaweah River
South Fork Kaweah River
Dunlap
Miramonte
Badger
Exeter
Dennison Mountain
Chagoopa Plateau
Sequoia National Park
Kings Canyon National Park
Giant Sequoia National Monument
FRESNO
TULARE

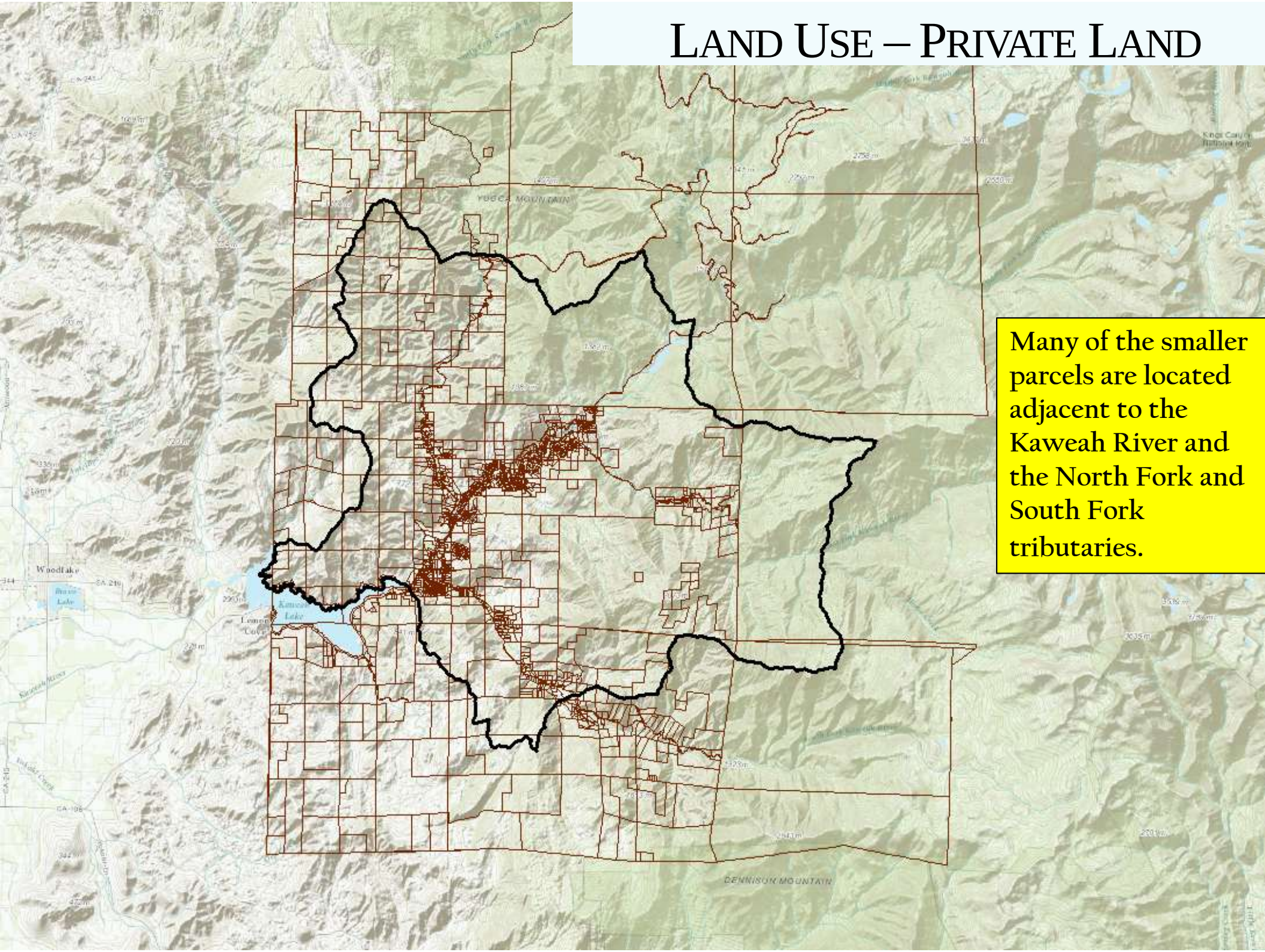
❖ Land Use



LAND USE

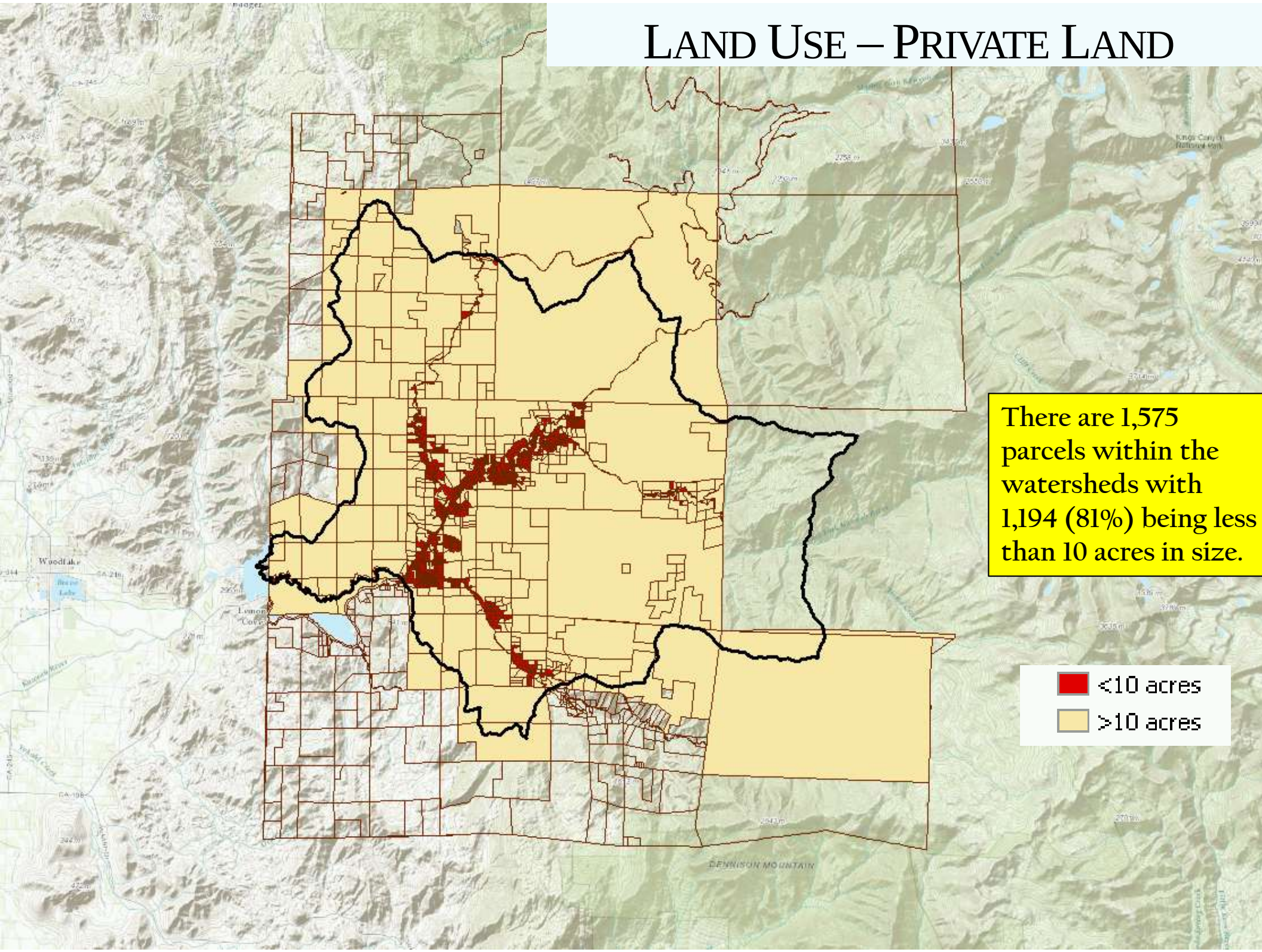
IN THE WATERSHEDS OF THE THREE RIVERS AREA

LAND USE – PRIVATE LAND

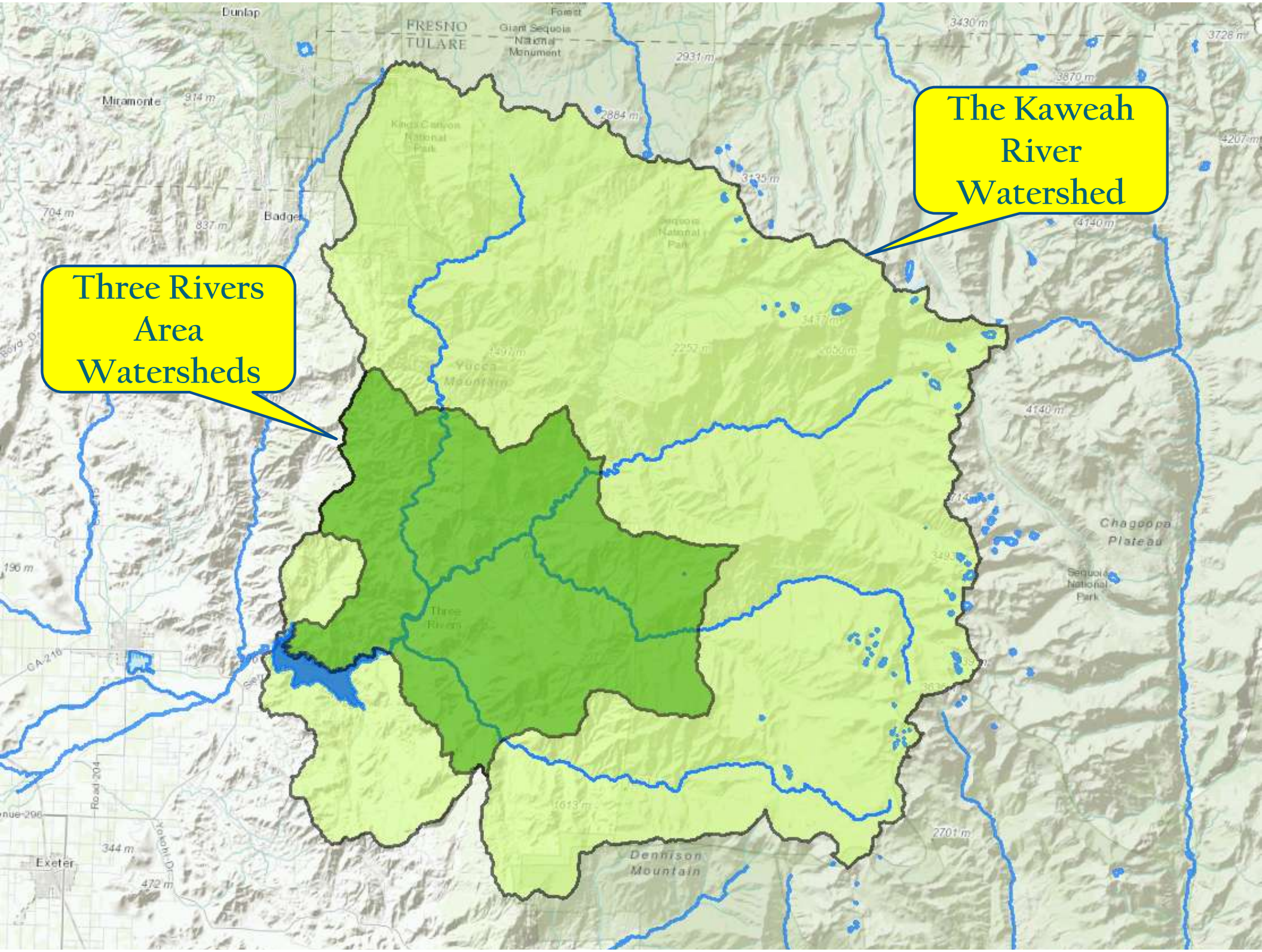


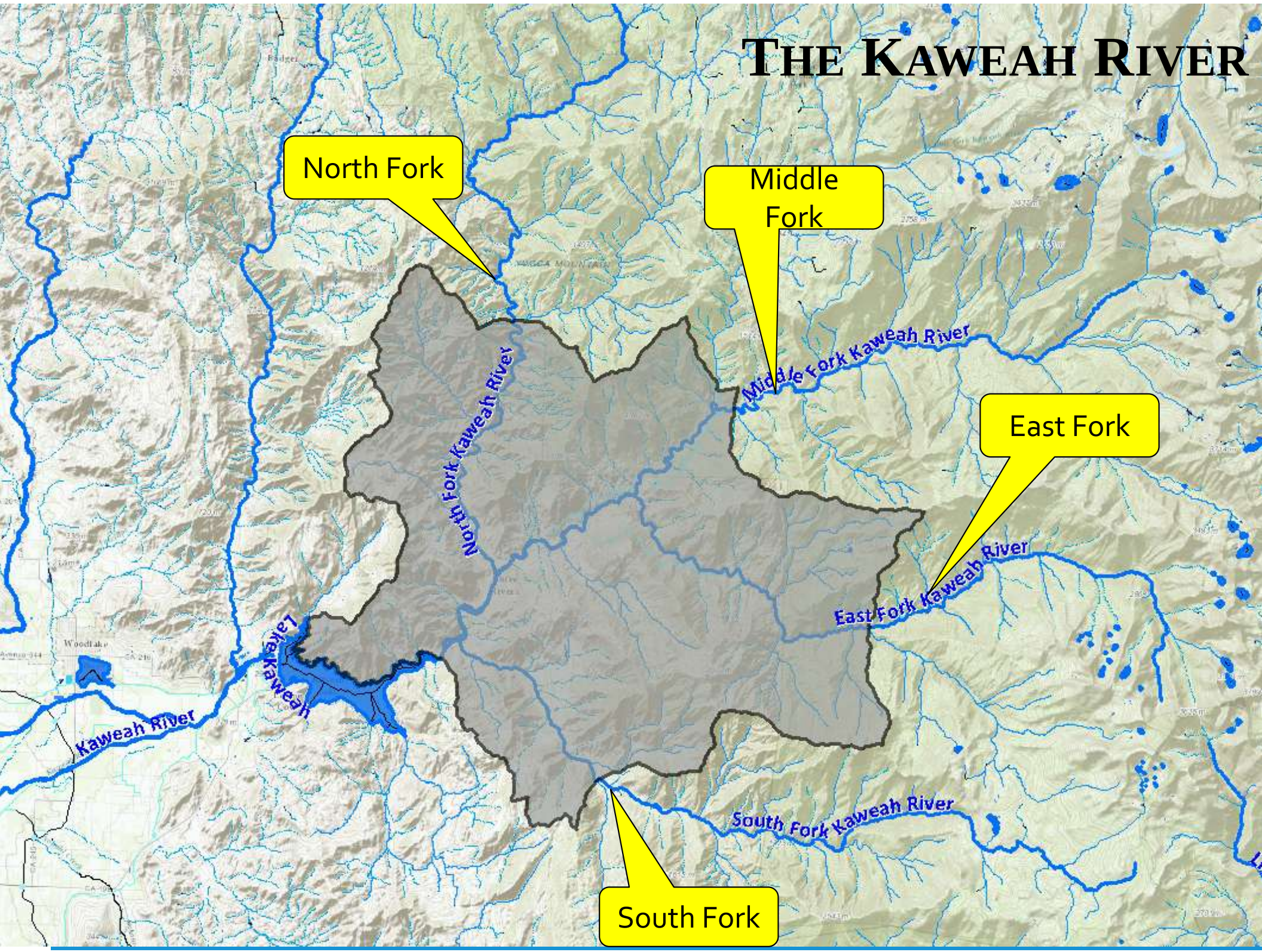
Many of the smaller parcels are located adjacent to the Kaweah River and the North Fork and South Fork tributaries.

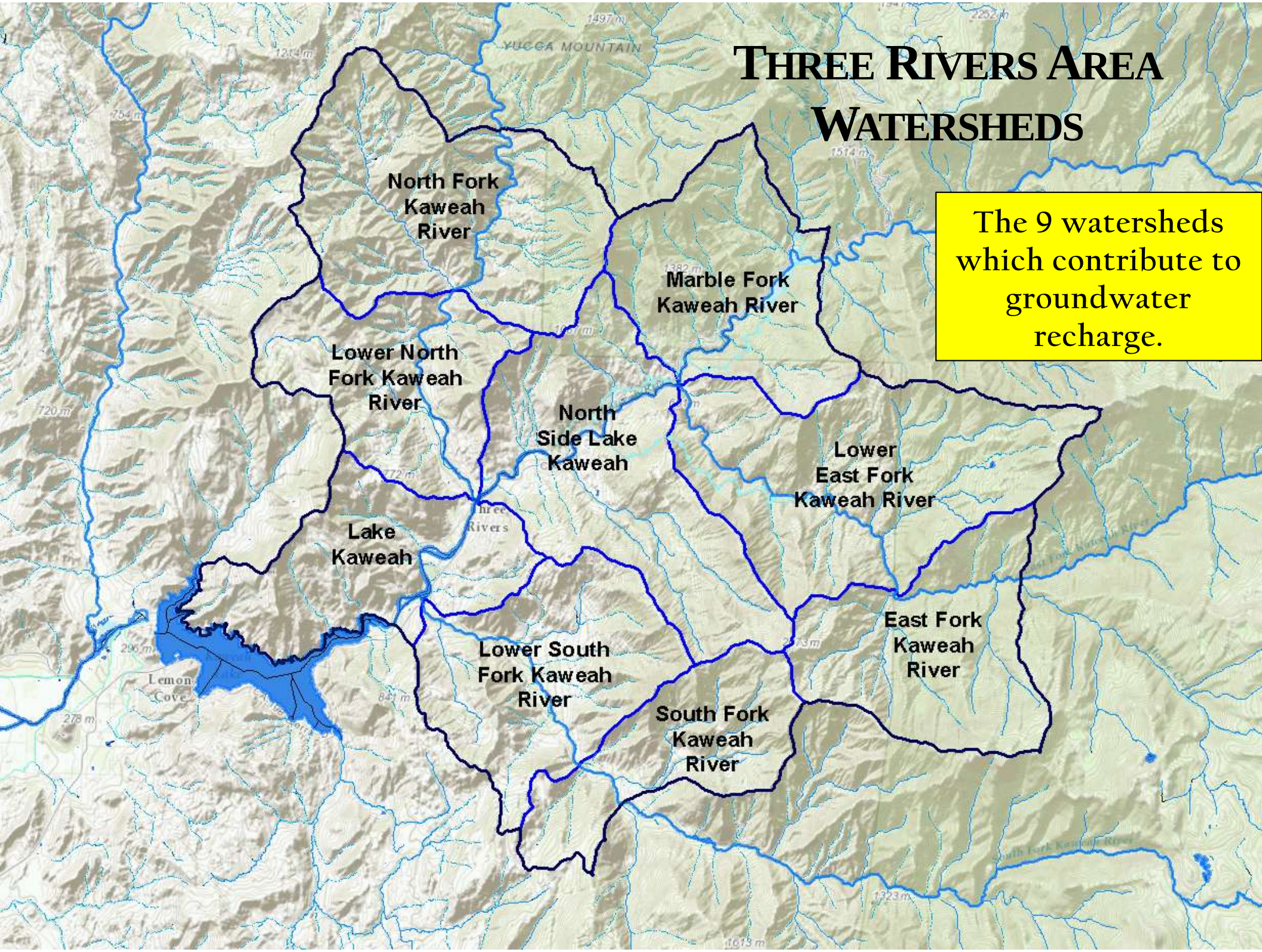
Land Use – Private Land



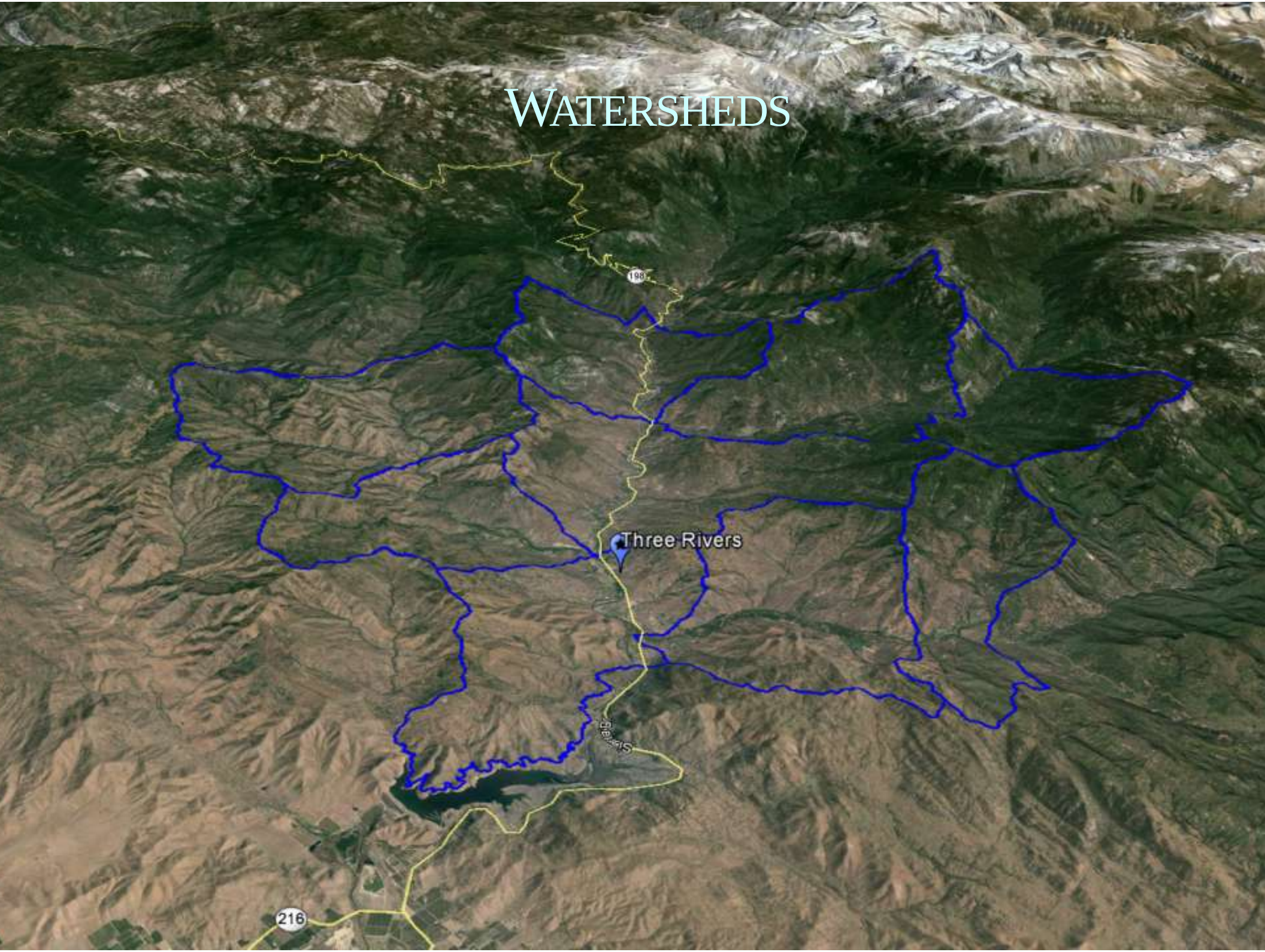
The Watersheds


The Kaweah River Watershed
Three Rivers Area Watersheds
Dunlap
FRESNO
TULARE
Giant Sequoia National Monument
Miramonte
Badger
Kings Canyon National Park
Sequoia National Park
Yucca Mountain
Three Rivers
Chagoopa Plateau
Dennison Mountain
Exeter
CA-216
Road 204
2931 m
2884 m
3135 m
3430 m
3726 m
3870 m
4207 m
4140 m
2257 m
1613 m
2701 m
704 m
837 m
914 m
344 m
472 m


THE KAWEAH RIVER
North Fork
Middle Fork
East Fork
South Fork
North Fork Kaweah River
Middle Fork Kaweah River
East Fork Kaweah River
South Fork Kaweah River
Lake Kaweah
Kaweah River

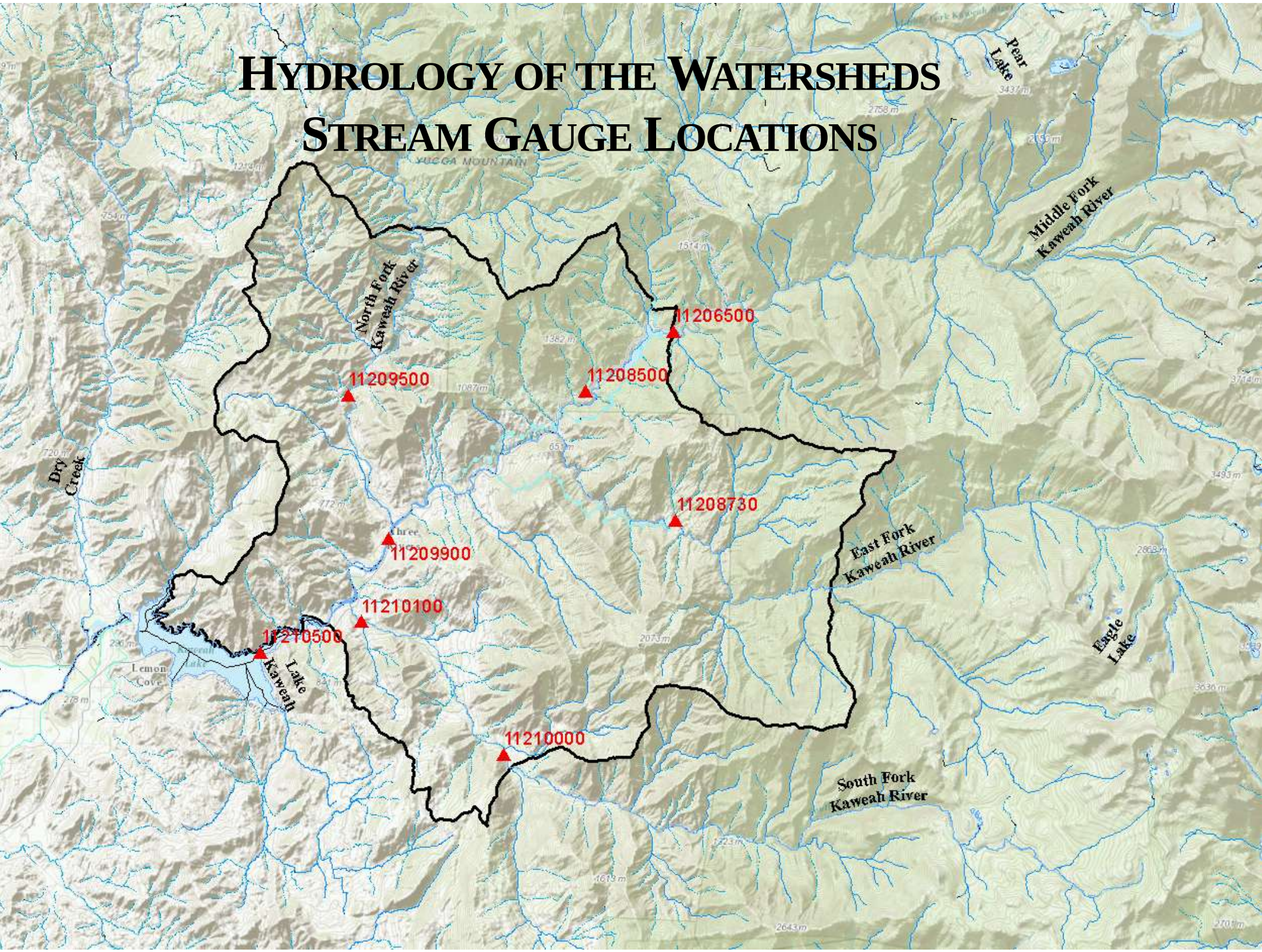

THREE RIVERS AREA
WATERSHEDS
The 9 watersheds which contribute to groundwater recharge.
North Fork Kaweah River
Marble Fork Kaweah River
Lower North Fork Kaweah River
North Side Lake Kaweah
Lower East Fork Kaweah River
Lake Kaweah
East Fork Kaweah River
Lower South Fork Kaweah River
South Fork Kaweah River
YUCCA MOUNTAIN
Three Rivers
Lemon Cove

WATERSHEDS



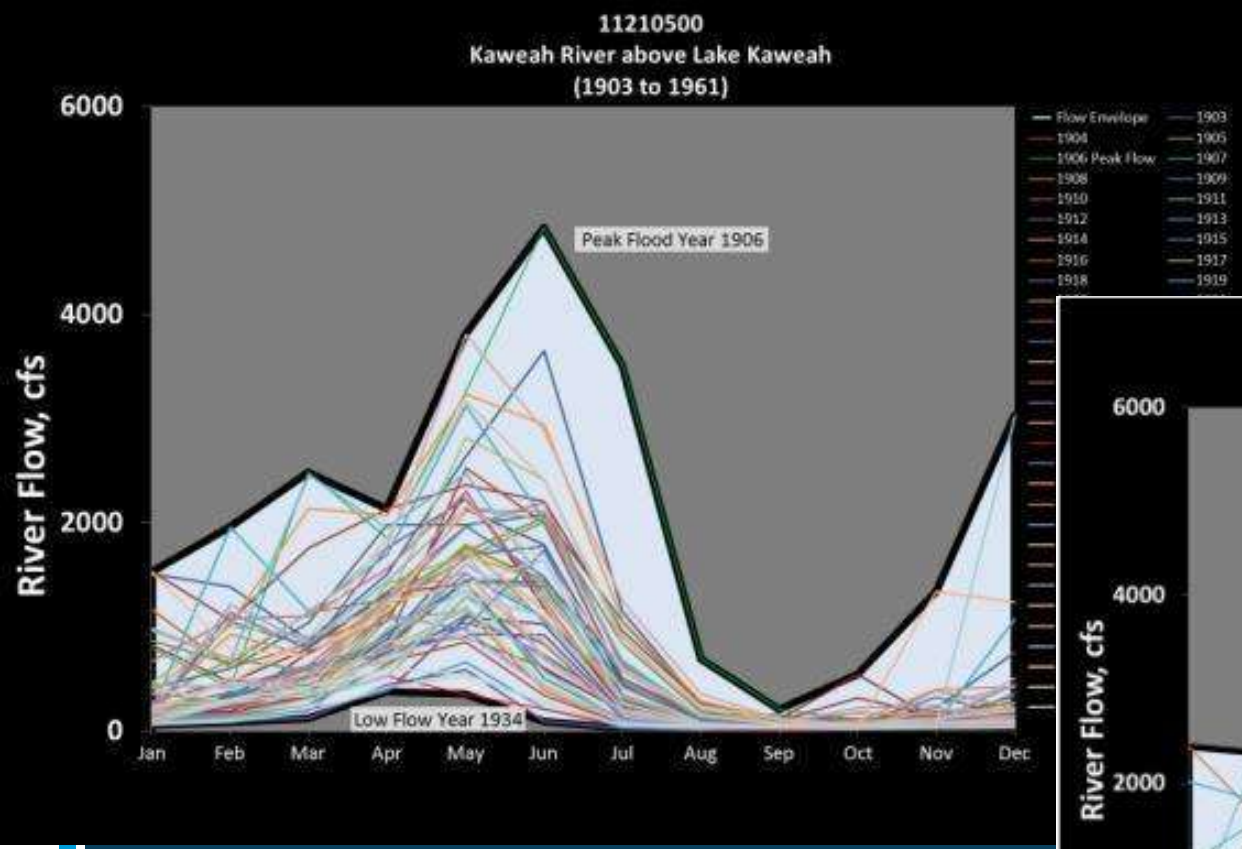
Hydrology of the Watersheds

HYDROLOGY OF THE WATERSHEDS
STREAM GAUGE LOCATIONS

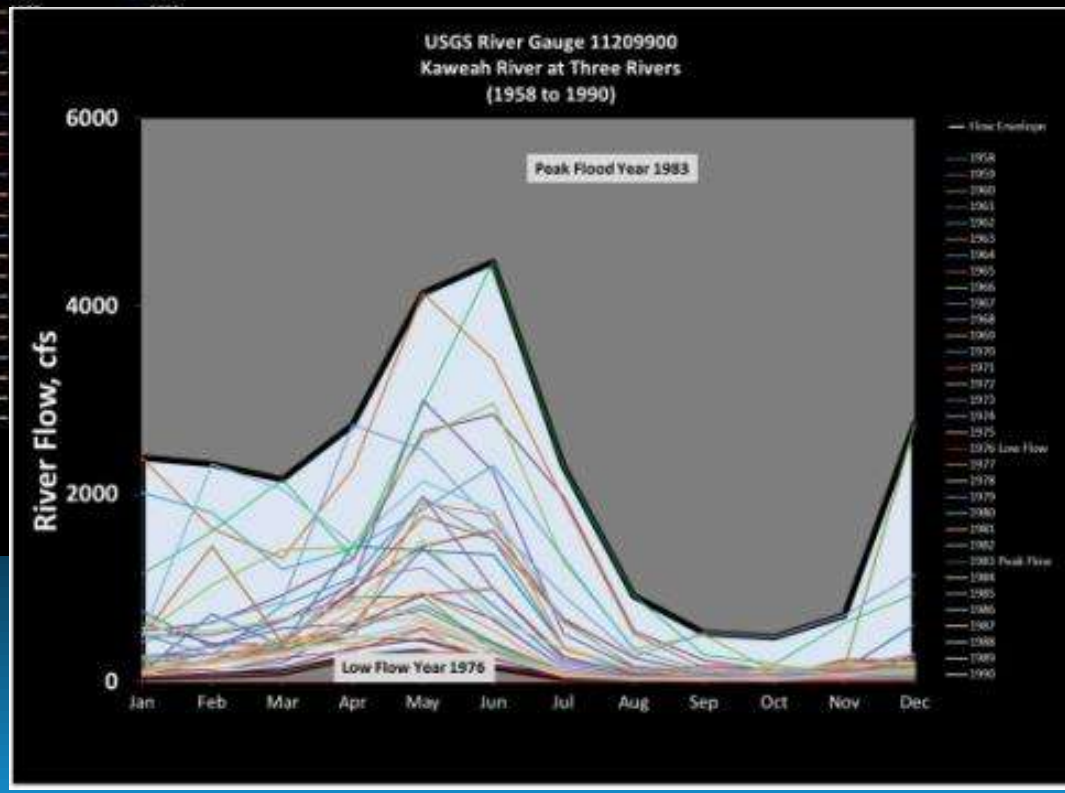


Hydrology of the Watersheds
River Flow for Gauges at Three Rivers

1903 to 1961
(Missing the main flood years)

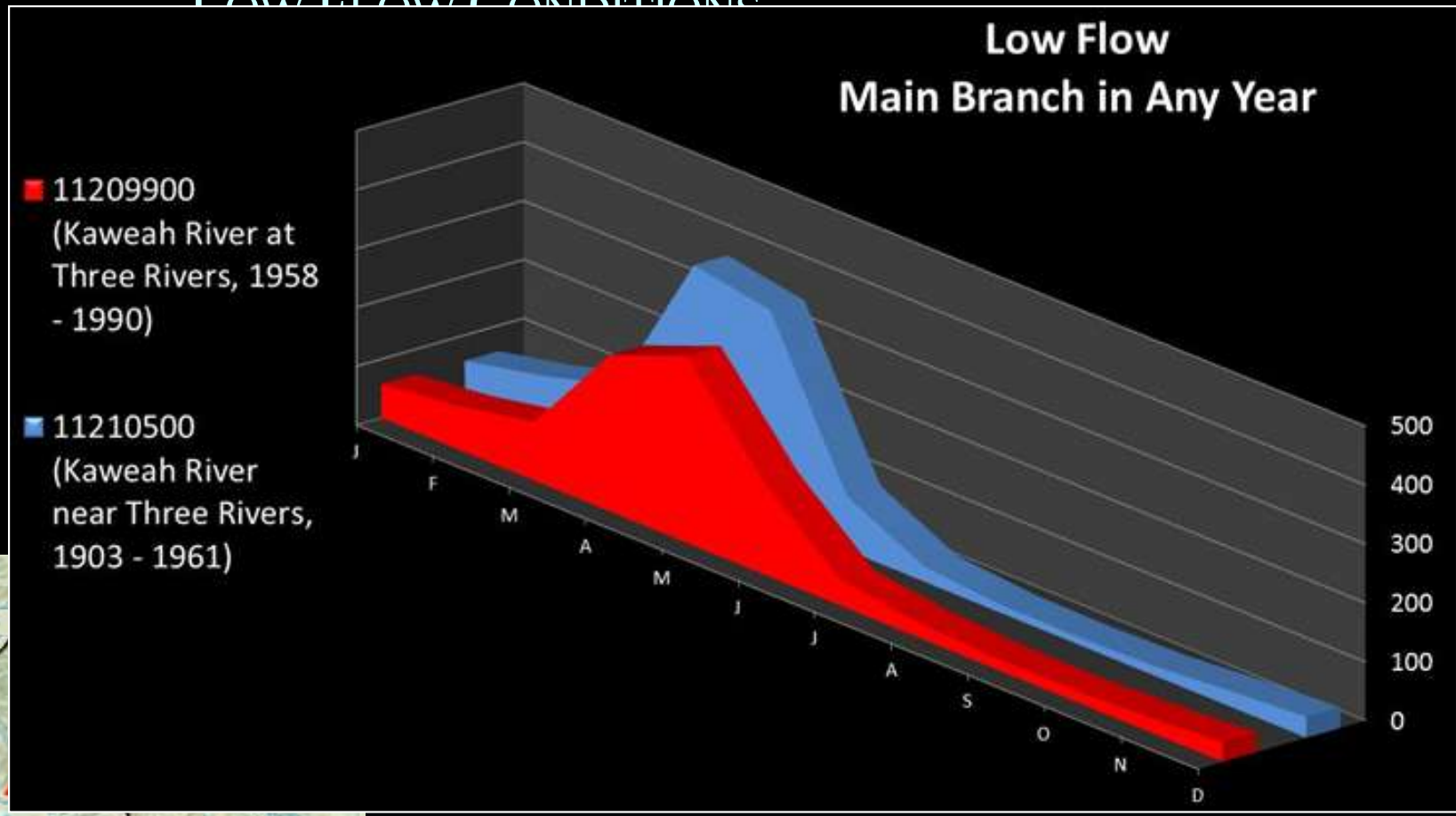


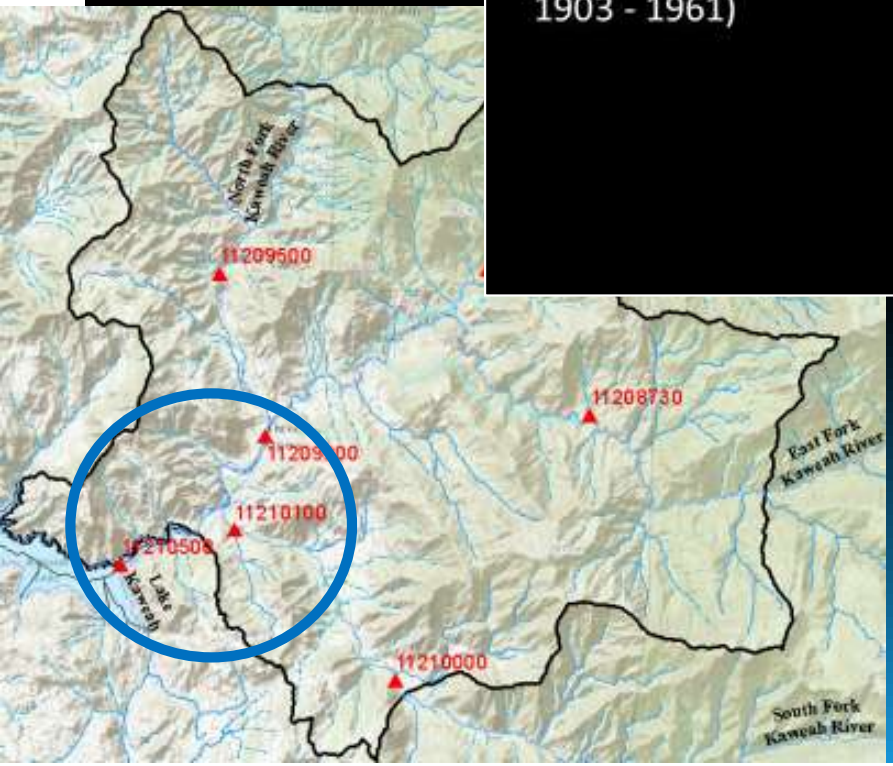
1958 to 1990
(Short Period of Record)



Hydrology of the Watersheds

Low Flow Conditions





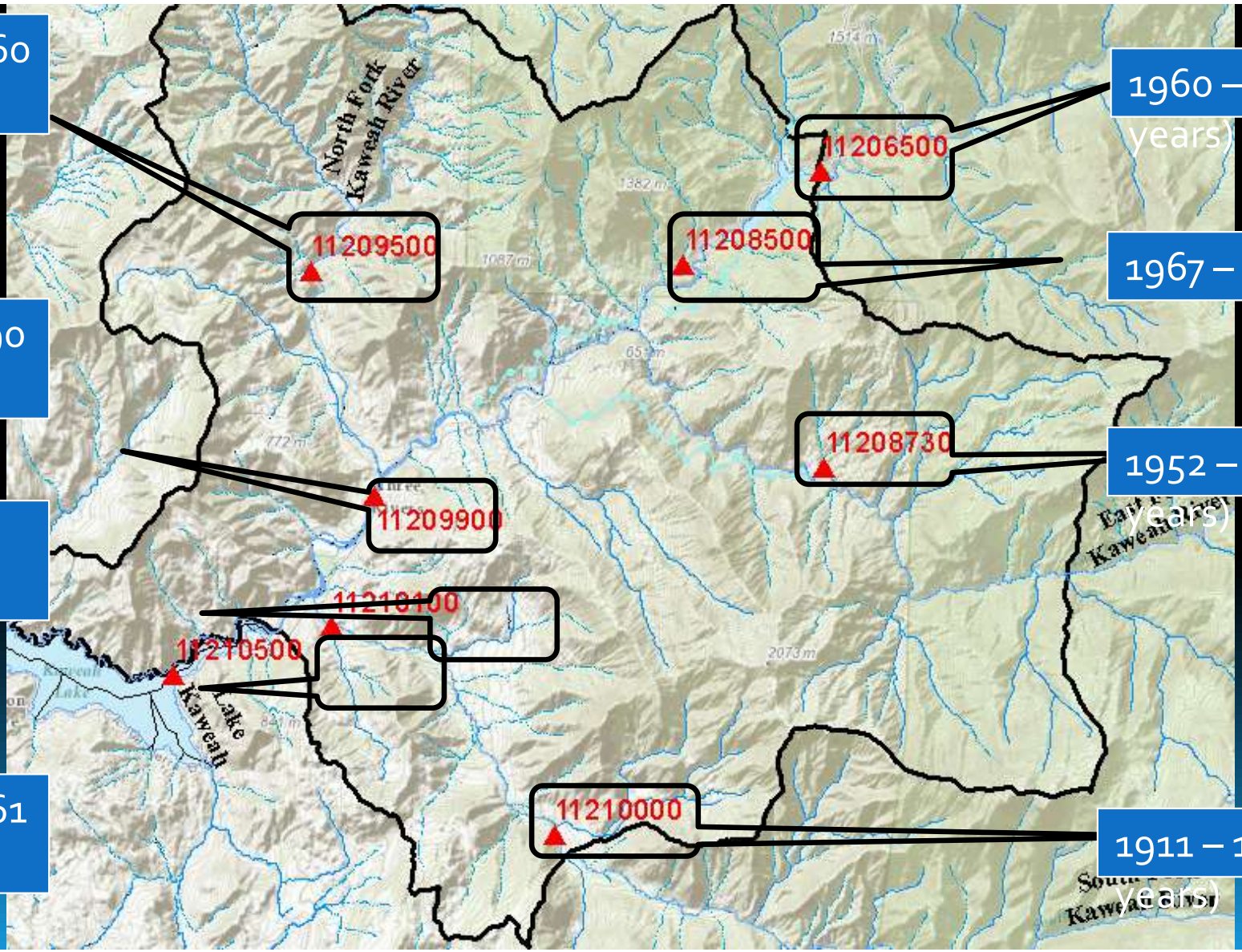
Low flow occurs in August and September and has a recorded minimum value of 14 cubic feet per second.

Hydrology of the Watersheds

River Flow Gauge Limitations

The periods of record are very short (6 to 61 years).

The records miss important drought and flood years.



1910 – 1960 (51 years)

1960 – 2003 (43 years)

1967 – 1973 (6 years)

1958 – 1990 (32 years)

1952 – 2013 (61 years)

1958 – 1990 (32 ears)

1903 – 1961 (58 years)

1911 – 1924 (13 years)

Water Demand

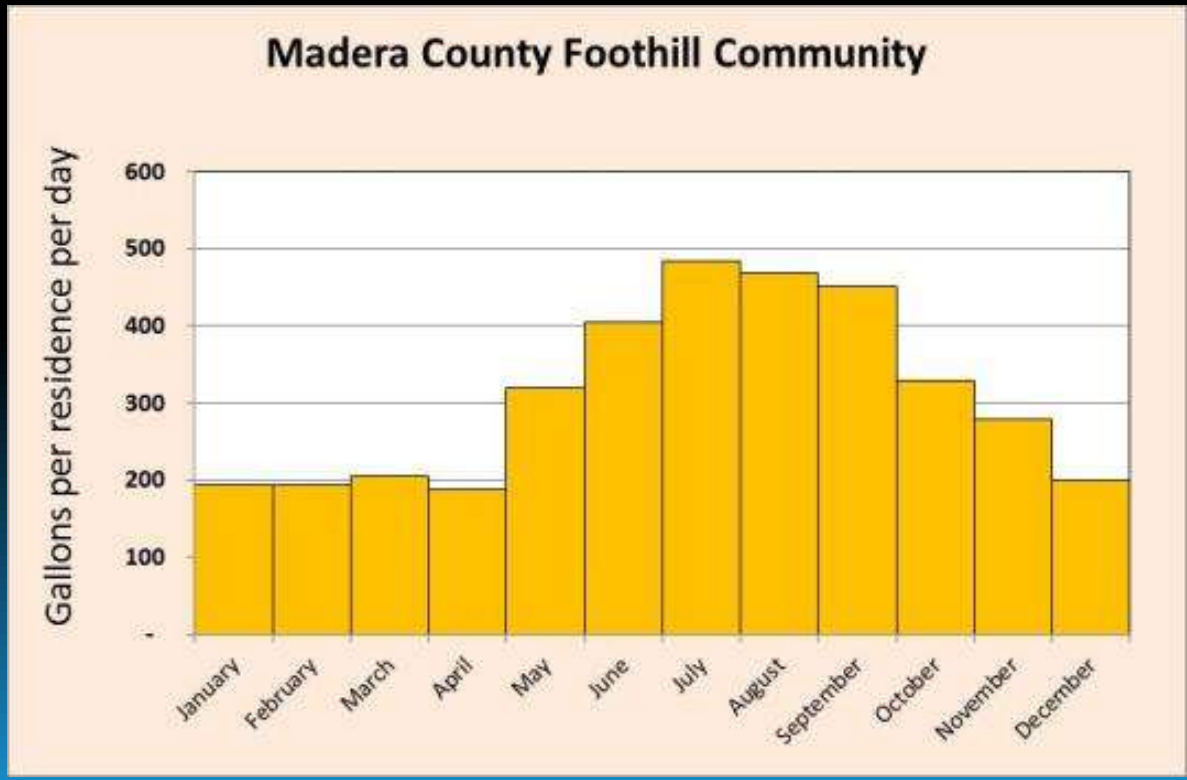
Water Demand

Water Demand

- US EPA estimate: 300 gallons/day
- Similar foothill community (YLP): 310 gallons/day - average

Water Demand Varies by Season

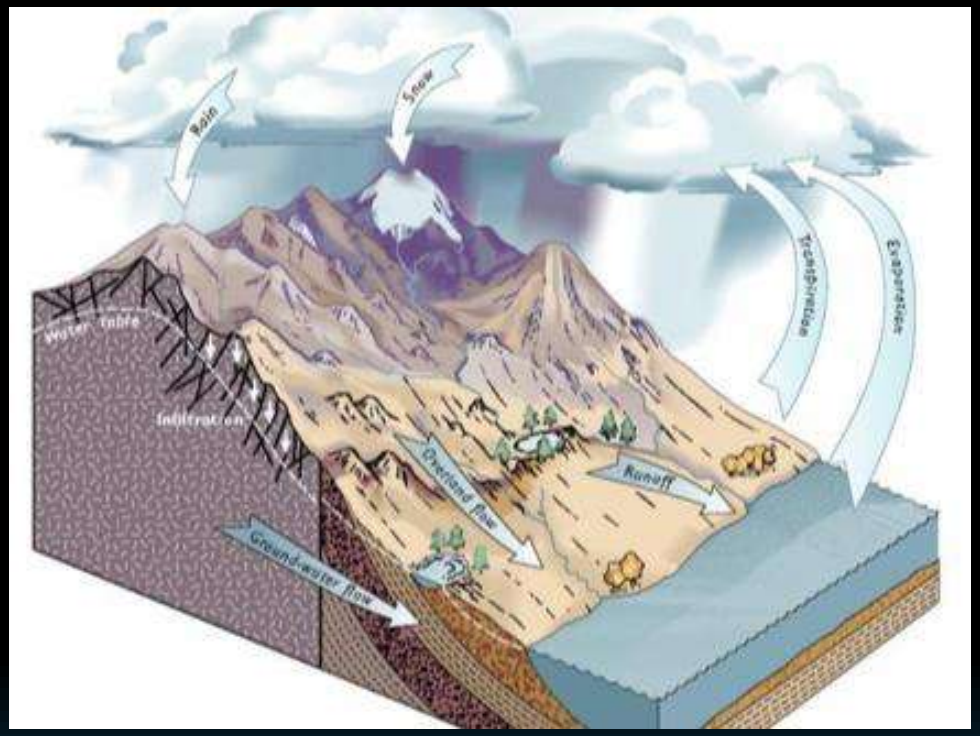
- Winter: 195 gallons/day
- Summer: 480 gallons/day



❖ Water Supply

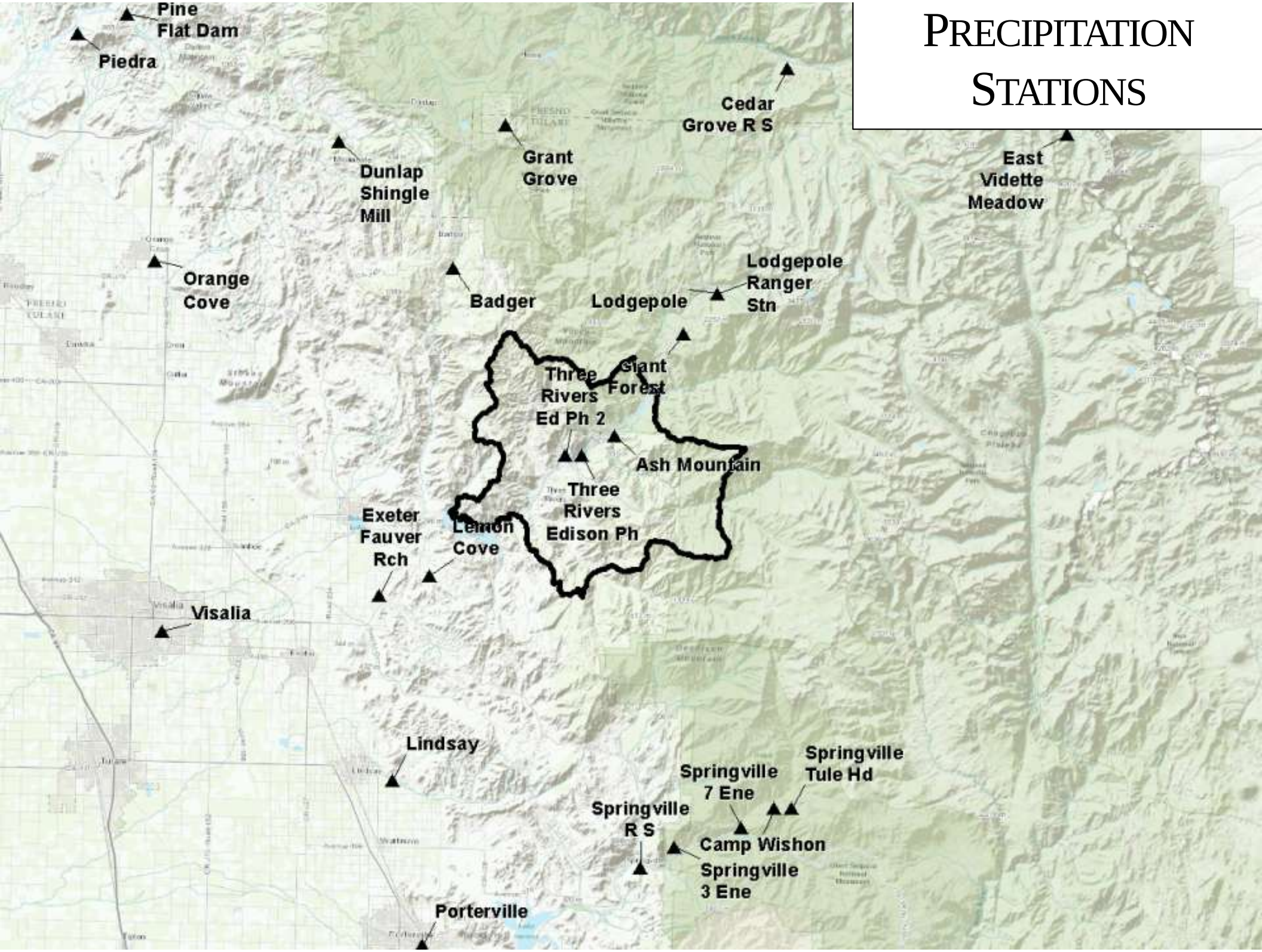
Water Supply

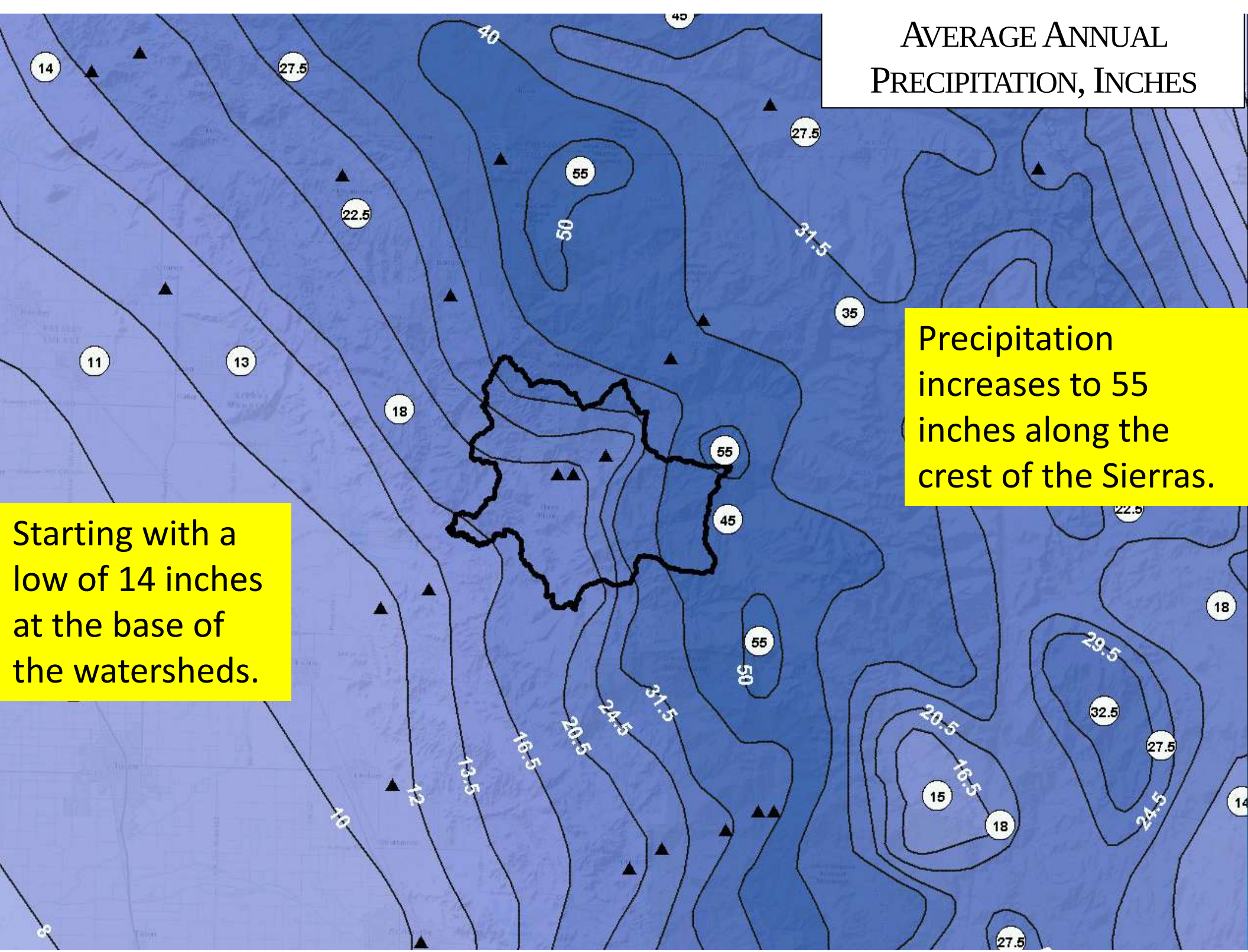
1. River flow from precipitation at high elevations.
2. Rain and snow falling within the local watersheds.



3. Groundwater in storage in the rock fractures.
4. Groundwater transported to the area via the rock fractures.

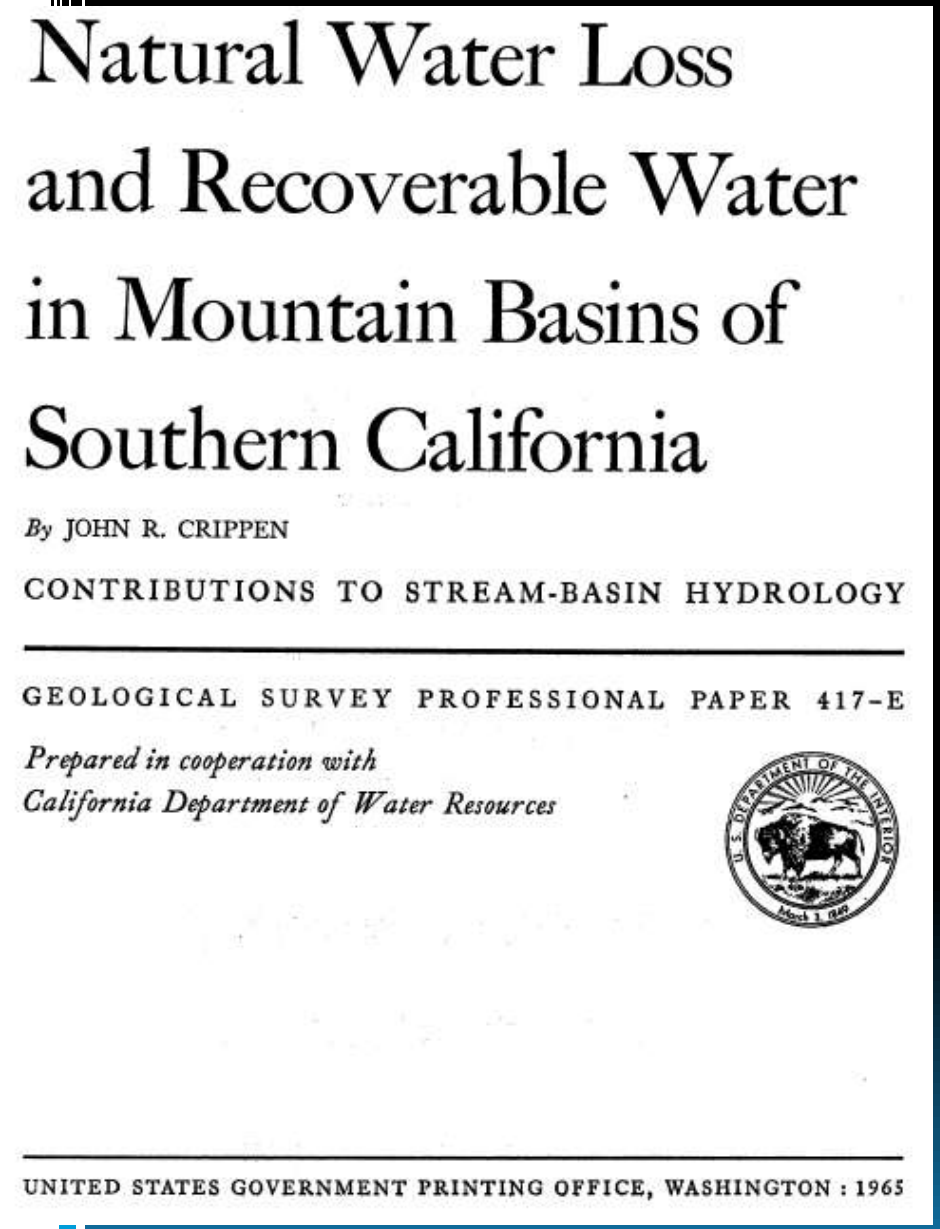
PRECIPITATION STATIONS




AVERAGE ANNUAL
PRECIPITATION, INCHES
Precipitation increases to 55 inches along the crest of the Sierras.
Starting with a low of 14 inches at the base of the watersheds.
14
27.5
40
45
55
50
31.5
35
22.5
11
13
18
45
55
50
31.5
24.5
20.5
16.5
13.5
12
10
8
29.5
32.5
27.5
20.5
16.5
15
18
24.5
18
14
27.5

❖ Groundwater Recharge

Groundwater Recharge
Methodology



Natural Water Loss and Recoverable Water in Mountain Basins of Southern California

By JOHN R. CRIPPEN

CONTRIBUTIONS TO STREAM-BASIN HYDROLOGY

GEOLOGICAL SURVEY PROFESSIONAL PAPER 417-E

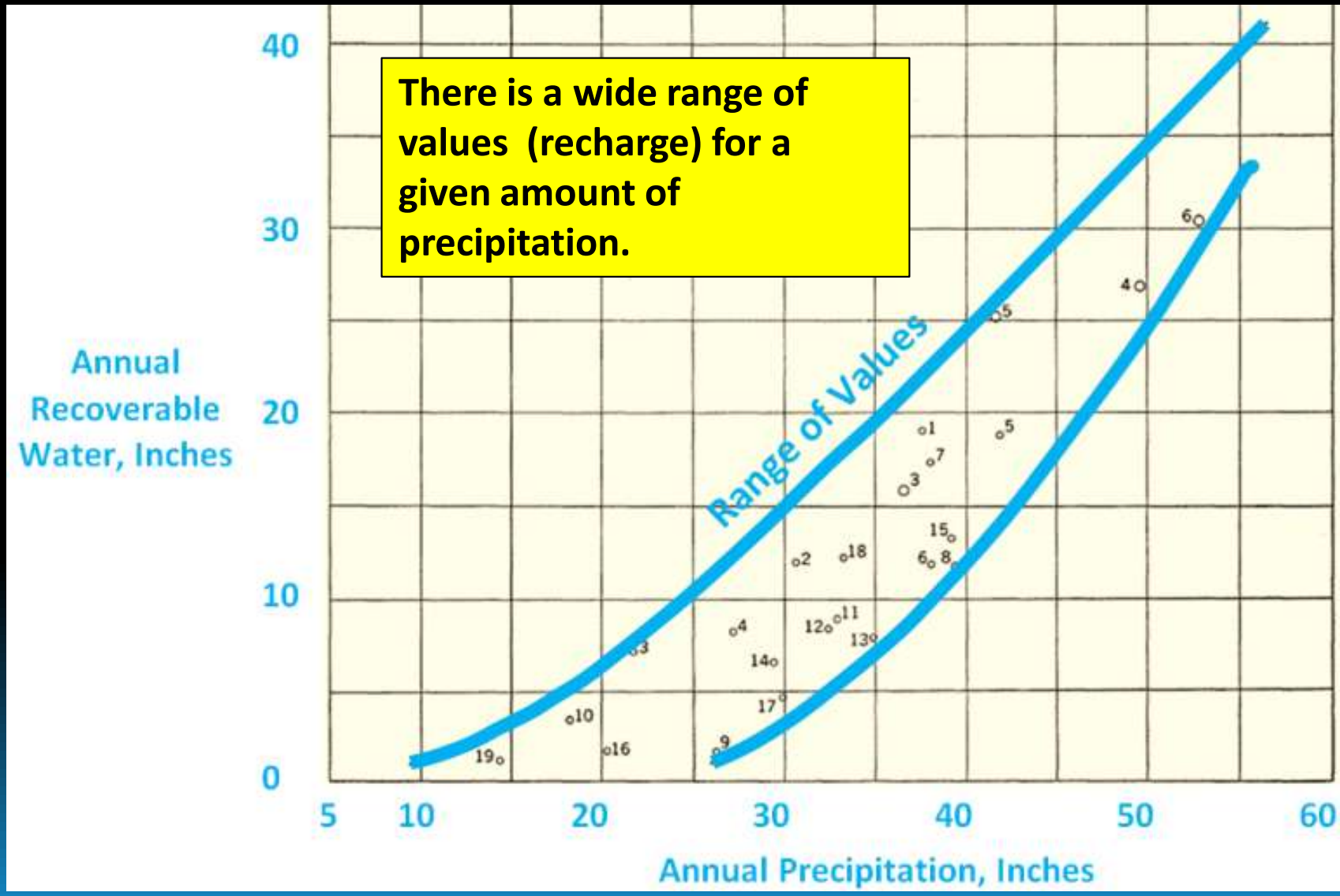
Prepared in cooperation with California Department of Water Resources

UNITED STATES GOVERNMENT PRINTING OFFICE, WASHINGTON : 1965

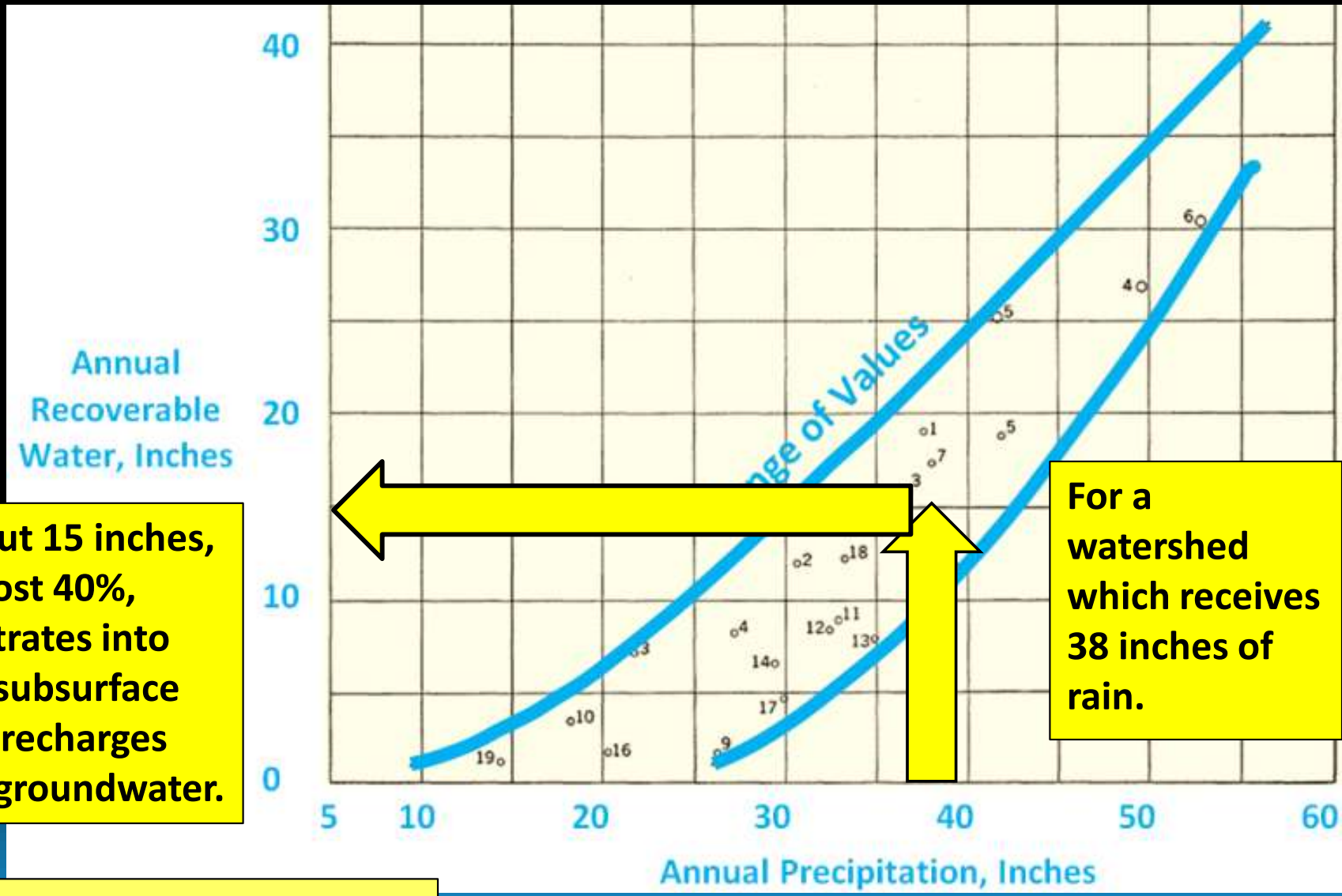
An older method that can be used to broadly estimate groundwater

Although the method has limitations, it can provide a simple and quick generalized estimate of regional recharge.

Groundwater Recharge
Methodology



Groundwater Recharge
Methodology

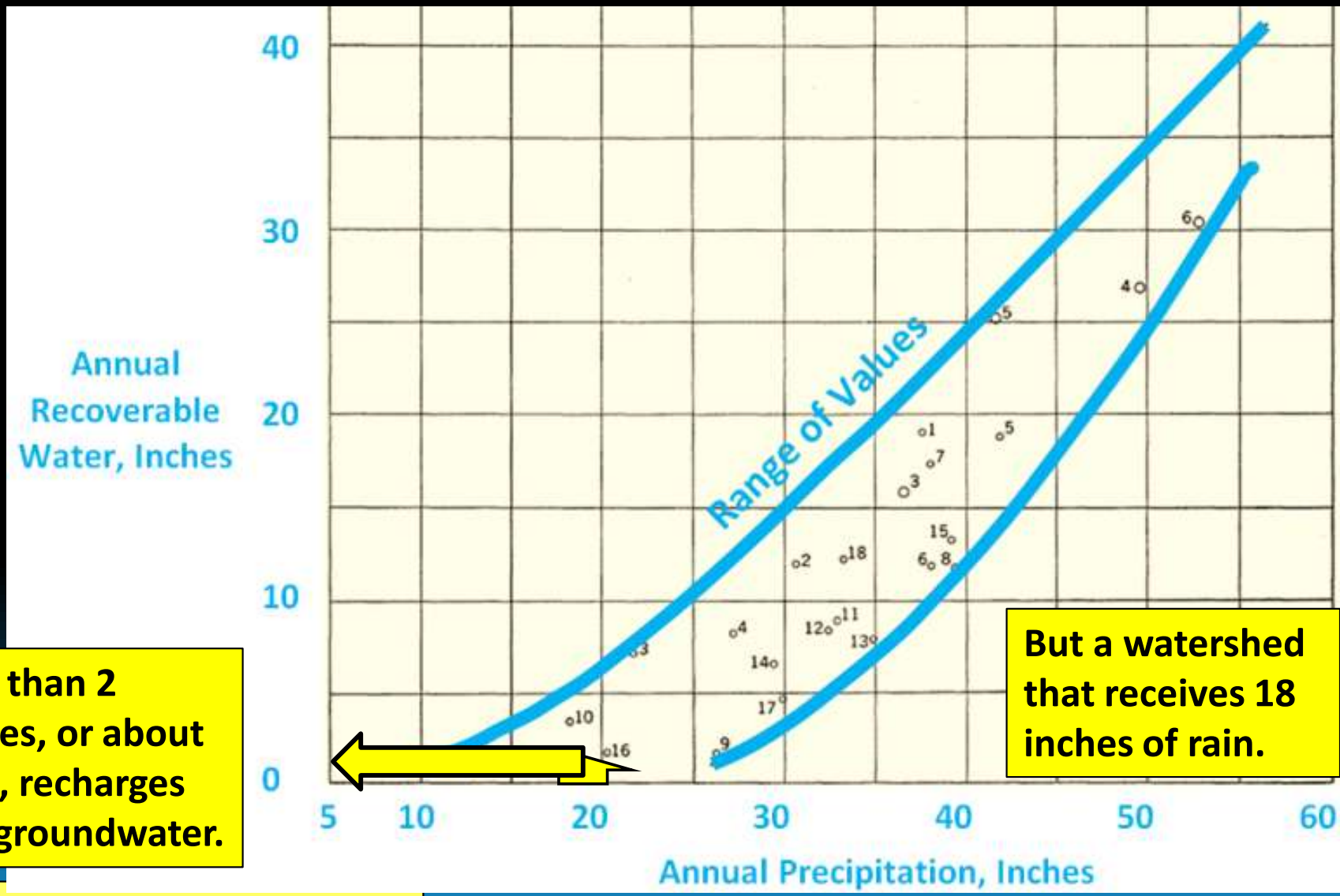


About 15 inches, almost 40%, infiltrates into the subsurface and recharges the groundwater.

For a watershed which receives 38 inches of rain.

But the range of values is 10 to 23 inches.

Groundwater Recharge
Methodology



Less than 2 inches, or about 10%, recharges the groundwater.

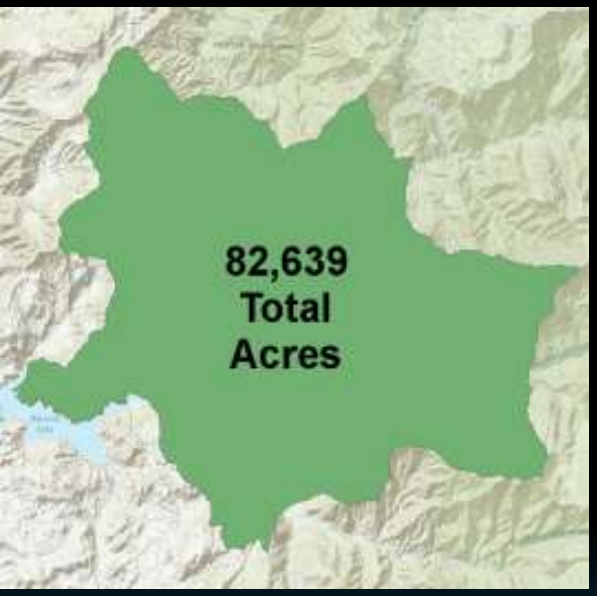
But a watershed that receives 18 inches of rain.

And the range of values is 0 to 5 inches.

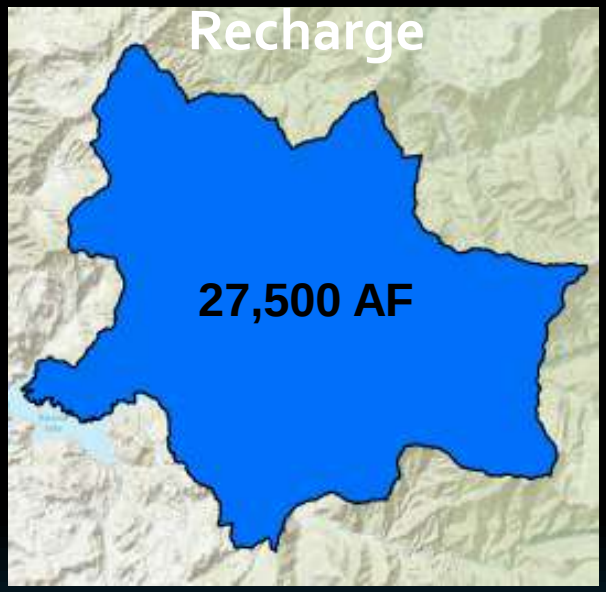
Water Balance

Average Precipitation Across the Entire Watershed = 22.5 inches.
Estimated groundwater recharge = 4 inches.

Area of the

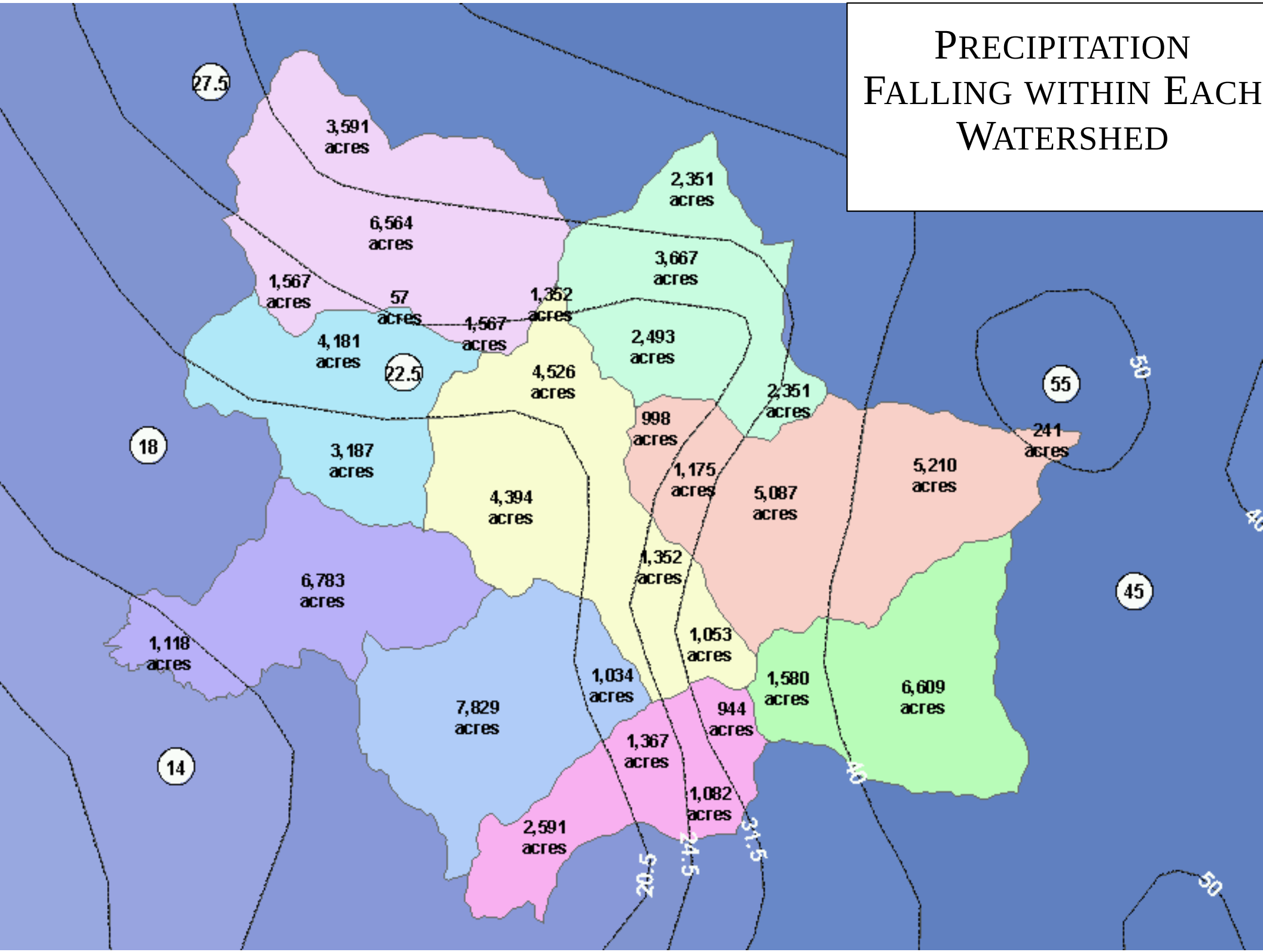


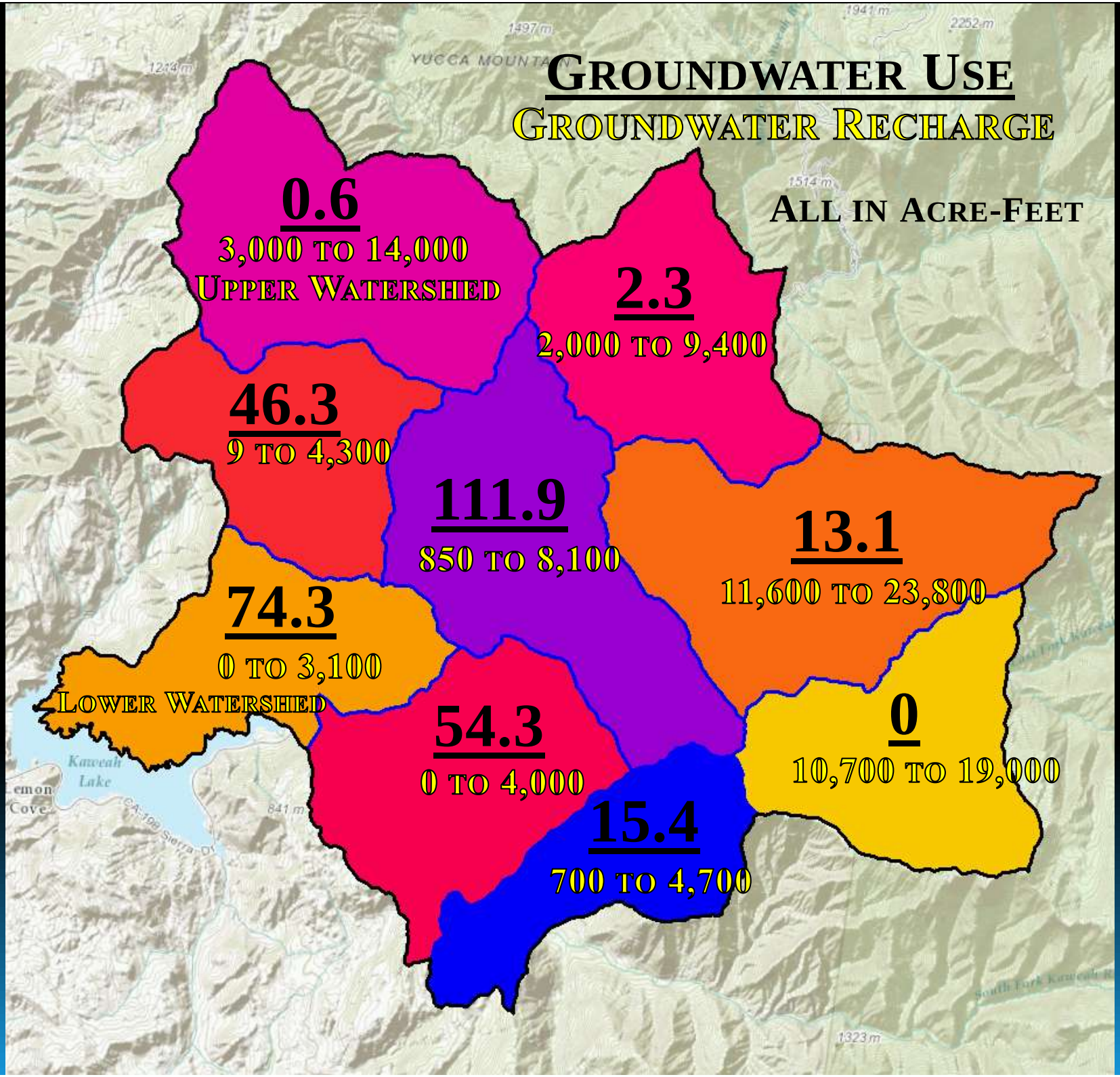
Groundwater Recharge



Groundwater Use

Precipitation Falling within Each Watershed

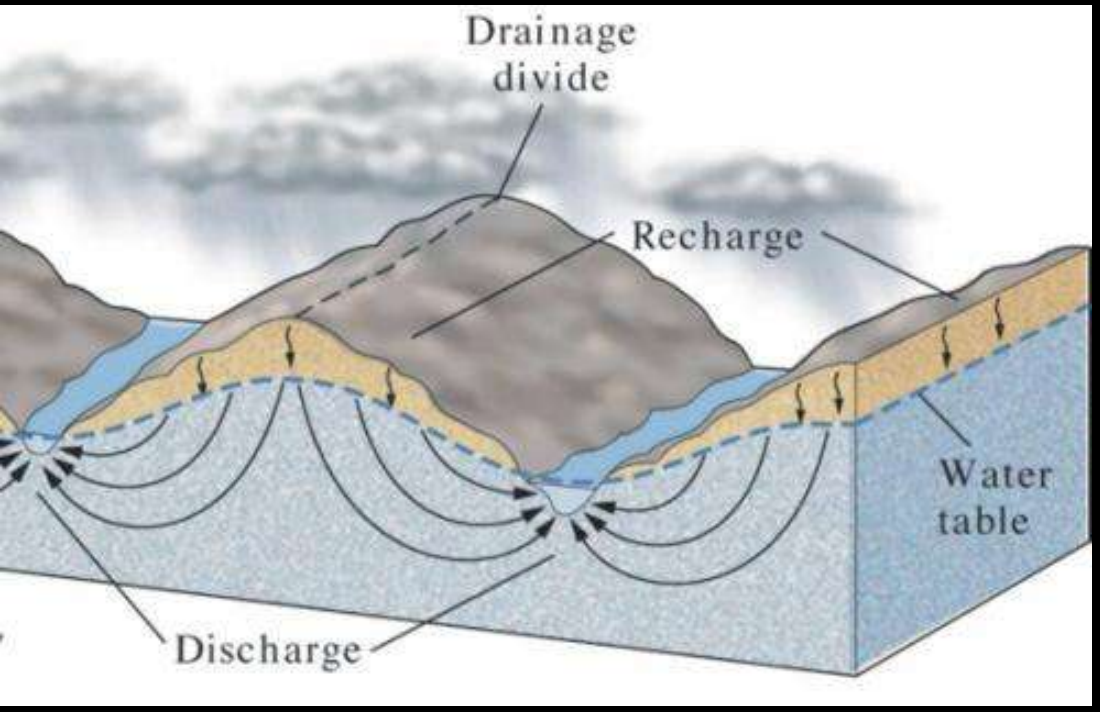


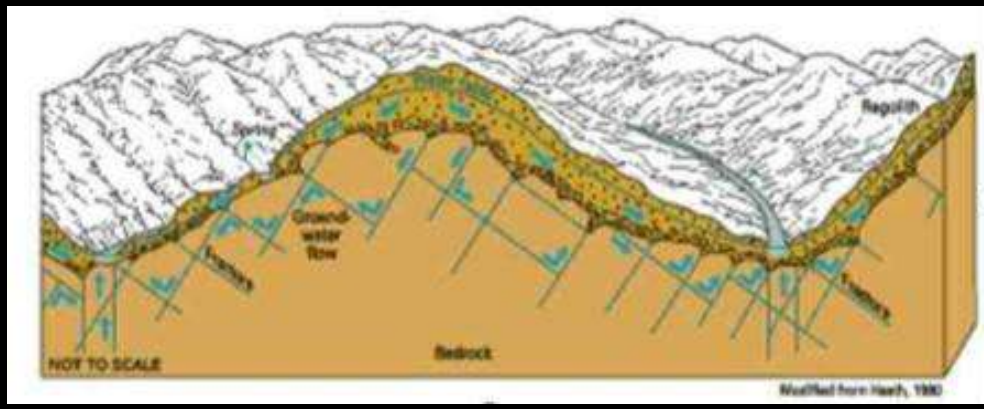

Groundwater Use
Groundwater Recharge
All in Acre-Feet
0.6
3,000 to 14,000
Upper Watershed
2.3
2,000 to 9,400
46.3
9 to 4,300
111.9
850 to 8,100
13.1
11,600 to 23,800
74.3
0 to 3,100
Lower Watershed
54.3
0 to 4,000
0
10,700 to 19,000
15.4
700 to 4,700
Yucca Mountain
Kaweah Lake
Cove
1497 m
1941 m
2252 m
1514 m
1323 m
841 m

- AQUIFERS

The Aquifers

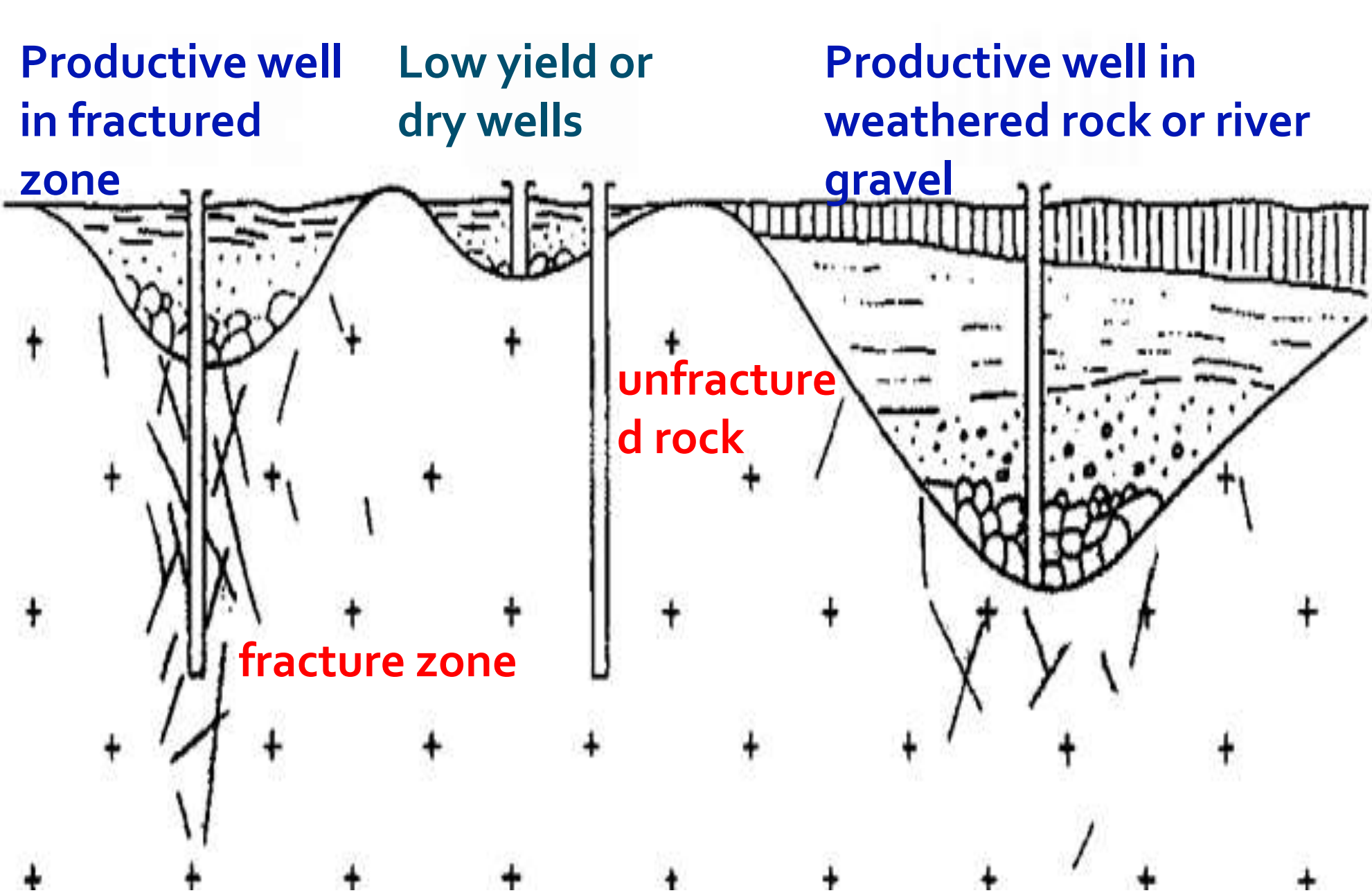
Alluvial and Fractured



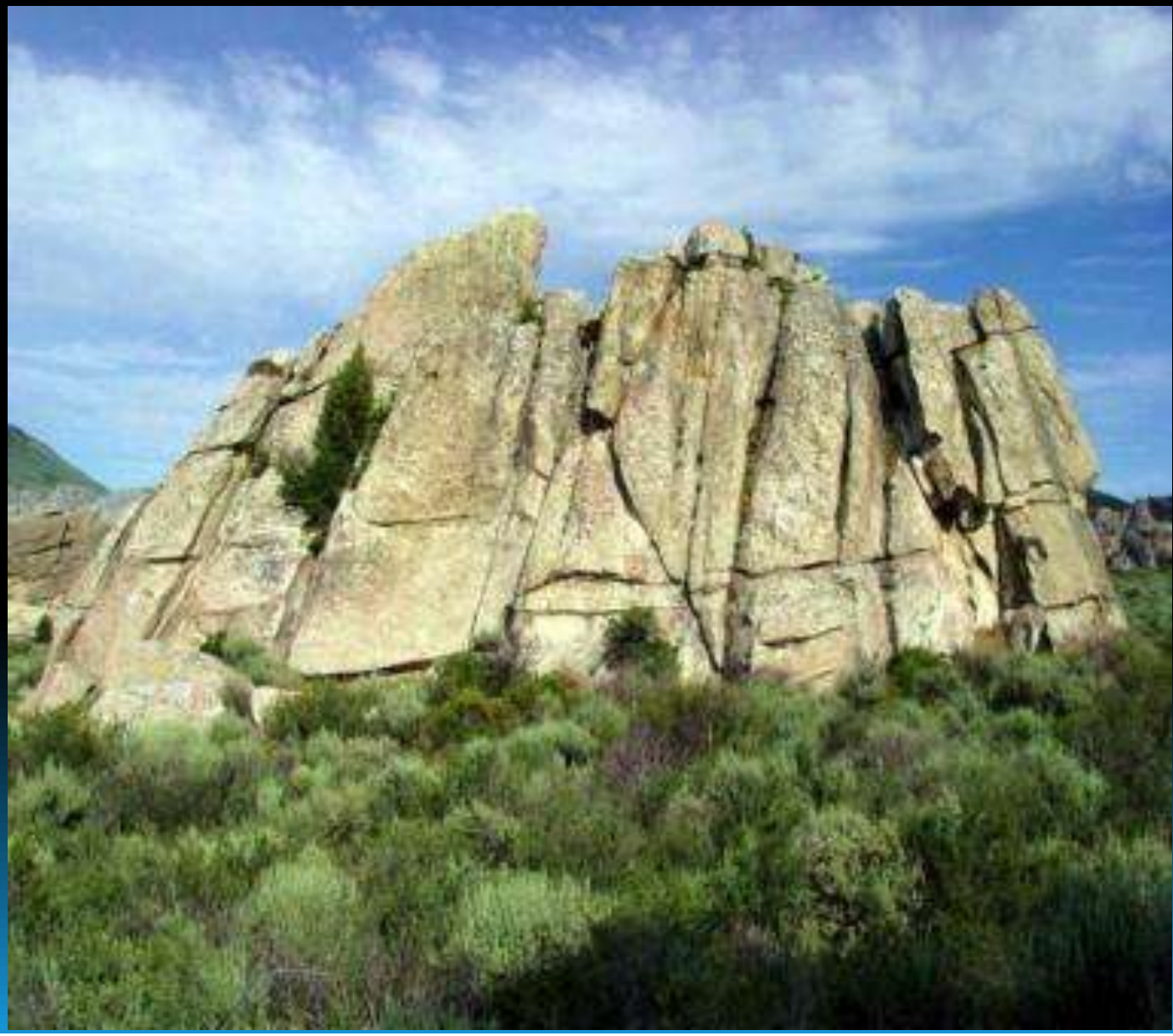


Groundwater Movement is Downhill...
…from High to Low Elevation...
…from Recharge to Discharge area.

Fractured Rock Aquifers



Fractured Rock Aquifers



Fractured Rock Aquifers

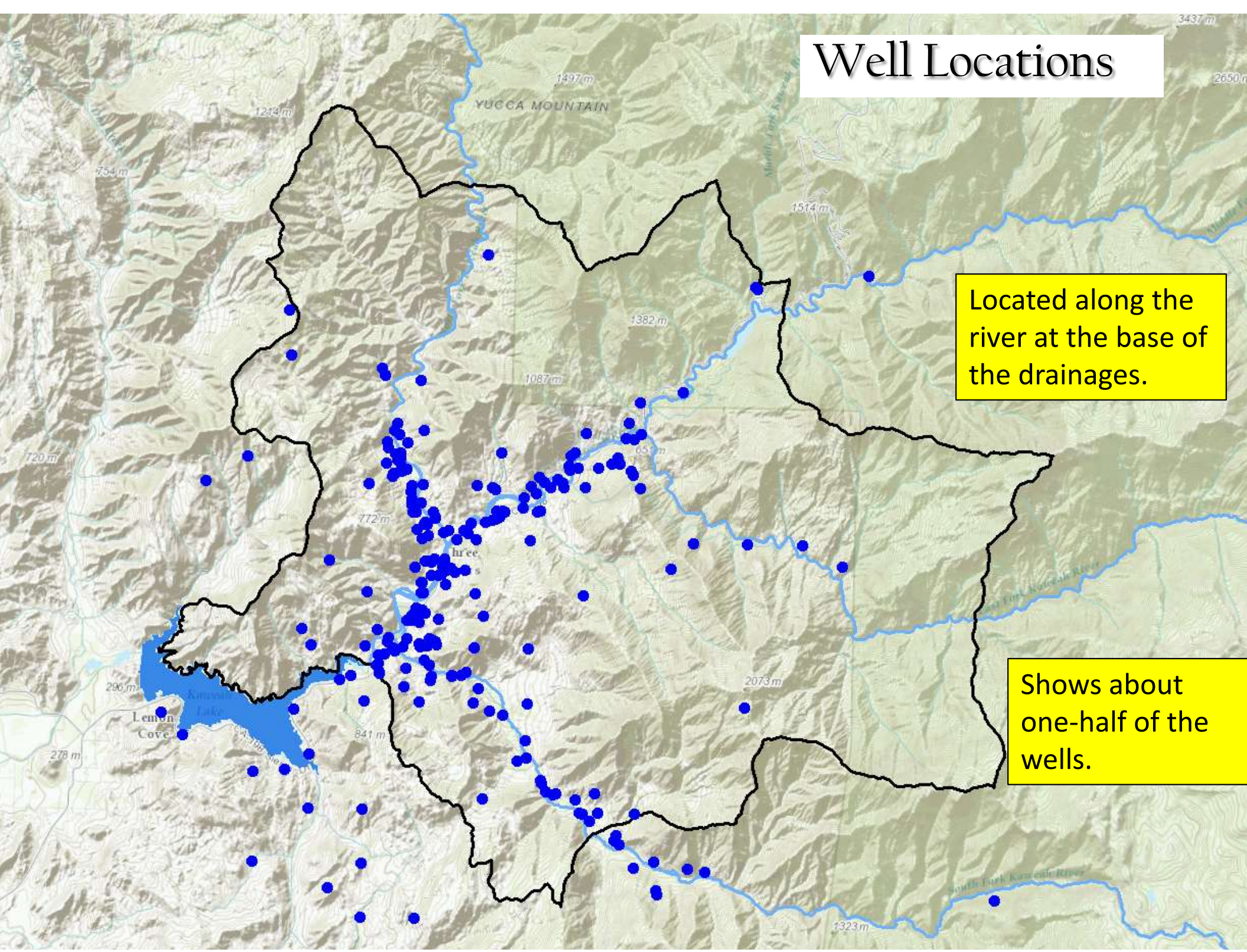
FRACTURED ROCK AQUIFERS


Northwest trending rock fractures, N. Fork of the Kaweah
Northeast trending fractures

Water Supply

Wells in Fractured Rock

Well Locations



Located along the river at the base of the drainages.

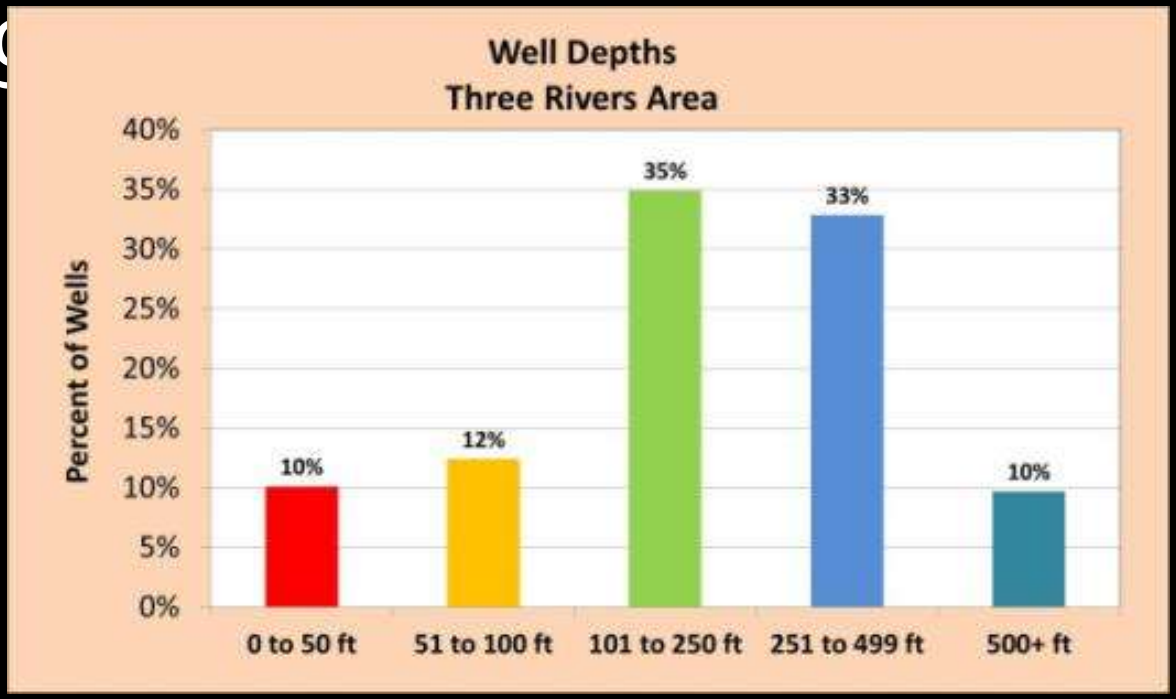
Shows about one-half of the wells.

Well Information from Well Driller's Logs

- Number of well logs reported to DWR: 486

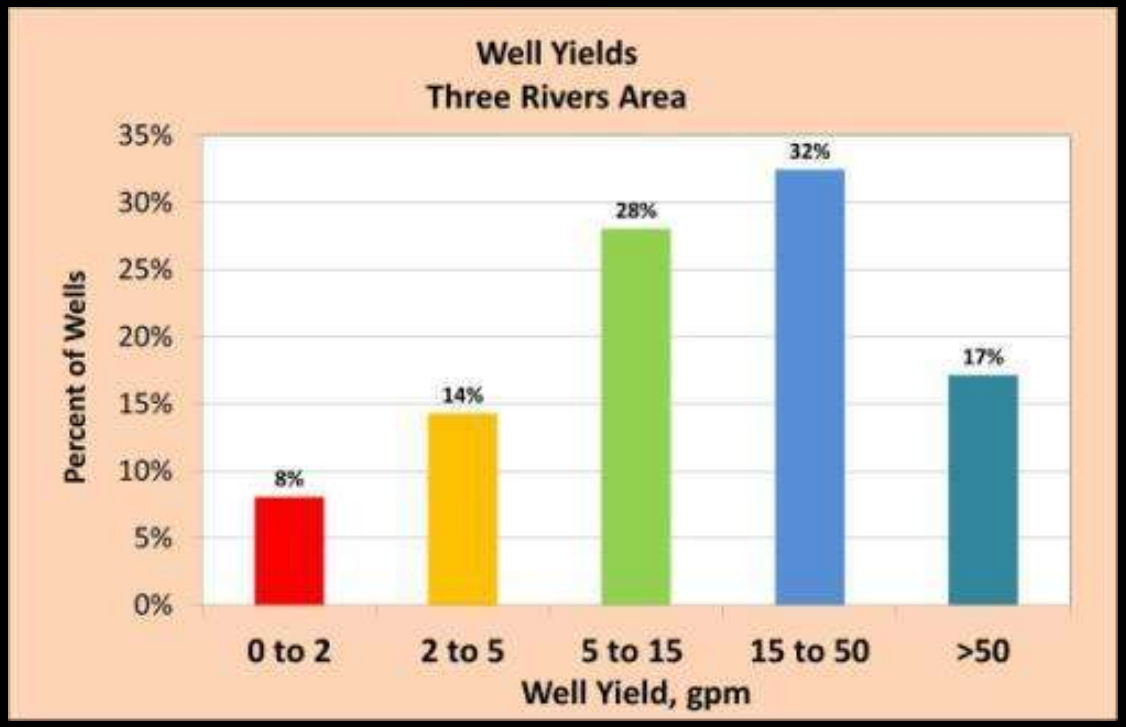
- 231 well logs with good location data and 255 located only to the nearest section.

Well Information from Well Driller's Log



- Well Depths
  - 68% of the wells had depths of 100 to 500 feet
  - 10% had depths less than 50 feet
  - 22% had depths less than 100 feet.

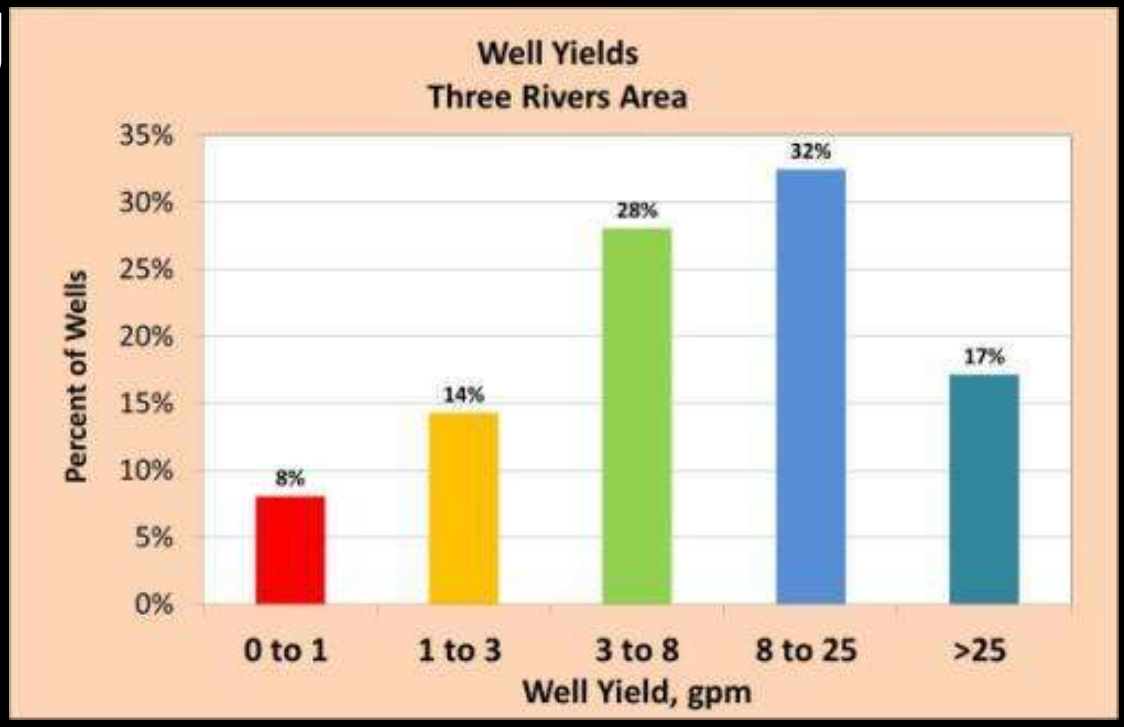
Well Information from Well Driller's Log



- Well Yields (*air lift test at time of drilling)
  - 8% of the wells had yields less than 2 gpm
  - 42% of the wells had yields between 2 and 15 gpm
  - 50% of the wells had yields greater than 15 gpm

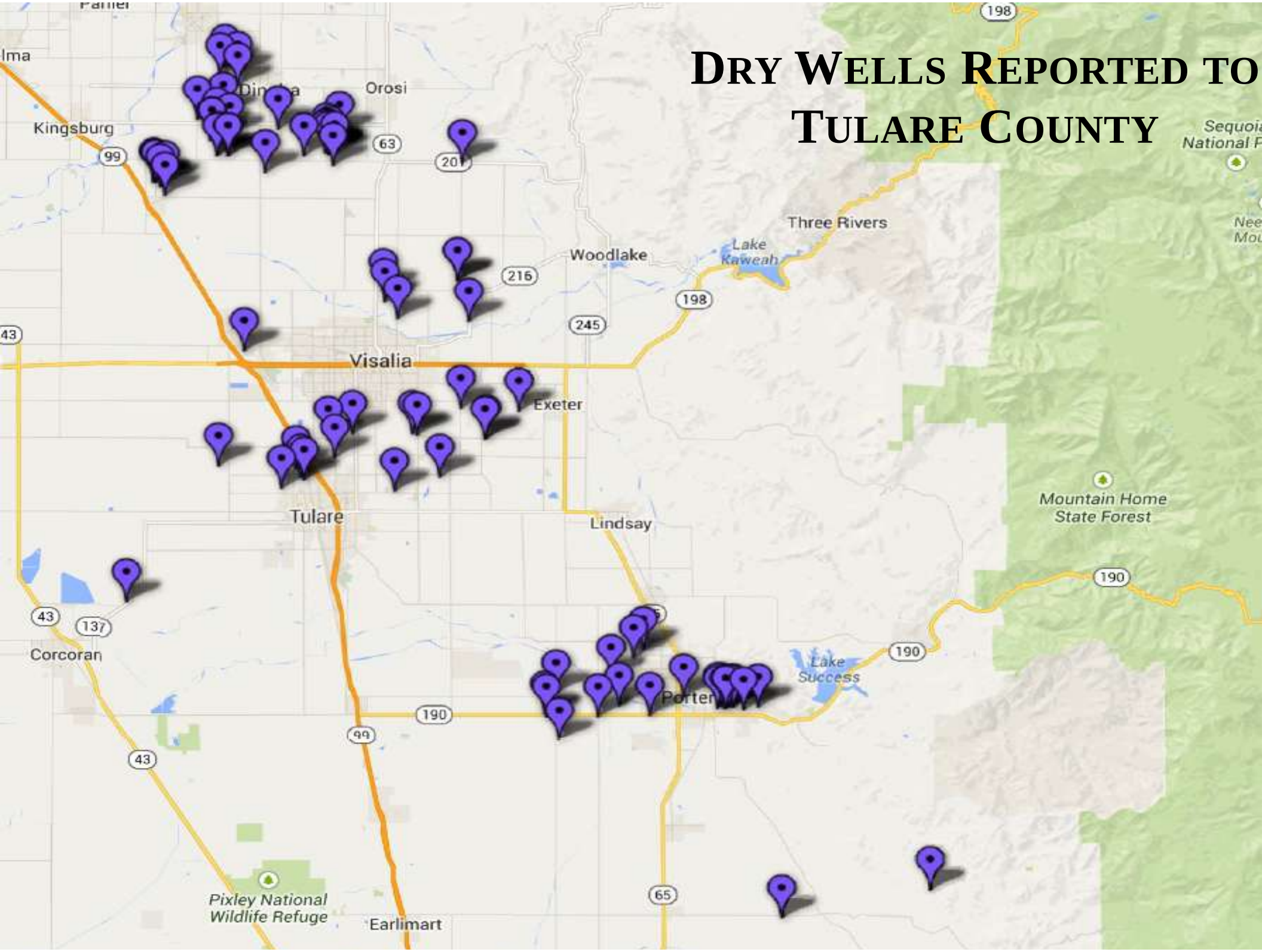
*Well yields by air lift are only rough estimates of the wells long-term pumping capacity. A rule of thumb to estimate in-use pumping capacity is take 1/4th to 1/2 of the air lift test estimate.

Well Information from Well Driller's Log



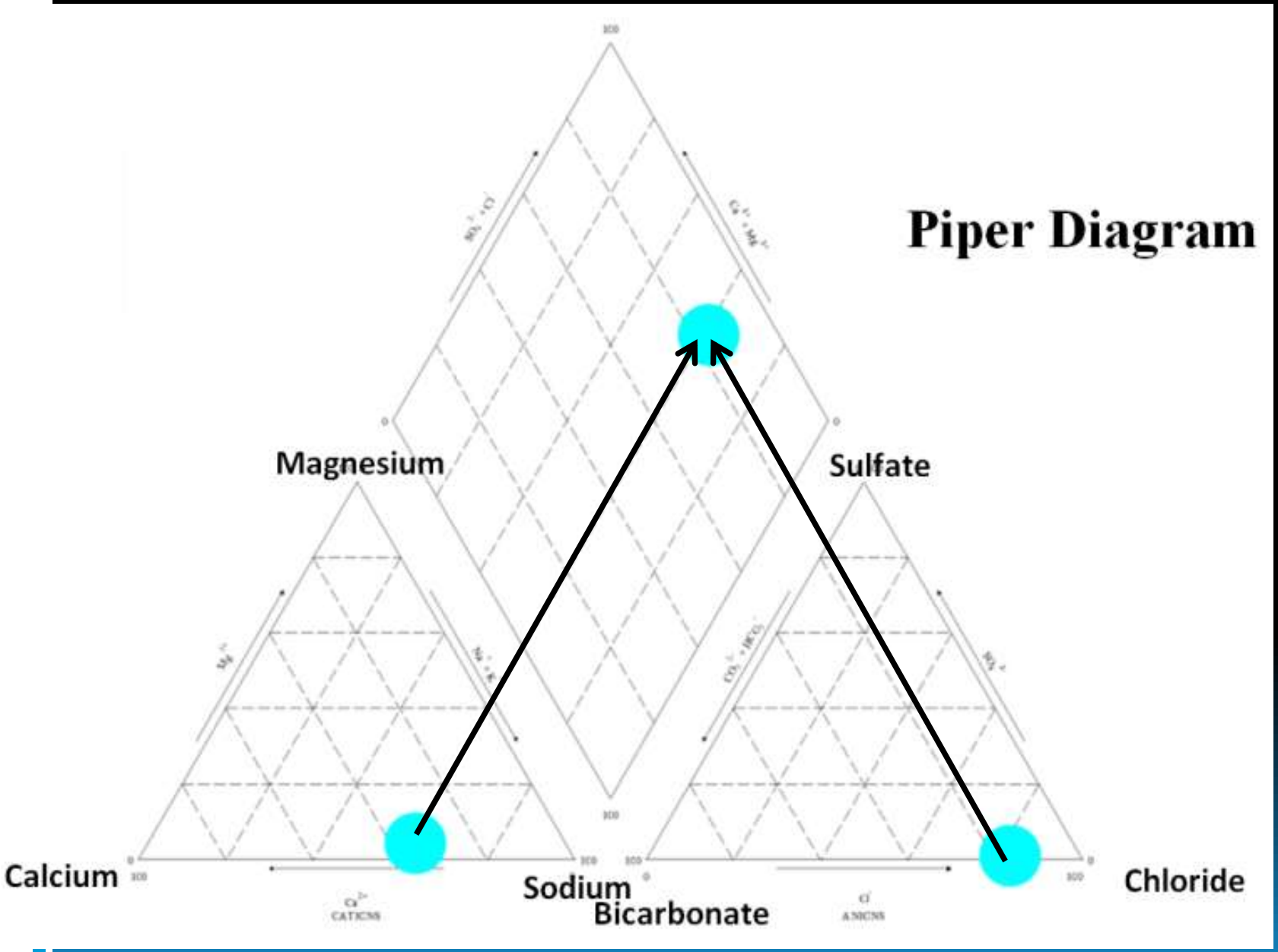
- Well Yields (estimated from ½ of the air lift test)
  - 8% of the wells had yields less than 1 gpm
  - 42% of the wells had yields between 1 and 8 gpm
  - 50% of the wells had yields greater than 8 gpm

Dry Wells Reported to Tulare County



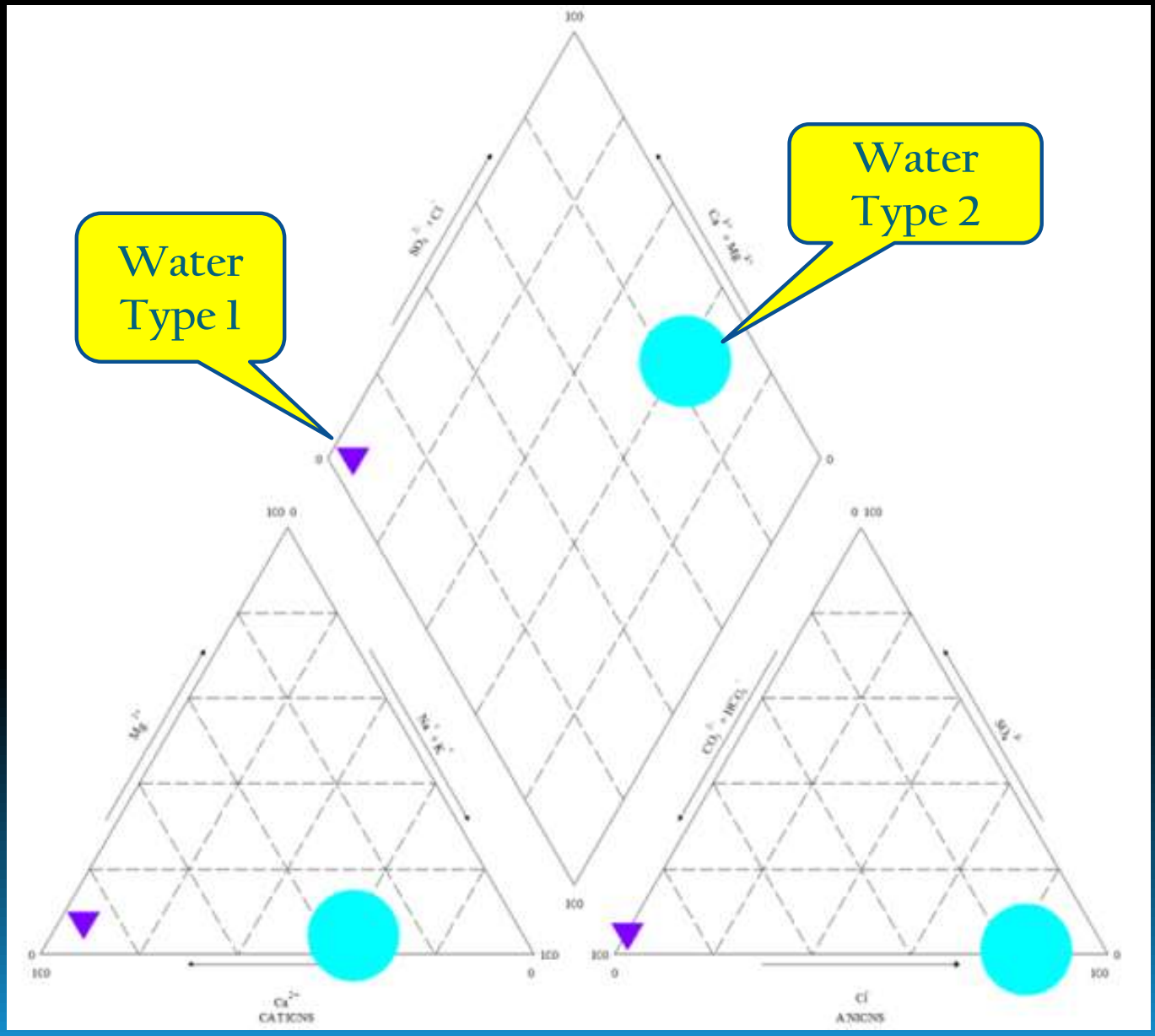
- Water Source Determined by Water Chemistry

Water Chemistry



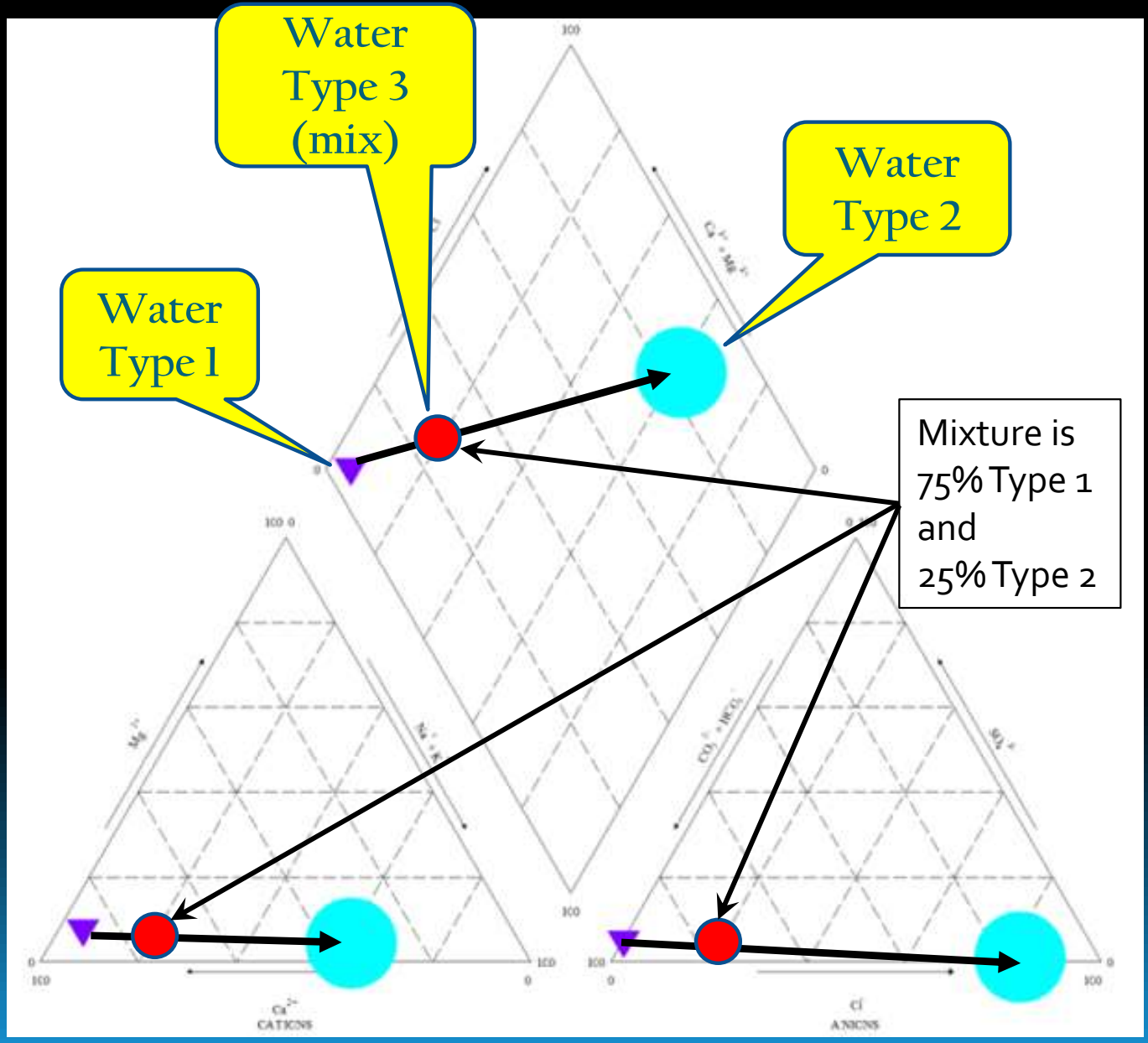
Chemistry from the cation and anion triangles are projected onto the central diamond

Water Chemistry



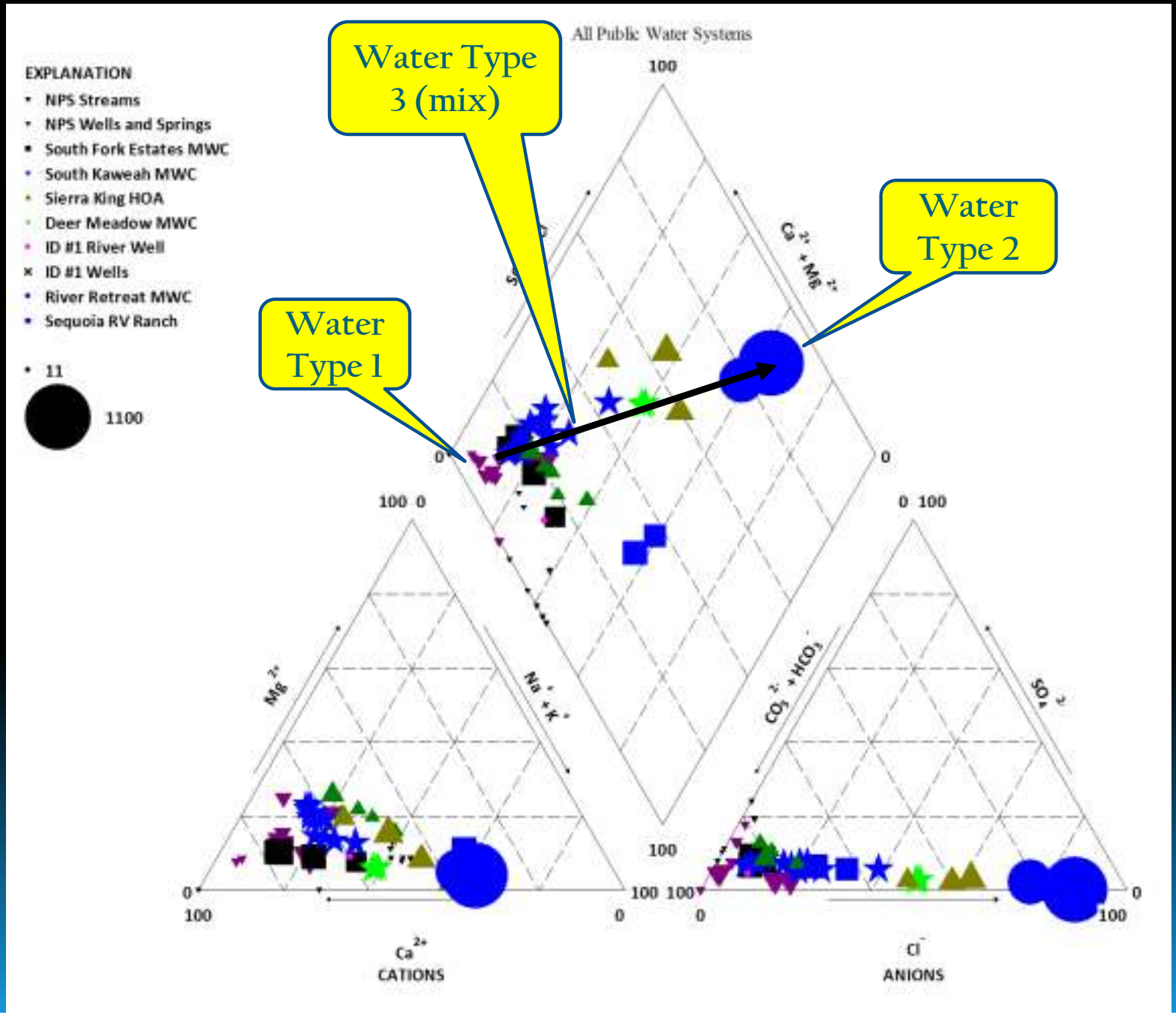
Diameter of the circle is proportional to its dissolved mineral content.

Water Chemistry

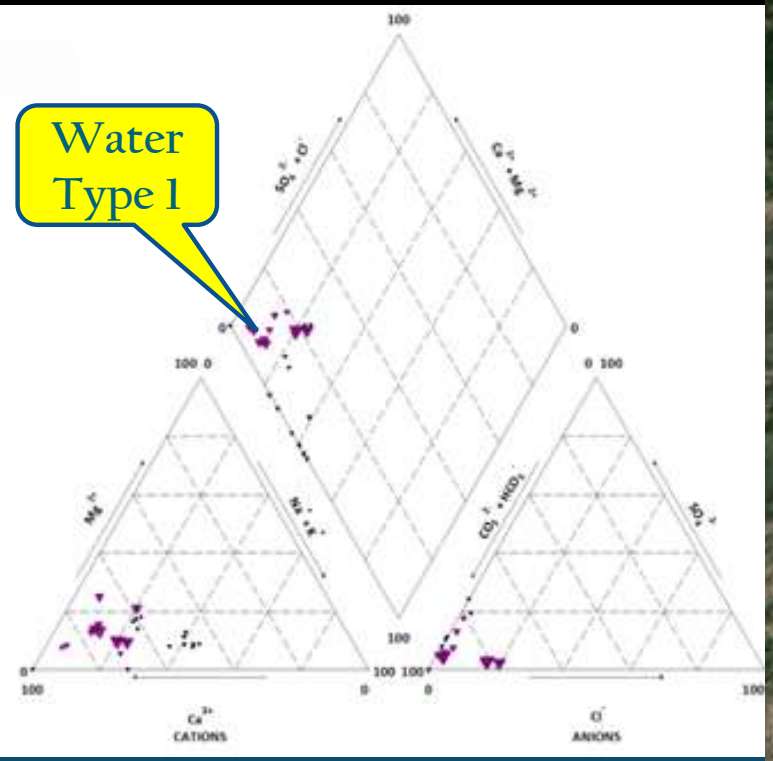


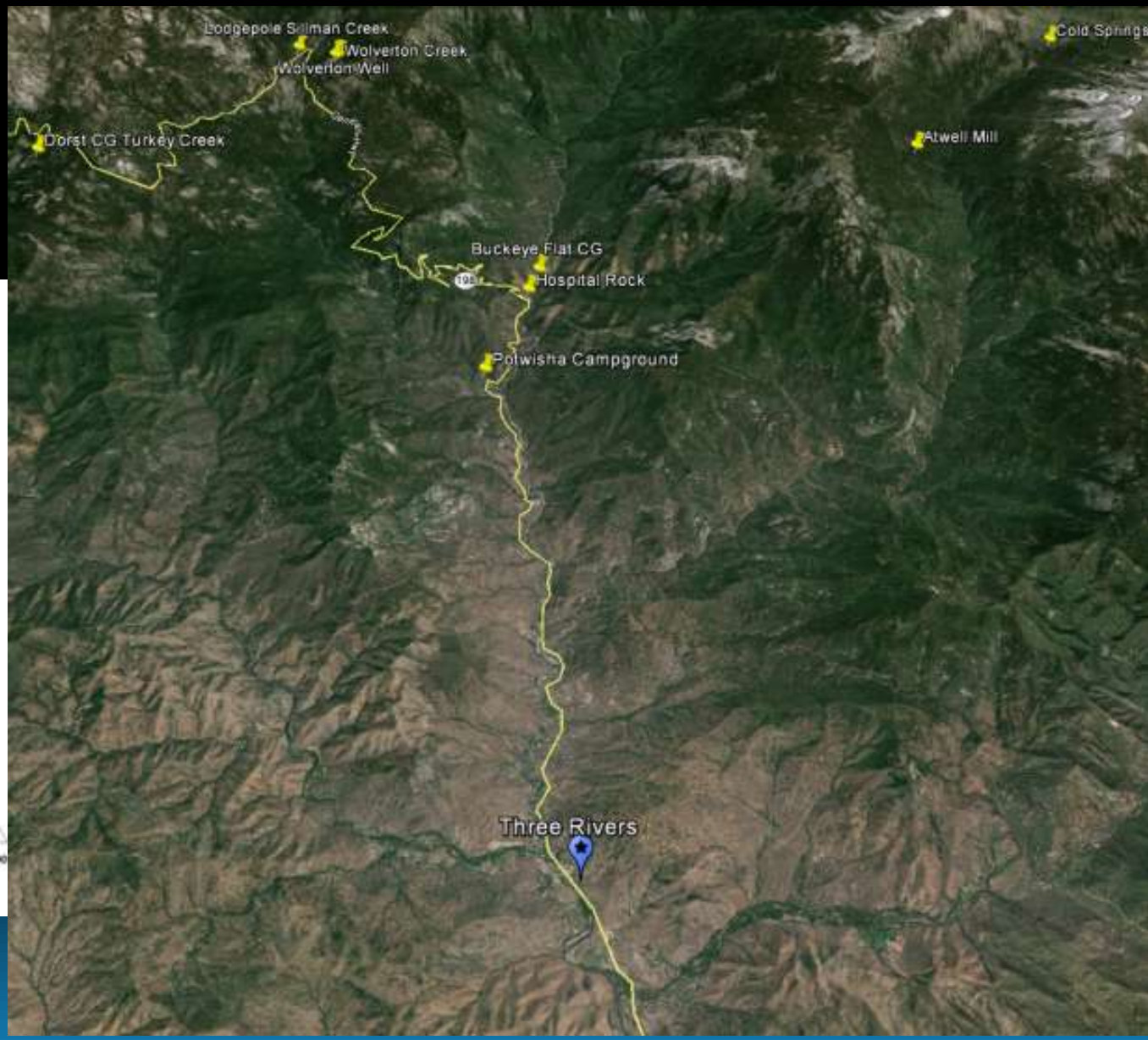
Water Chemistry

Water Chemistry of Public water Systems in the Three Rivers Area



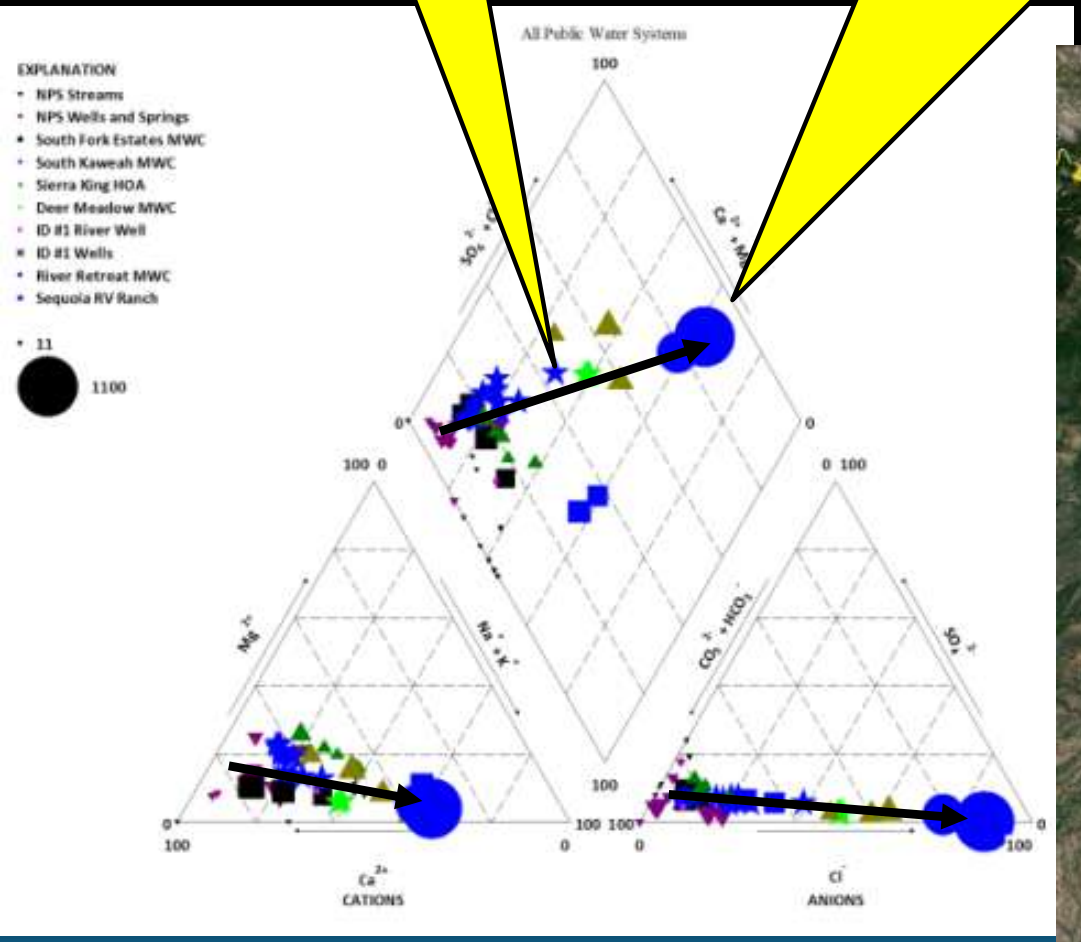
Water Chemistry

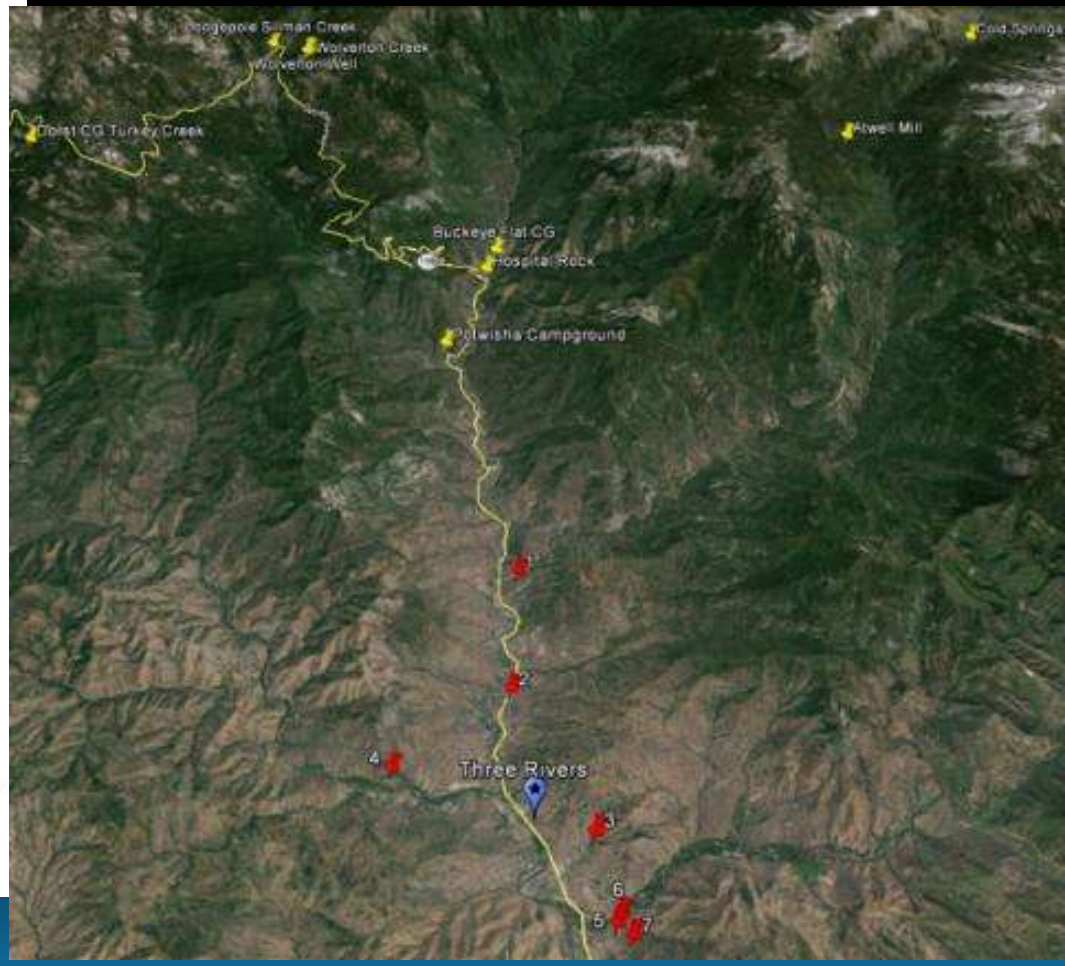




Water Type 3 (mix)

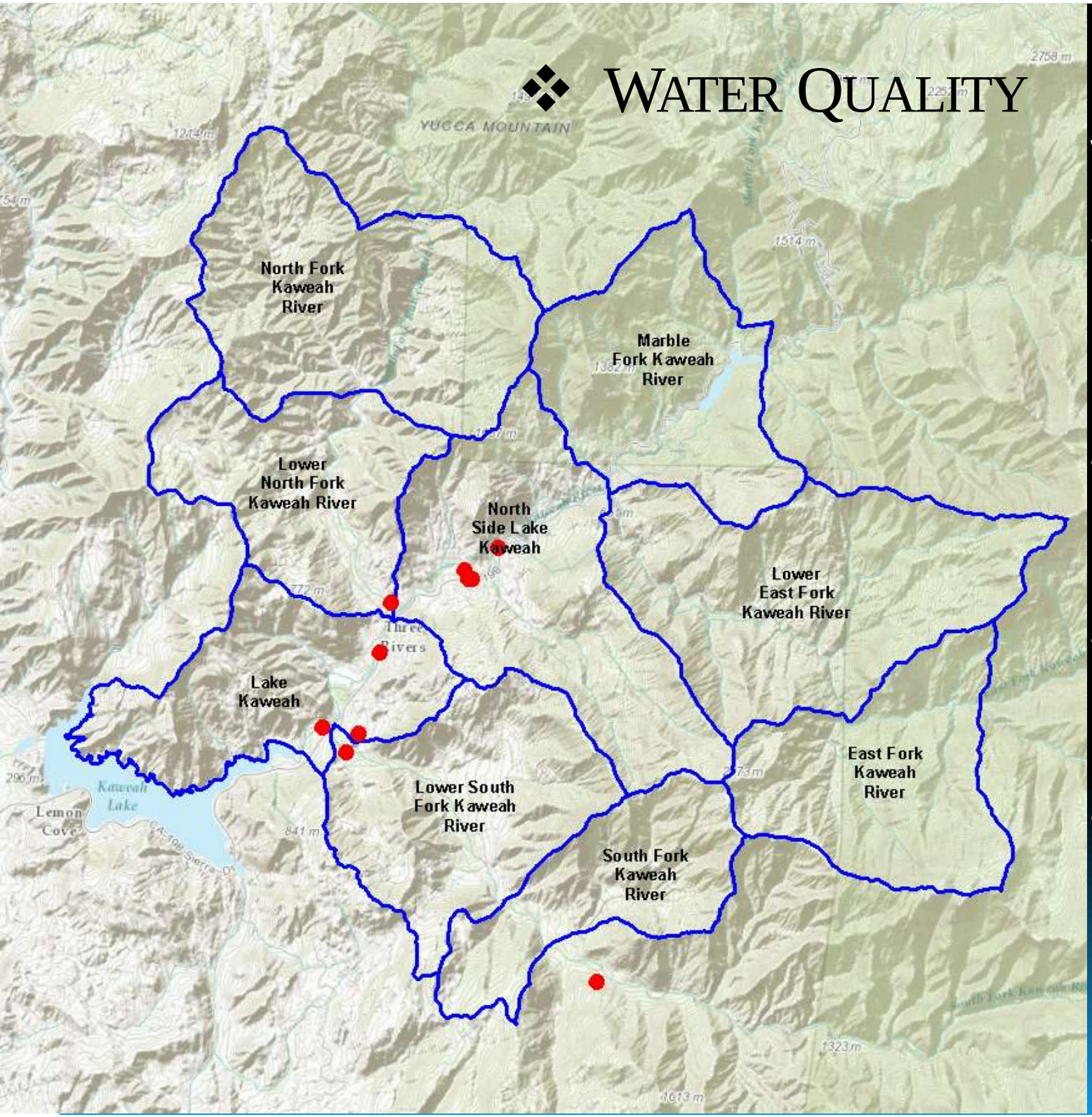
Water Type 2
Saltier groundwater from portions of the rock fractures in the lower basin





❖ Water Quality

❖ Water Quality



Wells with:

- high salt content (exceeding the secondary drinking water standard).
- Noted as having sulfur water on the well log.
- Noted as having hydrogen sulfide on the well log.
- Noted as salt water on the well log.

Putting it All Together

Putting It All Together

Study Area

- The watersheds of the Kaweah River that contribute to groundwater recharge.

Land Use

- 54% government owned and 46% privately owned.
- There are 1,575 parcels within the watersheds with 81% being less than 10 acres.
- Most of the smaller parcels are located next to the Kaweah River and its tributaries.

Census Data

- Population: 2,182.
- Households: 1,018.
- Household size: 2.14 persons.

Putting It All Together

- **Water Demand**
  - **Daily Average: 300 gallons per home.**
  - Daily Summer Use: 480 gallons per home.
  - Summer is maximum use when water levels are the lowest.
  - Annual use: 110,000 gallons per home (0.34 AF).
- **Water Supply**
  - Provided by wells.
  - Water from the wells comes from precipitation resulting in:
    - Groundwater recharge in the local watersheds.
    - Groundwater recharge from Kaweah River flow – benefit from a large drainage area.
    - Groundwater recharge from subsurface inflow along rock fractures.

Putting It All Together

Groundwater Recharge

- Highest recharge is in the upper the watersheds.
  - Recharge exceeds water supply requirements.
  - Area with the fewest homes.

- The lowest recharge is in the lower watersheds.
  - Little or no recharge in the upper part of each watershed.
  - Area with the most homes.
  - But, most of these are along the river bottom and may benefit from river recharge.

- This is for average precipitation conditions. An extended drought will impact the amount of recharge with greatest impact in the lower watersheds.

Putting It All Together

Aquifers

- A small, shallow alluvial aquifer along the river bottom.
- Rock fractures.
  - Large intersecting fracture system that extends across drainages – provides regional benefit.
  - Cut across differing geologic units, some adversely affecting water quality.
  - Provide water to nearly all of the wells.

Water Wells

- Provide nearly all of the water.
- More than 500 wells identified, representing about one-half of the homes.
- Hard rock wells dependent upon rock fractures.
- One-half of the wells have estimated yields of less than 1 gpm to 7 gpm.
- One-third of the wells are less than 100 feet deep
  - More potential for failure in an extended drought.

Putting It All Together

Water Chemistry and Water Quality

- Groundwater is a blend of high quality surface water and groundwater flowing through the rock fractures of the watersheds.
- There are wells with very high quality water and a few with high salt, sulfur or hydrogen sulfide.
- Salt and sulfur wells are related to the underlying bedrock type.

Questions?

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South Central Region Office
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Fresno, CA 9937260
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John.kirk@water.ca.gov
http://www.water.ca.gov

Appendix E

Special Status Species

Southern Sierra Regional Water Management Group
Special Status Species in Region

Abrams' onion
alpine dusty maidens
alpine jewelflower
American badger
American manna grass
An isopod
aromatic canyon gooseberry
bald eagle
Berry's morning-glory
Big Tree Forest
black swift
black-backed woodpecker
Blandow's bog moss
Bodie Hills rockcress
bog sandwort
Boggs Lake hedge-hyssop
Bolander's bruchia
Bolander's clover
Bolander's woodreed
broad-nerved hump moss
burrowing owl
calico monkeyflower
California condor
California linderiella
California tiger salamander
California wolverine
Cent. Vly Drainage Hardhead/Squawfish Stream
Charlotte's phacelia
Chimney Creek nemacladus
Clough Cave harvestman
common moonwort
Congdon's lewisia
Cooper's hawk
copper-flowered bird's-foot trefoil
cut-leaf checkerbloom
cylindrical trichodon
Dedecker's clover
delicate bluecup
Denning's cryptic caddisfly
Munz's iris
Nine Mile Canyon phacelia
Northern Basalt Flow Vernal Pool
Northern Claypan Vernal Pool
northern clustered sedge
northern goshawk
Northern Hardpan Vernal Pool
northern spleenwort
Olancha Peak buckwheat
Onyx Peak bedstraw
orange lupine
osprey
oval-leaved viburnum
Paiute cutthroat trout
pallid bat
Piedra harvestman
Pierpoint Springs dudleya
pinyon rockcress
Piute cypress
Piute Mountains navarretia
prairie falcon
prairie wedge grass
purple mountain-parsley
pygmy hulsea
pygmy pussypaws
Ramshaw Meadows abronia
Raven's milk-vetch
rayless mountain ragwort
recurved larkspur
Robbins' pondweed
rose-flowered larkspur
rosette cushion cryptantha
round-leaved filaree
San Joaquin adobe sunburst
San Joaquin kit fox
San Joaquin Valley Orcutt grass
scalloped moonwort
Scribner's wheat grass
Sequoia cave isopod

Southern Sierra Regional Water Management Group
Special Status Species in Region

Dry Creek cliff strider bug
elongate copper moss
Father Crowley's lupine
fell-fields claytonia
field ivesia
fisher - West Coast DPS
flat-leaved bladderwort
foothill yellow-legged frog
forked hare-leaf
fringed myotis
golden eagle
gray-headed pika
great blue heron
great gray owl
Great Valley Mixed Riparian Forest
Greene's tuctoria
Greenhorn fritillary
grey-leaved violet
Hall's daisy
Hartweg's golden sunburst
hidden rockcress
hoary bat
Hockett Meadows lupine
Kaweah brodiaea
Kaweah fawn lily
Kaweah monkeyflower
Keck's checkerbloom
Keil's daisy
Kern Canyon clarkia
Kern Canyon slender salamander
Kern Plateau bird's-beak
Kern Plateau horkelia
Kern Plateau milk-vetch
Kern Plateau salamander
Kern River daisy
Kern shoulderband
King's Creek parapsyche caddisfly
Kings River buckwheat
Kings River slender salamander
knotted rush
Sequoia gooseberry
Sharsmith's stickseed
Shevock's copper moss
Shevock's milk-vetch
Shevock's rockcress
Shirley Meadows star-tulip
short-leaved hulsea
Sierra draba
Sierra marten
Sierra Nevada bighorn sheep
Sierra Nevada red fox
Sierra Nevada yellow-legged frog
silver-haired bat
slender moonwort
slender-stalked monkeyflower
small mousetail moss
Southern Interior Cypress Forest
southern mountain yellow-legged frog
spear-fruited draba
spiny-sepaled button-celery
Spjut's bristle moss
spotted bat
Springville clarkia
striped adobe-lily
subalpine fireweed
succulent owl's-clover
sweet-smelling monardella
Sweetwater Mountains draba
Sycamore Alluvial Woodland
Table Mountain harvestman
tall draba
Tehipite Valley jewelflower
The Needles buckwheat
three-ranked hump moss
tight coin (=Yates' snail)
Tompkins' sedge
Townsend's big-eared bat
Tracy's eriastrum
tree-anemone
Tulare cryptantha

Southern Sierra Regional Water Management Group
Special Status Species in Region

Lahontan cutthroat trout
Letterman's blue grass
Little Kern golden trout
long-eared myotis
long-legged myotis
Madera leptosiphon
marble rockmat
marbled harvestman
Mariposa pussypaws
marsh arrow-grass
Mineral King draba
mingan moonwort
moestan blister beetle
Mojave tarplant
molestan blister beetle
Monarch buckwheat
Monarch gilia
Monarch golden-aster
Mono Hot Springs evening-primrose
Moody's gnaphosid spider
Morrison's blister beetle
Mount Lyell salamander
Mount Pinos sooty grouse
mouse buckwheat
Mt. Whitney draba
mud sedge
Muir's tarplant
Tulare cuckoo wasp
Tulare rockcress
tundra thread moss
Twisselmann's buckwheat
Twisselmann's nemacladus
unexpected larkspur
upswept moonwort
valley elderberry longhorn beetle
vernal pool fairy shrimp
vernal pool tadpole shrimp
Volcano Creek golden trout
watershield
Watts Valley harvestman
western goblin
western mastiff bat
western pearlshell
western pond turtle
western small-footed myotis
western spadefoot
western waterfan lichen
willow flycatcher
wooly hydroporus diving beetle
yellow warbler
Yosemite bog orchid
Yosemite ivesia
Yosemite lewisia
Yosemite toad
Yuma myotis

Notes: Special status species include State and Federally listed threatened and endangered species, and species protected under other special acts, laws and regulations.

Appendix F

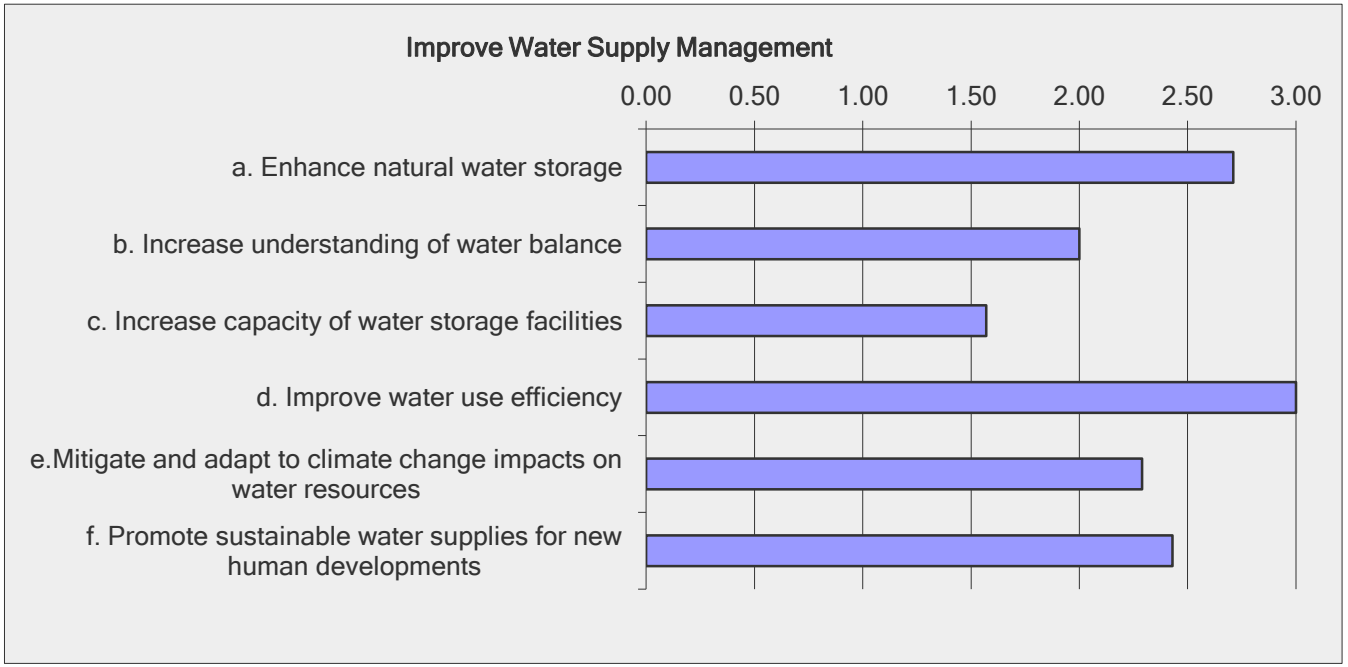
Regional Objectives Ranking Survey

Regional Objectives Ranking Survey

Southern Sierra IRWMP

Improve Water Supply Management

Answer Options	Low	Medium	High	Rating Average	Response Count
a. Enhance natural water storage	0	2	5	2.71	7
b. Increase understanding of water balance	2	3	2	2.00	7
c. Increase capacity of water storage facilities	4	2	1	1.57	7
d. Improve water use efficiency	0	0	7	3.00	7
e.Mitigate and adapt to climate change impacts on water	1	3	3	2.29	7
f. Promote sustainable water supplies for new human	1	2	4	2.43	7
				answered question	7
				skipped question	0

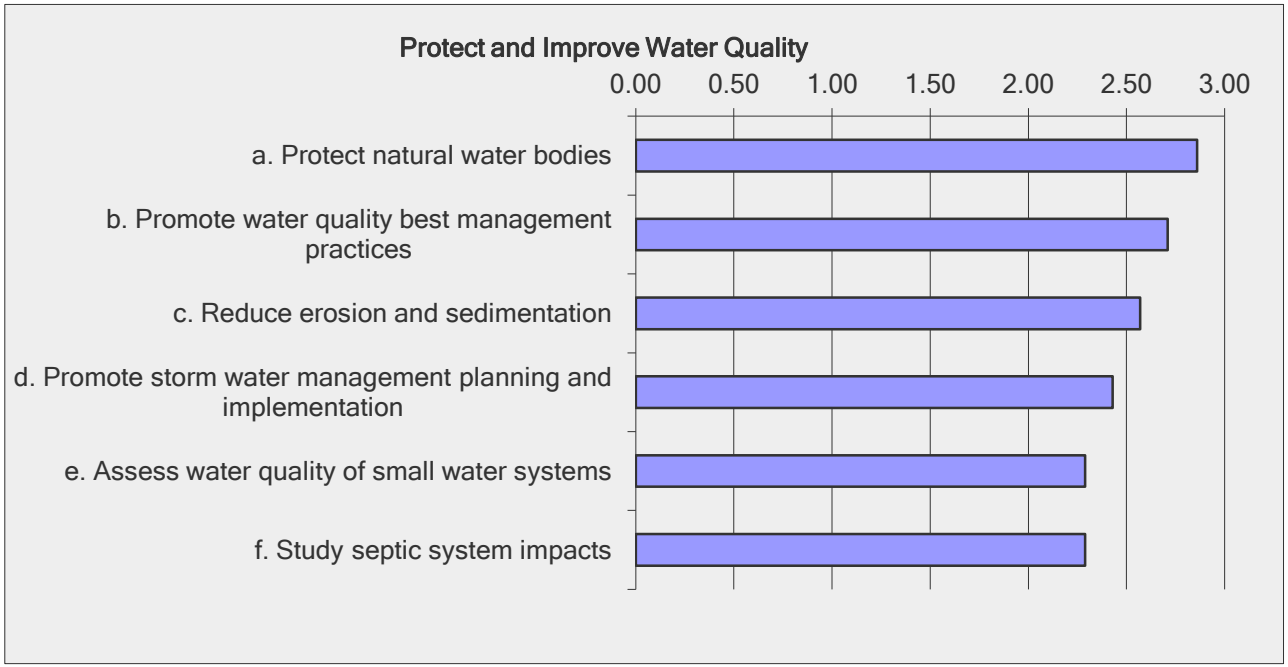


Regional Objectives Ranking Survey

Southern Sierra IRWMP

Protect and Improve Water Quality

Answer Options	Low	Medium	High	Rating Average	Response Count
a. Protect natural water bodies	0	1	6	2.86	7
b. Promote water quality best management practices	0	2	5	2.71	7
c. Reduce erosion and sedimentation	0	3	4	2.57	7
d. Promote storm water management planning and	1	2	4	2.43	7
e. Assess water quality of small water systems	0	5	2	2.29	7
f. Study septic system impacts	1	3	3	2.29	7
				answered question	7
				skipped question	0

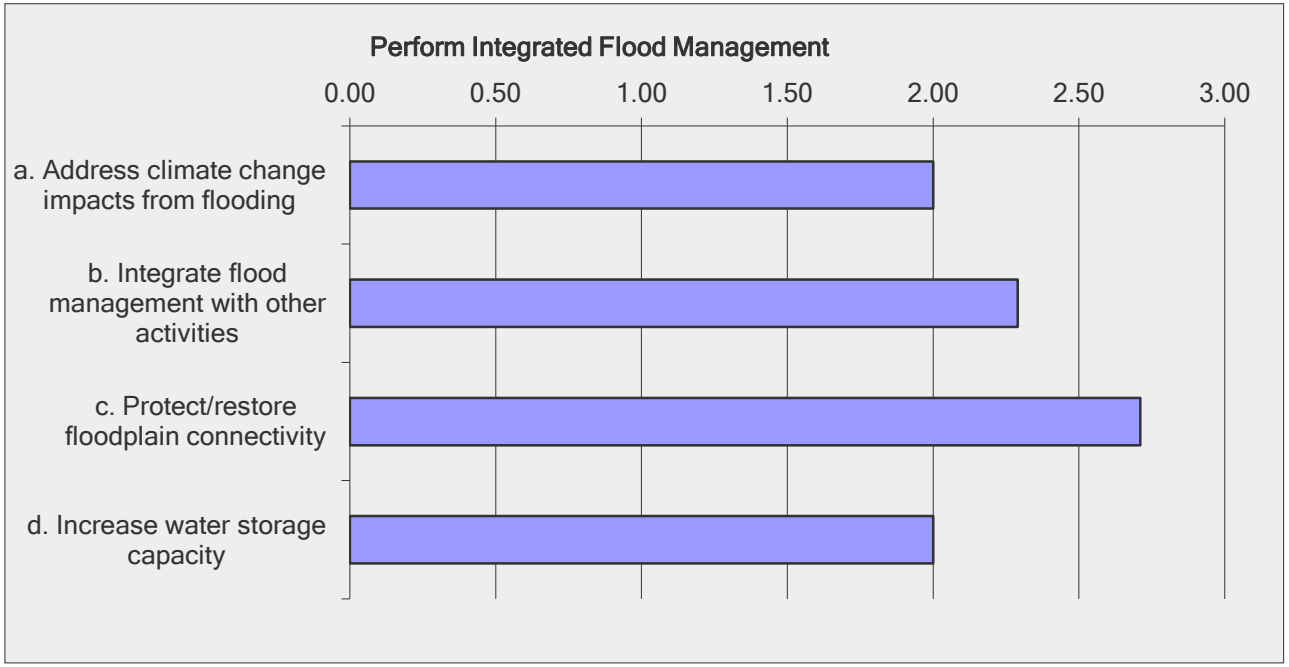


Regional Objectives Ranking Survey

Southern Sierra IRWMP

Perform Integrated Flood Management

Answer Options	Low	Medium	High	Rating Average	Response Count
a. Address climate change impacts from flooding	2	3	2	2.00	7
b. Integrate flood management with other activities	0	5	2	2.29	7
c. Protect/restore floodplain connectivity	0	2	5	2.71	7
d. Increase water storage capacity	2	3	2	2.00	7
				answered question	7
				skipped question	0

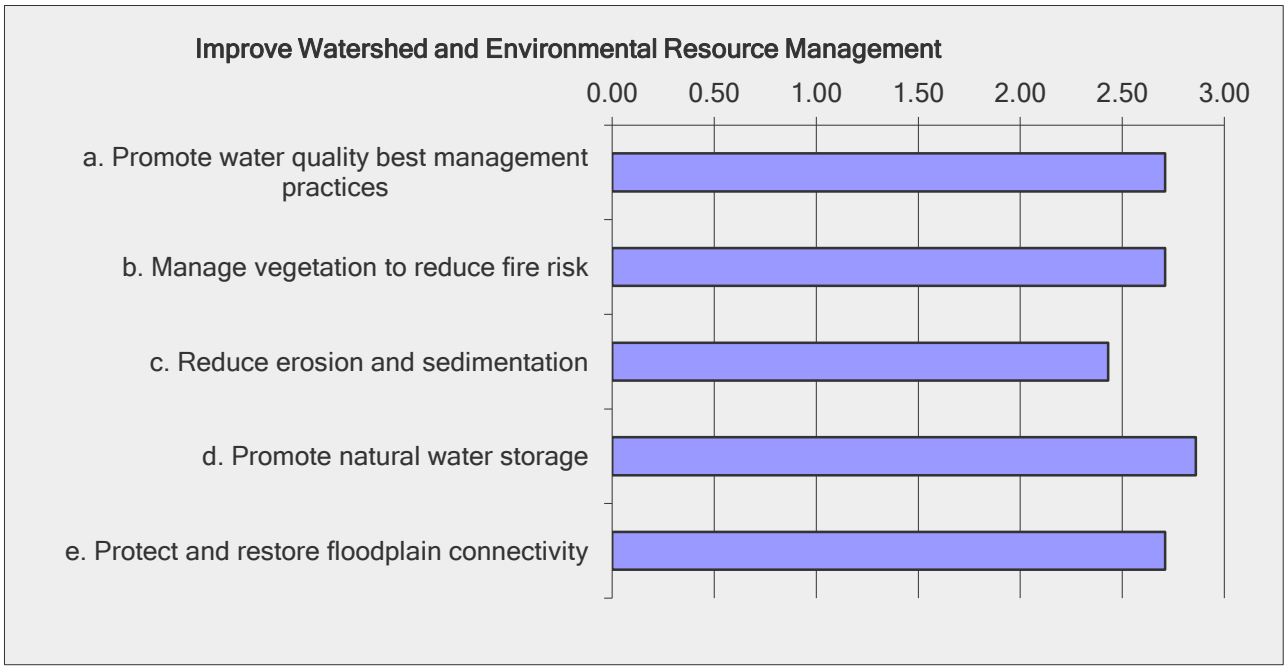


Regional Objectives Ranking Survey

Southern Sierra IRWMP

Improve Watershed and Environmental Resource Management

Answer Options	Low	Medium	High	Rating Average	Response Count
a. Promote water quality best management practices	0	2	5	2.71	7
b. Manage vegetation to reduce fire risk	0	2	5	2.71	7
c. Reduce erosion and sedimentation	0	4	3	2.43	7
d. Promote natural water storage	0	1	6	2.86	7
e. Protect and restore floodplain connectivity	0	2	5	2.71	7
				answered question	7
				skipped question	0

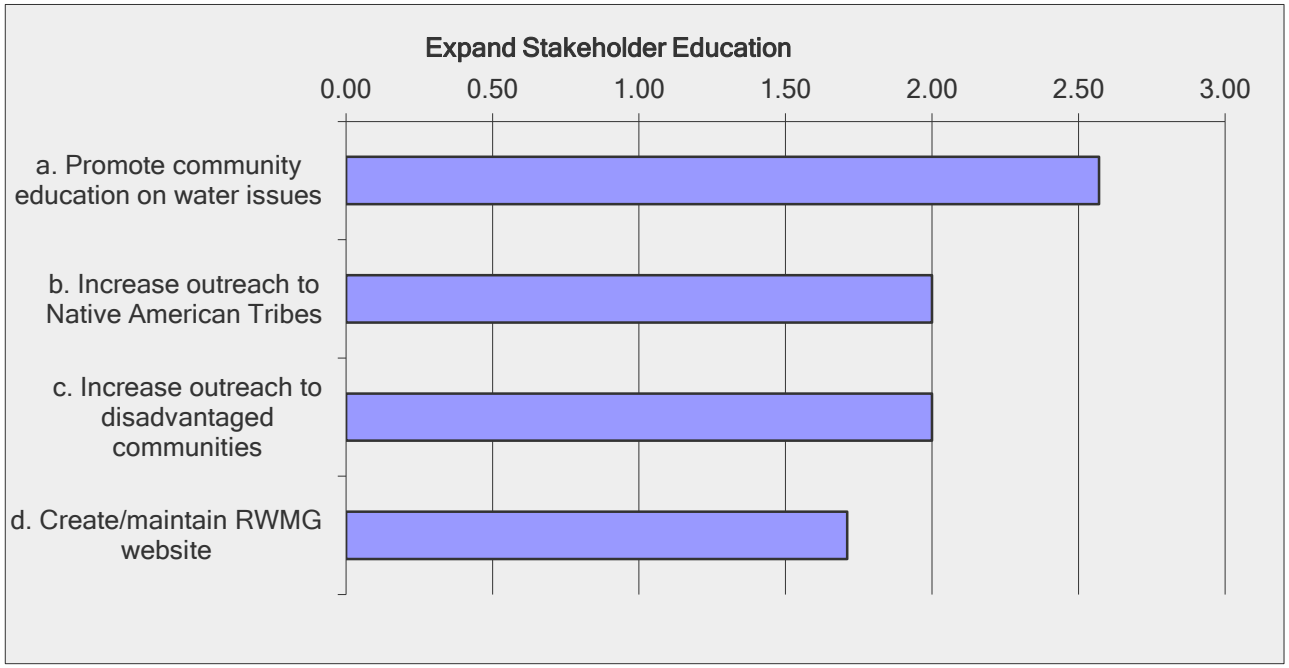


Regional Objectives Ranking Survey

Southern Sierra IRWMP

Expand Stakeholder Education

Answer Options	Low	Medium	High	Rating Average	Response Count
a. Promote community education on water issues	0	3	4	2.57	7
b. Increase outreach to Native American Tribes	0	7	0	2.00	7
c. Increase outreach to disadvantaged communities	0	7	0	2.00	7
d. Create/maintain RWMG website	2	5	0	1.71	7
				answered question	**7**
				skipped question	**0**

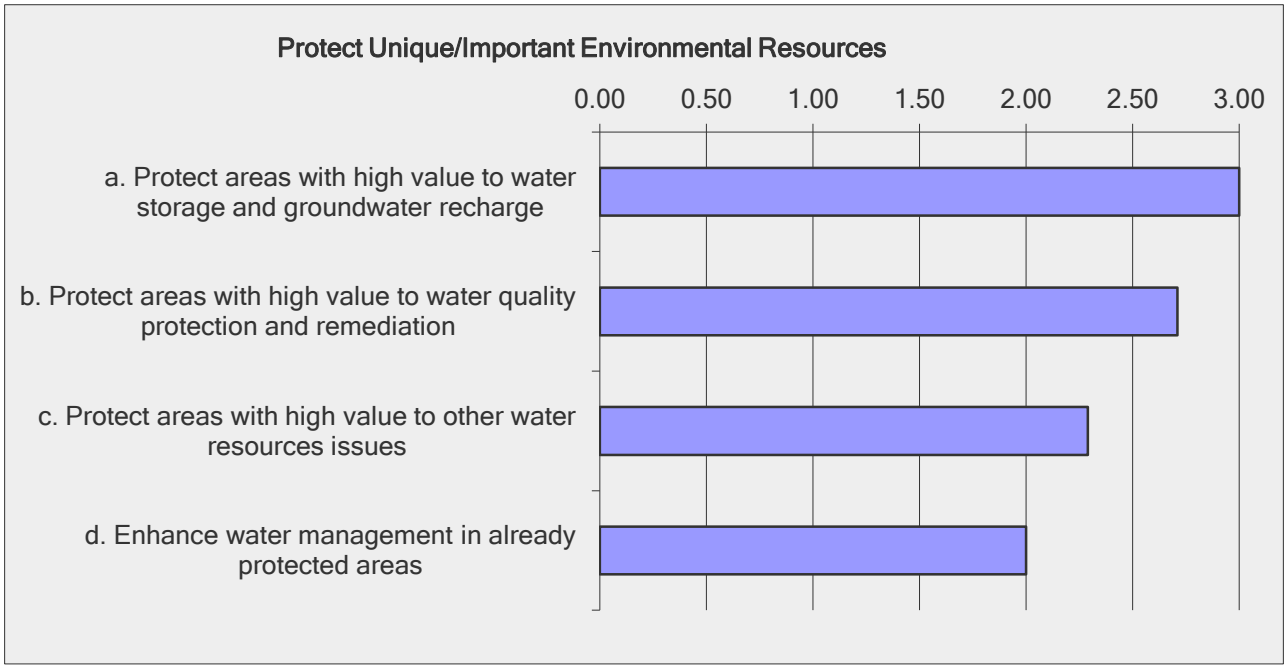


Regional Objectives Ranking Survey

Southern Sierra IRWMP

Protect Unique/Important Environmental Resources

Answer Options	Low	Medium	High	Rating Average	Response Count
a. Protect areas with high value to water storage and groundwater recharge	0	0	7	3.00	7
b. Protect areas with high value to water quality	0	2	5	2.71	7
c. Protect areas with high value to other water resources	1	3	3	2.29	7
d. Enhance water management in already protected	0	7	0	2.00	7
				answered question	7
				skipped question	0



Appendix G

Project List

Southern Sierra Regional Water Management Group

Project List

September 2014

TIER 1 PROJECTS				
No.	**Project Category**	**Project Title**	**Project Proponent**	**Project Description**
1-1	**Studies**	Big Meadows Project	Sequoia National Forest	The Big Meadows Project on Sequoia National Forest documented water table rises and flood attenuation, retention of cold-water environments, positive avifauna and arthropod responses to restoration.
1-2		Forest Service Data Synthesis	Forest Service	Synthesize existing Forest Service data for the Sierra and Sequoia National Forests on small stream discharge to better estimate water yield from un-gauged streams. This synthesis would enable better estimates of current water yields from headwater streams in the southern Sierra Nevada. This would be very low or no cost and might be able to be added to one of the proposals already in progress.
1-3	**DAC**	Treated Effluent Discharge to the Tule River Study	Springville Public Utility District	This project is composed of two phases. The first phase is a study to ready the project, including CEQA biological and hydrological studies and project development and integration. The second phase of the project is comprised of finalizing the designs and implementing the project.
1-4	**Flood Management**	Floodplain Stabilization	Tule River Tribe	Protect areas with high value to water quality protection and remediation through restoration of impacted floodplains to reduce sediment loads from runoff, provide riparian habitat and maintain biodiversity.
1-5	**Groundwater Recharge**	Mulching / Reseeding Project	Tule River Tribe	Perform mulching and reseeding to enhance natural water storage to encourage increased seepage of rain water into the ground so as to recharge underground aquifers. This water is later released for human or animal use by way of springs or boreholes.
1-6		Mulching / Reseeding Project 2	Tule River Tribe	Perform mulching and reseeding to enhance natural water storage to encourage increased seepage of rain water into the ground so as to recharge the underground aquifers. This will help to reduce surface runoff and flooding.
1-7		Mulching / Reseeding Project 3	Tule River Tribe	Perform mulching and reseeding to enhance natural water storage to encourage increased seepage of rain water into the ground so as to recharge the underground aquifers. This will help to reduce surface runoff and flooding.

Southern Sierra Regional Water Management Group

Project List

September 2014

TIER 1 PROJECTS				
No.	**Project Category**	**Project Title**	**Project Proponent**	**Project Description**
1-8	**Monitoring**	Groundwater Monitoring, Analysis and Planning in Sierra Nevada Granitic	Sierra Resource Conservation District	Unified School District's High/Middle and Elementary schools to state of the art SCADA (System Control and Data Acquisition) and Telemetry functionality. This is to ensure that the finite groundwater resources are better managed for long-term sustainability.
1-9	**Restoration**	Eagle Meadow Restoration	Tule River Tribe	Restore Eagle meadow by selectively removing shrubs to maintain wet conditions and improve water flow from the meadow downstream to Eagle Creek.
1-10		Long Meadow Restoration Project	Sequoia National Forest	Restore Long Meadow to repair eroding as a result of head cuts and improve hydrologic functions. Restoration will include installation of plug structures, installation of valley grade control structure, riparian revegetation of sod and willows, and installation of temporary fencing.
1-11		Dry Meadow Restoration	Sequoia National Forest	Restore Dry Creek Meadow including repairing a large gully, and restoring water storage functions. The project will also include culvert removal and road decommissioning. Benefits will include downstream fish habitat by cooling and extending flows, reduction of sediment transport, attenuation of sudden storm flows and improved water quality.
1-12	**Water Quality**	Non-point Source Best Management practices / Storm water Runoff Control	Tule River Tribe	Implement BMPs during construction projects to reduce storm water runoff, erosion and sediment transport; stabilization of areas vulnerable to storm water runoff in effort to reduce negative impacts to water quality within the South Fork Tule River watershed.
1-13	**Water Supply**	Water Storage Improvement Project	Tule River Tribe	Install new water storage tanks and improvements/upgrades to existing tanks.
1-14		Water Intake Enhancement	Tule River Tribe	Removal of silt within existing water impoundment; installation of filters at intake line; enhancement of water transport line from intake to main water system treatment plant.

Southern Sierra Regional Water Management Group

Project List

September 2014

TIER 1 PROJECTS				
No.	**Project Category**	**Project Title**	**Project Proponent**	**Project Description**
1-15	**Watershed Management**	Forest Road Rehabilitation	Tule River Tribe	Portions of several unsurfaced range and forest roads are contributing sediment to perennial watercourses. Due to their remote locations, these roads receive little maintenance. The project will correct the sedimentation problem by installing water drainage structures and rocking the road approaches to several existing stream crossings on these seasonally travelled roads.
1-16		Mill Flat Creek Watershed Restoration	Sierra National Forest	Implement proposed Watershed Improvement Needs Inventory (WINI) projects that have been identified within the Mill Flat Creek watershed, including replacement of culverts to allow for aquatic organism passage and the recommended closure (decommissioning) of several user created and maintained level 1 and 2 roads.
1-17		Deadwood Prescribed Fire Unit	Sequoia & Kings Canyon National Parks	Perform prescribed fire in the Deadwood unit to reduce the likelihood of future high intensity wildfire and accompanying potential for erosion and sedimentation.
1-18		Goliath Prescribed Fire Unit	Sequoia & Kings Canyon National Parks	Perform prescribed fire in the Goliath unit to reduce the likelihood of future high intensity wildfire and accompanying potential for erosion and sedimentation. Additional benefits will include increased Giant Sequoia reproduction and improved forest health.
1-19		Aquatic Effects from Forest Restoration and Fuels Reduction: Kings River Watershed	Pacific Southwest Research Station, USFS	This project quantifies positive and negative effects to stream ecosystems from forest restoration and fuels reduction activities at the watershed scale. It focuses on water yield and water quality in headwater streams of the Kings River watershed and would contribute to the continuation of data collection and analyses that have been ongoing for 10 years.

Note: Tier 1 projects are ready for implementation, have a project proponent, and a completed Project Information Form

Southern Sierra Regional Water Management Group

Project List

September 2014

TIER 2 PROJECTS				
No.	**Project Category**	**Project Title**	**Project Proponent**	**Project Description**
2-1	**Plans**	-	-	Prioritize meadows for restoration on the Sierra, Sequoia, Inyo National Forests, and Sequoia and Kings Canyon National Parks
2-2	**Restoration**	Mill Flat Creek Road Management Project	Sequoia National Forest	Decommission 14 forest roads or portions of roads (a total of approximately 3.3 miles) within Mill Flat Creek watershed to reduce resource damage.
2-3	**Restoration**	Osa Meadow, Kern Plateau/Kern River Watershed	Sequoia National Forest	This proposed project would restore approximately 80 acres of meadow through restoration of Osa Meadow.
2-4	**Restoration**	Osa Meadow and Stream Restoration	Sequoia National Forest	Restore Osa Meadow which has experienced down cutting. Restore 2,000 feet of degraded meadow and stream to improve hydrologic connectivity, improve natural water storage, cool water supplies, reduce sedimentation to the Kern River, and benefit numerous species.
2-5	**Restoration**	Restore Critical Wetlands in Cahoon Meadow	Sequoia & Kings Canyon National Parks	Complete an EIR and restore the 17-acre Cahoon Meadow that has severe and active erosion from historic grazing. The erosion gully is 1,150 feet long, 56 to 92 feet wide, and up to 17 feet deep. The gully has dewatered 5 acres of wetlands and threatens 13 acres of fen and wet meadow habitat.
2-6	**Restoration**	Tobias Meadow Restoration	Sequoia National Forest	The meadow has headcuts, lack of hydrologic connectivity and storage of water impaired. Tobias Creek has many roads and culverts surveyed. (elev. 6600 ft. 35°51'48.40"N 118°34'21.15"W)
2-7	**Restoration**	Last Chance Meadow Restoration	Sequoia National Forest	Last Chance Meadow has issues with lack of hydrologic connectivity and lack of water storage. (elev. 6695; 36° 0'14.49"N 118°33'56.96"W)
2-8	**Restoration**	Big Meadow Restoration	Sequoia National Forest	Big Meadow has roads into and around the meadow. Headcuts and loss of soils has occurred with some downcutting in the meadow and loss of connectivity with its floodplain except during very high flows has occurred. Salmon Creek has a lot of roads crossing the creek and within the watershed. The crossings and culverts, unimproved roads are a source of sediment and degradation of water quality. (elev. 7794 feet; Location 35°53'35.69"N 118°20'16.41"W)
2-9	**Restoration**	Taylor Meadow Restoration	Sequoia National Forest	Rattlesnake (elev. 6871 ft. 35°48'42.34"N, 118°16'17.58"W) and Long Meadows (elev. 7066 ft. 35°50'0.86"N 118°17'13.45"W) have lack of hydrologic connectivity and impaired storage. Taylor Creek has roads crossing creek throughout watershed. (South Fork Kern)
2-10	**Studies**	New Auberry engineer report/studies	New Auberry Water Association	This study project consists of an engineer's report required to update the water system in New Auberry. Without this report, the New Auberry Water Association cannot apply for grants to support additional operations and system improvements.

TIER 2 PROJECTS				
2-11	**Studies**	-	-	A modeling exercise to evaluate whether forest fuel reduction and/or restoration activities result in an increase or no change in water yield from small watersheds. Data to parameterize model(s) is available from KREW. The thinning and burning treatments are ongoing and can provide data to verify model results in the next 1-2 years. UC Merced is already in the process of parameterizing one model with KREW data. Forest Service would supply data but there would be a cost for modeling.
2-12	**Watershed Management**	-	-	Watershed protection through protection from development, by voluntary conservation easements especially in the Tule River Watershed, Deer Creek, the Kaweah River, Kings River and other flood prone areas in order to protect water quality
2-13	**Watershed Management**	-	-	Promote use of sustainable gardening practices to reduce pesticide use. Use native plants in landscaping. Compile preferred list of fire and drought resistant/tolerant plant species.
2-14	**Water Supply**	Tule River Tribe water supply needs	-	Tule River Indian Reservation has identified a need for a reliable supply of water. It has negotiated it's water rights and taken steps to implement water supply solutions including the potential for a new dam or other impoundments of surface water.

Note: Tier 2 projects are not ready for implementation, but have a full or partially completed Project Information Form

Southern Sierra Regional Water Management Group

Project List

September 2014

TIER 3 PROJECTS				
No.	**Project Category**	**Project Title**	**Project Proponent**	**Project Description**
3-1	**Best Management Practices**	-	-	BMPs for residential pesticide use in Auberry, Prather, Squaw Valley, Dunlap, Badger, Three Rivers, Springville, Posey, and White River communities.
3-2		-	-	BMPs and educational materials for septic tank maintenance in Auberry, Prather, Squaw Valley, Dunlap, Badger, Three Rivers (has an existing program and information), Springville, Posey, and White River communities
3-3		-	-	BMPs regarding fire clearance in Auberry, Prather, Squaw Valley, Dunlap, Badger, Three Rivers, Springville, Posey, and White River communities
3-4		-	-	BMPs for flood control and flood management/riparian management along the San Joaquin River, Kings River, Kaweah River, Tule River, Deer Creek, White River and Kern River
3-5		-	-	BMPs regarding preventing sedimentation and erosion in headwaters in the San Joaquin River, Kings River, Kaweah River, Tule River, Deer Creek, White River and Kern River watersheds
3-6		-	-	BMPs regarding well maintenance and monitoring in Auberry, Prather, Squaw Valley, Dunlap, Badger, Three Rivers, Springville, Posey, and White River communities
3-7		-	-	BMPs to promote grazing practices, cattle ponds and riparian areas along San Joaquin River, Kings River, Kaweah River, Tule River, Deer Creek, White River and Kern River
3-8		-	-	BMPs to identify land use to minimize environmental impact (cluster development) Auberry, Prather, Squaw Valley, Dunlap, Badger, Three Rivers, Springville, Posey, and White River communities
3-9	**Studies**	-	-	Assess and document options and needs for water storage infrastructure. This can be water recharge as well as storage in Auberry, Prather, Squaw Valley, Dunlap, Badger, Three Rivers, Springville, Posey, and White River communities
3-10		-	-	Study to identify the impact of septic systems in riparian areas on water quality and a feasibility study for sewers to replace them in Auberry, Prather, Squaw Valley, Dunlap, Badger, Three Rivers, Springville, Posey, and White River communities
3-11		-	-	Design a study that will determine the availability of water in the fractured rock system - hydrologic capacity in Auberry, Prather, Squaw Valley, Dunlap, Badger, Three Rivers, Springville, Posey, and White River communities. Provide a uniform approach to data collection and analysis, methodology, results and recommendations.

Southern Sierra Regional Water Management Group

Project List

September 2014

TIER 3 PROJECTS				
No.	**Project Category**	**Project Title**	**Project Proponent**	**Project Description**
3-12	**Studies**	-	-	Monitor wells for quality and quantity in Auberry, Prather, Squaw Valley, Dunlap, Badger, Three Rivers, Springville, Posey, and White River communities. Compile all data sets on one table, e.g. nitrates, radon, Uranium, salts etc.
3-13		-	-	Quantifies positive and negative effects to stream ecosystems from forest restoration and fuels reduction activities at the watershed scale. It focuses on water yield and water quality in headwater streams of the Kings River watershed and would contribute to the continuation of data collection and analyses that have been ongoing for 10 years.
3-14	**Plans**	-	-	Watershed management plans in the San Joaquin River, Kings River, Kaweah River, Tule River, Deer Creek, White River and Kern River watersheds
3-15		-	-	Habitat Conservation Plans - Synergize existing efforts and plans regarding habitat conservation
3-16		-	-	Studies and plans to prioritize oak woodland sites for protection in the San Joaquin River, Kings River, Kaweah River, Tule River, Deer Creek, White River and Kern River watersheds
3-17	**Demonstration Projects**	-	-	Meadow restoration – has been complete at Big Meadows and multiple locations on the Sierra National Forest
3-18		-	-	Fuel management for fire safety and water production
3-19		-	-	Invasive species removal (Arundo, Tamarisk, Scarlet Wisteria) along the San Joaquin River, Kings River, Kaweah River, Tule River, Deer Creek, White River and Kern River
3-20		-	-	Total exclusion of development from certain sensitive watersheds such as Deer Creek, and White River
3-21		-	-	Flood control projects (floodplain, etc.) that have multiple benefits (habitat, water quality, groundwater recharge etc.);
3-22		-	-	More detailed vegetation mapping throughout the region
3-23		-	-	Integrated strategies for increasing water supply in Shaver Lake, Auberry, Prather Squaw Valley, Dunlap, Badger, Three Rivers, Springville, Posey, and White River
3-24		-	-	Native plants (fire resistant/drought tolerant) in public and private landscaping
3-25		-	-	Riparian protection through fencing, grazing rotation, and additional water distribution systems.
3-26	**Restoration and Other Projects**	-	-	Invasive Species: remove tamarisk and Arundo donax, along the San Joaquin River, Kings River, Kaweah River, Tule River, Deer Creek, White River and Kern River
3-27		-	-	Water retention on grazing lands---RDM standards/BMP's--- relocate water sources for livestock to conserve riparian zones. Control, don't exclude, grazing
3-28		-	-	Establish "certified" habitats, i.e., documented foraging and nesting habitats that are managed without pesticides.

Note: Tier 3 projects are conceptual without a proponent and no Project Information Form. Tier 3 Projects are listed to reduce the potential for the duplicated planning and project development efforts, and to provide information concerning potential project integration opportunities to develop a regional project.

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
PROJECT DESCRIPTION FORM
Project Identification Short Form

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General Information

Project Name:	FLOODPLAIN STABILIZATION
Project Sponsor:	TULE RIVER TRIBE
If Joint Project, Other Partners:	
Project Website (if available):	

Project Contact Person:	Phone	FAX	Email
KERRI VERA	559-783-9984	559-783-8932	TULERIVERENV@yahoo.com

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):

IRWM Goal & Objective: GOAL 2- PROTECT AND IMPROVE WATER QUALITY (a) protect natural water bodies, (b) promote water quality best management practices, and (c) reduce erosion and sedimentation; GOAL 3- PERFORM INTEGRATED FLOOD MANAGEMENT (c) Protect and restore connectivity of floodplains with other water bodies; GOAL 4- IMPROVE WATERSHED AND ENVIRONMENTAL RESOURCE MANAGEMENT (c) reduct erosion and sedimentation, and (e) protect and restore floodplain connectivity; GOAL 6- PROTECT UNIQUE/IMPORTANT ENVIRONMENTAL RESOURCES (b) Protect areas with high value to water quality protection and remediation **Description:** *Restoration of impacted floodplain to reduce sediment loads from runof, provide riparian habitat and maintain biodiversity.*

Project Integration (Describe how the project does or could integrate with other projects in the Region):

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):
Tribal Water Quality Management Plan; Tribal Integrated Resource Management Plan

Project Location

Descriptive (Description of property location etc.):
TULE RIVER RESERVATION

Latitude/Longitude - info available at: http://geocoder.us/	Lat: 36.029807°	Long: -118.788018°

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate)				
Project Cost:	<$100K ☑	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):	Conceptual ☐	In-Design ☐	Ready for Construction ☑	CEQA Complete ☐
Estimated Year of Construction:	Project ready and willing sellers available to consider offers.			

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☑ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF	
Water Quality	Area Drained: and/or		Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored*):				
Other: *(Describe X amount of benefit)*				

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
- ☑ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☑ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
- ☐ Conveyance
- ☐ Desalination
- ☐ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☑ Ecosystem Restoration
- ☑ Floodplain Management
- ☐ Groundwater/Aquifer Remediation
- ☐ Matching Water Quality to Water Use
- ☑ Pollution Prevention
- ☐ Precipitation Enhancement
- ☑ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☑ Watershed Management

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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General Information

Project Name:	Mulching/Reseeding Project		
Project Sponsor:	Tule River Indian Tribe		
If Joint Project, Other Partners:	N/A		
Project Website (if available):	N/A		
Project Contact Person:	Phone	FAX	Email
Charles Lwenya	5597912126	5597912128	charles.lwenya@tulerivertribe-nsn.gov

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):
Goal: To improve water supply and management. Objective: To enhance natural water storage by encouraging increased seepage of rain water into the ground so as to recharge the underground aquifers. This water is later released for human and animal use by way of springs and boreholes.

Project Integration (Describe how the project does or could integrate with other projects in the Region):
This project will enhance a spring development program that is being implimented on the reservation. The springs provide water for livestock and wildlife.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):
This is one of the projects set out in the Tribe's Intergrated Resources Management Plan (IRMP). It was identified when the Tribe carried out a Range Inventory and Assessment.

Project Location

Descriptive (Description of property location etc.):
Tule River Indian Reservation, Tulare County,

Latitude/Longitude - info available at: http://geocoder.us/	Lat: 36.029807°	Long: -118.788018°	
Estimated Capital Costs (Note estimated cost, if known OR check rough estimate): Project Cost:	<$100K ☑	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):	Conceptual ☐	In-Design ☐	Ready for Construction ☑	CEQA Complete ☑
Estimated Year of Construction:	Project ready and willing sellers available to consider offers.			

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF
Water Quality: Area Drained: and/or		Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored*):			
Other: *(Describe X amount of benefit)*			

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☑ Support and improve local and regional water supply reliability
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☐ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☑ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☑ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☑ Conjunctive Management and Groundwater Storage
- ☐ Conveyance
- ☐ Desalination
- ☐ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☐ Ecosystem Restoration
- ☐ Floodplain Management
- ☑ Groundwater/Aquifer Remediation
- ☐ Matching Water Quality to Water Use
- ☐ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☑ Watershed Management

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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General Information

Project Name:	Mulching/Reseeding Project 2
Project Sponsor:	Tule River Indian Tribe
If Joint Project, Other Partners:	N/A
Project Website (if available):	N/A

Project Contact Person:	Phone	FAX	Email
Charles Lwenya	5597912126	5597912128	charles.lwenya@tulerivertribe-nsn.gov

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):
Goal: Protect and Improve Water Quality; Objectives: 1. Reduce erosion and sedimentation, 2. Promote storm water management planning and implimentation.This project will help control storm water runoof by enhancing seepage into the underground water aquifers,

Project Integration (Describe how the project does or could integrate with other projects in the Region):
This project will contibute to the Tribe's efforts to control soil erossion and river sedimentaion. This would result in improved water quality for its residences.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):
This is one of the projects set out in the Tribe's Intergrated Resources Management Plan (IRMP). It was identified when the Tribe carried out a Range Inventory and Assessment.

Project Location

Descriptive (Description of property location etc.):
Tule River Indian Reservation, Tulare County,

Latitude/Longitude - info available at: http://geocoder.us/	Lat: 36.029807°	Long: -118.788018°

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):					
Project Cost:		<$100K ☑	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):		Conceptual ☐	In-Design ☐	Ready for Construction ☑	CEQA Complete ☑

Estimated Year of Construction:
Project ready and willing sellers available to consider offers.

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF
Water Quality: Area Drained and/or		Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored*):			
Other: *(Describe X amount of benefit)*			

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards

Program Preferences

- ☑ Include integrated projects with multiple benefits
- ☑ Support and improve local and regional water supply reliability
- ☑ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☑ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☑ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

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- ☑ Pollution Prevention
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- ☐ Surface Storage - Regional/Local
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INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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General Information			
Project Name:	Mulching/Reseeding Project 3		
Project Sponsor:	Tule River Indian Tribe		
If Joint Project, Other Partners:	N/A		
Project Website (if available):	N/A		
Project Contact Person:	Phone	FAX	Email
Charles Lwenya	5597912126	5597912128	charles.lwenya@tulerivertribe-nsn.gov

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):
Goal: Perform Integrated Flood Mangement ; Objectives: 1. Integrate flood management with other activities. This project will help control storm water runoof by enhancing seepage into the underground water aquifers. This will reduce surface runoof and flooding

Project Integration (Describe how the project does or could integrate with other projects in the Region):
This project will contibute to the Tribe's efforts to control flooding.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):
This is one of the projects set out in the Tribe's Intergrated Resources Management Plan (IRMP). It was identified when the Tribe carried out a Range Inventory and Assessment.

Project Location

Descriptive (Description of property location etc.):
Tule River Indian Reservation, Tulare County,

Latitude/Longitude - info available at: http://geocoder.us/	Lat: 36.029807°	Long: -118.788018°

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):					
Project Cost:		<$100K ☑	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):		Conceptual ☐	In-Design ☐	Ready for Construction ☑	CEQA Complete ☑
Estimated Year of Construction:	Project ready and willing sellers available to consider offers.				

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)		☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF
Water Quality	Area Drained: and/or		Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored*):				
Other: *(Describe X amount of benefit)*				

Project Criteria

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Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
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- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
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- ☑ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards

Program Preferences

- ☑ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
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INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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General Information

Project Name:	Phase II Community Groundwater Monitoring, Analysis and Planning in Sierra Nevada Granitic Fractured Rock within the Non-Basin region of eastern Fresno County
Project Sponsor:	Sierra Resource Conservation District
If Joint Project, Other Partners:	Sierra Unified School District
Project Website (if available):	

Project Contact Person:	Phone	FAX	Email
Steve Haze	559.855.5840		stevehaze007@gmail.com

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):

The purpose of the project is to upgrade existing groundwater sourced systems for the Sierra Unified School District's High/Middle and Elementary schools to state of the art SCADA (System Control and Data Acquisition) and Telemetry functionality. This is to insure that the finite groundwater resources are better managed for long-term sustainability.

Project Integration (Describe how the project does or could integrate with other projects in the Region):

The project is a "Blueprint" and critical component in which to develop the realtime management of finite groundwater resources for high public usage in areas with prolong dry periods. The intent is to integrate the realtime collection of data and realtime monitoring with DWR's Water Data Library and/or CASGEM program.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):

The area is an unincorporated part of eastern Fresno County, in which the Fresno County Water Advisory Committee and Technical Advisory Sub-committee and Sierra RCD have been joint proponents of such a project.

Project Location

Descriptive (Description of property location etc.):

Sierra High/Middle School, 33330 Lodge Road, Tollhouse, CA 93667 and Foothill Elementary School, 29147 Auberry Rd, Prather, CA 93651

Latitude/Longitude - info available at: http://geocoder.us/	Lat:	37.037043 ° 37.037737 °	Long:	-119.454619 ° -119.519493 °

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):

Project Cost:	<$100K	$100K - $1M	$1M - $10M	>$10M
$150,000	☐	☑	☐	☐

Project Status (Check all that apply):	Conceptual	In-Design	Ready for Construction	CEQA Complete
	☐	☐	☑	☐

Estimated Year of Construction: Project ready and willing sellers available to consider offers.

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF
Water Quality — Area Drained: and/or		Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored):*			

Other: *(Describe X amount of benefit)*

Long-term sustainability of finate groundwater supplies for high public use areas

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- [x] Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- [ ] Implementation of Total Maximum Daily Loads that are established or under development
- [x] Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- [ ] Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- [ ] Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- [ ] Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- [x] Address environmental justice concerns
- [ ] Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- [x] Include integrated projects with multiple benefits
- [x] Support and improve local and regional water supply reliability
- [ ] Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- [ ] Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- [x] Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- [ ] Agricultural Lands Stewardship
- [ ] Agricultural Water Use Efficiency
- [x] Conjunctive Management and Groundwater Storage
- [ ] Conveyance
- [ ] Desalination
- [ ] Drinking Water Treatment and Distribution
- [ ] Economic Incentives
- [ ] Ecosystem Restoration
- [ ] Floodplain Management
- [ ] Groundwater/Aquifer Remediation
- [ ] Matching Water Quality to Water Use
- [ ] Pollution Prevention
- [ ] Precipitation Enhancement
- [ ] Recharge Areas Protection
- [ ] Municipal Water
- [ ] CALFED
- [ ] Regional/Local
- [ ] Reoperation
- [x] Management
- [x] Management
- [x] Use Efficiency
- [ ] Water Transfers
- [ ] Dependent
- [ ] Management

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
PROJECT DESCRIPTION FORM
Project Identification Short Form

Note: This two page project description form gathers information about projects that can be used as examples in the South Sierra region's request for Intergrated Regional Water Management Planning funding. If implementation funding is obtained, more information will be required at a later date to submit this project for funding. This form may be printed, filled out by hand and sent to Bobby Kamansky at the P.O. Box 731, Three Rivers, CA 93271 **OR** electronically filled out and e-mailed to: southernsierrairwmp@gmail.com

General Information			
Project Name:	Eagle Meadows Restoration		
Project Sponsor:	Tule River Tribal Council		
If Joint Project, Other Partners:			
Project Website (if available):			
Project Contact Person:	Phone	FAX	Email
Brian Rueger	559-783-9984	559-783-8932	brueger@ocsnet.net

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):
Eagle Meadows is comprised of several natural meadows that are being encroached by dry site woody shrubs such as mountain whitethorn and bush chinquapin. This project proposes to selectively remove shrubs to maintain the wet meadow areas and improve water flow from the meadow downslope to Eagle Creek. The following IRWM Goals and objectives will be addressed: Goal 1 - Improve Water Supply Management / Objective 1a: Promote natural water storage through meadow, stream & forest restoration. Goal 4 - Improve Watershed & Environmental Resource Management / Objective 4d: Promote natural water storage through meadow restoration. Goal 6: Protect and Enhance Unique and Important Environmental Resources / Objective 6a: Protect unique areas of high value for water storage and groundwater recharge.

Project Integration (Describe how the project does or could integrate with other projects in the Region):
The Tule River Indian Reservation is located in Tulare County, CA. The project is located at 6,900 feet elevation near the southeast boundary of the Reservation, within 1/2 mile of Giant Sequoia National Monument. The legal description of the area is within Sections 32 & 33, Township 22 South, Range 31 East.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):
Meadow protection and restoration is identified in the Tule River Tribe's Integrated Resource Management Plan and the Tribe's Forest Management Plan.

Project Location

Descriptive (Description of property location etc.):
The Tule River Indian Reservation is located in Tulare County, CA. The project is located at 6,900 feet elevation near the southeast boundary of the Reservation, within 1/2 mile of Giant Sequoia National Monument. The legal description of the area is within Sections 32 & 33, Township 22 South, Range 31 East, MDBM.

Latitude/Longitude - info available at: http://geocoder.us/	Lat: 36.029807°	Long: -118.788018°

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):					
Project Cost:		<$100K ☑	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):	Note:NEPA in progress.	Conceptual ☑	In-Design ☑	Ready for Construction ☑	CEQA Complete ☐
Estimated Year of Construction:	The year of implementation will depend on the availability of funding.				

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☑ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF	
Water Quality: Area Drained and/or		Volume Treated:		
Public Access, Open Space, Habitat, Recreation (*acres created/restored*):	Approximately 40 acres restored.			
Other: *(Describe X amount of benefit)*				

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☑ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☑ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☑ Include integrated projects with multiple benefits
- ☑ Support and improve local and regional water supply reliability
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☐ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
- ☐ Conveyance
- ☐ Desalination
- ☐ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☑ Ecosystem Restoration
- ☐ Floodplain Management
- ☐ Groundwater/Aquifer Remediation
- ☐ Matching Water Quality to Water Use
- ☐ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☑ Watershed Management

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
PROJECT DESCRIPTION FORM
Project Identification Short Form

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General Information

Project Name:	Dry Meadow and Stream Restoration
Project Sponsor:	Sequoia National Forest
If Joint Project, Other Partners:	NFWF through Jim Wilcox Plumas Corporation
Project Website (if available):	

Project Contact Person:	Phone	FAX	Email
Nina Hemphill	559 784 1500 x1161		nphemphill@fs.fed.us

Project Description

Project Description (Include which IRWM Goal and Objectives are addressed by the project):

Dry Meadow is on Bull Run Creek a tributary of the North Fork Kern River. Roads surround Dry Meadow, contributing sediment and degrading water quality. Dry Meadow has large gully and is functioning poorly for water storage. The combination of the past logging, road building, the 1990 Stormy fire has caused downcutting and destabilization in Dry Meadow. Surveys of the meadow will be taken in the next 6 months by Jim Wilcox as part of a Sierra Meadow monitoring project. Road decommissioning and culvert removal is currently being planned as well as restoring hydrologic connectivity, fish habitat and water storage (which are all impaired at this time). Without removing the culvert, the meadow cannot be restored. Restoration of the degraded meadow and stream and improving hydrologic connectivity would improve water storage within the meadow, extending cooler flows later into the dry season. Reducing sedimentation of the Kern River will improve water quality. In addition, Bull Run Creek has habitat for Kern River Rainbow (a native golden trout) which would benefit from this project. We anticipate that reconnecting the stream channel to its naturally-evolved floodplain and closing roads around the meadow and in it watershed will provide the following watershed and ecosystem benefits: 1) reduce peak flows and increase/extend summer base flows, 2) enhance aquatic and terrestrial habitat, 3) improve water quality, and 4) raise the local groundwater level within the meadow. These ecosystem benefits will improve downstream fish habitat by cooling and extending the flows longer into the dry season. Downstream water users will benefit by reduced sediment transport, attenuation of sudden storm flows, and better water quality for recreational fishing and other activities.

Project Integration (Describe how the project does or could integrate with other projects in the Region):

This project will be using a statewide protocol for monitoring Sierra meadows and the data once collected will be part of a larger database of how restored meadows function and whether they provide resilience to drought. This would be part of a larger effort to evaluate meadow restorations to detect the benefits and to prioritize meadow restoration across the Sierra Nevada. Different parameters will be monitored included changes in seasonal water storage, seasonal changes in stream flow, return of native flora and fauna; and production of habitat for future species recovery efforts. This restoration would be used to evaluate whether restorations can improve resilience of the meadow or its stream to drought. Recent data suggest that restored meadows maintain steam flows during drought while those not restored do not maintain flows during 2-3 years of drought. Mountain Yellow Legged Frogs are an endangered species at both state and federal levels. The Kern River Rainbow is part of an effort by the State Resources Agency, the USFS, USFWS, NPS and other entities to restore native trout to the north Fork Kern River. In addition extending flows during drought will benefit down stream water users.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):

FOURTH EDITION OF THE WATER QUALITY CONTROL PLAN (BASIN PLAN) FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS. 1995 Department of Fish and Wildlife publication “Fish Species of Special Concern in California, Second Edition,” by P. B. Moyle, R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake

Project Location

Descriptive (Description of property location etc.):

This project is located in a tributary of the upper Kern River in Tulare County California. The Kern River flows south to Kern County and terminates in the Tulare Basin. The project is within the Western Divede River Ranger District.

Latitude/Longitude - info available at: http://geocoder.us/	Lat:	35° 50’33.1’’N	Long:	118° 32’43.81” W

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):

Project Cost:	$450,000	<$100K ☐	$100K - $1M ☑	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):	NFWF grant survey meadow to initiate NEPA; USFS NEPA on Road closures in the watershed.	Conceptual ☑	In-Design ☑	Ready for Construction ☐	CEQA Complete ☐
Estimated Year of Construction:	Topographic surveys to be completed in 2015 to prepare for preliminary designs. Road closures will ready with NEPA in 2015. Once funding to complete NEPA is found for the meadow component of the watershed restoration 6 months to a year will be required for completion depending on timing of funding. Once funded 1 year after NEPA/CEQA/Permit completion may be needed to allow for winter closure of area for construction.				

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF	
Water Quality	Area Drained: and/or		Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored):*	55 acres of meadow habitat restored. 6 miles of perennial stream habitat restored.			

Other: *(Describe X amount of benefit)*

30 acres of meadow habitat and 1 mile of stream habitat for Mountain Yellow Legged Frogs restored and 6 miles of improved flows and water quality for Kern River Rainbows down stream in Osa Creek.

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☑ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☑ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
- ☑ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☑ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
- ☐ Conveyance
- ☐ Desalination
- ☐ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☑ Ecosystem Restoration
- ☐ Floodplain Management
- ☐ Groundwater/Aquifer Remediation
- ☐ Matching Water Quality to Water Use
- ☑ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☑ Watershed Management

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
PROJECT DESCRIPTION FORM
Project Identification Short Form

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General Information			
Project Name:	NONPOINT SOURCE BEST MANAGEMENT PRACTICES/STORMWATER RUNOFF CONTROL		
Project Sponsor:	TULE RIVER TRIBE		
If Joint Project, Other Partners:			
Project Website (if available):			
Project Contact Person:	Phone	FAX	Email
KERRI VERA	559-783-9984	559-783-8932	TULERIVERENV@yahoo.com

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):

IRWM Goal & Objective: GOAL 2- PROTECT AND IMPROVE WATER QUALITY (a) protect natural water bodies, (b) promote water quality best management practices, and (c) reduce erosion and sedimentation; GOAL 4- IMPROVE WATERSHED AND ENVIRONMENTAL RESOURCE MANAGEMENT (c) reduct erosion and sedimentation, and (e) protect and restore floodplain connectivity; GOAL 6- PROTECT UNIQUE/IMPORTANT ENVIRONMENTAL RESOURCES (b) Protect areas with high value to water quality protection and remediation. **Description:** *Implementation of Best Management Practices during construction projects to reduce stormwater runoff, erosion and sediment transport; stabilization of areas vulnerable to stormwater runnoff in effort to reduce negative impact to water quality within the South Fork Tule River watershed.*

Project Integration (Describe how the project does or could integrate with other projects in the Region):

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):
Tribal Water Quality Management Plan; Tribal Integrated Resource Management Plan

Project Location

Descriptive (Description of property location etc.):
TULE RIVER RESERVATION

Latitude/Longitude - info available at: http://geocoder.us/	Lat: 36.029807°	Long: -118.788018°

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):					
Project Cost:		<$100K ☑	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):		Conceptual ☐	In-Design ☐	Ready for Construction ☑	CEQA Complete ☐
Estimated Year of Construction:	Project ready and willing sellers available to consider offers.				

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)		☑	1-100 AF	☐	100-1000AF	☐ 1000+ AF
Water Quality	Area Drained: and/or			Volume Treated:		
Public Access, Open Space, Habitat, Recreation (*acres created/restored*):						
Other: *(Describe X amount of benefit)*						

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
- ☑ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☑ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
- ☐ Conveyance
- ☐ Desalination
- ☐ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☐ Ecosystem Restoration
- ☐ Floodplain Management
- ☐ Groundwater/Aquifer Remediation
- ☐ Matching Water Quality to Water Use
- ☑ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☑ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☑ Watershed Management

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
PROJECT DESCRIPTION FORM
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General Information			
Project Name:	WATER STORAGE IMPROVEMENT PROJECT		
Project Sponsor:	TULE RIVER TRIBE		
If Joint Project, Other Partners:			
Project Website (if available):			
Project Contact Person:	Phone	FAX	Email
DON WALTON/ KERRI VERA	559-783-9594/ 559-783-9984	559-783-8932	Don.Walton@tulerivertribe-nsn.gov TULERIVERENV@yahoo.com

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):

IRWM Goal & Objective: GOAL 1- IMPROVE WATER SUPPLY MANAGEMENT, (a) enhance natural storage and (c) increase capacity of water storage facilities. **Description:** *Installation of new water storage tank(s); improvements/upgrades to existing tanks*

Project Integration (Describe how the project does or could integrate with other projects in the Region):

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):
Tribal Integrated Resource Management Plan

Project Location

Descriptive (Description of property location etc.):
TULE RIVER RESERVATION

Latitude/Longitude - info available at: http://geocoder.us/	Lat: 36.029807°	Long: -118.788018°

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):					
Project Cost:		<$100K ☐	$100K - $1M ☑	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):		Conceptual ☐	In-Design ☐	Ready for Construction ☑	CEQA Complete ☐
Estimated Year of Construction:	Project ready and willing sellers available to consider offers.				

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)		☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF
Water Quality	Area Drained: and/or		Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored*):				
Other: *(Describe X amount of benefit)*				

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☑ Support and improve local and regional water supply reliability
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☐ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☑ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
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- ☐ Desalination
- ☑ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☐ Ecosystem Restoration
- ☐ Floodplain Management
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- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
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- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☐ Watershed Management

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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General Information			
Project Name:	WATER INTAKE ENHANCEMENT		
Project Sponsor:	TULE RIVER TRIBE		
If Joint Project, Other Partners:			
Project Website (if available):			
Project Contact Person:	Phone	FAX	Email
DON WALTON/KERRI VERA	559-783-9594/559-783-9984	559-783-8932	Don.Walton@tulerivertribe-nsn.gov TULERIVERENV@yahoo.com

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):

IRWM Goal & Objective: GOAL 1- IMPROVE WATER SUPPLY MANAGEMENT, (a) enhance natural storage and (c) increase capacity of water storage facilities. **Description:** *Removal of silt within existing water impoundment; installation of filters at intake line; enhancement of water transport line from intake to main water system treatment plant*

Project Integration (Describe how the project does or could integrate with other projects in the Region):

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):
Tribal Water Quality Management Plan, Tribal Integrated Resource Management Plan

Project Location

Descriptive (Description of property location etc.):
TULE RIVER RESERVATION

Latitude/Longitude - info available at http://geocoder.us/	Lat: 36.029807°	Long: -118.788018°

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):					
Project Cost:		<$100K ☑	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):		Conceptual ☐	In-Design ☐	Ready for Construction ☑	CEQA Complete ☐
Estimated Year of Construction:	Project ready and willing sellers available to consider offers.				

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)		☑	1-100 AF	☐	100-1000AF	☐ 1000+ AF
Water Quality	Area Drained: and/or			Volume Treated:		
Public Access, Open Space, Habitat, Recreation (*acres created/restored*):						
Other: *(Describe X amount of benefit)*						

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☑ Support and improve local and regional water supply reliability
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☐ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☑ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
- ☐ Conveyance
- ☐ Desalination
- ☑ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☐ Ecosystem Restoration
- ☐ Floodplain Management
- ☐ Groundwater/Aquifer Remediation
- ☐ Matching Water Quality to Water Use
- ☐ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☐ Watershed Management

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
PROJECT DESCRIPTION FORM
Project Identification Short Form

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General Information

Project Name:	Forest Road Rehabilitation
Project Sponsor:	Tule River Tribal Council
If Joint Project, Other Partners:	
Project Website (if available):	

Project Contact Person:	Phone	FAX	Email
Brian Rueger	559-783-9984	559-783-8932	brueger@ocsnet.net

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):

Portions of several unsurfaced range and forest roads are contributing sediment to perennial watercourses. Due to their remote locations, these roads receive little maintenance. This project will correct the sedimentation problem by installing water drainage structures and rocking the road approaches to several existing stream crossings on these seasonally travelled roads. IRWM Goals and Objectives to be addressed include Goal 2, Objective 2c; Goal 4, Objective 4c (Reduce erosion and sedimentation).

Project Integration (Describe how the project does or could integrate with other projects in the Region):

The South Fork Tule River headwaters are on federal lands administered by the U.S. Forest Service. Downslope flow transects the Tule River Indian Reservation and a number of private ownerships before reaching Lake Success. The project integrates well with other projects designed to improve water quality into the South Fork Tule River.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):

Improving water quality is an objective in the Tule River Tribe's Integrated Resource Management Plan, and the Tribal Water Quality Management Plan.

Project Location

Descriptive (Description of property location etc.):

The project is located on the Tule River Indian Reservation in Tulare County, CA. Project activities are proposed at several remote locations, including within Section 18, T22S, R31E (3,500 ' elevation); and Section 30, T22S, R31E, (5,700'), MDBM.

Latitude/Longitude - info available at:	http://geocoder.us/	Lat: 36.029807°	Long: -118.788018°	
Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate)				
Project Cost:		<$100K ☑	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):		Conceptual ☑	In-Design ☑	Ready for Construction ☑	CEQA Complete ☐
Estimated Year of Construction:	Project activities can occur the first summer after funding is available.				

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)		☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF
Water Quality	Area Drained: and/or		Volume Treated:	Year round flow
Public Access, Open Space, Habitat, Recreation (*acres created/restored*):				

Other: *(Describe X amount of benefit)*

Water quality will be enhanced at each rehabilitation site. Existing road approaches to Kessing Creek and Redwood Creek will be targeted. Water from these watercourses flows into the South Fork Tule River, which is a domestic water source for the Tule River Tribal community.

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☐ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

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- ☐ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☐ Watershed Management

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INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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General Information

Project Name:	Goliath Prescribed Fire Unit
Project Sponsor:	Sequoia and Kings Canyon National Parks
If Joint Project, Other Partners:	N/A
Project Website (if available):	N/A

Project Contact Person:	Phone	FAX	Email
Will Basye	559-565-3159	559-565-3797	William_Basye@nps.gov

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):

The Goliath prescribed fire unit will contribute to meeting several IRWM goals and objectives as well as additional agency objectives. The mixed conifer community of the Goliath unit has a historic fire return interval of 10-20 years. This has resulted in the significant buildup of fuels since full suppression became national fire policy over 100 years ago. This prescribed fire will reintroduce fire to the Goliath unit. It will reduce fuel accumulations and contribute to a more resilient ecosystem. Ecosystem resiliency will become an increasingly important goal as we continue to experience the effects of climate change. The burn will reduce the likelihood of future high intensity wildfire and accompanying potential for erosion and sedimentation. Additional benefits include increased Giant Sequoia reproduction and improved forest health.

Project Integration (Describe how the project does or could integrate with other projects in the Region):

The Goliath prescribed fire unit is part of an integrated plan to restore natural fire regimes and increase ecosystem resiliency in the Redwood Creek drainage (see attached fire history map). This drainage has a rich history of prescribed fire going back to the late 1960's at the inception of the parks prescribed fire program, however, the Goliath unit has not been burned. Many areas surrounding the Goliath unit have been burned twice in the past 45 years in an effort to return fire to this historic area and the Giant Sequoia groves located there. This unit would be last puzzle piece to reintroduce prescribed fire into this drainage.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):

This project is part of the Sequoia and Kings Canyon National Parks prescribed fire program. The project falls under guidance provided in the park General Management Plan and the Fire and Fuels Management Plan as well as is in compliance with the Fire and Fuels Management Environmental Assessment. The site specific Burn Plan has been completed and approved.

Project Location

Descriptive (Description of property location etc.):

The 769 acre Goliath prescribed fire unit is within Kings Canyon National Park in the Kaweah River drainage. The unit lies in Redwood Canyon on the east side of Redwood Creek.

Latitude/Longitude - info available at: http://geocoder.us/	Lat: 36.7		Long: -118.9	
Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):				
Project Cost:		<$100K ☐	$100K - $1M ☑	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):		Conceptual ☐	In-Design ☐	Ready for Construction ☐	CEQA Complete ☐
Estimated Year of Construction:	Project ready for completion fall 2014			

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF

Water Quality	Area Drained: and/or	☐	Volume Treated: ☐	☐
Public Access, Open Space, Habitat, Recreation (*acres created/restored):*				
Other: *(Describe X amount of benefit)*				
Water quality benefits will accrue by preventing erosion and subsequent sedimentation to Redwood Creek which may follow potential high intensity wildfire. The likelihood of an unwanted, high intensity fire will be significantly reduced by the accomplishment of this burn.				

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☑ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☐ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
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- ☐ Conveyance
- ☐ Desalination
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- ☐ Matching Water Quality to Water Use
- ☐ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
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INTEGRATED REGIONAL WATER MANAGEMENT PLAN
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General Information

Project Name:	Aquatic Effects from Forest Restoration and Fuels Reduction: Kings River Watershed		
Project Sponsor:	Pacific Southwest Research Station, USDA Forest Service		
If Joint Project, Other Partners:	Southern California Edison and University of California		
Project Website (if available):	www.fs.fed.us/psw/topics/water/kingsriver		
Project Contact Person:	Phone	FAX	Email
Dr. Carolyn Hunsaker	559-323-3211	559-297-3355	chunsaker@fs.fed.us

Project Description

Project Description (1 -2 sentences):

This project quantifies positive and negative effects to stream ecosystems from forest restoration and fuels reduction activities at the watershed scale. It focuses on water yield and water quality in headwater streams of the Kings River watershed and would contribute to the continuation of data collection and analyses that have been ongoing for 10 years.

Project Integration (Describe how the project does or could integrate with other projects in the Region):

It represents the primary surface water source supply for the region. It received funding from 2005-2010 through the CALFED Watershed Program and addressed CALFED's primary objectives of ecosystem quality and water quality. This project addresses CALFED Watershed Program goals of "provide assistance--both financial and technical for watershed activities that help achieve the mission and objectives of CALFED, and to promote collaboration and integration among existing and future local watershed programs." It can be considered a restoration project and has some relationship to meadow restoration.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):

Sierra Nevada Framework, USDA Forest Service 2001 and 2004

Project Location

Descriptive (Description of property location etc.):

Providence Creek, Bull Creek, and Teakettle Creek headwaters, Sierra National Forest. Region 5, Tulare Lake Basin Kings River (552.0) of the Central Valley Regional Water Quality Control Board. Pine Flat Reservoir (52.32) and North Fork of the Kings (52.30)

Latitude/Longitude - info available at: http://geocoder.us/	Lat:		Long:	
Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):				
Project Cost:	<$100K ☐	$100K - $1M ☑	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):	Conceptual ☐	In-Design ☐	Ready for Construction ☑	CEQA Complete ☐
Estimated Year of Construction:	Project ready and willing sellers available to consider offers.			

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☑ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF
Water Quality Area Drained: and/or	2,000 acres	Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored):*	2,000 acres		

Other: *(Describe X amount of benefit)*

Reduced risk of wildfire and associated debris flows and water quality degradation.

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☑ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☑ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☑ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☑ Include integrated projects with multiple benefits
- ☑ Support and improve local and regional water supply reliability
- ☑ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☐ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☑ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
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- ☐ Desalination
- ☐ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☑ Ecosystem Restoration
- ☐ Floodplain Management
- ☐ Groundwater/Aquifer Remediation
- ☐ Matching Water Quality to Water Use
- ☐ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
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General Information

Project Name:	Mill Flat Creek Road Management Project		
Project Sponsor:	Sequoia National Forest		
If Joint Project, Other Partners:	None at this time.		
Project Website (if available):	none		
Project Contact Person:	Phone	FAX	Email
Jeff Cordes	(559) 338-2251	(559) 338-2131	jcordes@fs.fed.us

Project Description

Project Description (1 -2 sentences):

The Sequoia National Forest proposes to decommission 14 Forest roads or portions of roads (a total of approximately 3.3 miles) within the Mill Flat Creek to reduce resource damage.

Project Integration (Describe how the project does or could integrate with other projects in the Region):

Other projects within the Mill Flat Creek Watershed: Fuel reduction projects to reduce the potential for catastropic wildfire, (Pine Ridge Fuels Reduction and Big Stump Fuels Reduction) Davis Road Maintenance and Millwood OHV staging area, (Improvement of water quality problems, habitat fragmentation, and riparian vegetation) and Weed Abatement (yellow starthistle).

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):

USDA Forest Service Watershed Condition Framework: Mill Flat Watershed 2011, Giant Sequoia National Monument Plan, 2012

Project Location

Descriptive (Description of property location etc.):

Mill Flat Creek Watershed, (180300100703) The majority of the watershed lies within the Hume Lake Ranger District, of the Sequoia National Forest. Mill Flat Creek is a tributary to the Kings River above Pine Flat Reservoir.

Latitude/Longitude - info available at: http://geocoder.us/	Lat: N 36.8915		Long: W 119.1690	
Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):				
Project Cost: $125,000	<$100K ☐	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):	Conceptual ☑	In-Design ☐	Ready for Construction ☐	CEQA Complete ☐
Estimated Year of Construction:	Starting in 2013 and continuing for the next 5 years.			

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF
Water Quality — Area Drained: and/or	31,292	Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored):*	500		

Other: *(Describe X amount of benefit)*

Acres of habitat improved by road decommissioning.

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☑ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☑ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
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General Information

Project Name:	Osa Meadow and Stream Restoration
Project Sponsor:	Sequoia National Forest
If Joint Project, Other Partners:	Cal Trout, Kern Fly Fishers
Project Website (if available):	

Project Contact Person:	Phone	FAX	Email
Nina Hemphill	559 784 1500 x1161		nphemphill@fs.fed.us

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):

Osa Meadow is on Osa Creek a tributary of the North Fork Kern River. The combination of the past gullying, the 2002 McNally fire followed by a severe 2002 storm increased downcutting in Osa Meadow. Erosion and warming of stream temperatures occurs within Osa meadow and influences Osa Creek. Osa Meadow Restoration would restore 2,000 feet of degraded meadow and stream improving hydrologic connectivity and thus water storage within the meadow, extending cooler flows later into the dry season. Reducing sedimentation of the Kern River would be an additional benefit. This project would also improve suitable habitat for Mountain Yellow Legged Frogs, an endangered species. Improving water quality by reducing fine sediment loading and moderating temperatures will improve water for downstream water users. In addition, Osa Creek has 3.5 kilometers of habitat for Kern River Rainbow (a native golden trout) which will benefit from this project. We anticipate that reconnecting the stream channel to its naturally-evolved floodplain will provide the following watershed and ecosystem benefits: 1) establish a single-thread, low flow channel, 2) reduce peak flows and increase/extend summer base flows, 3) increase in-stream cover and shading, 4) enhance aquatic and terrestrial habitat, 5) improve water quality, and 6) raise the local groundwater level within the meadow. These benefits will improve downstream fish habitat by cooling and extending the flows longer into the dry season. Reducing gullying and erosion as well as inundating the meadow in the spring and summer will reverse the declines in the quality and quantity of aquatic habitats for native fish and amphibians and improve water quality.

Project Integration (Describe how the project does or could integrate with other projects in the Region):

This project will be using a statewide protocol for monitoring Sierra meadows and the data once collected will be part of a larger database of how restored meadows function and whether they provide resilience to drought. This would be part of a larger effort to evaluate meadow restorations to detect the benefits and to prioritize meadow restoration across the Sierra Nevada. Different parameters will be monitored included changes in seasonal water storage, seasonal changes in stream flow, return of native flora and fauna; and production of habitat for future species recovery efforts. This restoration would be used to evaluate whether restorations can improve resilience of the meadow or its stream to drought. Mountain Yellow Legged Frogs are an endangered species at both state and federal levels. The Kern River Rainbow is part of an effort by the State Resources Agency, the USFS, USFWS, NPS and other entities to restore native trout to the upper north Fork Kern River. Habitat loss from the region's long history of grazing, logging, and roads, as well as stochastic events such as floods, drought, and fire, can degrade habitats reducing population persistence.

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):

FOURTH EDITION OF THE WATER QUALITY CONTROL PLAN (BASIN PLAN) FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS. 1995 Department of Fish and Wildlife publication "Fish Species of Special Concern in California, Second Edition," by P. B. Moyle, R. M. Yoshiyama, J. E. Williams, and E. D. Wikramanayake

Project Location

Descriptive (Description of property location etc.):

This project is located in a tributary of the upper Kern River in Tulare County California. The Kern River flows south to Kern County and terminates in the Tulare Basin. The project is within the Kern River Ranger District. T. 20 S., R. 34 E., SW ¼ of Section 16 and SE ¼ of Section 17; Mount Diablo Base Meridian

Latitude/Longitude - info available at: http://geocoder.us/	Lat:	36° 10'52.50"	Long:	-118° 18 '18.34"

Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):

Project Cost:	$350,000	<$100K ☐	$100K - $1M ☑	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):	$120,000 NFWF grant submitted; will need $250000	Conceptual ☑	In-Design ☑	Ready for Construction ☐	CEQA Complete ☐
Estimated Year of Construction:	Preliminary surveys done, species surveys to be completed in 2015, hydrologic sampling to start in 2015. Project will be ready with NEPA and CEQA within 6 months once funding to complete NEPA is found. Once funded 1 year after NEPA/CEQA/Permit completion may be needed to allow for winter closure of area for construction. Estimate 2017 for construction of project.				

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF	
Water Quality	Area Drained: and/or		Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored):*	45 acres of meadow restored. 3.5 miles of stream restored.			

Other: *(Describe X amount of benefit)*

20 acres of meadow habitat and 1 mile of stream habitat for Mountain Yellow Legged Frogs restored and 3.5 miles of improved flows and water quality for Kern River Rainbows down stream in Osa Creek.

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☑ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☑ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
- ☑ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☑ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
- ☐ Conveyance
- ☐ Desalination
- ☐ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☑ Ecosystem Restoration
- ☐ Floodplain Management
- ☐ Groundwater/Aquifer Remediation
- ☐ Matching Water Quality to Water Use
- ☑ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☑ Watershed Management

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
PROJECT DESCRIPTION FORM
Project Identification Short Form

Note: This two page project description form gathers information about projects that can be used as examples in the South Sierra region's request for Intergrated Regional Water Management Planning funding. If implementation funding is obtained, more information will be required at a later date to submit this project for funding. This form may be printed, filled out by hand and sent to Bobby Kamansky at the P.O. Box 731, Three Rivers, CA 93271 **OR** electronically filled out and e-mailed to: southernsierrairwmp@gmail.com

General Information

Project Name:	Restore Critical Wetlands in Cahoon Meadow, Sequoia National Park
Project Sponsor:	Sequoia and Kings Canyon National Parks
If Joint Project, Other Partners:	Colorado State University
Project Website (if available):	

Project Contact Person:	Phone	FAX	Email
Athena Demetry	559-565-4479	559-565-4429	athena_demetry@nps.gov

Project Description

Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):

This project will complete an Environmental Impact Statement and will implement restoration of the 17-acre Cahoon Meadow, which contains severe and active erosion gullies as a result of historic grazing. The erosion gully is about 1,150 feet long, from 56 to 92 feet wide, and a maximum of 17 feet deep; it has dewatered 5 acres of former wetlands and continues to threaten 13 acres of high-quality fen and wet meadow habitat. The meadow is located in designated wilderness, and treatment techniques that will achieve a restoration objective will require helicopter transport of mechanized equipment. In addition to improving water storage, wildlife habitat, and watershed health, this project will serve as a prototype for improving conditions of highly degraded wilderness meadows that have legacy impacts of past grazing. This project addresses IRWM goals/objectives 1a, 2a, 2c, 3c, 4c, 4d, 4e, and 6d.

Project Integration (Describe how the project does or could integrate with other projects in the Region):

This cooperative project was developed by staff of Sequoia National Park, the NPS Water Resources Division, Colorado State University, and UC Davis. When proposing the plan for this project, we consulted with Yosemite National Park and local agencies including Sequoia Riverlands Trust, the Southern Sierra Partnership, Sequoia National Forest, the Bureau of Land Management in Bakersfield, and Tulare Basin Wildlife Partners. We will consult widely with the public, local community, and concerned agencies and organizations during the NEPA scoping and public comment periods. Technical planning for this project is supported by the Sierra Nevada Conservancy ($74,500).

Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):

Beginning in 2014, the parks are developing a stand-alone plan to restore Cahoon Meadow. Restoration at Cahoon Meadow is conceptually included under the umbrella of the 2007 General Management Plan and 2014 Draft Wilderness Stewardship Plan for Sequoia and Kings Canyon National Parks.

Project Location

Descriptive (Description of property location etc.):

Cahoon Meadow is a 17-acre wet meadow located at 7,350 feet elevation at the headwaters of Cahoon Creek, a tributary of the East Fork of the Kaweah River in Sequoia National Park. Held in private ownership until 1977, the meadow was historically dedicated to cattle grazing, now discontinued. Cahoon Meadow is within the designated John Krebs Wilderness.

Latitude/Longitude - info available at: http://geocoder.us/	Lat: 36.385636		Long: -118.703713	
Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):				
Project Cost:		<$100K ☐	$100K - $1M ☐	$1M - $10M ☑	>$10M ☐
Project Status (Check all that apply):		Conceptual ☐	In-Design ☑	Ready for Construction ☐	CEQA Complete ☐
Estimated Year of Construction:	2020			

Project Benefits

Water Supply: *New Supply Created (AFY)* (Check one)	☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF

		☐		☐	☐
Water Quality	Area Drained: and/or		Volume Treated:		
Public Access, Open Space, Habitat, Recreation (*acres created/restored):*		loss			
Other: *(Describe X amount of benefit)*					
Approximately 20,000 cubic yards of sediment has been lost from the 372-acre watershed.					

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☐ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
- ☐ Conveyance
- ☐ Desalination
- ☐ Drinking Water Treatment and Distribution
- ☐ Economic Incentives
- ☑ Ecosystem Restoration
- ☑ Floodplain Management
- ☐ Groundwater/Aquifer Remediation
- ☐ Matching Water Quality to Water Use
- ☐ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☐ Watershed Management

Appendix H

Project Description Form

SOUTH SIERRA REGION
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
PROJECT DESCRIPTION FORM
Project Identification Short Form

Note: This two page project description form gathers information about projects that can be used as examples in the South Sierra region's request for Intergrated Regional Water Management Planning funding. If implementation funding is obtained, more information will be required at a later date to submit this project for funding. This form may be printed, filled out by hand and sent to Bobby Kamansky at the P.O. Box 731, Three Rivers, CA 93271 **OR** electronically filled out and e-mailed to: southernsierrairwmp@gmail.com

General Information			
Project Name:			
Project Sponsor:			
If Joint Project, Other Partners:			
Project Website (if available):			
Project Contact Person:	Phone	FAX	Email

Project Description
Project Description (Inculde which IRWM Goal and Objectives are addressed by the project):
Project Integration (Describe how the project does or could integrate with other projects in the Region):
Project Source (Cite Plan(s) to which the project belongs [e.g., Watershed Master Plans, Capital Improvement Plans]):

Project Location					
Descriptive (Description of property location etc.):					
Latitude/Longitude - info available at: http://geocoder.us/		Lat:		Long:	
Estimated Capital Costs: (Note estimated cost, if known OR check rough estimate):					
Project Cost:		<$100K ☐	$100K - $1M ☐	$1M - $10M ☐	>$10M ☐
Project Status (Check all that apply):		Conceptual ☐	In-Design ☐	Ready for Construction ☐	CEQA Complete ☐
Estimated Year of Construction:	Project ready and willing sellers available to consider offers.				

Project Benefits				
Water Supply: *New Supply Created (AFY)* (Check one)	☐ 1-100 AF	☐ 100-1000AF	☐ 1000+ AF	
Water Quality	Area Drained: and/or		Volume Treated:	
Public Access, Open Space, Habitat, Recreation (*acres created/restored):*				
Other: *(Describe X amount of benefit)*				

Project Criteria

Please review the project against the Statewide Priorities, Program Preferences, and Water Plan Management Strategies and place a check in the box if the project meets the criteria.

Statewide Priorities

- ☐ Reduce conflict between water users or resolve water rights disputes, including interregional water rights issues
- ☐ Implementation of Total Maximum Daily Loads that are established or under development
- ☐ Implementation of Regional Board (RWQCB) Watershed Management Initiative Chapters, plans and policies
- ☐ Implementation of the SWRCB's Non-point Source (NPS) Pollution Plan
- ☐ Assist in meeting Delta Water Quality Objectives; IRWM Grant Program Guidelines 6
- ☐ Implementation of recommendations of the floodplain management task force, desalination task force, recycling task force, or state species recovery plan
- ☐ Address environmental justice concerns
- ☐ Assist in achieving one or more goals of the CALFED Bay-Delta Program

Program Preferences

- ☐ Include integrated projects with multiple benefits
- ☐ Support and improve local and regional water supply reliability
- ☐ Contribute expeditiously and measurably to the long-term attainment and maintenance of water quality standards
- ☐ Eliminate or significantly reduce pollution in impaired waters and sensitive habitat areas, including areas of special biological significance
- ☐ Include safe drinking water and water quality projects that serve disadvantaged communities

CA Water Plan - Water Management Strategies

- ☐ Agricultural Lands Stewardship
- ☐ Agricultural Water Use Efficiency
- ☐ Conjunctive Management and Groundwater Storage
- ☐ Conveyance
- ☐ Crop Idling for Water Transfers
- ☐ Desalination
- ☐ Drinking Water Treatment and Distribution
- ☐ Drought Planning
- ☐ Economic Incentives
- ☐ Ecosystem Restoration
- ☐ Flood Management
- ☐ Groundwater/Aquifer Remediation
- ☐ Irrigation Land Retirement
- ☐ Land Use Planning & Management
- ☐ Matching Water Quality to Water Use
- ☐ Outreach and Education
- ☐ Pollution Prevention
- ☐ Precipitation Enhancement
- ☐ Rainfed Agriculture
- ☐ Recharge Areas Protection
- ☐ Recycled Municipal Water
- ☐ Salt and Salinity Management
- ☐ Sediment Management
- ☐ Surface Storage - CALFED
- ☐ Surface Storage - Regional/Local
- ☐ System Reoperation
- ☐ Urban Land Use Management
- ☐ Urban Stormwater Runoff Management
- ☐ Urban Water Use Efficiency
- ☐ Water and Culture
- ☐ Water Transfers
- ☐ Water-Dependent Recreation
- ☐ Watershed Management

Appendix I

Project Scoring Criteria

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP
PROJECT SCORING CRITERIA & RELATION TO STATE CRITERIA (Revised 2013)

Southern Sierra Criteria	Pass/Fail	Purpose of Question	Relation to State Criteria
Support for SOUTHERN SIERRA IRWMP. *The project proponent must have formally adopted the plan.*	P/F	Demonstrates that the project proponent has formally adopted the IRWMP plan	• Adopted IRWMP Plan and Proof of formal adoption
Implementation of the SOUTHERN SIERRA IRWMP. *The project must address the values, goals, objectives and strategies identified in the IRWMP.*	P/F	To fund projects that directly support and further the implementation of the region's water management goals and objectives.	• Consistency with IRWMP standards • Objectives • Priorities and Schedule • Impacts and Regional Benefits • Implementation

Southern Sierra Question No.	Southern Sierra Criteria	Range of Points Possible	Scoring Standard	Purpose of Question	Relation to State Criteria
1	**Objectives.** Does the project contribute to IRWM Plan Objectives?	1-10	A higher score indicates that the project is expected to contribute to the achievement of more of the plan objectives.	Assists in prioritizing projects into the regional plan and ensures that the project will meet plan objectives	• Objectives • Priorities
2	**Resource Management Strategies.** How well does the project relate to the SSIRWM Plan Resource Management Strategies?	1-10	A higher score identifies a project that contributes to more resource management strategies that diversify the water management portfolio used to meet plan objectives.	Ensures a diversity of resource management strategies are implemented towards fulfilling plan objectives	• Objectives • Resource Management Strategies • Integration
3	**Technical Feasibility.** Is the project based on a sound technical feasibility?	1-5	Higher scores indicate a thorough readiness to implement the project. Technical feasibility is related to knowledge of project location, water system, and geologic or hydrologic conditions. Lower scores could indicate gaps in data or information that could prevent a project's success.	Evaluate readiness to proceed, project feasibility, and obtain documentation.	• Technical Analysis • Plan Performance and Monitoring

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP
PROJECT SCORING CRITERIA & RELATION TO STATE CRITERIA (Revised 2013)

Southern Sierra Question No.	Southern Sierra Criteria	Range of Points Possible	Scoring Standard	Purpose of Question	Relation to State Criteria
4	**Disadvantaged Community.** Does the project address critical water supply and quality needs of a "disadvantaged community" as defined by the State?	1-10	A score of one to three will reflect the projects benefits to the community. A score of zero will be assigned if the project is not benefiting a disadvantaged community.	Identify projects that benefit disadvantaged communities	• Disadvantaged Communities • Impacts and Benefits • Ensure Equitable Distribution of Benefits • Stakeholder Involvement • Coordination
5	**Native American Communities.** Are there specific benefits to Native American tribal communities?	1-10	A higher score will be assigned to those projects that include strategies for addressing critical water supply and water quality needs of Native American tribal communities.	Identifies projects that benefit Native American tribal communities	• Improve Tribal Water and Natural Resources • Impacts and Regional Benefits • Ensure Equitable Distribution of Benefits • Stakeholder Involvement • Coordination
6	**Environmental Justice Considerations.** Does the project provide consideration for environmental justice or equality?	1-5	A higher score would address the important considerations for the SSIRWM of inequitable distribution of pollution and access to clean water and air, parks, recreation, and nutritious foods.	Encourages the equal distribution of resources to ensure that environmental benefits are fairly distributed	• Impacts and Benefits • Water Management Strategies and Integration • Ensure Equitable Distribution of Benefits • Coordination

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP
PROJECT SCORING CRITERIA & RELATION TO STATE CRITERIA (Revised 2013)

Southern Sierra Question No.	Southern Sierra Criteria	Range of Points Possible	Scoring Standard	Purpose of Question	Relation to State Criteria
7	**Project Costs and Financing.** Are project costs documented? If so, what are they based on?	1-10	A higher score is based on documented project costs that are based on a feasibility study, conceptual idea, design, etc.	Determine if the project costs are within reason for this project	• Budget • Implementation • Financing
8	**Economic Feasibility.** Does the project describe a feasible program of financing for implementation of project?	1-10	Higher score based on documentation of firm financial commitments; clear resource commitments for ongoing monitoring, maintenance and operations; and a high percentage local match.	Evaluate readiness to proceed, clear financial commitments	• Financing • Budget • Implementation
9	**Project Status.** What is the status of the project? Is the project ready to proceed?	1-10	Higher scores would be assigned to projects that are implementable and well documented. Conceptual projects may also be included in the IRWM Plan because the planning horizon for an IRWM Plan is 20-years. Projects with low readiness may be developed or the RWMG may seek additional funding in order to develop the project to be ready.	Evaluates the readiness to proceed with a given project	• Technical Analysis • Relation to Local Water Planning • Relation to Local Land use Planning • Implementation
10	**Strategic Considerations.** Could a smaller/local project be strategically restructured to satisfy regional objectives?	1-5	The RWMG will review strategic considerations that may bring multiple benefit and greater integration to projects. In this way, local projects may be integrated for regional benefit and explaining when a single purpose project needs to be implemented in order to best implement an IRWM Plan.	Evaluate readiness to proceed, provide greater integration	• Implementation • Multiple Stakeholder Benefits • Coordination • Objectives
11	**Climate Change.** Does the project address the effects of climate change?	1-10	Higher scores will be given to projects that specifically identify the impacts and benefits of climate change.	Does the project contribute to regional and state goals of adaptation for climate change	• Climate Change • Impacts and Benefits
12	**Greenhouse Gas Emissions.** Does the project contribute to the reduction of GHG emissions as compared to project alternatives?	1-5	Higher scores will be given to projects that, over the course of their life, will help the region lower GHG emissions.	Considerations such as energy efficiency and reduction of GHG emissions are important when choosing between project alternatives	• Climate Change • Impacts and Benefits

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP
PROJECT SCORING CRITERIA & RELATION TO STATE CRITERIA (Revised 2013)

Southern Sierra Question No.	Southern Sierra Criteria	Range of Points Possible	Scoring Standard	Purpose of Question	Relation to State Criteria
Total # of points (Out of 100)	**Projects will be determined based on scoring from the 12 questions above.**				

Appendix J

Outline for Grant Pre-Application

Southern Sierra Regional Water Management Group
Outline for Grant Pre-Application

1 – PROJECT DESCRIPTION
1.1 – Project Summary
1.2 – Goals and Objectives of Project
1.3 – Relation to Southern Sierra IRWMP

2 – PROJECT TASKS

3 – PROJECT BENEFITS
3.1 - Water Supply
3.2 - Water Quality
3.3 - Flood Damage Reduction
3.4 - Ecosystem
3.5 - Other Benefits

3 – PERMITTING AND ENVIRONMENTAL ISSUES

4 – DATA MANAGEMENT AND MONITORING DELIVERABLES

5 – PROJECT BUDGET

6 – PROJECT SCHEDULE

8 – IRWM PROGRAM PREFERENCES AND STATEWIDE PRIORITIES

9 – CONCLUSIONS AND JUSTIFICATION FOR IRWMP GRANT APPLICATION

Attachments
1 – Vicinity Map
2 – Project Location Map
3 – Cost Estimate

APPENDICES

Appendix K

Resource Database

Southern Sierra Regional Water Management Group

Resource Database

No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
1	AB3030 Groundwater Management Plan Madera County Final Draft	January 2002	Todd Engineers		In this AB3030 plan, the County desires to: study the current conditions of the groundwater basins, document current groundwater management practices, and explore techniques to cooperatively manage one of the County's most important resources. Focuses on valley floor.		No	10
2	Ahwahnee/Nipinnawasee Area Plan	1999	USFS	Rocky Mtn Research Station USFS	Cumulative Watershed Effects of Fuel Management, some Value for future climate change RMS.	http://forest.moscowfsl.wsu.edu/engr/cwe/	No	9
3	Biological Assessment & Criteria		Wayne S. Davis & Thomas P. Simon	Available in Carolyn Hunsaker library, Lewis Publishers	Various articles in the area of conceptual framework for biocriteria development, water resource planning and decision-making, methods advancement and technical applications, and policy and perspectives.		No	1
4	CAL/Ecotox		CAL Office of Environmental Health Hazzard Assessment	OEHHA 1001 I Street, 12th Floor, Sacramento, CA 95814	Cal/Ecotox database provides ecological, physiological, and toxicity data for California fish, reptiles, mammals, amphibians and birds.	http://www.oehha.ca.gov/cal_ecotox/DEFAULT.HTM	No	4
5	California Department of Fish & Game (CDFG) BIOS		California Department of Fish and Game	DFG Headquarters 1416 9th Street, Sacramento, CA 95814 • Google Map (916) 445-0411	BIOS is a system designed to enable the management, visualization, and analysis of biogeographic data collected by the Department of Fish and Game and its Partner Organizations. In addition, BIOS facilitates the sharing of those data within the BIOS community. BIOS integrates GIS, relational database management, and ESRI's ArcIMS technology to create a statewide, integrated information management tool that can be used on any computer with access to the Internet.	http://bios.dfg.ca.gov/	No	1
6	California Dept. Fish & Game: CalFish Database	2008, Updated		CDFG	CalFish provides direct access to many different types of data relating to fish and aquatic habitat data. These data include categories such as: - Population trends and counts - Distributions - Migration barriers - Hatcheries - Habitat restoration projects - Genetics - Monitoring		No	4
7	California Dept. of Fish & Game (CDFG) CWHR		California Dept. of Fish and Game	California Wildlife Habitat Relationships (CWHR)	CWHR contains life history, geographic range, habitat relationships, and management information on 694 species of amphibians, reptiles, birds, and mammals known to occur in the state.	http://www.dfg.ca.gov/biogeodata/cwhr/	No	1, 4, 12

Southern Sierra Regional Water Management Group

Resource Database

No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
8	California Environmental Resources Evaluation System (CERES)	2008, updated			CERES focuses on three related components: technology, data, and community. The first, technology, includes the development of new software and network structures to accommodate the search and retrieval, organization, and accessibility demands associated with huge volumes of data in a wide range of forms. The second, data, encompasses the conversion of vast quantities of information into digital form as well as the evaluation of existing digital data sets and the development of metadata catalogs required searching and data-quality and appropriate use assessment. The third, community, contains CERES' efforts to promote the use of the network for planning and policy and to foster the growth of new users and contributors in a far-reaching web of affiliations.	http://ceres.ca.gov/	No	12, 13
9	California Natural Diversity Database (CNDDB)		CA Dept. of Fish and Game	Biogeographic Data Branch 1807 13th Street, Suite 202 Sacramento, CA 95811 (916) 322-2493 Information Services 916-324-3812	The California Natural Diversity Database (CNDDB) is a program that inventories the status and locations of rare plants and animals in California . CNDDB staff work with partners to maintain current lists of rare species as well as maintain an ever-growing database of GIS-mapped locations for these species.	http://www.dfg.ca.gov/biogeodata/cnddb/	No	4, 3, 12, 16
10	California Water Plan Update 2009, Volume 3, Regional Reports - Chapter 7 San Joaquin River Hydrologic Region, Working Draft	2008	CA DWR	working draft 9/4/2008	More specific to the San Joaquin hydrologic area including: land use, water use, water supplies, water quality, flood management, regional water planning and management.	http://www.waterplan.water.ca.gov/regions/sjr/	No	7
11	California Water Plan Update 2013, Volume 3, Regional Reports - Chapter 13 Mountain Counties Area, Working Draft	2008	CA DWR	working draft 9/8/2008	Has chapters including: land use, water use, water supplies, water quality, flood management, regional water planning and management.	http://www.waterplan.water.ca.gov/regions/mc/	No	3, 5, 8, 12, 13

Southern Sierra Regional Water Management Group

Resource Database

No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
12	California Watershed Assessment Manual: Volume I	2005	F. Shilling, S. Sommarstrom, R. Kattelmann, B. Washburn, J. Florsheim, R. Henly.	Prepared for the California Resources Agency and the California Bay-Delta Authority	This manual is intended to provide guidance for planning and conducting watershed assessments for wildland and rural areas of northern and central California. Volume I of the Manual currently contains 8 chapters. These flow from the introductory chapter (1), through chapters describing the details of assessment planning (2), fundamentals of watershed functioning (3), data collection (4), data analysis (5), and data integration (6). Chapter 7 gives details on how to structure an assessment report; and chapter 8 describes connecting the assessment with decision-making.	http://www.cwam.ucdavis.edu/Manual_chapters.htm	No	12
13	California Watershed Assessment Manual: Volume II	2008 + drafting	F. Shilling, et. al.		Volume II of the CWAM provides guidance on specific aspects of watershed assessment and evaluation, including water quality, benthic macroinvertebrates, and fire ecology. Each chapter describes current methods to monitor and evaluate conditions of these watershed processes and features. They also include descriptions of how you can include the data collected about these watershed attributes in your watershed assessment or environmental indicator score-card.	http://cwam.ucdavis.edu/Volume_2/TOC.htm	No	7, 9
14	California Watershed Portal (CWP)	2008, Updated	CA DWR	cwp@resources.ca.gov	Identifies ongoing watershed activities, provides access to important data and information, and links to the larger California Watershed community.	http://cwp.resources.ca.gov/	Yes	
15	Coursegold Area Plan	2006	Mark H. Eisenbies	USFS Technical Report	Bibliography of Forest Water Yields, Flooding Issues, and the Hydrologic Modeling of Extreme Flood Events	N/A	No	7
16	Dangerous Development		Sierra Nevada Alliance	Sierra Nevada Alliance PO Box 7989 South Lake Tahoe, CA 96158	Dangerous Development - Wildfire and Rural Sprawl in the Sierra Nevada. Report on wildfire, population growth, development and consequences of current land use methods. Includes fire and land use statistics for Fresno and Madera Counties.	http://www.sierranevadaalliance.org/publications/db/pics/1190122868_27040.f_pdf.pdf	No	8, 9, 16
17	Declines of the California Red-Legged Frog: Climate, uv-b, Habitat, and Pesticides Hypotheses	Apr-01	Carlos Davidson, Bradley Shaffer, and Mark R. Jennings	Ecological Applications: Vol. 11, No. 2, pp. 464-479.	The federally threatened California red-legged frog (Rana aurora draytonii) has disappeared from much of its range for unknown reasons. We mapped 237 historic locations for the species and determined their current population status. Using a geographic information system (GIS), we determined latitude, elevation, and land use attributes for all sites and analyzed the spatial pattern of declines	http://www.esajournals.org/doi/abs/10.1890/1051-0761(2001)011%5B0464%3ADOTCRL%5D2.0.CO%3B2?prevSearch=null&searchHistoryKey=	No	4, 12, 16
18	Eastern Madera County and Mariposa County Long Term Plan for Watershed Conservation and Restoration	2007	Sarah Marvin	Dept. of Environmental Science, UC Berkeley	Possible Changes in Water Yields and Peak Flows in Response to Forest Management	http://fresnoriver.org/	No	7

Southern Sierra Regional Water Management Group

Resource Database

No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
19	Eastern Madera County and Mariposa County Long Term Plan MC2LTP		Central Sierra Watershed Committee	Central Sierra Watershed Committee November 2001	Eastern Madera County and Mariposa County Long Term Plan MC2LTP for Watershed Conservation and Restoration Includes the San Joaquin watershed. Managing watershed. Background info, community info, permitted and known facilities, potential problems, planned projects, monitoring and beneficial uses.		No	9, 8, 12
20	Eastern Madera County Coarsegold Resource Conservation District Voluntary Water Quality, Grazing Land, Oak Woodland Conservation Management Guidelines	Sept 26, 1996	Coarsegold Resource Conservation District, North Fork, CA		These Conservation Guidelines are designed to address the nonpoint source water pollution as identified in the 1972 Clean Water Act, as amended, on the private grazing lands and oak woodlands of Madera County. They integrate Best Management Practices (BMP); agronomic, forestry, wildlife, ecology, and economic principals; to protect, enhance, and manage the beneficial uses of the waters, and associated riparian area, of the County, while protecting the agriculture and forestry enterprises. They provide for cost-share conservation programs under the USDA 1996 Farm Bill to strengthen the land stewardship partnership between landowners, agencies, and groups, while protecting private property rights. The County Oak Woodland Guidelines are incorporated to integrate multi-resource benefits in the voluntary implementation of (?)	http://www.crcd.org/	No	7, 8
21	Ecological Assessment of Aquatic Resources: Linking Science to Decision-Making	2000	Michael T. Barbour, ed., et al.	Available in Carolyn Hunsaker's Library; Setac Press (Society of Environmental Toxicology and Chemistry)	Ecological Assessment Formulation, Engaging community stakeholders, Designing data collection, interpreting results of ecological assessments, valuing ecological resources, translating ecological science, Injecting ecological knowledge into decsion-making process, case studies for forumulating effective questions		No	1

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Resource Database

No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
22	Environmental Protection Indicators for California (EPIC)		CAL/EPA OEHHA --Office of Environmental Health Hazzard Assessment	Office of Environmental Health Hazard Assessment 1001 I Street, 12th Floor, Sacramento, CA 95814 P. O. Box 4010, Sacramento, CA 95812-4010 Phone: (916) 324-2829 FAX: (916) 322-9705	Environmental Protection Indicators for California (EPIC) describes the process for the identification and selection of environmental indicators that are adopted as part of the EPIC system, and presents the initial set of environmental indicators.	http://www.oehha.ca.gov/multimedia/epic/Epicreport.html	follow link	9, 10, 12
23	EPA Storet Data Warehouse	2008	US EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 (202) 272-0167	Online database for US watershed info water quality, habitat and biological results. Basic information: liilte input. As of 7/14 Kings River Lower and Mendota Pool are list as impared.	http://www.epa.gov/storet/dw_home.html	Yes	7 and 12
24	Final EIR of Fresno County's General Plan.		County of Fresno	County of Fresno 2220 Tulare Street, 6th floor Fresno, CA 93721	Final EIR of Fresno County's General Plan. Includes environmental analysis of water resources, biological resources, forestry resources, mineral resources, air quality and sesmic and geologic hazards.	http://www2.co.fresno.ca.us/4510/4360/General_Plan/GP_Final_EIR/EIR/toc.html	No	11, 6, 7, 2, 8
25	Final Environmental Impact Report for the Hillview OSL Water System Improvement Project; Hillview Water Company, Inc.	December 2004	Valley Planning Consultants, Inc.	Prepared for the California Dept of Health Services, SCH#2000072011	This EIR was prepared for a project in Oakhurst, Madera County. It does not contain the full text from the June 2004 Draft EIR, but only a few pages of revisions to the Draft EIR, plus comments and responses. It contains several letters from agencies related to the California Red-legged Frog and the Valley Elderberry Longhorn Beetle. One of the Appendices is a report titled: "The Status of the California Red-Legged Frog in the Vicinity of the Hillview Water Company Water System Improvement Project, Oakhurst, California."		No	4
26	Fresno County Regional Data Center		Fresno COG 2035 Tulare Street Suite 201 Fresno, CA 93721 (559) 233-4148	website info		http://www.fresnocog.org/document.php?pid=20	No	1

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No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
27	Fresno River Landscape Analysis	July 2005	Sierra National Forest Bass Lake Ranger District		Has chapters on: ecosystem elements and environmental indicators, reference variability, existing conditions, desired conditions, management opportunities.		No	7, 4, 9
28	FSGeodata Clearinghouse	2008, Updated		USFS Databases	Forest Service datasets, GIS, Aerial Survey, Aerial insect & disease, land cover monitoring, forest health protection data, FIA spatial data.	http://svinetfc4.fs.fed.us/clearinghouse/other_fs/other_fs.html	No	1, 4, 9, 10, 12,16
29	Geology, Hydrology and Quality of Water in the Madera Area, San Joaquin Valley, CA.	1970	Kenneth Schmidt	Kenneth D. Schmidt and Associates	Expert Report of Kenneth D. Schmidt on potential impacts of reduced friant water deliveries on groundwater	http://www.restoresjr.net/program_library/05-Pre-Settlement/Expert%20Reports/Friant%20Water%20Users%20Authority%20Expert%20Reports/	No	2
30	Groundwater Conditions Eastern Madera County, Draft Technical Memorandum	March 2002	Gordon E. Grant, et al.	May 2008 USFS Pacifc NW Station	Effects of Forest Practices on Peak Flows and Consequent Channel Response: A state of science report for western oregon and washington	N/A	No	7
31	Groundwater Conditions in the Oakhurst Basin. AB 303 Study	November 2005	EPA Science Advisory Board	EPA Science Advisory Board 1400A Washington, DC	A Framework for Assessing and Reporting on Ecological Condition: An SAB Report	http://www.epa.gov/sab/pdf/epec02009.pdf	No	12
32	Madera Area Investigation	August 1966	California Department of Water Resources	Bulletin 35, Preliminary Edition	This investigation was conducted between March 1961 and June 1965 to determine water supply available to the Madera Area, to determine the water requirements for continued development of the area, and to plan for the optimum development of all local supplies for maximum beneficial use. The investigation concluded that additional water would have to be imported to ensure continued economic growth of the area between the time of the report and 2020.	http://www.worldcat.org/oclc/9588557?tab=holdings#tabs	No	
33	Madera County Community Wildfire Protection Plan	2008	Madera County Resource Management Agency		Summarizes planning process. Describes environmental conditions, infrastructure, and population in the planning area. Summarizes fire policy, trends, and risk as well as existing mitigation standards. Presents community wildfire risk assessment and offers mitigation actions for communities at risk. Contains section on education and outreach, and funding possibilities.		No	8, 9, 16

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Resource Database

No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
34	Madera County General Plan. Policy Document and Background Report	1995	Madera County		Planning document with section called Agriculture and Natural Resources that contains info on forest resources, water resources, riparian habitat, fish and wildlife habitat, vegetation, etc.	pdf, available at: http://www.madera-county.com/rma/archives/uploads/1128960251_Document_gppolicy.pdf	No	8, 4
35	Madera County Integrated Regional Water Management Plan, Volume 1	2008	Boyle Engineering in association with Kenneth D. Schmidt and Associates		Major topics are: water demand, water supply, water quality, flood control, water resources management opportunities, watershed management	pdf, available at http://www.madera-county.com/supervisors/water-plan.html	No	7, 9, 8
36	Madera County Integrated Regional Water Management Plan, Volume 2 - Appendices	2008	Boyle Engineering in association with Kenneth D. Schmidt and Associates		Reports of Groundwater Studies: Oakhurst AB 303 Study: pg 7-99; Coarsegold groundwater study: pg 560 - 640; Raymond/Daulton Ranch groundwater study: pg 850 - 896. Proposed Groundwater Monitoring Plan for Madera County: pgs 1075-1109	pdf, available at http://www.madera-county.com/supervisors/water-plan.html	No	2
37	Madera County Regional Transportation Plan 2007	2007	Madera County Transportation Commission	Adopted May 23, 2007	Regional transportation plan.	Electronic - on line at http://www.maderactc.org/public.html	No	
38	Millerton Area Watershed Coalition	2008?	Cal State Parks		Covers the following area: Surface Water Quality, Groundwater Quality and Quantity, Fuels and Fire Safety, Invasive Species, Wildlife	http://www.sierrafoothill.org/watershed/		9,12
39	Natural Resources Conservation Service		Natural Resources Conservation Service	Natural Resources Conservation Service 14th and Independence Avenue, SW Washington, DC 20250	The NRCS is a federal conservation department in the US Dept of Food and Agriculture. Their Technical resources include GIS data, geospatial data gateway, forestry, range and pasture, soils and water resources.	http://www.nrcs.usda.gov/technical/	No	1, 4, 3, 8,
40	Natural Resources Council		National Resources Council	National Academies Press 888-624-8373 http://www.nap.edu/catalog/12223.html	National Resources Council - Hydrological effects of a changing forest landscape - Executive Summary	http://www.nap.edu/catalog/12223.html	No	2, 8
41	Oakhurst Area Plan	Sept 2005	Oakhurst Plan		Planning document with section called Environmental Setting that contains info on watersheds, geology, vegetation, wildlife, etc.	pdf, available at: http://www.madera-county.com/rma/archives/uploads/1157730052_Document_upload_oakhurstareaplan.pdf		4, 3, 9

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No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
42	Oakhurst-Ahwahnee Area General Growth Mgmt Plan	1980			Maps - GIS,HUC, (watershed and sub-watersheds) Topographic, Satellite, flood maps, DEM (Digital Elevation Model), Aerial			
43	Proposed Groundwater Monitoring Program for Madera County	2008	Calflora	Calflora 1700 Shattuck Ave. #198, Berkeley, CA 94709 510 528-5426	Calflora has a searchable database listing invasive species and reported observations. Searchable areas include the San Joaquin River areas.	http://www.calflora.org/	No	9
44	Revision of the workplan: Learning how to apply adaptive management in the Sierra Nevada Forest Plan Amendment	2007	University of California Science Team		Goal of the research proposed in plan is to learn how to use an adaptive management and monitoring system to understand ecosystem behavior, incorporate stakeholder participation, and inform the implementation of adaptive management for Forest Service lands in the Sierra Nevada. Focal questions: fire and forest ecosytem health; participatory processes; water quantity and quality; wildlife. One study site is in Fresno River basin	pdf, available at http://snamp.cnr.berkeley.edu/documents/91/	No	9, 4
45	Sanitary Engineering Investigation of Course Gold Creek. Prepared for Tital Group, Inc.	Mar-71	California Invasive Plant Council	California Invasive Plant Council 1442-A Walnut St. #462 Berkeley, CA 94709 (510) 843-3902	CIPC has risk assessment mapping of CA invasive plant species. Mapping includes the San Joaquin watershed areas.	http://www.cal-ipc.org/ip/mapping/statewide_maps/index.php	No	9
46	SEKI water resources information and isues report	2005	NPS		Sequoia and Kings Canyon NP Water Resoences inventory on quantity and quality and issues, 2005	http://www.nature.nps.gov/water/planning/Info_Issuesoverview_reports/seki_wriio_final_High.pdf	Y	
47	Shaver Lake Forest Specific Plan	1973, amended 1993	Wilsey & Ham Planners and Engineers	1973, amended 1993 prepared for Fresno County by Wilsey & Ham 393 Vintage Park Drive, Suite 100 Foster City, CA 94404 Phone:(650) 349-2151	Shaver Lake Forest Specific Plan - Refinement of Sierra Foothills General Plan. Includes land use, development, standards for population and building density, water supply, drainage, waste disposal, standards for conservation and natural resources includeing underground and surface waters, forests, soils, vegetation and wildlife specific to the Shaver Lake Forest (as defined within the plan.)	http://www.co.fresno.ca.us/departmentpage.aspx?id=19705	No	3, 7, 8, 13
48	Sierra National Forest Supervisors Office, Water Quality by PWI, Water Quality Records for the Sierra National Forest	1984	Earle Franks, Frank Estril					7

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No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
49	Sierra Watershed Community Directory	2005	Sierra Nevada Alliance		Directory of watershed councils, organizations, coordinated resource management processes, and conservation groups that work to conserve, protect, and restore watershed health in the Sierra Nevada. Contains map of Sierra Nevada Watersheds.	pdf; available at: http://www.sierranevadaalliance.org/publications/db/pics/1111699364_4254.f_pdf.pdf	No	1
50	SJR Flight Line Images		US Bureau of Reclamation	Ayres Associates 2445 Darwin Road Madison, WI 53704 (608)249-0471	San Joaquin River, U.S. Bureau of Reclamation, Flight Line Index 4 Images of SJR named for the miles of river they cover.		follow link	1
51	Soil Data Mart			USDA NRCS	Sierra National Forest:Brief Soil Descriptions (CA) Hydric Soils (CA) Storie Index Rating (CA) The following local interpretations are included: Basin, Border, and Furrow Irrigation (CA) California Revised Storie Index Rating (CA) Camp Areas, Off-Road Motorcycle Trails and Paths and Trails (CA) Desert Tortoise (CA) Dwellings and Small Commercial Buildings (CA) Landfills (CA) Picnic Areas, Playgrounds, and Lawns, Landscaping, Golf Fairways (CA) Ponds and Embankments (CA) Roads and Streets and Shallow Excavations (CA) Sewage Disposal (CA) Source of Reclamation Material, Roadfill, and Topsoil (CA) Source of Sand and Gravel (CA) Sprinkler and Drip Irrigation (CA)"	http://soildatamart.nrcs.usda.gov	No	2
52	State of Sierra Waters: a Sierra Nevada Watersheds Index	2006	Kerri Timmer, Megan Suarez-Brand, Janet Cohen, Joan Clayburgh	Sierra Nevada Alliance	Uses publicly available data to measure and assess watershed health for 24 watersheds in Sierra. Uses indicators and provides baseline data. Offers recommendations for ways to improve watershed health. Includes individual watershed reports.	pdf. Available at www.sierranevadaalliance.org	No	7
53	StreamNet		SteamNet	http://www.streamnet.org/	StreamNet is a cooperative venture of the Pacific Northwest's fish and wildlife agencies and tribes and is administered by the Pacific States Marine Fisheries Commission. Provides data and data services in support of the region's Fish and Wildlife Program and other efforts to manage and restore the region's aquatic resources.	http://www.streamnet.org/	No	4

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No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
54	Streams of the San Joaquin, El Valle De Los Tulares - The Valley of the Tules, Geographic and Ecological Considerations of California's San Joaquin Valley	2002	Robert Edminster	Published by Robert Edminster	Focuses on the ecology of the San Joaquin Valley. In addition to discussing the streams themselves, this publication has quite a bit of information on plant communities and wildlife.			4
55	Surface Water Ambient Monitoring Program, Fresno River Watershed, Annual Report Fiscal Year 2001-2002	July 2003	Pamela Bufurd, Annee Ferranti	Staff Report of the California Environmental Protection Agency and State Water Resources Control Board, Central Valley Region	The SWAMP has provided funding to develop a surface water monitoring program to evaluate water quality within the San Joaquin River basin. Water quality results have been assessed using the water quality objectives contained in the Water Quality Control Plan for the Sacramento and San Joaquin Rivers – Fourth Edition 1998. During Fiscal Year 2001-2002, the intent of the study was to begin baseline sampling and gather preliminary data from the Fresno River and Hensley Lake. Algal blooms have been observed in Hensley Lake. The Fresno River watershed has been identified as a possible contributor of nutrients.	http://www.waterboards.ca.gov/water_issues/programs/swamp/docs/fresnorvr_ann_rpt0102.pdf	No	9,10
56	The Montreal Process	1994	Various Countries	http://www.rinya.maff.go.jp/mpci/meetings_e.html	The Montréal Process is the Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests. It was formed in Geneva, Switzerland, in June 1994 to develop and implement internationally agreed criteria and indicators for the conservation and sustainable management of temperate and boreal forests.	http://www.rinya.maff.go.jp/mpci/whatis_e.html	No	8, 9
57	The Natural Resource Projects Inventory (NRPI)	2008, updated	Natural Resources Projects Inventory (NRPI)	ICE, UC Davis Dept. of Environmental Science and Policy Phone: (530) 752-2378 Email: kcward@ucdavis.edu	The Natural Resource Projects Inventory (NRPI) began as a collaborative effort between UC Davis Information Center for the Environment (ICE) and the California Biodiversity Council (CBC) in 1995. In response to a growing need for more project related data on California's natural resources, existing inventories* were synthesized into one database and thousands of new projects have been added through individual online entries and electronic database transfers. Today, NRPI is the most comprehensive statewide database of its kind in California with over 6,000 natural resource projects searchable on the Internet. These projects include watershed conservation and acquisition, restoration and noxious weed eradication, assessment, planning, and scientific studies.	http://www.ice.ucdavis.edu/nrpi/Home.aspx	No	2, 4, 7, 8, 9, 10
58	Tulare Basin Conservation Plans	2005, 2009	Tulare Basin Wildlife Partners		Corridor plan prescribing management on riparian and wildlife corridors	tularebasinwildlifepartners.org	Y	

Southern Sierra Regional Water Management Group

Resource Database

No	Name	Year of Publication	Author	Publication Info	Description	Website Address	Info on website?	IRWM Chapter relevance
59	Update for Eastern Madera County and Mariposa County Long Term Plan MC2LTP	2007	Central Sierra Watershed Committee	Central Sierra Watershed Committee January 2007	2007 Update for Eastern Madera County and Mariposa County Long Term Plan MC2LTP for Watershed Conservation and Restoration Includes the San Joaquin watershed. Managing watershed. Background info, community info, permitted and known facilities, potential problems, planned projects, monitoring, and beneficial uses.		No	9, 8, 13
60	Upper Fresno River Watershed	in progress	Jones & Stokes 2600 V Street Sacramento, CA 95818-1914 Contact: Russ Grimes or Mike Rushton 916/737-3000	Central Valley Regional Water Quality Control Board 11020 Sun Center Drive, Suite 200 Rancho Cordova, CA 95670 Contact: Devra Lewis	Irrigated Lands Program Existing Conditions Report for the Central Valley. Prepared by Jones & Stokes for the CVRWQB. Covers watershed basins and sub-basins in the Central Valley. Areas include General Description of each, plus land use patterns, basin plan status, impaired status, and water quality of each watershed. Report covers the San Joaquin.		No	4, 8
61	US EPA Upper San Joaquin Watershed -- 18040006	2008	US EPA	Environmental Protection Agency Ariel Rios Building 1200 Pennsylvania Avenue, N.W. Washington, DC 20460 (202) 272-0167	EPA Surf your Watershed - upper san joaquin watershed profile	http://cfpub.epa.gov/surf/huc.cfm?huc_code=18040006	No	7, 8
62	USFS Aerial Detection Survey	2008	USFS		Aerial Detection Survey Draft Results (Sierra National Forest, Inyo National Forest) Shows diseased trees on maps, fire and fuel locations.	http://www.fs.fed.us/r5/spf/fhp/fhm/aerial/draft/index.shtml	No	9
63	USJR Plant and Animal Species Fect Sheet	2008	multiple see report	Nature Serve Explorer Database	Comprehensive list of 63 animal and plant species in the USJR watershend. Includes endangered / legal status, population / occurrence viability, distribution and some images.	http://www.natureserve.org/explorer/	No	
64	Watershed Management and Water Yield		Theodore E. Adams, Jr., Ray Coppock	UC Water Task Force, Cooperative Extension University of California Division of Agriculture and Natural Resources, Leaflet 21420	Pamphlet on managing vegetatation (e.g. prescribed burning of brushlands) to increase water yield and protect against fire.		No	9

Appendix L

Grant Programs and Funding Sources

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
GRANT PROGRAMS AND FUNDING SOURCES

No.	Agency/Organization	Grant Program	Projects Funded	Available Funding	Recurrence	Website
1	Bass Pro Shop	Corporate Contributions	Wilderness Conservation Projects			https://basspro.custhelp.com/app/answers/detail/a_id/25/kw/donations
2	Bureau of Land Management	Fish, Wildlife and Plant Conservation Resource Management	Protect, Restore, & Enhance Fish, Wildlife, & Plant Conservation Resources	$500 - $1,400,000		http://www.federalgrantswire.com/fish-wildlife-and-plant-conservation-resource-management.html
3	Bureau of Land Management	Habitat Restoration	Restores Areas on the Land in Need of Attention- Like Abandoned Roads or Erosion Scars			http://www.blm.gov/ca/st/en/fo/hollister/fort_ord/restoration_fo.html
4	Bureau of Land Management	Environmental Quality & Protection Resource Management	Reduce or Remove Pollutants in the Environment for the Protection of Human Health, Water & Air Resources			http://www.federalgrantswire.com/environmental-quality-and-protection-resource-management.html
5	Bureau of Land Management	Rangeland Resource Management	Manage, Develop, & Protect Public Lands & Enhance the Understanding of Rangeland & Watershed Resources	$49,000 Avg. Per Project		http://www.federalgrantswire.com/rangeland-resource-management.html
6	Bureau of Land Management	Recreation Resource Management	Manage and/or Upgrade Recreational Resources & Related Facilities in Lands Administered by the BLM	$33,000 Avg. Per Project		http://www.federalgrantswire.com/recreation-resource-management.html
7	Bureau of Land Management	Secure Rural Schools & Community Self - Determination	Road & Trail Construction, Culvert Replacements for Fish Passage, Stream Channel Enhancement, Watershed Restoration	$83,000 Avg. Per Project		http://www.federalgrantswire.com/secure-rural-schools-and-community-self-determination.html
8	Bureau of Land Management	Wildland Fire & Resource Management	Wildland Fire Management Needs	$30,000 Avg. Per Project		http://www.federalgrantswire.com/wildland-fire-research-and-studies-program.html
9	Bureau of Reclamation	WaterSMART Programs (Water & Energy Efficiency Grants)	Increase Water Conservation & Efficiency	$20 Million / $1 million per project		http://www.usbr.gov/WaterSMART/weeg/index.html
10	Cabelas	Outdoor Fund	Conservation Programs			http://www.cabelas.com/category/Outdoor-Fund/112097880.uts
11	California Department of Conservation	California Farmland Conservancy Program	Agricultural Conservation Easements			http://www.conservation.ca.gov/dlrp/cfcp/Pages/Index.aspx
12	California Department of Conservation	Resource Conservation District Assistance Program		Currently Inactive (01/03/2014)		http://www.conservation.ca.gov/dlrp/RCD/Pages/Index.aspx
13	California Department of Conservation	Watershed Coordinator Grants Program	Watershed Improvements & Management			http://www.conservation.ca.gov/dlrp/wp/grants/Pages/wcgp_intro.aspx
14	California Dept. of Fish & Wildlife	Landowner Incentive Program	Habitat Management Plans that Benefit at-Risk Species			http://www.dfg.ca.gov/lands/lip/
15	California Dept. of Fish & Wildlife	Traditional Section 6 Species Recovery Program	Conserve & Recover Federally Threatened & Endangered Species by Focusing on Habitat Restoration			http://www.dfg.ca.gov/wildlife/grants/tradsec6/
16	California Dept. of Fish & Wildlife	Natural Community Conservation Planning Local Assistance Grants	Conservation Planning & Purchases of Vital Habitat for Threatened & Endangered Fish, Wildlife, & Plant Species			http://www.dfg.ca.gov/habcon/nccp/grants.html
17	California Dept. of Parks & Recreation	Land & Water Conservation Fund	Acquisition or Development of Recreation Areas & Facilities	50% Match	Annually	http://www.parks.ca.gov/?page_id=21360
18	California Dept. of Parks & Recreation	Habitat Conservation Fund	Acquisition or Development of Wildlife Corridors & Trails	$2 Million	Annually	http://www.parks.ca.gov/?Page_id=21361
19	California Dept. of Parks & Recreation	Statewide Park Program	Creation of New Parks and Recreation Facilities in Critically Underserved Communities	$368 Million		http://www.parks.ca.gov/?page_id=26025
20	California Dept. of Parks & Recreation	Recreational Trails Program	Recreational Trails & Trails Related	$1.47 Million; Max. Funding is 88% of Project	Annually	http://www.parks.ca.gov/?Page_id=24324
21	California Dept. of Parks & Recreation	Environmental Enhancement & Mitigation Program	Acquisition, Restoration, or Enhancement of Resource Lands	Currently Inactive (01/03/2014)		http://www.resources.ca.gov/eem/
22	California Dept. of Public Health	American Recovery & Reinvestment Act	Infrastructure Development for California's Drinking Water Systems	$20 Million Per Project		http://www.cdph.ca.gov/services/funding/Pages/ARRA.aspx
21	California Dept. of Water Resources	IRWMP Implementation Grant	IRWM Plan process developed water management projects	TBD, 25% Match	Round 3, Summer 2014 PSP	http://www.water.ca.gov/irwm/grants/implementation.cfm
22	California Dept. of Water Resources	IRWMP Prop 1E Stormwater Flood Management Grant	Projects designed to manage stormwater runoff to reduce flood damages consistent with IRWMP and the Basin Plan	Up to $30 Million Per Project, 50% Match	Future Round unknown	http://www.water.ca.gov/irwm/grants/stormwaterflood.cfm
23	California Dept. of Water Resources	Local Groundwater Assistance (LGA)	Groundwater studies or carry out groundwater monitoring and management actitivies	Up to $250,000. No Match	Future unknown	http://www.water.ca.gov/lgagrant/
24	California Dept. of Water Resources	Urban Streams Restoration Program	Reduce flooding and erosion & associated property damages; restore, enhance, or protect the natural ecological values of streams; & promote	Less than $1 Million	Spring 2014 PSP	http://www.water.ca.gov/urbanstreams/
25	California Dept. of Water Resources	FloodSAFE	Various programs: Delta Levee, Flood Control Sebventions, Flood Corridor, Flood Emergency Response and Local Levee Assistance	Varies	Varies	http://www.water.ca.gov/floodsafe/grants/
23	California Edison	Corporate Contributions	Environmental			http://www.edison.com/community/contribution_guidelines.asp

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
GRANT PROGRAMS AND FUNDING SOURCES

No.	Agency/Organization	Grant Program	Projects Funded	Available Funding	Recurrence	Website
24	California Infrastructure Bank	Infrastructure State Revolving Fund Program	Drainage, Water Supply & Flood Control, Environmental Mitigation Measures	$50,000 - $25 Million		http://www.ibank.ca.gov/infrastructure_loans.htm
25	Edison International	Environmental Giving Program	Environmental Sustainability	$2.7 Million		http://www.edison.com/community/programs.asp?id=7873
26	Environmental Protection Agency	Clean Water State Revolving Fund	Water Quality Protection Projects for Wastewater Treatment, Non-Point Source Pollution Control & Watershed Management	$5 Billion	Annually	http://water.epa.gov/grants_funding/cwsrf/cwsrf_index.cfm
27	Environmental Protection Agency	Drinking Water State Revolving Fund	Public Health Protection, Compliance with Drinking Water Standards, & Affordable Access to Drinking Water			http://water.epa.gov/grants_funding/dwsrf/index.cfm
28	Farm Services Agency	Water & Waste Disposal Direct Loans & Grants	Develop Water & Waste Disposal Systems in Rural Areas			http://www.rurdev.usda.gov/UWP-dispdirectloansgrants.htm
29	Farm Services Agency	Water & waste Revolving Fund Grant	Assist Communities with Water & Wastewater Systems			http://www.rurdev.usda.gov/UWP-revolvingfund.html
30	Federal Emergency Management Agency	Flood Mitigation Assistance Programs	Flood Mitigation Plans, & Implement Measures to Reduce Flood Losses	$120 Million		http://www.fema.gov/flood-mitigation-assistance-program
31	International Federation of Fly Fishers	Conservation Small Grants	Stream Access & Wild Fish Rescue	$1,500	Annually	http://www.fedflyfishers.org/Conservation/Programs/SmallGrants.aspx
32	National Fish & Wildlife Foundation	Five Star & Urban Waters Restoration Grant Program	Water Quality Issues in Priority Watersheds			http://www.nfwf.org/fivestar/Pages/home.aspx
33	National Fish & Wildlife Foundation	Sierra Nevada Meadow Restoration	Restore & Protect Meadows in the Sierra Nevada			http://www.nfwf.org/sierranevada/Pages/home.aspx
34	National Forest Foundation	Matching Awards Program	Conservation & Restoration Projects	1:1 Match	Annually	http://www.nationalforests.org/conserve/grantprograms/ontheground/map
35	National Forest Foundation	Wilderness Stewardship Challenge	Conservation Projects Benefiting National Forest Wilderness Areas	Match up to $50,000	Annually	http://www.nationalforests.org/conserve/grantprograms/ontheground/wilderness
36	National Forest Foundation	Ski Conservation Fund	Watershed Restoration, Recreation Enhancements, & Forest Projects		Annually	http://www.nationalforests.org/conserve/grantprograms/ontheground/scf
37	National Forest Foundation	Community Capacity & Land Stewardship	Watershed Restoration	$5,000 - $24,000	Annually	http://www.nationalforests.org/conserve/grantprograms/capacitybuilding/ccls
38	National Institute of Food & Agriculture	Foundational Program	Agriculture, Community Development, Natural Resources & Environmental	$82 Million		http://www.csrees.usda.gov/fo/foundationalprogramafri.cfm
39	National Science Foundation	Hydrologic Science	Studying Processes from Rainfall to Runoff to Infiltration & Streamflow	$10 Million	Annually	http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=13684&org=ERE
40	Natural Resources Conservation Service	Conservation of Private Grazing Lands	Grazing Land Management & Conservation of Water	$47 Million for Technical Assistance		http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/cpgl/
41	Natural Resources Conservation Service	Conservation Reserve Program	Establishing Conservation Practices	50% of Costs		http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=crp
42	Natural Resources Conservation Service	Conservation Technical Assistance	Opportunities, Concerns, & Problems Related to Natural Resource Projects	Technical Assistance		http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/
43	Natural Resources Conservation Service	Environmental Quality Incentives Program	Establishing Conservation Practices that address various Natural Resource Concerns	Varies		http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ca/programs/?cid=nrcs144p2_063939
44	Natural Resources Conservation Service	Wildlife Habitat Incentive Program	Establish & Improve Fish & Wildlife Habitat	Technical Assistance & up to 75% Cost-Share Assistance		http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/whip/?cid=nrcs143_008423
45	Natural Resources Conservation Service	Watershed Protection & Flood Prevention Program	Watershed Planning			http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/wfpo/
46	Natural Resources Conservation Service	Emergency Watershed Protection Program	Projects that Address Watershed Impairments	75% of Construction Cost		http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp/
47	Natural Resources Conservation Service	Farm & Ranch Lands Protection Program	Acquisition of Conservation Easements or Other Interests in Land from Landowners	50% of Fair Market Easement Value		http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/farmranch/
48	Natural Resources Conservation Service	Grassland Reserve Program	Protection of Grassland, Enhancement of Plant & Animal Biodiversity, & Grazing Operations	Currently Inactive (01/03/2014)		http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/grassland/
49	Natural Resources Conservation Service	Healthy Forests Reserve Program	Restoring & Protecting Forests	Currently Inactive (01/03/2014)		http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/forests/
50	Natural Resources Conservation Service	Wetlands Reserve Program	Wetland Improvements	Currently Inactive (01/03/2014)		http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/wetlands/
51	Natural Resources Conservation Service	Conservation Security Program	Conservation & Improvement of Water	Currently Inactive (01/03/2014)		http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/alphabetical/csp/

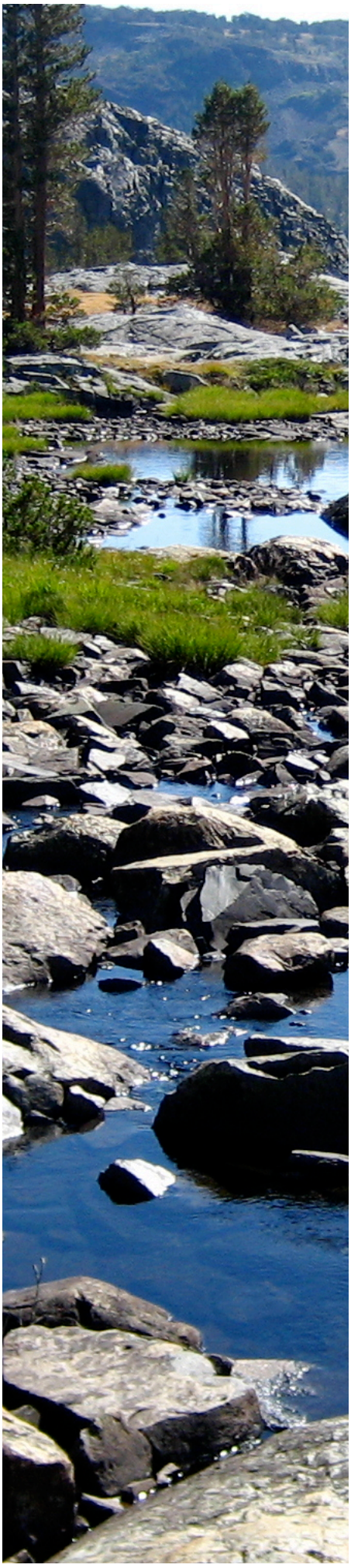
SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP
INTEGRATED REGIONAL WATER MANAGEMENT PLAN
GRANT PROGRAMS AND FUNDING SOURCES

No.	Agency/Organization	Grant Program	Projects Funded	Available Funding	Recurrence	Website
52	Pacific Gas & Electric	Nature Restoration Trust	Restoration Projects that Benefit Wildlife	$30,000/ Request		http://www.nfwf.org/nrt/Pages/home.aspx
53	Pacific Gas & Electric	Community Investment Program	Projects Vary			http://www.pge.com/en/about/community/contributions/index.page
54	Patagonia	Corporate Contributions	Environmental	$12,000	Annually	http://www.patagonia.com/us/patagonia.go?assetid=2942
55	Regional Water Quality Control Boards	Supplemental Environmental Projects Regional Water Quality Improvement Projects Program	Various Environmental Projects			http://www.waterboards.ca.gov/rwqcb5/water_issues/enforcement/index.shtml
56	Resources Legacy Fund Foundation	California Water Foundation	Improving Water Management			http://www.californiawaterfoundation.org/page.php?id=32&menuid=94
57	Rotary Club of Auberry Intermountain	Charitable Foundation	Projects That Support Broad Goals of an Organization and Groups			http://auberryrotary.org/requests.php
58	Sierra Nevada Conservancy	Prop 84 Grant Program	Forest Management to increase Forest resilience , Enhance Water Supply & Quality	$350,000		http://www.sierranevada.ca.gov/other-assistance
59	Sloan Foundation		Various			http://www.sloan.org/apply-for-grants/grant-proposals/?L=ilbfnjfrwnqn
60	State Water Resources Control Board	Non-Point Source Grant Program	Water Quality Problems in Surface & Ground Water Resulting from NPS Pollution	$40 Million	Annually	http://www.waterboards.ca.gov/water_issues/programs/nps/grant_program.shtml
61	US Bureau of Indian Affairs	Numerous	Water and environmental resources projects on tribal reservations	Varies		http://www.federalgrants.com/Bureau-of-Indian-Affairs-Grant-23918.html
62	US Fish & Wildlife Service	North American Wetlands Conservation Act	Wetlands Conservation Projects	$75,000		http://www.fws.gov/birdhabitat/Grants/NAWCA/index.shtm
63	US Fish & Wildlife Service	Wildlife Restoration Grant Program	Habitat Management, Species Restoration, & Land Acquisition			http://www.fws.gov/southwest/federal_assistance/wr.html
64	US Fish & Wildlife Service	Sport Fish Restoration Grant Program	Protect, Manage, & Restore Aquatic Habitats			http://www.fws.gov/midwest/wsfr/sfr.htm
65	US Fish & Wildlife Service	Clean Vessel Act Grant Program	Construction, Renovation, Operation, & Maintenance of Pump Out Stations & Waste Reception Facilities for Recreational Boaters			http://www.fws.gov/southwest/federal_assistance/cva.html
66	US Fish & Wildlife Service	State Wildlife Grant Program	Develop & Implement Programs that Benefit Wildlife & their Habitats			http://wsfrprograms.fws.gov/Subpages/GrantPrograms/SWG/SWG.htm
67	US Fish & Wildlife Service	Multistate Grant Program	Wildlife & Sport Fish Restoration	$6 Million	Annually	http://wsfrprograms.fws.gov/Subpages/GrantPrograms/MultiState/MS.htm
68	US Fish & Wildlife Service	Neotropical Migratory Birds Conservation Act	Conservation of Habitat for Hundreds of Neotropical Migratory Birds			http://www.fws.gov/birdhabitat/Grants/NMBCA/index.shtm
69	US Forest Service	Woody Biomass Utilization	Removal of Hazardous woody Biomass	Currently Inactive (01/03/2014)		http://www.fs.usda.gov/detail/r1/communityforests/?cid=stelprdb5339807
70	US Forest Service	Collaborative Forest Landscape Restoration Program	Achieve Ecological and Watershed Health	$40,000,000	Annually	http://www.fs.fed.us/restoration/CFLRP/
71	US Forest Service	Legacy Roads & Trails Restoration Program	Forest Service Roads that may be Contributing to Water Quality Problems in Streams & Water Bodies			http://www.fs.fed.us/restoration/Legacy_Roads_and_Trails/
72	Wildlife Conservation Board, State of California	Prop. 40	Wildlife Corridors & Landscapes, Public Access, Land Management	$89,000,000		https://www.wcb.ca.gov/FundingSources/Prop40.aspx
73	Wildlife Conservation Board, State of California	Prop. 50	Protect & Improve Regional Water Quality	$140,000,000	Continuously	https://www.wcb.ca.gov/FundingSources/Prop50/WaterCodeandFundingUses.aspx
74	Wildlife Conservation Board, State of California	Prop. 84	Water Quality & Supply, Flood Control	$823,855		http://bondaccountability.resources.ca.gov/p84.aspx
75	Wildlife Conservation Board, State of California	Prop. 1E	Flood Protection	$65,646		http://bondaccountability.resources.ca.gov/p1e.aspx

Note: Funding available is typically for a region, State or the entire Country. Only a portion of this funding would be available to the Southern Sierra Region.

Appendix M

Climate Change Study



Future Climate, Hydrology, Vegetation, and Wildfire Projections for the Southern Sierra Nevada, California

A climate change synthesis in support of Integrated Regional Water Management Planning

May 2014

GEOS INSTITUTE

Future Climate, Hydrology, Vegetation, and Wildfire Projections for the Southern Sierra Nevada, California

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Primary author: Marni E. Koopman, Geos Institute

Workshop: June 5, 2014

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Fresno, CA

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Acknowledgements: We received extensive assistance and modeling output from many individuals and organizations, including TACCIMO, Jon Kim at the Pacific Northwest Research Station, and Lorrie Flint. Additional input was provided by Connie Millar, Ryan Burnett, John Gallo, and Nate Stephenson. Thank you!

TABLE OF CONTENTS

INTRODUCTION

The state of California has committed to an integrated approach to managing its water resources. This approach, called Integrated Regional Water Management (IRWM) planning, brings together water-related interests to plan for sustainable water use, reliable supply, improved water quality, ecologically sound management, low use development, protection of agriculture, and a strong local economy.

This report was funded through the California Department of Water Resources (via Prop 84 funding) to provide basic climate change information for the Southern Sierra Integrated Regional Water Management Plan (SSIRWMP). The SSIRWMP boundaries include the foothills and headwaters of Kern, Poso, White River, Tule, Kaweah, Kings, and San Joaquin watersheds (Figure 1). Throughout this region, water flows from the crest of the Sierra Nevada range west towards Tulare Basin. Many dams and reservoirs store water throughout the region.

The ecology of the Southern Sierra Nevada is diverse and complex. Ecological zones range from annual grasslands, scrub and chaparral at lower elevations to subalpine forest and alpine meadows at higher elevations. The high mountains are dominated by coniferous forest.

Much of the land of the SSIRWMP area is in federal ownership. USFS manages the largest portion, with the National Park Service and BLM also managing significant amounts of land. The Tule River Indian Reservation is located in the southern portion. Most of the western extent is in private ownership.

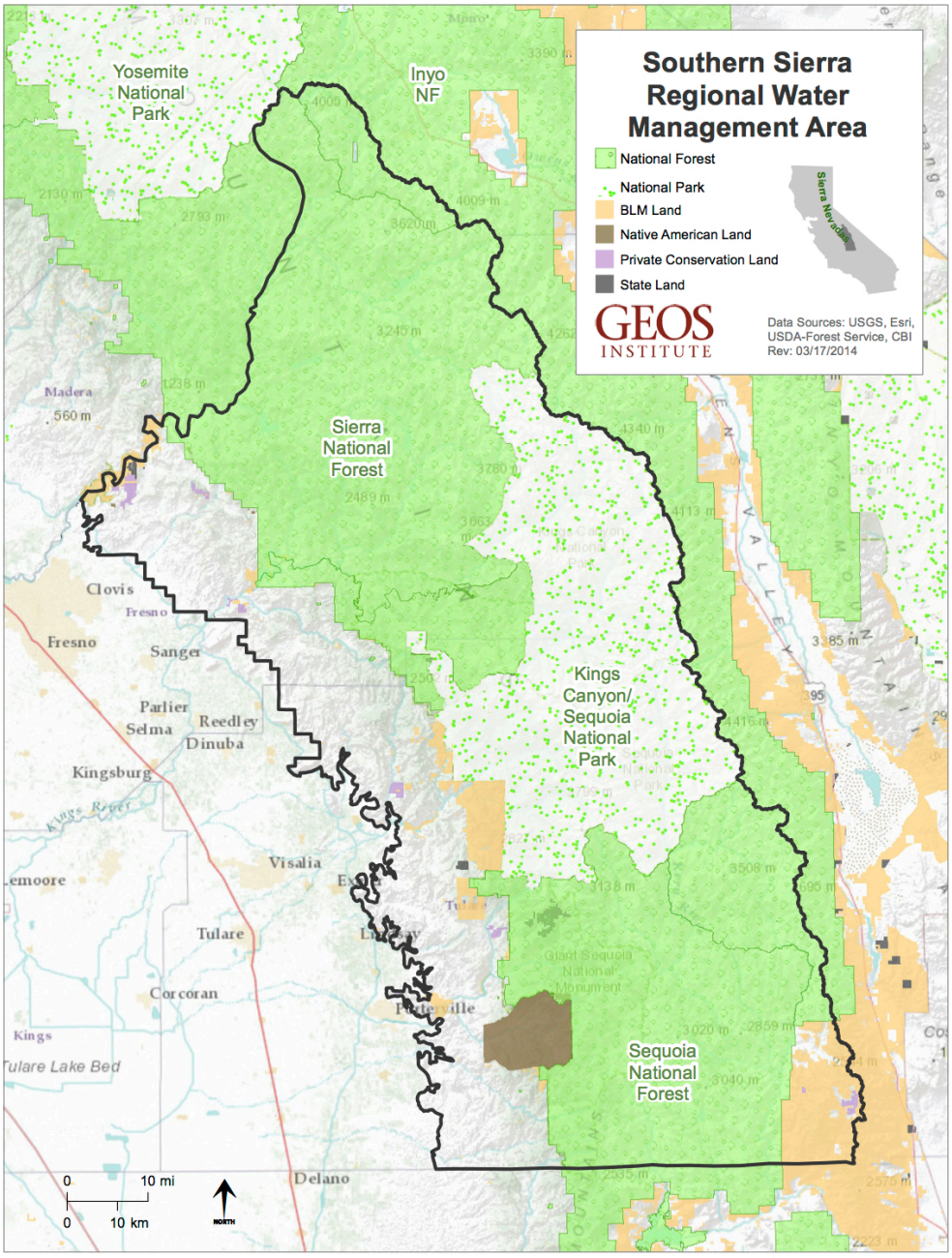
MITIGATION – Reducing the amount of greenhouse gases in the atmosphere in order to prevent rapid and irreversible climate change. Irreversible climate change occurs when positive feedbacks kick in to such an extent that emissions reductions are no longer effective.

ADAPTATION – Planning for expected and inevitable impacts of climate change and reducing our vulnerability to those impacts.

Broad scale changes in climate are already impacting local conditions across the West and are likely to continue and accelerate in the coming decades. Changes include the timing and availability of water, changes in tree and wildlife species, and changes in wildfire frequency and intensity. Local communities will need to plan for such changes in order to continue to provide vital services to local residents and to support the economy. Integrating climate change science into water management planning is one step towards preparing people for climate change.

Climate change presents us with a serious challenge as we plan for the future. Our current planning strategies at all scales (local, regional, and national) rely on historical data to anticipate future conditions. **Yet due to climate change and its associated impacts, the future is no longer expected to resemble the past.**

This report provides the Southern Sierra Integrated Regional Water Management planners with local climate change projections that can help them make educated planning decisions. We also provide supplementary information from the scientific literature. This report is intended to precede a vulnerability assessment and development of adaptation strategies for stakeholders in the Southern Sierra Nevada. Many of the impacts of climate change are inevitable due to current levels of greenhouse gas emissions already in the atmosphere. Preparing for these impacts to reduce their severity is called "adaptation" (see box). Preventing even more severe impacts by reducing future emissions is called "mitigation." Both are needed.



MODELS AND THEIR LIMITATIONS

To determine what conditions we might expect in the future, climatologists created models based on physical, chemical, and biological processes that form the earth's climate system. These models vary in their level of detail and assumptions, making output and future scenarios variable. Differences among models stem from differences in assumptions regarding what variables (and how many) are important to include in models to best represent conditions we care about. Differences also stem from different assumptions about greenhouse gas emissions. Because of the variation across models and assumptions, it is useful to look across numerous models to assess the full range of potential future conditions.

The Intergovernmental Panel on Climate Change (IPCC) uses numerous models to make global climate projections. The models are developed by different institutions and countries and have slightly different inputs or assumptions. Specific inputs to these models include such variables as greenhouse gas emissions, air and ocean currents, ice and snow cover, plant growth, particulate matter, and many others.[1]

Most climate models project the future climate at global scales. Managers and decision makers, however, need information about how climate change will impact the local area. Global climate models can be adjusted to local scales using a variety of different methods for "downscaling." Downscaling involves using locally

HIGH CERTAINTY:

Higher temperatures – Greater concentrations of greenhouse gases trap more heat. Measured warming tracks model projections.

Lower snowpack – Higher temperatures cause a shift from snow to rain at lower elevations and cause earlier snow melt at higher elevations.

Shifting distributions of plants & animals – Many species are limited in extent or number by climatic conditions that are expected to change.

MEDIUM CERTAINTY:

More severe storms – Changes in storm patterns will be regionally variable, but storms are generally expected to become more severe.

Changes in precipitation – Current models show wide disagreement on precipitation patterns, but the model projections converge in some locations.

Wildfire patterns – The relationship among fire, temperature, and available moisture has been well documented, but other components also play a role (such as vegetation, below).

LOW CERTAINTY:

Changes in vegetation – Vegetation may take decades or centuries to keep pace with changes in climate. While shifts are certain, what those shifts look like, and when will be highly variable.

specific data on historical temperature and precipitation variation over a landscape. The historical relationships between topography and climate variables are assumed to remain intact even as climate changes (a rainshadow, for example, is assumed to remain a rainshadow, even as overall levels of precipitation change over time).

The utility of the model results presented in this report is to help resource managers and other decision makers picture what the conditions and landscape might look like in the future and the magnitude and direction of change. Some model outputs have greater certainty than others (see box on previous page). Information is provided here to explore the types of potential changes, but actual conditions may be quite different, especially if greenhouse gas emissions change substantially.

Uncertainty associated with projections of future conditions, however, should not be used as a reason for delaying action on climate change. The likelihood that future conditions will resemble historic conditions is very low, so **managers and policy makers are encouraged to begin to plan for an era of change, even if the precise trajectory or rate of such change is uncertain.**


Photo courtesy of Wikimedia

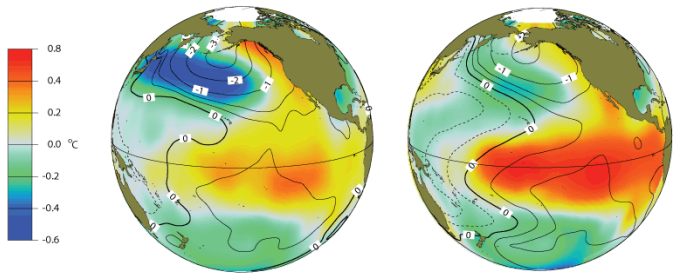
REGIONAL CLIMATE PATTERNS

The climate of the Western U.S. is heavily influenced by the Pacific Decadal Oscillation (PDO). The PDO influences surface ocean temperatures and cycles between a warm phase and a cool phase (Figure 2). Over the last century or more, these cycles have lasted about 20-30 years[2] (Figure 3).

During the warm phase, the surface of the ocean along the coast of North America is unusually warm and low barometric pressure is enhanced over the central North Pacific. This results in warmer than average air temperatures across western North America, especially west of the Rocky Mountains. Some of the characteristics of the warm phase of the PDO are hot dry summers, warmer than average winters, and reduced snowpack. The warm phase of the PDO has been linked to increased wildfire and bark beetle outbreaks.[3]

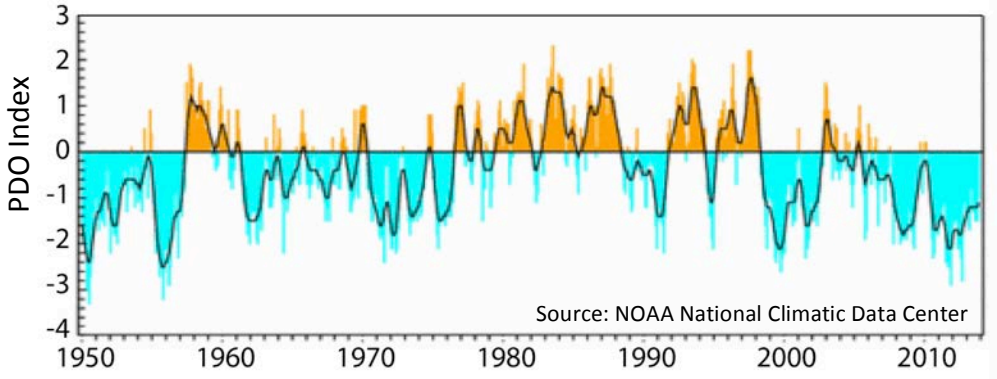
Embedded within the decades long cycles of the PDO are the one- to two-year cycles known as El Niño-Southern Oscillation (ENSO). When the warm and dry cycle of the PDO coincides with the dry years brought by ENSO, extreme drought and wildfire can occur.

Unfortunately, the precise cause and duration of PDO cycles are not well understood. The PDO was recognized as recently as 1996, and the drivers of the system are still being investigated. While our understanding increases every year, predicting future patterns and, more specifically, understanding the relationship between PDO and climate change is limited at this time.



Warm Phase PDO Warm Phase ENSO

Source: Climate Impacts Group, University of Washington



Figures 2 (top) and 3 (bottom). Warm phase PDO (top left) and warm phase ENSO (top right) sea surface temperature anomalies. Lower graph shows Pacific Decadal Oscillation, based on the PDO index, since 1950.

CLIMATE PROJECTIONS FOR THE SOUTHERN SIERRA NEVADA

Climate change projections are provided here in two different formats – as averages (monthly and annual) in table format, and as maps that show variation across the region and over future time periods. We mapped climate, vegetation, hydrology, and wildfire variables for historical period (1961-1990 for all variables except hydrology variables, where the historical period was 1971-2000) and for three future periods (2010-39, 2040-69, and 2070-99).

The IPCC emission scenario used in this assessment was the "business-as-usual" trajectory (A2) that assumes that most nations fail to act to lower emissions.[4] If the U.S. and other key nations drastically and immediately cut emissions, some of the more severe impacts, like irreversible climate change, may still be avoided. Due to climate system inertia, restabilization of atmospheric gases will take many decades even with drastic emissions reductions.[4] Reducing emissions is vital to prevent the Earth's climate system from reaching certain tipping points that will lead to sudden and irrevocable changes.

Throughout this report we present mid- and late-century model outputs.

We have more certainty in mid-century projections, due to greenhouse gases already released, but late-century projections may change, depending on future emission levels and natural feedback systems.

Historic trends are based on 4km PRISM data.[5] PRISM data are compiled from climate observations from a wide range of monitoring networks.

All future climate projections were developed using the same two global coupled ocean-atmospheric climate models – GFDL (Geosphysical Fluid Dynamics Laboratory)[6], and Parallel Climate Model (PCM; National Center for Atmospheric Research, USA)[7] based on the A2 emissions scenario.

Many other GCMs are available, but most have not been run with the Basin Characterization Model that provides detailed hydrology information for the region. Compared to projections from other models for the Southern Sierra, GFDL is warmer and drier than the average of all models, while PCM is cooler and wetter than average (climatewizard.org). These two models provide a reasonable range of potential future conditions, but many other outcomes are possible.

TEMPERATURE

On average, summer temperatures in the Southern Sierra are expected to rise more than winter temperatures (Figure 4; Table 1). This is a common trend throughout the Western U.S. Due to emissions already released, mid-century (2040-69) projections are highly likely to be realized while late-century (2070-99) projections are less certain due to potential changes in emissions or positive feedbacks that could accelerate change. The projections presented in this report are for the A2 "business-as-usual" emissions scenario, using 2 GCMs: GFDL and PCM.

Figure 4. Average monthly temperature across the Southern Sierra Integrated Regional Water Management Planning area.

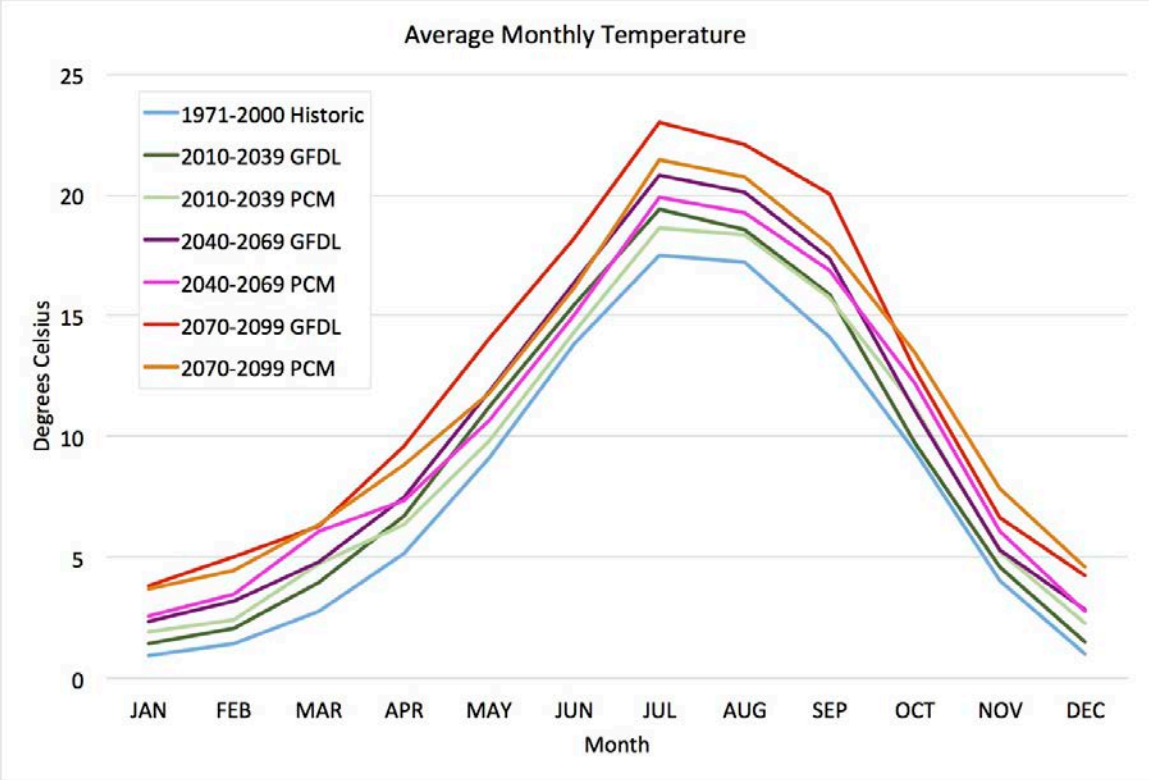


Table 1. Projected average annual and monthly temperature (and change from historic), in degrees Celsius, across the Southern Sierra IRWMP region, based on output from two different global climate models (GFDL and PCM) and the A2 emissions scenario.

	Historic	2010-39	2040-69	2070-99
Annual	9.3°	9.2° to 9.3° (+1.2° to 1.2°)	10.2° to 10.3° (+2.1° to 2.2°)	11.5° to 12.2° (+3.4° to 4.1°)
January	0.9°	1.4° to 1.9° (+0.5° to 1.0°)	2.4° to 2.6° (+1.4° to 1.6°)	3.7° to 3.8° (+2.7° to 2.8°)
February	1.5°	2.1° to 2.4° (+0.6° to 1.0°)	3.2° to 3.5° (+1.7° to 2.0°)	4.4° to 5.0° (+3.0° to 3.6°)
March	2.8°	3.9° to 4.8° (+1.2° to 2.0°)	4.8° to 6.1° (+2.1° to 3.3°)	6.3° to 6.4° (+3.5° to 3.6°)
April	5.2°	6.4° to 6.7° (+1.2° to 1.5°)	7.4° to 7.5° (+2.2° to 2.3°)	8.8° to 9.6° (+3.7° to 4.5°)
May	9.1°	9.8° to 11.2° (+0.7° to 2.1°)	10.6° to 11.9° (+1.5° to 2.8°)	11.8° to 14.1° (+2.7° to 5.0°)
June	13.8°	14.3° to 15.5° (+0.5° to 1.6°)	15.0° to 16.4° (+1.2° to 2.5°)	16.2° to 18.2° (+2.3° to 4.4°)
July	17.5°	18.6° to 19.4° (+1.1° to 1.9°)	20.0° to 20.8° (+2.4° to 3.3°)	21.5° to 23.0° (+4.0° to 5.5°)
August	17.2°	18.5° to 18.4° (+1.2° to 1.3°)	19.3° to 20.1° (+2.0° to 2.9°)	20.8° to 22.1° (+3.5° to 4.9°)
September	14.1°	15.7° to 15.9° (+1.6° to 1.7°)	16.9° to 17.3° (+2.8° to 3.2°)	17.9° to 20.1° (+3.8° to 5.9°)
October	9.4°	9.8° to 11.2° (+0.4° to 1.8°)	11.1° to 12.2° (+1.7° to 2.8°)	12.8° to 13.5° (+3.3° to 4.1°)
November	4.0°	4.6° to 5.3° (+0.6° to 1.2°)	5.3° to 6.1° (+1.2° to 2.1°)	6.6° to 7.9° (+2.6° to 3.8°)
December	1.0°	1.5° to 2.3° (+0.4° to 1.2°)	2.8° to 2.9° (+1.7° to 1.8°)	4.3° to 4.6° (+3.3° to 3.6°)

Figure 5. Average annual temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

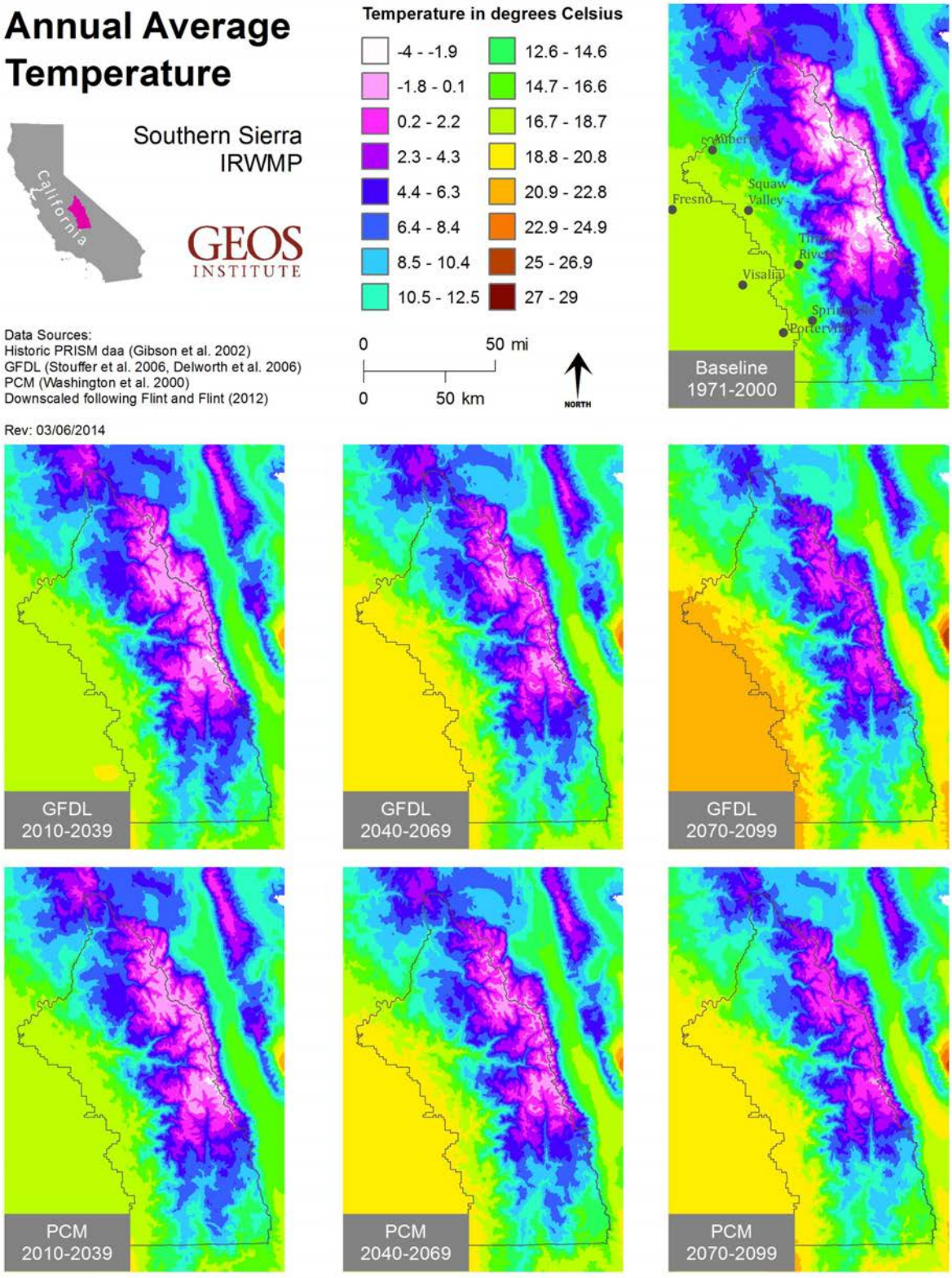


Figure 6. Average January temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

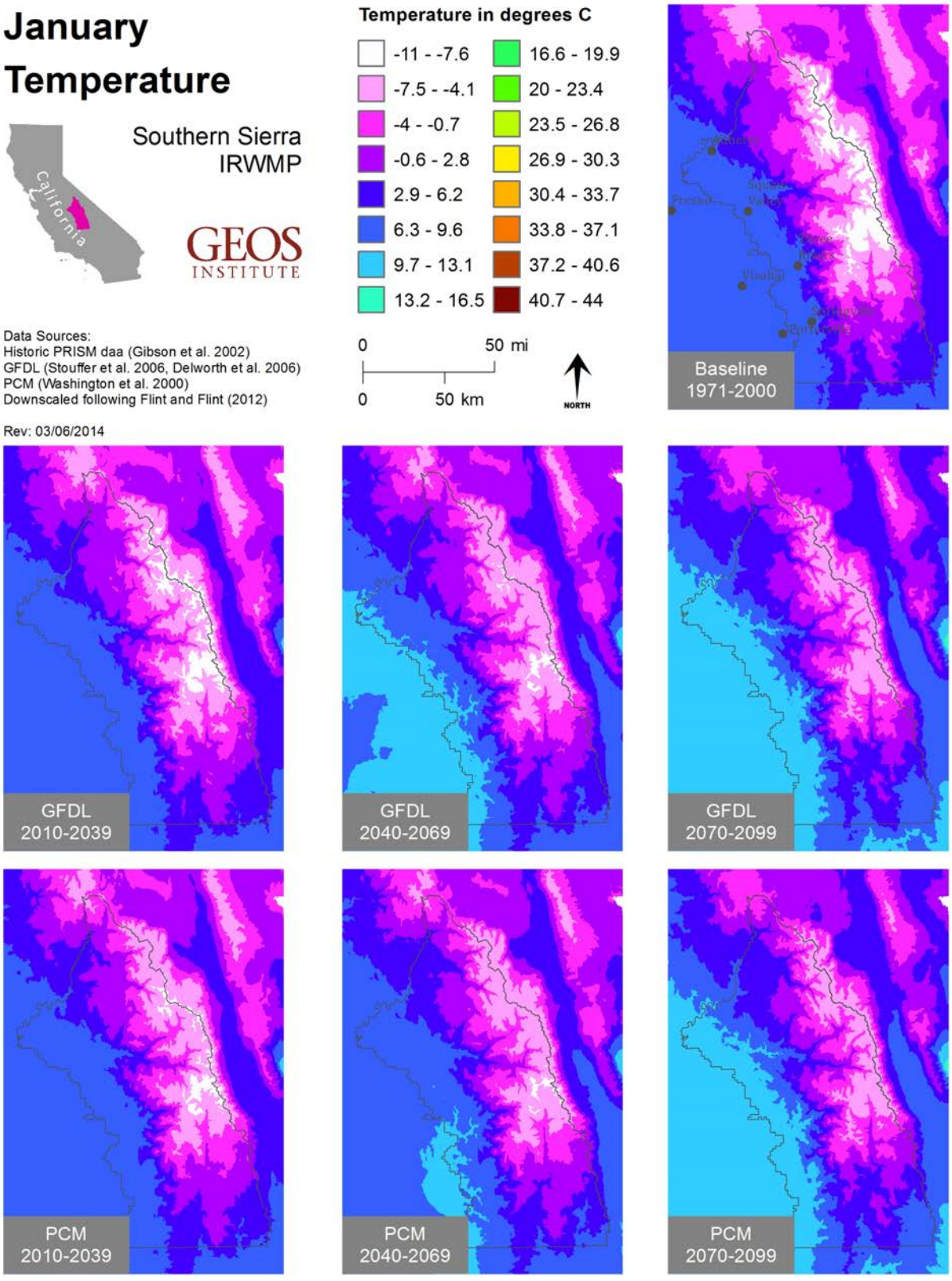


Figure 7. Average February temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

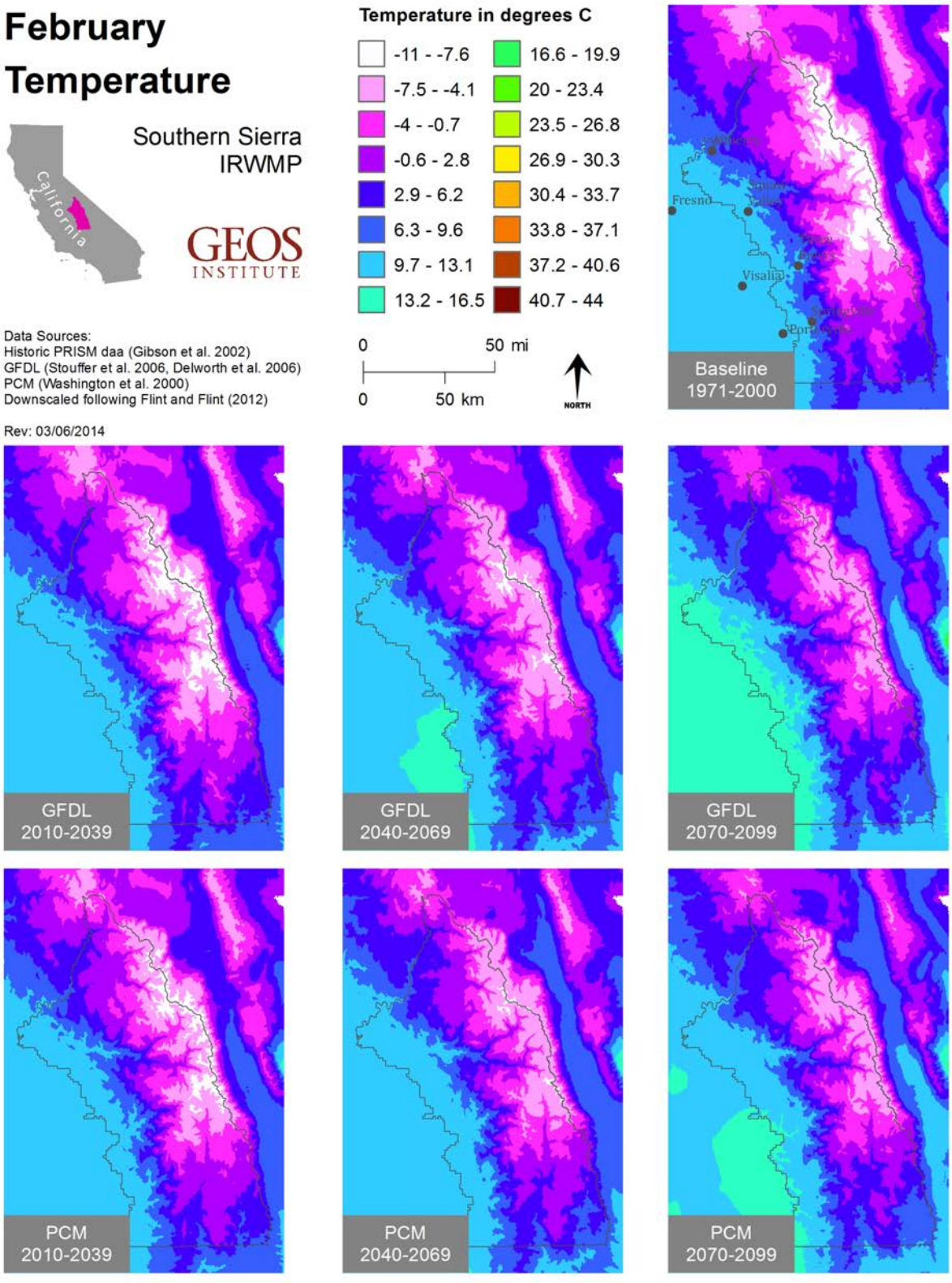


Figure 8. Average March temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

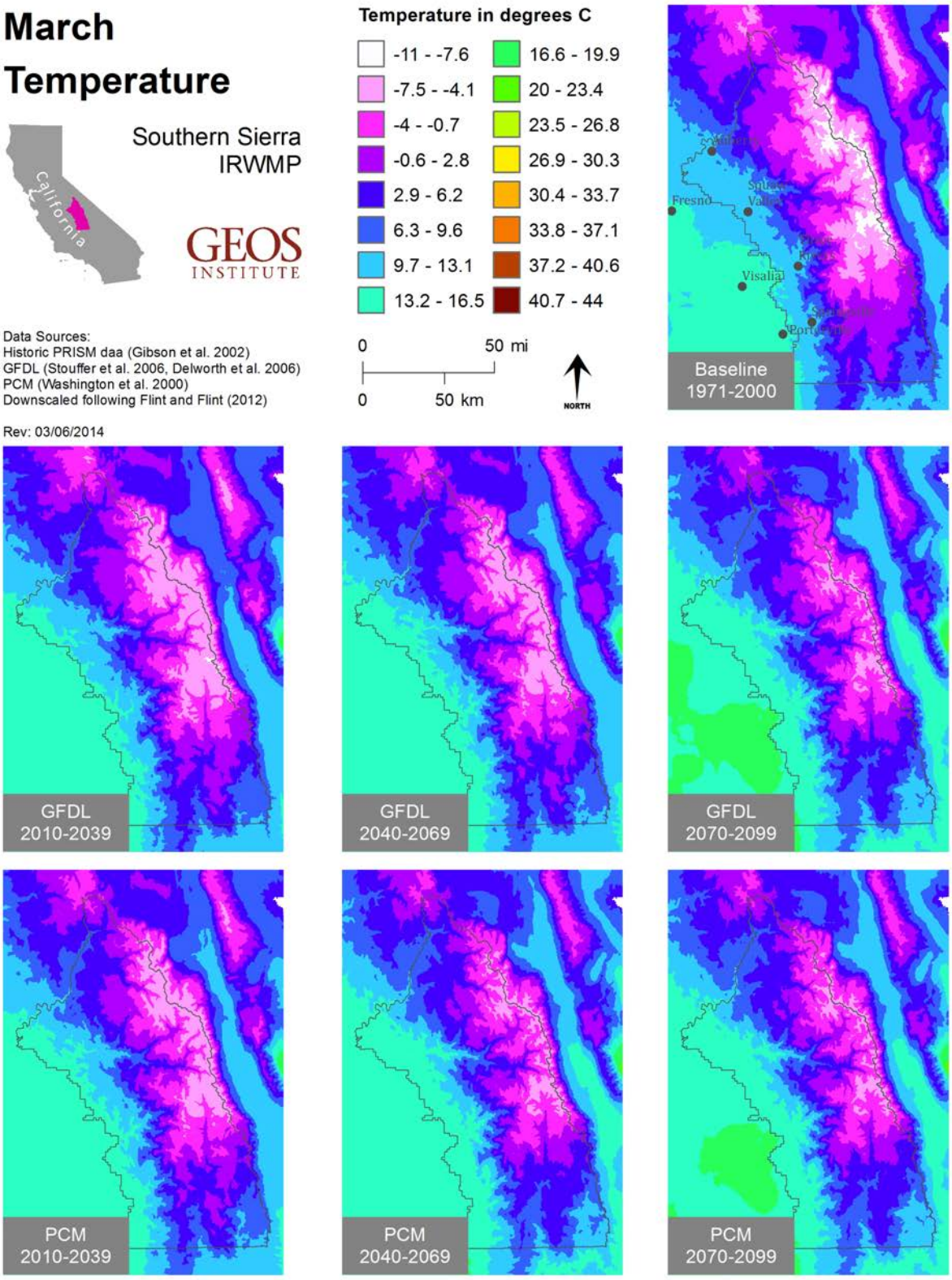


Figure 9. Average April temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

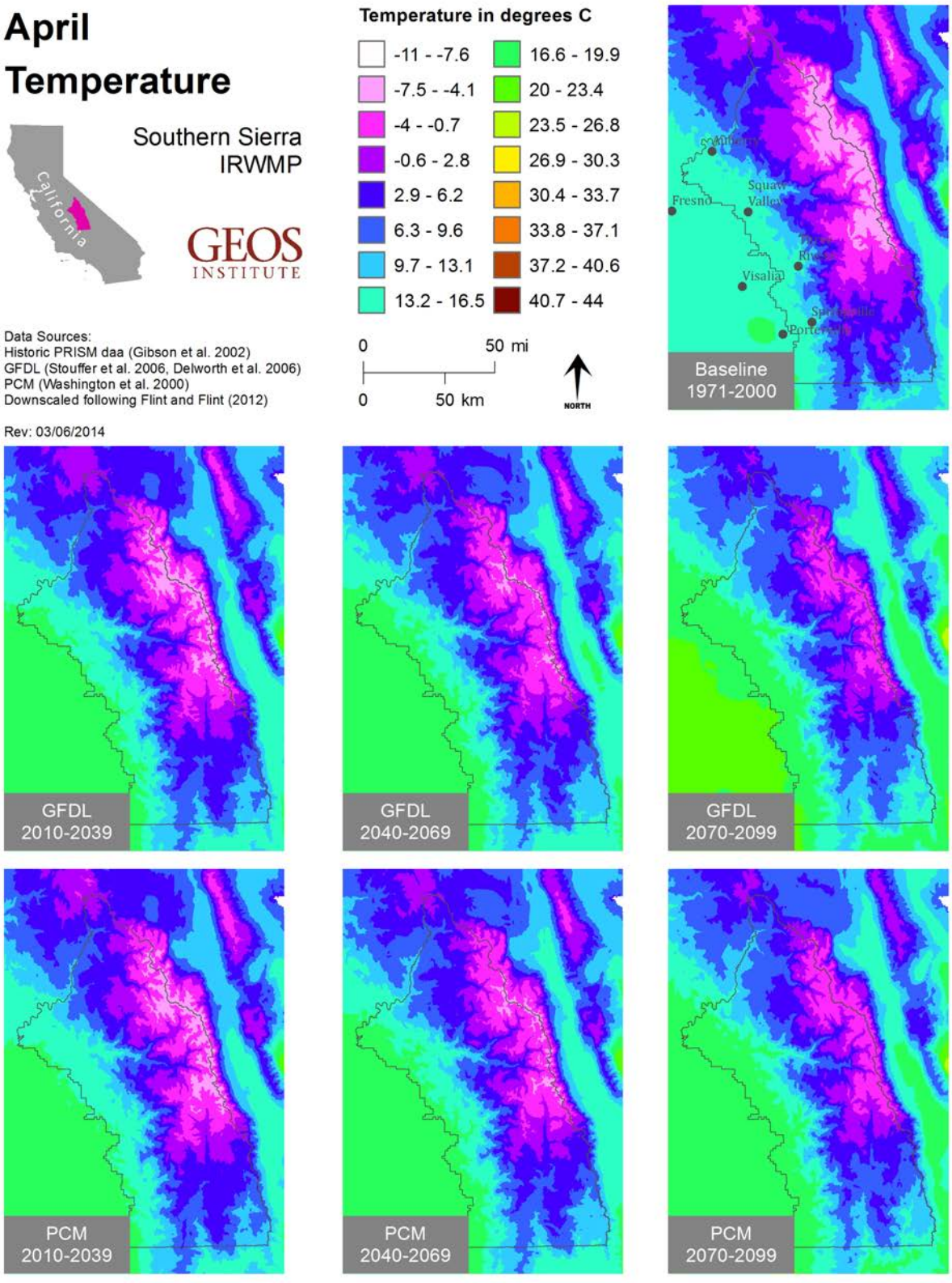


Figure 10. Average May temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

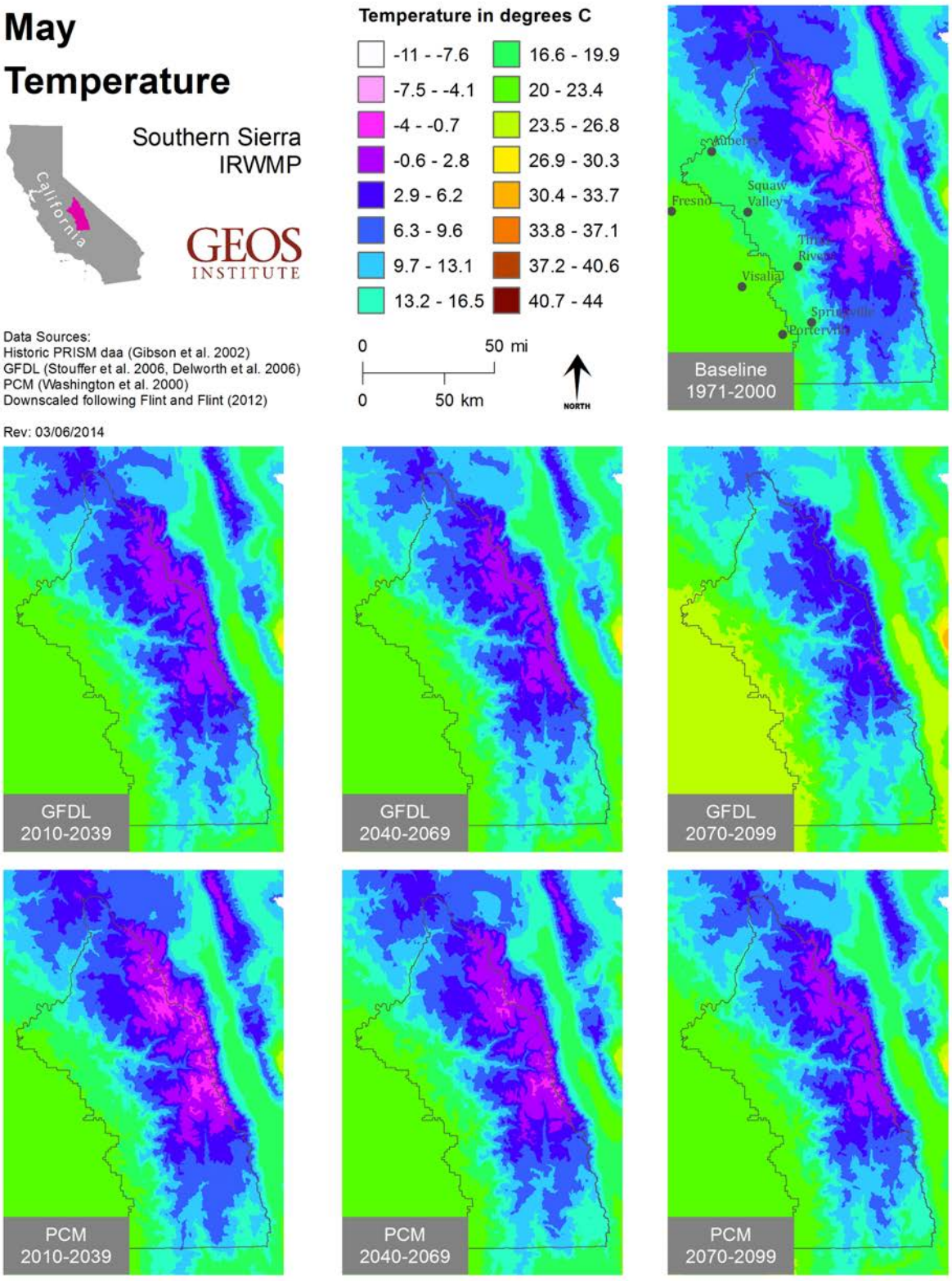


Figure 11. Average June temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

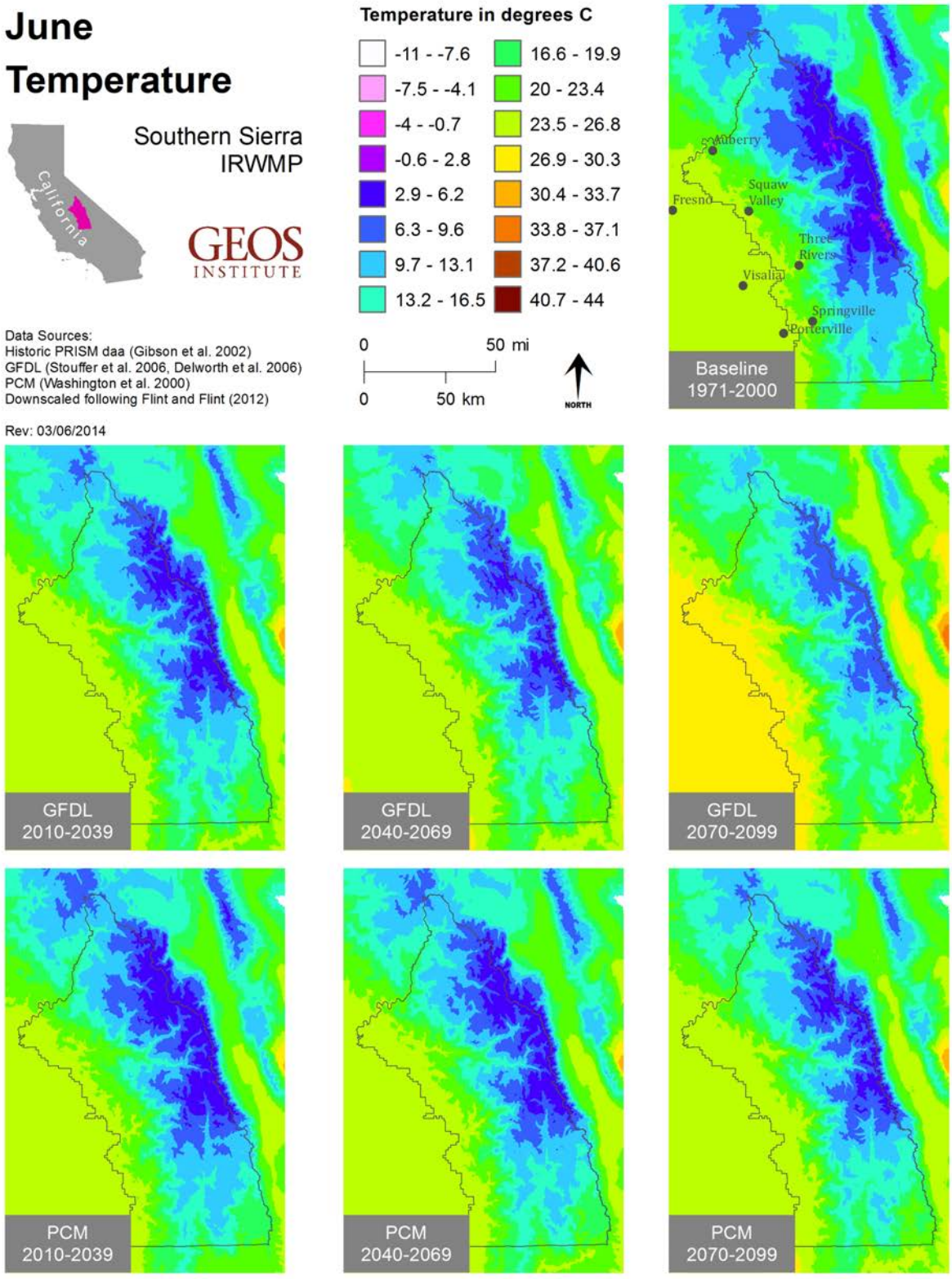


Figure 12. Average July temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

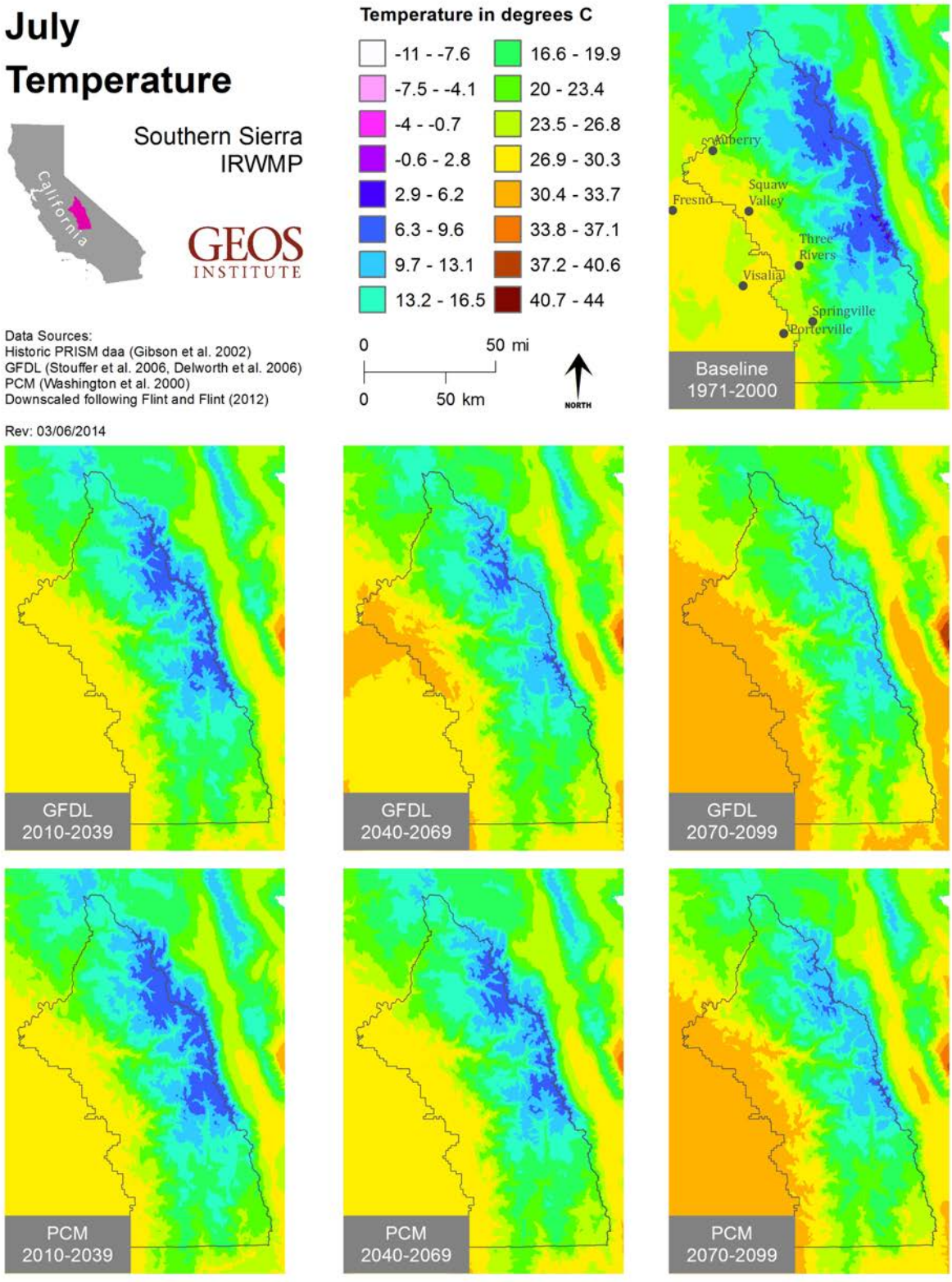


Figure 13. Average August temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

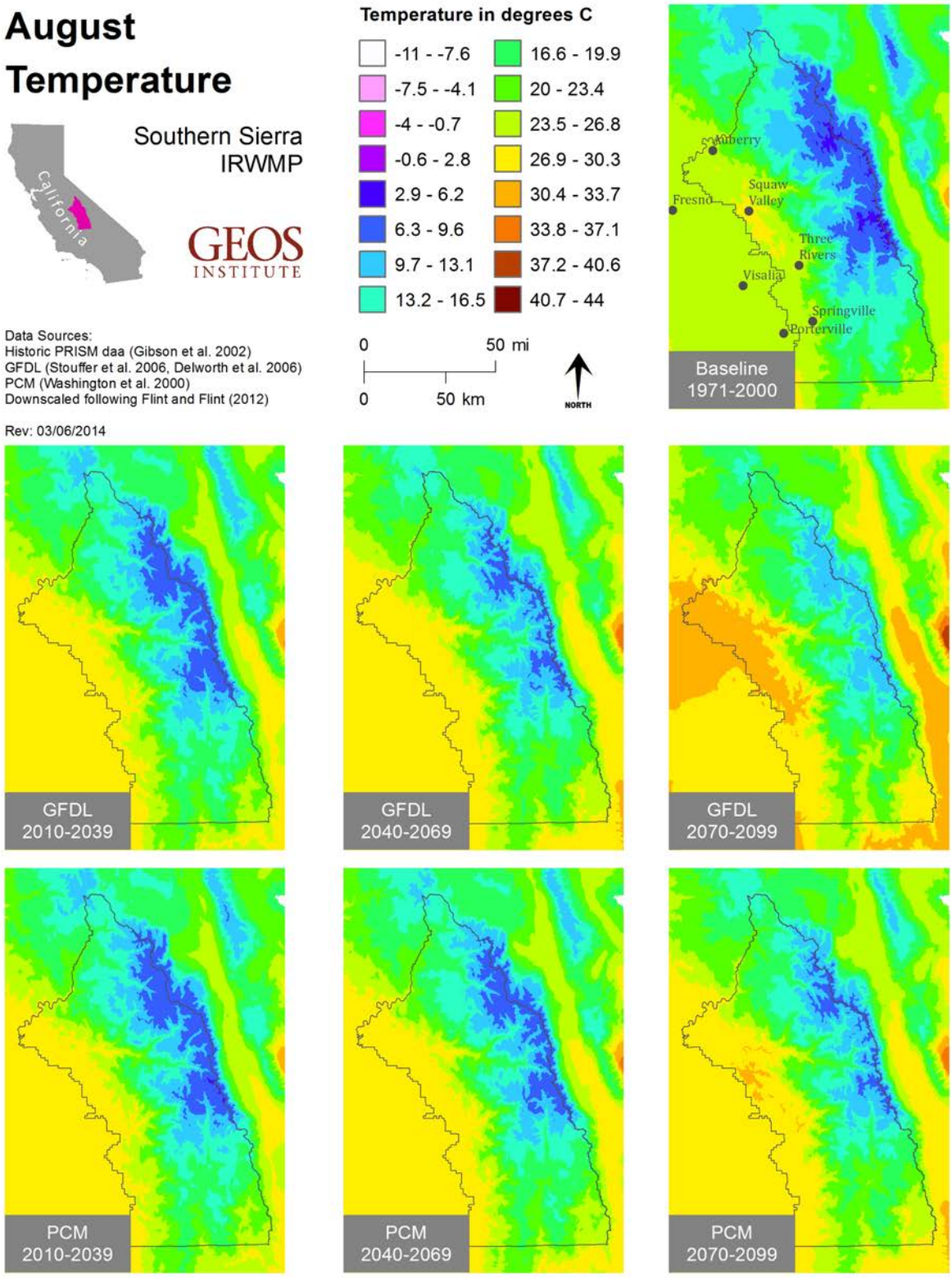


Figure 14. Average September temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

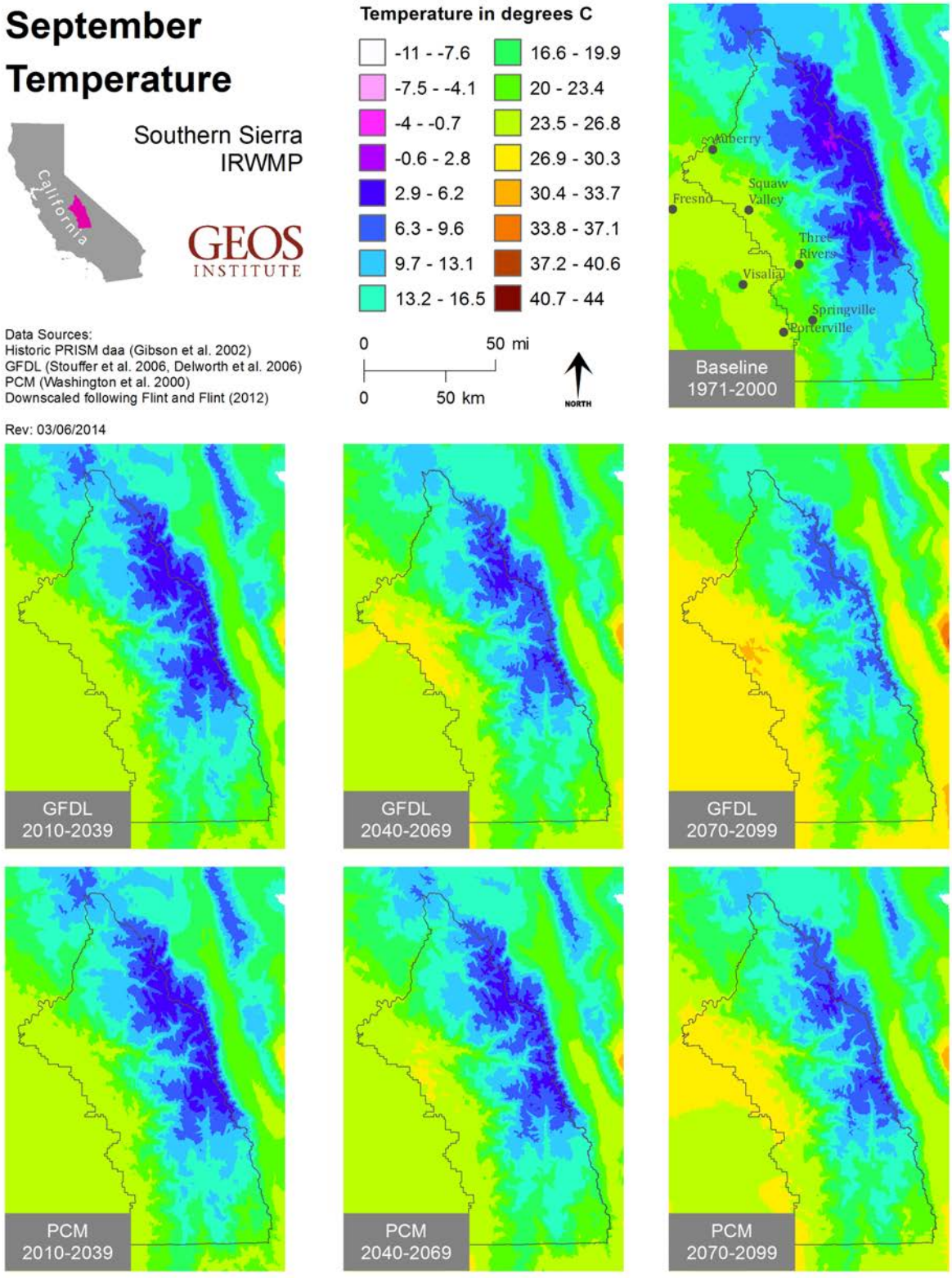


Figure 15. Average October temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

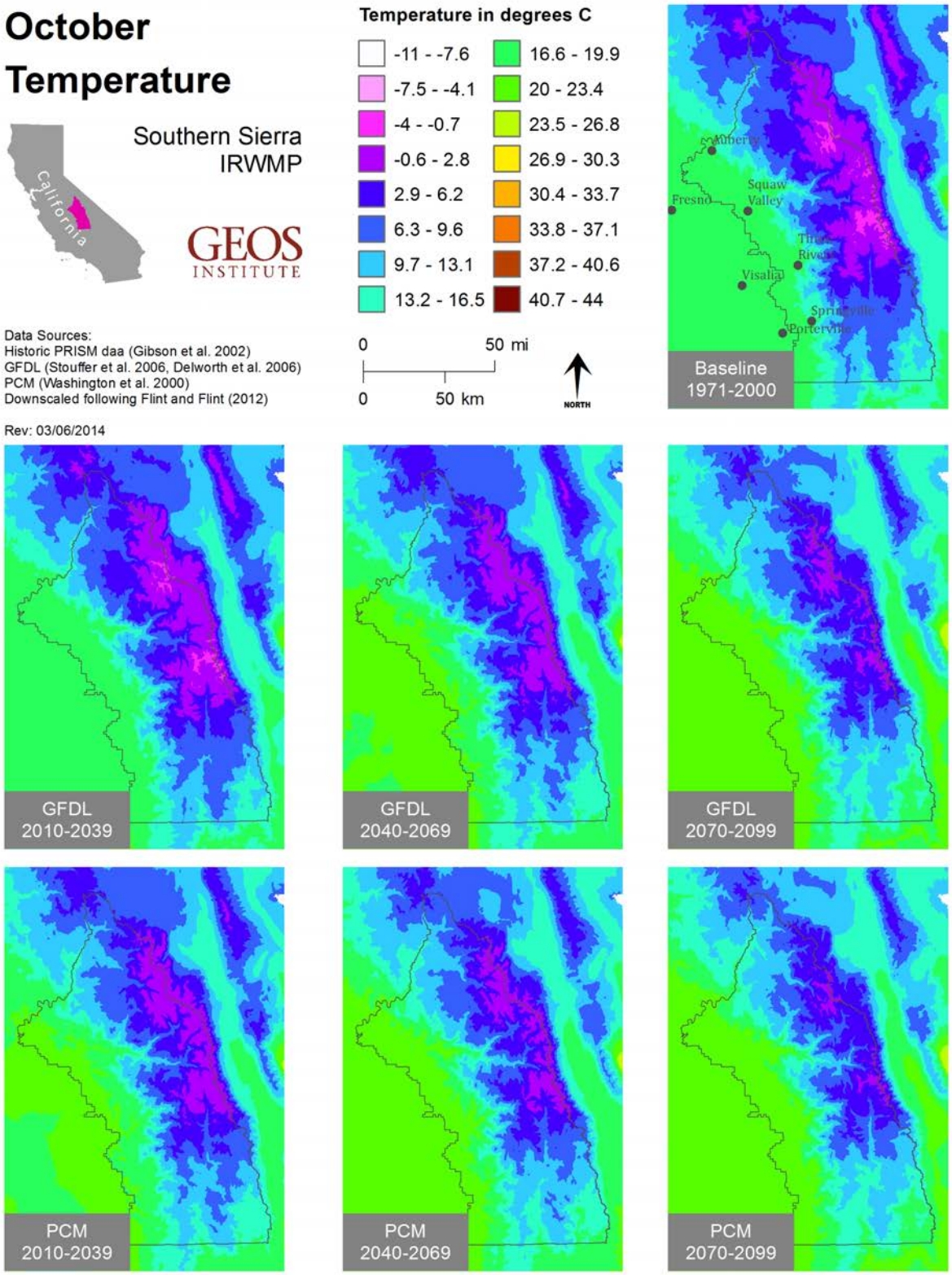


Figure 16. Average November temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

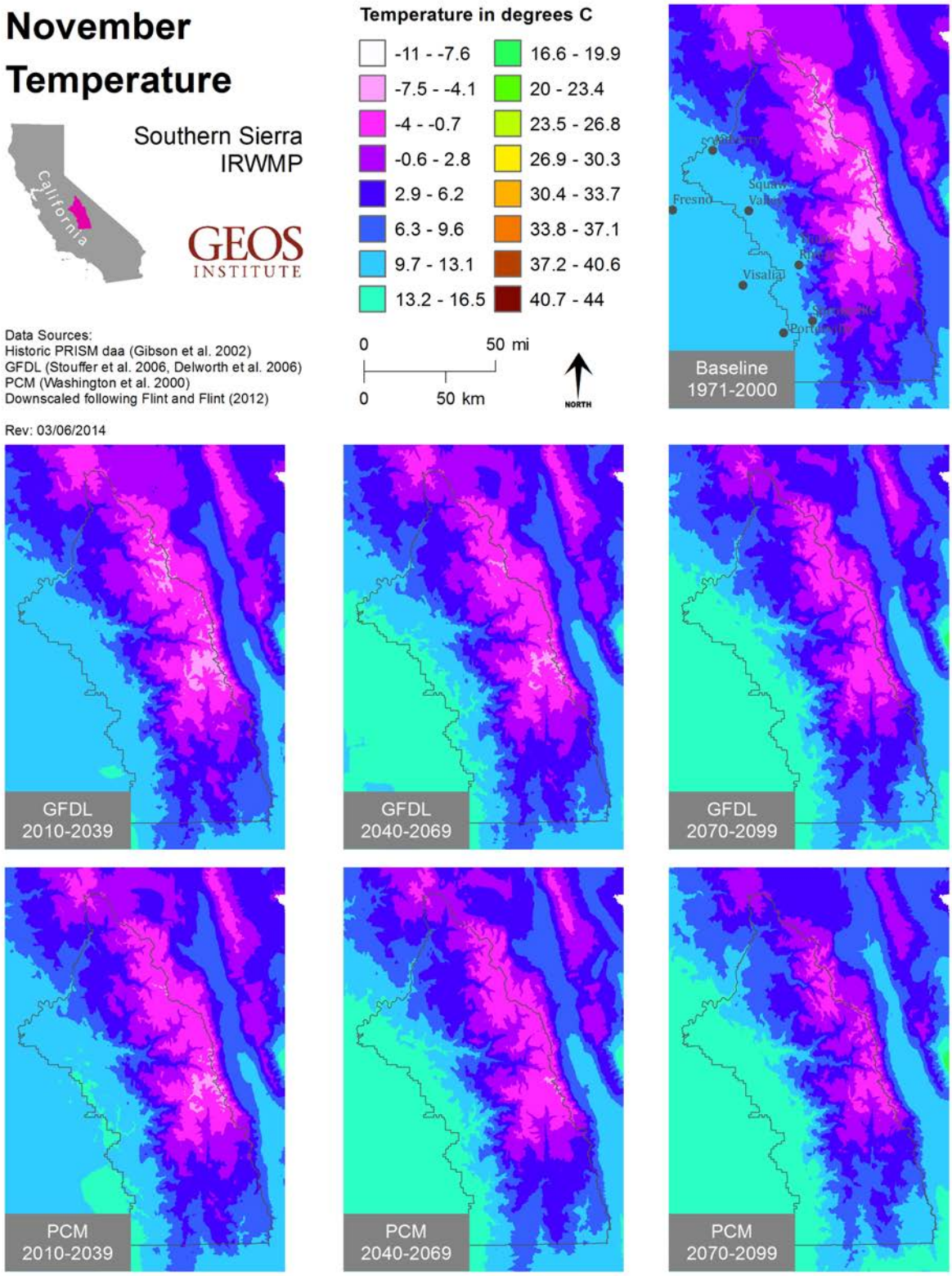
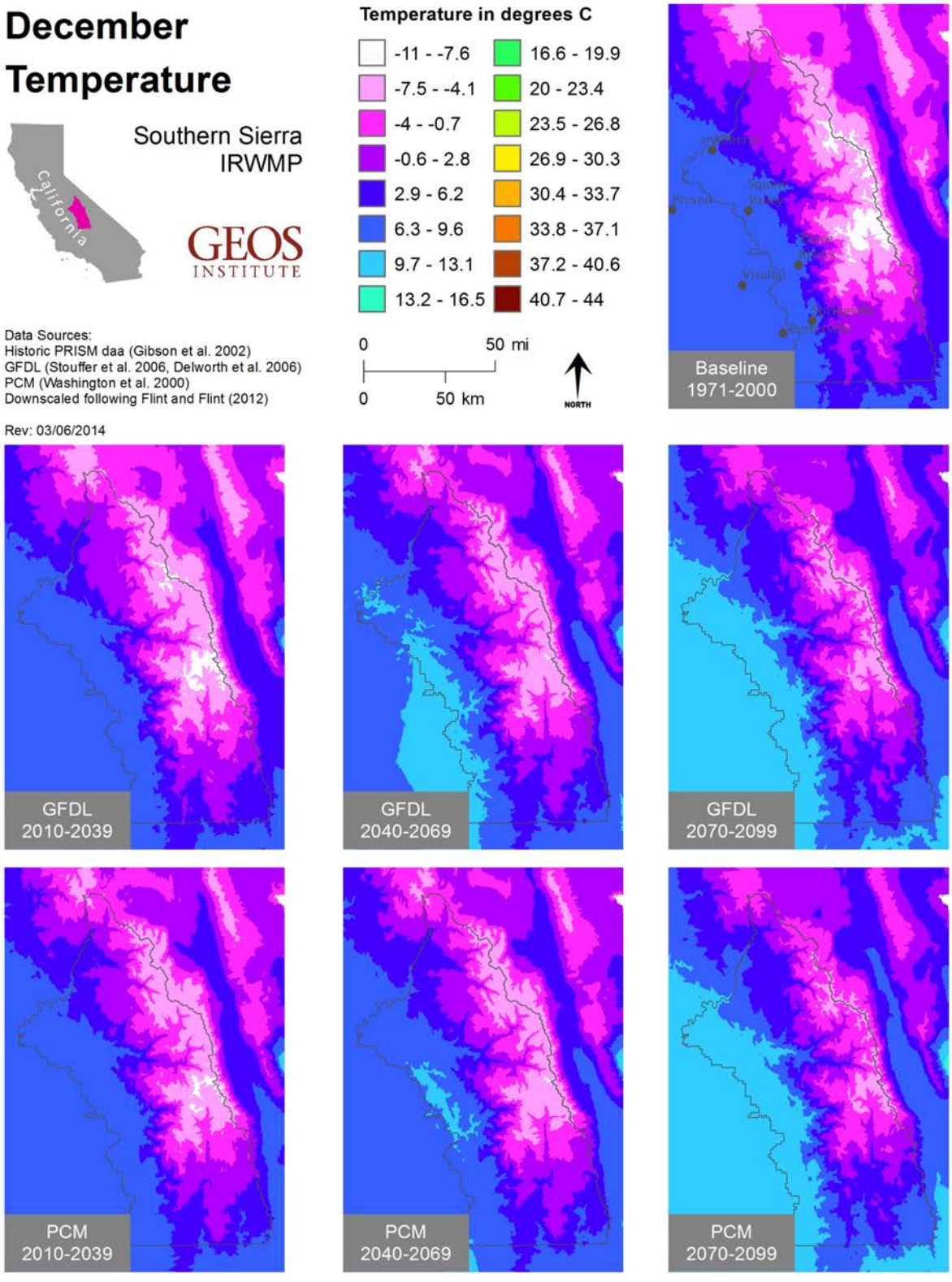


Figure 17. Average December temperature across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.



PRECIPITATION

Projections for future precipitation varied (Fig. 18 and Table 2), with some months wetter than historic (Jan-Mar) and some slightly drier (Apr-Jun and Oct-Dec). Even with increased precipitation in the late winter, overall drier conditions are expected to develop due to increases in temperature and evaporation. This can be seen in the water deficit projections (page 44).

Figure 18. Average monthly precipitation across the Southern Sierra Integrated Regional Water Management Planning area, for the historic period (1971-2000) and 3 future time periods (2010-2039, 2040-2069, and 2070-2099).

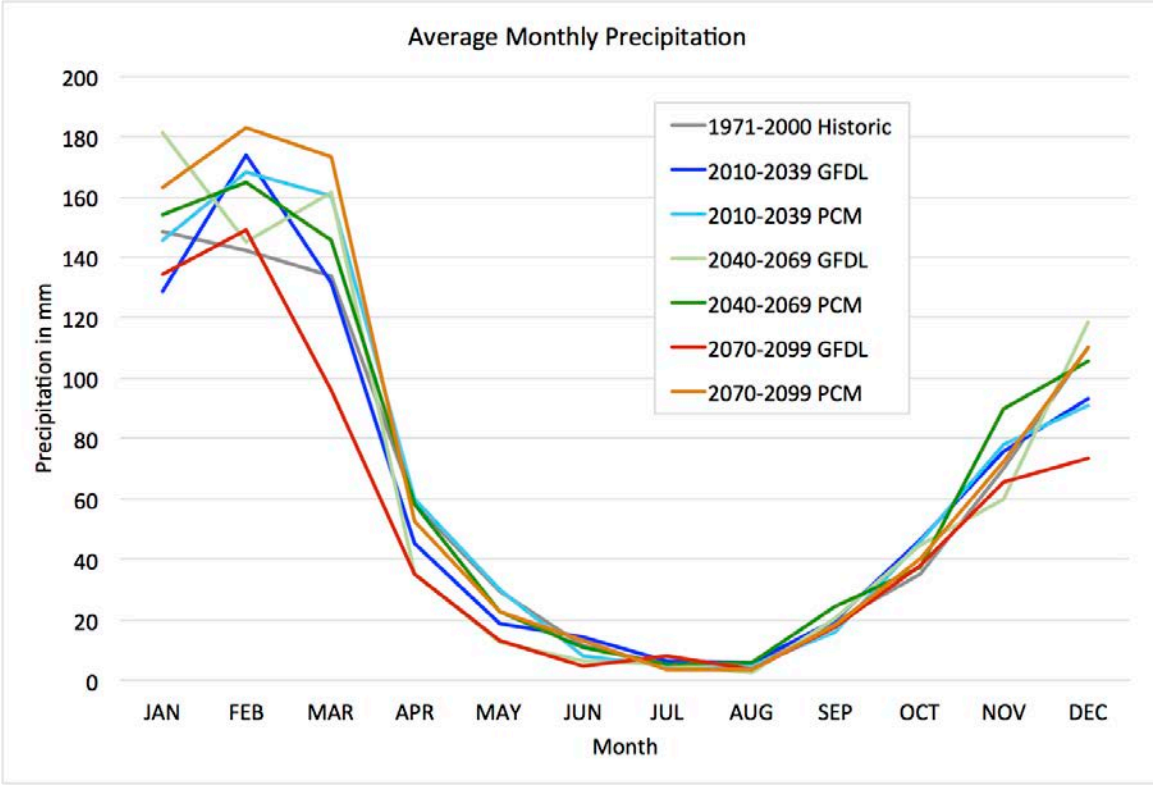


Table 2. Projected average annual and monthly precipitation (and percent change from historic) across the Southern Sierra IRWMP region, based on output from two different global climate models (GFDL and PCM) and the A2 emissions scenario. Precipitation projections include both rainfall and snow water equivalent, shown in millimeters.

	Historic	2010-39	2040-69	2070-99
Annual	768.8	759.5 to 812.0 (-1.2 to +5.6%)	792.6 to 825.1 (+3.1 to +7.3%)	637.6 to 855.4 (-17.1 to +11.3%)
Jan	148.5	128.7 to 145.9 (-13.4 to -1.8%)	154.2 to 181.3 (+3.8 to +22.1%)	134.1 to 163.1 (-9.7 to +9.8%)
Feb	142.1	168.1 to 173.7 (+18.3 to +22.2%)	145.3 to 165.7 (+2.3 to +15.9%)	148.9 to 182.9 (+4.8 to +28.7%)
Mar	134.0	131.5 to 160.5 (-19.7 to -1.9%)	145.5. to 161.4 (+8.6 to +20.5%)	96.0 to 173.5 (-28.3 to +29.4%)
Apr	58.5	45.4 to 60.0 (-22.3 to +2.7%)	35.0 to 58.1 (-40.2 to -0.6%)	35.1 to 52.5 (-39.9 to -10.1%)
May	29.4	19.0 to 29.9 (-35.5 to +1.7%)	12.6 to 22.7 (-57.3 to -23.0%)	12.9 to 22.6 (-56.3 to -23.2%)
Jun	11.6	14.1 to 8.1 (-29.9 to +21.4%)	6.2 to 10.9 (-46.7 to -5.6%)	4.8 to 13.3 (-58.6 to +14.4%)
Jul	5.5	6.1 to 4.8 (-12.4 to +12.6%)	5.3 to 5.4 (-2.6 to -1.1%)	3.8 to 7.9 (-30.4 to +45.6%)
Aug	4.6	4.7 to 5.6 (20.1 to 0.7%)	2.4 to 5.9 (-47.5 to +27.1%)	3.5 to 3.6 (-24.7 to -23.1%)
Sep	19.4	15.7 to 20.2 (-19.1 to +3.8%)	20.4 to 24.6 (+5.1 to +26.6%)	17.5 to 18.2 (-9.8 to -6.1%)
Oct	34.9	45.6 to 46.6 (+30.8 to 33.6%)	37.6 to 44.6 (+7.8 to +27.8%)	37.9 to 39.9 (+8.7 to +14.6%)
Nov	70.3	75.6 to 77.9 (+7.5 to +10.8%)	59.7 to 89.8 (-15.1 to +27.7%)	65.3 to 72.2 (-7.1 to +2.7%)
Dec	110.1	90.9 to 93.1 (-15.4 to -7.4%)	105.8 to 115.4 (-3.9 to +7.6%)	73.6 to 109.9 (-33.1 to -0.2%)

Figure 19. Average annual precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

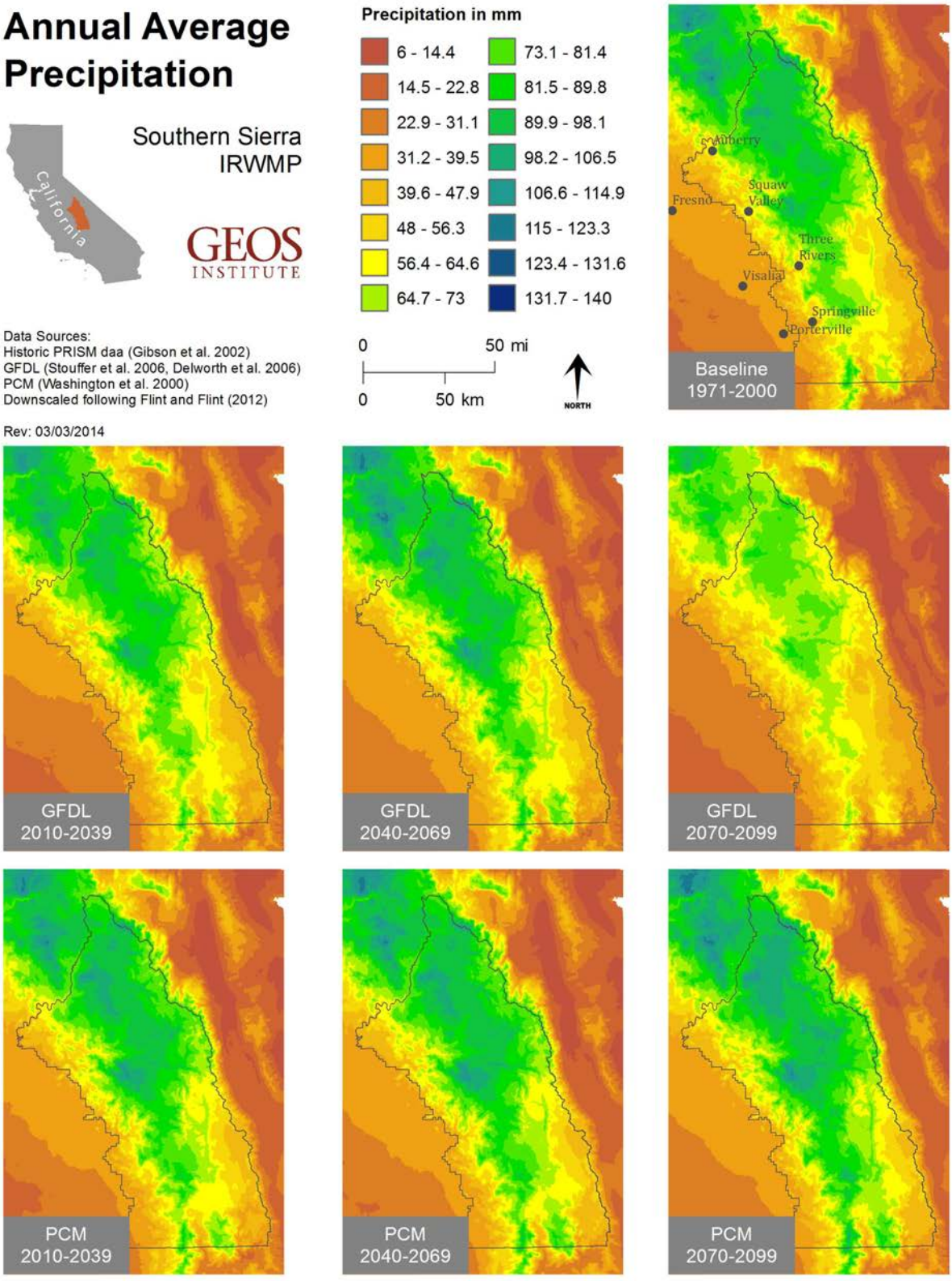


Figure 20. Average January precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

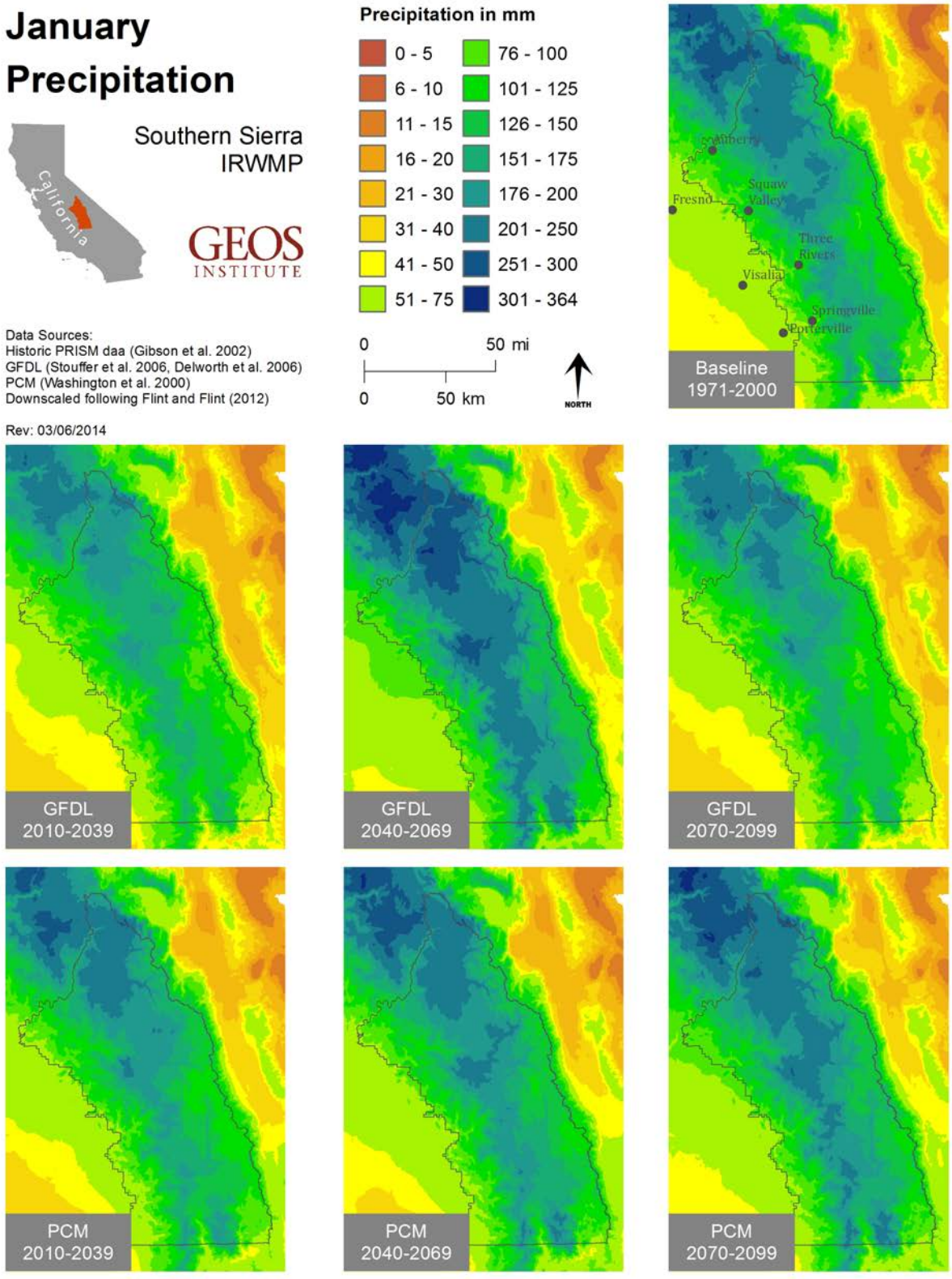


Figure 21. Average February precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

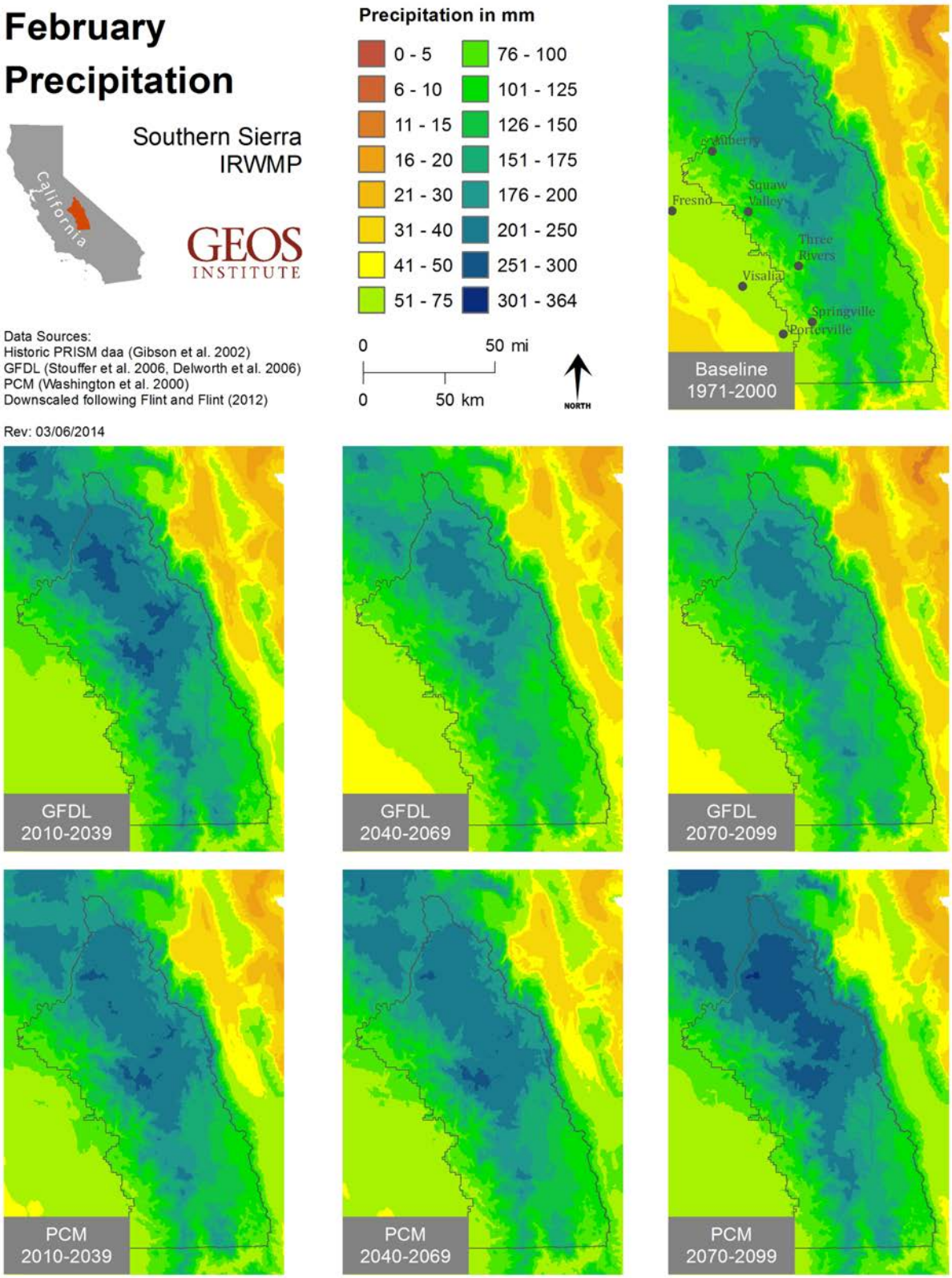


Figure 22. Average March precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

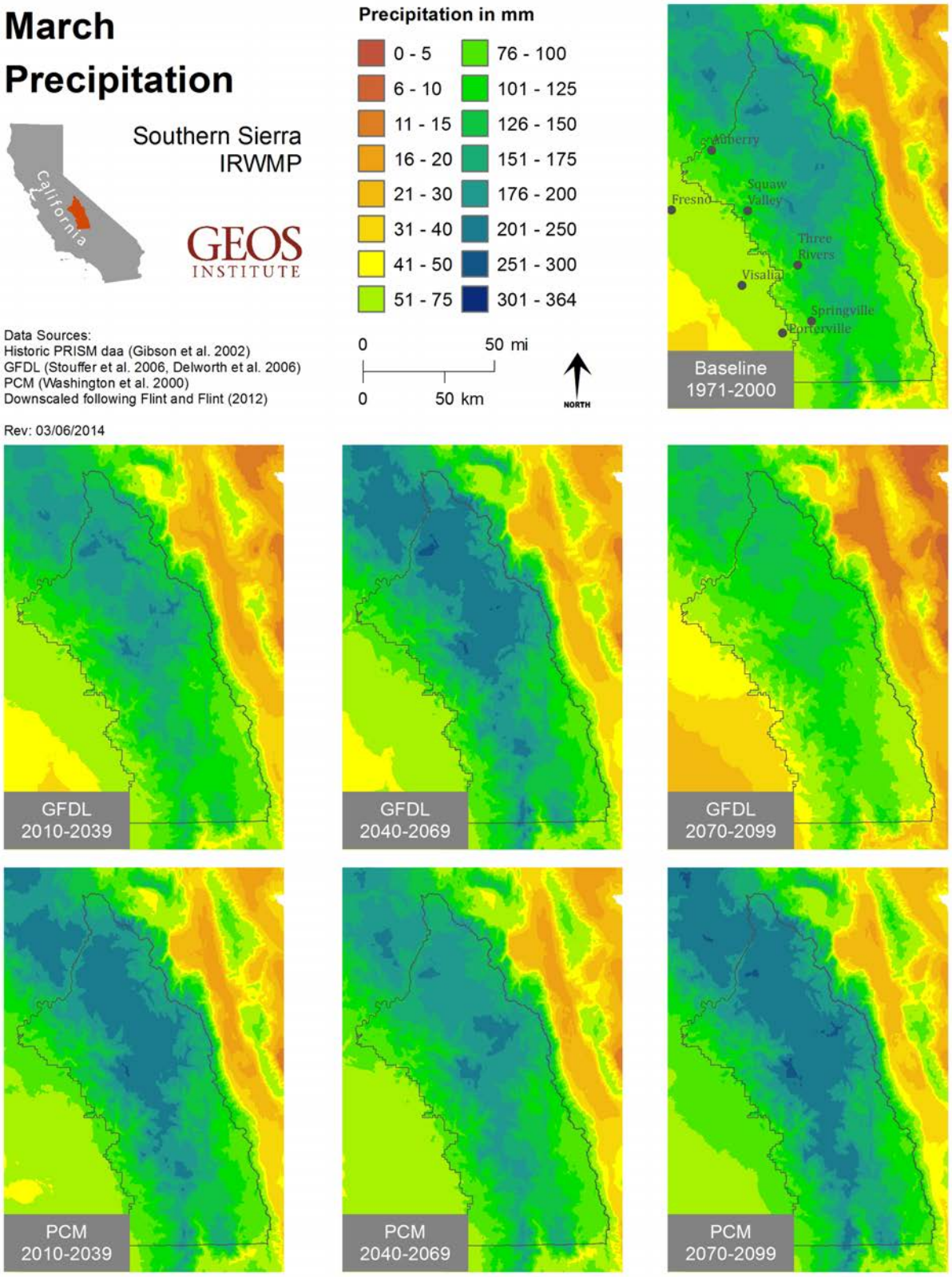


Figure 23. Average April precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

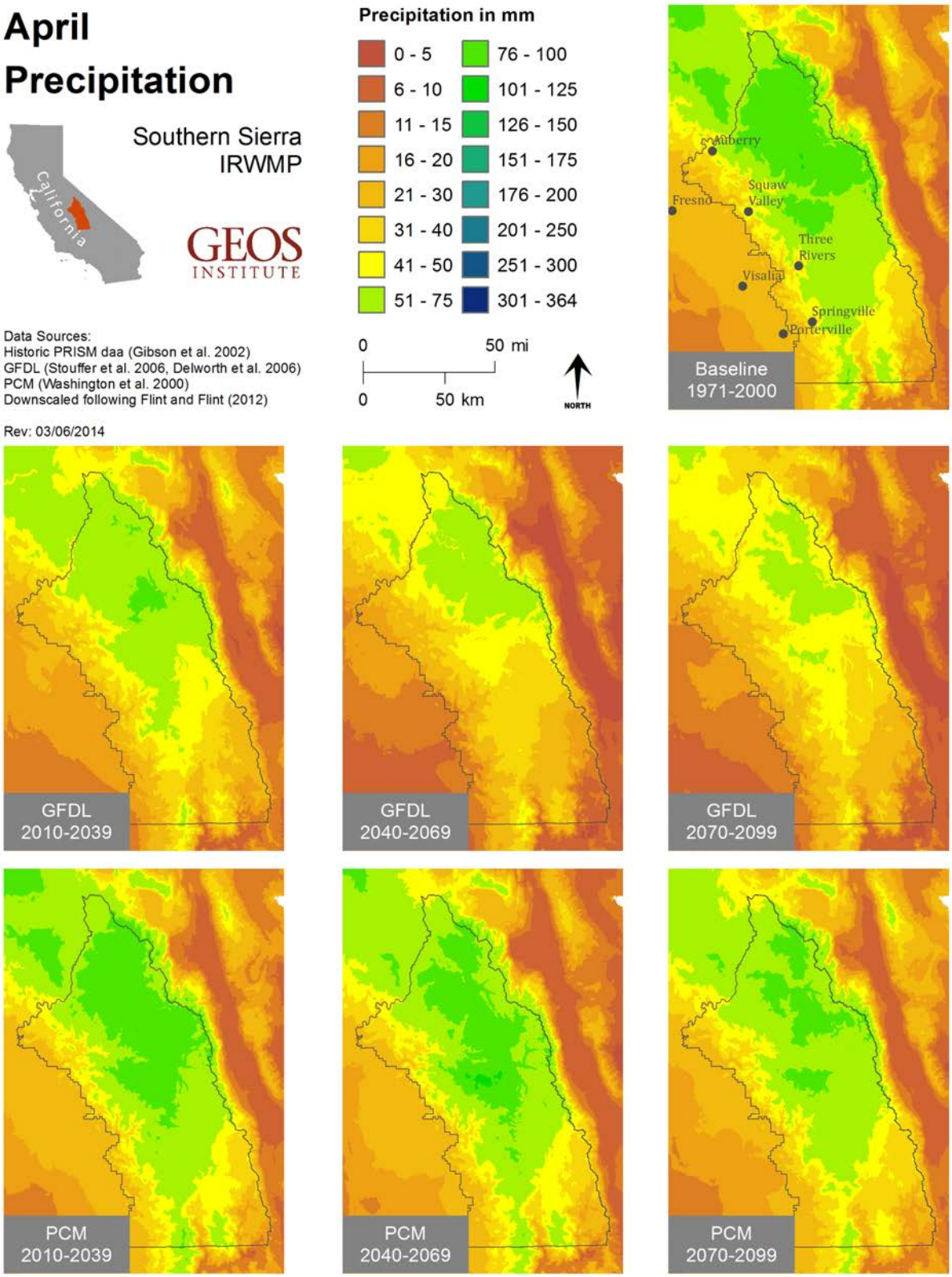


Figure 24. Average May precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

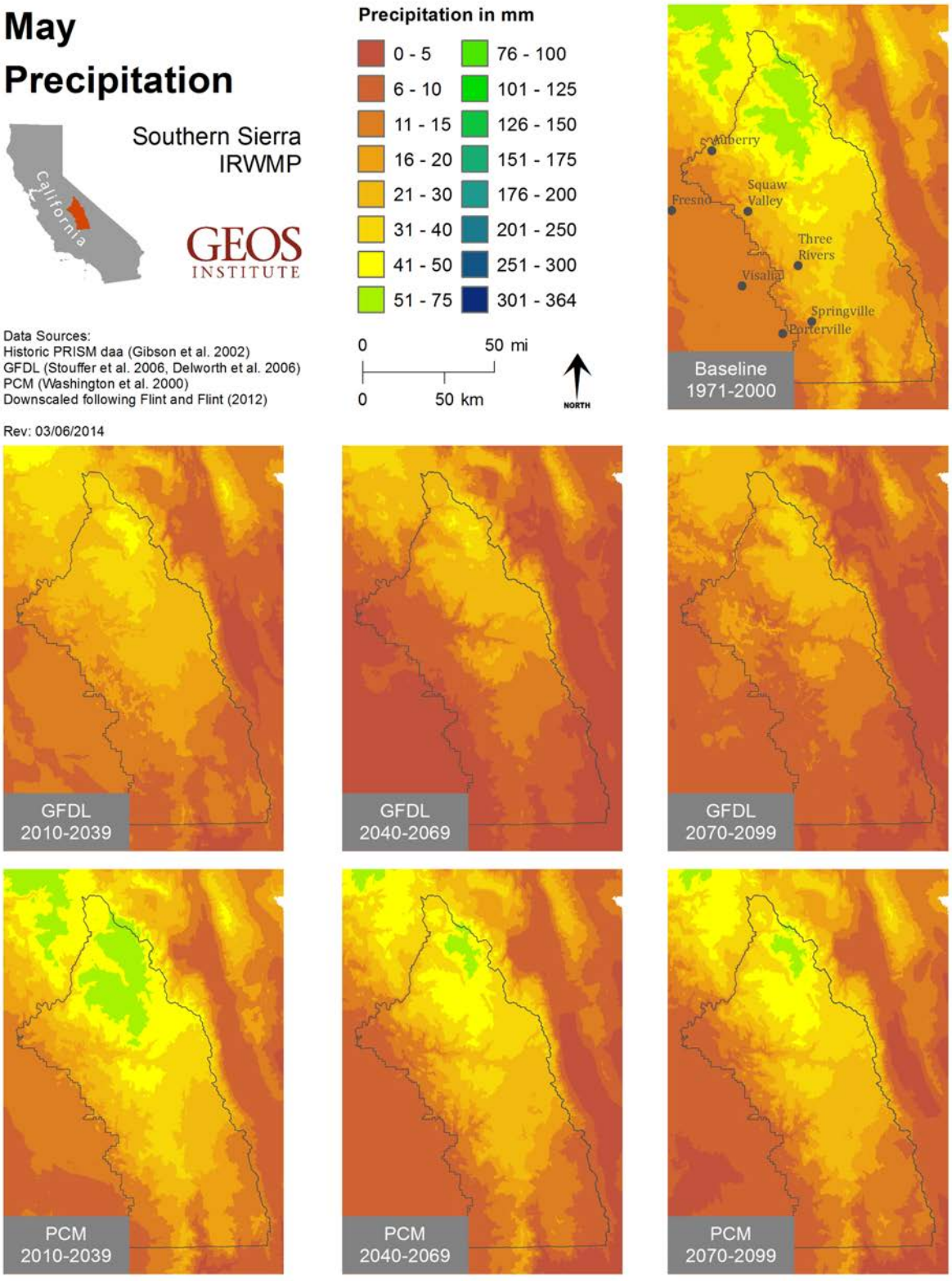


Figure 25. Average June precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

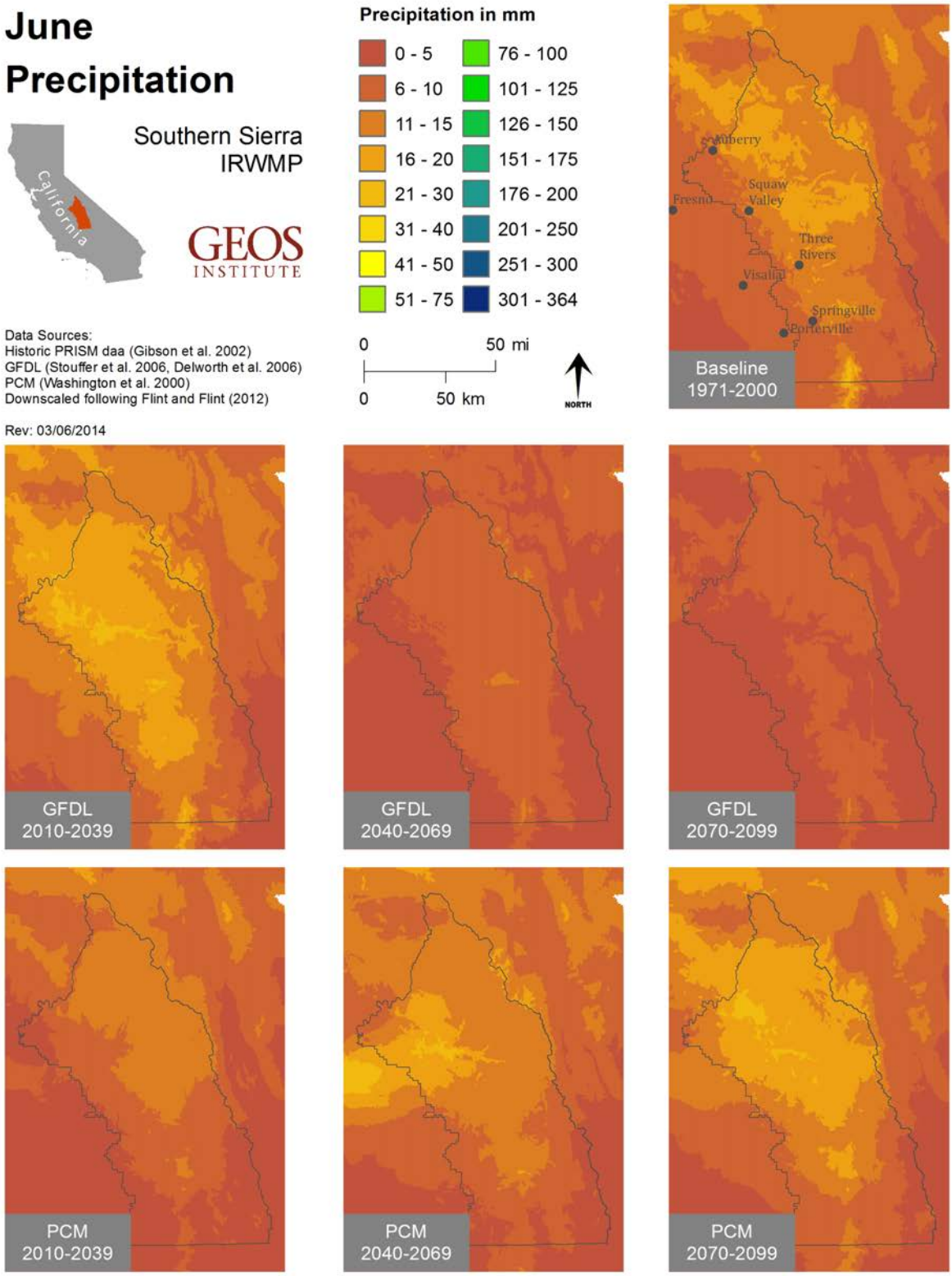


Figure 26. Average July precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

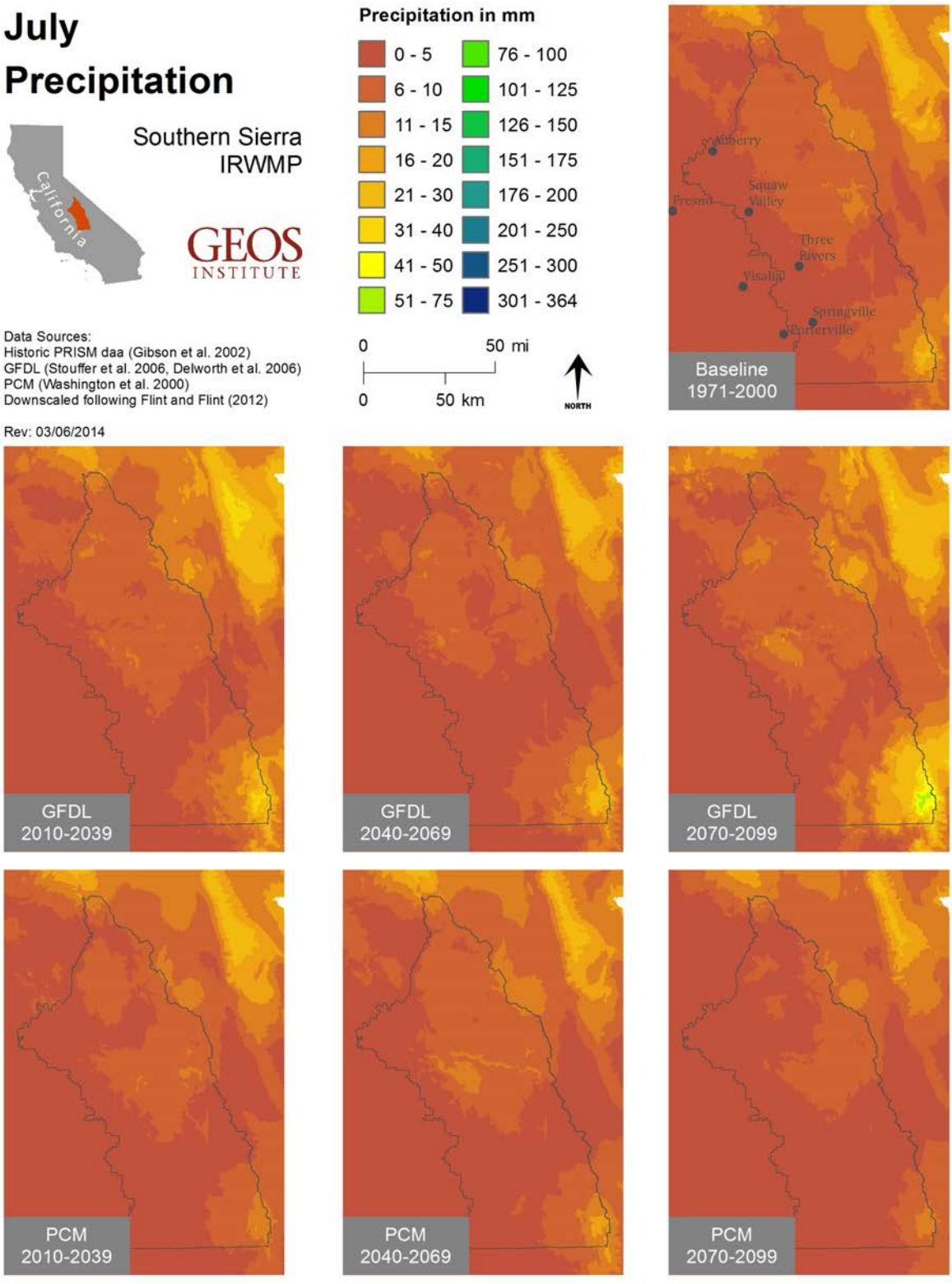


Figure 27. Average August precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

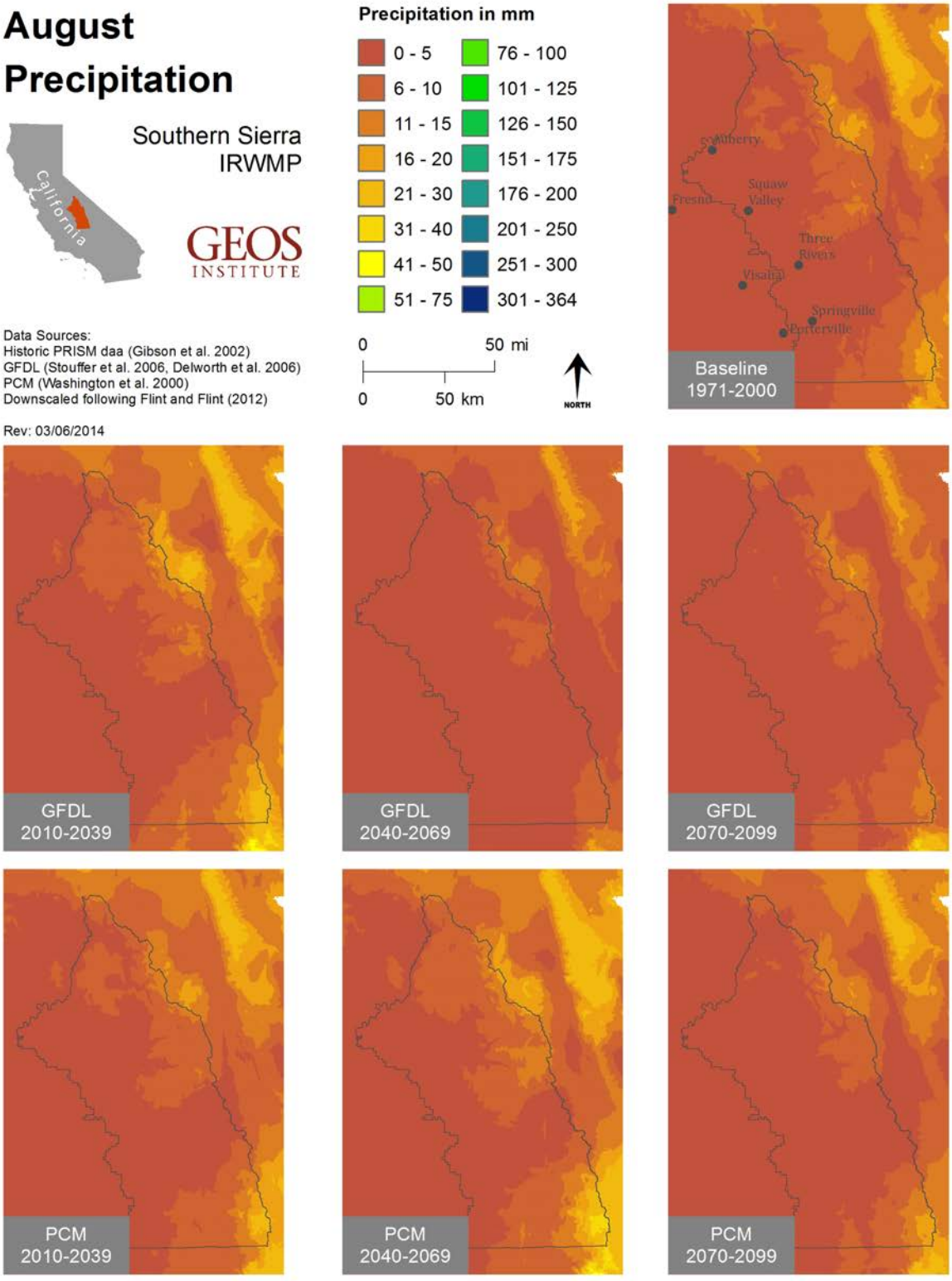


Figure 28. Average September precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

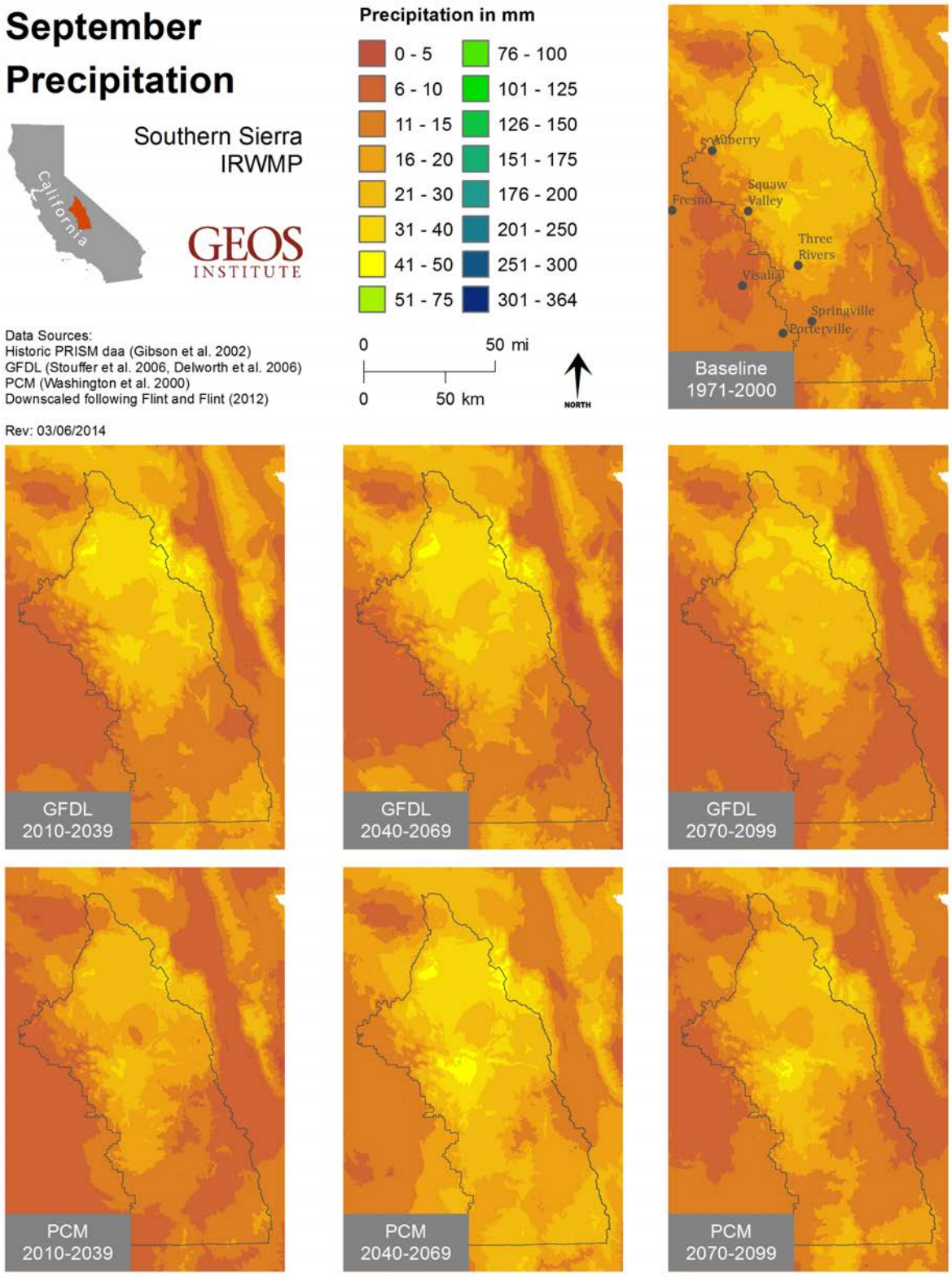


Figure 29. Average October precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

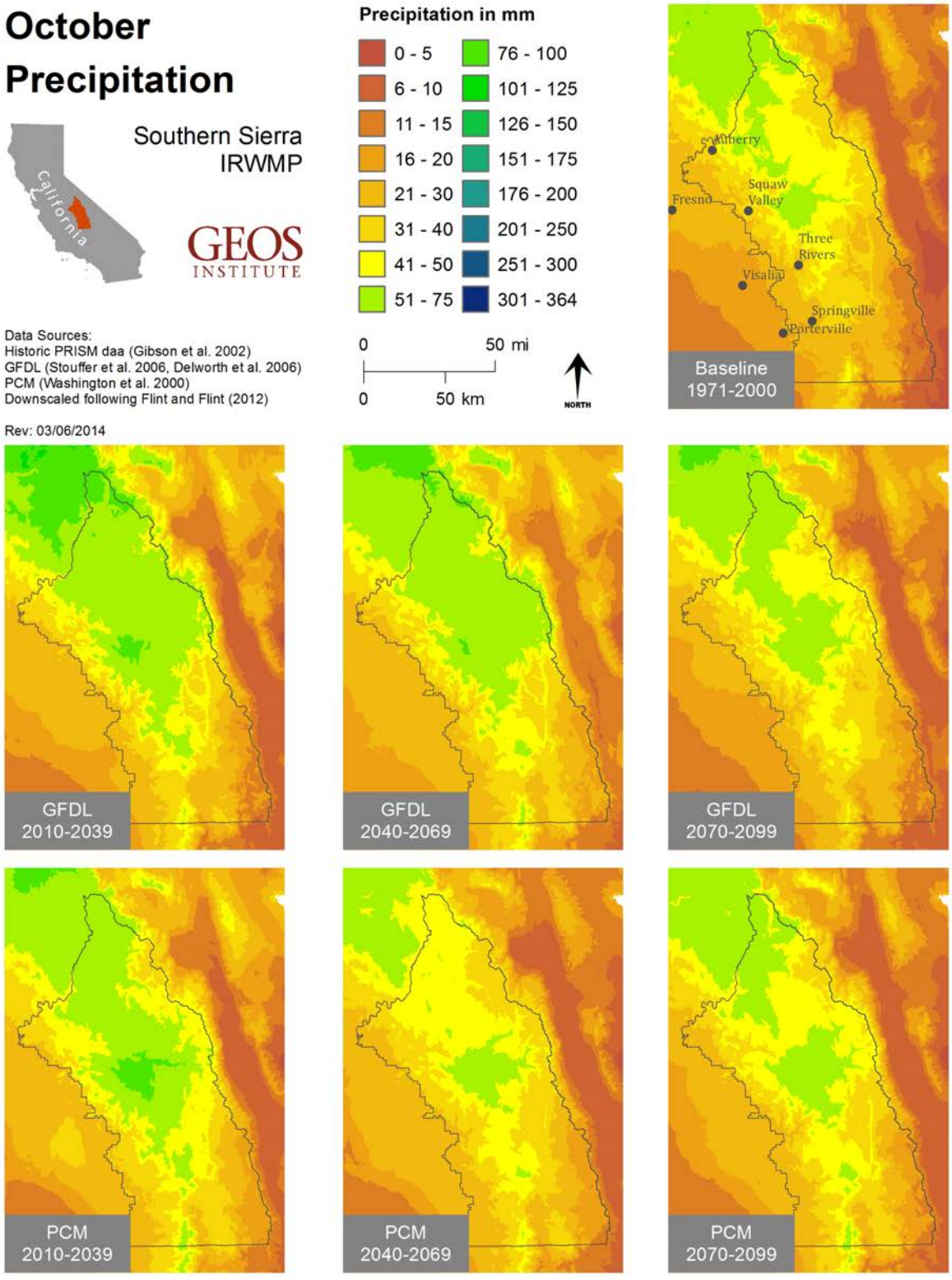


Figure 30. Average November precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

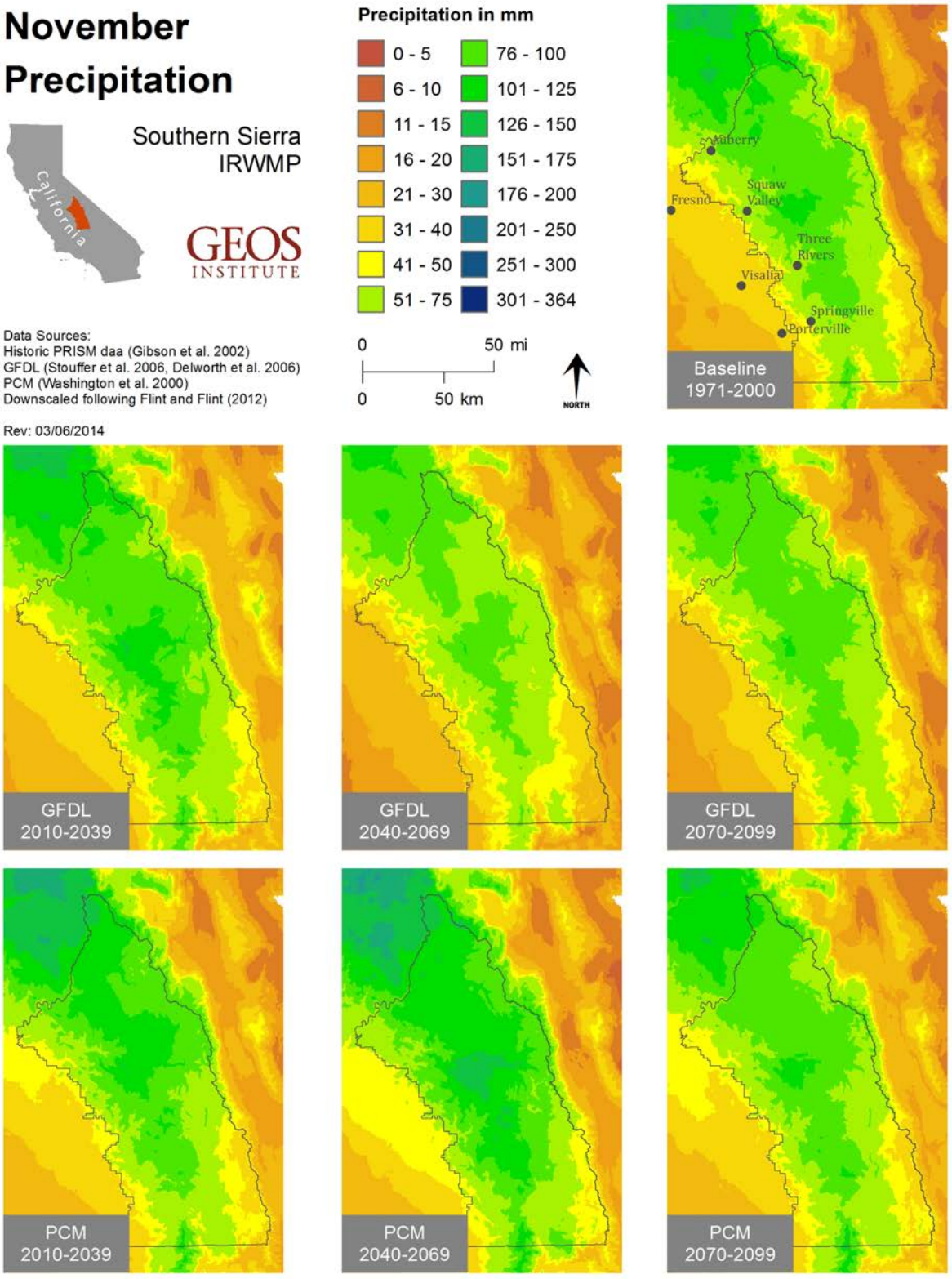
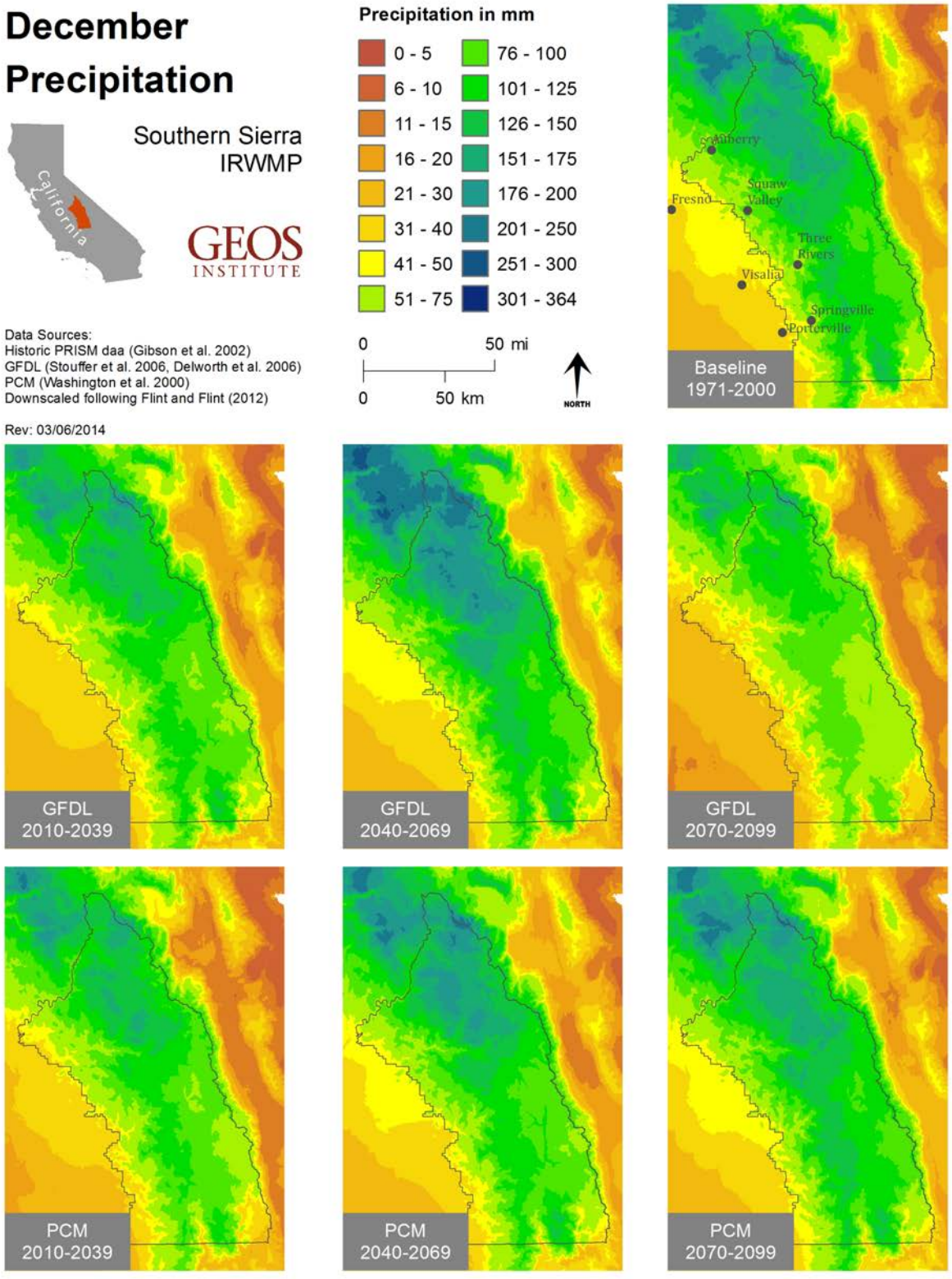


Figure 31. Average December precipitation across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.



HYDROLOGY

In the Sierra Nevada, surface runoff and hydrology is controlled largely by the snow water equivalent (SWE) of winter snowpack.

Many changes to the hydrology of the Western U.S. have been well documented. These include:

Changes in flow

- 15.8% declines in SWE[9]
- Declines in streamflow[10,11]
- Diminished recharge of subsurface aquifers that support summer baseflows[12]
- Declining summer low flows[13]

Changes in temperature

- Stream temperatures have increased in many areas[14]
- Increased wildfire leads to even more water temperature increase[15]

Changes in storm intensity

- 16% increase in frequency and intensity of very heavy precipitation[16]
- Increased probability of 20-year flood from 1915 to 2003[17]

Changes in seasonal timing

- Rivers and lakes freeze over, on average, 5.8 days later each century[10]
- The ice breakup date is, on average, 6.5 days earlier each century[10]
- Snowmelt and snowmelt-driven runoff also is occurring earlier[18]
- Spring runoff has advanced steadily during the latter half of the twentieth century and now occurs 1 to 3 weeks earlier[7,19]
- Observed streamflow has increased in March and declined in June[11]
- Shifts towards more rainfall, less snowfall[20]

Changes in minimum temperature, declines in SWE, and changes in streamflow timing were all attributed to increased greenhouse gas concentrations in the atmosphere.[18] More extreme downpours are expected to worsen during the coming century.[16,21]

As temperature increase leads to more rain and less snow, the flood risk is expected to increase in the Sierra Nevada.[22] Decreases in snow pack and in the length of the snow season could have serious repercussions to winter recreation and water storage alike.

As temperatures and evapo-transpiration increase, summer low flows are expected to become more severe, with longer and lower low flows.[12]

Basin Characterization Model

Projections of hydrological variables, including average annual and monthly runoff, water deficit, and snowpack, were provided via the Basin Characterization Model (BCM). Below is the abstract from a paper published on the model in 2012. The full paper can be downloaded from the following link:
http://climate.calcommons.org/bib/development-and-application-downscaled-hydroclimatic-predictor-variables-use-climate

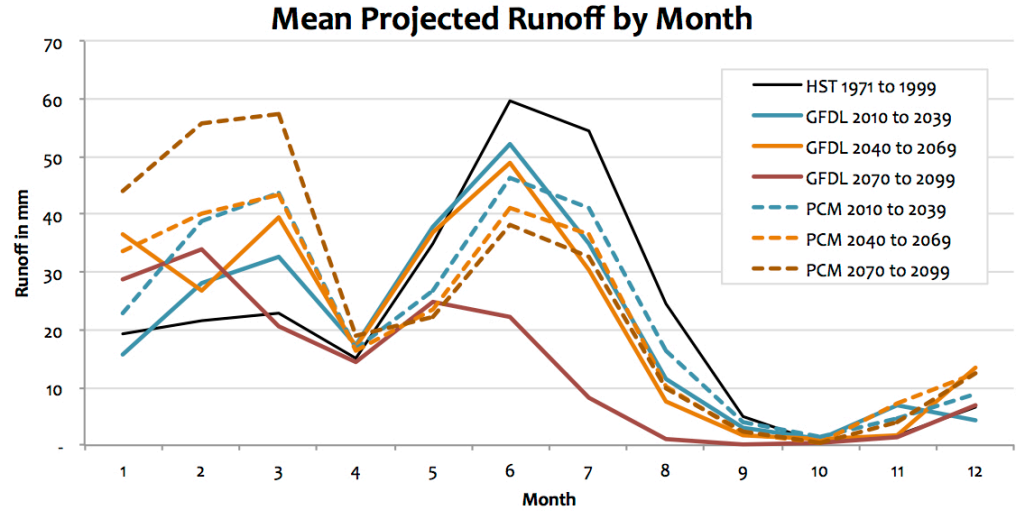
Citation:

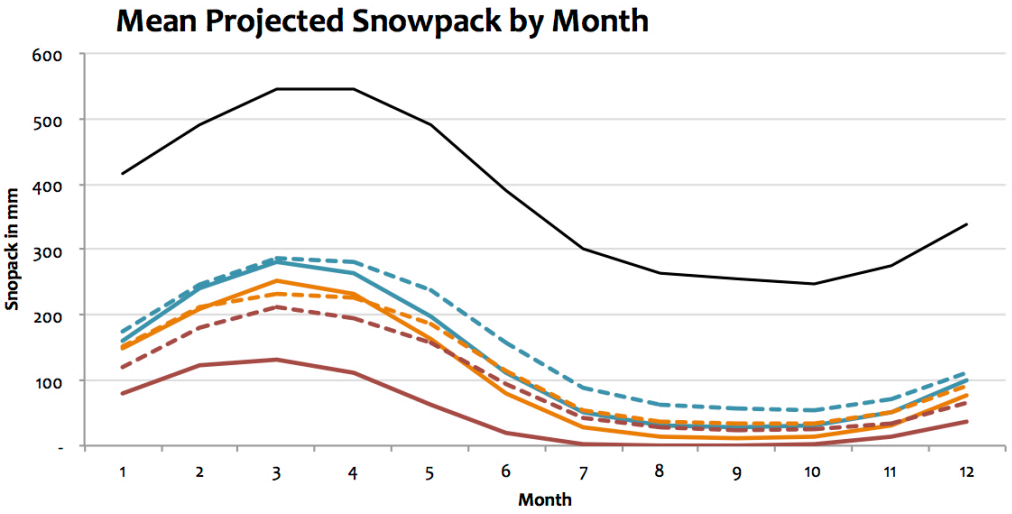
Thorne, J., R. Boynton, L. Flint, A. Flint, and T.-N. Le. 2012. **Development and Application of Downscaled Hydroclimatic Predictor Variables for Use in Climate Vulnerability and Assessment Studies.** California Energy Commission Report #500-2010-010.[23]

Abstract:

This paper outlines the production of 270m grid-scale maps for 14 climate and derivative hydrologic variables for a region that encompasses the State of California and all the streams that flow into it. The paper describes the Basin Characterization Model (BCM), a map-based, mechanistic model used to process the hydrological variables. Three historic and three future time periods of 30 years (1911–1940, 1941–1970, 1971–2000, 2010–2039, 2040–2069, and 2070– 2099) were developed that summarize 180 years of monthly historic and future climate values. These comprise a standardized set of fine-scale climate data that were shared with 14 research groups, including the U.S. National Park Service and several University of California groups as part of this project. The paper presents three analyses done with the outputs from the Basin Characterization Model: trends in hydrologic variables over baseline, the most recent 30-year period; a calibration and validation effort that uses measured discharge values from 139 stream gages and compares those to Basin Characterization Model-derived projections of discharge for the same basins; and an assessment of the trends of specific hydrological variables that links historical trend to projected future change under four future climate projections. Overall, increases in potential evapo-transpiration dominate other influences in future hydrologic cycles. Increased potential evapo-transpiration drives decreasing runoff even under forecasts with increased precipitation, and drives increased climatic water deficit, which may lead to conversion of dominant vegetation types across large parts of the study region, as well as have implications for rain-fed agriculture. The potential evapotranspiration is driven by air temperatures, and the Basin Characterization Model permits it to be integrated with a water balance model that can be derived for landscapes and summarized by watershed. These results show the utility of using a process-based model with modules representing different hydrological pathways that can be interlinked.

Figure 32. Mean projected runoff (top), snowpack (middle), and water deficit (bottom) across the Southern Sierra Integrated Regional Water Management Planning area based on output from the Basin Characterization Model, run with 2 global climate models (GFDL and PCM) and the A2 emissions scenario.





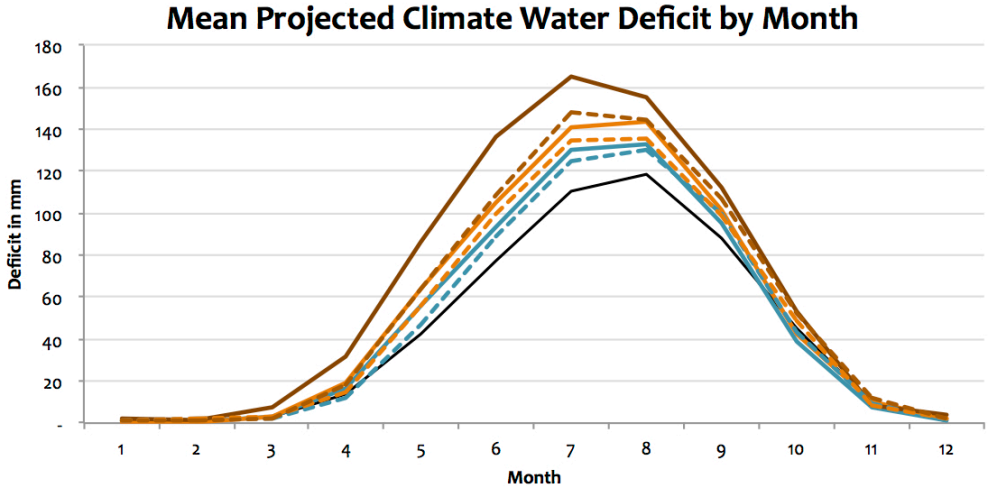


Table 3. Projected annual and monthly runoff (and percent change from historic) across the Southern Sierra IRWMP region, based on output from two different global climate models (GFDL and PCM), shown in millimeters.

	Historic	2010-39	2040-69	2070-99
Annual	267.1	245.8 to 272.3 (-8.0 to +1.9%)	262.5 to 268.1 (-1.7 to +0.4%)	163.6 to 299.3 (-38.8 to +12.0%)
Jan	19.4	15.8 to 22.8 (-18.6 to +17.7%)	33.7 to 36.6 (+73.8 to +88.6%)	28.7 to 44.0 (+48.1 to +126.6%)
Feb	21.7	28.2 to 38.7 (+29.6 to +78.1%)	26.9 to 40.2 (+23.8 to +85.0%)	34.1 to 55.8 (+56.8 to +156.8%)
Mar	22.8	32.6 to 43.7 (+43.5 to 92.0%)	39.7 to 43.5 (+74.3 to +91.0%)	20.6 to 57.3 (-9.4 to +151.9%)
Apr	15.2	16.6 to 17.4 (+8.8 to +14.0%)	16.5 to 17.2 (+8.5 to +12.7%)	14.5 to 19.1 (-4.7 to +25.3%)
May	35.0	26.9 to 37.8 (-23.1 to +8.1%)	23.4 to 36.9 (-33.2 to +5.5%)	22.3 to 24.7 (-36.2 to -29.3%)
Jun	59.7	46.4 to 52.1 (-22.2 to -12.7%)	41.2 to 48.9 (-30.9 to -18.0%)	22.2 to 38.2 (-62.8 to -36.1%)
Jul	54.4	34.8 to 41.2 (-35.9 to -24.2%)	30.5 to 36.6 (-43.9 to -32.6%)	8.3 to 32.5 (-84.7 to -40.2%)
Aug	24.6	11.7 to 16.3 (-52.6 to -33.8%)	7.7 to 10.1 (-68.6 to -58.8%)	1.2 to 9.9 (-95.1 to -59.7%)
Sep	5.1	3.0 to 4.0 (-41.11 to -20.6%)	1.6 to 2.2 (-68.0 to -57.7%)	0.1 to 2.5 (-97.4 to -51.2%)
Oct	0.4	1.1 to 1.5 (+162.9 to 255.1%)	0.4 to 0.9 (-11.9 to +123.3%)	0.3 to 0.4 (-26.0 to +0.9%)
Nov	1.7	4.7 to 6.9 (+177.8 to +309.2%)	1.8 to 7.3 (-7.1 to +336.6%)	1.5 to 4.1 (-10.3 to +146.4%)
Dec	6.8	4.3 to 9.1 (-36.7 to +33.7%)	12.6 to 13.4 (+85.9 to +98.2%)	7.0 to 12.6 (+3.8 to +86.6%)

Table 4. Projected annual and monthly average snowpack (and percent change from historic) across the Southern Sierra IRWMP region, based on output from two different global climate models (GFDL and PCM), shown in millimeters.

	Historic	2010-39	2040-69	2070-99
Annual	4151.3	1390.6 to 1662.3 (-66.5 to -60.0%)	977.6 to 1204.7 (-76.5 to -71.0%)	582.6 to 731.2 (-86.0 to -82.4%)
Jan	416.11	159.0 to 173.2 (-61.8 to -58.4%)	148.9 to 150.5 (-64.2 to -63.8%)	80.3 to 119.2 (-80.7 to -71.4%)
Feb	490.9	241.5 to 246.4 (-50.8 to -49.8%)	208.6 to 210.7 (-57.5 to -57.1%)	121.6 to 179.4 (-75.2 to -63.5%)
Mar	546.1	280.2 to 285.7 (-48.7 to -47.7%)	233.5 to 251.2 (-57.25 to -54.0%)	132.8 to 212.4 (-75.7 to -61.1%)
Apr	546.0	264.9 to 280.6 (-51.5 to -48.6%)	225.5 to 230.9 (-58.7 to -57.7%)	110.8 to 195.7 (-79.7 to -64.2%)
May	490.3	197.9 to 238.1 (-59.6 to -51.4%)	164.0 to 185.7 (-66.5 to -62.1%)	63.7 to 157.6 (-87.0 to -67.9%)
Jun	389.4	110.5 to 157.2 (-71.6 to -59.6%)	80.6 to 115.6 (-79.3 to -70.3%)	20.2 to 95.6 (-94.8 to -75.5%)
Jul	301.7	50.8 to 88.9 (-83.2 to -70.6%)	27.4 to 54.5 (-90.9 to -81.9%)	2.9 to 43.7 (-99.0 to -85.5%)
Aug	262.9	31.7 to 63.0 (-87.9 to -76.0%)	13.9 to 36.5 (-94.7 to -86.1%)	0.4 to 27.4 (-99.9 to -89.6%)
Sep	254.4	27.3 to 56.2 (-89.3 to -77.9%)	11.4 to 33.4 (-95.5 to -86.9%)	0.1 to 23.6 (-100.0 to -90.7%)
Oct	247.3	30.4 to 54.1 (-87.7 to -78.1%)	14.1 to 34.1 (-94.3 to -86.2%)	0.9 to 24.5 (-99.7 to -90.1%)
Nov	273.9	51.9 to 72.3 (-81.1 to -73.6%)	29.7 to 50.1 (-89.2 to -81.7%)	14.0 to 34.5 (-94.9 to -87.4%)
Dec	339.0	100.4 to 110.5 (-70.4 to -67.4%)	76.1 to 92.4 (-77.6 to -72.7%)	48.8 to 98.3 (-88.9 to -80.5%)

Table 5. Projected annual and monthly average water deficit (and percent change from historic) across the Southern Sierra IRWMP region, based on output from two different global climate models (GFDL and PCM), shown in millimeters.

	Historic	2010-39	2040-69	2070-99
Annual	502.4	553.2 to 567.6 (+10.1 to +13.0%)	597.3 to 625.1 (+18.9 to +24.4%)	654.8 to 755.2 (+30.3 to 50.3%)
Jan	0.9	0.7 to 0.9 (-19.34 to +5.1%)	0.9 to 1.9 (-0.1 to +124.7%)	1.1 to 1.2 (+31.1 to +38.7%)
Feb	1.1	0.4 to 0.7 (-63.4 to -34.3%)	1.5 to 2.1 (+31.1 to +88.8%)	1.5 to 2.1 (+38.9 to +89.0%)
Mar	3.1	2.7 to 3.0 (-12.9 to -2.3%)	2.4 to 7.3 (-21.9 to +135.3%)	2.4 to 3.0 (-24.1 to -3.8%)
Apr	13.7	16.8 to 19.1 (+23.2 to +39.4%)	12.0 to 31.7 (-12.4 to +132.1%)	14.6 to 18.1 (+6.9 to +32.5%)
May	42.4	56.0 to 63.8 (+32.0 to +50.6%)	47.2 to 86.4 (+11.4 to +103.9%)	56.3 to 63.8 (+32.9 to +50.5%)
Jun	77.4	93.4 to 105.3 (+20.6 to +36.1%)	88.9 to 136.3 (+76.1 to +14.8%)	99.8 to 109.0 (+28.4 to +40.8%)
Jul	110.2	129.9 to 141.3 (+18.0 to +28.3%)	165.4 to 124.8 (+13.3 to +50.1%)	135.2 to 147.9 (+22.7 to +34.2%)
Aug	118.3	132.6 to 143.9 (+12.0 to +21.6%)	129.9 to 155.8 (+9.8 to +31.7%)	135.8 to 144.8 (+14.8 to +22.4%)
Sep	87.8	95.1 to 101.2 (+8.3 to +15.2%)	99.4 to 111.9 (+13.2 to +27.4%)	98.5 to 106.9 (+12.2 to +21.7%)
Oct	44.8	38.6 to 42.5 (-13.8 to -5.2%)	43.2 to 52.8 (-3.7 to +17.9%)	48.4 to 52.4 (+8.1 to +16.9%)
Nov	9.0	7.4 to 10.1 (-18.4 to +12.4%)	8.6 to 9.2 (-4.9 to +1.4%)	8.7 to 12.3 (-3.7 to +36.8%)
Dec	2.4	1.7 to 2.6 (-28.9 to +8.0%)	1.7 to 4.2 (-30.1 to +75.5%)	1.9 to 2.4 (-20.3 to +1.8%)

Figure 33. January runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

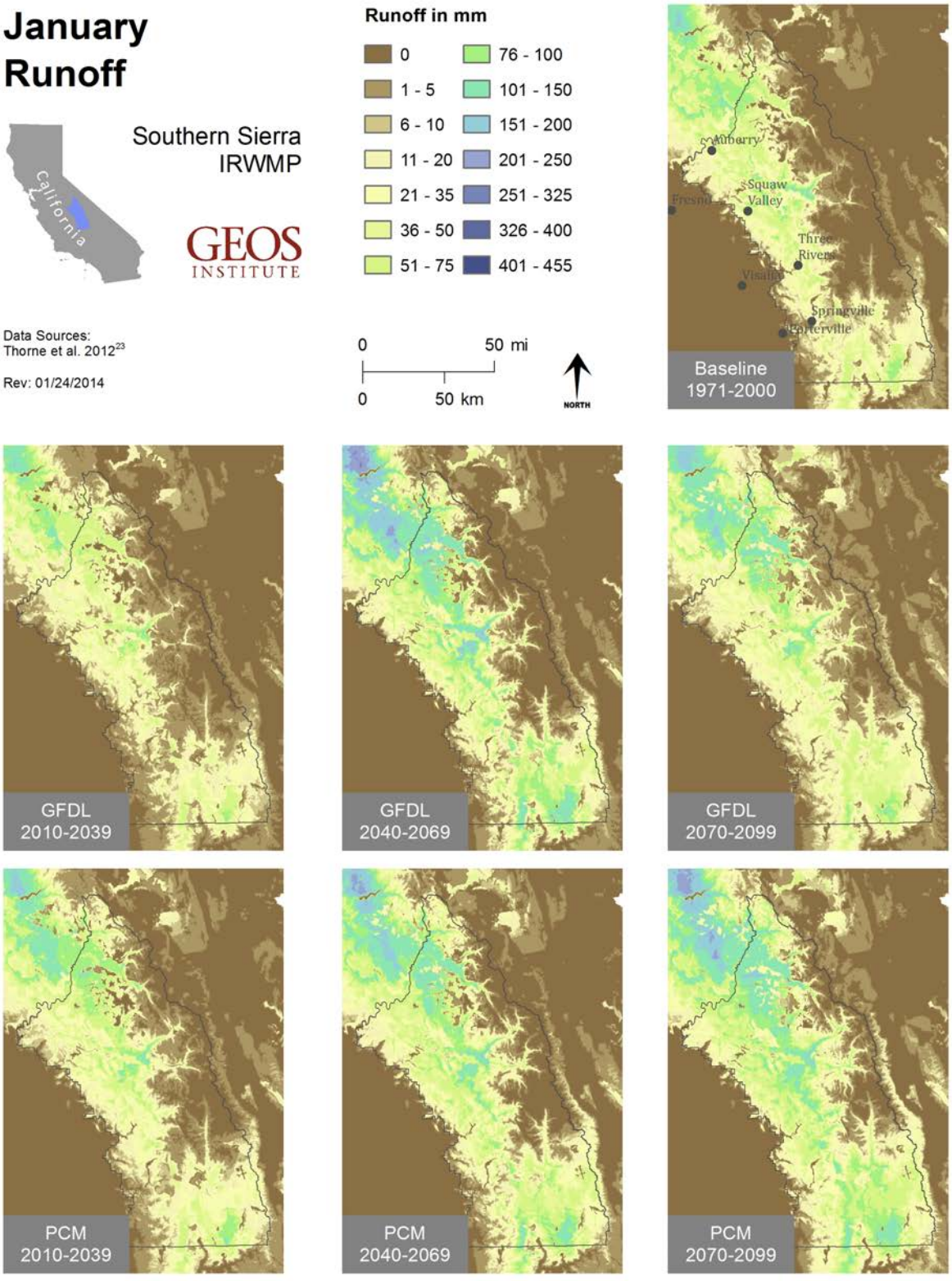


Figure 34. February runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

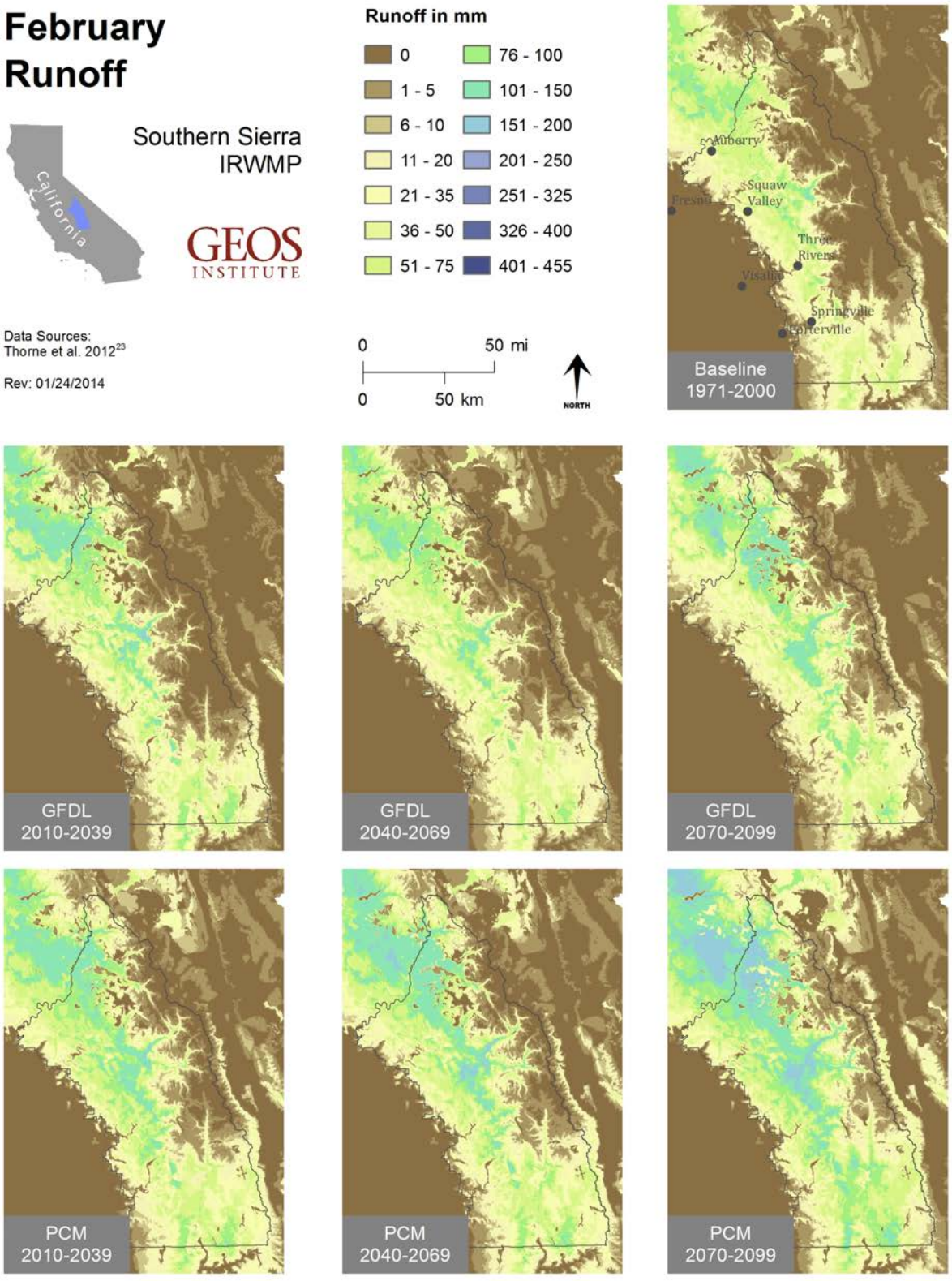


Figure 35. March runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

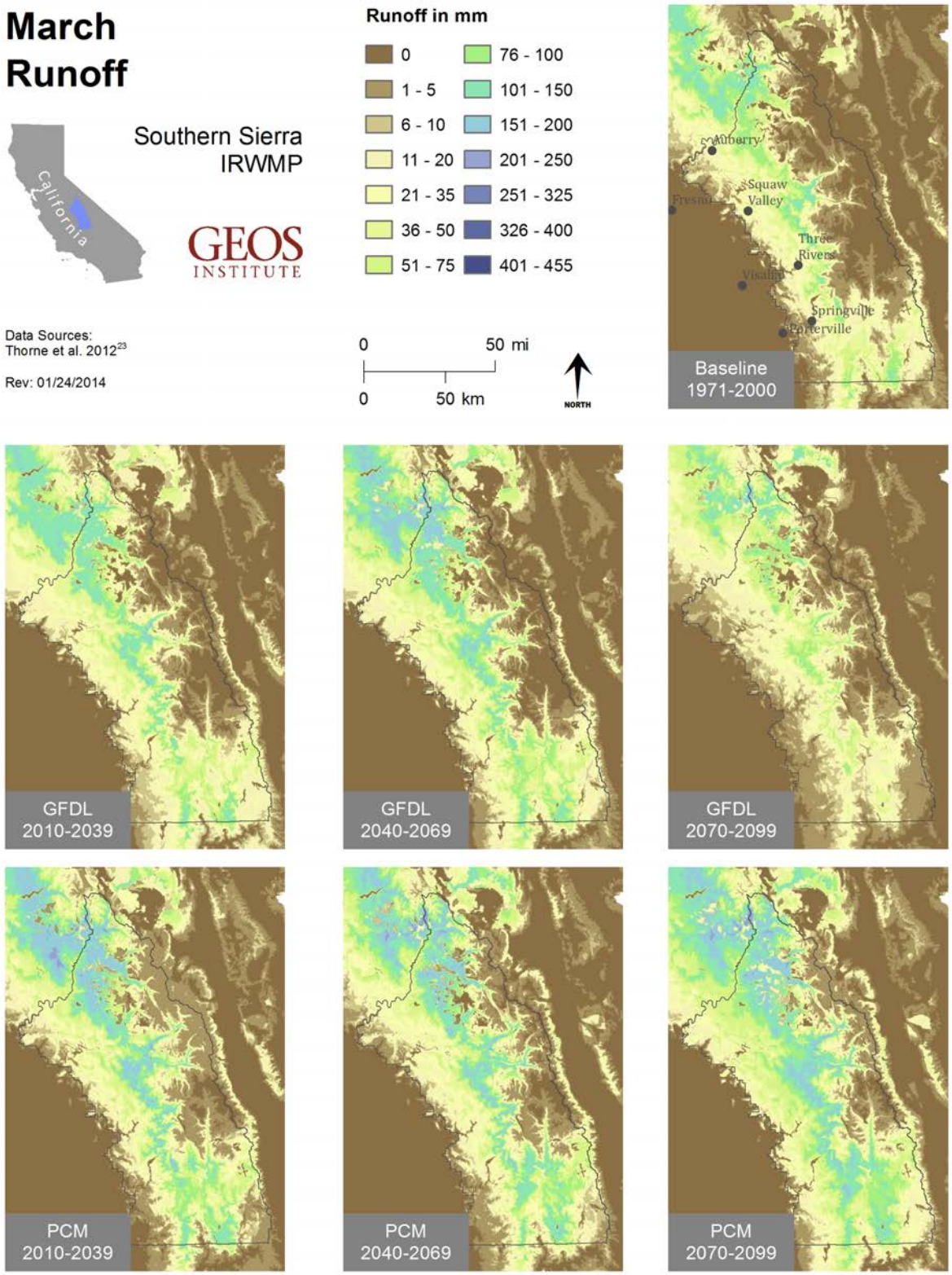


Figure 36. April runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

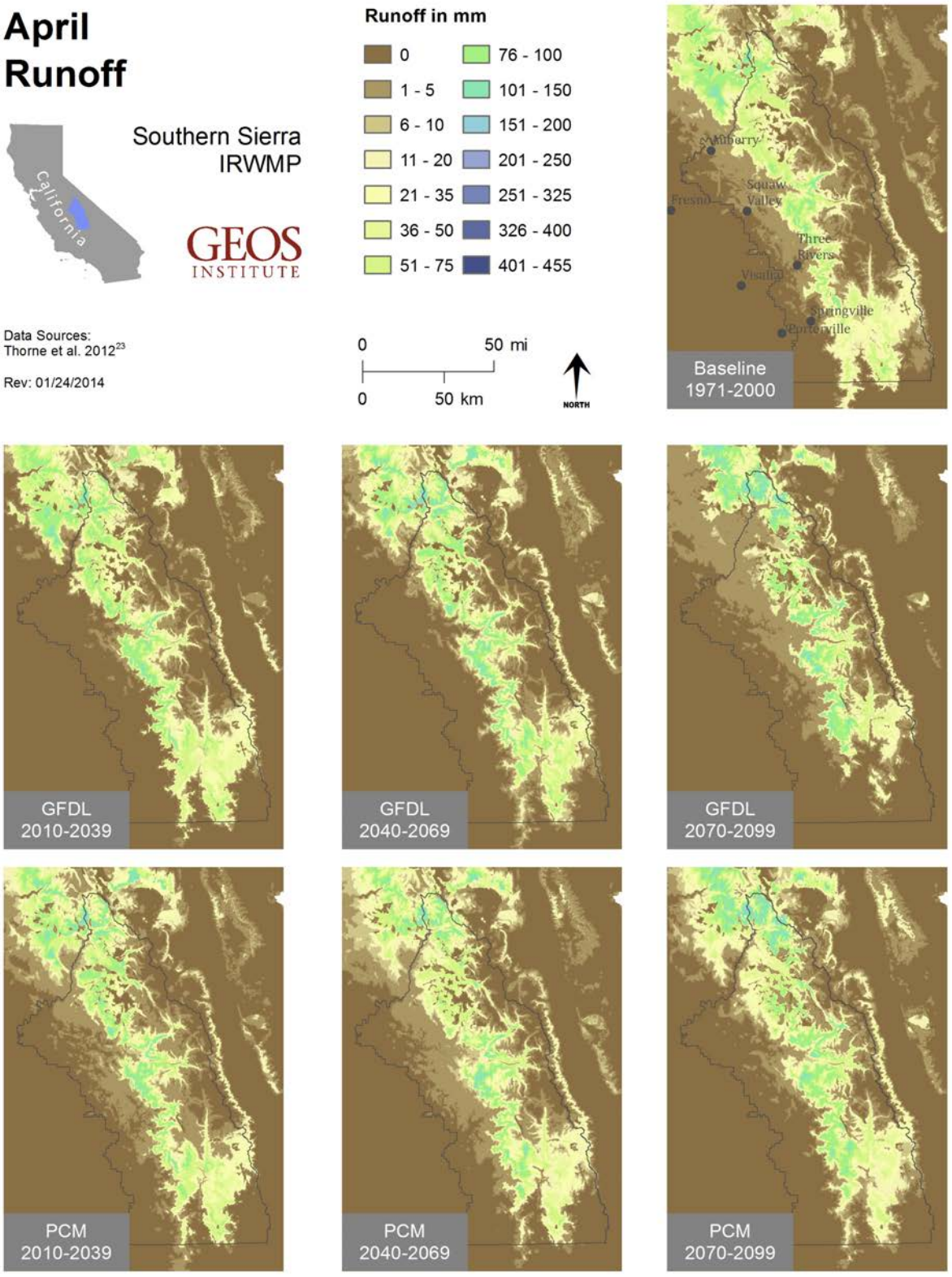


Figure 37. May runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

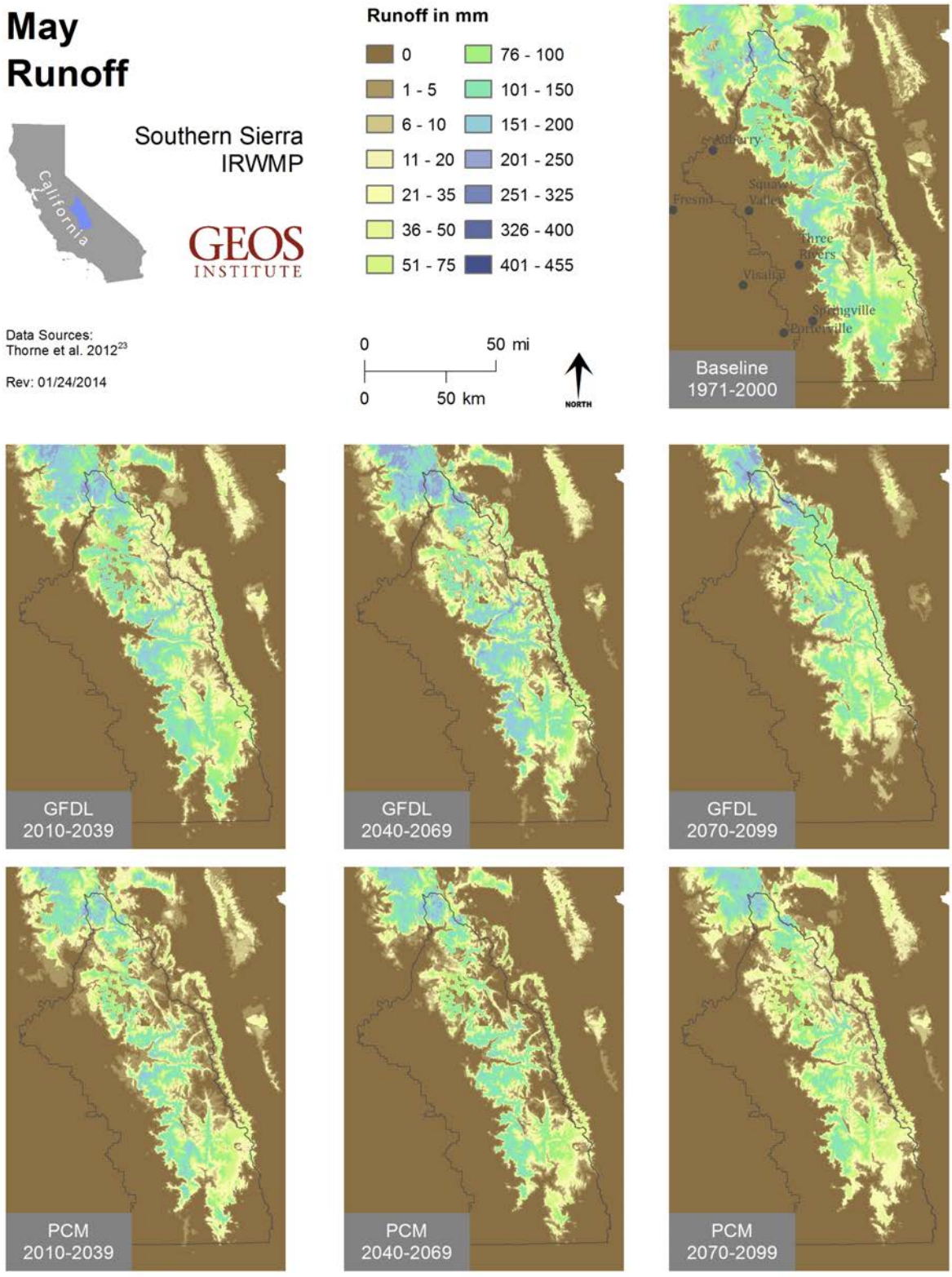


Figure 38. June runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

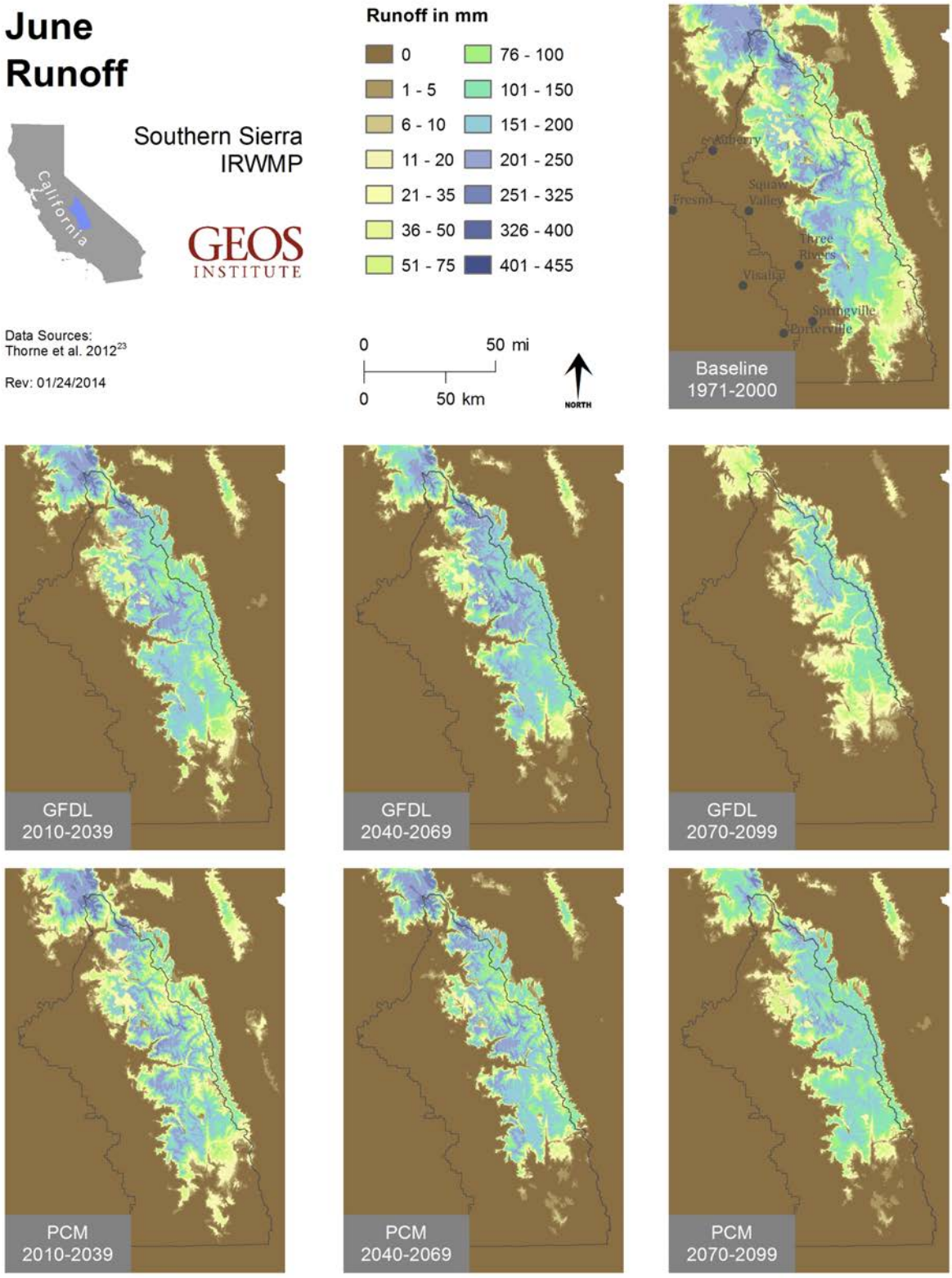


Figure 39. July runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

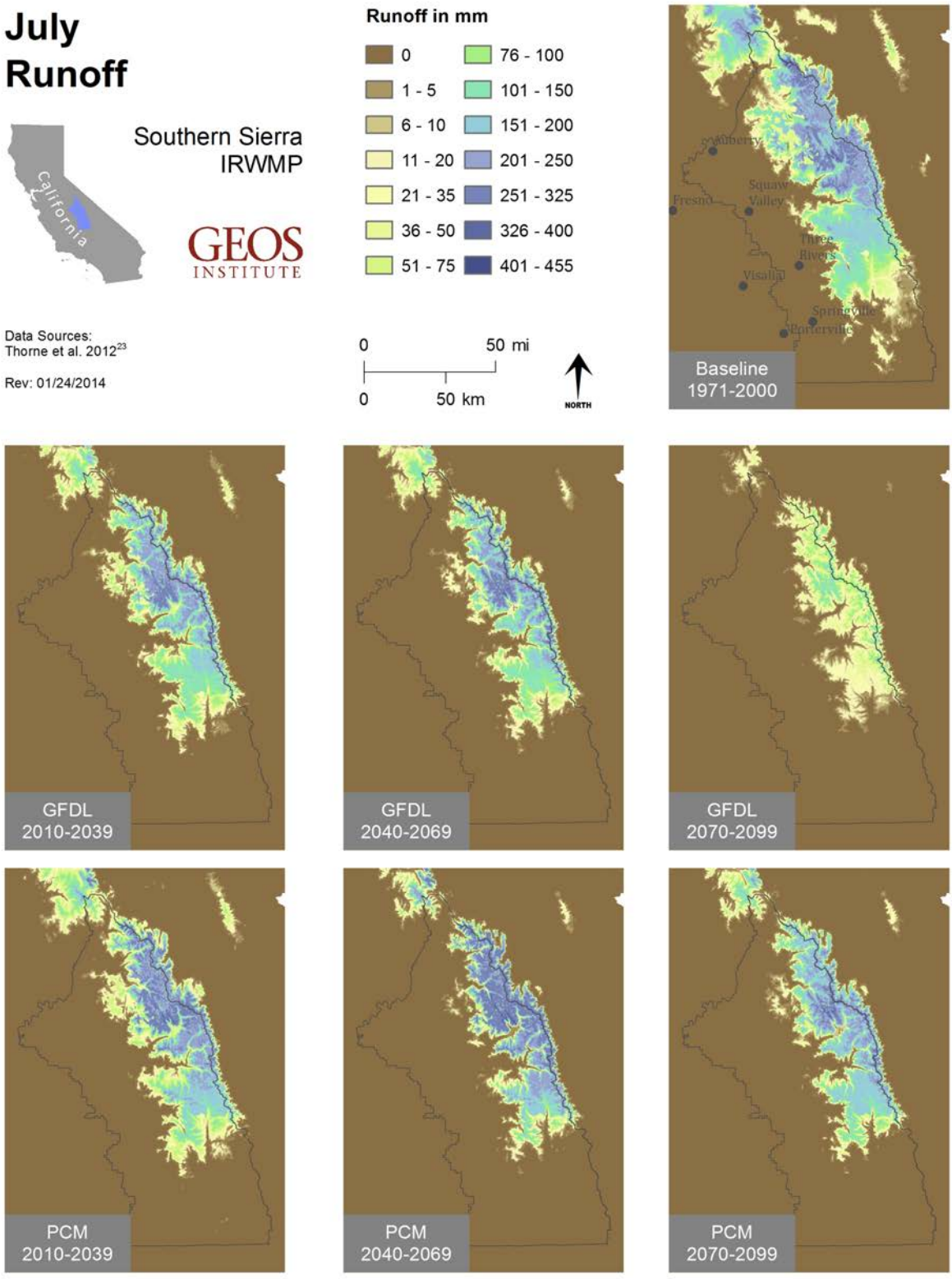


Figure 40. August runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

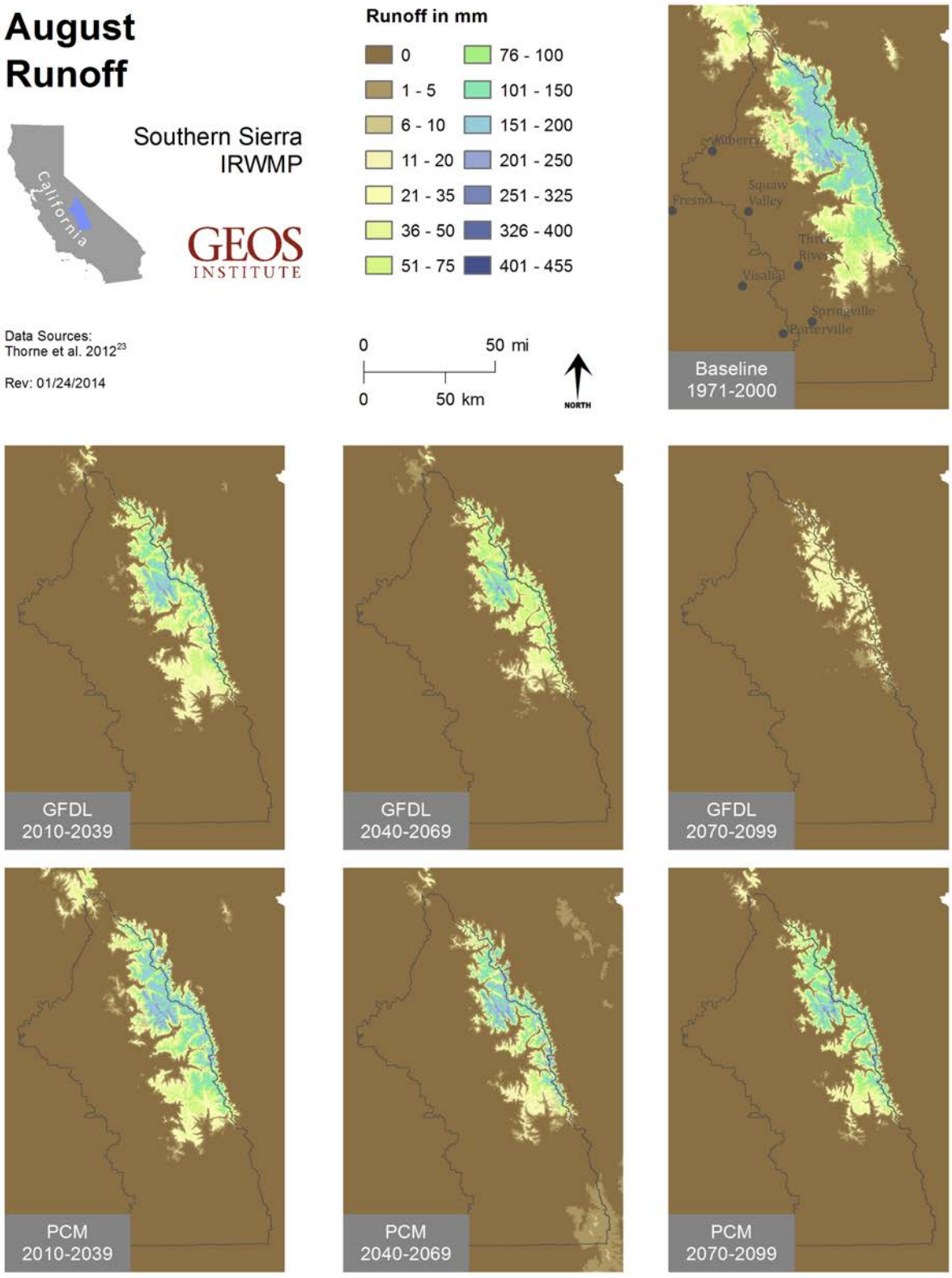


Figure 41. September runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

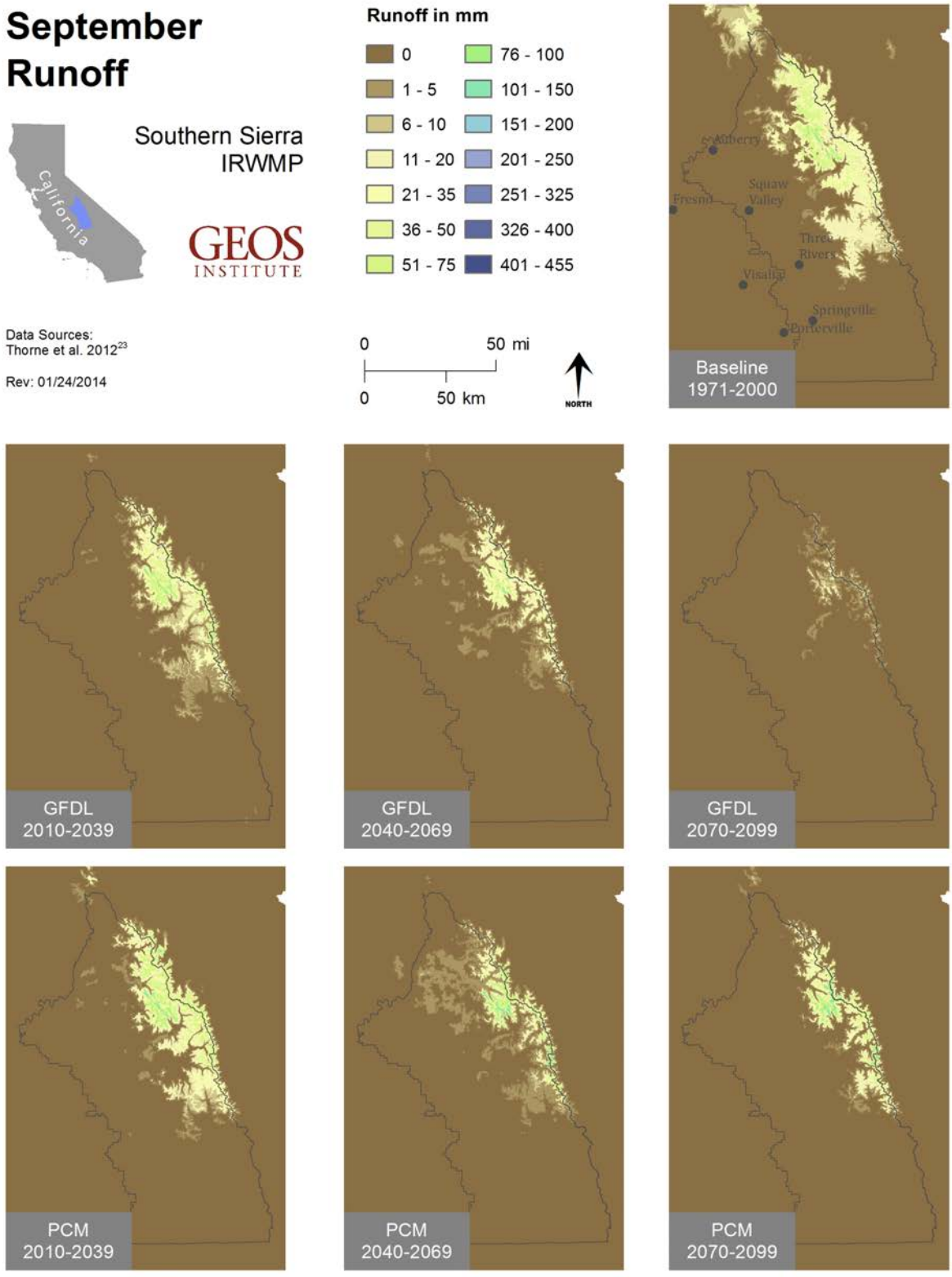


Figure 42. October runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

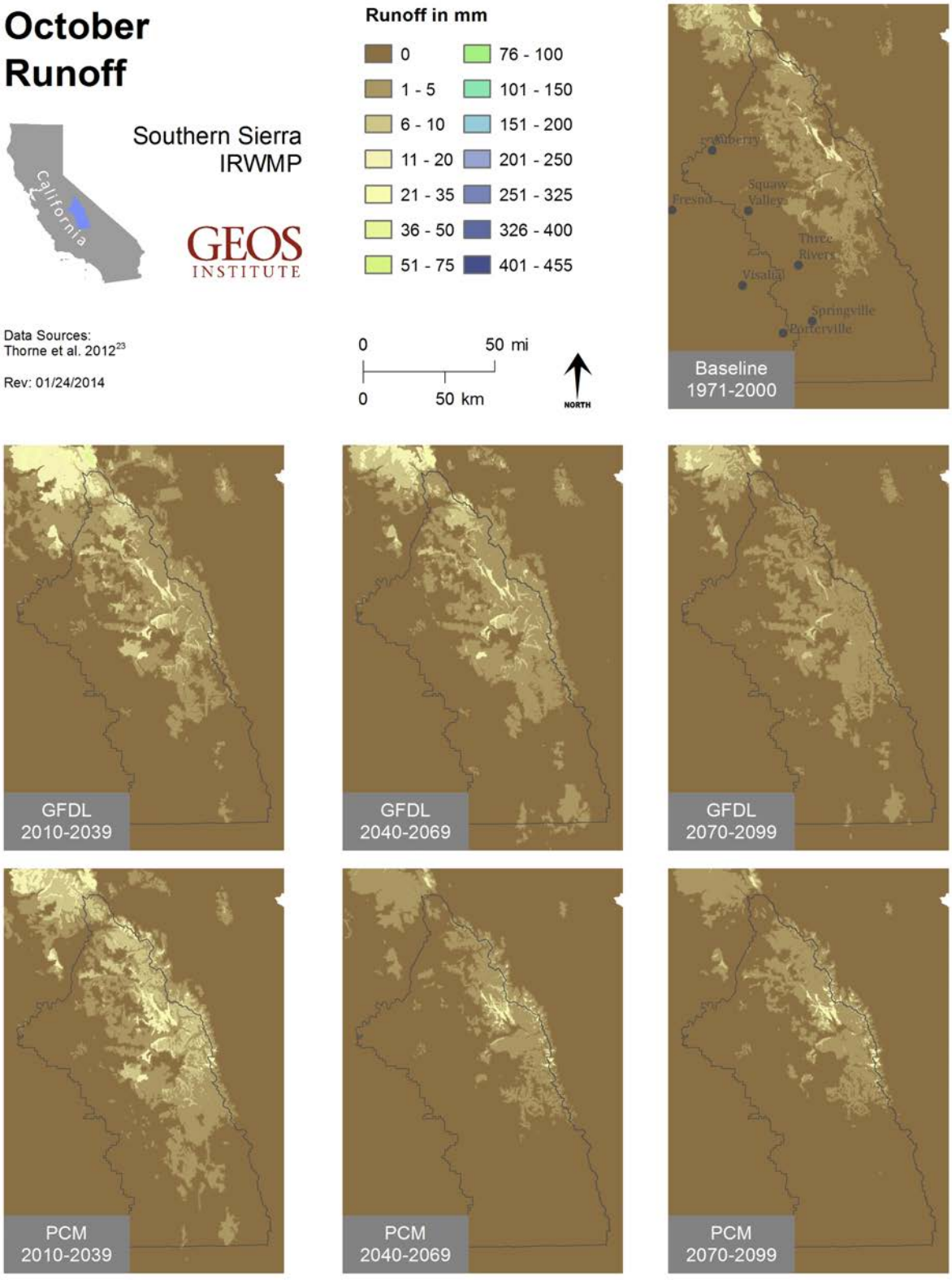


Figure 43. November runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

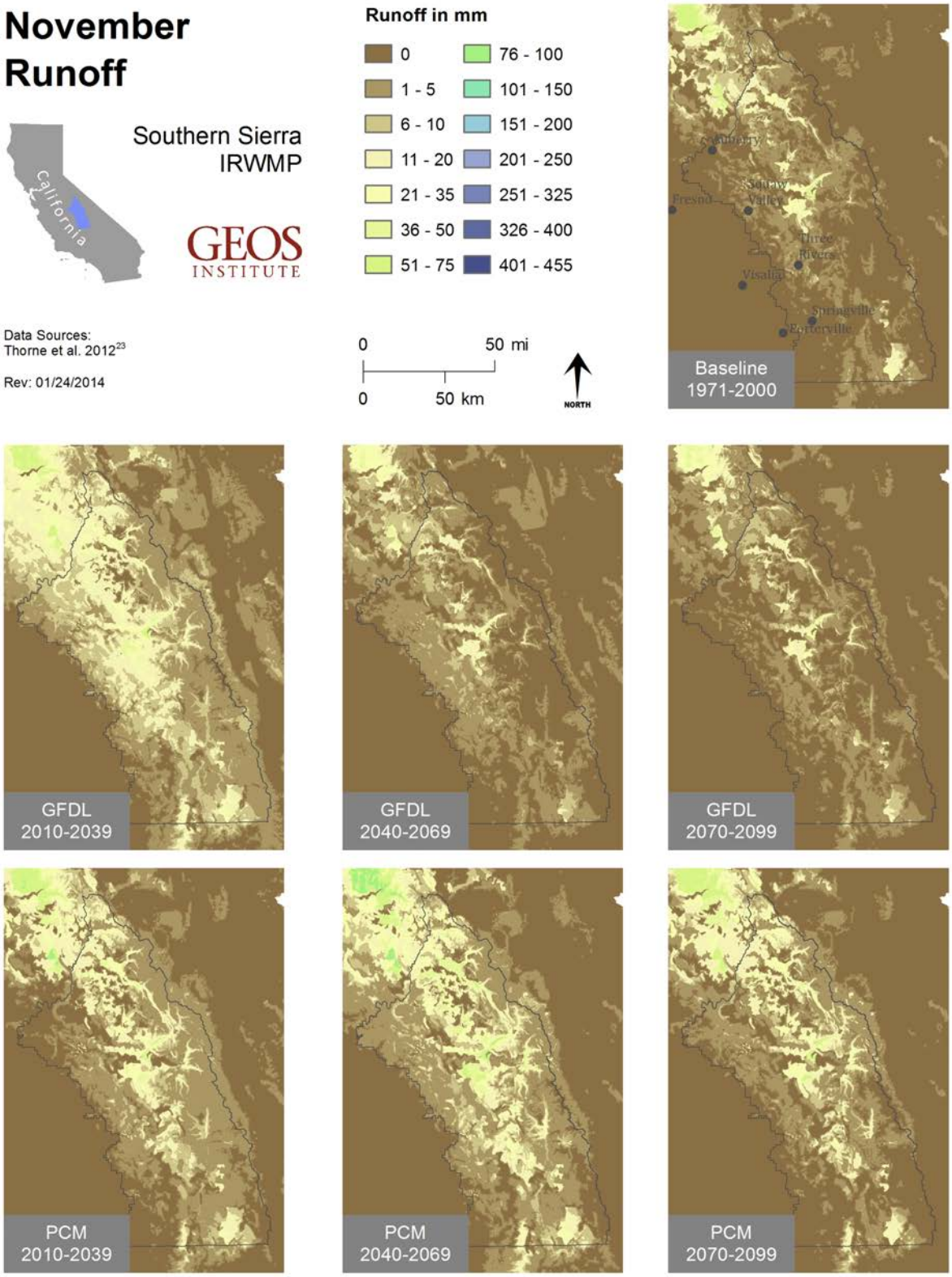


Figure 44. December runoff across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

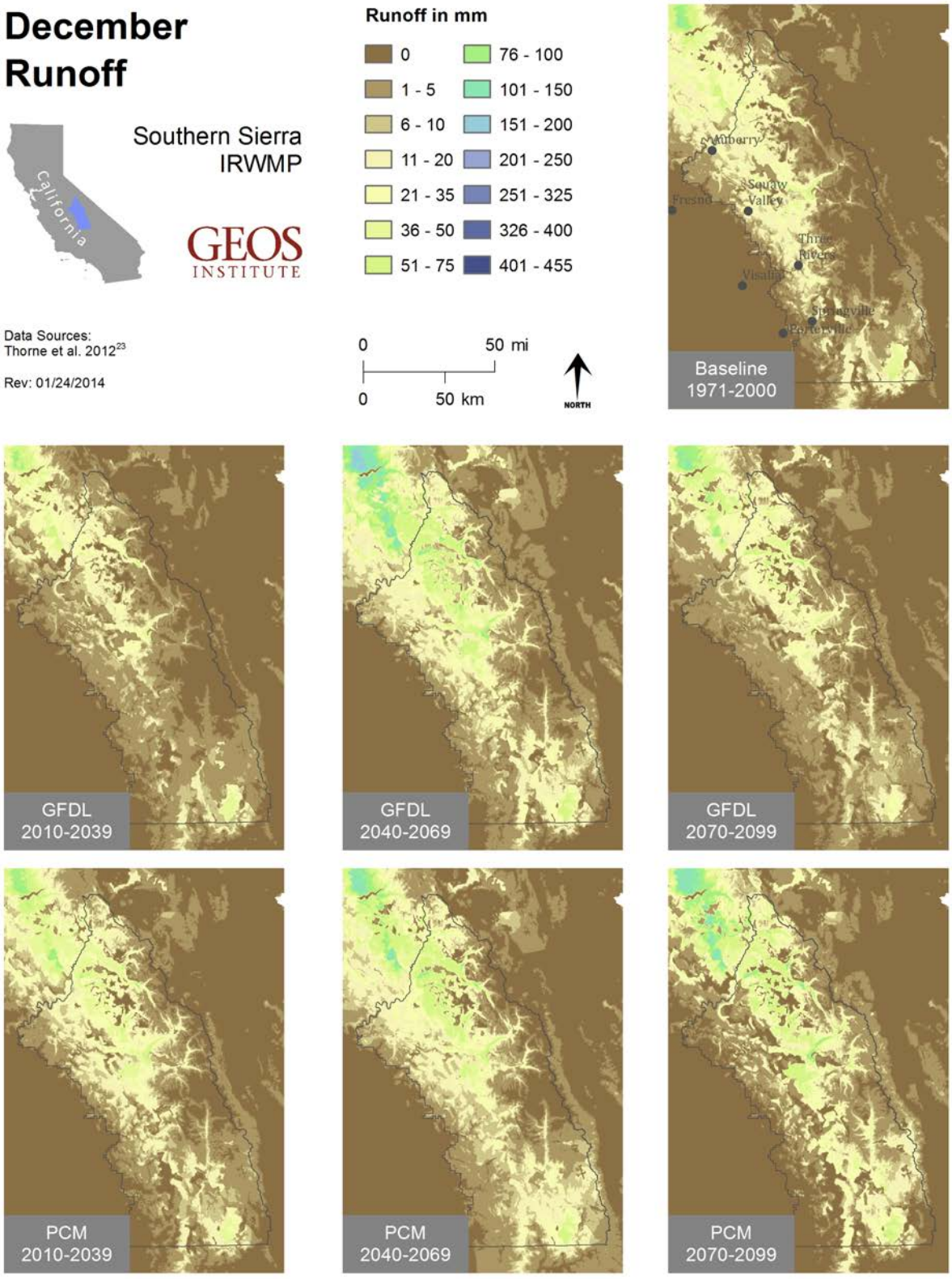


Figure 45. January snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

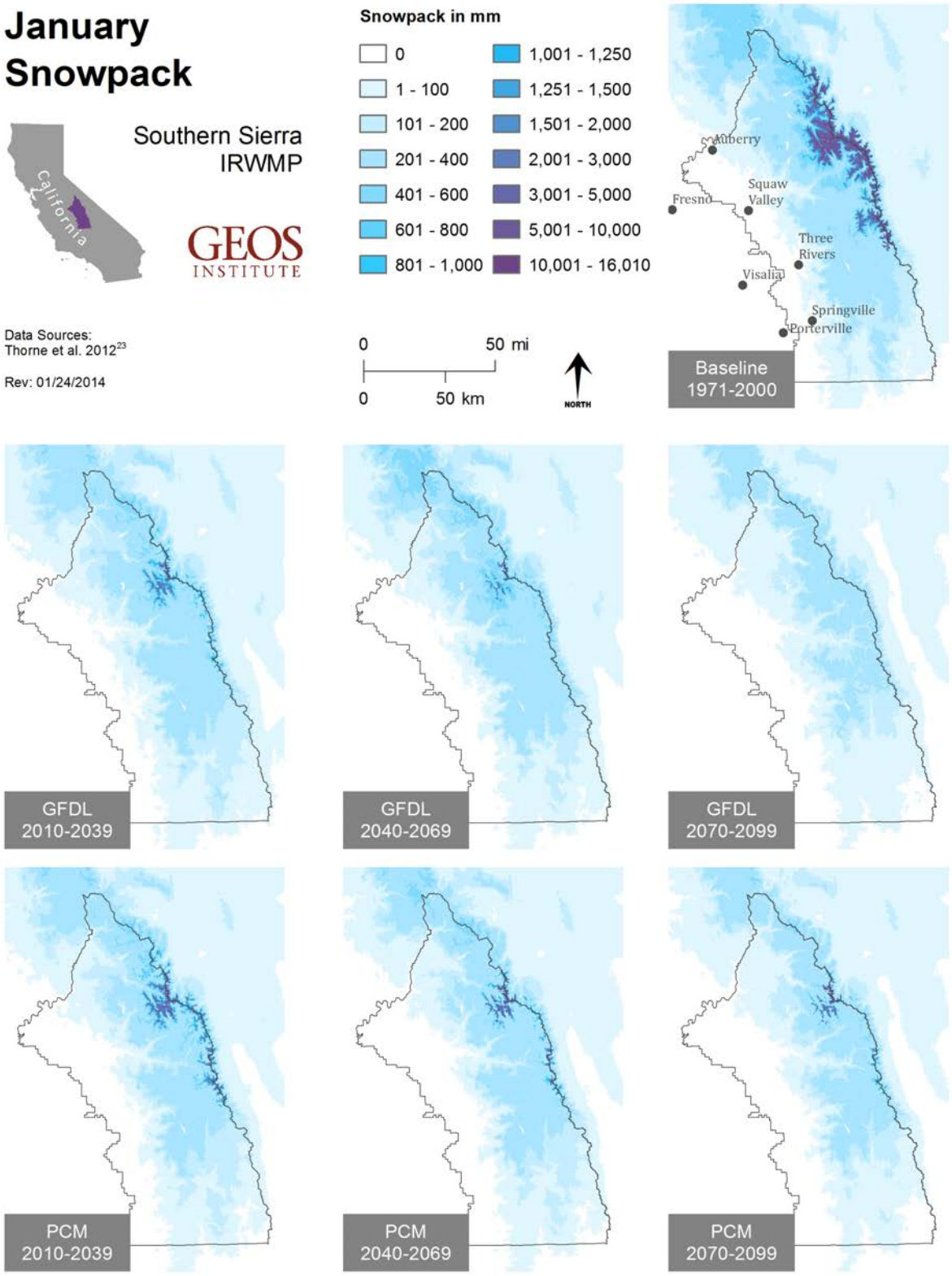


Figure 46. February snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

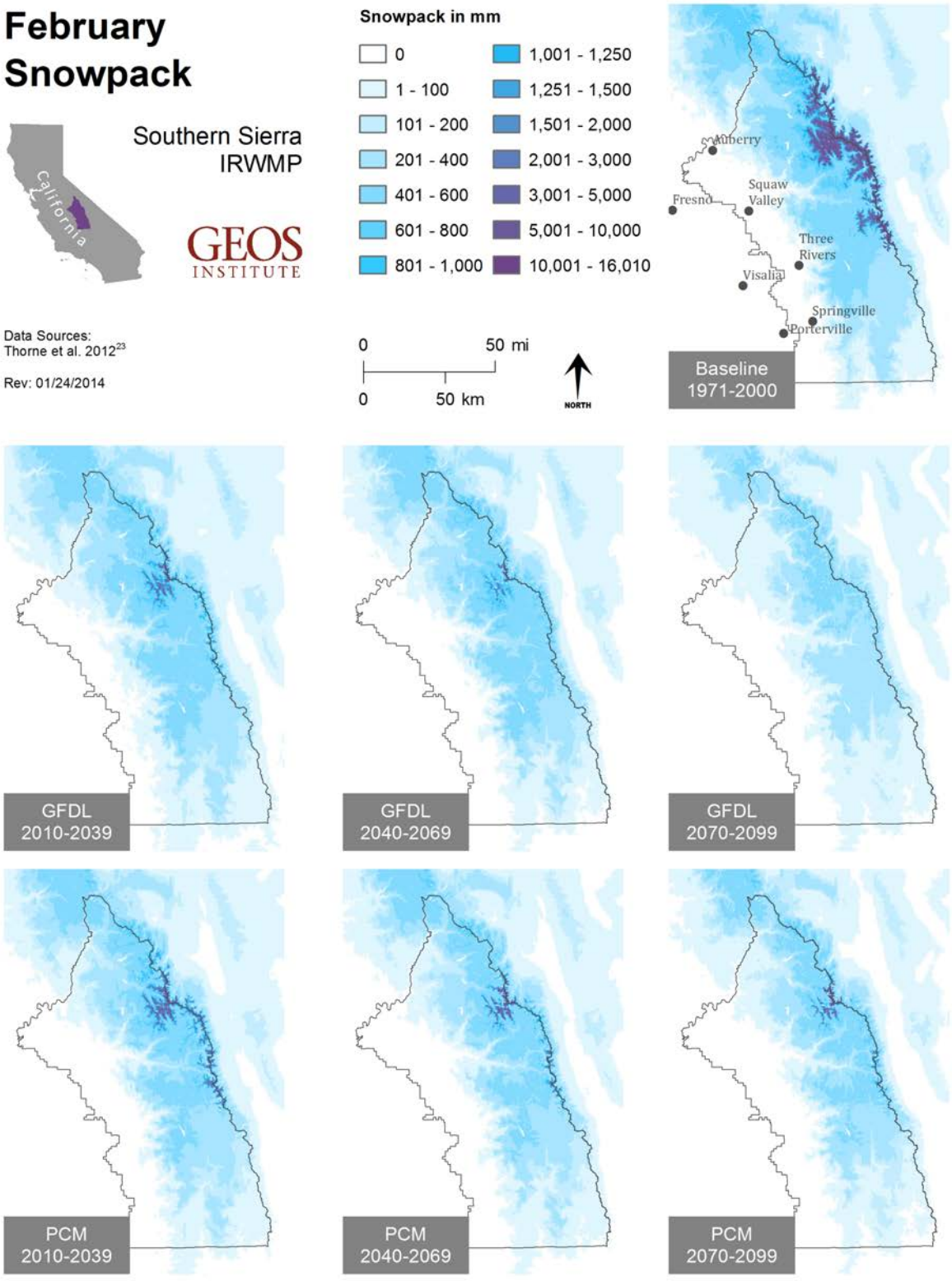


Figure 47. March snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

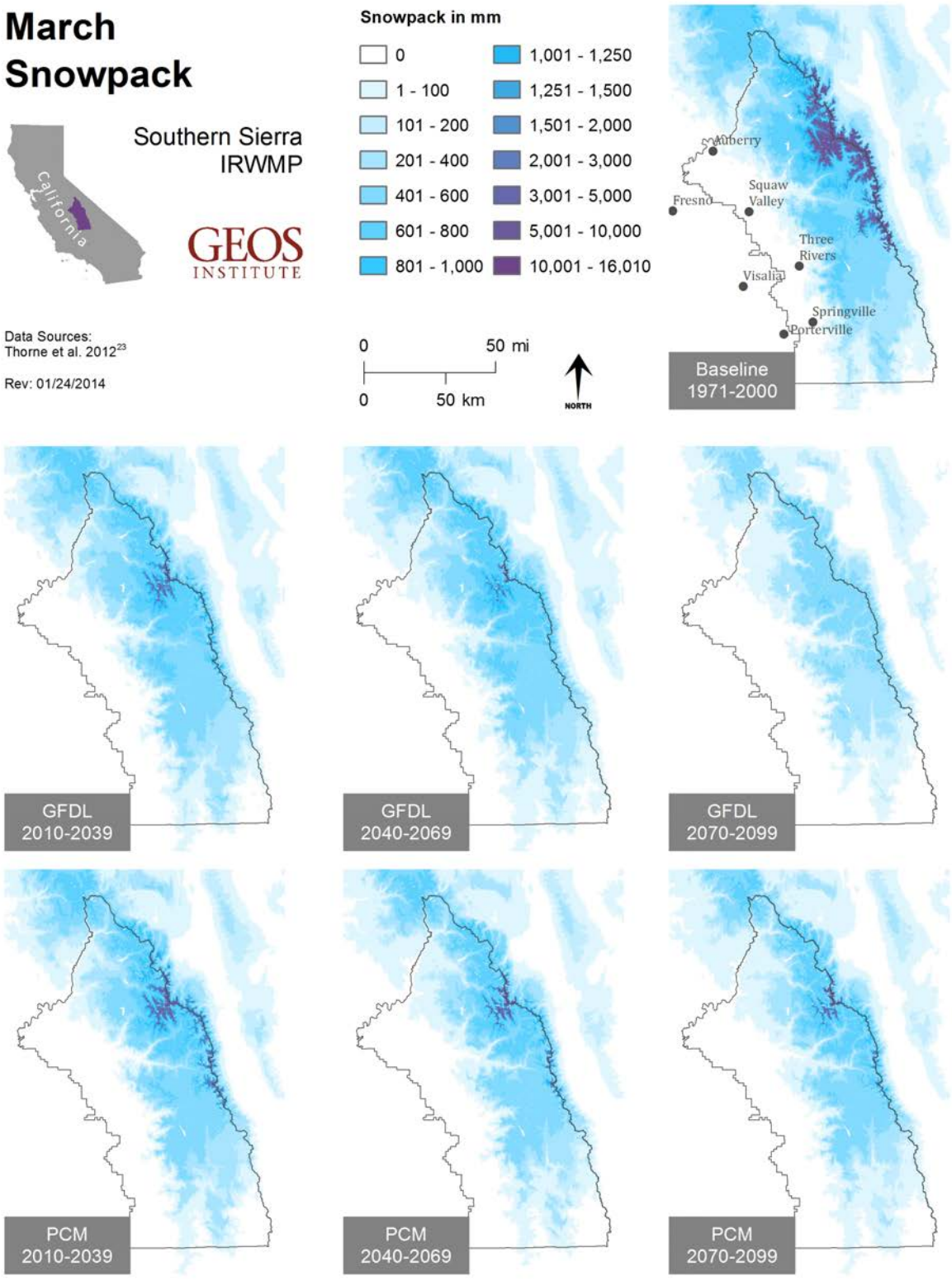


Figure 48. April snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

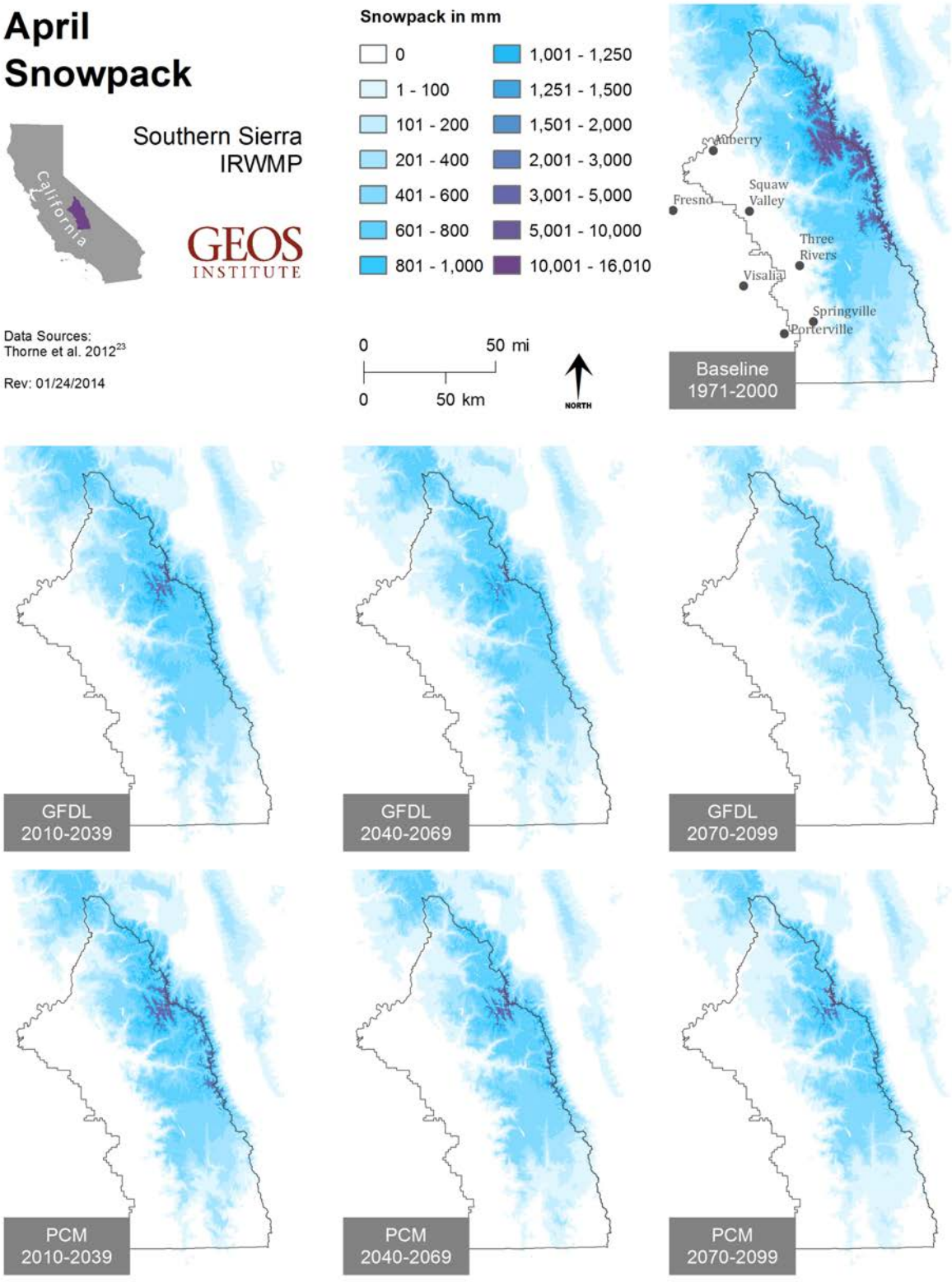


Figure 49. May snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

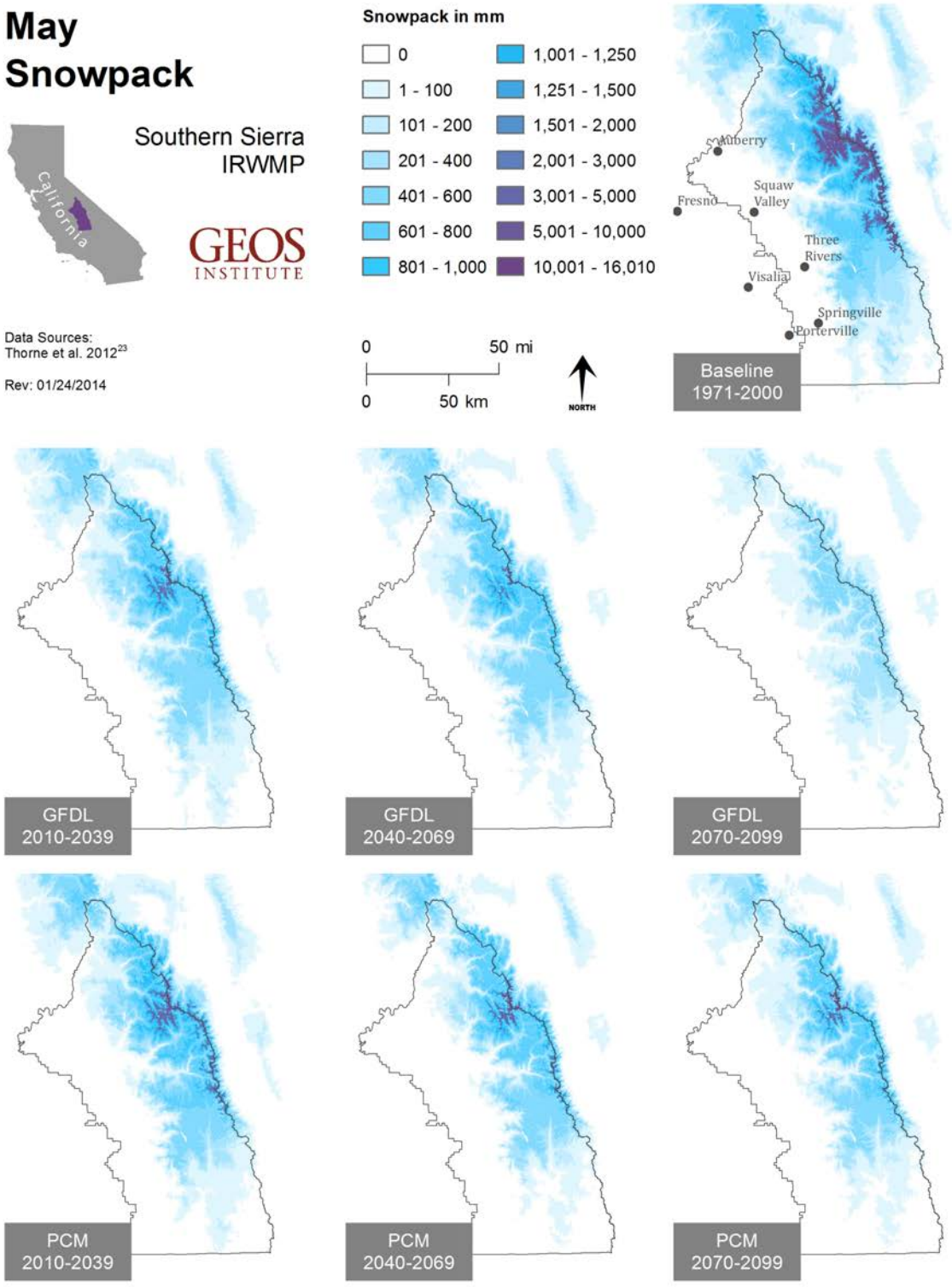


Figure 50. June snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

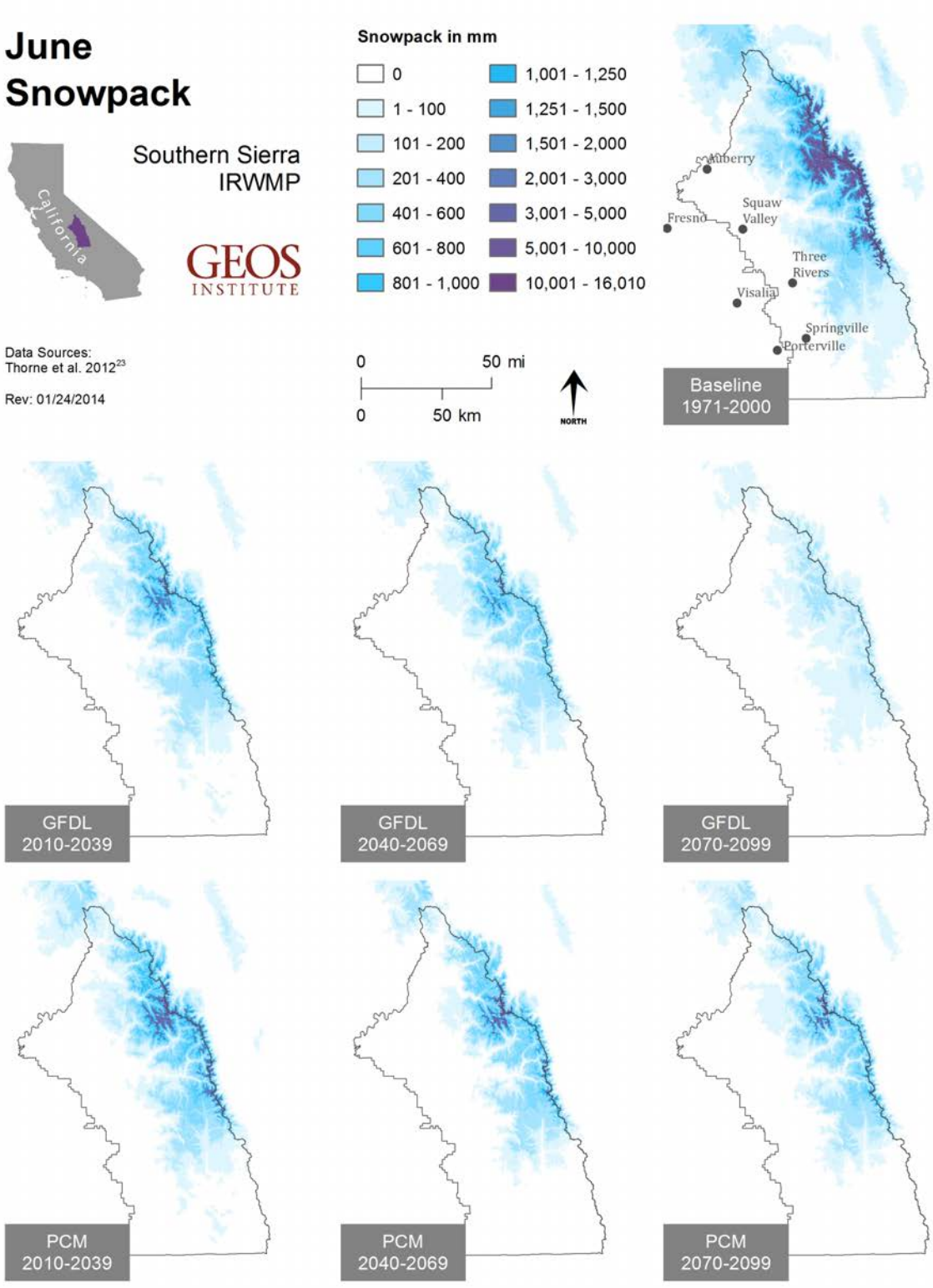


Figure 51. July snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

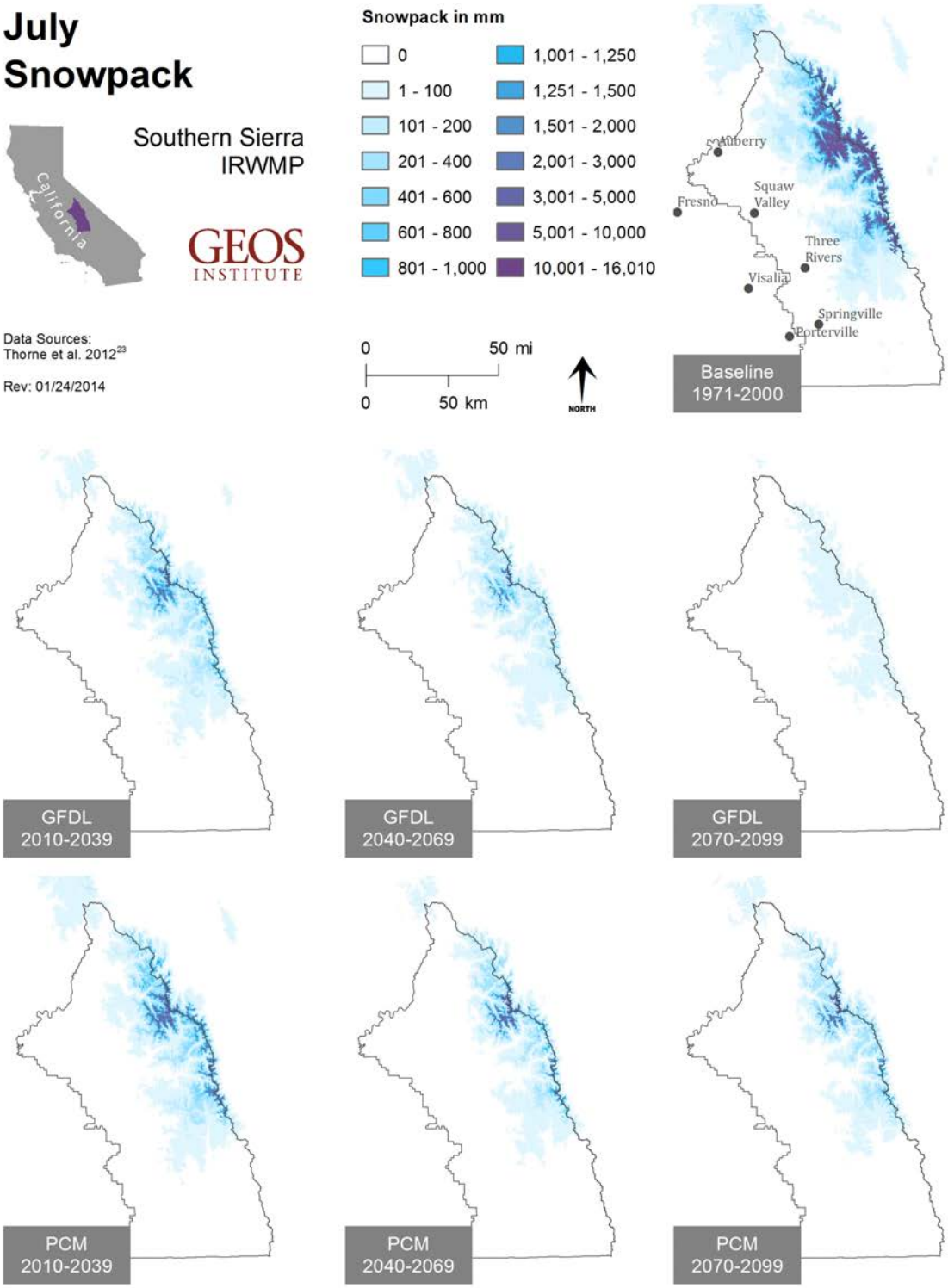


Figure 52. August snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

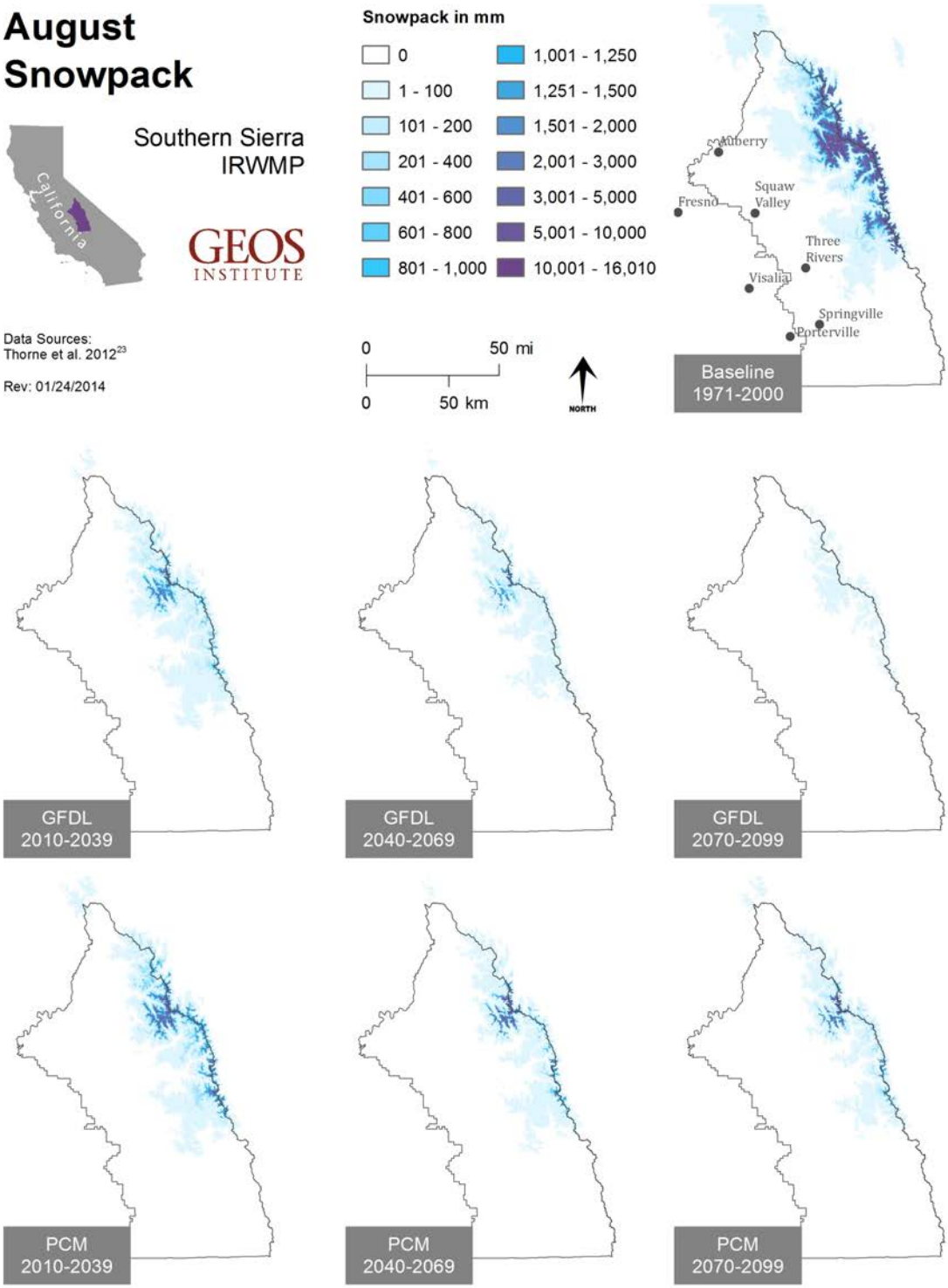


Figure 53. September snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

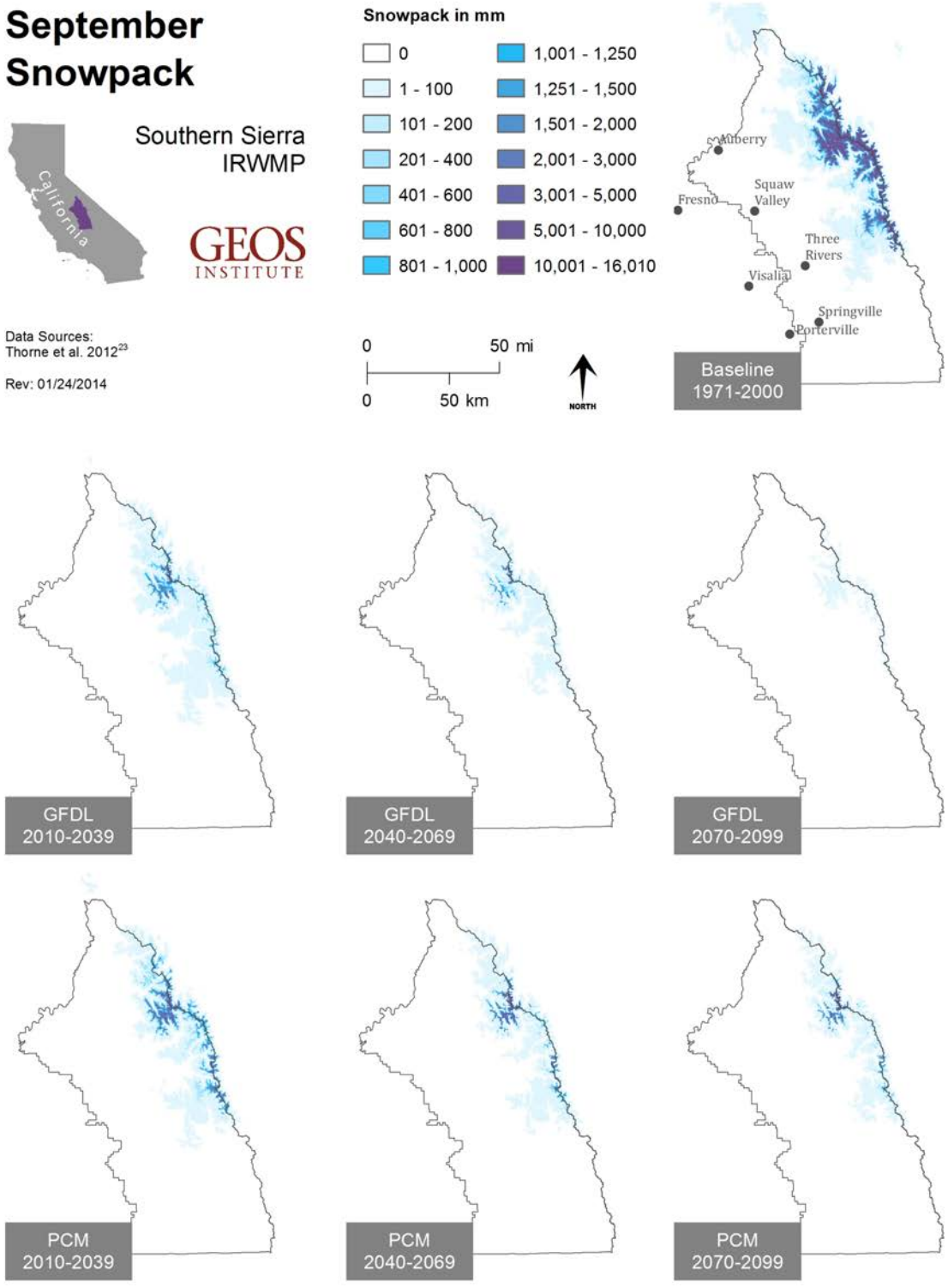


Figure 54. October snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

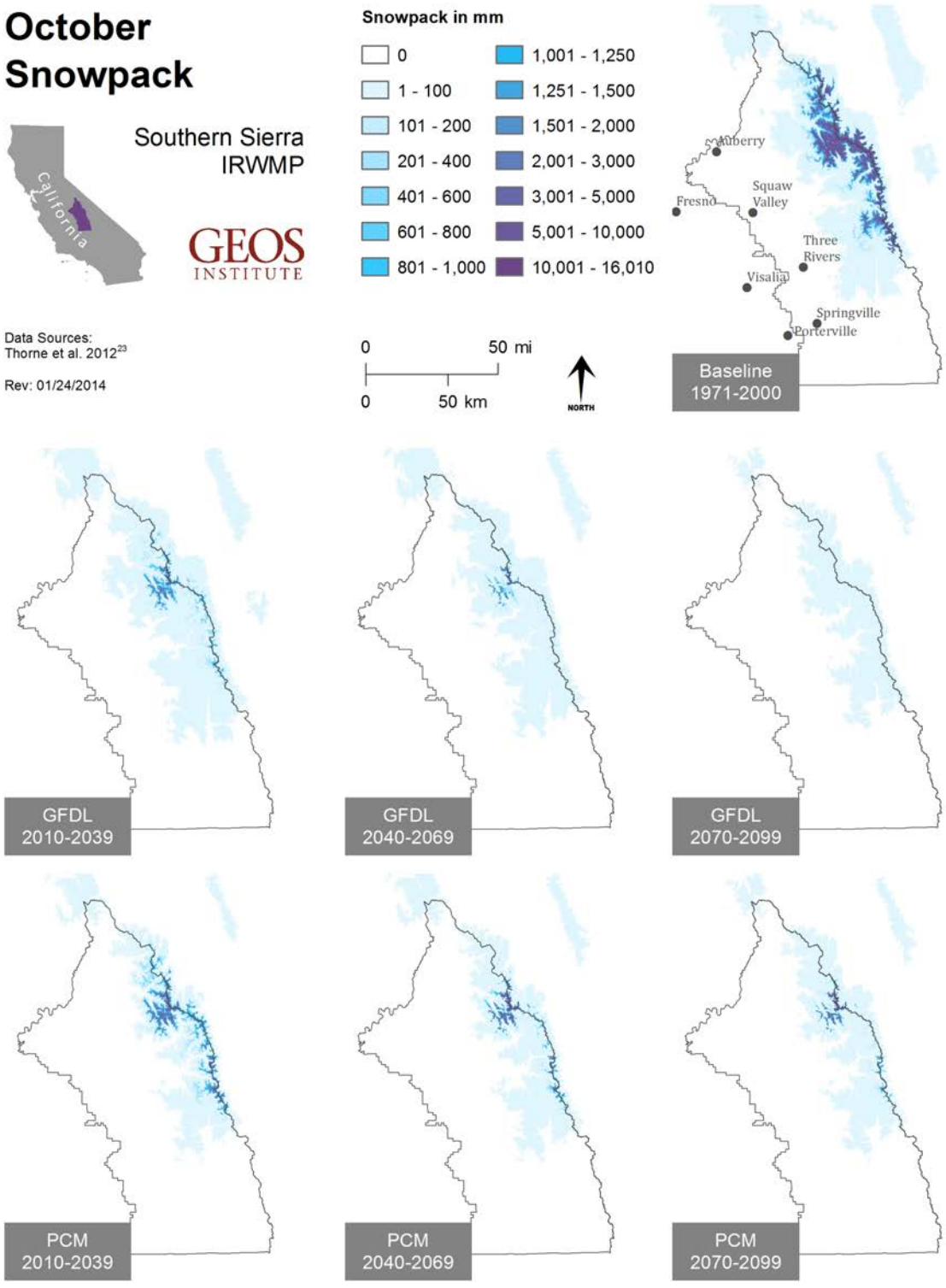


Figure 55. November snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

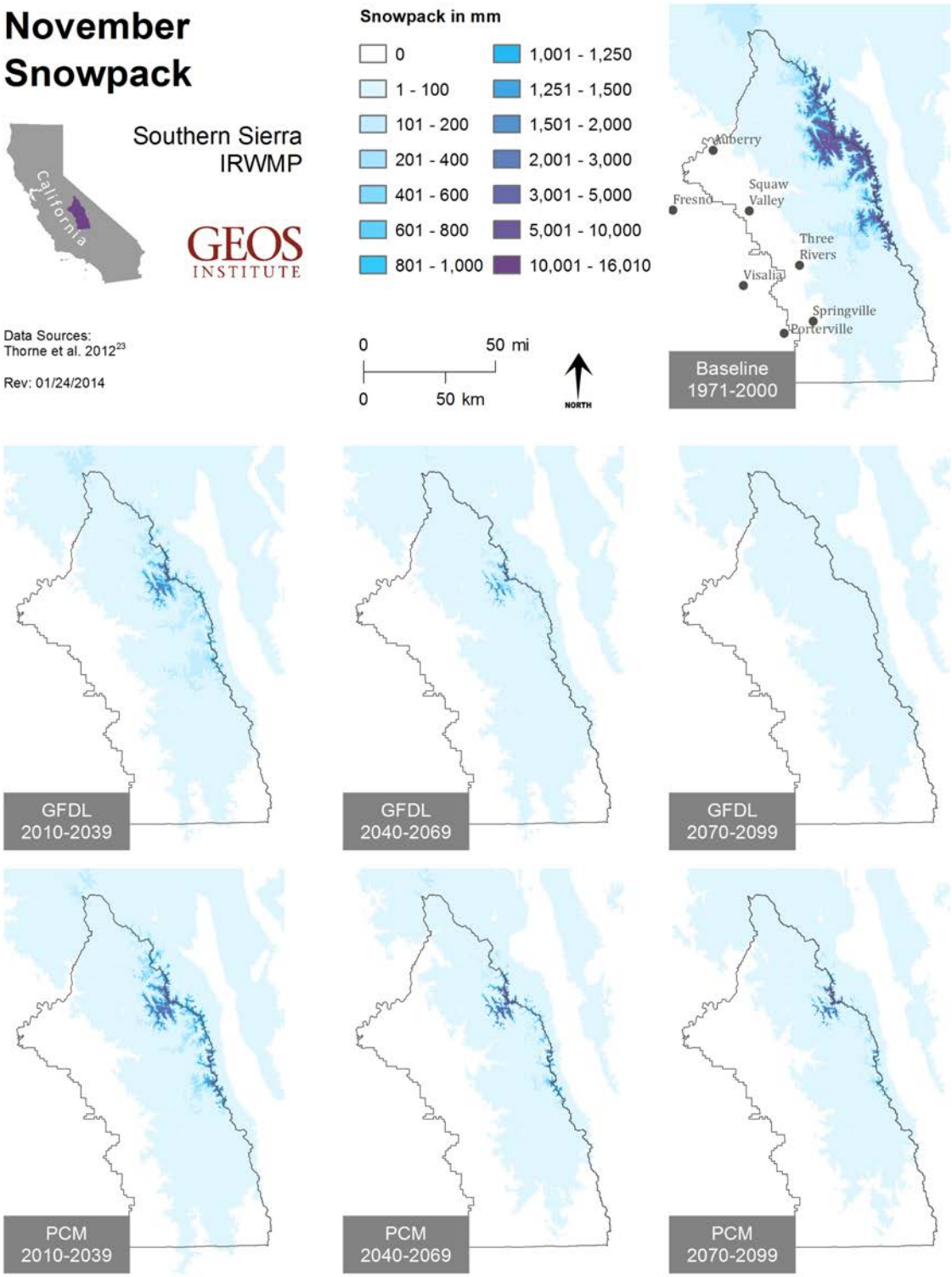


Figure 56. December snowpack across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

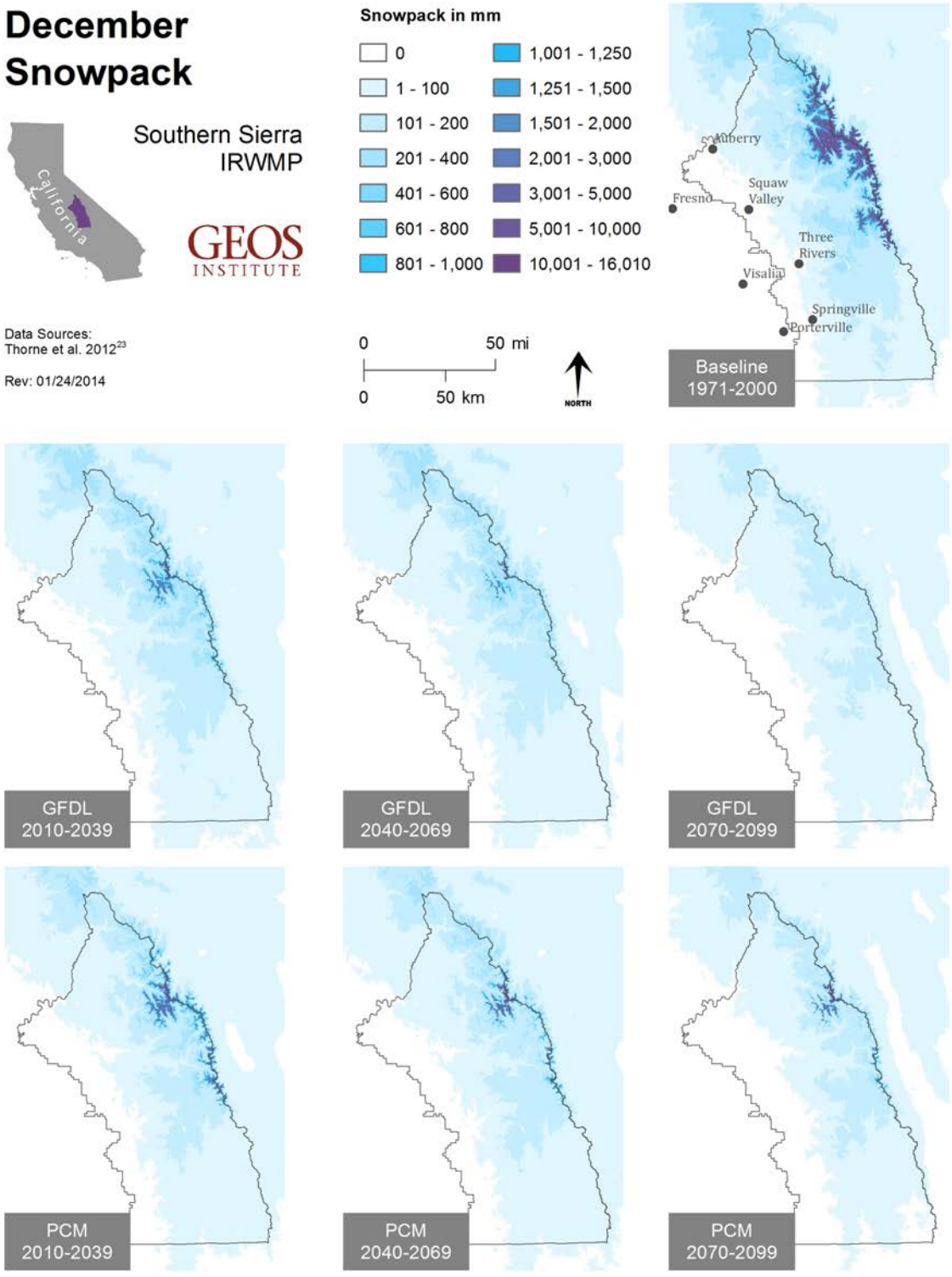


Figure 57. January climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

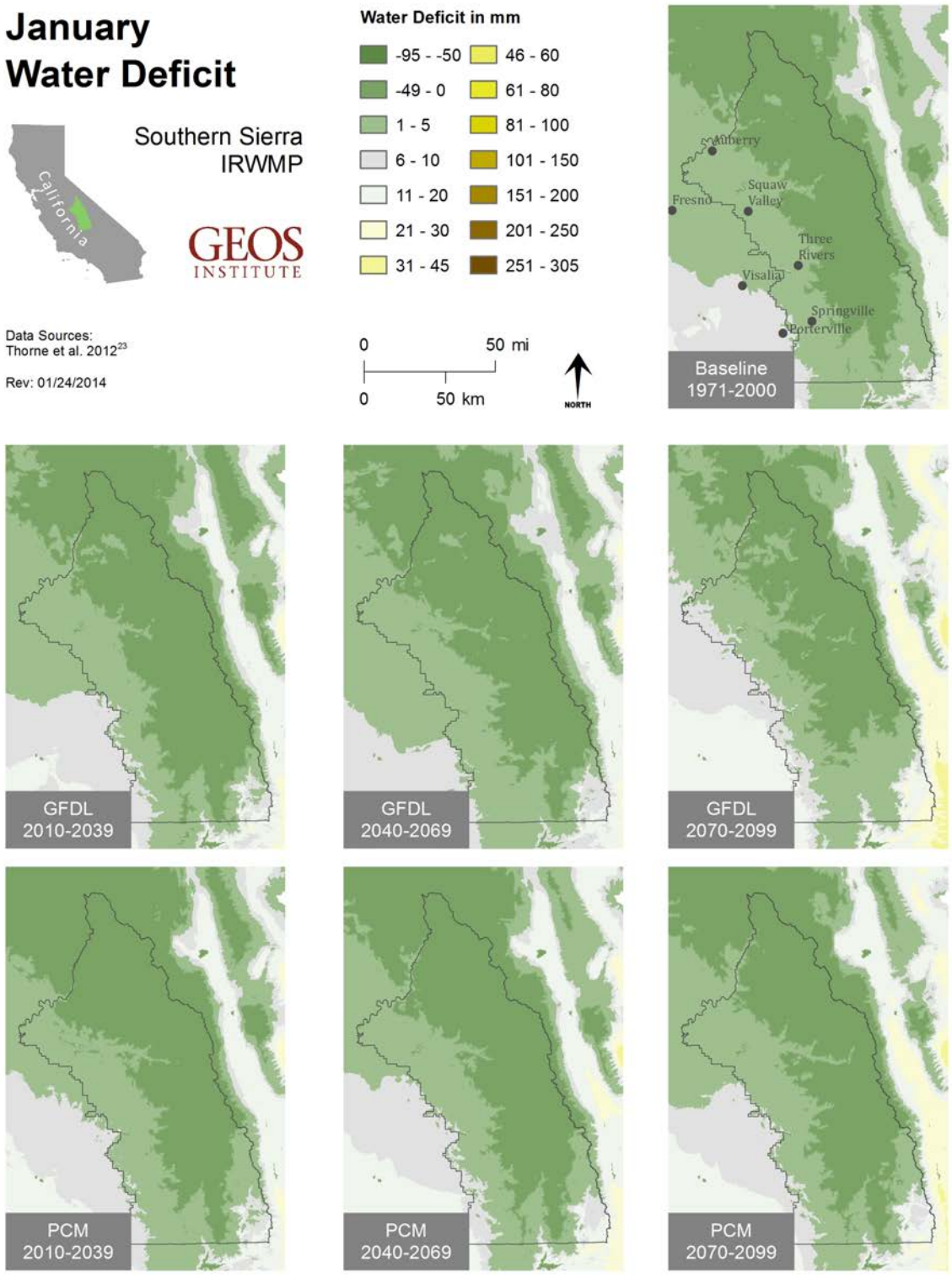


Figure 58. February climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

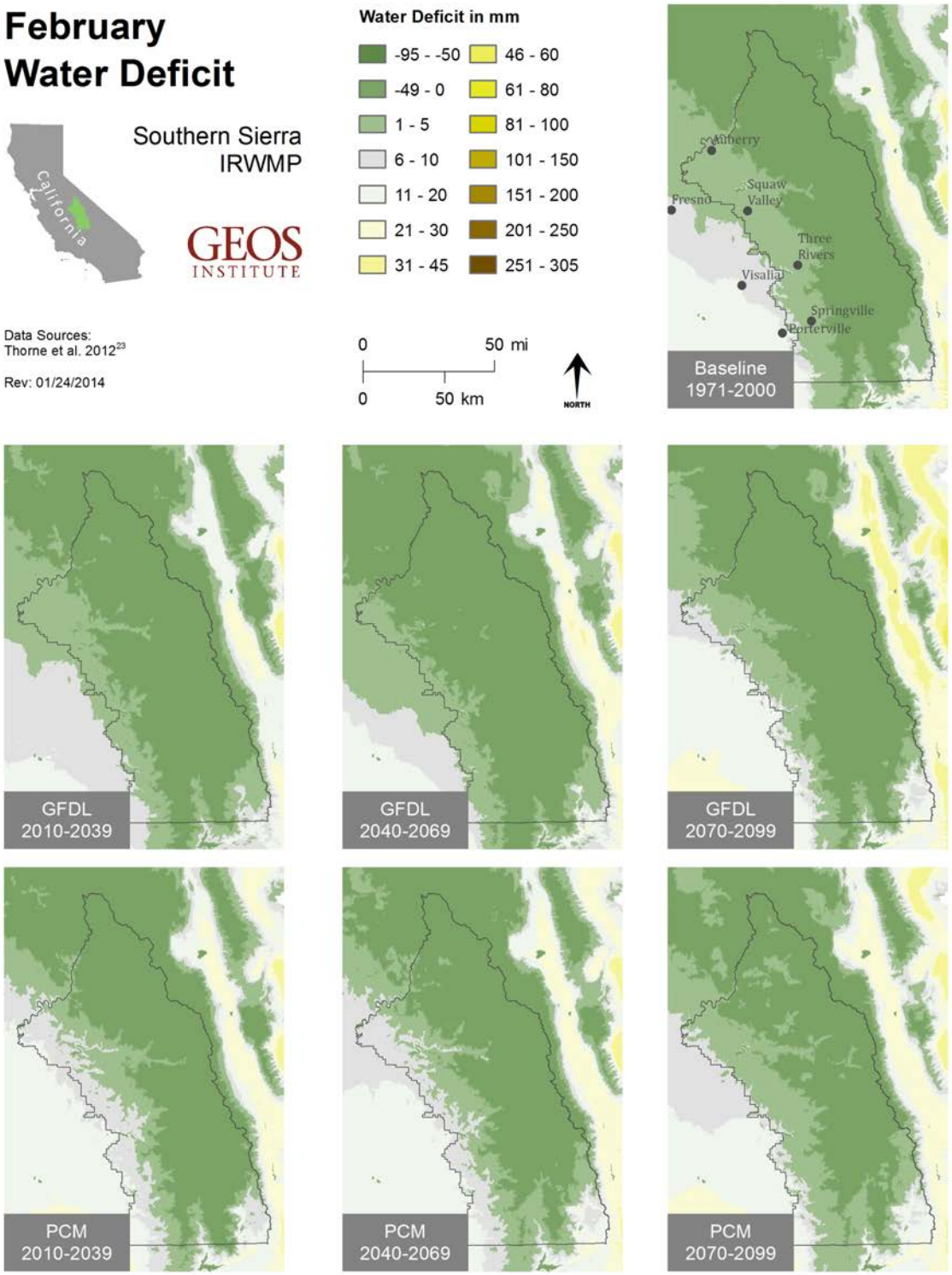


Figure 59. March climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

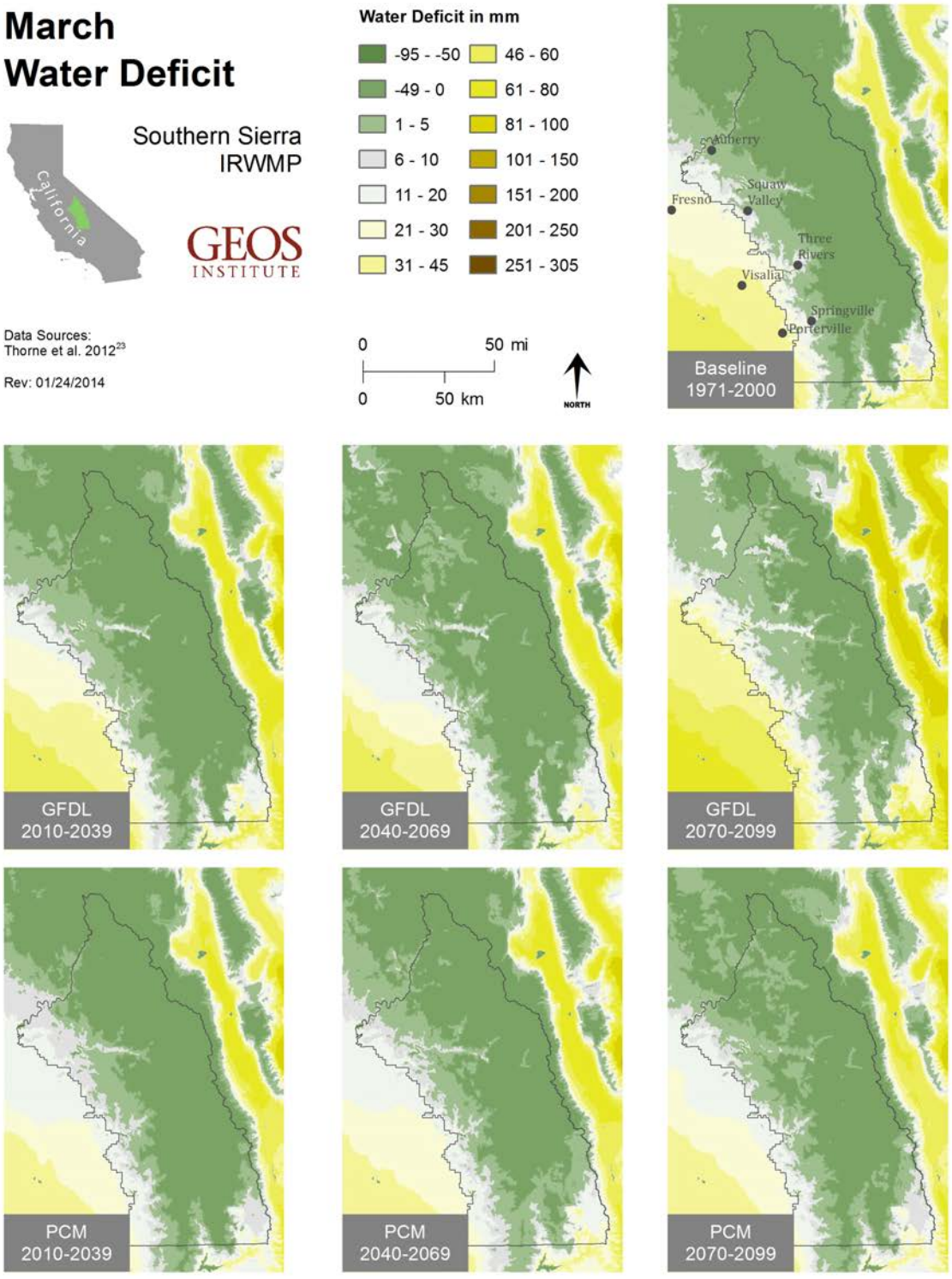


Figure 60. April climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

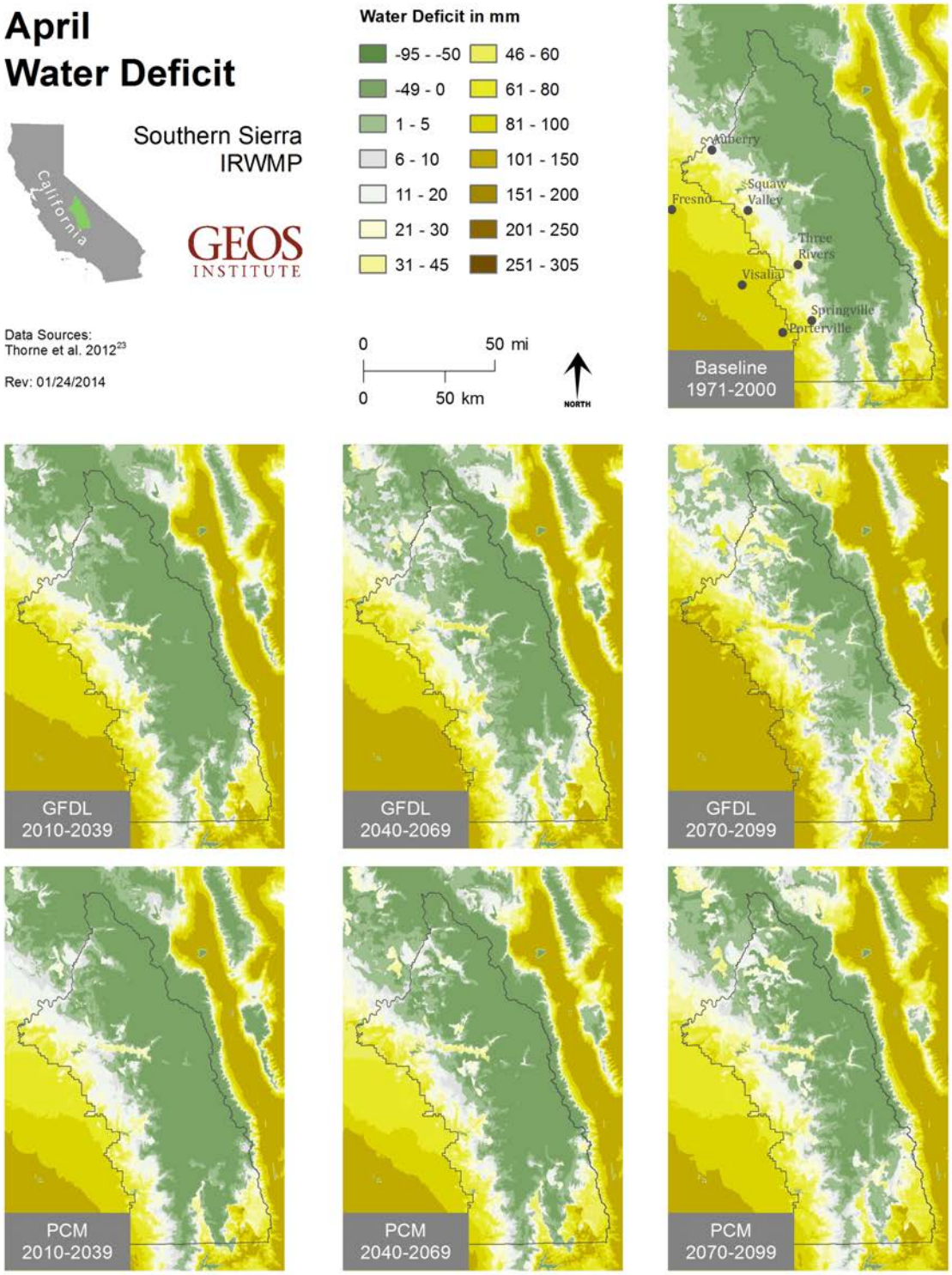


Figure 61. May climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

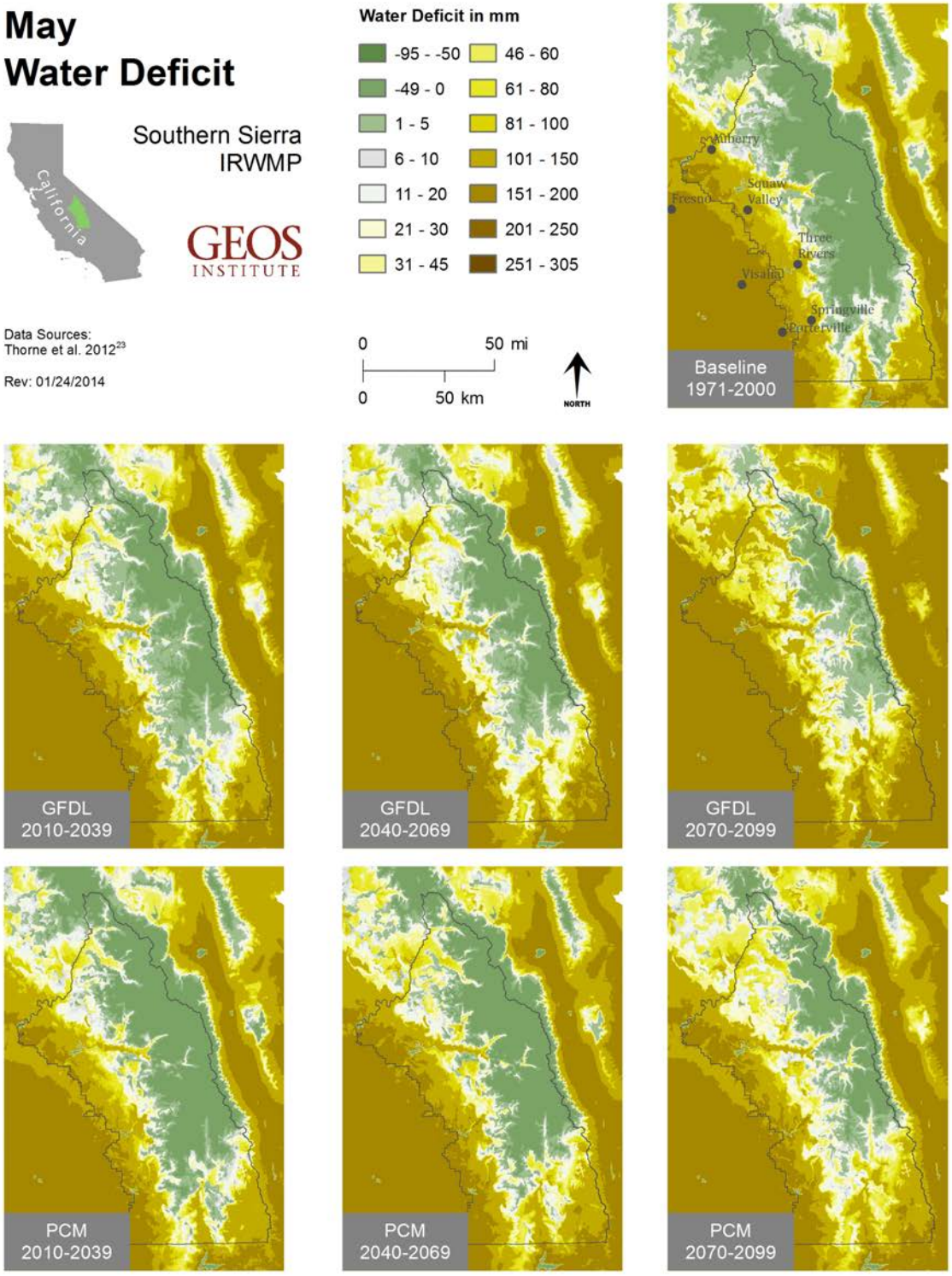


Figure 62. June climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

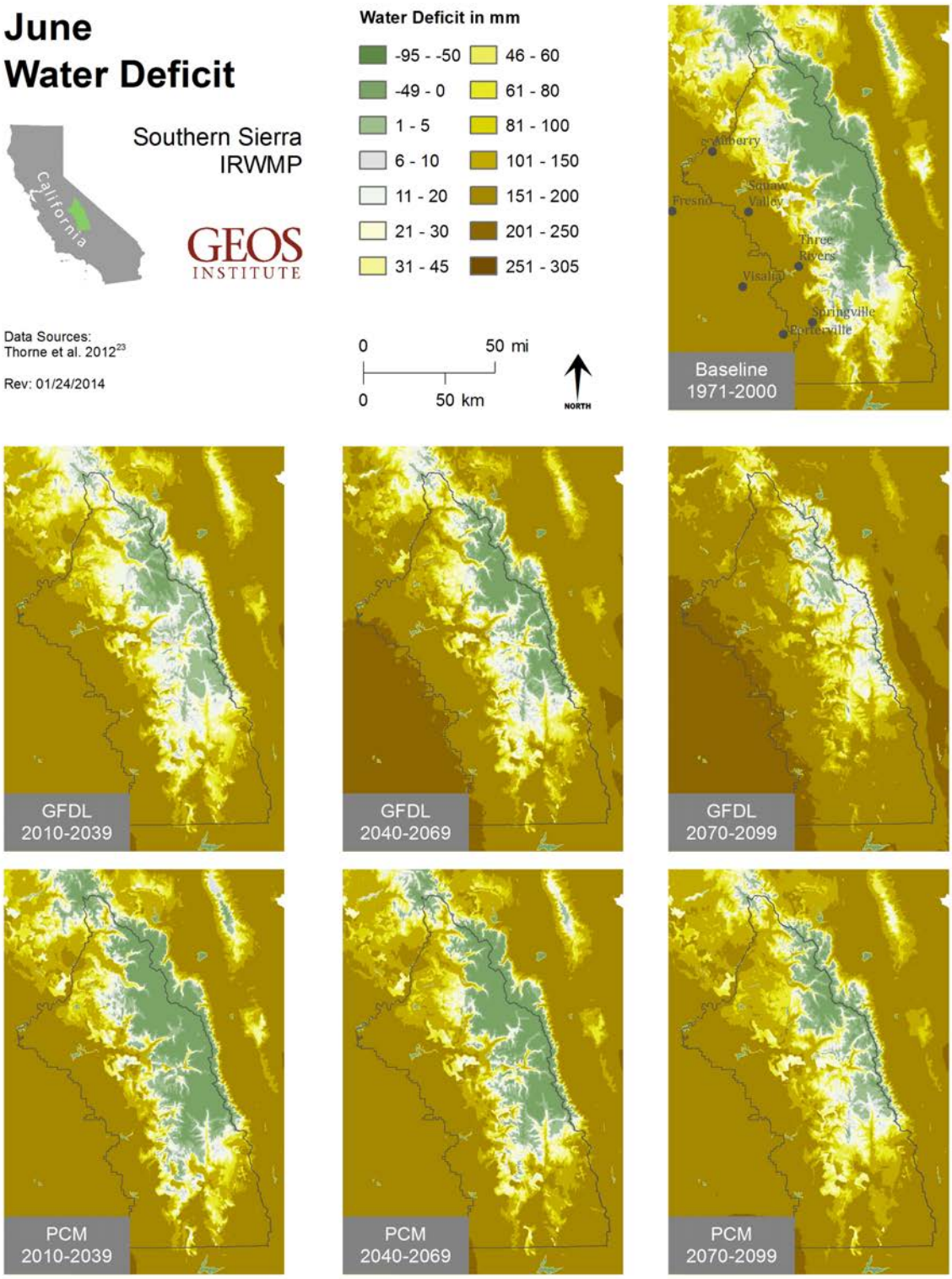


Figure 63. July climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

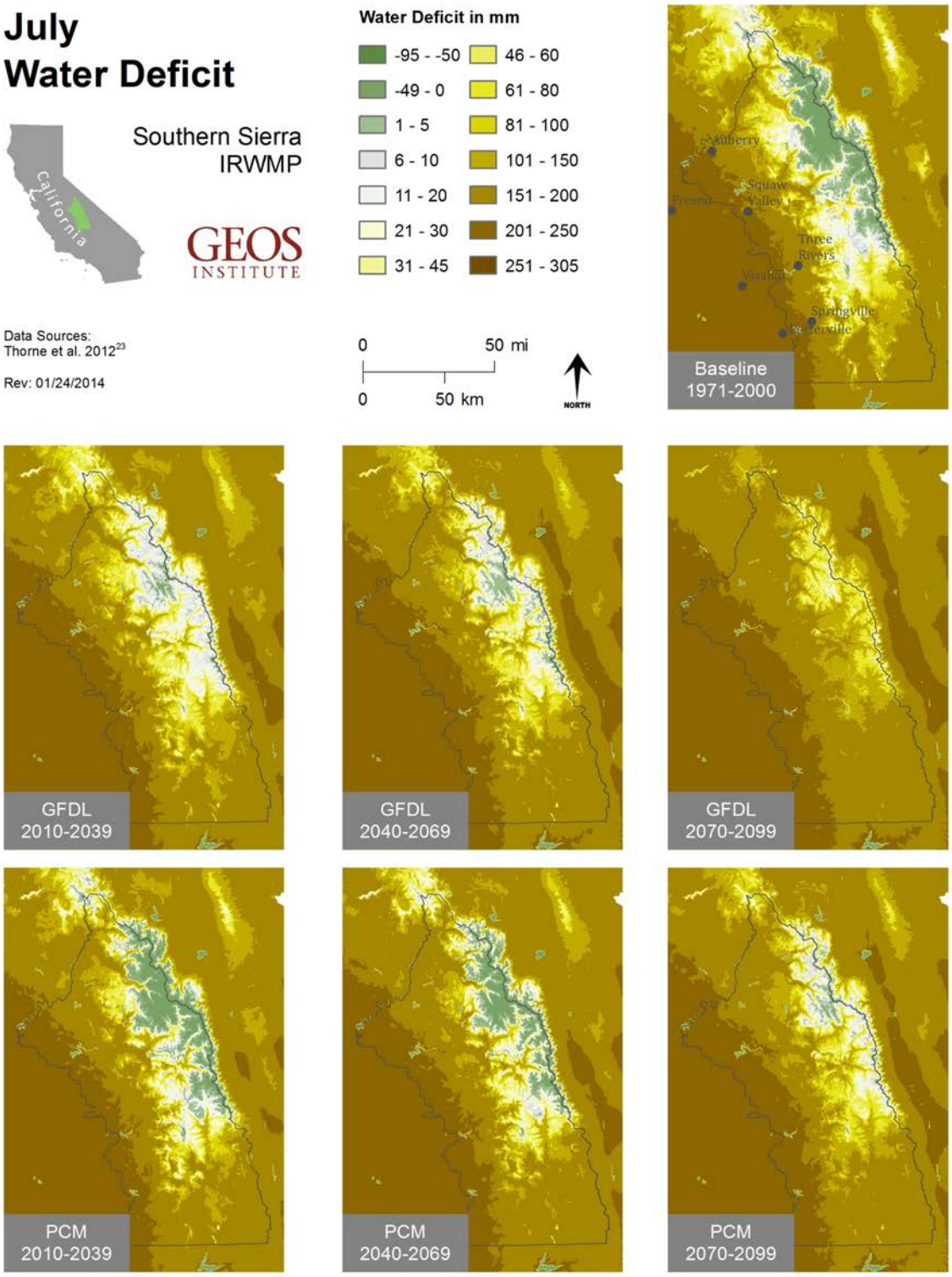


Figure 64. August climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

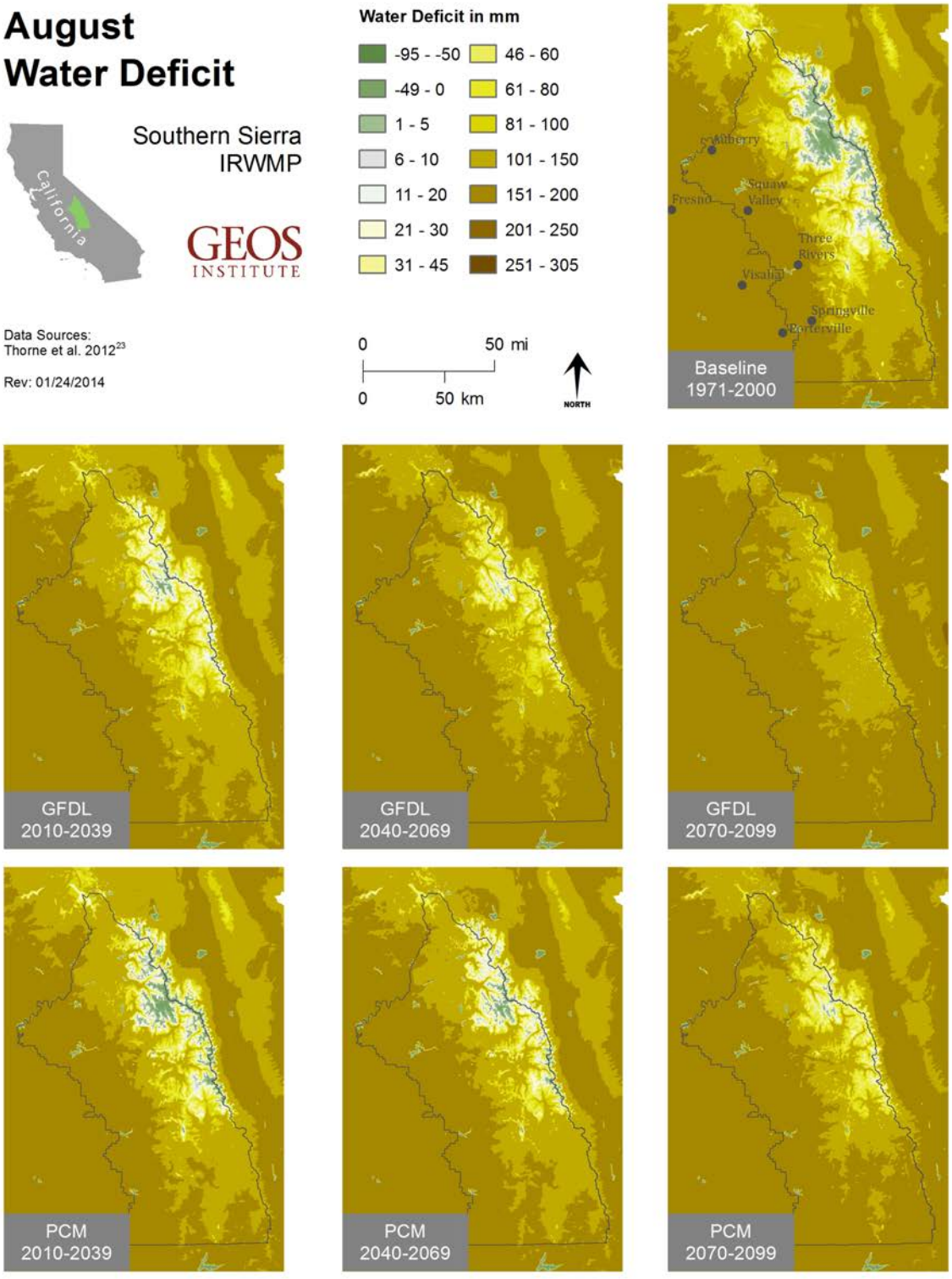


Figure 65. September climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

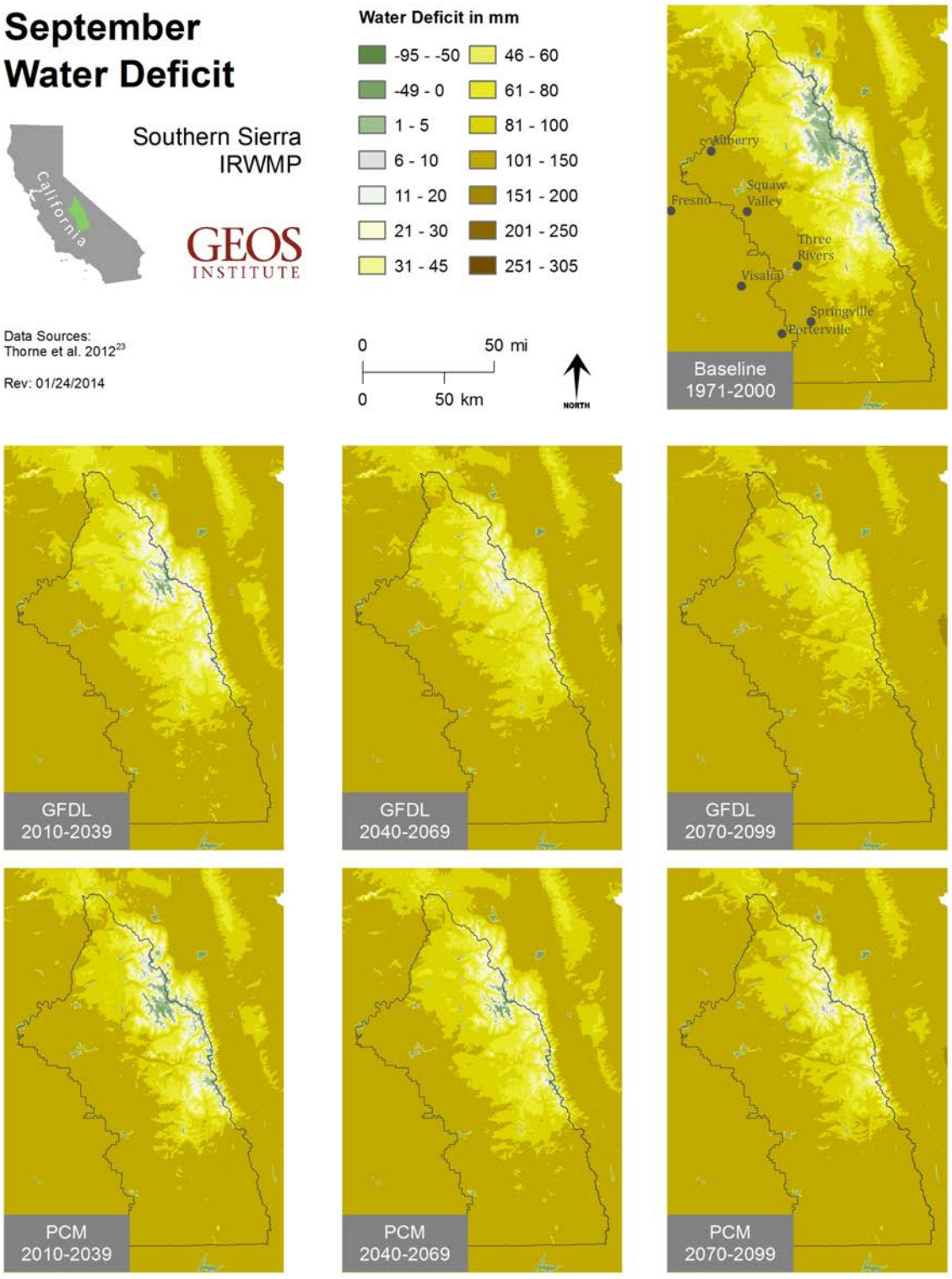


Figure 66. October climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

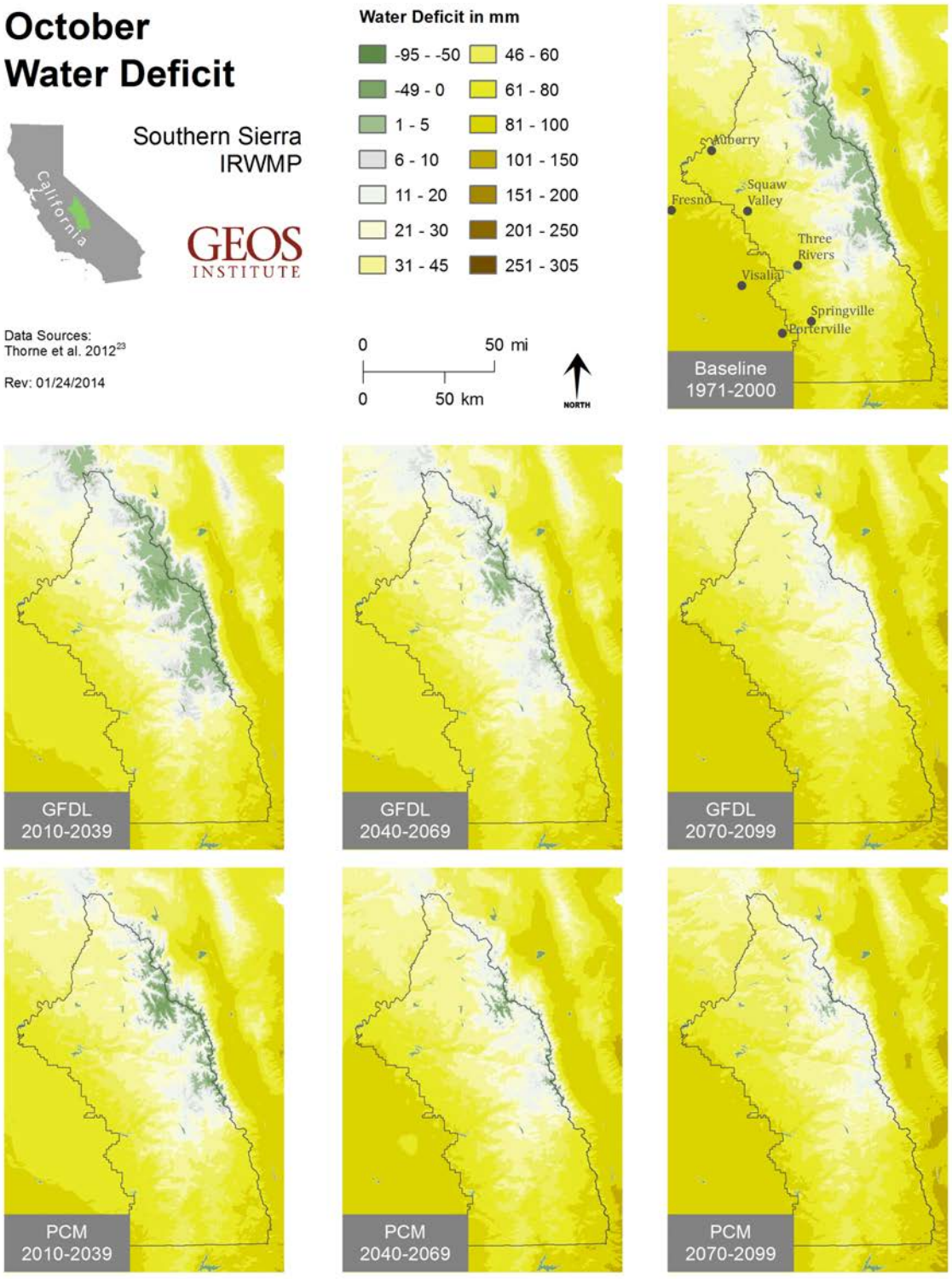


Figure 67. November climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.

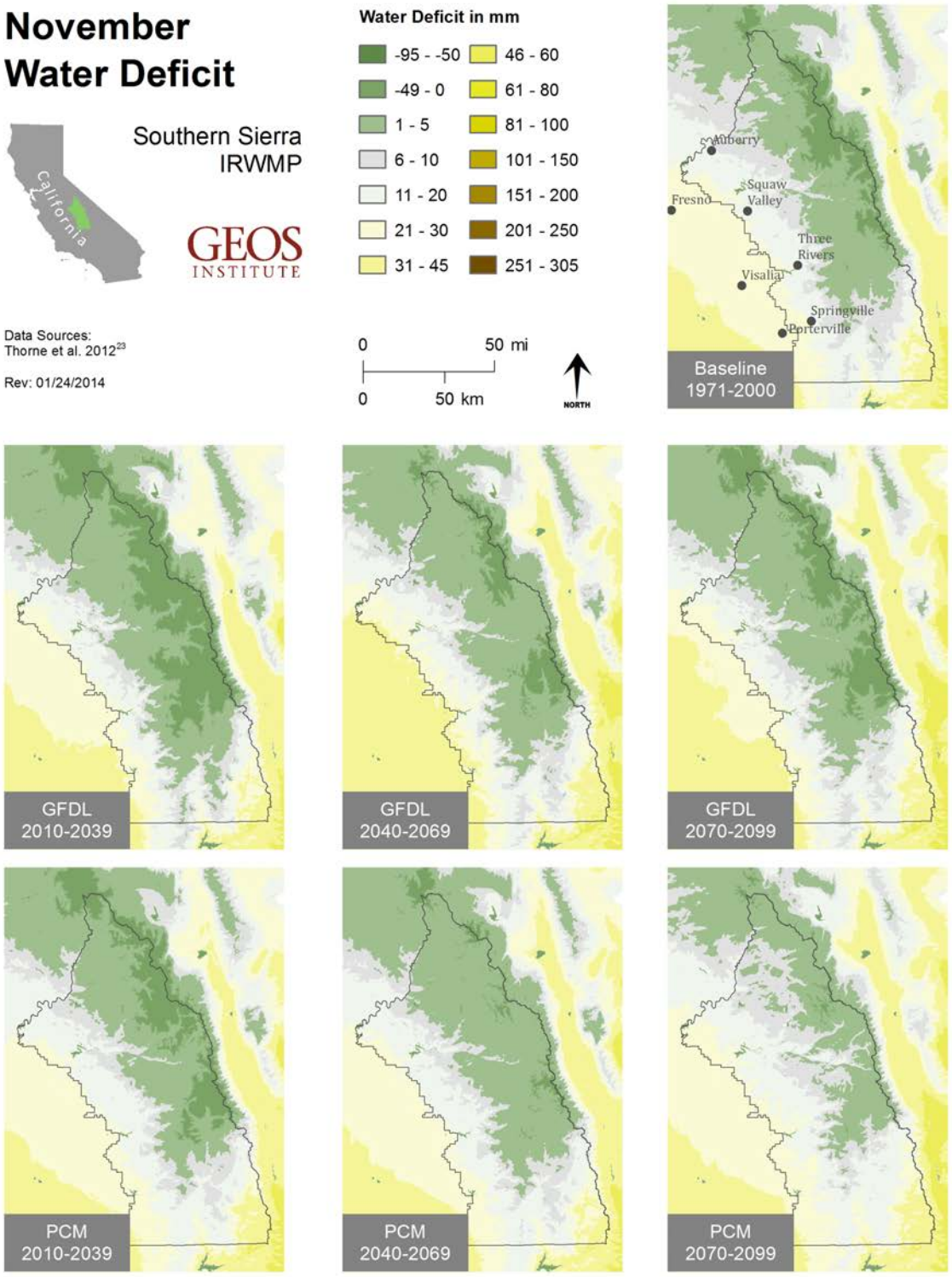
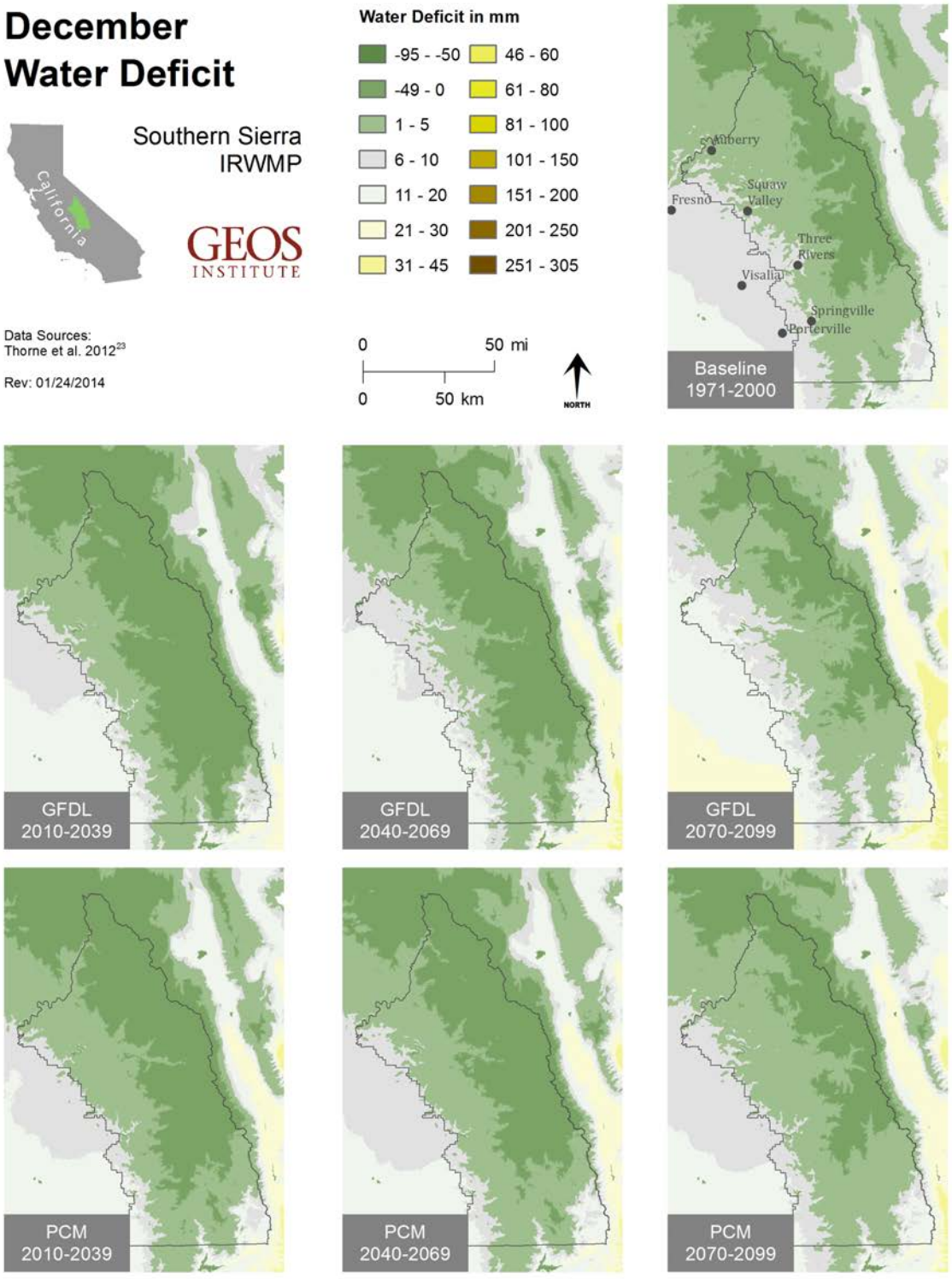


Figure 68. December climate water deficit across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM) and the A2 emissions scenario.



VEGETATION CHANGE AND WILDFIRE

Vegetation composition throughout the Sierra Nevada has changed over time.[24] Most changes are due to harvest, natural succession, fire, and insect or disease outbreaks, some of which may be linked to climate change. Overall, U.S. forests have become more productive in the last 55 years,[25] likely due to a longer growing season and higher CO_2 levels. Treeline has advanced up slope. As conditions become warmer and drier in the summer, forests in many areas are expected to become less productive due to lower soil moisture during the growing season, temperature stress, insect and disease outbreaks, invasive species prevalence, and wildfire.

In the western United States, wildfire is driven by a number of natural factors, temperature, precipitation, wind, humidity, lightning strikes, and anthropogenic factors, including human-caused fire starts. The natural factors are significantly affected by climate.[28] Wildfire is also closely associated with large scale climate patterns such as El Niño.[28]

Years with early arrival of spring account for most of the forest wildfires in the western United States (Figure 3). Wildfire activity increases during warm years, with relatively little activity in cool years. Since the mid-1980s the incidence of wildfire, extent of area burned, and length of season all have increased. The frequency of large wildfires in western U.S. forests, on average, is four times greater today than it was in 1970-1986.[29] Obviously, there is substantial variation from region to region.

The average length of fire season (the time between the first wildfire discovery date and the last wildfire control date) has increased by 78 days (64%) since 1970. The wildfire season is expanding its reach earlier into spring and later into fall.[28]

There is much debate over whether fire severity has already increased,

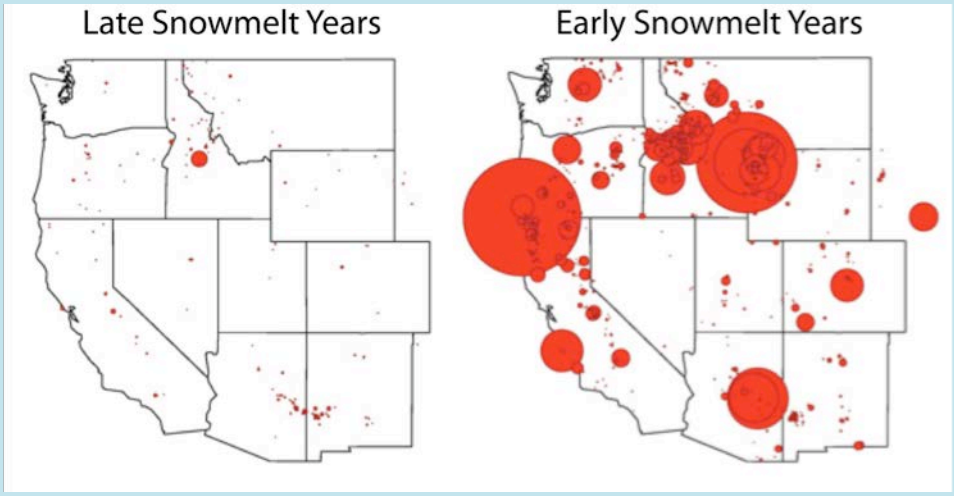


Figure 72. Forest Service, Park Service and Bureau of Indian Affairs large forest wildfires (>1000 acres) for years with early or late spring snowmelt, 1972 - 2003. From *Westerling et al 2006.*[29]

compared to early historical times.[30] Fire severity throughout the Western U.S. can be expected to increase given warmer and drier conditions.[31] An assessment of climate change and forest fires over North America projected 10-50% increases in seasonal severity rating (SSR) over most of the U.S.[32] Regional variation, however, means that not all areas will see such increases, and forest management will need to be based on local and regionally-specific information.

Lightning strikes are also expected to increase with increasing CO_2 in the atmosphere[33], potentially affecting fire frequency.[31]

Of note is the fact that the potential drivers of wildfire extent and severity throughout the western U.S. are primarily climatically driven. Whether future wildfire risk can or should be abated through fuels treatment remains unclear.[30] Most western forests are highly adapted to wildfire, and even the most severe fires have been shown to (1) have been common across pre-settlement landscapes, and (2) have positive long-term benefits for forests and biological diversity.[35]

MC1 Dynamic Vegetation Model

In this section we present the results of the MC1 dynamic vegetation model.[27] MC1 is a widely used dynamic global vegetation model (DGVM) that simulates vegetation types, ecosystem fluxes of carbon, nitrogen, and water, as well as wildfire occurrence and impacts. MC1 is routinely implemented on spatial data grids of varying resolution (i.e., grid cell sizes ranging from 900 m^2 to 2500 km^2). The MAPSS Team (Mapped Atmosphere-Plant-Soil System) at the USFS Pacific Northwest Research Station used two global climate models (GFDL and PCM) and the A2 emissions scenario to provide input variables to MC1.

The model reads climate data at a monthly time step and calls interacting modules that simulate biogeography, biogeochemistry and fire disturbance.

Most climate models project the future climate at global scales. Managers and decision makers, however, need information about how climate change will impact the local area. The MAPSS Team adjusted global model output to local and regional scales (800 m). This process increases the precision of the projections, but not the accuracy; they are still associated with high uncertainty and variation, especially because they are based on only 2 global climate models.

The MC1 model provides projections for suitable climate for predominant vegetation types rather than individual species. It only makes projections for native vegetation and does not account for land use change (i.e. agriculture and development), introduced species (i.e. non-native grasses), or human ignition.

Finally, the MC1 model assumes immediate shifts from one type of mature vegetation to another, without consideration of dispersal, establishment or succession. A lag time, which is not considered in the model, is expected between changes in climate conditions and establishment and maturation of new vegetation types on the ground – this lag time could be decades or even centuries.

MC1 Results

MC1 vegetation projections indicate an expansion of temperate evergreen needleleaf forest at higher elevations and a concomitant decline in alpine areas (listed as "tundra"; Fig. 73). Subalpine forest is expected to shift to higher elevations. Similar patterns were projected for much of the Sierra Nevada range.[36]

At lower elevations, temperate grassland is expected to be replaced by subtropical grassland and a mid-elevation band of subtropical shrubland.

The results from MC1 showed an increase in biomass consumed by wildfire over time – doubling by mid-century and tripling or quadrupling by late-century (Table 6; Fig. 74). The area burned, however, is not expected to increase to the same degree (Table 6; Fig. 75). This indicates that wildfires could become more severe, as compared to the historic period of 1961-1990, and/or that changes in vegetation type and condition could cause more biomass to be consumed.

The MC1 projections show an overall increase in carbon storage in vegetation over time, although a slight decrease is also possible (Table 6; Fig. 76).

Important to note is that MC1 projects the vegetation that the future climate is most suitable for, but transitions in vegetation are highly uncertain and can take decades to centuries to occur. Also, MC1 does not account for non-native species or vegetation altered by people.

Table 6. Modeled historic (1961-1990) and future wildfire trends across the Southern Sierra Nevada, based on the MC1 dynamic vegetation model and 2 global climate models, GFDL and PCM. Variables include annual average biomass consumed by wildfire (measured in grams of carbon per m^2), percent of grid cell burned by wildfire, and maximum carbon storage in vegetation (measured in grams of carbon per m^2).

	Historic	2010-39	2040-69	2070-99
BCW	99	171 to 203 (+73 to +105%)	183 to 263 (+84 to +166%)	282 to 374 (+185 to 277%)
PB	3.2%	3.4 to 3.8% (+6.6 to +20.1%)	3.0 to 4.0% (-6.6 to +25.8%)	3.8 to 5.3% (+20.1 to +65.4%)
CS	12,577	13,150 to 13,174 (+4.6 to +4.7%)	13,164 to 14,542 (+4.7 to +15.6%)	12,508 to 16,292 (-0.6 to +29.5%)

Figure 73. Modeled current and future vegetation type across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM), the A2 emissions scenario, and the MC1 dynamic vegetation model. Note that the MC1 model does not consider current vegetation or land use change.

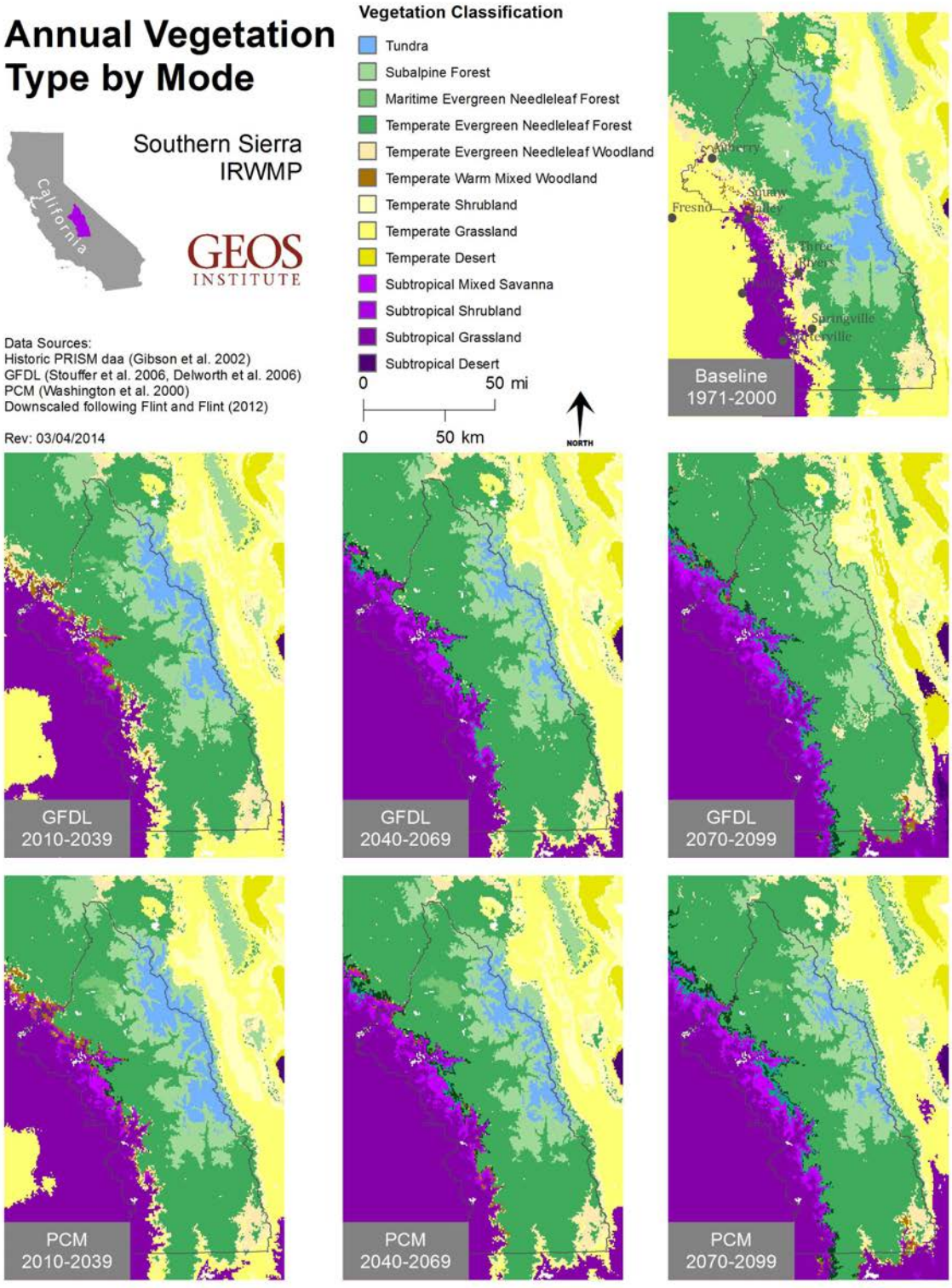


Figure 74. Modeled current and future biomass consumed by fire across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM), the A2 emissions scenario, and the MC1 dynamic vegetation model. Note that the MC1 model does not consider current (actual) vegetation or human influence.

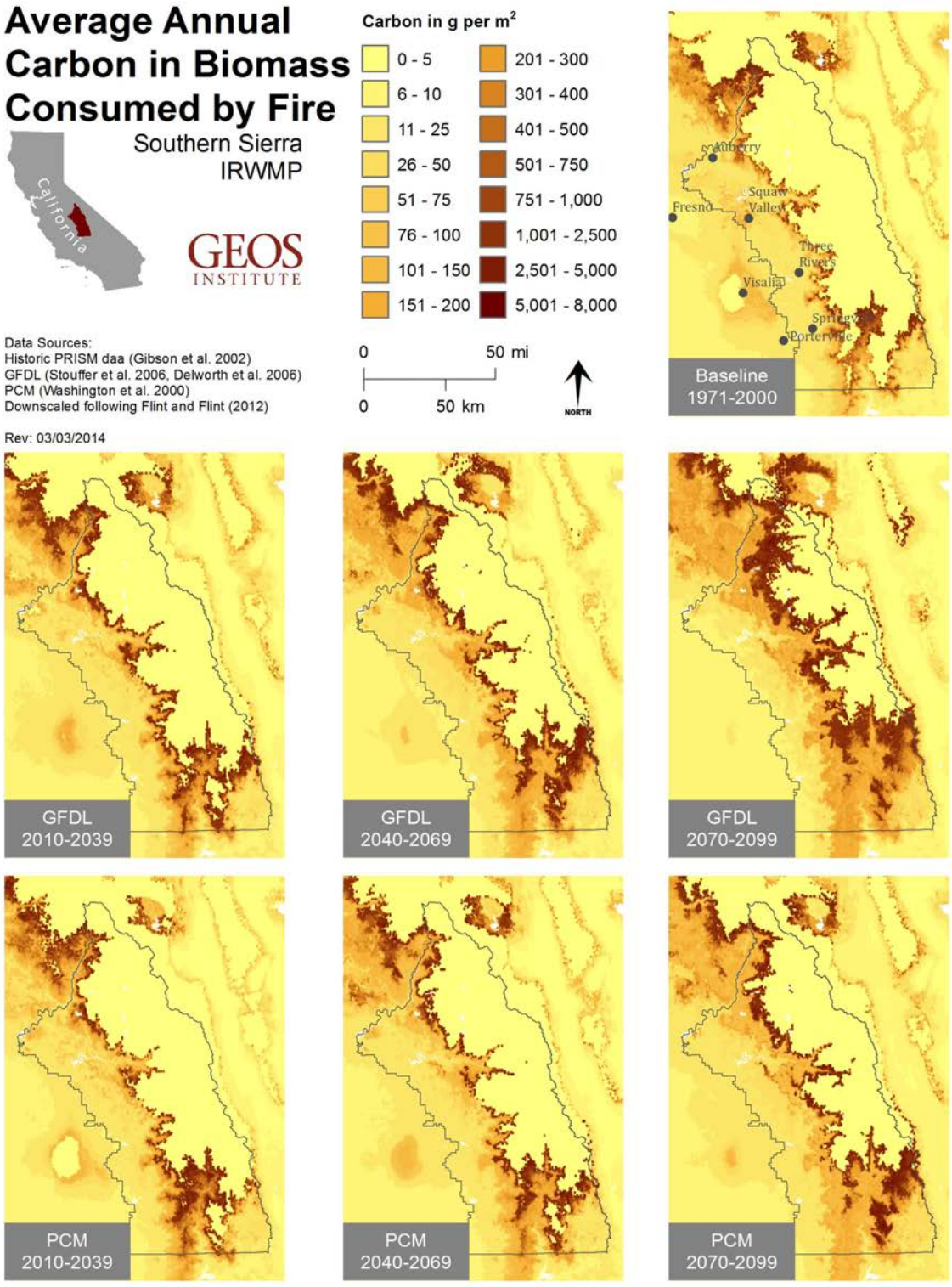


Figure 75. Modeled current and future proportion burned across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM), the A2 emissions scenario, and the MC1 dynamic vegetation model. Note that the MC1 model does not consider current (actual) vegetation or human influence.

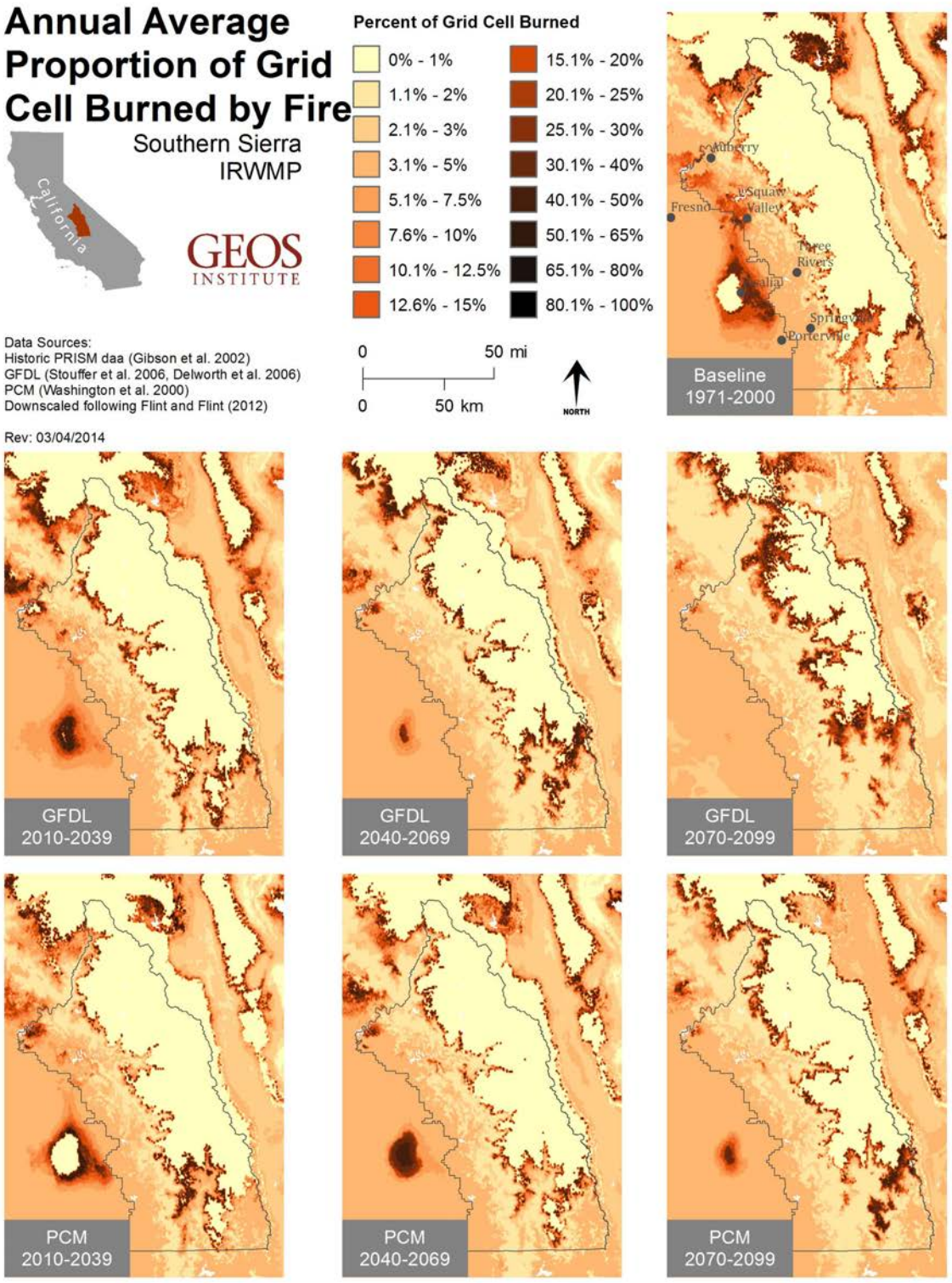
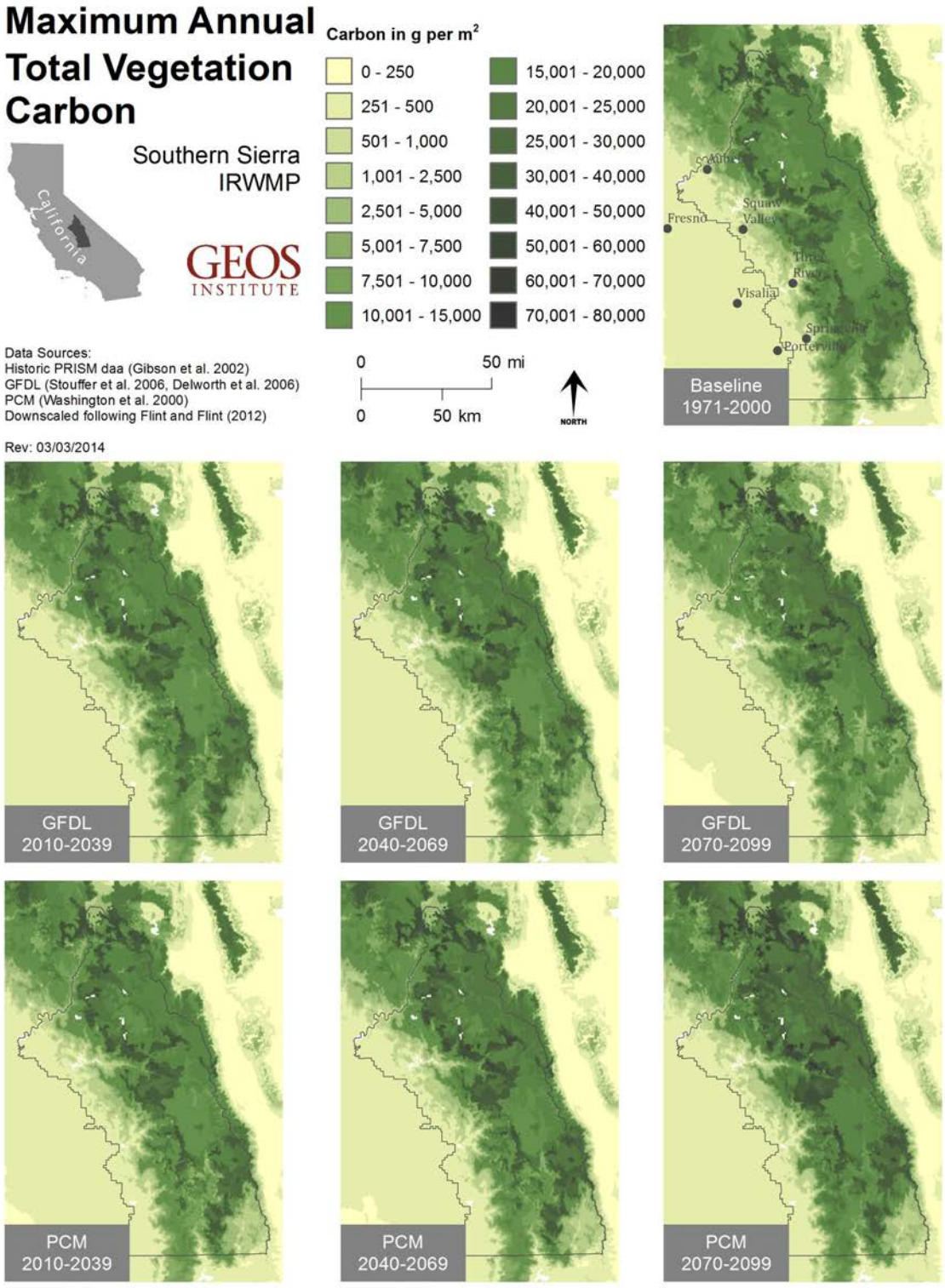


Figure 76. Modeled current and future annual vegetation carbon across the Southern Sierra Integrated Regional Water Management area in California, based on output from 2 different global climate models (GFDL and PCM), the A2 emissions scenario, and the MC1 dynamic vegetation model. Note that the MC1 model does not consider current (actual) vegetation or human influence.



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Appendix N

Stakeholder Outreach Plan

COMMUNICATION AND OUTREACH PLAN
SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP
Revised November, 2013

I. Purpose and Overview

- This plan serves as a guide for the public communication and outreach activities of the Southern Sierra IRWMP.
- The goal of the plan is to ensure that interested parties (e.g., members of the public, non-government organizations, and public agencies), and residents in the participating counties are well-informed of the deliberations and activities of the SSIRWMP Regional Water Management Group (RWMG), and can participate as desired.
- Foundational elements of this plan include objectives and principles, audiences and potential partners, and messages. A series of communication and outreach strategies follow. The last element is an evaluation of plan implementation. An appendix lists names of potential partner agencies and organizations.

II. Objectives and Principles

1. Objectives

A. To ensure that interested parties and residents as a whole are aware of the work, schedule, progress, and deliberations of the RWMG;
B. To ensure that interested parties and residents as a whole have opportunities to provide input to the RWMG's deliberations;
C. To support and engage disadvantaged communities and tribes, two of the highest priority stakeholders in the Region during the 2013-2014 timeframe.

2. Principles

A. The RWMG will proactively develop relationships and conduct activities related to communication and education.
B. The RWMG will partner with interested parties to leverage existing networks and outreach efforts, and to make the best use of limited resources.
C. The RWMG will provide Information and materials on a timely basis to allow interested parties and residents to consider information and, as appropriate, provide input and participate.
D. The RWMG will consistently characterize its aims and activities in the same ways, so that people in different arenas hear the same messages.
E. The RWMG will tailor its messages and materials to different audiences to increase their effectiveness.

III. Audiences and Partners

Water resource issues involve an array of geographical and interest-based audiences, including:

A. Disadvantaged communities;
B. Landowners ;
C. Farmers and growers;
D. Environmental groups;
E. Recreational users;
F. California Native American Tries;
G. Developers;
H. Community organizations;
I. Public agencies;
J. Elected officials.

Initial lists of specific groups, organizations, and agencies were identified 2008-2013, see Appendix 1 below.

Messages and materials will variously need to address residents as a whole, or to be tailored to specific audiences.

Some members of these audiences may choose to support the RWMG's communication and outreach efforts, thereby becoming the RWMG's partner. Partners will be critical to maximizing the efficiency and effectiveness of communication and outreach efforts. Additional partners will be solicited as activities are developed.

Partners may also include specific press and media, see Appendix 2 below.

IV. Messages

1. Universal Messages

A. The Southern Sierra is an important source of clean, abundant water for the communities, agriculture and the environment. It provides water for recreation, aesthetic purposes, irrigating crops and nourishes human and natural communities
B. The SSIRWMP and the SSRWMG represent a unique opportunity to protect and conserve a unique Region's resources with science-based, integrated regional water management;
C. Consensus-seeking process a way to address regionally significant issues;
D. By collaborating as a group, we can develop solutions to issues protecting and improving the entire Region;
E. Solutions range from funding and project implementation to project development and planning. In finding solutions and addressing issues the Region's capacity to respond positively to social, economic and environmental challenges may be increased.

2. Objective or Project-Specific Messages

Examples of messages for projects or objectives:

1. Rollout of the planning process:
    a. Published in July, 2013 - Simple press release and newspaper add about the intent to prepare the plan;
2. Project implementation solicitation to potential project proponents:
    a. Describes the IRWMP process, the model for grantee, project proponents and grant writing for the implementation program and describes the benefits of supporting or involvement in the process.

3. Special Messages

1. Special Message for potential RWMG members/MOU signatories.

   Signing the SSRWMG Memorandum of Understanding has attractive benefits. Benefits include:
    a. Decision-making in the RWMG;
    b. Help to decide regional priorities;
    c. Ability to submit project for implementation funding;
    d. Project integration and development to make them more competitive.

V. Communication and Outreach Strategies

This section identifies communication and outreach strategies. Each strategy should include information on supporting materials, audiences that would benefit specifically, next steps and when these would occur, and constraints that will need to be managed.

1. Use the SSIRWMP website as the clearinghouse for all information and materials associated with the RWMG meetings and the communication and outreach efforts.

Materials and Media: will post existing materials developed for meetings and activities
Special Target Audiences: none (it is for all audiences)
Next Steps & Timelines: the website has been official and functioning since…
Constraints: organization and accessibility as documents accumulate
Lead: Grantee
Potential partners: Sequoia Riverlands Trust, Provost and Pritchard Consulting Group

2. Develop and maintain an interested parties email and address distribution list, including denotation of parties that express an interest in partnering.

Materials and Media: email and address data management software, and existing news, promotional and educational materials (see below)
Special Target Audiences: individual interested parties
Next Steps & Timelines: differentiate the existing list into RWMG members and interested parties
Constraints: need to maintain up-to-date entries

Lead: Facilitator
Potential partners: Facilitator and/or Grantee Project Manager

3. Proactively develop and regularly utilize relationships with key press and media outlets for the purpose of sharing news and information.

Materials and Media: joint statements developed by the SSRIWMP, telephone calls
Special Target Audiences: county residents as a whole
Next Steps & Timelines: RWMG members identified and contacted major press and media outlets during summer. This will now be utilized as needed.
Constraints: inability to control final products, need to adhere to RWMG Media Protocol
Lead: Communication Work Group (not yet formed)
Potential partners: RWMG

4. Develop a standardized series of general promotional and outreach materials, as well as activity-specific and topic-specific materials as needed.

Materials and Media: trifold and booklet brochures, FAQs, annual newsletter (electronic and hard copy)
Special Target Audiences: directly impacted audiences
Next Steps & Timelines: general promotional material during summer of 2012, activity- and topic-specific materials in coordination with the RWMG's work plan
Constraints: need for subject matter expertise
Lead: Grantee and/or Communication Work Group
Potential partners: none

5. RWMG members periodically (e.g., twice a year) brief the geographical or interest-based groups that they serve on, participate in, or recommend, as applicable.

Materials and Media: standard promotional materials; short PowerPoint presentation with talking points about work plan, progress, and milestones; FAQs
Special Target Audiences: constituencies represented on the SSIRWMP, regional and sub-regional groups, community-based groups, potential signatories to MOU
Next Steps & Timelines: identify initial dates for briefings, prepare materials, develop a priority list for briefings.

Priority list for briefings in 2013-2014 (in order of priority):

1. Disadvantaged Communities – Held a briefing in August, 2013 for Springville Public Utility District. Potential date for briefing Three Rivers Community Services District, Auberry/Prather/Johnsondale: January-February, 2014 ;
2. Tribes – held tribal briefing during Sierra Tribal Forum in August, 2013. Sequoia Tribal Forum will be held December, 2013;
3. Counties – Potential date for briefing: January, 2014;

4. Federal Agencies (especially US Army Corps of Engineers) - Potential date for briefing: January, 2014;
5. Non-governmental Organizations.

Constraints: need for consistent messaging and characterization of the RWMG's activities
Lead: Communication Work Group and then all RWMG members
Potential partners: organizations in which RWMG members participate.

6. RWMG members conduct an annual round of briefings for elected officials and agency executive officers.

Materials and Media: standard promotional materials, invitation and briefing papers
Special Target Audiences: state legislative representatives, county supervisors, mayors and councilmembers, federal and state agency executive officers
Next Steps & Timelines: Develop talking points and memo for invitation to participate or sign MOU, identify appropriate period for briefings and schedule well in advance, identify appropriate briefing format and appropriate group to conduct briefings, develop needed promotional materials and priority list for briefings.
Constraints: limited availability of elected officials and agency executive officers
Lead: Communication Work Group and then all RWMG members
Potential partners: none….

7. The RWMG hosts public workshops or other public events to support the kickoff of the planning process and the rollout of key deliverables.

Materials: special announcements; materials to support the event activities
Special Target Audiences: residents as a whole, disadvantaged communities
Next Steps & Timelines: identify location and needed materials for October 11, 2012, public kickoff event; agree upon deliverables that will need a public rollout component, the type of public input desired (e.g., comment on draft, comment on final), and a corresponding timeframe
Constraints: need for advance scheduling and publicity to ensure turnout, significant logistical and administrative work, and associated costs
Potential partners: local organizations

VI. Evaluation

As part of its normal business, the RWMG will evaluate annually the effectiveness of its communication and outreach efforts, and revise this plan accordingly.

Evaluation Keys:

a. The merit in having evaluation is to ensure that progress is made towards objectives and identify and address obstacles to achievement of the objectives;

b. Evaluation must be based on measurable progress towards objectives or tasks that have been identified.

    1. Potential metrics:

        a. Number of stakeholders on the email list;
        b. Feedback from the process;
        c. Meeting participation;
        d. Media interactions, new stories, news articles;
        e. Number of collaborative, inter-regional projects.

Appendix 1: Potential Audiences and Partners

Audiences:

A. State Agencies
    a. California Department of Water Resources
    b. California Department of Fish and Wildlife
    c. Regional Water Quality Control Board
    d. State Department of Public Health

B. Federal Agencies
    a. Sequoia National Forest and Sequoia and Kings Canyon National Parks
    b. Bureau of Land Management
    c. Army Corps of Engineers
    d. Bureau of Reclamation
    e. US Fish and Wildlife Service

C. General Public

D. Communities and NGOs

Partners:

A. RWMG;
B. California Department of Water Resources;
C. Provost and Pritchard Consulting Group;
D. Sierra Nevada Alliance;
E. Sierra Nevada Conservancy;
F. Tulare County;
G. Fresno County;
H. Sequoia National Forest;
I. Sierra National Forest;
J. Springville Public Utility District.

Appendix 2: Potential Press and Media Partners

A. Newspapers

a. The Porterville Recorder,
Judy Hall, Ad-Visor
(559) 784-5000 Ext. 1031
jhall@portervillerecorder.com

Donna Copeland, Ad-Visor
(559) 784-5000 Ext. 1030
dcopeland@portervillerecorder.com

b. Upper Tule River Association Newsletter

c. Springville Chamber of Commerce Newsletter
chamber@springville.ca.us

d. Kaweah Commonwealth
The Kaweah Commonwealth
P.O. Box 806
Three Rivers, CA 93271
(559) 561-3627

e. Visalia Times-Delta
P. O. Box 31
330 N. West Street
Visalia, California 93279
(559) 735-3200

f. Mountain Press
Auberry

g. Fresno Bee
1626 E Street
Fresno, CA 93786
(559) 441-6111

B. Radio Stations

a. KTIP

Appendix O

Regional Water Management Group Brochure

Get Involved!

The IRWM planning process is under way *now*. Become a part of the process, contribute to integrated water management in the Sierra Nevada, and ensure your agency goals and projects are represented!

Ways to stay informed and be involved:

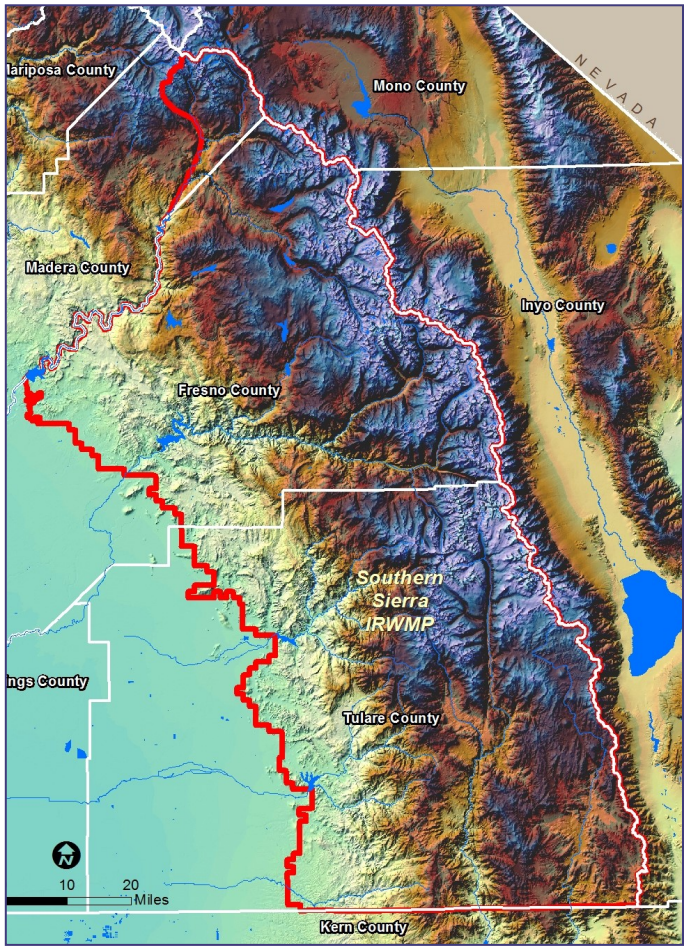
1. Attend Regional Water Management Group Meetings. The group meets on a bi-monthly basis in 2014;
2. Have your organization review and sign the Memorandum of Understanding which guides the process and ensures broad stakeholder involvement;
3. Submit projects and project ideas to the group for integration, development and potential funding;
4. Help write a grant, fund a project or assist with reaching other organizations with interests in water management;
5. Lend you or your agency's expertise!

Contact:

Chris Moi, Project Manager,
Sequoia Riverlands Trust
(559) 738-0211
chris@sequoiariverlands.org

Visit www.southernsierraRWMG.org for more information and to view a calendar of upcoming meetings and events.

The Southern Sierra RWMG Region



Southern Sierra RWMG:

427 Garden Street
Visalia, California 93277
Phone: (559) 738-0211
Fax: (559) 624-5555
E-mail: chris@sequoiariverlands.org

SOUTHERN SIERRA

REGIONAL WATER MANAGEMENT GROUP

Collaborating for Science-based Integrated Regional Water Management in California's Southern Sierra

An Integrated Approach to Regional Water Management

The Southern Sierra Regional Water Management Group (RWMG) is a voluntary collaboration of nonprofits, government agencies, and landowners committed to creating better water management outcomes for the Southern Sierra region – from the headwaters of the San Joaquin River south to the source of the Kern River, from the grand peaks of the Sierra Nevada east to the Valley foothills. The Southern Sierra RWMG is recognized by the state of California as an Integrated Regional Water Management (IRWM) group that has the authority to apply for project planning and implementation grants. As a group, they:

- Utilize sound science, best available data, and local knowledge to inform project decisions
- Foster a broad, long-term approach to increasing regional self-sufficiency and sustainable resource management
- Promote broad public engagement, coordination, and collaboration to leverage benefits across the region and reduces costs.

What is an Integrated Regional Water Management Plan (IRWMP)?

An IRWM Plan is a region-wide, voluntary planning document that identifies broadly supported, multiple-benefit water resource projects and programs. It is:

- Non-regulatory
- Collaborative
- Non-binding
- Consensus-based
- Generates multiple-benefit projects
- Integrates land use and water planning

An IRWM Plan is developed regionally and includes input from many diverse, local stakeholders. It investigates a broad spectrum of water resource issues, including water supply, flood and stormwater management, water quality, environmental ecosystem protection and restoration, recreation, land use and stakeholder involvement.

IRWM Plans integrate a variety of water management strategies to solve multiple challenges. IRWM Plans can attract state and other funding to support regional projects.

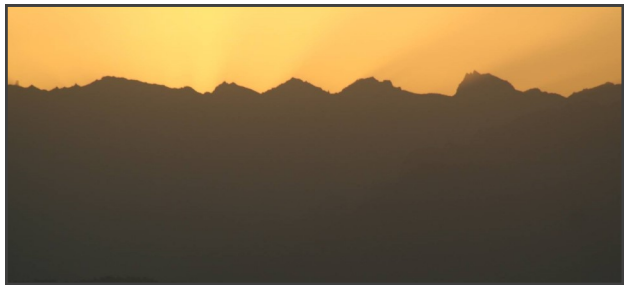
Proposition 84, approved by California voters in 2006, allocated $1,000,000,000 in funds for IRWM planning and the water-related project implementation. The IRWM program is entering into its third and final project implementation grant cycle.

Southern Sierra Regional Water Management Successes

The Southern Sierra IRWM planning effort began in 2008 when the Sierra Nevada Conservancy awarded Sequoia Riverlands Trust (SRT) $50,000 to identify stakeholders and organize public meetings.

After successfully forming the SS RWMG, SRT received $50,000 in facilitation support funds from DWR in 2010 and 2012 to continue engaging stakeholders in the IRWM process. In 2012, the SS RWMG applied for and received $520,000 to write its IRWMP.

In 2013, the SS RWMG submitted applications to implement three projects, of which two have been funded. The National Fish and Wildlife Foundation will fund the Long Meadow Restoration Project and DWR will conduct a hydrologic capacity study for the town of Three Rivers.



The SS RWMG is currently in the process of developing its IRWMP with support from Provost & Pritchard Consulting Group. The group is also considering projects to submit for funding through Round 3 of the IRWM grant cycle. Proposals are due in the fall of 2014.

Appendix P

Public Outreach Presentations

Integrated Regional Water Management in the Southern Sierra

By Owen Kubit, PE and David Norman
Provost & Pritchard Consulting Group

AWRA Conference on Integrated Water Resources Management

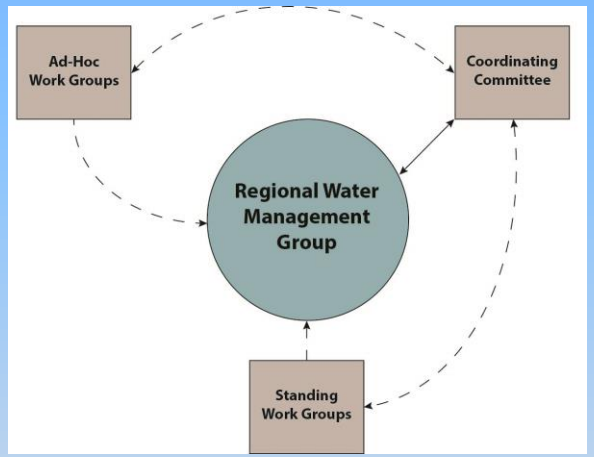
July 2, 2014

History of Southern Sierra Regional Water Management Group

- 2008 – Regional Water Management Group formed
  - Launch grant from Sierra Nevada Conservancy
  - No true regional or integrated planning before 2008
- 2009 - Memorandum of Understanding
- 2008 – 2014 - Meetings / public outreach / integration efforts
- 2012 - Received grant to prepare Regional Water Management Plan
- 2014 - Will complete Regional Water Management Plan

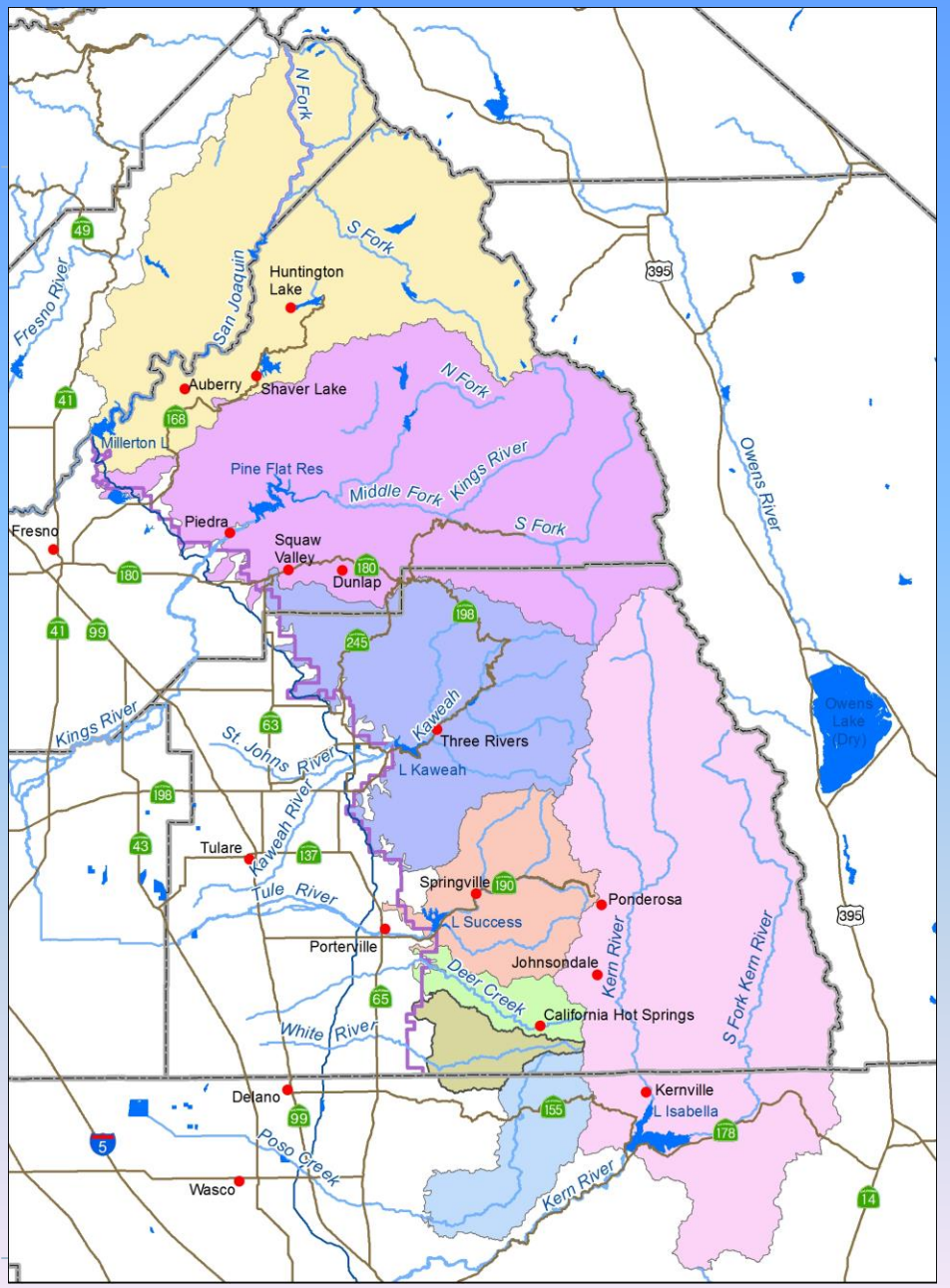
Membership and Governance

- Regional Water Management Group
  - 18 Members / Numerous Interested Parties
  - Open to any organization with interest in local water management
  - Organized under MOU
  - No annual dues (good and bad)
  - Meet bi-monthly
  - Voluntary / non-binding / non-regulatory
- Committees and Work Groups
  - Regional Water Management Plan preparation
  - Financing
  - Project selection



Watershed Map

- Eight different watersheds
- Small creeks to large rivers
- Only includes upper portion of watersheds
- Base of foothills to crest of Sierras
- Watersheds to vast agricultural lands in San Joaquin Valley



Principal Features of Region

- 4 million acres (6,200 square miles)
- Entirely within foothills and mountains
- Topography 600 to 14,000 feet
- Primarily granitic rock
- Covers three different counties in Central California

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP

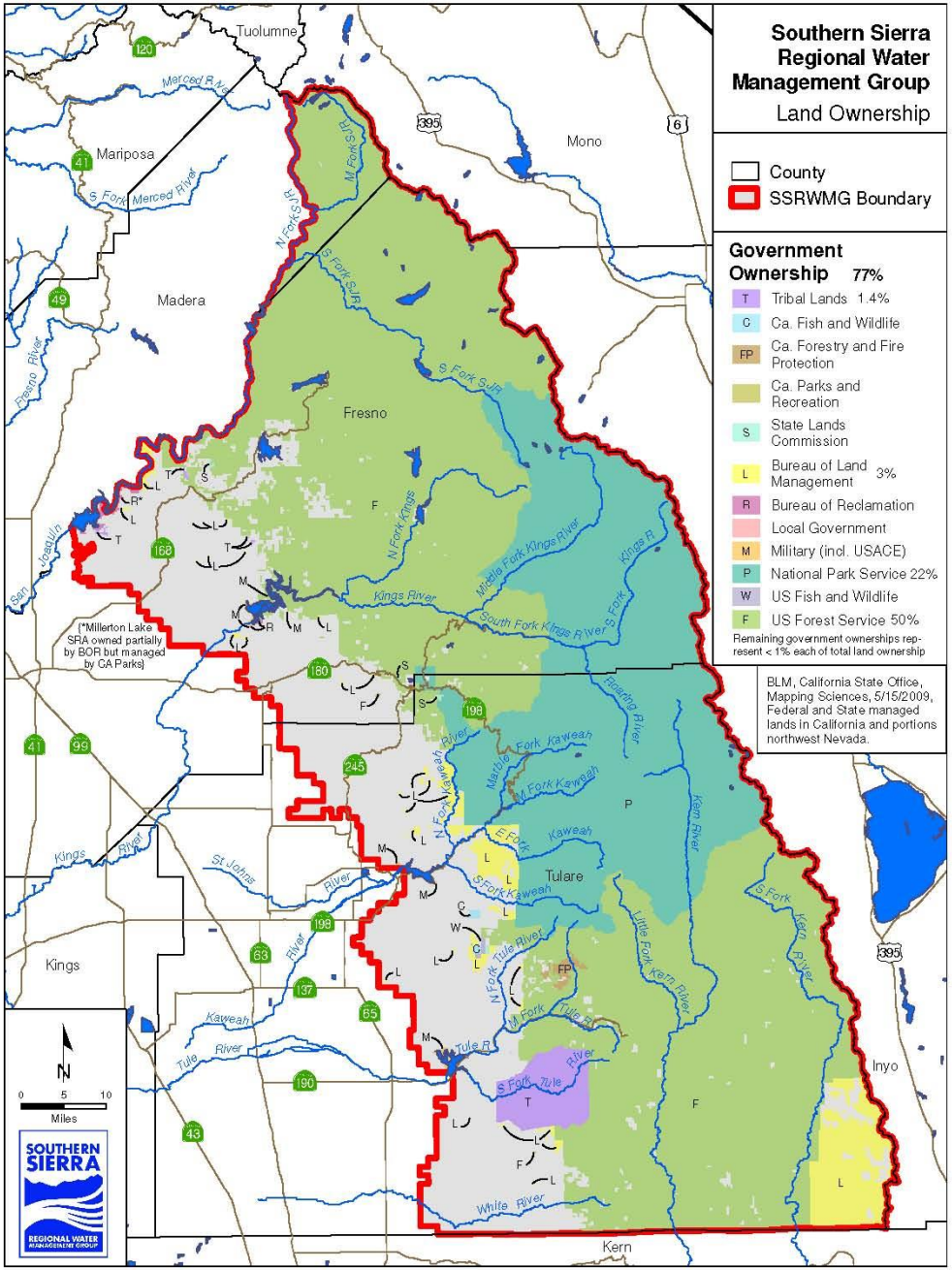
Unique Features of Region

- Lack of defined groundwater basins
- Vast quantities of surface water used outside of region
- Sequoia and Kings Canyon National Parks
- Giant Sequoia groves (including world's largest tree)
- Almost all wilderness / semi-wilderness areas

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP

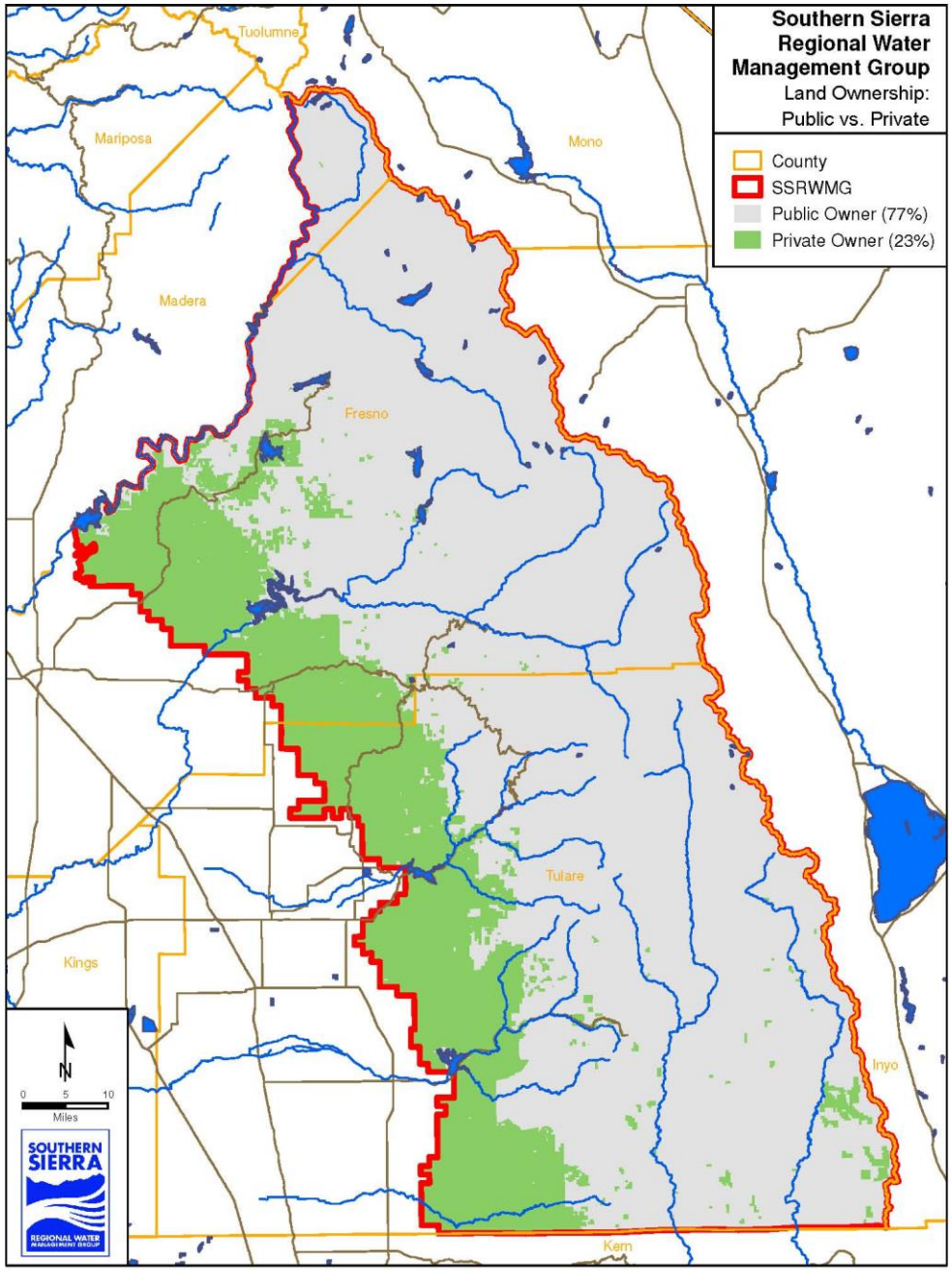
Land Ownership

- Large areas covered by National Forests or National Parks
- Three recognized Native American Tribes



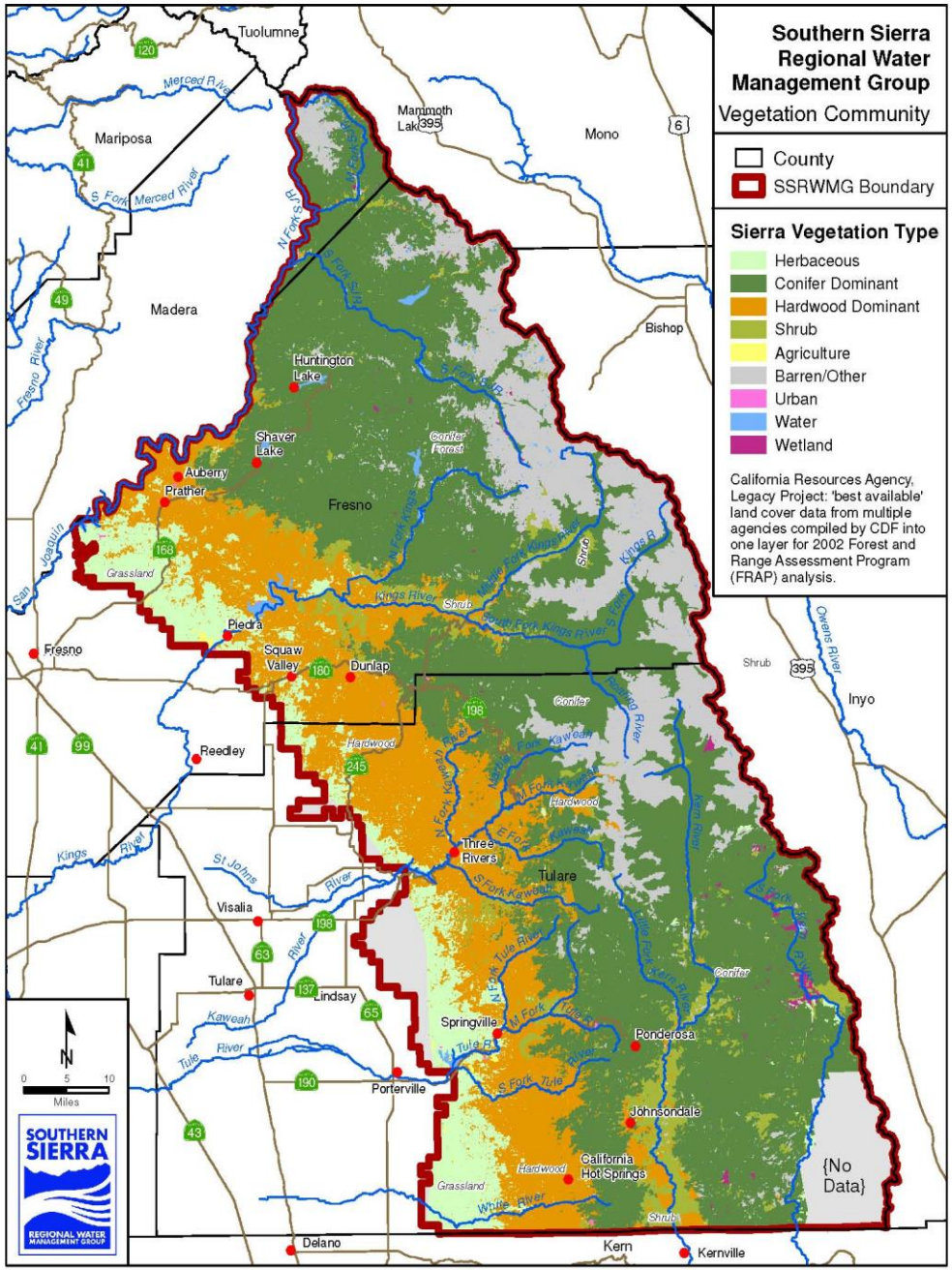
Federal / Private Land Ownership

- Primarily public lands
- Most public lands managed with water supply in mind
- Foothill areas largely privately owned ranches and farms.



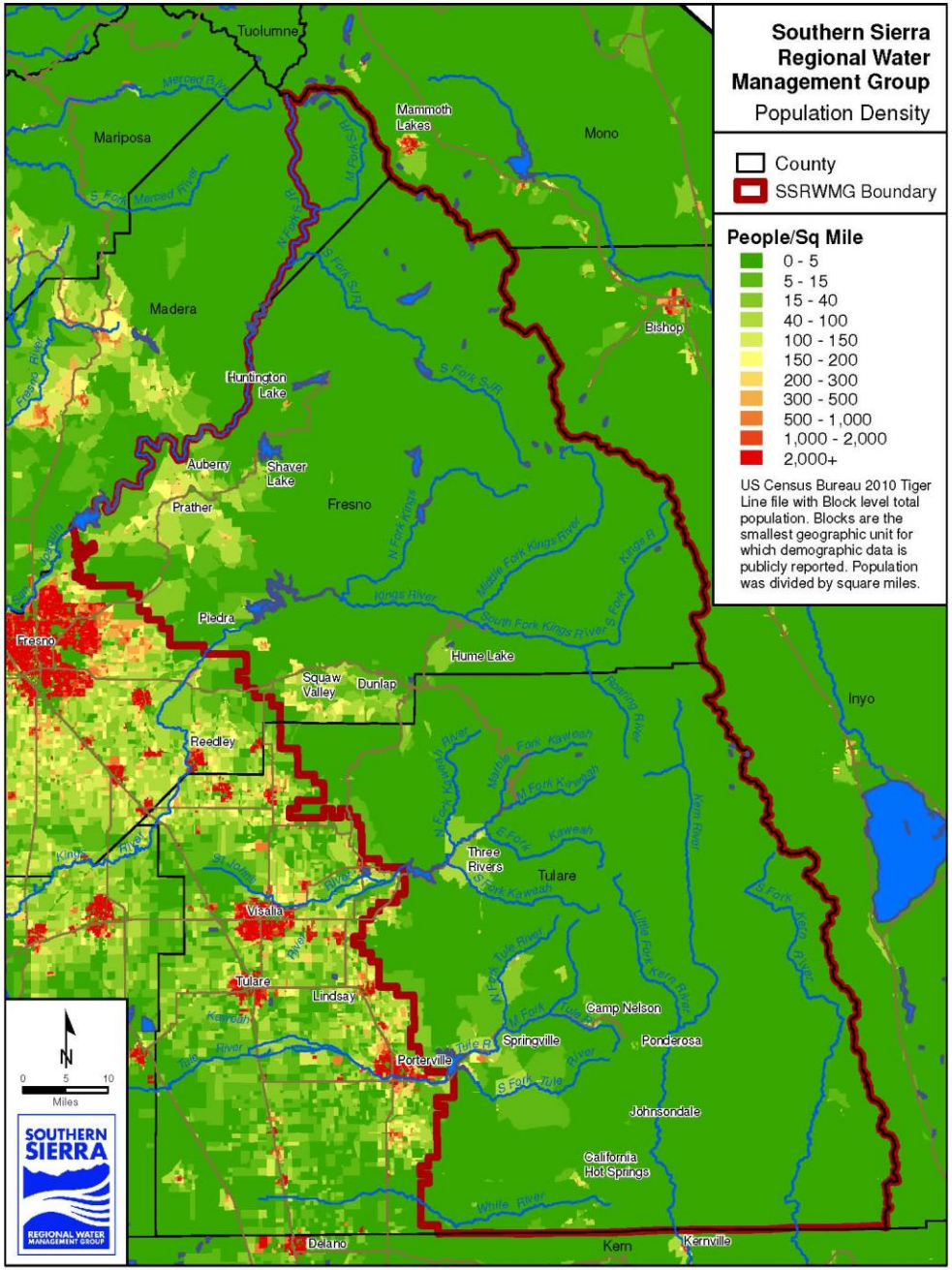
Land Uses

- Range from brush to forest to alpine
- Largely hardwood and coniferous forest
- Small areas of agricultural / urban lands



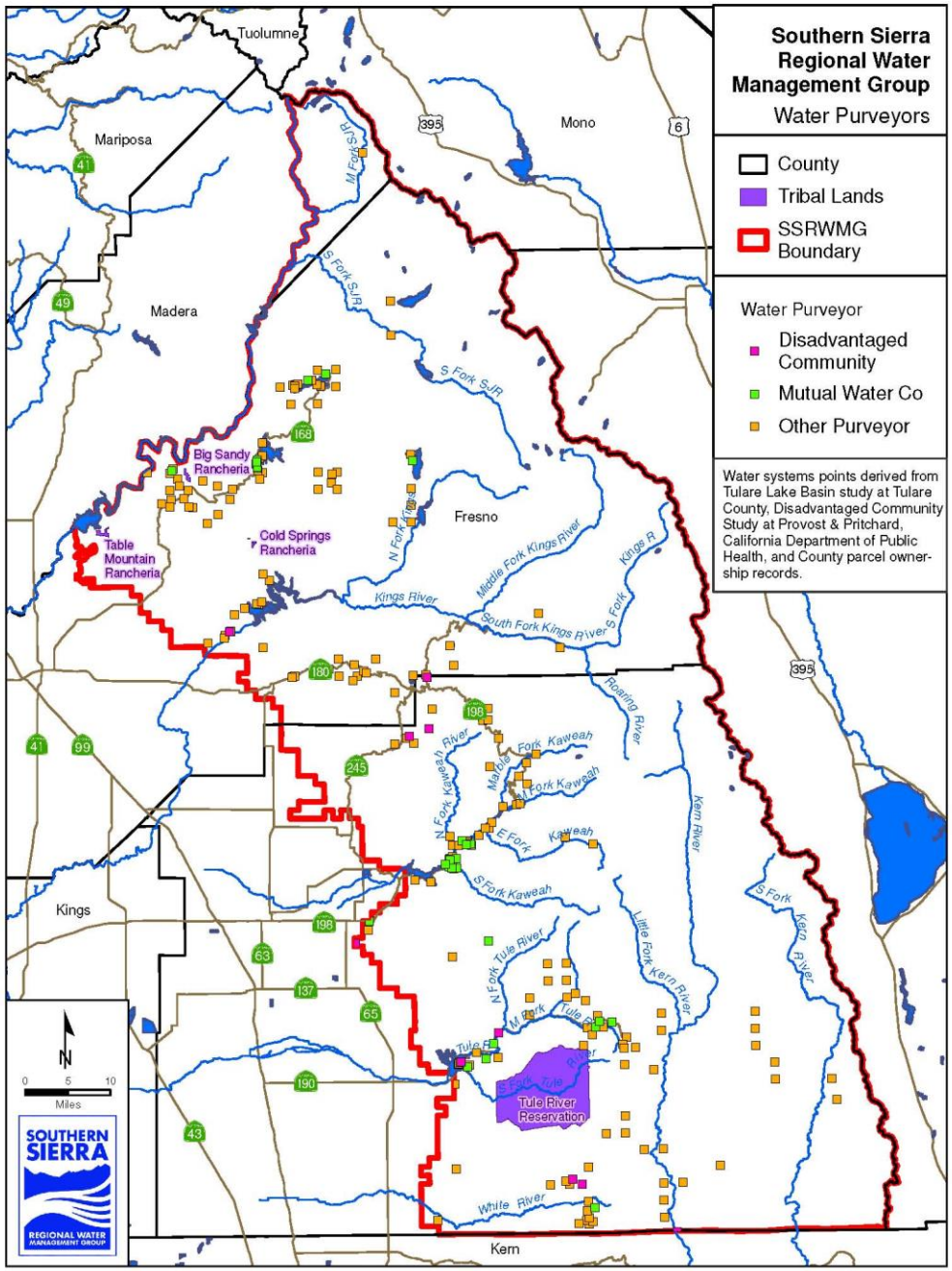
Population Density

- Entire area low population density
- No incorporated cities
- High population density downstream
- < 50,000 residents
- > 1.6 million visitors annually (stress on groundwater supplies)



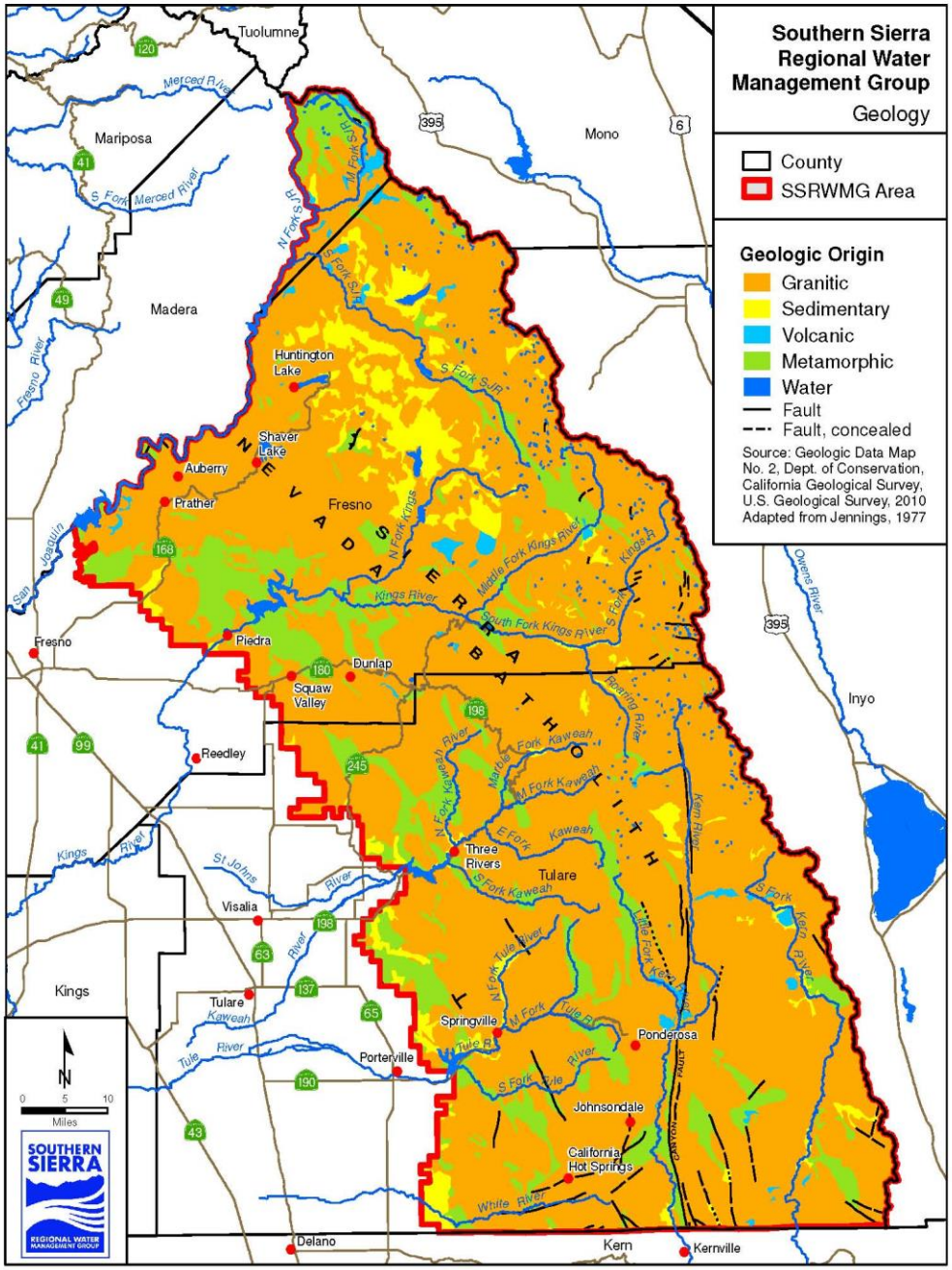
Water Purveyors

- Numerous water purveyors in region
- Most water purveyors very small – not represented in Regional Water Management Group
- Water purveyors generally in two groups:
  - Disadvantaged community
  - Affluent vacation community

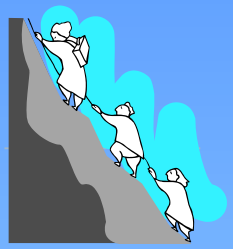


Regional Geology

- Primarily hard rock aquifers
- Shallow soil layers
- Granite most common rock type
- Small areas of alluvium along rivers



Water Management Challenges



- Large geographic area
- Small population
- Disadvantaged communities
- No large agency to lead Regional Water Management Group
- Shortage of water agencies with rate payers (Federal agencies, NGOs)

- Vast surface water supplies used outside of area
- Limited groundwater supplies
- Limited data on water resources

- Increasing development in foothills
- Numerous small water purveyors

- Impacts of fire on water supply/quality
- Septic systems / nitrate pollution

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP

Federal Land Management

- National Forests
  - Manage watersheds to improve water supply and quality (erosion control, forest thinning, road mang., etc.)
  - Develop forest products and resources
  - Constantly manipulating watersheds
  - Maintains / improves existing water infrastructure
- National Parks
  - Prefer to leave watersheds untouched
  - Removes infrastructure
  - Manage water through preservation (hands off approach)
  - Do little to 'manage' water
  - Do restore some damaged habitats (i.e. meadows)

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP

Groundwater and Surface Water

- Groundwater
  - No defined groundwater tables or basins
  - Primarily fractured granite
  - Low storativity / variable transmissivity
  - Difficult to quantify supplies
  - Replenishment unpredictable

- Surface Water
  - Vast quantities (millions of acre-feet) flow out annually
  - Fully appropriated in downstream areas
  - Used very little locally
  - Number one export from region

Regional Goals and Objectives

- Primary Goals:
  1. Improve Water Supply Management
  2. Protect and Improve Water Quality
  3. Perform Integrated Flood Management
  4. Improve Watershed / Environmental Resources Management
  5. Expand Stakeholder Education
  6. Protect Unique / Important Environmental Resources

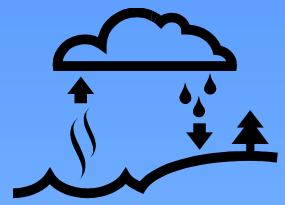
SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP

Climate Change Model

- Climate Change Model of Southern Sierra
  - Prepared by GEOS INSTITUTE
  - Evaluated climate, hydrology, vegetation and wildfire
  - Completed in May 2014
- A2 Climate Trajectory (business as usual)
- Certainty in Predictions
  - High – Temperature, snowpack
  - Medium – Severe storms, precipitation, wildfire
  - Low – Vegetation

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP

Climate Change Model (cont'd)



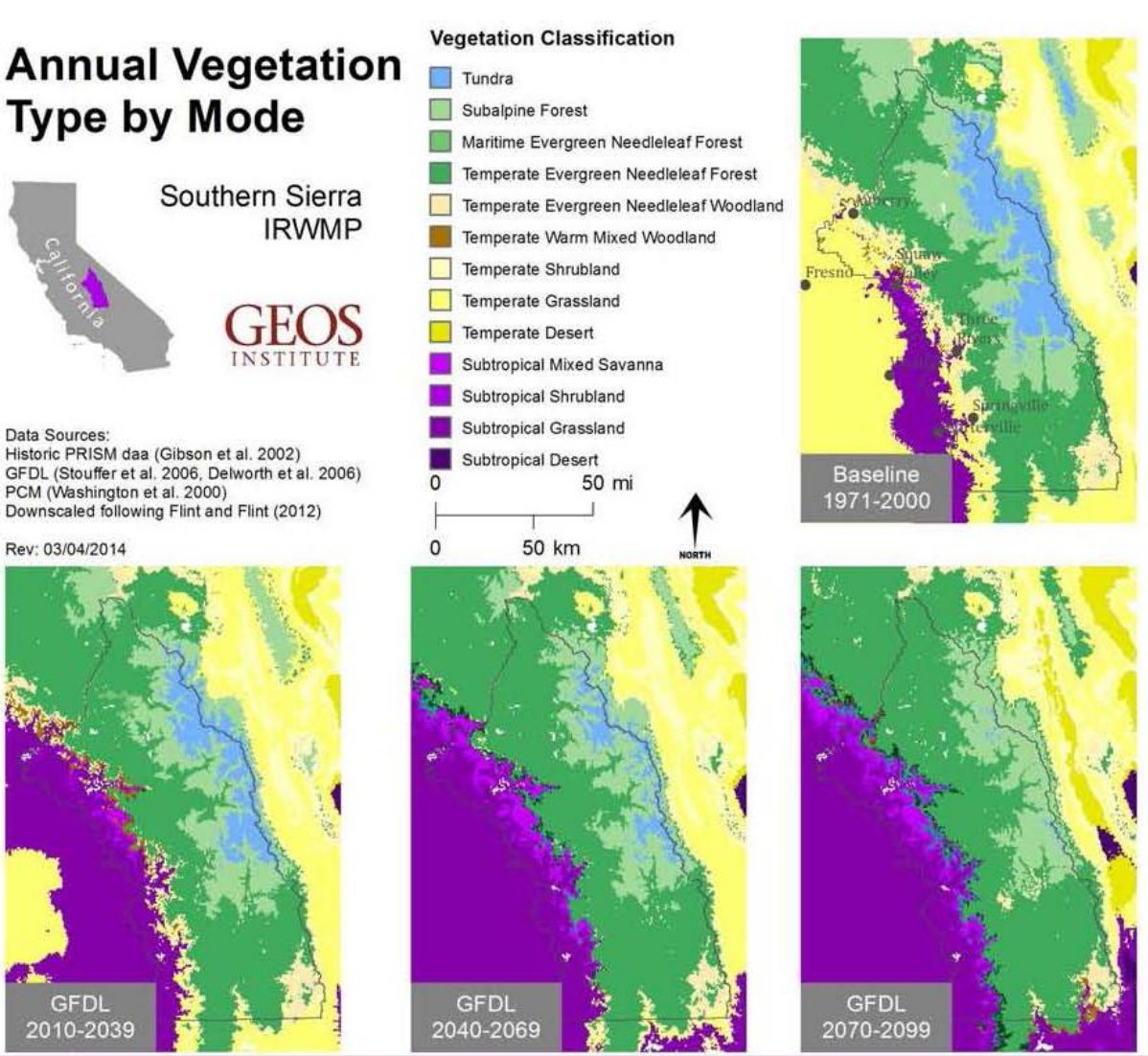
- Temperature Predictions:
  - 2010-2039 – (+1.2°)
  - 2040-2069 – (+2.1° to 2.2°)
  - 2070-2099 – (+3.4° to 4.1°)

- Precipitation Predictions
  - Vary from higher to lower
  - Overall drier conditions due to higher temp. and evapo-transpiration

- Hydrology
  - Changes already seen in flow, water temperature, storm intensity and seasonal timing
  - Runoff predictions
    - 2010-2039 – (-8% to +1.9%)
    - 2040-2069 (-1.7% to +0.4%)
    - 2070-2099 (-39% to +12%)

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP

Climate Change Model (cont'd)



Climate Change Model (cont'd)

- Future hydrology will not resemble the past
- Plan for change, even if precise trajectory uncertain
- No Regret Strategies promoted
  - "Strategies that benefit water management with or without climate change"

Integrated Regional Water Management Plan

- First truly regional, integrated effort
- Funded by California Dept. of Water Resources
- Required for eligibility for several grant programs
- Public process and collaboration
- Topics covered:
  - Goals and Objectives
  - Water Management Strategies
  - Stakeholder Outreach / Coordination
  - Climate Change
  - Project Review and Selection
  - many others

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP

Lessons Learned

1. Value of professional meeting facilitator
2. Importance of lead agency / regional water management agency
3. Importance of agencies with ratepayers
4. Difficulty identifying / ranking goals and objectives
5. Need for inter-regional projects across entire watershed OR regional water management groups that cover entire watershed

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT GROUP

Questions or Comments

SOUTHERN SIERRA REGIONAL WATER MANAGEMENT

September, 2014

Plan Briefing

SOUTHERN SIERRA
REGIONAL WATER MANAGEMENT GROUP

The IRWM Process

- ✓Voluntary
- ✓Non-regulatory
- ✓Non-binding
- ✓Collaborative
- ✓Consensus-seeking
- ✓Generates multiple-benefit projects
- ➢Integrate land use and water planning
- ➢Designed to be a stakeholder-driven plan
- ➢Implement the plan with projects

SOUTHERN SIERRA
REGIONAL WATER MANAGEMENT GROUP

The IRWM Process

Pre-planning
Grant Application

Complete

Planning
IRWM Plan

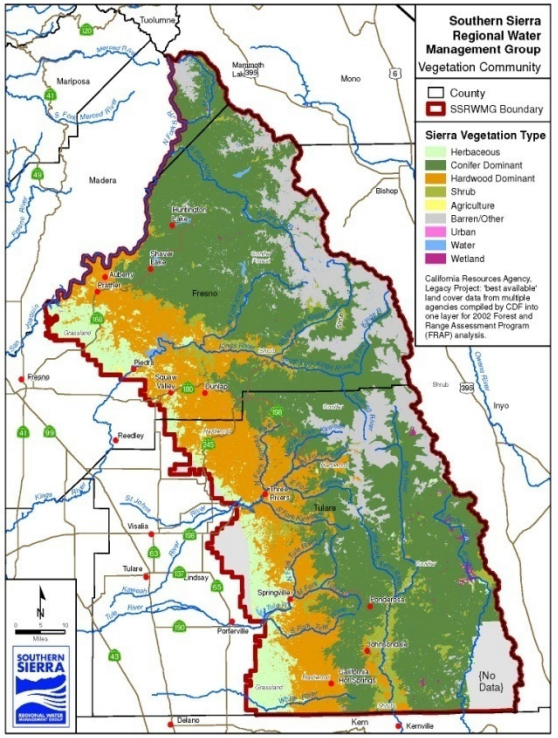
Beginning work now on IRWMP; Complete by Nov 2014

Implementation
Apply for project funding

Submitted DWR implementation grant application March, 2013
Call for projects, 2014

Region Description

- Largest Chapter in IRWMP
- Provides general regional description of IRWMP area (only a few details of individual entities provided)
- Provides background information to help inform decisions and planning
- Topics addressed include:
  - Watersheds
  - Water Supply/Demands
  - Water Quality
  - Biological/Environmental Issues
  - Social/Cultural Makeup
  - Membership
  - Boundaries



Regional Goals and Objectives

- Regional Goals and Objectives developed through collaborative process
- 6 Main Goals:
  1. Improve Water Supply Management
  2. Protect and Improve Water Quality
  3. Perform Integrated Flood Management
  4. Improve Watershed and Environmental Resource Management
  5. Expand Stakeholder Education
  6. Protect Unique/Important Environmental Resources
- Each Goal has 4 to 6 Measurable Objectives
- Six goals considered co-equal
- Objectives ranked (low, medium, high) through public survey

Objectives

- **1 - Improve Water Supply Management**
- Enhance natural water storage
- Increase understanding of water balance
- Increase capacity of water storage facilities
- Improve water use efficiency
- Mitigate and adapt to climate change impacts on water resources
- Promote sustainable water supplies for new human developments

2 - Protect and Improve Water Quality

- Protect natural water bodies
- Promote water quality best management practices
- Reduce erosion and sedimentation
- Promote storm water management planning and implementation
- Assess water quality of small water systems
- Study septic system impacts

3 - Perform Integrated Flood Management

- Address climate change impacts from flooding
- Integrate flood management with other activities
- Protect/restore floodplain connectivity
- Increase water storage capacity

4 - Improve Watershed and Environmental Resource Management

- Promote water quality best management practices
- Manage vegetation to reduce fire risk
- Reduce erosion and sedimentation
- Promote natural water storage
- Protect and restore floodplain connectivity

5 - Expand Stakeholder Education

- Perform community education on water issues
- Increase outreach to Native American Tribes
- Create and distribute water management best practices
- Increase outreach to disadvantaged communities
- Create RWMG website

6 - Protect Unique/Important Environmental Resources

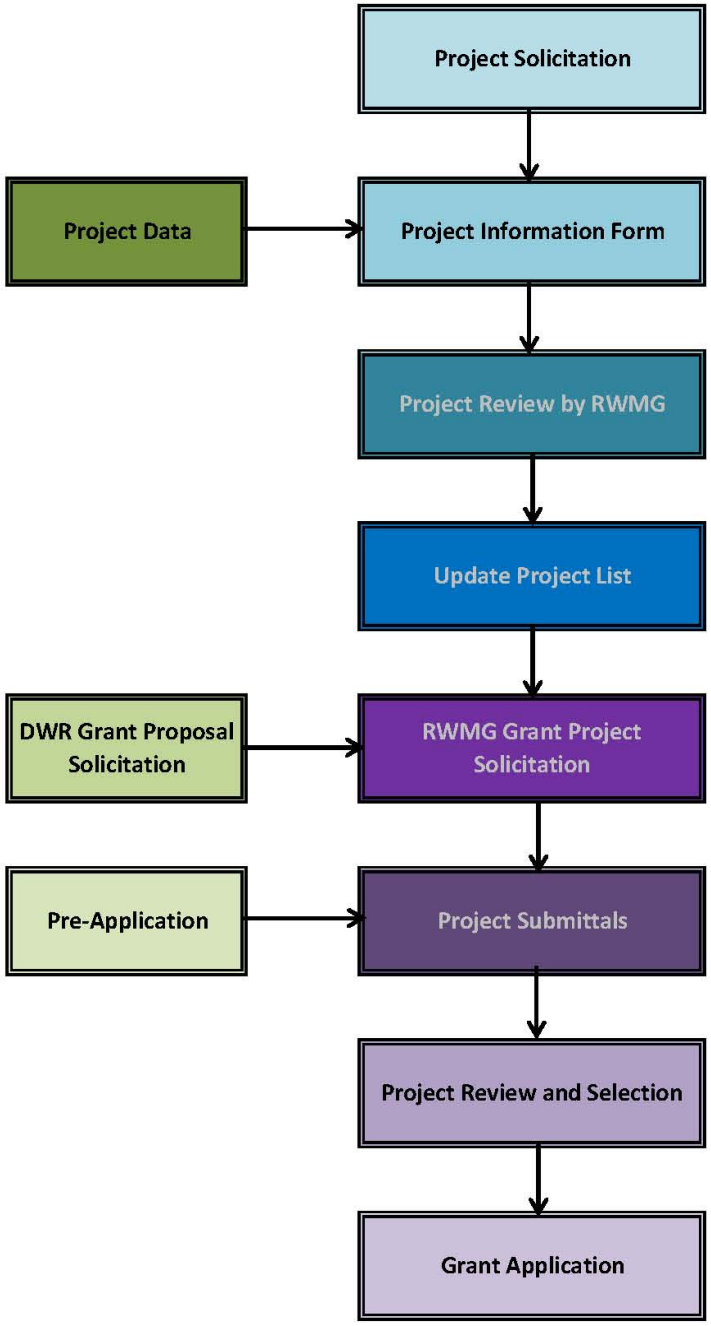
- Protect areas with high value to water storage and groundwater recharge
- Protect areas with high value to water quality protection and remediation
- Protect areas with high value to other water resources issues
- Enhance water management in already protected areas

Resource Management Strategies

- **Resource Management Strategy**: A project, program or policy that helps local agencies and governments manage their water and related resources (or simply 'water and land management strategies')
- 37 strategies evaluated → 32 applicable to area
- Examples:
  - Urban water conservation
  - Watershed management
  - Rainfed agriculture
  - Matching water quality to use
  - Drought planning
  - etc.

Project Review Process

- Project must be on official list to be considered for funding
- Project must be consistent with at least one goal/objective
- Detailed process for selecting projects for grant applications
- Preliminary work recommended
- Pre-application required



COMMENTARY: 2014 DROUGHT

Water management requires regional collaboration

Chris Moi

BobbyKamansky

In this year, when drought impacts grip the majority of California, identifying solutions to our water challenges is more imperative than ever.

The water challenges we face affect us on many levels, from the water that comes out of our tap, to the water that irrigates the food we eat, and that which filters back into the ground to restore underground aquifers. Managing this important resource is complicated and is marked by a contentious history.

In a shift toward collaborative, cross-jurisdictional and multiple-benefit water management, Integrated Regional Water Management refines the process for managing water challenges and opportunities. IRWM works off the premise that outcomes are more sustainable when a diversity of viewpoints agree on solutions; when multiple benefits are maximized; and when planning efforts transcend federal, state, county, and local jurisdictions. At a time when economic and human capacities are stretched thin, collaboration expands a region's collective resources to effect meaningful change.

The Southern Sierra Regional Water Management Group formed in 2008 to do just that. The RWMG is a voluntary collaboration of nonprofit organizations, agencies, local water/flood/conservation districts and landowners recognized by the California Department of Water Resources as the IRWM group for the Southern Sierra Region. For the past six years, the group has convened public meetings to plan and implement creative water-management solutions that enhance the natural resources and human communities in the expansive region.

The Southern Sierra Region, one of the more severely drought-impacted areas of California, is critically important to all southern San Joaquin Valley residents, and beyond. The region includes many of California's most precious natural resources: Sequoia and Kings National Parks; Sequoia, Sierra and Inyo National Forests; Devils Post Pile National Monument; and the upper watersheds of the San Joaquin, Kings, Kaweah, Tule, Deer, White and Kern rivers, in addition to several smaller watersheds. The boundaries of the Southern Sierra Region include the foothill and Sierra Nevada portions of Madera, Fresno and Tulare Counties as well as Native American tribal lands.

Water is the largest export of the region. The Sierra Nevada's snowy peaks form the headwaters of several major rivers, which pass through storage facilities to supply clean water to Valley cities, farms, ecosystems and underground aquifers. Those headwaters irrigate millions of acres of the nation's top-producing farmland and support more than two million seasonal visitors from around the world, which also supports the local economy.

Careful, collaborative management of this special region is critical.

To that end, the RWMG recently released its Southern Sierra Integrated Regional Water Management Plan, a voluntary, non-regulatory planning document that identifies consensus-based water resource projects and programs for the 6,200 square-mile region. The plan is available on the RWMG website for review and public comment. Public comments will be accepted through Oct. 26.

The SSIRWM Plan is an important planning document; moreover, it is a tool to attract state and federal funding to this large, rugged, and sparsely-populated region, which has struggled to compete for project funding. Once the plan is approved, the RWMG will focus on bringing in resources to implement the plan and its multiple-benefit projects aimed at improving conditions for the watershed, both upstream and downstream.

Examples of multiple-benefit projects and programs include those that improve water quality, provide better flood management, restore and enhance ecosystems, and create more reliable water supplies. Such multiple-benefit projects are our best shot at managing California's erratic precipitation patterns in the face of increasing water demands and a changing climate.

Even when the state is not gripped in drought, we are between potentially devastating dry spells and should plan accordingly. Or we are flooded by storm water that overwhelms our natural and human infrastructure.

In this time of drought, we should remind ourselves that we are all stakeholders in the integrated management of our most precious and limited resource, water. Successful, sustainable water management requires collaborative, regional, and resourceful multiple-benefit project planning and implementation, which also depends largely on an informed, voting citizenry.

TERESA DOUGLASS

Snow on the Sierra Nevada.

INFORMATION

Learn more about the Southern Sierra RWMG and its IRWMP at *www.southernsierrarwmg.org*.

Public comments will be accepted through Oct. 26.

Chris Moi is Land Transaction Director for the Sequoia Riverlands Trust, and Bobby Kamansky is Principal Biologist with Kamansky's Ecological Consulting.

Appendix Q

Public Notices

VISALIA TIMES-DELTA
www.VisaliaTimesDelta.com
Tulare Advance-Register
www.TulareAdvanceRegister.com

Visalia Times-Delta/Tulare Advance-Register
PO Box 31 - 330 N West St
Visalia CA 93291
(559) 735-3333

Order Confirmation For Ad #0000260202

Customer # 41047
SEQUOIA RIVERLANDS TRUST,
427 S GARDEN ST
VISALIA CA 93277 USA
Customer Phone: 559-738-0211
Customer EMail: chris@sequoiariverlands.org

Payor Customer # 41047
SEQUOIA RIVERLANDS TRUST,
427 S GARDEN ST
VISALIA CA 93277 USA
Payor Phone: 559-738-0211

PO Number:
Ordered By: Chris Moi
Customer Fax:
Special Pricing: None
Sales Rep: mdperez
Order Taker: mdperez
Order Source: Phone

Tear Sheets	Proofs	Affidavits @ $10.00	Blind Box	Promo Type
0	0	1		

Materials

Net Amount	$149.30
Tax Amount	$0.00
Total Amount	$149.30
Payment Amount	$0.00 -
Amount Due	$149.30

Ad Order Notes

Invoice Text

Ad Number	Ad Type	Ad Size	Color	Production Method	Production Notes
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External Ad Number	Ad Attributes	Ad Released	Pick Up
		No	

Product Information	Placement/Classification		Start Date	# Inserts
Visalia Times-Delta::	Legals	9060-Public Notices	7/24/2013, 7	2
Online-VTD/TAR::	Legals	9060-Public Notices	7/24/2013, 7	2

Ad Content

NOTICE OF INTENTION TO PREPARE AN INTEGRATED REGIONAL WATER MANAGEMENT PLAN

PUBLIC NOTICE IS HEREBY GIVEN that the Southern Sierra Integrated Regional Water Management Group (Group) intends to prepare an Integrated Regional Water Management Plan (IRWMP). The IRWMP will identify strategies and projects to meet the water needs of the Southern Sierra region. A public meeting is scheduled for August 8, 2013, 1 to 4 pm, at the Sierra National Forest Headquarters Office, 1600 Tollhouse Rd., Clovis, CA 93611, to provide attendees with an overview of the IRWMP and an opportunity to comment. Interested parties that wish to provide input to the IRWMP may submit comments to the Project Manager, Chris Moi, at chris@sequoiariverlands.org. This Notice has been prepared in accordance with Government Code 6066.
Pub: July 24, 31, 2013 #260202

NOTICE OF INTENTION TO ADOPT
SOUTHERN SIERRA INTEGRATED REGIONAL WATER MANAGEMENT PLAN

NOTICE IS HEREBY GIVEN that the Southern Sierra Regional Water Management Group (RWMG) plans to adopt their Integrated Regional Water Management Plan (IRWMP). The IRWMP was prepared in accordance with the State of California Department of Water Resources IRWMP Guidelines. The IRWMP includes groundwater, surface water, flood control, and watershed management objectives for the southern Sierra Region covering parts of Madera, Fresno and Tulare Counties. The IRWMP also includes planned strategies to accomplish the objectives of the IRWMP. Additional information on the RWMG and a draft copy of the IRWMP can be found at http://www.southernsierrarwmg.org/. Hard copies of the IRWMP are also available for review at Springville Public Utility District's office; Three Rivers Branch Library; Auberry Elementary School; Sequoia Riverlands Trust's office in Visalia.

Landowners and other interested parties who wish to provide comments on the draft IRWMP may submit them in writing through October 26, 2014 to Chris Moi at Sequoia Riverlands Trust, 427 South Garden Street, Visalia, CA 93277 or at chris@sequoiariverlands.org. A RWMG meeting, open to the public, will be held at 9:00 am on November 13, 2014 at the Provost & Pritchard Office, 130 N. Garden Street, Visalia, CA 93291 to adopt the updated IRWMP. This Notice has been prepared in accordance with Government Code 6066 requirements per the IRWMP Guidelines.

Appendix R

Letters of Agreement with Neighboring RWMGs

2037 W. Cleveland Ave.
Madera, CA 93637-3593
(559) 661-6333
FAX (559) 675-7639
TDD (559) 675-8970

RESOURCE MANAGEMENT

AGENCY

Rayburn Beach, Director

DATE: October 14, 2008

TO: Board of Supervisors

FROM: Greg Farley, County Engineer

SUBJECT: Coordination with South Sierra IRWMP Planning Committee on 'Joint Madera-South Sierra IRWMP Overlap Area

Recommendation: That your Board conceptually agree to support a 'Joint Madera – South Sierra IRWMP Overlap area' and appoint a representative to work with the South Sierra IRWMP Planning Committee.

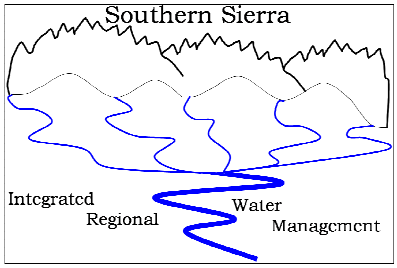
In 2005 Madera County received a grant from the Department of Water Resources (DWR) to create an Integrated Regional Water Management Plan (IRWMP) for the County. This planning process has been completed, and the IRWMP was adopted by the Board of Supervisors last April. The 'region' covered by the plan is defined as the Madera County jurisdictional boundaries.
DWR will be funding a new round of IRWMP planning grants in the near future. The Southern Sierra foothill region has begun to prepare for this application process, under the auspices of the newly formed South Sierra IRWMP Planning Committee. The 'region' they are contemplating currently includes most of the foothill areas in Kern, Tulare and Fresno Counties. Because DWR is moving to a more 'watershed-based' approach, the Planning Committee would also like to include the San Joaquin River watershed in the regional boundaries, including the portions that are in Madera County. This would mean that the Madera County portion of the San Joaquin River watershed would be included in two IRWMPS – the Madera County IRWMP and the South Sierra IRWMP.

The Department of Water Resources has indicated that such IRWMP overlap is not a problem. In fact, for the cross-over area inclusion in both plans could be an advantage. For example, specific water management projects may be targeted as priorities in one plan but not the other. This will increase the options for funding for the cross-over area. There is also the possibility of having management projects that are agreed upon by the two IRWMP's, giving those issues greater credibility and funding chances.

The South Sierra IRWMP Planning Committee is requesting that Madera County conceptually agree to the IRWMP overlap in the Madera County portion of the San Joaquin River watershed. They have proposed that the overlapping area be termed the "Joint Madera – South Sierra IRWMP Collaboration Area". They also propose that the governance bodies of the two plans should enter into a conceptual agreement or MOU on how to handle projects and issues that arise in the joint area. This agreement would not bind or restrict either group but would set forth some suggestions on how to communicate and collaborate on plans and projects and how to handle any potential disputes or issues that might arise. They have requested that the Board of Supervisors appoint a representative to work with the South Sierra IRWMP in drafting the conceptual agreement or MOU on the joint area.

This request was considered and approved by the Water Advisory Commission in its meeting of September 18, 2008. It is recommended that the Board appoint one of the Commissioners as its representative to work with the South Sierra IRWMP.

Fiscal Impact: There will be no fiscal impact from this item.



427 Garden Street
Visalia, CA, 93277

DATE: November 14, 2008

TO: Board of Supervisors

FROM: The South Sierra IRWMP Planning Committee

SUBJECT: Coordination with South Sierra IRWMP Planning Committee on 'Joint Madera-South Sierra IRWMP Overlap Area

Request: That the Madera County Board of Supervisors conceptually agree to support a 'Joint Madera – South Sierra IRWMP Overlap area' and appoint a representative to work with the South Sierra IRWMP Planning Committee.

In 2005 Madera County received a grant from the Department of Water Resources (DWR) to create an Integrated Regional Water Management Plan (IRWMP) for the County. This planning process has been completed, and the IRWMP was adopted by the Board of Supervisors last April. The 'region' covered by the plan is defined as the Madera County jurisdictional boundaries.

DWR will be funding a new round of IRWMP planning grants in the near future. The Southern Sierra foothill and mountain region has begun to prepare for this application process, under the auspices of the newly formed South Sierra IRWMP Planning Committee. The 'region' we are contemplating currently includes most of the foothill and mountain areas in Kern, Tulare and Fresno Counties. Because DWR is moving to a more 'watershed-based' approach, the Planning Committee would also like to include the San Joaquin River watershed in the regional boundaries, including the portions that are in Madera County. This would mean that the Madera County portion of the San Joaquin River watershed would be included in two IRWMPS – the Madera County IRWMP and the South Sierra IRWMP.

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The South Sierra IRWMP Planning Committee requests that the Madera County Board of Supervisors conceptually agree to the IRWMP overlap in the Madera County portion of the San Joaquin River watershed. We propose that the overlapping area be termed the "Joint Madera – South Sierra IRWMP Collaboration Area". We also propose that the governance bodies of the two plans should enter into a conceptual agreement or MOU on how to handle projects and issues that arise in the joint area. This agreement would not bind or restrict either group but would set forth some suggestions on how to communicate and collaborate on plans and projects and how to handle any potential disputes or issues that might arise. We request that the Board of Supervisors appoint a representative to work with the South Sierra IRWMP in drafting the conceptual agreement or MOU on the joint area.

This request was considered and approved by the Water Advisory Commission in its meeting of September 18, 2008. The Water Commission recommended that the Board appoint one of the Commissioners as its representative to work with the South Sierra IRWMP.

Fiscal Impact: There will be no fiscal impact from this item.

Draft Conceptual Agreement/MOU regarding Joint Area Covered by the Madera County IRWMP and the South Sierra IRWMP
Draft 9/12/08

Recitals: Whereas

- Madera County has adopted an Integrated Regional Water Management Plan (IRWMP) in which the 'region' is defined as the County's jurisdictional boundaries.

- A partnership in the South Sierra region is developing a South Sierra IRWMP (SSIRWMP) in which the regional boundaries are based on watersheds. The Upper San Joaquin River Watershed is included in the Plan's 'region'.

- The Upper San Joaquin River Watershed is partially in Madera County. This area will therefore be jointly covered by two IRWMPs, (the Joint Area).

- The South Sierra IRWMP Planning group and Madera County (hereafter 'Entities') wish to avoid disputes over management of this joint area and establish communication and collaboration procedures between the two Entities with the goal of maximizing effective water and watershed management.

Therefore, the Madera County Board of Supervisors and the South Sierra IRWMP Planning Committee enter into this Memorandum of Understanding (MOU) consisting of the following policies and procedures for planning and management of the Joint Area.

1. Communication – Within 90 days of executing this Agreement each Entity will select a planning/policy body to be actively involved in communication and collaboration with the other Entity regarding the Joint Area. Each planning/policy body will appoint a contact person to receive communications and requests from the other Entity and to take the necessary steps to assure that they are addressed.

2. Planning – Each Entity will make every reasonable effort to include the other Entity in the development and completion of plans which address or impact the Joint Area. Prior to the adoption of any such plan, each Entity will provide written notice to the other of the proposed plan's impact on the Joint Area and will provide sufficient time (a minimum of 90 days) for the other Entity to analyze and comment on the proposed plan. All such comments will be included in the final version of the proposed plan.

3. Requests for Funding and other Resources – When seeking resources (grant applications, technical assistance requests, etc.) for activities that address or impact the Joint Area, each Entity will make every reasonable effort to include the other Entity in the development of such applications and requests. Prior to the submission of any such request, each Entity will provide written notice to the other of the proposed request's impact on the Joint Area and will provide sufficient time (a minimum of 30 days) for the other Entity to analyze and comment on the proposed request. All such comments will be included in the final version of the proposed request.

4. Management Activities - Prior to initiating any management activities in the Joint Area, each Entity will inform the other of the proposed activity and provide sufficient time (a minimum of 45 days) for the other Entity to communicate concerns or suggestions. This process will not substitute for any CEQA, NEPA notification/comment process or any other notification otherwise required.

5. Disputes – If a dispute or serious disagreement arises between the Entities regarding water or watershed management of the Joint Area, the Entities will make every reasonable effort to engage in alternative dispute resolution, including mediation and/or arbitration, prior to taking legal action.

6. Sharing Data – Each Entity agrees to make all non-confidential studies, reports and data regarding the Joint Area available to the other Entity upon request.

7. Non-Interference - Nothing in this MOU will be construed to require modification of each Entity's established decision-making or governance process.

Signed and Agreed:

Madera County_____ South Sierra IRWMP Planning Group___

By Authorized Representatives:

_____ _____

Date:_____ _____

United States Department of the Interior

NATIONAL PARK SERVICE
Devils Postpile National Monument
P. O. Box 3999
Mammoth Lakes, California 93546
760-934-2289

L317

March 9, 2009

Norman Shopay
Department of Water Resources
PO Box 942836
Sacramento, CA 94236

Subject : Devils Postpile National Monument within Madera, Southern Sierra, and Mono/Inyo IRWMP

Dear Mr. Shopay,

Thank you for the opportunity for inclusion of Devils Postpile (DEPO) into the Integrated Regional Management Groups process that is underway within California. The purpose of this letter is to inform Dept of Water Resources of an agreement between Madera, Southern Sierra, and Mono/Inyo IRWMPs to identity this as an area of shared interest and overlapping boundaries, and to request approval of this agreement to help facilitate the regional acceptance process.

Devils Postpile National Monument is located near the headwaters of the Upper Middle Fork of the San Joaquin in Madera County, and can only be accessed by road from the Town of Mammoth Lakes in Mono County CA. Devils Postpile is at the core of the glaciated river valley with abundant wetlands and wildlife, and as a National Park Service unit is a destination visited by many people that brings satisfaction to them and revenue to the local gateway communities in Mono County. The Monument which is along the Upper Middle Fork of the San Joaquin in Madera County is interconnected to Mono County by the shared groundwater aquifer on Mammoth Mountain, migratory corridors for wildlife and shared biodiversity, and the ecotourism benefits to the gateway communities. By maintaining a healthy watershed, biodiversity and migratory corridors will be preserved, while there is a clean and sustainable water supply for downstream users. Additionally, visitors and gateway communities will benefit from the recreational and ecotourism benefits, and an intact watershed will reduce risk of catastrophic fires and eroded slopes that could cause flooding and siltation and have a negative impact on gateway communities sustainable tourism economy and downstream users. Another important aspect of insuring the watershed's integrity, is maintaining the resilience of the watershed and the ability to adapt to climate change scenarios that may significantly impact water resources.

IRWMPs share the goals of understanding the watershed resources, and making sound decisions. Through the discussions among the representatives of the Madera, Southern Sierra, and Inyo/Mono IRWMP, and DEPO, there is consensus that it is important to include DEPO in these IRWMPS and include each other in discussions that affect this shared area of interest. Thank you again for your consideration, and if any further information can be provided, please contact me.

Sincerely,
/s/ Deanna M. Dulen
Superintendent

INYO-MONO INTEGRATED REGIONAL WATER MANAGEMENT PLANNING PROJECT

TO: Mr. Svetich

State of California
Department of Water Resources
Division of Planning and Local Assistance

FROM: Dr. Mark Drew, Project Manager, Inyo-Mono IRWMP Launch Project

SUBJECT: Integrated Regional Water Management-Letter of Agreement on Regional Boundaries

DATE: 4/1/2009

CC: Tracie Billington, Department of Water Resources
Jim Lin, Department of Water Resources

Dear Mr. Svetich:

This Letter of Agreement establishes that the undersigned Regional Water Management Groups (RWMGs) accept a common shared boundary for purposes of defining their respective IRWM Regions, as set forth in the Department of Water Resources' (DWR) 2009 *Final IRWM Region Acceptance Process Guidelines*. The shared boundary between the South Sierra RWMG and the Inyo-Mono RWMG is defined in the paragraph below.

Shared Boundary Description:

The majority of the shared boundary between the South Sierra RWMG and the Inyo-Mono RWMG will follow the crest of the Sierra Nevada range, which also follows the Inyo and Mono County jurisdictional lines to the east and Tulare and Fresno County jurisdictional lines to the west. In Kern County, the South Sierra and Inyo-Mono RWMGs are separated by the Sierra Nevada crest, a watershed boundary.

On behalf of the South Sierra Regional Water Management Group:

Bobby Kamansky, South Sierra IRWMP Project Manager
Lead Agency: Sequoia Riverlands Trust
Contact: Mr. Bobby Kamansky
Phone number: (559) 298-3311

On behalf of the Inyo-Mono Regional Water Management Group:

Mark Drew, Inyo-Mono IRWMP Launch Project Manager
Lead Agency: California Trout
Contact: Dr. Mark Drew
Phone number: (760) 924-1008

Tule IRWMP Letter

TO: MR. SVETICH

State of California
Department of Water Resources
Division of Planning and Local Assistance
Attn. Ralph Svetich
Post Office Box 942836
Sacramento, CA 94236-0001

FROM: MR. BOBBY KAMANSKY, PROJECT MANAGER

SUBJECT: INTEGRATED REGIONAL WATER MANAGEMENT-LETTER OF AGREEMENT ON REGIONAL BOUNDARIES

DATE: 6/18/2009

cc: Tracie Billington, Department of Water Resources
Jim Lin, Department of Water Resources

Dear Mr. Svetich:

This Letter of Agreement establishes that the undersigned Regional Water Management Groups (RWMGs) accept a common shared boundary for purposes of defining their respective IRWM Regions, as set forth in the Department of Water Resources' (DWR) 2009 *Final IRWM Region Acceptance Process Guidelines*. The shared boundary between the South Sierra RWMG and the Tule RWMG is defined in the paragraph below.

Shared Boundary Description:

In the Tule River Area, the SSIRWMP boundary includes the Tule River Indian Reservation and down to approximately the 600-foot contour in all forks of the Tule and squared to section lines. The Tule IRWMP planning area will follow irrigated lands while the SSIRWMP will follow rangeland in the mountains.

The parties will work to maintain communication and collaboration on a variety of watershed-based issues.

On behalf of the South Sierra Regional Water Management Group:

_____

Lead Agency: Sequoia Riverlands Trust
Contact: Mr. Bobby Kamansky
Phone number: (559) 287-3311

On behalf of the Tule Regional Water Management Group:

Lead Agency:
Contact: David Hoffman
Phone number: