



Sustainability Indicators Workshop

August 24, 2011

MEETING SUMMARY

**CALIFORNIA WATER PLAN: UPDATE 2013
SUSTAINABILITY INDICATORS WORKSHOP
AUGUST 24, 2011 1:15 P.M. – 4:45 P.M.
CALEPA, COASTAL HEARING ROOM
1001 I STREET, SACRAMENTO, CA**

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Action Items

- Add the links to the meeting materials webpage for: the CPUC California Water Action Plan 2010; SAP software, 2010 Green Innovation Index.
- To scope the definition for water sustainability, use the question of “who and what” is to be sustained.
- Clarify the adaptive management aspect within the Sustainability Indicators Framework.
- Workshop members will email additional written comments to cwpc@water.ca.gov.

Welcome and Introductions

Kamyar Guivetchi, DWR Chief of Division of Statewide Integrated Water Management, introduced himself to workshop participants. He explained that the Water Plan is one of projects that he especially enjoys – he has worked on Updates 2005, 2009 and now 2013. He welcomed everyone in the room and on the webcast, noting that this workshop is the first public meeting on water sustainability indicators. The topic of sustainability was introduced in Update 2009, and this topic will interact with all of the content for Update 2013. Specifically, it will be important to describe the impacts of the different Water Plan actions and recommendations on water resources. Mr. Guivetchi extended his appreciation to those contributing to the overall effort. Introductions were then made around the room and webcast participants were acknowledged.

Overview of the Water Plan and Sustainability Indicators

Paul Massera, Program Manager for Water Plan Update 2013, reviewed four key policy questions that inform decision support for integrated water management (IWM):



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- How can sustainability be defined in terms of IWM?
- What are California's objectives for sustainability?
- What actions or strategies would support sustainability objectives?
- How can implementation be tracked?

These questions frame the work on sustainability indicators for Update 2013.

Sustainable water use was a foundational component for Update 2009 and carried forward throughout the strategic plan. The expanded work for sustainable water use will be reflected in many sections of Update 2013: Strategic Plan, Regional Reports, Future Scenarios, Resource Management Strategies (RMS), Companion State Plans, Update 2013 Finance Plan, and the California Water Management Progress Report. The Finance Plan will include a report on the costs and finance recommendations for achieving sustainability objectives.

Discussion

Question: Is there a place to discuss the impacts of overdraft on future recharge capabilities?

Response: This topic can be included in the sustainability section. It will also be addressed in the groundwater enhancement work to be described in the Regional Reports

Question: Could some of the simpler indicators, such as groundwater levels, be included prior to Update 2018 for the Progress Report?

Response: The Progress Reports will be released in mid-cycle of the Updates, to inform the upcoming Water Plan Update. The first Progress Report will be making its debut in less than twelve months. It could certainly include items that are readily reportable.

California Footprint Sustainability Indicators for Decision Support

Vance Fong (USEPA) is the Program Manager for Region 9 Environmental Indicators Program. He works with Don Hodge on the California Footprint Sustainability Indicators project. This effort is funded through the Advanced Monitoring Initiative, which is EPA's component within the international Global Earth Observation System of Systems (GEOSS). The core of GEOSS is decision support, by incorporating data and observations into predictive models that inform potential social benefits.

The conceptual model for the California Footprint Sustainability Indicators relates an aggregate indicator of human demand with a measure of natural resource response. The ecological footprint is linked to a plant growth index; the water footprint is linked to a groundwater availability indicator. This project correlates with the work of the Water Plan – the water footprint provides an index for a complex set of information relating to water resources. Mr. Fong noted that the ecological footprint did not take into account freshwater, only land use and carbon footprints. This set of information can inform the Water Plan as well.



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The groundwater availability indicator monitors the flux of groundwater using data from the Gravity Recovery and Climate Experiment (GRACE) satellite observations. The GRACE effort is being conducted through a partnership with the NASA Jet Propulsion Laboratory and USGS. The end goal of the California Footprint Sustainability Indicators is to provide a web-based tool for incorporating information from a robust footprint “family” into decisions and target-setting relating to environmental impacts. The value of footprints is that they present a large amount of information in an accessible manner, whereas individual indicators focus on particular areas of data.

Another sustainability project is the EPA’s Safe and Sustainable Water Resource Research Program. This program includes two major themes:

- Sustainable Water Resources – ensuring safe and sustainable water quality and availability to protect human and ecosystem health.
- Sustainable Water Infrastructure Systems – ensuring the sustainability of critical water resources using systems-integrated water resource management.

Both themes rely on integrating social, economic and environmental research for the purposes for protecting and restoring water resources for designated uses.

Questions of clarification:

Comment: The California Action Plan also looked at sustainability by considering sustainability of the water resource and the provider of the water resource. The Plan is available online.

Response: The goal is to bring together the network of people working on sustainability.

ACTION ITEM: Post link to the California Water Action Plan 2010.

Comment: It was good to see culture in the diagram, as a component of social uses of water.

Funding will be an important consideration of sustainability, along with changing behavior. The model seems oriented towards urban areas – is there a model more oriented towards rural areas?

Response: Coming from Region 9, Mr. Fong has a strong awareness of, and sensitivity towards, Tribal issues – which often have unique settings. EPA is looking to bring both local and regional input into the national policy.

Comment: Desired Future Conditions for the resource, along with the trend for the resource, are key factors in local and regional planning. Being able to relate the effort to these metrics will be very helpful.

Response: The two research themes also incorporate climate variability and demographics. Keeping the concepts simple will help in their application.



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Water Sustainability Indicators Framework

Background

Abdul Khan, the DWR lead for California Water Sustainability Indicators Framework, provided a brief overview of the efforts related to sustainability indicators. This effort seeks to address whether water resource management and Water Plan objectives are supporting sustainable water uses and reliable supplies throughout the State. The concept is based on the three aspects of sustainability: economic, social and environmental. The work for Update 2013 focuses on monitoring the progress towards meeting sustainability objectives through an analysis framework. Some of the challenges to work through include: defining sustainability, establishing a systematic approach for quantifying indicators, and working with limited data.

Mr. Khan also reviewed the work plan for developing and applying the sustainability indicators framework. The analytical framework is intended to support water sustainability analyses throughout the State. Use of the framework is envisioned to help evaluate resource conditions, improve data collection and monitoring efforts, and inform policy decisions to support water sustainability. The day's presentation would include definition and concepts of water sustainability, as well as proposed sustainability objectives and indicators.

Question: How does the work on sustainability indicators relate to the other efforts of the Water Plan?

Response: Kamyar Guivetchi replied that the sustainability indicators will underpin the activities of Update 2013. It will serve as a foundational component for the Water Plan. The other work, such as water quality and groundwater, will feed into the sustainability indicators effort. The indicators are metrics, to see how well the sustainability objectives are being met.

Question: How was the term "social" selected, rather than "equity"? In several ways, the economy is a subsection of society.

Response: We will start looking at definitions in the next presentation and will come back to this question.

Concept of Sustainability

Mary Simmerer, DWR's Sustainability Coordinator, explained that sustainability is more of a dynamic than a definition. The dynamic incorporates both the present and the future, in terms of interwoven systems, feedback loops, and high-level interactions. Key questions for discussing sustainability include considering the time horizon, trajectory and scale of a decision, as well as the impact to future generations. Other factors include the levels of uncertainty and risk, and whether the resources are renewable or can be substituted for.

Sustainable decisions are developed through systemic and holistic approaches. Sustainability indicators represent new tools for decision support. For the Water Plan, the objective is to sustain the state's population and water-related ecosystems in terms of appropriate levels of water reliability and flood protection. The State's water system must be sustainable. The proposed



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definition for water sustainability in California is: *“the dynamic state of water use and supply in the state that meets today’s needs without compromising the long-term capacity of the natural and human aspects of the water system to meet the needs of future generations.”*

Question: Regarding the tolerance of risk uncertainty, will there be more or less as greater uncertainty is realized in the future?

Response: The reference was to the precautionary principle, an underlying concept of sustainability. While there may be more uncertainty, the key is that decision-making becomes more careful.

Discussion

Workshop participants were asked to identify any important concepts that are missing from the proposed (working draft) definition as it relates to water sustainability in California. The following comments surfaced during the report out:

- It would be good to work towards eventually being able to quantify outcomes. The Update 2009 provided a helpful definition. A tighter definition might help.
- The Vision Statement from Update 2009 was clearer.
- The 2009 definition should be carried forward.
- The focus on natural and human systems might be better defined by adding terms such as “ecological systems” and “environment.” The proposed definition needs additional text to convey the full meaning of sustainability. Sustainability is a very difficult thing to convey in a short sentence.
- There were some questions about what the human aspects noted in the definition entailed.
- The human and natural aspects are not clear from the definition. For example, is resilient aquatic life part of the natural aspect? Or should this be added to the definition?
- The intrinsic value of the ecosystem and watershed is missing in the definition; it needs to be articulated.
- What does the term “need” mean? It is a critical element in the definition.
- Definitions often use mechanistic and economic terms, which devalues some ecosystem aspects. Metabolic models may be more useful for looking at sustainability.
- The State of Minnesota defined sustainability as “that which does not harm ecosystems, degrade water quality or compromise the ability of future generations to meet their own needs.” This is straight-forward. The protection of environmental resources needs to be added. (Two possible options: “...supply in the State that protects its environmental resources while meeting today’s needs without compromising the long-term capacity of the natural and human aspects of the water system to meet the needs of future generations.” OR “...without compromising the long-term capacity of natural aspects of the water system...”)
- The proposed definition seems more like a vision statement. It might be helpful to look at the EPA’s Safe and Sustainable Water Resource Research Program, which defines two components.



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- There is a balancing that takes place with public trust – looking at ecosystem uses and other uses. Uses that are balanced are sustainable. Public trust supports a balanced approach that brings all uses together in a sustainable policy.

Lisa Beutler emphasized the importance of definitions in helping to shape the scope of the conversation. The range of comments will be pulled into as the definition is refined in future iterations.

Kamyar Guivetchi suggested that it might be more helpful to focus on “who and what” is being sustained; using this as a guiding principle can assist in creating a definition later on. The idea of supporting institutions is a big element to consider. Also, water resources and water systems both need to be sustained. Sustainable outcomes are the goal that we are after. Some earlier management actions can no longer be operated in the way they were originally designed, because they were not designed to work with the natural systems that sustain them. Future actions should support sustainable outcomes, by being better aligned with the natural systems in which they co-exist.

ACTION ITEM: As a working proposal, the group will move forward by looking at “who and what” will be sustained. This focuses on what is being intended.

Draft Framework

Fraser Shilling (UC Davis) presented a recap of the proposal for the framework – which outlines how the proposed workplan will proceed and what it might contain. Seven steps are identified in the straw proposal – encompassing the “how and what” of the approach. The steps include: creating a vision; identifying goals and objectives; identifying indicators and desired future conditions; collecting and analyzing data; and evaluating trends and status of the indicators. The results are intended to help decision-makers evaluate sustainability of decisions. Information so developed must be useful to help change behaviors over time.

A number of other terms were highlighted, emphasizing different ways to organize information. For example, organizing around desired outcomes, major categories, key measurements, looking at progress, and reporting out. Mr. Fraser presented a diagrammatic representation of the Framework to illustrate how the pieces fit together. Indicators represent the first area in quantifying objectives. This process is closely linked to selection criteria and targets for the indicators. Targets are related to desired future conditions. The data analysis in the Framework will be transparent and readily accessible for review and exploration. Ultimately, the process envisioned in the Framework is intended to build wisdom over time.

Several discussion questions were presented for feedback on the Framework, especially seeking input on making the Framework useful for policy decisions and whether there are any missing considerations in the Framework.



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Discussion

Question: Is there a step to retool data collection, to better reflect what is happening in the world and accommodate adaptive management as lessons are learned?

Response: The framework emphasizes the evaluative component of adaptive management, bringing the information back to inform future decisions. We can make the relationship to adaptive management more explicit.

ACTION ITEM: Clarify the adaptive management aspect within the framework.

Comment: Consider using dashboards to report information back out. It provides information real-time, showing the information that is available at any given time.

Comment: Look at the work being done by the Strategic Growth Council on the California Regional Progress Report, which looks at indicators across several domains.

Comment: This diagram seems directive in terms of how to make decisions. It might be helpful to think about different ways to present the approach.

Comment: Many agencies are also dealing with looking at how to fiscally sustain their existence and mission. This emphasizes the link between sustainability and economic vitality. Agency revenue streams are an important consideration.

Response: The fiscal realities are being dealt with by the Finance Caucus.

Comment: Sustainability also includes transformation and the idea of advancements.

Response: The idea of resourcing needs to be captured within the framework.

Comment: Limited resources require that actions be focused and prioritized.

Comment: A great plan fits within the available resources and determines how to use them well.

Sustainability Objectives

Looking at the process diagram, the “why” for the effort can be defined in terms of particular goals – which embed more specific objectives within them. Themes represent particular areas of interest, which may not have goals, and are composed of particular attributes of the system. For example, water quality attributes include drinking water and aquatic species. The Framework also shows linkage to conceptual models, which help explain how systems are conceptualized to work.

The proposed sustainability objectives include an objective that provides an overarching idea of sustainability. The remaining objectives are more specific and focus on specific attributes of water sustainability. The proposed objectives are also tied back to components of Update 2009. Workshop participants were asked to consider and discuss the proposed sustainability objectives, thinking about the how these objectives capture the goal of attaining sustainability.

Vance Fong was asked how USEPA is addressing the issue of equity – whether it stands alone or is a component of the social system. He responded that the sense is that the social system incorporates issues of equity and that consideration of equity alone may omit other important aspects of social considerations.



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Report Out

Table Report: There was some discussion regarding the overlap of social and economic aspects. There was also a proposed definition for equity as “access to basic needs” and how that needs to be brought in. It might be helpful to bring in social and economic considerations as specific indicators, rather than developing specific objectives. Existing metrics, such as poverty indexes and access to education, could be brought in. It was noted that objective #6 focuses on natural resource needs – it should perhaps be balanced by an objective regarding social and equity needs. If so, is equity more of a local responsibility? Another discussion looked at how to try and incorporate opinions from end-users who are not involved in decision-making. Lastly, there was a question as to whether the focus was on measuring the process or results – there was a preference for measuring results. This then linked to identifying indicators. For example, flood risk could be addressed through increased channelization, or moving people out of the floodplain which then brings in the issue of land use. It was noted that objective #5 could address social equity issues in an overarching way.

Online Comment: Two goals developed for the Southern California Watershed Assessment Framework (February 2011) may be helpful for bringing social and economic issues into the objectives: widespread community awareness and deep civic engagement in the protection and improvement of watersheds; and to meet human needs and enhance the quality of life by improving conditions in watersheds and the ecosystem. Both address human well-being that needs to be brought forward more explicitly in the proposed objectives.

Table Report: There was a discussion on social equity in terms of community benefits and a sense of community being incorporated into the social component. Another aspect focused on thinking of this in a broader sense, for example, that in addition to using water, industry also assists in developing solutions. Industry helps develop tools for better use of resources. Another idea was that the watershed concept provides an organizing principle at the geographic scale. The SAP software may also be a helpful tool for looking at environmental sustainability and social equity. There is also a green innovation index provided by Next Ten, which looks at how public policy flow back into the innovation economy – which is expanding faster than other sections of the economy. It identifies the core green economy as well as practices adopted by industry.

ACTION ITEM: Provide links to SAP software and the Green Innovation Index.

Table Report: Much of the discussion centered on defining and measuring social impacts. Approaches such as measuring access to resources, public health and well-being can be used in measuring the social impacts of decisions. How do water technologies contribute to social beneficial uses? The ecological and economic benefits of technology are often described and it would be informative to surface social benefits as well.



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Table Report: The question being asked is a difficult one. Economic and social issues are implicit in many of the objectives, and might benefit from being made a bit more explicit. This could be accomplished by either including the topics specifically or adding a new objective for maintaining reliable, safe and affordable water supplies. Or to support the businesses in the communities. It might also be possible to rearrange some of the objectives, so that the goal of supporting economic and social values is stated earlier in the objective (rather than at the end). In looking at gaps, something that is missing is the idea of adjusting the timing and magnitude of water extractions (from both surface and ground water sources) to avoid adverse impacts. Need to add text to indicate that many of the resources are already overextended and that, in addition to reducing demand, it will be necessary to reduce the level of extraction.

Table Report: The discussion focused on the economic aspect and looking at a least-cost planning approach for implementing some of the Resource Management Strategies, with recognition of economic constraints. Characterizing the objectives will shape the overall direction of this effort and may require additional conversation. One question is how will the objectives be used – by whom and at what level? The objectives must be relevant for all levels of decision-making.

Table Report: Unacceptable environmental, social or economic impacts mean different things to different people. That which is acceptable to one, in one area, may not be acceptable to others in a different area. The “in order to” parts of the objectives actually speak to goals. For example, in #2, improved water use efficiency does not necessarily improve water supply reliability (suppose saved water goes to geothermal energy?). Objectives and indicators need to be measurable and distinct – and not connected to values. Currently, each objective includes a value (which may be good for one person, but not another).

Lisa Beutler noted that the hierarchy of how to nest the vision, goals and objectives is very difficult to sort out. It surfaces on almost every topic and needs to be carefully considered in the Framework and in defining sustainability objectives

Sustainability Indicators

Fraser Shilling continued his presentation, noting that objectives and indicators represent the two most important components for the discussion on sustainability. Two considerations relating to the indicators are: selecting the indicators (selection criteria and why indicators are chosen to measure something about sustainability) and then setting a target (the quantifiable condition against which current conditions are measured). Participants were reminded that indicators are the measurable aspects of the objectives. Several examples of indicators were provided for the different objectives. Indexes may be adopted as an indicator – the indexes are composites of information collected on different conditions.



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Several questions were posed to the workshop participants regarding selection criteria, developing the indicators, and refining the initial list of sample indicators. The current selection criteria include: availability of high-quality data; affordability of long-term data acquisition; degree to which the indicator represents the system of interest; sensitivity to change over time; independence from other indicators; and ability to support management decisions and actions.

Comment: Does the system of interest also relate to functions?

Response: The system of interest includes attributes, conditions, processes and relationships within the system. The important thing is making sure that for a particular area what is being measured addresses what we are interested in.

Question: Do the sample indicators meet the selection criteria?

Response: The sample indicators were selected to show a range of possible indicators for the objectives. During the initial screening process, they appeared to satisfy most of the criteria.

Lisa Beutler clarified that the team is asking if the selection criteria should be changed, in terms of screening out different indicators. The team is also asking if there are existing criteria that can be used to screen sustainability indicators.

Comment: The distance that water travels (#3 on page 8 of Workbook) is not a good indicator for affordability or energy. Also, percentage of irrigation in water-stressed areas may not be helpful. Irrigation typically occurs in water-stressed areas.

Kamyar Guivetchi shared his thoughts about sustainability indicators, and that their value comes from tracking outcomes. Performance measurements or metrics are more focused on measuring activities.

Comment: It is also important to note the history of high-quality data.

Comment: We typically avoid the term “high-quality” data, which may not exist. The focus should be on the adequacy of data.

Comment: The extent to which the indicator represents the system of interest is also important. It should be a dominant factor in the selection process

Comment: For indicator selection criteria #6, is there a threshold as to which indicators rise to higher-level policy questions?

Response: There is no scale-dependence in the analytical framework; therefore, it will be able to support all levels of decision-making. We will be able to roll up computed indicators to support decision making at different levels.

Comment: Indices can be very helpful.

Response: The Water Footprint is an example of an index.



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ACTION ITEM: Workshop members will email additional written comments to cwpc@water.ca.gov.

Next Steps and Closing Remarks

Lisa Beutler recapped that this first workshop provided the initial framing for the topic. She characterized this as a large conversation that relates back to the other categories and themes of the Water Plan. In a report back from staff, Abdul Khan noted that the framework will also be taken out to the IRWM groups in the regions. Rich Juricich reported that additional workshops will be held into 2012, with a draft document to be released in the spring of 2012. Mr. Juricich also provided the contact information for the leads working on the Sustainability Indicators Framework:

- Abdul Khan: akhan@water.ca.gov
- Rich Juricich: juricich@water.ca.gov
- Fraser Shilling: fmsilling@ucdavis.edu

Attendance (51):

Sustainability Indicators Workshop Participants (31):

1. Bill Anderson, Environmental Coordinator, Augustine Band of Cahuilla Indians
2. Donna Begay, Inter-Tribal Council
3. Dave Bolland, ACWA
4. Chris Brown, California Urban Water Conservation Council
5. Grace Chan, Metropolitan Water District
6. David Cone, Kings River Conservation District
7. James Cornelius, Sutter County RCD
8. Tamara Cronin, Strategic Growth Council
9. Anisa Divine, Imperial Irrigation District
10. Vance Fong, US EPA, Environmental Indicators Program Manager
11. Lindsey Fransen, CPUC, Div. of Ratepayer Advocates
12. Kim Glazzard, Organic Sacramento
13. Trish Kelly, Applied Development Economics, consultant to Strategic Growth Council
14. David Kennedy, American Council of Engineering Companies
15. John Kingsbury, Mountain Counties Water Resources Association
16. Alan Kurotori, Santa Clara Valley Water District
17. Karl Longley, California Water Institute
18. Kelly Larvie, California Department of Forestry and Fire
19. John Mills, Tuolumne-Stanislaus IRWM
20. Tim Parker, Groundwater Resources Association
21. Frank Ramirez, National American Indians Veterans, Government Affairs
22. John Ricker, County of Santa Cruz Dept. of Environmental Health
23. Phil Rosentrater, Colorado River EDA – Salton Sea
24. Tito Sasaki, Sonoma County Farm Bureau



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25. Bob Siegfried, Agricultural Civil Engineer
26. Ron Sprague, CA County Planning Commissioners Association
27. Nancy Steele, Council for Watershed Health
28. Susan Tatayon, The Nature Conservancy
29. Michael Urhammer, Padre Dam Municipal Water District
30. Jane Wagner-Tyack, League of Women Voters of California
31. Cliff Raley, Table Mountain Rancheria

State Agency Steering Committee Members (2):

1. Bruce Gwynne, Department of Conservation
2. Al Schiff, California Public Utilities Commission

Staff (18):

1. Jose Alarcon, DWR, Lead for Water Quality Caucus
2. Tito Cervantes, DWR, Northern Regional Office, Lead for Water Supply and Balance
3. Megan Fidell, DWR, Lead for Resource Management Strategies
4. Chas Grant, DWR, Travel Coordinator
5. Kamyar Guivetchi, DWR, Chief, Division of Statewide Integrated Water Management
6. Rich Juricich, DWR, Lead for Statewide Water Analysis Network
7. Lindsay Kammeier, DWR, Sustainability Office
8. Abdul Khan, DWR, Lead for Sustainability Indicators Framework
9. Stephan Lorenzato, DWR, Riparian Habitat Joint Venture
10. Paul Massera, Water Plan Update 2013 Program Manager
11. Ray McDowell, DWR, FloodSAFE Environmental Stewardship Office
12. Dan McManus, DWR, Northern Regional Office, Co-lead for Groundwater Enhancement
13. Lewis Moeller, Water Plan Update 2013 Project Manager
14. Elizabeth Patterson, DWR, Lead for Land Use
15. Michael Perrone, DWR, Lead for Ecosystem Services
16. Frasier Shilling, UC Davis, Technical Assistance for Sustainability Indicators Framework
17. Mary Simmerer, DWR, Sustainability Coordinator
18. Karandev Singh, DWR, Student Assistant

Facilitation Team: Lisa Beutler, MWH; Judie Talbot, Center for Collaborative Policy, CSUS