Climate Change Program Annual Report, 2015

California Department of Water Resources

Release Date: October 14, 2016

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CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Adaptation Planning in IWM

Sponsor/Program Manager	John Andrew
Project Manager	John Andrew

Project Status:

Project Initiation Only

Project Objective:

Build and strengthen DWR's institutional capacity for incorporating climate change adaptation planning and strategies within IWM.

Project Description:

The successful implementation of integrated water management relies on the coordination and integration between programs within Integrated Water Management (IWM). Greater coordination between the Climate Change Program and the divisions is needed to promote climate change adaptation planning in the numerous programs and projects underway in DFM, DSD, DSIWM, and DIRWM. This project will help identify programs, within IWM, that would benefit from additional support from the Climate Change Program and those programs that in turn could provide additional support to the Climate Change Program; develop topic-specific guidance to assist programs/projects to integrate adaptation strategies and; improve coordination and communication between IWM Divisions.

Funding Information:

Project Budget (Total):		**Funding Source:**	
Budget Notes:			
Project Start Date:		**Project End Date:**	

External Partners:

All divisions in IWM (DFM, DSD, DSIWM, DIRWM)

2015 Project Accomplishments

Project Initiation Only

Project Deliverables/Timeline

Undetermined as of 8/31/16

Customers:

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities

IWM Business Categories

N/A

State Water Project Related? No

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Agriculture Mitigation and Stewardship

Sponsor/Program Manager	Elissa Lynn, John Andrew, Kent Frame
Project Manager	Jennifer Morales

Project Status:

On Going

Project Objective:

Resiliency building and GHG emission reduction in the agricultural sector through the implementation of AB 32: California's Global Warming Solutions Act.

Project Description:

California produces nearly half of all US grown fruits, nuts and vegetables yet has been slow to adopt progressive water and energy stewardship practices. Practices such as on-farm water storage, healthy soils, on-farm anaerobic digesters, no till/low till cropping, and increased irrigation efficiency can reduce GHG emissions through carbon sequestration, reduced energy use, and water use conservation and efficiency. This can be done by partnering with agencies with related goals to leverage resources, incentivize stewardship though grant programs, and by creating an aggressive education campaign for the public, academia, and the agricultural industry.

Funding Information:

Project Budget (Annual):	$125,000	**Funding Source:**	AB 32
Budget Notes:	Listed budget represents a portion of the total funding already indicated under the project "Mitigation Team".		
Project Start Date:	May 2011	**Project End Date:**	On-going

External Partners:

WUE Branch, IRWM, UC Co-op, CASI, CalCAN, CDFA, CDFW, Cal Poly Pomona/ITRC, USDA Climate Sub-Hub

2015 Project Accomplishments

Work began on the update to the AB 32 Scoping Plan, along with staff from CNRA, ARB, CDFA, and others, with hopes of having a draft in summer 2016. The Scoping Plan sets the focus for investments in climate change mitigation and planning for California. For the first time ever, the Scoping Plan will include an economic analysis as well as GHG quantification and accounting.

CDWR worked with CDFA to implement the 2015 round of SWEEP (State Water Efficiency and Enhancement Program) Funding. The Program targets agricultural water and energy use efficiency and GHG mitigation by offering financial assistance to install new or upgraded irrigation equipment.

K-12 curriculum regarding agricultural GHG mitigation and climate change adaptation was pursued through drafting a 4th-8th grade level brochure. This brochure was reviewed by the outreach team and PAO staff and edited. The brochure was intended to introduce students to the basic concepts as well as promote DWR in an interactive, easily digestible manner. However, it was discovered that a more informative set of brochures had already been developed by the California Foundation for Ag in the Classroom and satisfied the goals of this project.

Meanwhile, work continued on the Climate Menu poster. As reported under the "Posters" project, the Climate Menu poster was created to connect climate change with the food we eat and the impacts on agriculture. The original poster concept was redone, and the latest version resulted from collaboration among DWR, CA Department of Fish and Wildlife, CA Department of Food and Agriculture, and CA Polytechnic State University at San Luis Obispo and its Irrigation Training and Research Center. DWR got the poster printed and began distributing it to libraries, fairs, and other venues. This poster can be found on the DWR California Agriculture Water-Energy web page: http://www.water.ca.gov/climatechange/WaterEnergyAg.cfm.

Project Deliverables/Timeline

Climate Menu poster I (2015)
Climate Change Handbook for Agricultural Water Suppliers (2016)
Climate Menu poster II (2017)

Customers:

Irrigation/ Water Districts, Academic Institutions, NGO's, and teh public at large.

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR’s Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management
Provide Safe Water for All Communities

Safeguarding California Implementation Plan

Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks
N/A

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Atmospheric Rivers and Climate Change

Sponsor/Program Manager	DWR
Project Manager	Michael L Anderson / Jeanine Jones

Project Status:

On Going

Project Objective:

Characterize atmospheric rivers as they pertain to benefit to water supply and flood hazard Examine past, present, and future characteristics of atmospheric rivers and their change with climate change Develop decision support services for forecasting and planning in water management as they relate to atmospheric rivers and precipitation and runoff

Project Description:

Better monitoring and prediction of atmospheric river events (AREs) has the potential to add flexibility to water management efforts in California. This project aims to increase our understanding of the role of AREs in the development of annual water supply and their role in flood events and how they might change with climate change.

Funding Information:

Project Budget (Total):		**Funding Source:**	General Fund/Prop 84
Budget Notes:	UCOP Climate Services Agreement is contract 46-10378. AR work is $3 million for work in 2015. An additional $3 million was provided by budget act for fiscal year 2017		
Project Start Date:	2014	**Project End Date:**	2019

External Partners:

SIO/CW3E/University of California Campuses as specified by task order/NOAA ESRL

2015 Project Accomplishments

CW3E hosted the Winter Outlook Workshop in November of 2015 and the presentations throughout the day were made on the progress of the DWR sponsored projects. CW3E director, F. M. Ralph, lead a CalWater overview paper with several CW3E personnel and partners that was accepted to BAMS (Bulletin of American Meteorological Society) in the fall of 2015. CalWater. CW3E implemented test runs in real time of the West-WRF model, which is being tailored to California extreme precipitation forecasts, and atmospheric rivers.

Project Deliverables/Timeline

Workshops, decision support material, studies and projects with a goal to improve extreme precipitation prediction

Customers:

DWR Flood Management and Climate Change as well as broader public

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk

State Water Project Related? Yes

Governor's Water Action Plan

Manage and Prepare for Dry Periods
Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Basin Studies

Sponsor/Program Manager	Curtis Anderson (NRO-Klamath), John Andrew
Project Manager	Peter Coombe / Lauma Jurkevics

Project Status:

On Going

Project Objective:

To participate and provide technical assistance in USBR Basin Study work in California

Project Description:

Strategies need to be developed for meeting projected future water demands where supplies may not be sufficient. Need to focus on basins or sub-basins where imbalances in water supply and demand exist or may exist in the future. The Department of the Interior's WaterSMART Program provides an opportunity for Non-Federal Cost Share Partners and technical stakeholder agencies to participate in the basin study process. The Basin Study Program is part of the Department of the Interior's WaterSMART Program, which addresses 21st century water supply challenges such as population growth, increased competition for finite water supplies, and climate change. The Basin Studies are a comprehensive assessment to define current and future imbalances in water supply and demand, to evaluate the effects of climate change on water supply and demand, and to develop and analyze adaptation and mitigation strategies to resolve imbalances in the future. Regional climate staff have been involved in the Los Angeles, Santa Ana River Watershed, Klamath Basin, and Truckee River studies. As cost-share partners for the Klamath Basin Study, regional climate staff will be seated on a Technical Working Group.

Funding Information:

Project Budget (Annual):	$42,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	$16,640- NRO staff work $22,000/yr - SRO work, 2012-2015 (LACFCD-draft plan of study and subsequent STAC involvement began in Dec 2011) $3,000 - DSIWM work, Sacramento/San Joaquin Rivers		
Project Start Date:	2011	**Project End Date:**	

External Partners:

USBR; State of Oregon's Water Resources Department, local agencies (e.g., SAWPA, LACFCD, Truckee Meadow Water Authority, TRPA, Truckee River Flood Management Authority, Placer County Water Agency, El Dorado County Water Agency, Stockton East Water District, the California Partnership for the San Joaquin Valley, and the Madera County Resource Management Agency) Internal: DWR Climate Program & Regional Office/Headquarters Staff

2015 Project Accomplishments

Continued collaboration occurred with USBR on providing DWR data for Basin Study modelling requirements and reviewing draft documents for the Klamath Basin Study. Regional staff continued participating in the Truckee River Basin Study, which was completed in December.

Staff also continued to be involved with the Stakeholders Technical Advisory Committee (STAC) for the Los Angeles Stormwater Conservation Study being co-led by Los Angeles County Flood Control District (LACFCD) and USBR. Responsibilities included reviewing and providing input on draft scopes of work and reports. In 2015, the STAC met to refine a list of stormwater capture opportunities and options; evaluate criteria for technical and economic analyses; review environmental and social effects; assist with the trade-off analysis and review its interim report; and comment on the Infrastructure and Operations Concepts Report. The STAC officially completed its duties December 31, 2015. The Trade-Off Analysis Report was to be finalized the following month and a Study Summary Report on the basin study to be released in 2016.

Headquarters staff also participated in basin studies, specifically the Sacramento and San Joaquin Basin Study, which was funded by USBR, DWR, El Dorado County Water Agency, Stockton East Water District, the California Partnership for the San Joaquin Valley, and the Madera County Resource Management Agency. The purpose of the study was to assess current and future water supplies and demands in the Sacramento, San Joaquin, and Tulare Lake Basins and adjacent areas that contribute to or receive water from these basins, and to identify a range of potential strategies to address any projected imbalances.

Project Deliverables/Timeline

Deliverables for 2013:
• LACFCD/USBR Basin Study products: Development of Climate-Adjusted Hydrologic Model Inputs (Oct); Hydrologic Modeling Report (Dec)

Deliverables for 2014:
• LACFCD/USBR Basin Study products: Existing Infrastructure Response & Operations Guidelines Analysis (Sep); Water Supply & Water Demand Projections (Dec)
• Klamath Basin Study product: draft reports for the Klamath Basin Study

Deliverables for 2015:
• LACFCD/USBR Basin Study products: Stormwater Capture Opportunities and Options List; Technical Analysis Criteria; Economic Analysis; Environmental and Social Effects; Trade-Off Analysis; Trade-Off Analysis & Recommendations Interim Report; Infrastructure and Operations Concepts Report (Dec)
• Klamath Basin Study product: a series of nine final technical reports and a final report
• Truckee River Basin Study final report (Dec)

Deliverables for 2016:
• LACFCD/USBR Basin Study products: Trade-Off Analysis and Opportunities (Jan); Study Summary Report
• Sacramento and San Joaquin Rivers Basin Study Report and Executive Summary, Technical Report, and Appendices (Mar)

Customers:

Local agencies (e.g., SAWPA, LACFCD, Truckee Meadow Water Authority, TRPA, Truckee River Flood Management Authority, Placer County Water Agency, El Dorado County Water Agency, Stockton East Water District, the California Partnership for the San Joaquin Valley, and the Madera County Resource Management Agency), DWR, State of Oregon's Water Resources Department, and USBR

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management
Provide Safe Water for All Communities
Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
IRWM
UWMP

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Bulletin 195 Update

Sponsor/Program Manager	Division of Flood Management, Office of the State Climatologist
Project Manager	Peter Coombe / Michael L Anderson

Project Status:

Project Initiation Only

Project Objective:

The objective is for data from verified stations to feed into a database in coordination with Dr. Michael Anderson's (current State Climatologist) efforts for emergency response and planning initiatives and monitor for climate change; provide relevant climate data and value added products to the data providers and the general public.

Project Description:

This initiative will be focused on Jim Goodridge's (former State Climatologist) critical and unique knowledge of precipitation Depth-Duration-Frequency curves and annual extremes data sets that make up Bulletin 195. A bulletin 195 update is in progress, but will require succession planning to facilitate a station update and verification process in order to facilitate the process of collecting, storing, and analyzing precipitation data from various sources throughout California. The project will provide an updated station location dataset of Bulletin 195 data sources.

Funding Information:

Project Budget (Total):	$10,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:			
Project Start Date:		**Project End Date:**	

External Partners:

Division of Flood Management, Division of Safety of Dams; GEI Consultants Inc.

2015 Project Accomplishments

Development of web-based map server for Bulletin 195 data, and data updating toolkits. Staff continued with updating stations and verifying information for Bulletin 195. Continued coordination with retired State Climatologist Jim Goodridge to provide updated annual rainfall information for extreme precipitation analysis.

Project Deliverables/Timeline

Data from verified stations will feed into databases resulting in an extreme precipitation analysis that will ultimately be available from map-based servers from DWR's Flood Emergency Response Information Service. Web-based map server for Bulletin 195 data, data updating toolkits, full EPN sites with data flow to CDEC. The Flood Emergency Response Information Exchange (FERIX) will house a new map-based server for (former State Climatologist) Jim Goodridge's precipitation DepthDuration-Frequency curves and annual extremes data sets that make up Bulletin 195. This will greatly facilitate the serving of the data which was handled through a now discontinued ftp site with over 4000 spreadsheets. Data requests and data collection for this effort will be transitioned from Jim Goodridge to DWR in the coming years.

Customers:

Emergency response, Division of Safety of Dams, engineering design, and the general public.

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

N/A

State Water Project Related? Yes

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

California Netherlands Water Resources Cooperation and Exchange

Sponsor/Program Manager	John Andrew
Project Manager	Andrew Schwarz

Project Status:

On Going

Project Objective:

DWR has formed a cooperative partnership with the Rijkswaterstaat in the Netherlands to exchange information and expertise about topics of common interest.

Project Description:

In March 2011, a delegation from the Dutch Rijkswaterstaat visited California for a series of discussions and tours of California water facilities. In February 2012, a Letter of Intent was signed between DWR and the Rijkswaterstaat to continue cooperation and information exchange in the areas of integrated water management, operational water management, and policy planning on water management with special consideration to the impacts of climate change on those aspects of water management.

Funding Information:

Project Budget (Annual):	$5,000	**Funding Source:**	N/A
Budget Notes:	Attendance and preparation for quarterly meetings. Budget may increase in future if a joint project is identified as planned.		
Project Start Date:	2012	**Project End Date:**	In Progress

External Partners:

Rijkswaterstaat of The Netherlands

2015 Project Accomplishments

In 2015, four webinars were held between the Rijkwaterstaat and DWR. Topics included: Drought and drought communications with the public, partnership evaluations and approval of continuation of cooperative efforts, and water service evaluations and public information on water reliability.

Project Deliverables/Timeline

N/A

Customers:

No External customers at this time, this is a professional development, information sharing, and relationship development project.

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

California Water Plan (CWP) Update 2013 - Analysis of Climate Change Scenarios

Sponsor/Program Manager	Paul Massera
Project Manager	Rich Juricich / Abdul Khan

Project Status:

Complete

Project Objective:

Quantify alternative scenarios of future water demand and supply conditions and use to evaluate performance of potential water management responses for Water Plan Update 2013

Project Description:

The California Water Plan Update 2013 (CWP 2013) built upon the scenario planning begun in previous Updates and includes an analysis of the performance of different resource management strategies and response packages for the Central Valley under different assumptions about uncertain future conditions. The Water Plan evaluated the effect of different assumptions about uncertain future conditions including climate change on future water demand for all 10 hydrologic regions in California. A wide range of scenarios were developed that reflect uncertainty about future population growth, agricultural land use, climate conditions, water use rates, and other factors.

Uncertain future climate conditions are represented by diverse sequences of temperature and precipitation applied to geographically-disaggregated catchment areas in the Water Evaluation and Planning (WEAP) model. Some sequences were based upon projections of temperature and precipitation from global climate models (Atmosphere-Ocean General Circulation Models—GCMs). Others were based on historical observations and were designed to test the effects of drought conditions experienced in the recent past at different times in the future. The Climate Change Technical Advisory Group (CCTAG) provided guidance to DWR about which specific sequences to evaluate that reflect a wide range of plausible climatic conditions and include periods of droughts similar to those experienced in recent decades.

A significant improvement to the Water Plan scenarios in Update 2013 is a quantitative look at the uncertainty surrounding future climate change when evaluating the performance of new resource management strategies. After consultation with its Climate Change Technical Advisory Group, DWR chose to include 22 alternative climate scenarios in the evaluation of future strategies. These include 12 climate scenarios identified by the Governor's Climate Action Team (CAT) for future climate change, 5 scenarios repeating historical climate with a severe 3 year drought offset by 10 years, and 5 scenarios repeating historical climate with a warming temperature trend offset by ten years. Each of the climate scenarios has separate estimates of future precipitation and temperature. Collectively these estimates provide planners with a range of precipitation and temperature that might be experienced in the future and are used with other factors to estimate future water demands.

The CWP Update 2013 evaluated 12 sequences of downscaled global predictions of temperature and precipitation, corresponding to the 12 model-emissions scenario combinations selected by the Governor's Climate Action Team (Maurer and Hidalgo, 2008). The GCMs used were:

1. CNRM-CM3 (France)
2. GFDL-CM21 (USA)
3. Micro32med (Japan)
4. MPI-ECHAM5 (Germany)
5. NCAR-CCSM3 (USA)
6. NCAR-PCM1 (USA)

The two emissions scenarios used were the A2 and B1 scenarios:

"The A2 SRES global emissions scenario represents a heterogeneous world with respect to demographics, economic growth, resource use and energy systems, and cultural factors. There is a de-emphasis on globalization, reflected in heterogeneity of economic growth rates and rates and directions of technological change. These and other factors imply continued growth throughout the 21st century of global GHG emissions. By contrast, B1 is a "global sustainability" scenario. Worldwide, environmental protection and quality and human development emerge as key priorities, and there is an increase in international cooperation to address them as well as to convergence in other dimensions. Neither scenario entails explicit climate mitigation policies. The A2 and B1 global emission scenarios were selected to bracket the potential range of emissions and the availability of outputs from global climate models" California Climate Action

Team (2009).
Downscaled monthly temperature and climate projections were obtained from the downscaled climate dataset jointly developed by the Lawrence Livermore National Laboratory (LLNL), the U.S. Department of the Interior, Bureau of Reclamation (Reclamation), and Santa Clara University (SCU), available at http://gdo-dcp.ucllnl.org. These data were derived from the World Climate Research Programme's (WCRP) Coupled Model Intercomparison Project Phase 3 (CMIP3) multi-model dataset, and include data from 112 different global climate simulations of 16 global models evaluated for three global emissions scenarios. The projections are available from 1950 to 2099.

Funding Information:

Project Budget (Total):	$750,000	**Funding Source:**	Proposition 84
Budget Notes:			
Project Start Date:	July 2010	**Project End Date:**	2015

External Partners:

MWH, RAND Corporation, Stockholm Environment Institute, National Center for Atmospheric Research

2015 Project Accomplishments

Completed

Project Deliverables/Timeline

• Nine growth scenarios for California describing alternative values for uncertain factors like population growth, land use changes, socioeconomic conditions, technological advancement, and institutional and political changes
• Up to 22 scenarios of future climate conditions (precipitation, temperature) for all Central Valley planning areas selected with advice from the Climate Change Technical Advisory Group
• 13 scenarios of future climate conditions (precipitation, temperature) for California's ten hydrologic regions.
• Quantification of future water demands for California's ten hydrologic regions reflecting the nine growth scenarios and up to thirteen future climate scenarios
• Quantification of future water supplies and demands reflecting the nine growth scenarios and up to twenty-two future climate scenarios for all Central Valley planning areas
• Performance criteria for evaluating effectiveness of regional water management responses
• Evaluation of many alternative water management responses using Robust Decision Making for all Central Valley planning areas

Customers:

• Department of Water Resources for support of DWR programs and projects
• Local and regional water planning entities for consideration of alternative future scenarios and water management responses
• California Legislature to meet Water Code requirements
• General public for education on future water issues
• Water Plan advisory groups including the Public Advisory Committee, State Agency Steering Committee, Statewide Water Analysis Network, and Regional Forums.

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Provide Safe Water for All Communities
Increase Flood Protection
Increase Operational and Regulatory Efficiency
Identify Sustainable and Integrated Financing Opportunities

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

California Water Plan (CWP) Update 2013 – Climate Change content

Sponsor/Program Manager	John Andrew, Paul Massera, Lew Moeller
Project Manager	Elissa Lynn

Project Status:

Complete

Project Objective:

Provide greater detail and regionally specific climate change information in Update 2013 than in Update 2009, including regionally appropriate and statewide adaptation and mitigation strategies, resource management strategies, and climate change scenarios decision support. *Note, also see “Analysis of Climate Change for the California Water Plan Update,” as reported below.

Project Description:

Climate change stems from a steady gradual increase in global temperatures that has been taking place over recent decades. Determining the local impacts of and response strategies to climate change in California involves climate modeling downscaled to the regional level. Current developments in climate science and research can provide guidance for projecting likely ranges of temperatures and precipitation changes by region. Responding to these hydrologic changes and reducing their impact are known as adaptation strategies. Reducing GHG (Greenhouse Gas) impacts by reducing energy consumption are known as mitigation strategies. Many adaptation and mitigation strategies are conducted at the regional level, so CWP update 2013 will include climate change in the regional reports, based on appropriate hydrologic impact, as well as statewide strategies in the broader document. Strategies and vulnerabilities to climate change will also appear in the Resource Management Strategies. This project will also be tasked with technical assistance to the Statewide Water Analysis Network choice of scenarios related to climate change impacts. These four approaches to incorporating climate change into CWP 2013 will improve upon the initial steps taken in CWP 2009 to include responses to climate change.

Funding Information:

Project Budget (Total):	$800,000	**Funding Source:**	Prop 84
Budget Notes:			
Project Start Date:	2010	**Project End Date:**	Completed with release of the California Water Plan Update 2013 in 2014: http://www.waterplan.water.ca.gov/cwpu2013/final/index.cfm

External Partners:

Public Advisory Committee, Statewide Water Analysis Network, Local Water Planners and IRWM’s

2015 Project Accomplishments

In June 2015, a brochure was developed from the climate change and water-energy nexus content created for CWP Update 2013. "California Climate Science and Data for Water Management," can be found at: http://www.water.ca.gov/climatechange/docs/CA_Climate_Science_and_Data_Final_Release_June_2015.pdf

Project Deliverables/Timeline

Final content was developed as listed in the Accomplishments above.
A standalone brochure of the climate change science and data developed for the CWP Update 2013 began being developed by staff in 2014, to be released in 2015; COMPLETED.

Customers:

California Water Plan, Public Advisory Committee, State Agency Steering Committee, The Public

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self -Reliance and Inte
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

SGMA
IRWM
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

California Water Plan (CWP) Update 2018 – Climate Change content

Sponsor/Program Manager	John Andrew
Project Manager	Andrew Schwarz

Project Status:

On Going

Project Objective:

Provide climate change content related to CA water resources for the 2018 CWP.

Project Description:

California Water Plan Update 2018 will build on and refine analyzes done in CWP Update 2013. Water Plan program managers are currently defining the scope and focus of CWP Update 2018 which will likely follow a significantly different format and focus from previous CWP updates. Climate Program staff have been involved in discussions regarding climate change information incorporation. As of June, 2016 the plan is to update the WEAP model to be consistent with improvements made by SWRCB and USBR over the last 5 years and to run new climate scenarios based on the 10 GCMs selected by the DWR CCTAG.

Funding Information:

Project Budget (Total):	$35,000	**Funding Source:**	
Budget Notes:	$13,000 was contributed to a contract to MWH for modeling services to assist with updating the WEAP model and re-running it with a new suite of climate scenarios. Climate change and data analysis staff will expend an additional $22,000 on this effort, $12,000 on data development, $10,000 on coordination, analysis, and writing up of results.		
Project Start Date:	January 2015	**Project End Date:**	December 2018

External Partners:

2015 Project Accomplishments

Not underway in 2015

Project Deliverables/Timeline

By September 2016, Climate Change Staff working with Data Analysis Branch staff will develop the input data files needed to run WEAP with 20 climate scenarios based on the GCMs selected by the CCTAG and new LOCA downscaling provided by Scripts.

Customers:

Legislators, the public, water managers

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Central Valley Flood Protection Plan - Incorporating Climate Change into the 2017

Sponsor/Program Manager	Michael Mierzwa
Project Manager	Amarjot Bindra / Mary Jimenez

Project Status:

On Going

Project Objective:

The 2017 Central Valley Flood Protection Plan needs to incorporate Climate Change into its planning scenarios. The goal of the 2017 CVFPP is to Improve flood risk management in the Central Valley by making improvements to the facilities of the State Plan of Flood Control (SPFC) which is a 1,600 mile system of levees, weirs, bypasses and pumping plants along the Sacramento and San Joaquin Rivers in California's Sacramento and San Joaquin valleys. The CVFPP will be informed by three planning efforts: Sacramento and San Joaquin Valley Basin-Wide Feasibility Studies, the eco-system Conservation Strategy, and six Regional Flood Management Plans. The 2012 CVFPP had a Climate Change strategy and the 2017 CVFPP is updating the Climate Change strategy. More specifically, improving flood risk management will be achieved through the promotion of multi-objective projects, improving facility operations and maintenance, restoration of ecosystem functions, and improving institutional support. Implementation of the 2017 CVFPP will accomplish: improvements to public safety (save lives), reduced expected annual damages, target species recovery, and improved ecosystem services.

Project Description:

In order to achieve a more resilient Central Valley flood management system whose principal component is the State Plan of Flood Control, climate informed hydrology needs to be incorporated into the CVFPP planning process. The CVFPP Climate Change approach is using the latest science and is designed to be flexible to incorporate new information as it is made available. The process involves integrating information related to atmospheric rivers, general atmospheric circulation models and temperature data that leads to the development of watershed models that can be used to develop hydrographs for various return periods. The Climate Change hydrology is being developed using scientifically supported global climate projections and in coordination with ongoing climate research and the results of that research including data from the USACE, NOAA, USGS, UC Davis and Scripps. As part of the CVFPP Climate Change analysis, a series of Climate Change scenarios are being developed by varying temperature and precipitation changes and changes to flow-frequency curves. Preliminary results show that changes in flood volumes due to modeled Climate Change scenarios will not be uniform across the watersheds. Current efforts focus on converting computed unregulated flows (flows upstream of flood control reservoirs) to regulated flows (flows downstream of reservoirs).

Funding Information:

Project Budget (Total):	$600,000	**Funding Source:**	Proposition 1E and small amount of General Fund.
Budget Notes:	Prop 1E funds		
Project Start Date:	July 2012. Work on the 2017 Central Valley Flood protection Plan (CVFPP) was begin immediately after the adoption of the 2012 CVFPP by the Central Valley Flood Protection Board. Climate Change analysis was incorporated in the 2012 CVFPP and is being updated	**Project End Date:**	2017

External Partners:

CVFPB, DFW, DSC, DPC, Delta Conservancy, USACE, USFWS, BDCP (Water Fix-Eco Restore), Central Valley cities and counties, and Central Valley flood management and levee maintaining agencies.

2015 Project Accomplishments

Climate change hydrology has been updated for rivers and streams that affect the State Plan of Flood Control, using the latest science.

Project Deliverables/Timeline

Incorporate climate change informed hydrology into Central Valley flood planning process (CVFPP) to ensure project goals of achieving sustainable 200-year urban level of flood protection is achieved for urban and urbanizing communities that are protected by the levees of the SPFC; and that sustainable 100-year level of flood protection is achieved for small communities protected by the levees of the SPFC.

Customers:

Central Valley Flood Protection Board, Central Valley cities and counties, Central Valley residents, levee maintaining districts/agencies

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Protect and Restore Important Ecosystems
Expand Water Storage Capacity and Improve Groundwater Management
Increase Flood Protection
Increase Operational and Regulatory Efficiency
Identify Sustainable and Integrated Financing Opportunities

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Citizen Science

Sponsor/Program Manager	Division of Flood Management, Office of the State Climatologist
Project Manager	Peter Coombe / Lauma Jurkevics

Project Status:

On Going

Project Objective:

The goal is to expand citizen science precipitation monitoring throughout California through the Community Collaborative Rain, Hail & Snow (CoCoRaHS) network.

Project Description:

DWR's integration with citizen science programs needs to be updated and expanded. Since the inception of DWR we have been a long term proponent of using volunteers or "citizen scientists" to help us collect valuable data to aid in water resources management in the State. In recent years, several of these programs including DWR's Volunteer Climate Cooperator Network (VCCN) have been in a steady decline to the point of almost non-existence.

In the field of Water Resources, there are many emerging citizen science projects that show promise for data collection, awareness education, and providing a platform to enable public participation. We will be focusing outreach efforts to expand the Community Collaborative Rain, Hail & Snow (CoCoRaHS) network project throughout California. This project will reinvigorate citizen science in the State and in turn will bolster existing data collection efforts related to weather and climate.

This project will initiate an effort to migrate all of DWR's VCCN stations to the CoCoRaHS network, a non-profit network of over 15,000 citizen scientists throughout the United States and Canada. We will also work to recruit additional volunteers from multiple sources including tribal groups.

Funding Information:

Project Budget (Annual):	$16,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	SRO staff - $11,000/yr; NRO staff - $5,000/yr		
Project Start Date:	2012	**Project End Date:**	

External Partners:

Within DWR - Public Affairs Office, Department of Flood Management, Division of Safety of Dams; Federal - National Weather Service, NOAA; Others - Colorado Climate Center, CoCoRaHS network, Water Education Foundation/CA Project WET

2015 Project Accomplishments

The DWR Climate Team informed stakeholders about citizen science by promoting the Community Collaborative Rain, Hail & Snow (CoCoRaHS) network. Staff continued to provide brochures and flyers on the network, especially to RWMGs in Southern Region, emphasizing the importance on documenting local rainfall during El Nino events CoCoRaHS continued to be integrated into DWR's Project WET (Water Education for Teachers) 2015 workshops with Water Education Foundation in Los Angeles, Bishop, Redding, and Fresno. In addition to presentations on CoCoRaHS, raffles were conducted in each of the workshops to give away a rain gauge suitable for citizen science.

As indicated under the "Posters" project, staff coordinated with DWR's Public Affairs Office and put together the CoCoRaHS pop-up rain gauge poster that was used at different venues in 2015.

Project Deliverables/Timeline

(2013-2015)Promotion of CoCoRaHS at RWMG meetings
(2013) Presentation at SAWPA Government Alliance Pillar meeting (2013-2014) Guest lectures at CSU Chico on Citzen Sicence/Crowdsourcing and CoCoRaHS
(2014-2015) Integration of CoCoRaHS in DWR Project WET climate change workshops
(2015) CoCoRaHS pop-up poster

(2016-2017) Continue to promote citizen science at teacher workshops and water conferences throughout California. Promote CoCoRaHS by providing rain gauges to willing volunteers with an emphasis on schools and educational institutions.

Customers:

schools and teachers, local and regional water management groups, public, citizen scientists/volunteers

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Manage and Prepare for Dry Periods
Increase Flood Protection

Safeguarding California Implementation Plan

Diversify Local Supplies and Increase Water Use Efficiency Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources Continue to Mainstream Climate Considerations into Water Management Protect and Restore Water Resources for Important Ecosystems Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Action Plan: Phase I GGERP (Internal DWR Policies on Climate Change Mitigation, Analysis, and Adaptation)

Sponsor/Program Manager	Andrew Schwarz, Katy Spanos
Project Manager	Andrew Schwarz

Project Status:

Complete

Project Objective:

Develop comprehensive DWR policies and procedures to guide climate change mitigation, analysis, and adaptation on activities performed by DWR.

Project Description:

In June 2009, the Director formally established the CEQA Climate Change Committee ("C4") to review all climate change analyses in DWR environmental documents and exemption considerations prior to publication. Since that time C4 has served as the key advisory board for all elements of climate change analysis in CEQA documents. Since 2008, C4 has reviewed and commented on dozens of environmental impact reports and hundreds other Departmental environmental documents. During the first 5 years of C4's existence, C4's recommendations and approach to addressing climate change issues in CEQA documents evolved and matured as new legislation and litigation has provided additional requirements, information, and context. In 2010, C4 began a three phase process to develop a comprehensive DWR Climate Action Plan which will contain internal policies to address climate change mitigation, effects analysis, and adaptation. DWR staff, located in the four regional offices and headquarters, will continue to provide technical assistance to project managers and consultants throughout the department to implement policies and guidance developed by the C4. Phase I of the Climate Action Plan is a comprehensive DWR-wide Greenhouse Gas Emissions Reduction Plan that documents 1) DWR's actions to reduce GHG emissions from its activities consistent with AB 32 and Executive Order S-3-05 and 2) Complies with the requirements of CEQA Guidelines section 15183.5 for "Plans for the reduction of greenhouse gas emissions" that can be relied on in subsequent project specific analysis.

Funding Information:

Project Budget (Total):	$100,000	**Funding Source:**	N/A
Budget Notes:			
Project Start Date:	2009	**Project End Date:**	See GGERP Monitoring and Tracking of implementation

External Partners:

Phase I: California Attorney General's Office, OPR.

2015 Project Accomplishments

In 2015, DWR reviewed and approved 137 CEQA projects for consistency with the GGERP. DWR GHG Emissions in 2014 (the most recent year for which verified emissions are available) emissions were 472,547 mtCO2e creating a five year trailing average of emissions of 1,596,534 mtCO2e, 42% below 1990 levels and 22% below 2010 levels. (http://www.water.ca.gov/climatechange/docs/2016/2014AnnualEmissionsReport.pdf)

Project Deliverables/Timeline

Phase I: Completion of DWR GHG Emissions Reduction Plan (GGERP) March 2012, Completion of CEQA review May 2012, formal adoption of GGERP by DWR Director Cowin May 24th, 2012. Full Implementation of GGERP began June 1st, 2012.

Annual reporting and assessment of progress.

Customers:

DWR project managers

Annual Reporting Category before 2015

Business Practices & Technical Expertise

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government

Safeguarding California Implementation Plan

Continue to Mainstream Climate Considerations into Water Management

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: State Agencies Implement GHG reductions
EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
EO B-18-12: Reduce Agency GHG Emissions by 10% by 2015 and 20% by 2020 from 2010 Baseline

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Action Plan: Phase II (Internal DWR Policies on Climate Change Mitigation, Analysis, and Adaptation)

Sponsor/Program Manager	Andrew Schwarz, Katy Spanos
Project Manager	Andrew Schwarz

Project Status:

On Going

Project Objective:

Develop comprehensive DWR policies and procedures to guide climate change analysis, and adaptation on activities performed by DWR

Project Description:

Phase II of the Climate Action Plan will be a guidance framework and data toolbox to guide incorporation of climate change in future planning analysis of DWR projects and activities. Completion of Phase II will result in a guidance document and an accompanying climate scenario toolbox to assist DWR project managers with assessing the need for climate change analysis in their planning activities and guiding decision making for selection of analytical tools and analysis procedures, as well as, assumptions about future conditions. The guidance framework will ensure that DWR projects meet standards for consistency, quality, and adequacy in climate change analysis. This phase of the Climate Action Plan builds on the December 2010 publication of "Climate Change Characterization and Analysis in DWR Planning Studies" by Abdul Khan and Andrew Schwarz. This foundational document is a comprehensive and comparative review of planning studies conducted by DWR and its partner agencies that have addressed climate change.

Funding Information:

Project Budget (Annual):	$50,000	**Funding Source:**	N/A
Budget Notes:			
Project Start Date:	2009	**Project End Date:**	In Progress

External Partners:

DWR Climate Change Technical Advisory Committee

2015 Project Accomplishments

Based on the work of the CCTAG (http://www.water.ca.gov/climatechange/docs/2015/Perspectives_Guidance_Climate_Change_Analysis.pdf) DWR staff are continuing to consider and develop an appropriate structure, framework, and approach to this project.

Project Deliverables/Timeline

Phase II completion in 2017

Customers:

DWR project managers

Annual Reporting Category before 2015

Business Practices & Technical Expertise

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Action Plan: Phase III VA/AP (Internal DWR Policies on Climate Change Mitigation, Analysis, Adaptation)

Sponsor/Program Manager	John Andrew
Project Manager	Michelle Selmon / Andrew Schwarz

Project Status:

On Going

Project Objective:

Develop comprehensive DWR policies and procedures to guide climate change mitigation, analysis, and adaptation on activities performed by DWR.

Project Description:

Phase III of the Climate Action Plan will be a DWR Climate Change Resiliency and Adaptation Plan. This plan will review DWR owned and operated facilities and DWR's activities throughout the state, conduct a vulnerability analysis of these facilities and activities and develop resiliency and adaptation strategies for the department to prepare and protect DWR's assets and services from expected change in climate.

Funding Information:

Project Budget (Total):	$300,000	**Funding Source:**	N/A
Budget Notes:			
Project Start Date:	2013	**Project End Date:**	In progress

External Partners:

Phase III: TBD

2015 Project Accomplishments

Analysis of habitat and ecosystem services and hydrologic impacts analysis continued, the latter in concert with the University of Massachusetts on a decision-scaling technique which represents a new way of exploring climate change impacts on State Water Project operations by the Department.

Project Deliverables/Timeline

Phase III completion: Vulnerability Assessment to be completed by end of 2016; Adaptation Plan to be completed by the end of 2017

Customers:

DWR project managers

Annual Reporting Category before 2015

Business Practices & Technical Expertise

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Change Data Subgroup

Sponsor/Program Manager	Elissa Lynn, Michael Anderson
Project Manager	Peter Coombe

Project Status:

On Going

Project Objective:

Assessment and coordination of climate change data needs for internal DWR projects and provide data support for external partners.

Project Description:

DWR's Climate Change Basic Data group is composed of representatives from DSIWM and the Division of Flood Management, and DWR's regional offices. The project goals are to assess current climate data acquisition efforts at DWR, promote cooperation and coordination across programs, and strategize on issues of data storage, management, and dissemination.

Funding Information:

Project Budget (Annual):	$140,000	**Funding Source:**	Prop 84 thru 15/16, GF starting in 16/17
Budget Notes:			
Project Start Date:	May 2011	**Project End Date:**	N/A

External Partners:

Western Regional Climate Center (WRCC), NOAA

2015 Project Accomplishments

During 2015 the Basic Data workgroup will focused on continued strengthening working relationship with the WRCC, inventorying old climate records in the regional offices, and working on integrating existing data collection and management within DWR. Research was conducted into snow and rain trends in the state, using DWR and other data sources. DWR volunteer climate data observers were continued to be encouraged to migrate to the CoCoRaHS network. A draft document was developed, and data was collected and analyzed from external partners for the 2015 California Hydroclimate Report to be published in 2016.

Project Deliverables/Timeline

Hydroclimate Report- 2016 Final Draft DWR historical data inventory/consolidation- Ongoing Citizen Science, promoting the CoCoRaHS precipitation network- Ongoing SGMA- Data deliverables to groundwater sustainability agencies-2016 Rain/Snow Trends paper to be completed for journal submission

Customers:

State of California Agencies, General Public, DWR Staff

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related?

Governor's Water Action Plan

Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Support Regional Groundwater Management for Drought Resiliency
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
N/A

Legislative and Gubernatorial Mandates

EO S-13-08: NRC SLR Study
SGMA

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Change FAQs and Responses

Sponsor/Program Manager	John Andrew, Elissa Lynn
Project Manager	Michelle Selmon

Project Status:

On Going

Project Objective:

To goal is to develop a list of FAQs that clearly articulate climate change facts in 'plain language' for use in presentations and meetings. Objectives include the following: (1) create a list of questions that have been asked of Climate Change Team members during meetings and presentations and prepare short, articulate responses; (2) identify additional likely FAQs that may be asked in the future based on trends, polls, or 'hot' news items and develop responses; and (3) update the website with short FAQs related to climate change and water impacts (possibly include links to 'reliable' FAQ sites on climate change, such as NASA, IPCC, and others)

Project Description:

Climate change science is complex and nuanced, and many members of the public are not well-versed on the facts about the topic. Laypersons commonly get their knowledge from popular press news stories and/or political commentary, which frequently oversimplifies the issue and in some cases provides misleading or incorrect information. This can lead to confusion about the strength and veracity of the science which clearly implicates the role human activities such as the burning of fossil fuels and deforestation on climate changes that have occurred in the past 100 years. Regional Climate Change Specialists and other members of the Climate Program are frequently asked clarifying questions about the issue in private and public forums, and it is important that answers are consistent and framed in a way that is scientifically accurate, yet doesn't overly rely on technical jargon that only confuses or even 'turns off' people to the issue. Clear and concise communication is very important. This project will result in a list of FAQs and responses that Climate Team members can use to help them be prepared for, and succinctly respond to, questions commonly asked of them.

Funding Information:

Project Budget (Annual):	$1,920	**Funding Source:**	Prop 84 (15/16); GF (16/17)
Budget Notes:			
Project Start Date:	January 2016	**Project End Date:**	

External Partners:

N/A

2015 Project Accomplishments

A list of common climate change myths and refutations has been developed. It will remain a 'living document' where additional information may be added as needed in the future.

Project Deliverables/Timeline

Draft list of climate change myths and refutations - 2015
Final list of climate change myths and refutations - 2016
Related list of FAQs (not based on common myths but rather technical questions about climate change that are frequently asked by people with some knowledge of the subject who would like to understand it at a deeper level)

Customers:

DWR climate change staff
If posted on the website the Myths and Refutations document could be used by the public

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change

IWM Business Categories

Building Capacity for Regional Sustainability

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government

Safeguarding California Implementation Plan

Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Change Impacts on California Water Rights Study

Sponsor/Program Manager	John Andrew
Project Manager	Andrew Schwarz

Project Status:

On Going

Project Objective:

Evaluate the potential impact of climate change on existing water rights in California

Project Description:

This project will look at how changing streamflow as a result of climate change could potentially impact the ability of water rights holders to exercise their water rights. As the amount and timing of surface water flows change the ability of water rights holders to divert water as they have in the past is expected to change. This study will attempt to quantify those changes and discuss the potential impacts to water users and other sources of water if such changes occur.

Funding Information:

Project Budget (Total):	$50,000	**Funding Source:**	N/A
Budget Notes:			
Project Start Date:	2013	**Project End Date:**	In Progress

External Partners:

None

2015 Project Accomplishments

This paper was published in the June 2015 edition of San Francisco Bay Estuary and Watershed Science.
https://escholarship.org/uc/item/25c7w914

Project Deliverables/Timeline

Publication of Paper June 2015

Customers:

California water policy makers and water rights holders. State Water Resources Control Board.

Annual Reporting Category before 2015

Operations

Climate Change Objectives

O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians

State Water Project Related? Yes

Governor's Water Action Plan

Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Change Matrix Team

Sponsor/Program Manager	Gary Bardini
Project Manager	John Andrew / Elissa Lynn

Project Status:

On Going

Project Objective:

Communication and coordination of climate change activities across DWR

Project Description:

DWR's Climate Change Matrix Team includes representatives from every division and major program in the Department. The team of approximately 50 staff (membership is on the last page of the annual report) meets quarterly to communicate and coordinate on climate change issues. Meetings regularly feature an external speaker on climate change, Department and State policy discussion, and an update from the State Climatologist.

Funding Information:

Project Budget (Annual):	$40,000	**Funding Source:**	Various
Budget Notes:	Budget is not dedicated, rather, an estimate of staff cost (using PY costs and hours).		
Project Start Date:	March 2007	**Project End Date:**	Ongoing

External Partners:

None

2015 Project Accomplishments

The Matrix team met on the following dates in 2015, with special focus: January 28; Will Travis, Executive Director (retired), BCDC April 29; Central Valley Flood Protection Plan July 29; Matt Rodriquez, Secretary for Environmental Protection and New DWR Lead Scientist—Ted Sommer October 28; DWR Climate Action Plan.

Project Deliverables/Timeline

Quarterly meetings

Customers:

DWR management and staff

Annual Reporting Category before 2015

Business Practices & Technical Expertise

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government

Safeguarding California Implementation Plan

Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubinatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Change Metrics (for use by local, regional, & other managers)

Sponsor/Program Manager	
Project Manager	Andrew Schwarz

Project Status:

Project Initiation Only

Project Objective:

The goal is to provide clear, regionally specific, and actionable metrics of climate change for use by local and regional resource managers that promote analysis and planning for climate change impacts.

Project Description:

DWR has provided a great deal of climate change guidance to RWMGs. In general this guidance has focused on procedures, decision-making, and planning with a great deal of discretion left to the individual RWMGs about how to do climate change analysis and even what level of climate change they should be planning for. This has resulted in a wide range of approaches taken to characterizing and analyzing potential future effects of climate change for IRWM planning purposes. While use of the information developed by this project would remain voluntary, DWR would be establishing a consistent dataset of climate change metrics for water resource planning that would assist the vast majority of RWMGs. This would improve consistency of analysis across IRWM regions, would allow the impacts and vulnerabilities of each region to be intercomparable, and would facilitate more sophisticated and complete analyses of climate change impacts by RWMGs interested in integrating more fully climate change mitigation and adaptation into their IRWM plans and project reviews. This project would develop a set of metrics, tailored specifically to the needs of the RWMGs that would provide information about how important variables of concern (e.g., streamflow, Evapotranspiration, temperature, groundwater recharge) would be expected to change in the future. Metrics would be presented in multiple formats (e.g., time series data, change metrics) so as to be most useful and applicable for the wide range of technical capacities that exist between the RWMGs. Note that this project is identified in the 2015 CC Strategic Plan as "IRWM Climate Change Metric Development" under the Project Initiation Form.

Funding Information:

Project Budget ():		**Funding Source:**	
Budget Notes:			
Project Start Date:		**Project End Date:**	

External Partners:

Within DWR - IRWM program, Bay Delta Office, DWR CCTAG; Outside DWR - RWMGs, Round Table of Regions

2015 Project Accomplishments

Project remains on hold. This project is a secondary piece coming out of DWR's Climate Action Plan, Phase II. It is currently not at a point to become an outreach project yet.

Project Deliverables/Timeline

Customers:

DWR programs; RWMGs; Round Table of Regions

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

N/A

State Water Project Related? No

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Change Technical Advisory Group (CCTAG)

Sponsor/Program Manager	John Andrew
Project Manager	Elissa Lynn / Andrew Schwarz

Project Status:

Complete

Project Objective:

An external panel of expert advisors provides Department-wide guidance for Climate Change Scenario selection and methodology for the California Water Plan and various Department planning efforts and projects, future flood needs, and IRWM support. See CCTAG website for member bios, meeting materials and charter: http://www.water.ca.gov/climatechange/cctag.cfm

Project Description:

The CCTAG advises DWR on the scientific aspects of climate change, its impacts on water resources, the use and creation of planning approaches and analytical tools, and the development of adaptation responses. A standing technical advisory group on climate change impacts and adaptation serving all DWR programs provides external guidance and support for a variety of climate elated issues, including scientific review of climate change models and scenarios, interpretation of scientific information produced by the National Climate Assessment and the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, and informing DWR's climate change adaptation policies. Benefits include consistency in the scientific advice the Department receives on climate change, and the administrative efficiency of not having redundant climate change advisory groups across the Department. The Department's Climate Change Program oversees and coordinates the CCTAG.

Funding Information:

Project Budget (Total):	$300,000	**Funding Source:**	Prop 84
Budget Notes:			
Project Start Date:	2011	**Project End Date:**	March 2015

External Partners:

California Water Plan Statewide Water Analysis Network, State Climatologist Office

2015 Project Accomplishments

2015 marked the conclusion of this CCTAG tenure. A final report, "Perspectives and Guidance for Climate Change Analysis" was released in August, 2015. This Technical Information Record represents the preliminary findings from 2012-2015 by DWR's expert external advisory committee on global climate model selection appropriate for California water resources, planning for extreme conditions, downscaling, and recommendations for future work. Link to the report: http://www.water.ca.gov/climatechange/docs/2015/1_14_16_PerspectivesAndGuidanceForClimateChangeAnalysis_MasterFile_FINAL_08_14_2015_LRW.pdf. Following release of the report, DWR programs and activities were informed by the model selection process established by the CCTAG. Information-sharing and cross coordination began with other State agencies about the models selected by CCTAG.

Project Deliverables/Timeline

In addition to a broad array of technical and policy advice, the CCTAG provides specific guidance on climate change scenario selection for the California Water Plan, and other planning efforts of the Department, including DWR Framework guidance climate change approach recommendations.
As of the start of 2016, no further deliverables are anticipated with this iteration of the CCTAG, however, the resulting model selection was shared and adapted for use by: CEC/4th Assessment, SWRCB, SGMA and Proposition 1 DWR and SWRCB activities and policies.

Customers:

In general, the Department of Water Resources is the customer. Specific customers within DWR include the California Water Plan, the Climate Change Framework Team, which is developing guidance on the selection of climate change scenarios, approaches and project-level analytical tools, and other groups, including IRWM, Flood Management, and the Natural Resources Agency, on the incorporation and consistency of climate change in planning studies and projects.

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting IRWM
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate News Digest

Sponsor/Program Manager	John Andrew, Elissa Lynn
Project Manager	Michelle Selmon

Project Status:

On Going

Project Objective:

To goal of the Climate News Digest is to provide information and though-provoking material help DWR and other agency staff stay informed about the issue of climate change so they can understand its relevance to their projects and other work.

Project Description:

A tremendous amount of information about climate change is published daily in many formats, making it a bit overwhelming for people to read it all to stay informed about the latest developments. A monthly selected compilation of climate news articles, publications, and other information about climate change is distilled from the vast body of information that is available each day into a more digestible form for DWR and other agency staff, water managers, and member of the public. Items are hotlinked to the original source on the internet and are organized by category so that people can quickly find information that is of most relevance to their work and interests. Sometimes quotes from the article/publication or comments from the Climate News Digest editor are included to provide additional information about the link and its potential relevance.

Funding Information:

Project Budget (Annual):	$38,400	**Funding Source:**	Prop 84 (15/16); GF (16/17)
Budget Notes:			
Project Start Date:	April 2010	**Project End Date:**	

External Partners:

2015 Project Accomplishments

In 2015, the Climate News Digest transitioned to monthly production (versus every 5-6 weeks) for more consistency in distribution and to ensure that news items didn't get to 'stale' before subscribers read them. Twelve issues averaging approximately 6-8 pages containing anywhere from 60-100 weblinks were produced in 2015.

Project Deliverables/Timeline

The Climate News digest will continue to distribute monthly editions to the list of subscribers (over 250) and also post on the DWR Climate Change website on the Climate News page.

Customers:

DWR and other agency staff working on climate change or those who are interested in how climate change might impact their work, water managers and other resources managers, and members of the public.

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change

IWM Business Categories

Building Capacity for Regional Sustainability

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government

Safeguarding California Implementation Plan

Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

SGMA
IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Climate Resiliency Policy

Sponsor/Program Manager	John Andrew
Project Manager	

Project Status:

Project Initiation Only

Project Objective:

A Climate Resiliency Policy will promote the implementation of climate protection practices throughout the department while also supporting the implementation of the Sustainability Policy.

Project Description:

Implementation of DWR's Sustainability Policy includes, in part, a focus on climate protection practices. Some practices are starting to occur within DWR, for example the adoption of the Greenhouse Gas Reduction Plan, projects including analyses of climate change impacts (i.e. BDCP and CVFPP), and the development of adaptation and mitigation strategies for the Water Plan Update 2013. However, climate protection practices are not yet being implemented broadly throughout the department. The project develops a Climate Resiliency Policy and framework for implementation to facilitate integration of climate change adaptation and mitigation strategies into DWR activities and promote staff acceptance of climate change resiliency as one of DWR's core values. The implementation framework would lay the foundation for addressing the Department's vulnerabilities to climate change and support successful integration of all phases of our Climate Action Plan into DWR programs and projects.

Funding Information:

Project Budget (Total):		**Funding Source:**	
Budget Notes:			
Project Start Date:		**Project End Date:**	

External Partners:

DWR-wide

2015 Project Accomplishments

Project Initiation Only

Project Deliverables/Timeline

Customers:

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities

IWM Business Categories

N/A

State Water Project Related? Yes

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Data Collection and Climate Services

Sponsor/Program Manager	John Andrew, Elissa Lynn
Project Manager	Michael L Anderson / Peter Coombe

Project Status:

On Going

Project Objective:

Collect relevant climate data to support Department's emergency response and planning initiatives and monitor for climate change; provide relevant climate data and value added products to general public.

Project Description:

DWR continues to develop the Flood Emergency Response Information Exchange (FERIX), a web based platform to provide flood information. Efforts are underway to link information presented in FERIX to the climate data in the California Climate Data Archive. FERIX will also house a new map-based server for (former State Climatologist) Jim Goodridge's precipitation Depth-Duration-Frequency curves and annual extremes data sets that make up Bulletin 195. This will greatly facilitate the serving of the data which was handled through a now discontinued ftp site with over 4000 spreadsheets. Data requests and data collection for this effort will be transitioned from Jim Goodridge to DWR in the coming years.

For observing data systems, DWR is continuing its partnership with the Earth Systems Research Lab of the National Oceanic and Atmospheric Administration (NOAA) and Scripps Institution of Oceanography to deploy new monitoring equipment for extreme precipitation events. For this network, water vapor measurements, wind profilers, soil moisture sensors and freezing level radar are being deployed across the state. The data from this network is currently served through NOAA's Hydrometeorology Testbed website at http://hmt.noaa.gov. Efforts continue to get the data into the California Data Exchange Center. Other observing opportunities that are in their initial stages include elements of the Forecast Coordinated Operations Program and the UC Merced observing system in the American River watershed. A new remote sensing monitoring effort using airborne LIDAR measurements of the snowpack is being developed under a joint project between DWR and NASA's Jet Propulsion Laboratory. NOAA has stopped funding for the new Regional Climate Reference Network and is considering streamlining the National Weather Service Cooperative Observer Network.

Funding Information:

Project Budget (Annual):	$140,000	**Funding Source:**	Climate Change Program and Division of Flood Mgmt.
Budget Notes:			
Project Start Date:	July 2009	**Project End Date:**	In Progress

External Partners:

NOAA ESRL, Scripps, Jim Goodridge

2015 Project Accomplishments

Depth duration frequency precipitation data contained within Bulletin 195 can now be accessed through the Flood Emergency Response Information Exchange (FERIX) web page at: http://ferix.water.ca.gov/webapp/precipitation/

DWR continued its partnership with the Earth Systems Research Lab of the National Oceanic and Atmospheric Administration (NOAA) and Scripps Institution of Oceanography. CalWater2 a Precipitation, Aerosols, and Pacific Atmospheric Rivers Experiment was initiated to gain a better understanding of the evolution and structure of Atmospheric Rivers. The CalWater2 study was completed January through March 2015.

Project Deliverables/Timeline

Web-based map server for Bulletin 195 data, data updating toolkits, full EPN sites with data flow to CDEC.

Development of a climatology of Atmospheric Rivers working with Scripps Institution of Oceanography, including A/R's role in precipitation extremes in CA, and projected impacts of climate change.

Customers:

DWR, General Public

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk

State Water Project Related? Yes

Governor's Water Action Plan

Manage and Prepare for Dry Periods
Increase Flood Protection
Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks
N/A

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
SGMA
IRWM
UWMP

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Decision Scaling Analysis of Climate Change Impacts on SWP

Sponsor/Program Manager	John Andrew
Project Manager	Andrew Schwarz

Project Status:

On Going

Project Objective:

Complete a comprehensive vulnerability assessment and adaptation analysis for the SWP

Project Description:

A comprehensive climate change vulnerability assessment of State Water Project operations will be completed. This vulnerability assessment will, for the first time, provide DWR with a comprehensive assessment of its vulnerabilities to changes in State Water Project performance as a result of future changes in climate.

Funding Information:

Project Budget (Total):	$520,000	**Funding Source:**	
Budget Notes:	$200,000 contract with UMass + 320,000 in staff time		
Project Start Date:	March 2013	**Project End Date:**	September 2017

External Partners:

University of Massachusetts

2015 Project Accomplishments

In 2015, the team completed the development of preprocessing routines for generating input datasets for the CalLite model. The team also began investigations into system response and scoping of the SWP vulnerability assessment.

Project Deliverables/Timeline

By August 2016, The team will complete the SWP vulnerability Assessment and present results in the DWR Phase III Climate Action Plan- Vulnerability Assessment. By September 2017, the team with complete an analysis of a suite of potential climate adaptations for the SWP using the decision scaling platform and will present the results in the DWR Phase III Climate Action Plan- Adaptation Plan.

Customers:

DWR Executive, DWR project managers, SWP customers, SWP contractors

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Taking Action to Reduce Residual Risk

State Water Project Related? Yes

Governor's Water Action Plan

Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Development of Messaging and Talking Points

Sponsor/Program Manager	
Project Manager	Andrew Schwarz

Project Status:

Project Initiation Only

Project Objective:

Project will improve communication between public/customers and DWR staff and will eventually lead to improvements in DWR's public image/perception.

Project Description:

While DWR has successfully developed and implemented a number of cutting edge projects and programs and has resources available and can provide assistance on range of topics, DWR is still not always seen as a leader in the field and had not always done a good job of conveying a consistent, easy-to-understand message. Working with the Public Affairs Office, DWR Climate Change Program staff will develop a limited set of talking points or messaging points that will help guide and hone the information that we provide in future public presentations and documents.

Funding Information:

Project Budget (Total):		**Funding Source:**	
Budget Notes:			
Project Start Date:		**Project End Date:**	

External Partners:

DWR Public Affairs Office

2015 Project Accomplishments

Project Initiation Only

Project Deliverables/Timeline

Customers:

Public

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

N/A

State Water Project Related? No

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

DWR Climate Change Program

Sponsor/Program Manager	John Andrew
Project Manager	Elissa Lynn

Project Status:

On Going

Project Objective:

The Climate Change Program supports all climate change activities across the Department. Specialists in both adaptation and mitigation are located throughout the regional offices, and headquarters. Program goals include providing regionally-specific climate change information to programs, projects, and documents, by accessing and synthesizing research, data, tools, and topical content for California's unique water management issues with regard to a warming climate.

Project Description:

DWR has had a climate change program since 2009. Executive Manager for Climate Change, John Andrew, hired a multidisciplinary team of climate change specialists to serve the Department and public on issues related to climate change and water management. Members are matrixed across and the Statewide Integrated Water Management and Integrated Regional Water Management Divisions. The Climate Change program received funding through FY 15/16 from Proposition 84, and fees from the Air Resources Board under Assembly Bill 32 (Global Warming Solutions Act). Additional climate change support is provided by Executive, and Water Use Efficiency.

Funding Information:

Project Budget (Annual):	$2,500,000	**Funding Source:**	Proposition 84, AB 32, General Fund
Budget Notes:	The program has bond funding and AB32 fee funds to support all activities of the climate change program through FY 15/16. The program anticipates being funded by the General Fund, starting in FY 16/17 for adaptation work, with continued funding from AB32		
Project Start Date:	2009	**Project End Date:**	In Progress

External Partners:

Matrix managed across multiple divisions of DWR.

2015 Project Accomplishments

The program held four Climate Change Matrix Team meetings in 2015, for internal DWR coordination on projects and topics related to climate change and water management. Climate Change staff met regularly to address adaptation and mitigation issues in the following subgroups; Mitigation & Water-Energy, Tribal- Climate Change, Outreach, Data, and the CAP Phase III (DWR Vulnerability Assessment), plus held bi-weekly full team meetings. Under the program, DWR was awarded a Climate Leadership Award in 2015: http://www.water.ca.gov/news/newsreleases/2016/030916climateleadership.pdf

Project Deliverables/Timeline

Continue implementation of the Climate Change Program Strategic Plan, leading Safeguarding CA water sector implementation, and meeting all legislative and gubernatorial mandates for climate change in the water sector.

Customers:

California Water Plan, Integrated Regional Water Management, and FloodSAFE programs. The program also provides support to the WETCAT, the Governor's Climate Action Team and the Governor's Water Action Plan

Annual Reporting Category before 2015

Business Practices & Technical Expertise

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Achieve the Co Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management
Provide Safe Water for All Communities
Increase Flood Protection
Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Support Regional Groundwater Management for Drought Resiliency
Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: State Agencies Implement GHG reductions
EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
EO B-18-12: Reduce Agency GHG Emissions by 10% by 2015 and 20% by 2020 from 2010 Baseline
EO S-13-08: NRC SLR Study
EO S-13-08: Review and NRC SLR Study Every 2 Years
SGMA
IRWM
UWMP
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

DWR Climate Literacy

Sponsor/Program Manager	John Andrew
Project Manager	Elissa Lynn

Project Status:

On Going

Project Objective:

The objectives include the following: (1) to conduct literacy classes each year at DWR Training Center, as well as in Regional or Field offices; (2) to partner with other agencies on climate literacy, either participating in their training, or making ours available to the Resources Agency; and (3) to extend climate literacy classes to external audiences, such as UC Davis Extension, or other.

Project Description:

With respect to Objective (1), the class is designed to inform DWR staff about the climate and climate change issues that relate to water management in California. Subject matter experts cover: the climate in California; hydrologic change measurement and analysis; greenhouse gas emissions; State and DWR policies, responses and actions for adapting and mitigating for CO2; the relationship between work activities and DWR's Climate Action Plan; and the latest research, modeling and science. Engaging activities will result in practical support and help DWR staff impart reliable information on the topic to society at large.

Funding Information:

Project Budget (Annual):	$25,000	**Funding Source:**	
Budget Notes:			
Project Start Date:	2011	**Project End Date:**	ongoing

External Partners:

DWR Training Center, the State Climatologist Office, the Bay-Delta Modeling Group, the State Water Project Power and Risk Office, and the Division of Flood Management.

2015 Project Accomplishments

In 2015, Climate Literacy classes were converted to a 1-day, 8-hour training rather than the 2-day classes in years prior. Content was re-organized by Hawks to consolidate and simplify materials. Classes were held on August 5 and December 8, in the Sacramento Training Center, each attended by 28 DWR staff.

Project Deliverables/Timeline

Smaller to-go versions for other audiences besides DWR Staff.

Customers:

Primarily DWR Staff

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities

IWM Business Categories

Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self -Reliance and Inte

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Economic Analysis Guidebook

Sponsor/Program Manager	To be determined
Project Manager	Emmanuel Asinas

Project Status:

Project Initiation Only

Project Objective:

To incorporate a full life cycle accounting of costs in economic analysis in consideration of climate change impacts

Project Description:

This work is part of the overall goal of updating the DWR Economic Analysis Guidebook in view of recent developments in state and federal policy mandates (e.g. Governor's Executive Order B-30-15), guidelines, and procedures, and new methods for conducting economic analysis that account for climate change risks and other extreme events.

Funding Information:

Project Budget (Total):	$200,000	**Funding Source:**	We are looking for sponsor/s to fund this project
Budget Notes:	Budget will include costs associated with consultant and/or staff time and project deliverables.		
Project Start Date:		**Project End Date:**	

External Partners:

2015 Project Accomplishments

Project Initiation Only

Project Deliverables/Timeline

Still to be developed, but may include 1. Literature review of life cycle cost accounting, 2. Full life cycle cost accounting spreadsheet tool, and 3. Updated DWR Economic Analysis Guidebook.

Customers:

DWR executives, program managers, specialists, and grants and loans project applicants

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management
Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Emissions Reports to the California Air Resources Board (CARB)

Sponsor/Program Manager	Veronica Hicks
Project Manager	Ram Verma

Project Status:

On Going

Project Objective:

Reporting and verification of Greenhouse Gas (GHG) emissions.

Project Description:

Reporting and verification of Greenhouse Gas (GHG) emissions.

Funding Information:

Project Budget (Annual):	$200,000	**Funding Source:**	SWC
Budget Notes:	The budget is mostly staff time, and travelling to the Field Divisions.		
Project Start Date:	2013	**Project End Date:**	

External Partners:

California Air Resources Board

2015 Project Accomplishments

In 2015, DWR reported its 2014 pump load and generation data to CARB. DWR purchased compliance instruments to meet its contractual obligation for the Lodi Energy Center. In May 2015, DWR submitted its annual report to the CARB for the emission year 2014. The report included energy generated and consumed by the SWP, and SF6 emissions associated with the SWP's switchyard circuit breakers. To meet its contractual obligation for the Lodi Energy Center, DWR participated in GHG allowance auctions conducted by CARB.

Project Deliverables/Timeline

Current Objectives:
1. Compliance with mandatory reporting requirements of AB32
2. Monitoring of emissions and quantities of SF6

Future Objectives:
1. Tracking and reducing SF6 emissions

Tangible results that will result from the project:
1. Compliance with AB32 regulation
2. Optimized compliance cost
3. Reduced SF6 emission
4. Availability of SF6 emission reports

Customers:

Public, CARB and State Water Contractors

Annual Reporting Category before 2015

Energy & Greenhouse Gas Emissions

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: State Agencies Implement GHG reductions

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Environmental Stewardship Policy

Sponsor/Program Manager	Executive
Project Manager	Ted Frink

Project Status:

On Going

Project Objective:

Implementation of the Environmental Stewardship Policy in DWR programs and projects. DWR shall implement the environmental stewardship policy through a commitment to manage and protect natural resources (water, air, land, plants and animals) and ecosystems in a sustainable manner that ensures they are available for future generations in consideration of climate change.

Project Description:

In October 2010 DWR's Director Mark Cowin established the inaugural Environmental Stewardship Policy. This policy is integral to advancing a Department-wide "Total Resource Management" approach to planning and design of projects. It sets forth the intent that DWR shall work towards the sustainability of public trust resources related to water resources management and the environment including strategies to address climate change impacts. The Policy states that DWR shall fully integrate environmental benefits, which include, but are not limited to, habitat protection and restoration/enhancement objectives and climate change adaptation in the planning, development, and implementation of operations, maintenance, and all projects under the authority of DWR. The Environmental Stewardship Policy commits DWR managers to consider, integrate, and design environmental stewardship attributes into DWR's water and flood management programs and projects in several ways: integrate ecosystem protection and restoration into water storage and conveyance and flood control/management planning and implementation; include environmental stewardship and ecosystem protection and restoration as criteria in project funding decisions for all DWR programs; plan for conservation, restoration and maintenance of the biological diversity and natural physical processes of aquatic and related terrestrial ecosystems; and plan and implement projects that contribute to the recovery of aquatic and riparian species listed under the federal and state Endangered Species Acts and other laws, as well as other at-risk species. In March 2012, the revised WREM 58b: Environmental Stewardship and Compliance was adopted. It provides guidance for consideration and application of Environmental Stewardship Principles along with project-level guidelines to improve DWR's ability to meet or exceed environmental compliance requirements. Following the adoption of WREM 58b, the Environmental Stewardship Implementation Plan Work Group (ESIP) has begun development of an Environmental Stewardship Implementation Plan. The Plan will focus on developing education, outreach, and guidance on integrating Environmental Stewardship concepts and principles into all facets of DWR programs and projects. The ESIP Team has initiated the establishment of individual work teams for each of five identified areas of need for implementing the ES Policy throughout DWR programs. The five areas include Resources, Technical Assistance, Monitoring, Education and Training, and Communication and Outreach plans. The Plan will be completed in three phases. In Phase 1, initiated in 2014, the ESIP work teams will develop the scope, schedule, and budget needed to carry out the Plan. The development and implementation of the full Plan will occur in Phases 2 and 3, respectively. The outcomes of the project are expected to help advance environmental stewardship and sustainability objectives for public trust resources and the State's water management infrastructure by following the Director's Total Resource Management approach.

Funding Information:

Project Budget (Total):	$200,000	**Funding Source:**	Individual Division funds
Budget Notes:	Budget was set as a commitment from each DWR Division to support staff that had been identified to be a representative to the ESIPP Team based on the Charter approved by all levels of Executive. The budget was the amount of staff time to work on the ESIPP over approximately 18 months.		

Project Start Date:	July 2014	Project End Date:	In Progress

External Partners:

N/A

2015 Project Accomplishments

ESIPP was put on hold indefinitely by Executive leadership as of June 16, 2015. Schedule status at time of hold by Executive: Teams were to review 2nd draft of PMP and attachments from 5/27 - 6/12. Team reviews of final draft PMP and attachments to see if ready to go to ECC Steering Committee. Final edits review from 6/17 - 6/23. This task was halted, teams were told to wrap up any last changes and document where they were in the project as of June 19, 2015.

The Environmental Stewardship Guidebook and Appendix was completed and waiting for Executive final approval as of June 2015. Approval of the ES Guidebook was withheld by Executive pending reorganization of the ECC Leadership.

Project Deliverables/Timeline

The ESIPP workgroup was formed and Phase 1 of the Environmental Stewardship Implementation Plan Project was to be completed by mid-2015. Project was put on hold by Executive.

Customers:

DWR managers and staff, public trust resources and general public, resources and regulatory agencies.

Annual Reporting Category before 2015

Business Practices & Technical Expertise

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Make Conservation a California Way of Life
Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management
Increase Flood Protection
Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Utilize Low-impact Development and Other Methods in State and Regional Stormwater Permits to Restore the Natural Hydrograph
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: State Agencies Implement GHG reductions
EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
SGMA
IRWM
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Evaluation of Benefits of Meadow Restoration on Sierra Nevada Water Supply

Sponsor/Program Manager	FESSRO/DSIWM/Climate Change Team
Project Manager	Stefan Lorenzato

Project Status:

Complete

Project Objective:

Investigate the role of restoring degraded montane meadows in water management in the Sierra Nevada, specificaly flow and timing

Project Description:

In a natural, un-degraded condition, mountain meadow communities have deep soils, dense herbaceous vegetation, and a naturally-developed drainage pattern where water flows across the flat meadow surface and infiltrates the soil; shallow meandering channels then carry water to downstream drainages. Meadows typically remain fully saturated for most of each year and can store substantial quantities of groundwater in their soils, acting as natural reservoirs of water at high elevations. Slow release of water stored in meadow sediments can provide base flow to downstream drainages long after surface runoff has stopped for the season; in addition, the water storage capacity of meadows can buffer the rate of water runoff during snowmelt and reduce peak flows that cause flooding downstream. The net result is a reduction in extremes of runoff, increasing the low flow and reducing peak flows. Degraded meadows that have been exposed to poor land-use practices, such as overgrazing of livestock, off-highway vehicle traffic, and draining, typically exhibit “gully erosion,” in which shallow channels are deeply eroded and all water entering the meadow drains rapidly into stream channels rather than across meadow surfaces. The channelized flow does not allow the soils to become saturated, eliminating the beneficial hydrologic effects of meadow communities and leading to drastic changes in meadow vegetation. Meadow restoration is the practice of reversing the effects of gully erosion by filling gullies and re-establishing a quasi-natural hydrologic regime by redirecting surface flows across meadows, allowing water to infiltrate the sediment, raise groundwater levels, and potentially restore the beneficial hydrologic functions of meadows. DWR has provided funding to the US Forest Service for a three-year investigation (partly extended to five years due to operational and management difficulties) of the hydrologic effects of meadow restoration and how restored meadows can contribute to improved system operation as well as ecosystem functioning. In 2010 the project began meeting the goals of the funding, including: delineating potential meadows using available Geographic Information System (GIS) datasets, delineating meadows in the field and comparing the field delineations to those derived from GIS analysis; assessing meadow condition in a random sample to extrapolate to the condition of all Sierra meadows; installing instrumentation to assess hydrology of undisturbed and restored meadows. The Project has since been completed and a final report issued.

Funding Information:

Project Budget (Total):	$313,000	**Funding Source:**	Prop 84
Budget Notes:	$313,000 (DWR match)		
Project Start Date:	6/1/2010	**Project End Date:**	Project extended to 3/2015

External Partners:

National Fish and Wildlife Federation, US Forest Service

2015 Project Accomplishments

Final report issued and accepted.

Project Deliverables/Timeline

• Literature review of hydrologic effects of montane meadow restoration: completed
• Geographic inventory of meadow communities in the Sierra Nevada: completed
• Evaluation of extent and prevalence of meadow degradation through erosion: completed
• Simulation modeling of meadow hydrology and synthesis of results: groundwater modeling completed, with results published in a peer-reviewed scientific journal. Evaluation of the hydrologic role of ponds in restored meadows completed.
• Determination of water budgets for sample of degraded and undegraded meadow communities: additional data will be collected during an extension of project funding period; completed.
• "EFFECTS OF MEADOW EROSION AND RESTORATION ON GROUNDWATER STORAGE AND BASEFLOW IN NATIONAL FORESTS IN THE SIERRA NEVADA, CALIFORNIA" paper to be prepared in 2015.

Customers:

USDA Forest Service, public agencies managing water derived from Sierra snow melt

Annual Reporting Category before 2015

Field Studies

Climate Change Objectives

O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability

State Water Project Related? No

Governor's Water Action Plan

Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Utilize Low-impact Development and Other Methods in State and Regional Stormwater Permits to Restore the Natural Hydrograph
Protect and Restore Water Resources for Important Ecosystems

Legislative and Gubernatorial Mandates

EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Evaluation of Benefits of Reoperation of Water Supply and Flood Protection Systems

Sponsor/Program Manager	Ajay Goyal
Project Manager	Sean Sou

Project Status:

On Going

Project Objective:

Improve water supply reliability and flood protection, and ecosystem restoration and protection

Project Description:

The California Department of Water Resources (DWR) is conducting a system reoperation study (SRS) in cooperation with other State and federal agencies, local water districts, groundwater managers, and other stakeholders, to identify potential strategies for reoperation of the statewide flood protection and water supply systems. The opportunity to reoperate portions of California's statewide water system to yield increased water resources-related benefits was recognized by the State Legislature in Senate Bill X2 1 (SB X2 1) (Perata, 2008 – Water Code Section 83002.5).
In support of the legislative objectives, DWR developed the SRS to identify viable reoperation strategies and understand how integrated management can:
Improve the reliability of municipal and irrigation water supply
Reduce flood hazards
Restore and protect ecosystem function and habitat conditions
Buffer the hydrologic variations expected from climate change
Improve water quality

Development of the SRS is a multi-phased effort that includes:
Phase 1 – Plan of Study – Completed 2011
Phase 2 – Strategy Formulation and Refinement - Completed 2013
Phase 3 – Preliminary Assessments of Strategies – Planned to be completed in 2016

Next Phase - The next phase of SRS will consist of evaluation of the reoperation of reservoirs to support enhanced ecosystem flows, to support sustainable groundwater management, to obtain additional benefits with integration of potential new reservoirs that may be funded by Proposition 1, and to obtain expanded benefits with potential new Sacramento-San Joaquin Delta (Delta) conveyance associated with California WaterFix.

The system reoperation strategies are analyzed with appropriate climate change scenarios and evaluated for their ability to reduce or minimize climate change impacts to water supply, flood management, and the ecosystem. System reoperation which involves primarily the use of existing water storage infrastructure and conveyance systems, such as conjunctive use of surface water and groundwater, could help reduce climate change impacts including reduced snowpack, more precipitation in the form of rain, and early snowmelt.

Funding Information:

Project Budget (Total):	$10,000,000	**Funding Source:**	Prop. 84
Budget Notes:			
Project Start Date:	2010	**Project End Date:**	2017

External Partners:

N/A

2015 Project Accomplishments

Completed administrative draft of the Phase III Report Assessment of Reoperation Strategies

Project Deliverables/Timeline

Phase III Report: Assessment of Reoperation Strategies Planned to be completed in 2016
Next Phase: Reports for assessments of reoperation strategies with potential new water storage projects and new Delta conveyance to be completed in 2017 through 2019.

Customers:

General Public, California Legislature, Water management facilities owners and operators

Annual Reporting Category before 2015

Operations

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities

IWM Business Categories

Ensuring Reliable Water Supply for All Californians

State Water Project Related? Yes

Governor's Water Action Plan

Achieve the Co -Equal Goals for the Delta
Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Exhibits

Sponsor/Program Manager	John Andrew, DWR Public Affairs Office
Project Manager	Elissa Lynn / Lauma Jurkevics

Project Status:

On Going

Project Objective:

To goal is to develop exhibit material for DWR or external facilities to educate the public about impacts of climate change on water and DWR operations. Objectives include the following: (1) coordinate with the Public Affairs Office on revamping existing exhibits; (2) coordinate with the Public Affairs Office to identify suitable locations for new exhibits and develop material for those sites

Project Description:

Public climate change display materials are to be developed for DWR Visitors' Centers and potential external locations.

Funding Information:

Project Budget (Annual):	$31,280	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	Public Affairs will cover the cost to VC remodels, beyond the posters CC program has been providing. Headquarters cost = $15,000 SRO staff cost = $11,000 SCRO staff cost = $1,280		
Project Start Date:	2011	**Project End Date:**	Ongoing

External Partners:

DWR Public Affairs Office, Fossil Discovery Center, Long Beach Aquarium, Buena Vista Museum of Natural History and Science in Bakersfield.

2015 Project Accomplishments

Reconnaissance visits were made to the three Visitors' Centers (VC) to evaluate each location and feasibility of creating exhibits specific to climate change. DWR videos on climate change were forwarded to the Vista del Lago VC to supplement the video collection they had. Staff also evaluated a draft exhibit proposal by the Public Affairs Office for the Vista del Lago VC, which is the most frequently visited site because of its proximity to Interstate 5.

Project Deliverables/Timeline

Deliverables Completed:
2007 Science On a Sphere, California State Fair, winner of the Government Communicators Award

2011 (Oct) Aquarium of the Pacific, Long Beach with shortened version of Climate of Change video; still in place through 2015, no changes until they remove display.

Buena Vista Museum of Natural History and Science in Bakersfield; still in place through 2015, no changes until they remove display.

2013: Fossil Discovery Center (FDC) climate change exhibit, Partners are FDC and DWR. The FDC displays some of the 15,000+ fossils that have been excavated from the Madera landfill site since 1996, when a Columbian Mammoth tusk was found during earthmoving. The climate change exhibit ties the themes of water and climatic changes to the abundance and diversity of species found in this region historically, as well as the challenges we face in the future due to a declining snowpack and changing hydrology. Still in place through 2015, no changes until they remove display.

Deliverables for 2016
CC vulnerabilities by region posters to Public Affairs to replace outdated posters at the Visitors' Centers. Climate Change Program staff to meet and collaborate with Public Affairs. Public Affairs staff attend Climate Literacy.

Deliverables to come:
Support the re-vamp of DWR Visitors' Centers displays related to climate change, under the direction of Public Affairs, on their timeline.
Possible deliverable: climate change video on the spherical globe at Vista del Lago.
No new "non-DWR" (external) sites or partnerships are currently planned, but could be created.

Customers:

Public

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change

IWM Business Categories

Ensuring Reliable Water Supply for All Californians

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government

Safeguarding California Implementation Plan

Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Flood Investment Strategy

Sponsor/Program Manager	DFM or State Plan of Flood Control? -
Project Manager	Ricardo Pineda / Jason Sidley

Project Status:

Project Initiation Only

Project Objective:

Address flood risk management in the context of integrated water management, and include recommendations for state investments that consider existing and changed conditions.

Project Description:

As part of Safeguarding Implementation Plan under EO-B-30-15, flood investment strategies should consider * Local, State and federal agency proposed flood management project needs. * Potential management actions to address flood risk and climate change to balance risk and reward on floodplains. *How climate change and sea-level rise affect flood risk, and how flood risk is understood by the public.

Funding Information:

Project Budget (Total):		**Funding Source:**	
Budget Notes:	TBD		
Project Start Date:		**Project End Date:**	

External Partners:

2015 Project Accomplishments

Project Initiation Only

Project Deliverables/Timeline

Customers:

Cities, counties, local flood control agencies and regional flood control agencies.

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding

Legislative and Gubernatorial Mandates

EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Flood preparedness cooperation with CalOES

Sponsor/Program Manager	DFM
Project Manager	Ricardo Pineda

Project Status:

Project Initiation Only

Project Objective:

TBD

Project Description:

TBD

Funding Information:

Project Budget (Total):		**Funding Source:**	
Budget Notes:			
Project Start Date:		**Project End Date:**	

External Partners:

2015 Project Accomplishments

Project Initiation Only

Project Deliverables/Timeline

Customers:

Annual Reporting Category before 2015

Field Studies

Climate Change Objectives

O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Managing Floodwaters while Protecting the Ecosystem Taking Action to Reduce Residual Risk

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding

Legislative and Gubernatorial Mandates

EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Greenhouse Gas Emissions Reduction Plan - Monitoring and Tracking of Implementation

Sponsor/Program Manager	Andrew Schwarz, Katy Spanos, Heidi Rooks
Project Manager	Andrew Schwarz

Project Status:

On Going

Project Objective:

Monitor and track implementation of DWR Greenhouse Gas Emissions Reduction Plan to meet the commitments laid out in the Plan and ensure that DWR is on course to meet its GHG emissions reduction goals.

Project Description:

With the adoption of the DWR Greenhouse Gas Emissions Reduction Plan (GGERP) on May 24th, 2012 DWR committed to substantial GHG emissions reduction goals (Near-term: Reduce GHG emissions to 50% below 1990 levels by 2020; Long-term: Reduce GHG emissions to 80% below 1990 levels by 2050). DWR also committed to annual tracking and reporting of GHG emissions and a quinquennial review of progress toward achievement of goals and re-evaluation of GHG emissions reduction strategies if necessary.

Funding Information:

Project Budget (Annual):	$20,000	**Funding Source:**	N/A
Budget Notes:			
Project Start Date:	2012	**Project End Date:**	On-going through 2050

External Partners:

The Climate Registry

2015 Project Accomplishments

In 2015, DWR re-calculated and re-verified emissions for 2012 and calculated and verified emissions from years 2013 and 2014. 2014 emissions were 20% below 1990 levels. In 2015, DWR developed new "2nd Generation" Emissions Reduction targets in order bring its emisisions reduction targets in line with industry best practice. The new tragets call for DWR to reduce emissions 33% below 2010 emissions by 2020 and 77% below 2010 levels by 2050. DWR also reviewed and approved CEQA documentation consistent with the GGERP for 139 different projects. In 2015, DWR won the Climate Leadership Award for Excellence in Greenhouse Gas Management for its GGERP.

Project Deliverables/Timeline

On-going monitoring and reporting of DWR GHG emissions consistent with the GGERP each year, Quinquennial evaluation of progress toward meeting GGERP GHG emissions reduction goals.

Customers:

DWR Executive Management, State of California, Public, State Water Project Contractors

Annual Reporting Category before 2015

Energy & Greenhouse Gas Emissions

Climate Change Objectives

O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

Diversify Local Supplies and Increase Water Use Efficiency

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: State Agencies Implement GHG reductions
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
EO B-18-12: Reduce Agency GHG Emissions by 10% by 2015 and 20% by 2020 from 2010 Baseline
EO B-18-12: Zero Net Energy Buildings
EO B-18-12: LEED Silver
EO B-18-12: Electric Vehicle Charging Stations

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Hydroclimate Report

Sponsor/Program Manager	State Climatologist Office
Project Manager	Peter Coombe / Michael L Anderson

Project Status:

On Going

Project Objective:

To improve annual reporting of current hydroclimate conditions, and meet the objectives set by EO-B-30-15, an annual hydroclimate bulletin will give historical context to water conditions.

Project Description:

Following on the efforts of the National Climate Assessment and the California Climate Change Indicators Report, the DWR Hydroclimate Report will document characteristics of a changing climate on California's water resources. By tracking change through a collection of indicators on an annual basis, it is hoped that transitions of past important thresholds can be better anticipated enabling the continued refinement of adaptation strategies. This report includes key indicators for hydrology and climate in California and will be updated annually with the newest available data to track important trends, provide a compilation of indicators, and provide graphical visualization of data trends that are of interest to water managers, the media, State government, and the research community. Key indicators in the Hydroclimate Report include temperature, precipitation, snowpack, streamflow, rain/snow ratios, atmospheric rivers, and sea level.

Funding Information:

Project Budget (Annual):	$50,000	**Funding Source:**	Prop 84
Budget Notes:			
Project Start Date:	1/5/2015	**Project End Date:**	

External Partners:

WRCC, California Cooperative Snow Surveys, CAL EPA, NOAA

2015 Project Accomplishments

Scope and purpose of report was defined. Meetings were held bi-monthly to develop content. Draft copy of report was produced including: text, figures, tables, and descriptive graphics. Data was collected from multiple external partners to include in the report. Meetings were held with potential customers (CAL EPA) to determine report needs and to get input into final deliverables.

Project Deliverables/Timeline

(2016-2017) Final 2015 Water Year Hydroclimate Report release, Water Year 2016 Hydroclimate Report to be updated and released by December 2016.

Hydroclimate report will be updated annually at the beginning of each water year.

Customers:

Water managers, the media, State government, and the research community.

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods
Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO S-13-08: NRC SLR Study

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Integrated Regional Water Management Grant Program

Sponsor/Program Manager	Tracie Billington
Project Manager	Muzaffar Eusuff / Joseph Yun

Project Status:

On Going

Project Objective:

Projects funded by IRWM funding expect to achieve the following:
• Sustainable water management – developing estimates for water supply yield, water savings, improved water quality, etc.
• All IRWM Plans will be updated to 2016 standards
• More collaborative water management
• Improved integration of projects
• IRWM Plans consider Climate Change vulnerability adaptation
• Project selection considers mitigation of greenhouse gas emissions

Project Description:

The IRWM Grant Programs provide financial assistance in a manner that:
• Results in optimal investment of state funding providing maximum benefit to the State's people and environment through improved local and regional water management
• Is transparent and provides for engagement by partner agencies, interest-based stakeholders, and the public on program development and implementation
• Is consistent with legal, legislative, and DWR policy requirements for each funding source

Funding Information:

Project Budget (Total):	$1,308,800,000	**Funding Source:**	Propositions 50 and 84
Budget Notes:	All funds are awarded. Total authorized funding $1.31B. Funds are reappropriated to allow for reimbursements.		
Project Start Date:	November 2002	**Project End Date:**	December 2020

External Partners:

The IRWM grant program is solely administered by DWR. However, in order to deliver the program we work with a variety of state agencies along with 48 Regional Water Management Groups (RWMGs) supporting individual IRWM regions.

2015 Project Accomplishments

The main activities for IRWM this year were managing existing agreements, executing the 2014 Drought agreements, and conducting the final Proposition 84 grant solicitation (2015 Implementation for $232M). Once the 2015 funds are awarded, DWR will have finished awarding all of the Proposition 84 IRWM funds, which included $808.5 million in Implementation, $30 million in Planning, and $24 million for the Local Groundwater Assistance grant program.

Project Deliverables/Timeline

Current program schedule: http://www.water.ca.gov/irwm/grants/programschedule.cfm

Customers:

48 RWMGs supporting individual IRWM regions which includes a variety of local and regional water/flood management agencies, land use agencies, state and federal agencies, non-governmental organizations, and tribal entities.

Annual Reporting Category before 2015

Grantmaking & Technical Assistance

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management
Provide Safe Water for All Communities
Increase Flood Protection
Increase Operational and Regulatory Efficiency
Identify Sustainable and Integrated Financing Opportunities

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Support Regional Groundwater Management for Drought Resiliency
Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Utilize Low-impact Development and Other Methods in State and Regional Stormwater Permits to Restore the Natural Hydrograph
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: State Agencies Implement GHG reductions
EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
SGMA
IRWM
UWMP
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Integrated Resource Plan for the State Water Project

Sponsor/Program Manager	Ghassan ALQaser
Project Manager	Ghassan Alqaser

Project Status:

On Going

Project Objective:

A 20 year resourcing plan (updated every 3 years) under which the long-term energy needs of the State Water Project's (SWP) would be met.

Project Description:

The Integrated Resource Plan (IRP) is a resourcing plan outlining strategies under which the long-term energy needs of the State Water Project's (SWP) would be met. The IRP considers a balanced approach to meeting the operational, economic, and policy needs of the SWP's water delivery requirements. One component of the IRP is a renewable resources procurement plan that will keep SWP Power Portfolio consistent with the GHG reduction goals outlined is DWR's Climate Action Plan which incorporates the Governor's Executive Order S-03-05 and AB 32. In developing the IRP, DWR considers numerous operational and regulatory constraints and objectives. The SWP is committed to: • Protecting human safety, property, and natural environment • Sustaining reliable water deliveries; • Sustaining efficient and affordable water deliveries; • Performing responsibilities under regulatory authorities; and • Complying with State and Federal environmental policy goals.

Funding Information:

Project Budget ():		**Funding Source:**	
Budget Notes:			
Project Start Date:	2006	**Project End Date:**	In Progress

External Partners:

State Water Contractors

2015 Project Accomplishments

Project Deliverables/Timeline

Triennial update to the IRP and renewables procurement plan was completed in Fall 2013.
Enter into a contract for renewable resources under a renewable request for proposal (RFP).
Long-term power purchase agreement for energy from RG Unit No. 4 will terminate in Summer 2013.
Initiate standard block purchases recommended in IRP13 through incremental portfolio purchases.
Continue participation in the power planning portion of Value Engineering Studies meant to manage reliability and efficiency improvements throughout the SWP.
Complete initial studies of additional small hydro power plants at or adjacent to SWP facilities in 2014.

Customers:

State Water Contractors

Annual Reporting Category before 2015

Energy & Greenhouse Gas Emissions

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities

IWM Business Categories

N/A

State Water Project Related? Yes

Governor's Water Action Plan

N/A

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Integrating SLR into National Flood Insurance Program (NFIP)

Sponsor/Program Manager	John Andrew
Project Manager	Lauma Jurkevics

Project Status:

On Going

Project Objective:

To provide a non-regulatory approach in integrating sea-level-rise science into the National Flood Insurance Program (NFIP)

Project Description:

A grant from the National Oceanic and Atmospheric Administration's (NOAA) Coastal and Ocean Climate Applications (COCA) program was given to the California Ocean Science Trust (OST) and the Scripps Institution of Oceanography (Scripps). DWR initiated the grant process to secure the funding and worked with OST and Scripps as a cost share partner to take the sea-level-rise work from the National Research Council that DWR supported and apply it at the local level.

The grant was received in January 2014. DWR and its partners began the process that would assist local floodplain and coastal managers, DWR's Division of Flood Management (DFM), and local NFIP staff working at the regional offices of DWR. The project is intended to translate the science into on-the-ground applications. The Climate Change Program reached out to DFM, who joined the planning team.

A scoping group was formed to solicit recommendations on the formation of an advisory committee, known as the Focus Group, which would inform the principal investigators on the project the direction to take with the grant products. Initial work was focused on providing a Coastal Appendix to DWR's CA Quick Guide to the NFIP. With input from the Needs Assessment and Focus Group, the products were expanded to include a Technical Methods Manual and Comprehensive Report.
The work was advertised and promoted at the 2014 and 2015 annual conferences held by the Flood Management Association, a member of the Focus Group, as well as other venues.

Funding Information:

Project Budget (Annual):	$50,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	SRO: $35,000/yr ~$23,000 were 2014-15 & 2015-16 CC program contract funds. CC Program:$15,000 contract funds (2015); ~$8,000 (2016) For the NOAA grant support (Integrating SLR into non-regulatory aspects of NFIP): 1. Coastal Quick Guide Appendix development - FloodSAFE Program Management Consulting Services, Contract No. 4600009146, Task Order No. 14-07; Contractor: GEI Consultants, Inc., Subcontractor: David Ford Consulting; $132,356.63 (DFM funding) 2a. Technical Methods Manual development - Contract No. 4600008950, Task Order No. 10-20; Contractor: CH2M HILL Engineers, Inc., Subcontractor: Environmental Science Associates (ESA); $30,000.00 (split 50:50 between DFM and CC Program) 2b. Technical Methods Manual additional analyses (task identified as Sea Level Rise Technical Methods Manual Updates) -Contract No. 4600010567, Task Order No. 29; Contractor: Environmental Science Associates (ESA); $16,733.58 (split 50:50 between DFM and CC Program)		

	Budget does not include DFM staff costs.		
Project Start Date:	2014	**Project End Date:**	

External Partners:

NOAA, California Ocean Science Trust, Scripps Institution of Oceanography, DFM, and local, state, federal agencies involved with coastal planning.

Details: DWR-wide (including FloodSAFE)DWR-wide (including FloodSAFE); OPR, CDPH, , Cal/EPA, CEC, Cal OES, SIO (UCD), BCDC, Coastal Commission, OPC, SCC; FEMA, NOAA, US ACOE; Local governments, CA OST, FMA.

2015 Project Accomplishments

Sea-Level-Rise Project and National Flood Insurance Program (NFIP) (previously reported in the "Represent DWR in Interagency and Stakeholder Groups" category and in the project initation form as "Local and Regional Planning Coordination"):

Regional staff is working with the CA Ocean Science Trust (OST) and Scripps Institution of Oceanography (SIO) on a National Oceanic and Atmospheric Administration (NOAA) grant-funded project, whereby DWR is providing matching funds through in-kind services and monetary support. DWR staff serves as one of the principal investigators for the project. The project began in 2014 after the grant was awarded to OST and SIO. The pilot project (Piloting Non-Stationary Approaches to Floodplain Management: Supporting Local Communities and Informing National Policy) focuses on understanding local sea-level rise in context of other coastal processes to provide the science background in supporting adaptation strategies for the coastal regions. Products are currently posted on OST's website at http://www.oceansciencetrust.org/project/sea-level-rise-and-floodplain-management/ for finalized items (Focus Group meeting summaries and Needs Assessment).

Refer to deliverables below on specific 2015 accomplishments. Main items that were done in 2015 included the final Focus Group face-to-face meetings, the formation of a Technical Methods Manual (TMM) committee, the development of draft versions of the TMM and the Coastal Appendix to the CA Quick Guide to the NFIP, and the presentation of the project in a technical workshop that DWR staff moderated during the annual Flood Management Association's Conference in Rancho Mirage. An update poster was also developed for the conference and DWR staff presented a synopsis of the project in a separate session at the conference. Additional funding was also secured for ESA to develop the TMM.

Project Deliverables/Timeline

NOAA grant SLR-NFIP project (2014):
--Discuss with Cal-Adapt Technical Advisory Committee (February)
--Project summary page (April)
--Scoping meeting (May)
--Interview template for Needs Assessment (July)
--Focus Group - background informational webinar (September)
--Project poster developed by DWR's FloodSAFE and Climate Change Program staff and OST for Flood Management Association's Annual Conference in Santa Rosa (September) and also presented at DWR's Annual Environmental Scientist Workshop (October)
--First Focus Group meeting (October)
--Technical webinar hosted by FEMA (October)
--List of expectations of Coastal Quick Guide Appendix (November)
--Climate change staff presentation of climate change, flooding, and this project at DWR’s class to floodplain managers on the NFIP in Oceanside (December)
--List of additional products for improved knowledge sharing: Technical Methods Manual and Comprehensive Report (December)

NOAA grant SLR-NFIP project (2015):
--Draft Needs Assessment (January)
--Advertise project in CHARG map project list (February)
--Final Needs Assessment titled "Sea-Level Rise and Floodplain Management in California: Understanding Information Needs, Challenges and Opportunities" and prepared by OST (March)
--Second Focus Group meeting (March)
--Draft outline of Coastal Quick Guide Appendix (March)
--Technical Methods Manual Committee Meeting #1 (April)
--Subsequent draft outlines of Coastal Quick Guide Appendix (April and May)
--Initial Draft of Coastal Quick Guide Appendix (May)
--Outline of Comprehensive Report (May)
--Third Focus Group meeting (June)
--Presentations at Coastal Future Conditions Workshop in Pacifica by OST and ESA on project (July)
--Subsequent drafts of Coastal Quick Guide Appendix (July, August, September)
--Technical Methods Manual Committee Meeting #2 (August)
--Initial draft of the Technical Methods Manual (August)
--Presentations at Flood Management Association's Annual Conference (September)
-- Updated project poster developed by DWR's FloodSAFE and Climate Change Program staff and OST for Flood Management Association's Annual Conference in Rancho Mirage (September)
--Final Draft Coastal Appendix to Quick Guide from David Ford Consulting (October)
--Advertise project on Sea-Level Pilot Programs for Resilience on State's new web site (http://storms.ca.gov/state-preparation/) (October)
--Subsequent drafts of Technical Methods Manual from ESA (November, December)

NOAA grant SLR-NFIP project (2016):
--Presentation of Technical Methods Manual by ESA at Environmental Modelling Forum in Sacramento (April)
--Project summary to proposed Safeguarding California "Sneak Peek" report (May)
--Final Draft Technical Methods Manual to Technical Methods Manual Committee (May)
--Final Technical Methods Manual (August)
--Final Draft Coastal Appendix to Quick Guide integrating additional comments from Focus Group and others (September)
--Draft Comprehensive Report (September)
--Presentation of Technical Methods Manual by ESA at Annual Floodplain Management Association Conference in Sacramento (September)
--Products on DWR webpage (October)

Customers:

local governments and regional groups

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR’s Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Achieve the Co -Equal Goals for the Delta
Increase Flood Protection
Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO S-13-08: NRC SLR Study
SGMA
IRWM
UWMP
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Investment and Planning for water-related climate impacts in Disadvantaged Communiites

Sponsor/Program Manager	Climate change program with California Water Plan
Project Manager	Lauma Jurkevics / Jose Alarcon

Project Status:

On Going

Project Objective:

To assist in integrating climate change concerns for disadvantaged communities

Project Description:

Project is focused on working with staff involved with the California Water Plan updates and assists with climate change text and information to highlight State concerns and effects on communities where climate change might pose undue burden.

Funding Information:

Project Budget (Annual):	$320	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	SRO staff: $11,000/yr (for previous years). 2015 reduced to $320.		
Project Start Date:	2014	**Project End Date:**	

External Partners:

Within DWR: CA Water Plan staff

Outside DWR: State and local agencies, Tribal organizations, non-profit organizations

2015 Project Accomplishments

As part of the California Water Plan Update 2013, an interagency committee, which also included Tribes and non-profit organizations, was formed to develop the "Californians without Safe Water and Sanitation" report. This report was an update to the "2005 Californians without Safe Water."

During that time, the State had provided guidance on addressing human right to water, "The Human Right to Water Bill in California: An Implementation Framework for State Agencies" (May 2013), which was integrated into the report. Staff had attended meetings and provided assistance on the climate change component of the report. After consultation with the report's Work Team, the information was downsized to fit the format and context of the report.

Many discussions and much coordination occurred on the drafts of the report. The final report to the CA Water Plan 2013, "Californians Without Safe Water and Sanitation," was officially released in February 2015 and can be found at http://www.water.ca.gov/waterplan/docs/cwpu2013/Final/vol4/water_quality/04Californians_Without_Safe_Water_Sanitationv2.pdf.

Project Deliverables/Timeline

2015:
"Californians without Safe Water and Sanitation" report

Customers:

State and local agencies, Tribes

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management
Provide Safe Water for All Communities
Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Support Regional Groundwater Management for Drought Resiliency
Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

IRWM
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Investment in Climate Adaptation for the Delta

Sponsor/Program Manager	Eco-Restore - Bill Harrell
Project Manager	Tim Smith / Charlotte Chorneau

Project Status:

Project Initiation Only

Project Objective:

Position DWR to work efficiently with California Natural Resources Agency and other State departments under the California Water Action Plan to coordinate habitat restoration activities and leverage efficient use of Prop 1 and other bond funds to meet DWR goals.

Project Description:

A program to provide DWR with a centralized location for coordination, communication, and integration of all habitat restoration planning and implementation efforts within the Department. Specifically, this program is focused on achieving a streamlined and efficient process when using resources, approving land acquisition for restoration, developing policy and issue resolution, coordinating unified communication and outreach efforts, and tracking progress on restoration projects.

Funding Information:

Project Budget (Annual):	$1,561,590	**Funding Source:**	SWP
Budget Notes:	Annual Budget for DWR EcoRestore Program		
Project Start Date:	5/29/2015	**Project End Date:**	None

External Partners:

California Natural Resources Agency, Delta Stewardship Council, Delta Conservancy, California Department of Fish and Wildlife

2015 Project Accomplishments

Project Initiation Only

Project Deliverables/Timeline

(EL note, 8/31/16; Charlotte's email last name is Biggs. PSO database is unable to find her listed as Biggs).

Customers:

Annual Reporting Category before 2015

Field Studies

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem

State Water Project Related? Yes

Governor's Water Action Plan

Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Protect and Restore Water Resources for Important Ecosystems

Legislative and Gubernatorial Mandates

EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Investments in Flood Protection

Sponsor/Program Manager	DFM
Project Manager	Ricardo Pineda

Project Status:

Project Initiation Only

Project Objective:

TBD

Project Description:

TBD

Funding Information:

Project Budget (Total):		**Funding Source:**	
Budget Notes:			
Project Start Date:		**Project End Date:**	

External Partners:

2015 Project Accomplishments

Project Initiation Only

Project Deliverables/Timeline

Customers:

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Managing Floodwaters while Protecting the Ecosystem Taking Action to Reduce Residual Risk

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government Achieve the Co Goals for the Delta Protect and Restore Important Ecosystems Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding

Legislative and Gubernatorial Mandates

EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

K-12 Outreach

Sponsor/Program Manager	Elissa Lynn, John Andrew, and Director of Public Affairs
Project Manager	Lauma Jurkevics / Jennifer Morales

Project Status:

On Going

Project Objective:

The overall goal is to foster outreach and improve efficiency of resources by being a sustainability leader and providing direction to California's youth. The objectives are the following: (1) to investigate existing DWR efforts in working with other state agencies on public environmental education for K-12 classes; (2) to augment existing efforts to include climate literacy; and (3) to develop climate literacy presentations to be inserted into Project WET (Water Education for Teachers) workshops or other appropriate products, if identified.

Project Description:

Although California has been on the forefront in addressing climate change, understanding climate variabilities, human actions, and solutions may not be as evident at the local public level. Since a changing climate will more profoundly affect future generations, tools are needed to educate the younger generation on climate science and the choices they can make to prepare themselves for it. Because DWR declared its vision to be a sustainability leader, it can make a difference by being involved in the curriculum development for the state's students in the area of climate change and its effects on water management. An approach is to investigate existing DWR efforts in working with other state agencies on public environmental education for K-12 classes and augment those efforts to include climate literacy. The project was intended to develop climate literacy modules for grades K-8 and for grades 9-12 to be inserted into Project WET (Water Education for Teachers) products or other appropriate products, if identified. However, since its original inception (labeled as "Cimate Literacy K-12 Modules" in the original Project Initiation form and "K-12 curriculum and slides" in the Outreach and Education Report), the project now covers overall "K-12 Outreach" with Project WET climate change workshops now in its own category. "K-12 Outreach" covers the areas where DWR is not the lead, rather a supporter. This would include presentations at non-DWR supported Project WET workshops, direct involvement with schools at events and as speakers, and judging at student science fairs to further the development of students in the field of science. There will be a need to collaborate more with the Public Affairs Office should we want to get more involved with actual curriculum development with the Department of Education, which may need its own project initiation form. And as indicated earlier, Project WET climate change workshops that are directly supported by DWR are now being addressed as its own item.

Funding Information:

Project Budget (Annual):	$8,800	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	STAFF FUNDING - SRO = $4,800/yr SCRO = $800/yr NCRO = $3,200/yr Pursued supporting Project WET, conducted through Water Education Foundation (WEF) - 2014: two pilot workshops through a sponsorship letter (funding from PAO, augmented by USBR directly to WEF) 2015: four workshops through a sponsorship letter (funding from Climate Change		

	Program) - $13,679 (identified in the newly formed Project WET category).		
Project Start Date:	2010	**Project End Date:**	n/a

External Partners:

PAO, WEF (California Project WET), USBR, local supporters (location hosts and local facilitators), K-12 teachers and educators, student science fair coordinators

2015 Project Accomplishments

Climate Change Program continued to support Project WET workshops in 2015 because of the high interest on the climate change topic from participants of the 2014 pilot workshops. Because of continued work on this task, Project WET (DWR-Climate Change-sponsored) activities are reported in its own category: "Project WET Climate Change Workshops." "K-12 Outreach" now will cover other general components of outreach outside of the DWR/Climate Change-initiated Project WET components.

Additional activities in 2015 include judging at the California State Science Fair and speaking on a bus tour and rolling Project WET workshop through the American River watershed. Staff has been participating in these fairs as a judge since 2010. The California State Science Fair is held annually in Los Angeles at the California Science Center, a state museum promoting science and engineering to students and the local community. The science fair encourages participation by junior and high school students in conducting science research on current and relevant topics. In May 2015, staff served as a judge and chair for the junior biological product science category and as a project-of-the-year judge for the junior categories.

As for the other activity, the California Project WET program designed a day-long field course in October at the request of the California Science Teachers' Association as part of the California Science Teachers' Conference. The course was a combination bus tour and rolling Project WET workshop through the American River watershed and included DWR staff who presented connections of climate change with the state's water challenges. This workshop was well-received by the teachers.

Project Deliverables/Timeline

DWR-sponsored Project WET climate change workshops:
2014 - two pilot workshops (Oroville and Visalia), April-May
2015 - four workshops (Los Angeles, Bishop, Redding, Fresno), April, June, and September
Rest to be covered under the "Project WET" category.

Participation in Project WET workshops (not sponsored by DWR, Climate Change Program):
2012 - Northern Region workshops
2013 - Northern Region workshops
2014 - Northern Region workshops
2015 - speaker on a combination bus tour and rolling Project WET workshop through the American River watershed

School presentations:
2011 -Thousand Oaks High School 2nd Annual Sustainability Summit, January, Thousand Oaks
- Fairfax High School Planeteers' Earth Day Event, April, Los Angeles
2012 - Dailey Elementary 2nd grade students, November, Fresno
2013 - Sunnyside High School AVID Program, February, Fresno
- Riverview Elementary, November, Fresno
- Mountain View Elementary 6th Grade, November, Fresno
2014 - Dailey Elementary 3rd Grade, May, Fresno
2015 - Fugman Elementary, May, Fresno

Science Fairs:
2010 - California State Science Fair, May, Los Angeles (judge- junior environmental science category)
2011 - Sacramento Regional Science and Engineering Fair, March, Mather (judge- junior categories)
- California State Science Fair, May, Los Angeles (judge- junior environmental science category)
- Intel ISEF, May, Los Angeles (grand awards judge- environmental science category)
2012 - Sacramento Regional Science and Engineering Fair, March, Mather (judge- junior categories)

- California State Science Fair, May, Los Angeles (judge and chair- junior biological product science category)
2013 - Sacramento Regional Science and Engineering Fair, March, Mather (judge- junior categories)
- California State Science Fair, Apr, Los Angeles (judge and chair- junior biological product science category)
2014 - Sacramento Regional Science and Engineering Fair, March, Mather (judge- junior categories)
- California State Science Fair, April, Los Angeles (judge and chair- junior biological product science category)
-Intel ISEF, May, Los Angeles (grand awards judge- environmental management category)
2015 - California State Science Fair, May, Los Angeles (judge, chair, and project-of-the-year judge- junior biological product science category)
2016 - California State Science Fair, May, Los Angeles (judge and chair- junior environmental science category)

Ongoing: slide development and updates to align with DWR Climate Literacy classes and their subsequent updates

Customers:

K-12 school teachers and educators; K-12 students

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Local and Regional Planning Coordination

Sponsor/Program Manager	John Andrew; Elissa Lynn
Project Manager	Michelle Selmon / Lauma Jurkevics

Project Status:

On Going

Project Objective:

The goal is to produce helpful materials that assist local governments/planners in considering and incorporating climate change mitigation and adaptation into local planning efforts. The objectives include the following: (1) produce a list of resources such as websites, documents, case studies, etc. that can be handed out to local government representatives; (2) develop and deliver presentations about climate change as opportunities arise to local government representatives; and (3) develop a list of website links that would help local planners find good information about incorporating climate change into their efforts and add them to the appropriate location on our website.

Project Description:

The California Water Plan Update 2009 identifies the important linkage between land use planning and water resources management, and encourages collaboration on flood management, water supply, water quality, and habitat protection. The Prop 84-funded Integrated Regional Water Management (IRWM) program guidelines encourage regional water managers to coordinate with local planners on projects and priorities. Despite the knowledge that such collaboration is very important, especially in light of the need to plan for future conditions with climate change and the related uncertainties, opportunities are being missed as General Plans, Specific Plans, Hazard Mitigation Plans, local Climate Action Plans (CAPs), and other planning activities are going on that are setting the stage for how development will occur in the next 20-30 years and beyond in California.

This project is intended to use the DWR Climate Team staff, particularly the Regional Climate Change Specialists, to help improve local planning tools and to connect with local planning efforts (e.g., General Plan updates, CAP planning efforts) to specifically inform the efforts regarding the current and future impacts of climate change on water resources, and how they can incorporate those considerations into their plans.

The project seeks to develop key resources that will assist local and regional planners in identifying their climate change vulnerabilities and developing relevant adaptation strategies, with emphasis on the water sector. Such resources might include case-studies of successful local government incorporation of climate change into planning efforts that can serve as models for resource-limited communities. A webpage on the DWR Climate Change portal could serve to provide tools and resources for integrating water management and land use planning. Links to resources for public health, habitat management, and other sectors could be included to facilitate cross-sector planning. At this time, though, such services appear to be filled by other organizations, such as the Local Government Commission and Institute for Local Government.

Climate Change staff has also served in an advisory role for upgrades to Cal-Adapt, an easily-usable web-based tool for obtaining and understanding downscaled climate projection data intended for use by local and regional planning efforts. However, that project has been completed.

Now that the Fresno and Cal/Adapt projects have been completed, this coordination may evolve into commenting on local CAPs.

Note that segments of this item were identified in the 2014 Outreach Report as "Local Government Assistance" and in the 2014 Annual Climate Change Report as "Represent DWR in Interagency and Stakeholder Groups."

Funding Information:

Project Budget (Annual):	$500	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	SRO staff = $500		
Project Start Date:	2013	**Project End Date:**	

External Partners:

South-Central Region: Local Government Commission, City of Fresno

CalAdapt: CEC and other agencies involved with the technical committee

2015 Project Accomplishments

City of Fresno Connections: Staff was unable to engage with the Local Government Commission in 2015 because there appeared to be no continued interest. Re-engagement with the City of Fresno also is not anticipated because it has finished its general plan update. After the General Plan was completed, many of the lead contacts moved onto other jobs. Also, organizations like the Local Government Commission and Institute for Local Government are filling this niche of climate adaptation information for local governments. Therefore, it is recommended not to continue with this activity.

Cal-Adapt Advisory Committee: Staff participated in the Cal-Adapt Advisory Committee, led by the California Energy Commission (CEC). Participation in the Committee occurred throughout the course of the last CEC contract (late 2013 through mid-2015). The purpose of the committee was to generate feedback and guidance regarding site development from those who are using resources like the Cal-Adapt website to support their adaptation efforts. In addition to getting input from State users of the site, the CEC also received feedback from local and regional planners and decision-makers who rely on Cal-Adapt for their adaptation planning.

The committee's input helped refine the CEC's vision for Cal-Adapt's role and future, identify useful features (such as aggregation by a number of criteria, including census tracts, watersheds, and district boundaries), and better understand what a variety of stakeholders are doing in the area of adaptation, as well as what they need to support their adaptation-related efforts.

The Committee met for the last time in May 2015. A result of the project was the roll-out of Cal-Adapt 2.0 beta-site that displays annual averages of temperature and precipitation.

As indicated on the Cal-Adapt website, "Cal-Adapt 2.0 will showcase higher-resolution data describing projected temperature and precipitation in California, based on a new method ("LOCA", or Localized Constructed Analogues) that improves descriptions of extreme temperatures and spatial distribution of precipitation, both of which are critical for understanding climate-related risks such as heat waves and inland flooding. These new data also align Cal-Adapt 2.0 with current IPCC scenarios used in its Firth Assessment Report (AR5). In addition to LOCA data at 1/16 degree spatial resolution and daily time steps, Cal-Adapt 2.0 presents users with gridded observed historical data."

Project Deliverables/Timeline

Cal-Adapt Technical Advisory Committee (2013):
--First meeting (November)
--Compilation of input on Cal-Adapt Planned Enhancements from SRO stakeholders (November-December)
--Draft vision/guiding principles and revisions (December)
--Second meeting (December)

List of climate change resources for local governments (2014)

Cal-Adapt Technical Advisory Committee (2014):
--Meetings (February, March, June, August)

Cal-Adapt Advisory Committee (2015):
--Final meeting (May)
--Roll-out of Cal-Adapt 2.0, beta-site, http://cal-adapt.org/blog/2015/dec/14/cal-adapt-20-beta-site/ (December)

Customers:

local governments and regional groups

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Protect and Restore Important Ecosystems

Safeguarding California Implementation Plan

Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Mitigation Team

Sponsor/Program Manager	John Andrew, Elissa Lynn
Project Manager	Qinqin Liu / Jennifer Morales

Project Status:

On Going

Project Objective:

GHG emission reduction in water resource management and planning to implement AB 32 Scoping Plan for climate change mitigation

Project Description:

DWR major actions for GHG emission reduction related to water- energy efficiency for water resource management and planning include 1) developing white paper and conceptual framework to connect climate change with water, energy, and food in ecosystem for GHG reduction, developing water- energy reference and climate science documents related to California Water Plan Update; 2) providing outreach for agriculture water use efficiency, 3) contributing to WETCAT Climate Action Team management actions and coordinating with the WETCAT agencies for AB 32 Scoping Plan implementation, 4) coordinating urban and agricultural water management as well as integrated regional water management programs regarding water energy efficiency and GHG emissions reductions, 5) working with DWR carbon offset work team for GHG reduction in water sector.

Funding Information:

Project Budget (Annual):	$224,000	**Funding Source:**	AB 32
Budget Notes:	Year to year budget depends on AB32 funding. Funds support 2 climate change program staff; Environmental Scientist in the South Central Regional Office on agriculture sector mitigation and Sr. Environmental Scientist Specialist in the Water Use Efficiency Branch on urban sector mitigation.		
Project Start Date:	2011	**Project End Date:**	In Progress

External Partners:

WETCAT agencies, agriculture and urban water organizations, the public

2015 Project Accomplishments

Prepared white paper and peer reviewed book chapter and peer reviewed paper to connect water, energy and food as well as ecosystem process with climate change implication; provided coordination and outreach and policy inputs on water, energy and food at interagency meetings and National science foundation work shop; provide guidance on water-energy reporting in urban water management plan in 2015.

Project Deliverables/Timeline

DWR have completed draft white paper connecting water, energy and food for climate change and related reference information in May 2016, and will complete book chapter in July 2016, the white paper and peer reviewed paper including conceptual framework in August 2016.

Customers:

WETCAT agencies, agriculture and urban water organizations, the public.

Annual Reporting Category before 2015

Energy & Greenhouse Gas Emissions

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Diversify Local Supplies and Increase Water Use Efficiency
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: State Agencies Implement GHG reductions
EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
EO B-18-12: Reduce Agency GHG Emissions by 10% by 2015 and 20% by 2020 from 2010 Baseline
SGMA
IRWM
UWMP
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Office of the California State Climatologist

Sponsor/Program Manager	
Project Manager	Michael L Anderson

Project Status:

On Going

Project Objective:

Work collaboratively with NOAA to deliver climate data services for California

Project Description:

Through an interagency memorandum of agreement, Dr. Michael Anderson serves as the State Climatologist for California. In that role, Dr. Anderson supports NOAA climate data services in California and facilitates the use of climate data in resources management for California

Funding Information:

Project Budget (Annual):	$250,000	**Funding Source:**	
Budget Notes:	NOAA provides no funding for this activity. Dr. Anderson's salary is covered through general funds for the Hydrology and Flood Operations Office. Cost formula = 3/4 time @ $160/hour per year for staff and assessments.		
Project Start Date:		**Project End Date:**	None

External Partners:

NOAA NCDC (now NCEI), WRCC, NWS

2015 Project Accomplishments

Over the past year the California State Climate Office has been involved in a variety of projects and collaborations. The efforts are in the areas of design hydrology, volunteer observing networks, extreme precipitation monitoring, and drought. Data services are provided via phone, fax, email, and web services. A project was launched in 2008 to begin the deployment of weather monitoring equipment to assist in the forecasting and monitoring of extreme precipitation conditions in California. The project is a partnership effort between DWR, Scripps Institution of Oceanography, and NOAA's Earth Systems Research Laboratory (ESRL). Three types of instrumentation are to be deployed in this project: GPS-Met (water vapor), soil moisture, and vertically pointing radar (freezing level). Deployment of the instruments is finishing up and new storm diagnostics from the new data streams are being developed. Data transfer into the California Data Exchange Center is still being pursued. The partnership now includes the new Center for Western Weather and Water Extremes housed at Scripps Institution of Oceanography. Dr. F. Martin Ralph heads the new center after a career at NOAA's ESRL. Calendar year 2013 set a new record for dryness at the state level. Winter 2014 and 2015 set new records for warmth. The April 1 snow pack of 2015 is on pace to be the smallest since 1950 at about half of the previous low set in 2014 and 1977. The ongoing drought is providing many opportunities to evaluate drought impacts and water management from the perspective of a changing climate. There are many speaking opportunities and interview requests as a result including some international interest from Brazil, Japan, Denmark and the Netherlands. The drought has also elevated interest in the NIDIS pilot projects going on in California. These pilot projects have supported collaboration with the NIDIS federal agencies as well as the California Nevada Applications Program RISA

and the Western Region Climate Center. A recent product is a two-pager on California Precipitation developed in collaboration with the California Nevada Applications RISA and the Center for Western Weather and Water Extremes. The product can be found on the State Climatologist web page and the CNAP RISA page at: http://cnap.ucsd.edu/pdffiles/CA_Precip_final.pdf.
As part of the State's Climate Action Team, the Research working group developed a five year research plan to help guide the State's investment in climate change research. The plan is being finalized and is expected to be released in the spring of 2015. The plan can be viewed at: http://www.climatechange.ca.gov/climate_action_team/reports/CAT_research_plan_2015.pdf. Additional work is going into a research development and deployment plan for the Hydrology and Flood Operations Office within the Department of Water Resources where the Office of the State Climatologist sits.
In its sixth year of operation, the CoCoRaHS California effort has signed up more than 1,200 volunteers covering 55 of California's 58 counties. Over 10,000 daily precipitation reports are entered each month. The program provides an opportunity for the State Climatologist to interact with the multiple weather forecast offices that serve the state and is providing insight into the spatial variability of rainfall at the event scale. The National Weather Service State Coordinator at the San Diego Weather Forecast Office is leading the effort to produce a quarterly newsletter.
Work continues on developing information to inform flood planning efforts in a changing climate. Vulnerabilities in the flood management system have been identified and potential impacts from climate change have been described along the lines of impact to system vulnerabilities. Further research and development will be pursued to assist the State's flood planning efforts. This work includes working with the California Nevada Applications Program RISA and the Western Region Climate Center.
The State Climatologist has been involved in related work at the regional level in examining the benefits of advanced monitoring for extreme precipitation in the San Francisco Bay region and exploring the benefits of forecast informed reservoir operations. Work to date has involved participation in work groups and speaking engagements.
Collaboration continues with the Western Region Climate Center, the National Oceanographic Atmospheric Administration Regional Integrated Science Assessment California Nevada Applications Program, the Department of the Interior Southwest Climate Science Center, and the United States Department of Agriculture Southwest Climate Science Hub. Collaborative efforts with the United States Bureau of Reclamation and United States Geological Survey also continue. Collaboration and funding of climate services task orders with the University of California also continues.
Work is wrapping up on the United States Forest Service Sierra Nevada Adaptive Management Program, a collaborative state-federal effort to examine the watershed impacts of different fire-treatment methods.

Project Deliverables/Timeline

Customers:

General Public, NOAA, DWR, other State Agencies, local agencies

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

N/A

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Support Regional Groundwater Management for Drought Resiliency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Outreach and Education Subgroup

Sponsor/Program Manager	John Andrew, Elissa Lynn
Project Manager	Lauma Jurkevics

Project Status:

On Going

Project Objective:

Produce educational and outreach materials about climate change.

Project Description:

The project entails leading the Outreach and Education Team for the Climate Change Program to produce educational and outreach materials about climate change for DWR staff, water managers, and the public. Outreach-related tasks from the Climate Change Program's 2014-2018 Strategic Plan were integrated within this group for further progress and reporting. These tasks, or subgroups as they are called, included the following: K-12 education; sea-level-rise booklet; posters; agricultural mitigation stewardship; citizen science; climate change mitigation; climate literacy; tribal literacy; local government assistance; climate change frequently asked questions; website; and exhibits. A summary report was developed for the 2014 reporting period on these various tasks or subgroups. Starting in 2015, individual progress reporting of these subgroups are identified under their own project reporting.

Funding Information:

Project Budget (Annual):	$125,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	Includes staff time, DWR PAO support, printing, etc.		
Project Start Date:	2013	**Project End Date:**	n/a

External Partners:

DWR Public Affairs Office, DWR Training Center

2015 Project Accomplishments

Regular meetings of the DWR Climate Change Program Outreach and Education Team were held on the 2nd Monday of each month, except for October and December. Since then, the group decided to meet in 2016 every other month because of other commitments. General topics included: Subgroup Updates; Progress on Team's Report; Outreach Presentations; Upcoming Events and Outreach Sessions; and Updating the Outreach Subgroup Matrix. Specific topics, discussions, and evaluations included: Project WET (water education for teachers); Agricultural Brochure for School Kids; Agricultural Climate Menu Poster; NOAA Flood Management Grant; Cal/Adapt; CoCoRaHS Poster; Climate and Tribal Literacy; World Ag Expo; UN World Water Week; UN World Monitoring Day; Science Brochure; Photographing Historical Climate Change; Climate Change Displays at Visitor Centers; Climate Adaptation for Farmers; and Alliance for Climate Education. Specific reporting and deliverables on some of these topics can be found under individual project reporting.

Project Deliverables/Timeline

2015: Ten monthly team meetings with agendas (Jan-Sep, Nov). Refer to individual project reporting on deliverables for specific subgroups.
2016: Six bi-monthly team meetings with agendas (Jan, Mar, May, Jul, Sep, Nov).
See several individual project reports for some specific outreach deliverables.

Customers:

DWR staff, local water managers, public

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods
Increase Flood Protection

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

SGMA
IRWM
UWMP

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Paleohydrology

Sponsor/Program Manager	John Andrew
Project Manager	Jeanine Jones

Project Status:

On Going

Project Objective:

Use paleoclimate information to better understand natural climate variability & risks of drought/water shortage. The drought risk information will help support the more rigorous local agency water shortage contingency planning required by Executive Order B-37-16.

Project Description:

In September 2015 DWR executed a contract with the University of Arizona to develop long-term streamflow or precipitation reconstructions using tree ring data for larger Southern California watersheds, the Kern River, and Colorado River inflow to Lake Powell. The work, which includes preparation of a guidebook for water managers on using the data, entails field data collection, sample processing, and statistical modeling.

Funding Information:

Project Budget (Total):	$597,000	**Funding Source:**	Prop 84/General Fund
Budget Notes:	$125,000 from climate change program (bond), balance from one-time drought funding (General Fund)		
Project Start Date:	2015	**Project End Date:**	2017

External Partners:

University of Arizona

2015 Project Accomplishments

Executed contract and performed minor initial fieldwork. Most work this year was to prepare for 2016 field data collection season.

Project Deliverables/Timeline

By the end of 2017 the University will submit a report providing the reconstructed paleohydrology records and summarizing various statistical analyses of them, along with a guidebook for water managers.

Customers:

DWR Drought program, Water Use Efficiency program, DFM hydrology branch, Climate Change Program and website

Annual Reporting Category before 2015

Field Studies

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

UWMP

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Posters

Sponsor/Program Manager	Elissa Lynn; John Andrew
Project Manager	Lauma Jurkevics / Peter Coombe

Project Status:

On Going

Project Objective:

The goal is to provide up-to-date posters for workshops and other venues. Objectives include the following: (1) to diversify information for different audiences; (2) to keep poster information current, relevant, and flexible; and (3) to identify ways to make posters accessible to DWR Climate Change Team (Hawks) for presentations.

Project Description:

Posters are an important tool in communicating climate change and the work we do in DWR. This form of outreach is used in a variety of venues, including conferences, DWR annual ES workshops, Project WET workshops with teachers, and the general public. The goal of this project is to provide up-to-date posters, while keeping the topic of climate change up in the forefront.

Funding Information:

Project Budget (Annual):	$65,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	SRO = $11,000/yr (for tribal, IRWM, and NOAA grant posters) SCRO = $11,200/yr (includes printing costs of ~$550 for Climate Menu) (for tribal, IRWM, and Climate Menu posters) DSIWM/PAO/NCRO = $24,400/yr (for tribal, AGU, and IRWM posters NRO staff = $800/yr (for IRWM poster), $16,000 for time.		
Project Start Date:	2014 (as its own project)	**Project End Date:**	n/a

External Partners:

Various, depending on poster. PAO; DFM, CA Ocean Science Trust, Scripps (NOAA grant project); CDFW, CDFA, Cal Poly, ITRC (Climate Menu); PAO, DFM, CoCoRaHS network (CoCoRaHS pop-up); PAO, CNRA (CA CC vulnerabilities)

2015 Project Accomplishments

A follow-up poster was developed in 2015 on the NOAA grant project on which DWR is collaborating with the CA Ocean Science Trust and Scripps Institution of Oceanography in assisting floodplain managers on how to address sea-level rise in the context of the FEMA National Flood Insurance Program's non-regulatory approaches. This poster was presented at the annual Floodplain Management Association's annual meeting in Rancho Mirage. Additional posters were also created in 2015 with tribal, citizen science, and agricultural themes. A diagram poster was developed to assist tribal communities in identifying areas where they may be vulnerable to the anticipated impacts of climate change on a general scale, received input from several tribal members, and was finalized in the Fall of 2015. The poster is now on the DWR website at http://www.water.ca.gov/climatechange/docs/2015/DWR_final_version.pdf. For citizen science we put together the CoCoRaHS pop-up rain gauge poster that we are using at different venues. In

addition, a Climate Menu poster was created to connect climate change with the food we eat and the impacts on agriculture. The original poster concept was redone, and the latest version resulted from collaboration among DWR, CA Department of Fish and Wildlife, CA Department of Food and Agriculture, and CA Polytechnic State University at San Luis Obispo and its Irrigation Training and Research Center. DWR had the poster printed and began distributing it to libraries, fairs, and other venues. This poster can be found on the DWR California Agriculture Water-Energy web page: http://www.water.ca.gov/climatechange/WaterEnergyAg.cfm.

For the Integrated Regional Water Management 2.0 Conference in San Diego last spring, a poster was developed to offer DWR climate change services to local and regional water management groups.

In addition, for the American Geophysical Union (AGU) conference in December, DSIWM/PAO staff developed a poster titled "Producing Scientific and Strategic Guidance for California's Department of Water Resources: The Climate Change Technical Advisory Group," as well as a Poster on Co-production of science for management, for decision scaling.

Project Deliverables/Timeline

Sea-level rise & NFIP posters (2014 & 2015)
Tribal diagram poster (2015)
CoCoRaHS pop-up poster (2015)
Climate Menu poster (2015)
DWR IRWM climate change services poster (2015)
AGU poster (2015)
California climate change vulnerabilities poster (2016)

Customers:

public, schools, tribes, regional water management groups, and others

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O III: Integrate Climate Change into DWR’s Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Diversify Local Supplies and Increase Water Use Efficiency
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
EO S-13-08: NRC SLR Study
IRWM
UWMP

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Presentations by Climate Team Members and Associates

Sponsor/Program Manager	John Andrew, Elissa Lynn
Project Manager	Lauma Jurkevics

Project Status:

On Going

Project Objective:

To provide outreach and technical information and expand climate change knowledge to external audiences

Project Description:

This project involves a variety of presentations given to diverse audiences, from basic climate science to technical information. The purpose is to promote climate change knowledge beyond DWR, as well as to share experiences in what we have learned along the way in assisting with mitigating for and adapting to climate change in the water sector and beyond. Presentations include posters, as well as talks to professional organizations, local and regional groups, and industry.

Funding Information:

Project Budget (Annual):	$140,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	SRO=$35,000/yr SCRO=$12,800/yr NRO=$33,280/yr DSIWM=$10,000/yr CC Program Management=$50,000/yr		
Project Start Date:		**Project End Date:**	

External Partners:

2015 Project Accomplishments

Emily Alejandrino
"Potential Climate Change Vulnerabilities and Adaptation for Tribal Communities," Robinson Rancheria Climate Change Workshop, April, Upper Lake

"California Climate 101" joint with Lauma Jurkevics, Department of Water Resources and Water Education Foundation Project WET Workshop, June, Bishop

"Mitigation and Adaptation in a Changing Climate" joint with Lauma Jurkevics, Department of Water Resources and Water Education Foundation Project WET Workshop, June, Bishop

Jamie Anderson
Moderator “Kaleidoscope of Modeling from Shasta, the Sacramento River and the Delta,” California Water and Environmental Modeling Forum, March, Folsom

Michael L. Anderson
“Drought and Climate:”

PPIC Meeting, January, Sacramento
Interview with Brazilian TV crew, February
Walnut Board Workshop, February, Yuba City
ACWA Meeting, April
California State University, April, Sacramento
US Drought Monitor Forum, April, Reno, NV
UC Irvine, AGU Chapman Conference on Drought, April, Irvine
ASCE/EWRI World Water Congress, May, Austin Texas
Moderated also Panel Discussion on Flood Management and Climate Change, ASCE/EWRI, May, Austin, TX
Western States Water Council, May, San Diego
Cattlemen Association, June, Sacramento
AASC Meeting, June, Cape May, NJ
UC Irvine, NCEI Drought Amelioration Workshop, July, Irvine
National Water Resources Association Meeting, August, Monterey
Sierra Nevada Climate Alliance, September, Kings Beach (Lake Tahoe)
American Geophysical Union (AGU) Fall Meeting, December

“State of Monitoring Climate in CA,” PACLIM, March, Monterey
“Sensitivity of San Joaquin Floods to Climate Change,” Extreme Precipitation Symposium-UC Davis, June, Davis
“Hydrologic Indicators,” Climate Change Indicators Workshop, August, Sacramento
“Climate Change Research with USGS,” USGS Legislative Staff Workshop, August, Tahoe City
“El Nino, Drought, and Climate Change,” California Emergency Services Association, September, South Lake Tahoe
“El Nino, Drought, and Climate Change,” San Diego Water Authority, October, San Diego
“California Water Resources and Climate Change,” NASA JPL Seminar, October, Pasadena
“Current Conditions, El Nino, and Seasonal Outlook,” California Cooperative Snow Surveys Annual Meeting, November
“State of the Climate,” Water Year Outlook Workshop, November, San Diego

John Andrew
"Adapt, Flee, or Perish:"
California Water Law and Policy class, UC Santa Cruz, March, Santa Cruz
Institute for International Studies seminar, UC Berkeley, March, Berkeley
Landscape Architecture and Environmental Planning seminar, UC Berkeley, March, Berkeley
Central Valley RWQCB, March, Sacramento
Tribal Drought Meeting, March, Sacramento
California Municipal Utilities Association Annual Meeting, April, Carlsbad
I.S. Rivers, June, Lyon, France
Beahrs Environmental Leadership Program, UC Berkeley, July, Berkeley
Climate Law and Policy class, King Hall, UC Davis, September, Davis
Water Resources Planning class (Civil Engineering 251), CSU Sacramento, October, Sacramento

Erin Chappell
"California Climate 101" joint with Peter Coombe, Department of Water Resources and Water Education Foundation Project WET Workshop, September, Redding

"Mitigation and Adaptation in a Changing Climate" joint with Peter Coombe, Department of Water Resources and Water Education Foundation Project WET Workshop, September, Redding

Climate change presentation on Project WET American River Watershed bus tour, California Science Teachers' Conference, October, Sacramento and American River Watershed

Peter Coombe
Rain Gauge Demonstration and CoCoRaHS, Lincoln Street School, January, Red Bluff

Poster Displays, Integrated Regional Water Management 2.0 Conference, May, San Diego

"California Climate 101" joint with Erin Chappell, Department of Water Resources and Water Education Foundation Project WET Workshop, September, Redding

“Community Collaborative Rain, Hail & Snow Network: A Rain Gauge at Every School,” Department of Water Resources and Water Education Foundation Project WET Workshop, September, Redding

"Mitigation and Adaptation in a Changing Climate" joint with Erin Chappell, Department of Water Resources and Water Education Foundation Project WET Workshop, September, Redding

Aaron Cuthbertson
"California Climate 101" joint with Lauma Jurkevics, Department of Water Resources and Water Education Foundation Project WET Workshop, April, Los Angeles

“Community Collaborative Rain, Hail & Snow Network: A Rain Gauge at Every School,” Department of Water Resources and Water Education Foundation Project WET Workshop, April, Los Angeles

"Mitigation and Adaptation in a Changing Climate" joint with Lauma Jurkevics, Department of Water Resources and Water Education Foundation Project WET Workshop, April, Los Angeles

Lauma Jurkevics
"Climate Change: Another Factor in Managing Southern California’s Water Resources," 'Do We Have Enough Water: Mitigate or Adapt?' speaker series event, Institute on Science for Global Policy and Whittier Working Group, February, Whittier

"Climate Change: Another Factor in Managing Southern California’s Water Resources," Society of Women Engineers-Orange County dinner meeting, March, Costa Mesa

"Climate Change: Another Factor in Managing Southern California’s Water Resources," Extreme Events and Climate Adaptation Planning Workshop, USEPA-Region IX, April, Los Angeles

"California Climate 101" joint with Aaron Cuthbertson, Department of Water Resources and Water Education Foundation Project WET Workshop, April, Los Angeles

"Mitigation and Adaptation in a Changing Climate" joint with Aaron Cuthbertson, Department of Water Resources and Water Education Foundation Project WET Workshop, April, Los Angeles

Invited Debater, "Sustainability Challenges: Coping with Less Water and Energy" Conference, Institute on Science for Global Policy and Whittier Working Group, June, Whittier

"California Climate 101" joint with Emily Alejandrino, Department of Water Resources and Water Education Foundation Project WET Workshop, June, Bishop

“Community Collaborative Rain, Hail & Snow Network: A Rain Gauge at Every School,” Department of Water Resources and Water Education Foundation Project WET Workshop, June, Bishop

"Mitigation and Adaptation in a Changing Climate" joint with Emily Alejandrino, Department of Water Resources and Water Education Foundation Project WET Workshop, June, Bishop

Poster presentations:
“Climate Change: Stressing Our Water Systems,” Department of Water Resources and Water Education Foundation Project WET Workshop, April, Los Angeles

“Climate Change: Stressing Our Water Systems,” Department of Water Resources and Water Education Foundation Project WET Workshop, June, Bishop

Lauma (Jurkevics) Willis
Keynote Speaker, "Climate Change, Water, Energy: Understanding Science & Pursuing Sustainability," First Annual Trade Pro Mixer, Southern California Gas Company, August, Downey

"Climate Change, Water, Public Health: Finding Connections," Water and Emergency Preparedness: Innovative Opportunities webinar, Public Health Alliance for Southern California, August

"Connecting Science with Coastal Floodplain Management," 2015 Floodplain Management Association Annual Conference: Breaking Down RISK – Resiliency, Integration, Sustainability, and Knowledge in a Climate of Extremes, Floodplain Management Association, September, Rancho Mirage

Moderator, "Enhancing NFIP Resources to Support Coastal
Community Efforts to Plan for and Adapt to Sea Level Rise" workshop session, 2015 Floodplain Management Association Annual Conference: Breaking Down RISK – Resiliency, Integration, Sustainability, and Knowledge in a Climate of Extremes, Floodplain Management Association, September, Rancho Mirage

Poster: “Incorporating Sea-Level Rise and Zone of Flooding Information into Coastal Planning,” Adolfo Luna III, Lauma M. Jurkevics, Marisa Villarreal (Ocean Science Trust), and Maria Lorenzo-Lee, 2015 Floodplain Management

Association Annual Conference: Breaking Down RISK – Resiliency, Integration, Sustainability, and Knowledge in a Climate of Extremes, Floodplain Management Association, September, Rancho Mirage

Keynote Speaker, "Climate Change, Water, Energy: Understanding Science & Pursuing Sustainability," Trade Professional Mixer, San Diego Gas and Electric, October, San Diego

Jennifer Morales
"Climate Change and Water Resources," Fugman Elementary, May, Fresno

"California Climate 101" joint with Michelle Selmon, Department of Water Resources and Water Education Foundation Project WET Workshop, September, Fresno

"Mitigation and Adaptation in a Changing Climate" joint with Michelle Selmon, Department of Water Resources and Water Education Foundation Project WET Workshop, September, Fresno

Qinqin Liu
“A Journey to Connect Multidisciplinary Science from Genetics to Ecology and Climate Change,” November, Taiwan University, Taipei

Art exhibition on watershed and climate change for dialogue between arts and environmental science, November-December, Taiwan Science Museum, Taipei

Elissa Lynn
Video Production: Atmospheric Rivers: https://www.youtube.com/watch?v=MgKT__9ThSs&feature=youtu.be, CalWater Media Day, February, McClellan AFB, Sacramento

Panel Moderator: "Comprehensive Climate Change Projections to Support Multisectoral Analyses," CA Climate Change Symposium, , August, Sacramento Convention Center, Sacramento

AGU Fall Meeting, December:
Session: "Toward Effective Decision Maker-Scientist Interactions III"
Poster: "Producing Scientific and Strategic Guidance for California’s Department of Water Resources: The Climate Change Technical Advisory Group"

Andrew Schwarz
CWEMF Water Plan Briefing, Climate change and Water-Energy Nexus in 2013 CWP, Sacramento
CWEMF Annual Conference, Decision Scaling with CalLite to Identify Climate Change Vulnerabilities to the State Water Project, Sacramento
American River College- Natural Resource Management 400, California Water Resources Management , Sacramento
Kazak Delegation, Climate Change and California Water Resource, Sacramento
TCR/SCE Water-Energy protocol workshop, Water-Energy Accounting DWR Perspectives, virtual
ACWA conference, Water-Energy Accounting for Urban Water Management Plans , Sacramento
UC Davis World Food Center Global Water Conference, Climate Change Impacts on California's Water System, Davis
AGU Fall Conference, Poster, Co-production of science for management, San Francisco

Michelle Selmon
“Partner Feedback: California Department of Water Resources and the California Landscape Conservation Cooperative,” April, National Academy of Sciences Review Panel for LCCs, Irvine

“Climate Change and Water,” May, Healthy People in Mariposa’s Changing Climate, Mariposa

"California Climate 101" joint with Jennifer Morales, Department of Water Resources and Water Education Foundation Project WET Workshop, September, Fresno

"Mitigation and Adaptation in a Changing Climate" joint with Jennifer Morales, Department of Water Resources and Water Education Foundation Project WET Workshop, September, Fresno

Session Moderator “Tribal Climate Adaptation II,” Southwest Climate Summit, November, Sacramento

“Tulare Basin Watershed Connections Workgroup,” November, California Association of Resource Conservation Districts, Oakhurst

Project Deliverables/Timeline

2016:
Art exhibition on watershed and climate change for dialogue between arts and environmental science, January, Taiwan Science Museum, Taipei

Institute on Science for Global Policy and CSU Sacramento Conference on "Climate Change, Water, & Fire" (debater), April, Sacramento

Customers:

professional organizations, local and regional groups, industry

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management
Provide Safe Water for All Communities
Increase Flood Protection
Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Support Regional Groundwater Management for Drought Resiliency
Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Protect and Restore Water Resources for Important Ecosystems

Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: State Agencies Implement GHG reductions
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
EO B-18-12: Reduce Agency GHG Emissions by 10% by 2015 and 20% by 2020 from 2010 Baseline
EO B-18-12: Reduce Grid Based Energy Purchases for State Buildings by 20% by 2018 as Compared to 2003 Baseline
EO S-13-08: NRC SLR Study
IRWM
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Project WET Climate Change Workshops

Sponsor/Program Manager	Elyssa Lynn
Project Manager	Lauma Jurkevics

Project Status:

On Going

Project Objective:

To promote climate literacy to teachers and educators through Project WET.

Project Description:

Although California has been on the forefront in addressing climate change, understanding climate variabilities, human actions, and solutions may not be as evident at the local public level. Since a changing climate will more profoundly affect future generations, DWR decided to expand its existing connections with Project WET (Water Education for Teachers) to integrate climate literacy into the workshops led by CA Project WET Coordinator at the Water Education Foundation. Though this project was previously reported under other categories, future reporting will be covered under its own specific category.

Funding Information:

Project Budget (Annual):	$67,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	STAFF FUNDING - SRO = $35,000/yr SCRO = $7000/yr NCRO = $4000/yr NRO = $16,640/yr DSIWM = $4200/yr Pursued supporting Project WET, conducted through Water Education Foundation (WEF) - 2014: two pilot workshops through a sponsorship letter (funding from PAO, augmented by USBR directly to WEF) 2015: four workshops through a sponsorship letter (funding from Climate Change Program) - $13,679 2016: two Spring workshops through PAO contract (#4600011185) - $3,309 (Riverside; WEF Invoice #: 12011), $3,086 (West Sacramento; WEF Invoice #: 12012)		
Project Start Date:	2013	**Project End Date:**	n/a

External Partners:

PAO, WEF (California Project WET), USBR, local supporters (location hosts and local facilitators), K-12 teachers and educators

2015 Project Accomplishments

As reported in the "K-12 Outreach" category, the Climate Change Program continued to support Project WET workshops in 2015 because of the high interest on the climate change topic from participants of the 2014 pilot workshops. DWR's Public Affairs Office (PAO) also provided administrative support. This education training focused on understanding climate change in California. DWR's Climate Change Team provided the basics of climate science, how DWR is addressing climate change impacts to water supply, and what adaptation measures and mitigation of greenhouse gas emissions entail. The Project WET facilitators showed how interdisciplinary activities from the Project WET workbook could help teachers integrate climate science and skill in the classroom.

Project WET activities are designed to supplement existing curriculum to promote awareness and knowledge of water resources. These activities are aligned to California Science, History, Social Science, and National Common Core Standards, and supplement existing curriculum, including the use of Education and the Environment Initiative curriculum units.

Partners for the 2015 workshops included the following: Los Angeles – University of Southern California in coordination with Heal the Bay and USC-Sea Grant; Bishop – the Paiute Shoshone Cultural Center in the Eastern Sierra Nevada region with project partners from the Bishop Paiute Tribe and the Nevada Division of Environmental Protection; Redding – Turtle Bay Exploration Park; Fresno – Scout Island Education Center in partnership with the Fresno County Office of Education and the CREEC Network (California Regional Environmental Education Community).

The main challenge in 2015 was budgeting. As identified in the Water Education Foundation's (WEF) final report, there was a greater than anticipated demand for Project WET workshops specifically focused on water conservation – the number one priority for allocating use of U.S. Reclamation funding for workshops within the Central Valley Project service area. This resulted in elimination of anticipated support to offset budget costs for two workshops in that area (Fresno and Redding). Nevertheless, reallocation of task items helped the program to remain within the budget. Other unexpected issues included technology glitches, imposed room changes, and disruptions by a minority group in one class. Flexibility was key in moving the exercises and lectures forward with follow-up strategies for future workshops.

All of the educators attending the climate change workshops in 2015 reported on exit evaluations that they plan to use Project WET activities and information from the climate change workshop team in their classrooms. This translates into providing climate change knowledge to almost 60,000 California K-12 students from 89 educators attending these four workshops.

Furthermore, the DWR-WEF Project WET climate change workshops have created synergy among other groups to conduct similar training. The popularity of the Los Angeles workshop resulted in two more Project WET climate change workshops sponsored by the USC-Sea Grant Program and Heal the Bay in 2015. In addition, the California Project WET program designed a day-long field course at the request of the California Science Teachers' Association as part of the California Science Teachers' Conference last October. The course was a combination bus tour and rolling Project WET workshop through the American River watershed and included DWR staff in connecting climate change with the state's water challenges. And last but not least, as a result of the DWR-WEF partnership, the South Coast Climate Science Alliance and WEF partnered to offer a San Diego-focused Project WET climate workshop in collaboration with the U.S. Geological Survey, California Water Science Center.

A change in the funding process also occurred in 2015. Because of the popularity of Project WET workshops, not only with the Climate Change Program but also with Flood and Groundwater Programs in DWR, PAO shifted the funding process from a sponsorship approach to a contracting one, which will help facilitate the transfer of funds and provide structure for future Project WET support starting in 2016.

Project Deliverables/Timeline

DWR-sponsored Project WET climate change workshops:
2014 - two pilot workshops (Oroville and Visalia), April-May
2015 - four workshops (Los Angeles, Bishop, Redding, Fresno), April, June, and September
2016 - four workshops (Riverside, West Sacramento, San Jose, Visalia)

Customers:

K-12 school teachers and educators; K-12 students

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Quasi-decadal Oscillation in the CMIP5 and CMIP3 Climate Model Simulation: California Case

Sponsor/Program Manager	Francis Chung/Erik Reyes & Hongbing Yin
Project Manager	Jianzhong Wang

Project Status:

Complete

Project Objective:

Investigate if current climate model simulation/projections are able to reproduce the observed oscillation in California climate

Project Description:

The ongoing four drought years in California are reminding us of two other historical long drought periods: 1987-1992 and 1928-1934. This kind of interannual variability is corresponding to the dominating 7-15 yr quasi-decadal oscillation (QDO) in precipitation and streamflow in California. When using global climate model projections to assess the climate change impact on water resources planning in California, it is natural to ask if global climate models are able to reproduce the observed interannual variability like 7-15 yr quasi-decadal oscillation. Further spectral analysis to tree ring chronicles and historical precipitation records prove the existence of 14 yr quasi-decadal oscillation in California in modern climate. But while implementing spectral analysis to all the CMIP5 and CMIP3 global climate model historical simulations using wavelet analysis approach, it was found that only CESM1-WACCM, have statistically significant 14 quasi-decadal oscillations in California.

Funding Information:

Project Budget ():		**Funding Source:**	
Budget Notes:			
Project Start Date:	7/1/2014	**Project End Date:**	12/31/2014

External Partners:

N/A

2015 Project Accomplishments

Completed

Project Deliverables/Timeline

A scientific paper summarizing this project will be prepared and submitted to a peer-reviewed journal.

Customers:

This work can be referred by DWR other climate change related projects and outside readers.

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Building Capacity for Regional Sustainability

State Water Project Related? Yes

Governor's Water Action Plan

Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Continue to Mainstream Climate Considerations into Water Management

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Regional Flood Management Programs Support

Sponsor/Program Manager	DFM/Michael Mierzwa
Project Manager	Ricardo Pineda / Christopher Williams

Project Status:

On Going

Project Objective:

Complete regional flood management plans for areas protected by the facilities of the State Plan of Flood Control. The regional flood management plans are a key component and support the development of the 2017 update to the 2012 Central Valley Flood Protection Plan.

Project Description:

Local interests, with financing from DWR, have completed six regional flood management plans for the following regions: Feather River Region; Mid and Upper Sacramento Region; Lower Sacramento River/Delta North Region; Lower San Joaquin/Delta South Region; Mid San Joaquin River Region; and Upper San Joaquin River Region. Links to final RFMPS reports for all six regions are available at the Central Valley Flood Protection Board Coordinating Committee website "www.RFMPCC.com." Regional Flood Management Planning support will continue under Phase 2 of the six work agreements through 2017.

Funding Information:

Project Budget (Total):		**Funding Source:**	Proposition 1E
Budget Notes:	TBD		
Project Start Date:	2014	**Project End Date:**	2017

External Partners:

Central Valley Flood Protection Board, United States Army Corps of Engineers, State Plan of Flood Control (SPFC) Reclamation and Levee Districts, SPFC Regional Flood Control Agencies, SPFC affected tribal entities, SPFC affected counties, SPFC affected cities, SPFC affected water districts and agencies, private agriculture, California Farm Bureau and local farm bureaus,

2015 Project Accomplishments

Draft reports for the six regional flood management plans were completed at the end of 2015 and the six RFMPs were completed in 2016.

Project Deliverables/Timeline

Work under the Phase Two work agreements for the six RFMPs is ongoing and will be completed when the Central Valley Flood Protection Board adopts the 2017 update to the 2012 Central Valley Flood Protection Plan.

Customers:

Department of Water Resources, Central Valley Flood Protection Board, U.S. Army Corps of Engineers, Federal Emergency Management Agency, California Governor's Office of Emergency Services, SPFC regional flood control agencies, SPFC reclamation and levee districts, SPFC affected tribal entities, SPFC affected cities, and SPFC affected counties.

Annual Reporting Category before 2015

Field Studies

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Protect and Restore Important Ecosystems
Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Protect and Restore Water Resources for Important Ecosystems

Legislative and Gubernatorial Mandates

IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Represent DWR in Interagency and Stakeholder Groups

Sponsor/Program Manager	John Andrew, Elissa Lynn
Project Manager	Lauma Jurkevics

Project Status:

On Going

Project Objective:

For regional DWR staff to represent DWR in a variety of interagency and stakeholder groups within California

Project Description:

Federal, state, and local agencies, as well as other entities, have been convening workgroups to facilitate discussions in preparing for climate change, to understand the dynamics of water management and the interaction with managing other resources, and to implement the measures identified in the 2009 California Climate Adaptation Strategy and in subsequent updates, such as Safeguarding California: Reducing Climate Risk and Safeguaring Implementation and reporting. Regional DWR staff represents DWR in these discussions, communicates the agency's perspectives, provides technical expertise and climate change resources, and reports to the Climate Change Program on relevant information that DWR can use in its own departmental activities.

Funding Information:

Project Budget (Annual):	$200,000	**Funding Source:**	Prop 84
Budget Notes:	SRO - $35,000/yr (includes NCRO for 2015) SCRO - $23,000/yr NRO - $133,120/yr CC Program Management - AS and EL and other DWR staff for Safeguarding, $18,000/ year of staff time.		
Project Start Date:	January, 2010	**Project End Date:**	In Progress

External Partners:

Federal, state, and local agencies, water and electrical providers, teachers, and non-profit entities (as this project gets re-defined and split into categories, partners will change)

2015 Project Accomplishments

Regional DWR staff continued to participate in the following workgroups: California Landscape Conservation Cooperative (CA-LCC); Baylands Ecosystem Habitat Goals (BEHGU) Steering Committee; Bay Area Ecosystem Climate Change Consortium; Capital Region Climate Readiness Collaborative; and Tulare Basin Watershed Connections Workgroup. Of note, the BEHGU report was finalized and released in October 2015. Furthermore, the California Water-Energy Coalition (CalWEC), in which staff was involved in the past, does not appear to be a functioning entity anymore and has morphed into a non-profit organization, Syzergy (http://www.syzergy.org/). The Tulare Basin Watershed Connections Workgroup is a new group formed in 2015 as a collaborative of natural resource managers working together to advance watershed planning and resource management in the Tulare Basin based on sound science and mutually identified needs for regional economic and ecological sustainability. The group conducts its work through active subcommittees and convenes as a full group on a quarterly basis to coordinate overarching strategies. DWR staff currently serves as the group's coordinator. The Tulare Basin Wildlife Partners

(TBWP) founded the Watershed Connections Workgroup as an evolution of the Tulare Basin Working Group, which the TBWP coordinated for 11 years.

Staff also served multiple roles with the CA-LCC, including being Chair of the Steering Committee, Chair of the Tribal and TEK (Tribal Ecological Knowledge) Team, and members on the Science Management and Communication Teams. A Climate Summit and a Tribal Climate Adaptation Training session were developed and presented in Fall 2015.

Staff also participated in the Water Working Group in developing a Framework for the Los Angeles Regional Collaborative on Climate Action and Sustainability (LARC). In addition to providing comments, suggestions, and resources for the water segment, staff also reviewed and commented on the ocean and coastal resources section. The Framework is intended to identify priorities for various resource sectors in Los Angeles County. A final Framework, supported by funding from the Local Government Commission, is due to be released in 2016.

Staff also assisted non-DWR and DWR-sponsored Project WET (Water Education for Teachers) workshops. This work now is being reported in the "Project WET Climate Change Workshops" category for Climate Change Program-sponsored workshops and "K-12 Outreach" category for all other Project WET workshops. Work on CoCoRaHS (Community Collaborative Rain, Hail, and Snow Network) now is reported under the "Citizen Science" category.

The work on Basin Studies is identified in its own category, "Basin Studies," where further information can be found. This work includes the following Basin Studies: Los Angeles County Storm Water Basin; Klamath Basin; Truckee River Basin; and Sacramento/San Joaquin River Basins.

The work on the Federal Emergency Management Agency's National Flood Insurance Program (NFIP) and the CA Ocean Science Trust and Scripps Institution of Oceanography grant-funded project from National Oceanic and Atmospheric Administration (NOAA) is currently being reported in the "Integrating SLR into NFIP" category. Additional involvement with the Coastal and Oceans Working Group of the CAT occurred because of the grant work on sea-level rise and the National Flood Insurance Program (NFIP).

Program Management staff also provided a great deal of support to Resources Agency Safeguarding California Implementation, by acting as sector lead author for the Water Sector report, released in March, 2016: http://resources.ca.gov/docs/climate/safeguarding/Water%20Sector%20Plan.pdf Additional support to Safeguaring was conducted by tracking DWR's Safeguarding related projects. In addition, regional staff actively participated in the October "Listening Sessions for Climate Adaptation in California" held in Oakland and San Diego. These sessions focused on receiving input on the draft sector-based implementation action plans for "Safeguarding California: Reducing Climate Risk," the state's climate adaptation strategy.

Project Deliverables/Timeline

2015
•Baylands Ecosystem Habitat Goals Technical Update – final report, October
•CA-LCC product: Climate Summit (October); Tribal Climate Adaptation Training (Fall)
•4 Project WET workshops sponsored by DWR's Climate Change Program (April, June, September) (refer to "Project WET" category)
•LACFCD/USBR Basin Study products: Stormwater Capture Opportunities and Options List; Technical Analysis Criteria; Economic Analysis; Environmental and Social Effects; Trade-Off Analysis; Trade-Off Analysis & Recommendations Interim Report (refer to "Basin Studies" category)
•Klamath Basin Study product: a series of nine final technical reports and a final report (refer to "Basin Studies" category)
•Truckee River Basin Study draft final report (refer to "Basin Studies" category)
•NOAA Grant products: Needs Assessment; Coastal Appendix to Quick Guide (drafts); Initial Drafts of Technical Methods Manual; presentations at FMA Conference (September) (refer to "Integrating SLR into NFIP" category)

2016
•Truckee River Basin Study final report (refer to "Basin Studies" category)
•LARC's Draft Framework (July) and Final Framework (November)

ONGOING
Provide lead support for the Water Sector and DWR project tracking for Implementation of Safeguarding California.

Customers:

Federal, state and local agencies, water and electrical providers, teachers, non-profit entities, and DWR climate change program (as this project gets re-defined and split into categories, customers will change)

Annual Reporting Category before 2015

Planning, Modeling, and Data Collection

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Provide Safe Water for All Communities
Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
EO S-13-08: NRC SLR Study
IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Research Partnerships: National Scientific and External Coordination Committees

Sponsor/Program Manager	Executive
Project Manager	Jeanine Jones / Michael L Anderson

Project Status:

On Going

Project Objective:

Represent DWR at interstate, national, and international levels on climate-related matters

Project Description:

Influence federal agency decisions regarding climate change programs, with a near-term focus on extreme events and improving sub-seasonal to seasonal (S2S) prediction of precipitation to support drought preparedness and long-term adaptation measures such as forecast-informed reservoir operations.

Funding Information:

Project Budget (Annual):	$100,000	**Funding Source:**	General Fund
Budget Notes:	$75,000 in one-time drought emergency funding, for a contract with Western States Water Council to engage NOAA and the research community on improving S2S precipitation forecasting		
Project Start Date:	Estimated 2010	**Project End Date:**	On Going

External Partners:

NOAA, NWS, USBR, USACE, USGS, NOAA RISAs, ASCE, USDA, WSWC, Scripps

2015 Project Accomplishments

Developed 5-year renewal for USDA WERA climate data coordinating committee of western state climatologists and federal agency partners. New effort includes more interaction with USDA Climate Hubs and DOI Climate Science Centers; Continued engagement with the national ASCE Hydroclimate Committee looking at representing extreme events in hydrologic engineering planning applications. Executed contract in June with WSWC to sponsor series of workshops with NOAA on improving S2S precipitation forecasting -- initial workshops were held in October at NWS' Western Region headquarters in Salt Lake City and in December at the Colorado River Water users' Association annual meeting. Workshops are also intended to engage other state water agencies in urging federal support for improving S2S forecasting.

Project Deliverables/Timeline

Continue to influence federal agency decisions regarding climate change programs, with a near-term focus on extreme events and improving sub-seasonal to seasonal (S2S) prediction of precipitation to support drought preparedness and long-term adaptation measures such as forecast-informed reservoir operations. Continue working with WSWC and Western Governors Association on federal implementation of the National Integrated Drought Information System legislation. Work with NOAA and NASA to advance priority of research to improve S2S prediction, including holding science workshops and meetings.

Customers:

Other public agencies

Annual Reporting Category before 2015

Grantmaking & Technical Assistance

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods
Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Science Coordination: Research and Science Community Engagement

Sponsor/Program Manager	John Andrew
Project Manager	Elissa Lynn / Michael L Anderson

Project Status:

On Going

Project Objective:

In order to keep DWR up to date with the most recent and accurate climate science, as well as meet legislative mandates and direction for incorporating climate change in water management, the Climate Change Program conducts collaborative engagement with the academic and scientific community. See description and deliverables for the many projects that fall under this category; some have their own project reporting entry.

Project Description:

Various projects and research activities are undertaken to engage the science community so that DWR can be aware of and incorporate the latest climate science into its activities and planning.

Funding Information:

Project Budget (Annual):	$50,000	**Funding Source:**	Bond funds through FY 15-16
Budget Notes:	Approximate budget for staff time on efforts engaging the science community. Individual projects listed in the deliverables may have their own budgets, as well.		
Project Start Date:	2007	**Project End Date:**	On going

External Partners:

State Climatologist, UC System, CCTAG, various State, federal and local science partners.

2015 Project Accomplishments

See individual projects listed

Project Deliverables/Timeline

Past Deliverables:
- NRC Study
- CCTAG (2007-09, and 2012-2015)* See report

Ongoing Deliverables:
- Paleohydrology Studies* See report
- Rain/Snow Trends in California * See Data
- Coastal Quick Guide (NOAA, TMM)* See report
- Tribal Ecological Knowledge and Engagement* See Tribal
- Science and Data Brochure
- Atmospheric River research with Scripps* See report
- Decision Scaling Analysis of Climate Change Impacts on SWP* See report
- Extreme Event Modeling with UC Davis

Customers:

DWR

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Achieve the Co -Equal Goals for the Delta
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
EO S-13-08: NRC SLR Study
EO S-13-08: Review and NRC SLR Study Every 2 Years
SGMA
IRWM
UWMP
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Sea-Level Rise Case Study Booklet

Sponsor/Program Manager	Elissa Lynn, John Andrew
Project Manager	Lauma Jurkevics

Project Status:

Complete

Project Objective:

The goal is to improve outreach. Objectives included the following: (1) to provide examples others can use in adapting to changing sea-level rise; (2) to be a leader for locals in setting examples; and (3) to develop a downloadable case study booklet.

Project Description:

Local agencies, specifically those involved with Regional Water Management Groups, are seeking examples on where effective adaptive measures are being implemented to address climate change. Several guidance documents in various topic areas have been prepared for local agencies, which may not always have the funds or means to fully use or understand what will work for them. Therefore, providing examples of effective adaptation strategies that are currently in place or being used by a specific entity could provide others an easier approach in pursuing similar strategies for their own agencies.

The focus was to be on the state's guidance document for sea level rise and research and to describe examples and case studies where agencies are implementing this guidance. This project was to result in a downloadable case study booklet. However, after meeting with the CO-CAT and discussing this project with the DWR Interstate Manager, DWR staff found that keeping track of case studies would be onerous for one agency and that using existing websites to input these studies would be more desirable. After further discussion with the Climate Change Team, it was determined that no further work would be done on this project. Focus has now shifted on integrating sea-level-rise information with non-regulatory approaches to the National Flood Insurance Program. Details of this project can be found elsewhere.

Funding Information:

Project Budget (Annual):	$11,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	SRO staff = $11,000/yr		
Project Start Date:	2014	**Project End Date:**	2015

External Partners:

DWR's C4 and Matrix Teams, BDCP staff; members of the CO-CAT and OPC

2015 Project Accomplishments

Internal discussions within the Climate Change Program were held, and it was determined that no further work will be done on this project. Efforts have shifted to working on sea-level-rise science and applying it to non-regulatory approaches of the National Flood Insurance Program, a separate project identified in its own category. Meanwhile, "Lifting the Fog" website (http://coastaladaptation.org/LiftingTheFog/) has added four additional case studies.

Project Deliverables/Timeline

Downloadable case study booklet - it was later determined that the best use of resources was to utilize existing websites for inclusion of case studies, so no booklet will be developed.

Customers:

local coastal agencies

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Protect and Restore Important Ecosystems
Increase Flood Protection

Safeguarding California Implementation Plan

Vigorously Prepare California for Flooding
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO S-13-08: NRC SLR Study
IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

State Government Regional Climate Change Coordination

Sponsor/Program Manager	
Project Manager	Michelle Selmon

Project Status:

Project Initiation Only

Project Objective:

Conduct quarterly or semiannual meetings in regions of the state to discuss CC efforts, projects and resources.

Project Description:

Climate Change adaptation and mitigation strategies can differ across different geographic regions. For example, coastal areas may have more concerns about sea level rise, whereas inland areas may be more concerned with extreme events, flooding, and water supply reliability. Discussion of Climate Change is frequently addressed in a top-down fashion in State Government. There is a need for more regional cooperation of CC strategies and knowledge. The project's aim is to conduct regular (quarterly or semiannual) meetings in regions to discuss CC adaptation and mitigation efforts and regional and local challenges. Meetings will focus on:(1) Sharing information relating to climate change efforts in region; (2) Networking; and (3) CC-related presentations.

Funding Information:

Project Budget (Total):		**Funding Source:**	
Budget Notes:			
Project Start Date:		**Project End Date:**	

External Partners:

IRWM, SIWM, O&M; F&W, Cal OES, Parks, CalEPA, RWRCB, UC and Cal State Universities, CALCC

2015 Project Accomplishments

Project Initiation Only

Project Deliverables/Timeline

Customers:

State government departments

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Identify Sustainable and Integrated Financing Opportunities

Safeguarding California Implementation Plan

Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management

Legislative and Gubernatorial Mandates

EO B-30-15: State Agencies Implement GHG reductions
SGMA
IRWM
UWMP

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Sustainability

Sponsor/Program Manager	Carl Torgersen
Project Manager	Mary Simmerer

Project Status:

On Going

Project Objective:

DWR will be a sustainability leader within State government and the California water community

Project Description:

DWR has established a Sustainability Policy, which received approval from former DWR Director Snow, on April, 22, 2009. DWR's Sustainability Policy embodies the goals and directions the Department will take to be a sustainability leader within State government and the California water community. The policy sets initial targets in the following areas:
• Carbon- 50% reduction below 1990 levels by 2020 (consistent with the AB 32 Scoping Plan); 80% reduction below 1990 levels by 2050 (EO S-0-05)
• Energy- Progressive acquisition of 360 GWh of renewable energy resources by 2020; reduce grid-based retail energy demand 20% by 2015; ensure Energy Star purchasing (EO S-2-04)
• Wastewater- Incorporate recycled wastewater and/or greywater into facilities if technically feasible and cost-effective
• Waste- 50% diversion form waste stream by 2020 (AB 1016)
• Water- 20% reduction in per employee water use by 2020 (consistent with SB 7x-7)

Funding Information:

Project Budget (Annual):	$324,366	**Funding Source:**	Executive Overhead
Budget Notes:			
Project Start Date:	April 22, 2009	**Project End Date:**	In Progress

External Partners:

None

2015 Project Accomplishments

• Target: Carbon-
o 50% reduction below 1990 levels by 2020 (consistent with the AB 32 Scoping Plan);
o 80% reduction below 1990 levels by 2050 (EO S-0-05)
• Progress: DWR has achieved its 2020 goal.
o It is anticipated that DWR will meet its 2050 goal by 2035 or sooner.
• Target: Energy- Progressive acquisition of 360 GWh of renewable energy resources by 2020;
o Progress: DWR is on track to exceed its goal of 360 GWh by nearly 140 GWh.
• Target: Energy- Reduce grid-based retail energy demand 20% by 2015;
o Progress: DWR has met this objective.

• Target: Energy- Ensure Energy Star purchasing (EO S-2-04)
o Progress: DWR only purchases Energy Star rated equipment or higher.

• Target: Wastewater- Incorporate recycled wastewater and/or greywater into facilities if technically feasible and cost-effective
o Progress: DWR has reviewed all facilities for recycling wastewater and/or greywater. However, recycled water use is not feasible as insufficient quantities of this type of water are not available.
• Target: Waste- 50% diversion form waste stream by 2020 (AB 1016)
o Progress: DWR has met it waste diversion goal and exceeded it by 20% or more.

• Target: Water- 20% reduction in per employee water use by 2020 (consistent with SB 7x-7)
o Progress: DWR has met it water use reduction by 2015 with a 30% water reduction.
Other 2015 Sustainability Accomplishments
Sustainability activities for DWR in 2015 focused on extending DWR's efforts out to other State Agencies that have a direct impact on DWR operations and objectives, especially the newly formed Government Operations Agency (GOVOps) and the Department of General Services (DGS). These two agencies are responsible for such issues as Information Technology standards, energy, water, building maintenance and other critical aspects relating to Sustainability. Additionally, efforts continued in education and awareness of Sustainability practices and principles, as well as implementing various Sustainability activities. Following is a list of significant 2015 sustainability accomplishments and efforts. (For the reader's convenience, the list is grouped alphabetically by activity.)
• Agency Sustainability Coordination Efforts
o 2018 California Water Plan- Role of Sustainability Indicators.
 The California Water Plan, updated every five years, presents the status and trends of California's water-dependent natural resources; water supplies; and agricultural, urban, and environmental water demands for a range of plausible future scenarios. The plan also evaluates different combinations of regional and statewide resource management strategies to reduce water demand, increase water supply, reduce flood risk, improve water quality, and enhance environmental and resource stewardship. The evaluations and assessments performed for the plan help identify effective actions and policies for meeting California's resource management objectives in the near term and for several decades to come. The 2013 California Water Plan produced the Sustainability Indicators Framework, which will continue to evolve over time.
• Committees: Updates & Accomplishments
o Agency Sustainability Coordinators.
 Members: Other State Agencies Sustainability personnel
 Purpose: Provide a forum to discuss Sustainability issues within the public sector and coordinate solutions and provide peer-to-peer learning opportunities.
 Meeting Frequency: Monthly
 Accomplishments: Development of a new state-wide exemption process to 2015 landscaping moratorium. Demonstrated need for ecosystem services, public safety and security, and public health in maintaining state agency landscaping.
o Environmental Coordination Committee
 Members: Division chiefs and Executive staff
 Purpose: provide assistance to DWR staff to assure that DWR's activities that involve environmental considerations are in compliance with legal, legislative and policy mandates, and that work products are internally consistent. The ECC is a forum in which DWR staff discusses a wide range of topics from current regulatory issues, document protocols, environmental analyses and mitigation policies. The ECC works closely with DWR's Sustainability program and facilitates various Sustainability working teams as noted below.
 Meeting Frequency: Monthly
 Accomplishments:
• Re-organization and new organizational charter
• Accepted as a working group the Pesticide Reduction and Water Resources Engineering Memorandum (WREM) 10a update. Work proceeded on developing a team to review pesticide use at DWR and to bring the concept of integrated pest management into DWR procedures. Work is ongoing.
• Accepted as a working group the Environmental Stewardship Implementation team
• Accepted as an informational group the Invasive terrestrial species team.
o State Agency Green Employees (SAGE)
 Members: SAGE, originally known as the State Agency Recycling Coordinator's Committee (SARCC), is a group for State Recycling Coordinators and other employees involved with the State's Green efforts.
 Purpose: SAGE communicates with other Agencies regarding meeting State mandates, materials reuse, recycling programs, and Environmentally Preferred Purchasing and provides peer-to-peer learning opportunities.
 Meeting Frequency: Monthly
 Accomplishments:
• Developed a governing structure for the group with CalRecycle as lead agency.
• Set quarterly membership meetings with presentations and speakers.
• Established website and meeting archives format.
o Sustainability Leads
 Members: Business Services, Water and Energy Efficiency, Climate Change, and IRWM staffs.
 Purpose: Develop Sustainability Initiatives and Sustainability Best Practices. This group also makes annual

recommendations on Sustainability Policy.
 Meeting Frequency: Minimal
 Accomplishments:
• Many of the functions of this group have been absorbed by other groups. This group will be restructured in 2016.
o Sustainability Working Group
 Members: Mostly Climate Change staff
 Purpose: To discuss Sustainability initiatives, perform pilot projects and make recommendations on DWR's Sustainability policies
 Meeting Frequency: Minimal
 Accomplishments:
• Most of the functions of this group have been taken over by other committees. This group will be restructured in 2016.
o Bike Committee
 Members: Business Services, DWR interested employees, DWR Wellness Program, other interested Resources employees
 Purpose: To promote commuter bicycling at DWR
 Meeting Frequency: Monthly
 Accomplishments:
• Applied for and won Kaiser Permanente BikeShare grant to start a BikeShare Program at DWR.
• Supported May is Bike Month Activities
• Held an October Climate Action Ride in partnership with State Parks and the TMA.
o Sacramento Transportation Management Association (TMA) Commuter Club Committee
 Members: The Sacramento TMA is the oldest TMA in Sacramento and one of the largest in the country. Incorporated in 1989, the TMA has 165 members, representing more than 90,000 commuters. The Sacramento TMA serves employers, commuters and residents from the American River to Elk Grove and from the Sacramento River to 65th Street.
 Purpose: Through DWR's membership in the TMA, DWR offers an employee commute program that puts the Emergency Ride Home vouchers online and offers commute information, incentives, and prizes. By using the incentives that TMA has to offer, DWR continues to promote Greenhouse Gases awareness and encourage alternate transportation.

 Meeting Frequency: Monthly
 Accomplishments: 2015 May is Bike Month
• DWR participated in the Sacramento Transit Management Authority's "May is Bike Month" event. The event is held every May to encourage commuter biking and substitute bike riding for car trips. 2015's participation was less than 2014's with 191 participants in 2015 versus 229 in 2014 and the total miles showed a decrease to 35,552 miles versus 43,057 in 2014.
• Education and Awareness Activities
o Websites:
 Sustainability Program SharePoint Site. SharePoint allows extensive collaboration across divisions at DWR as well as providing website services and is restricted to DWR employees only.
Date 1/1/2015 - 12/31/2015
Total Number of Page Views 23,990
Average Number of Page Views per Day 66
Total Number of Daily Unique Visitors 1,437
Total Number of Referrers 1,739
Average Number of Referrers per Day 5
Total Number of Sites 15
Total Storage Used (MB) 398.28

o The Sustainability Program site also hosts 15 working groups totaling 103 members ranging from temporary workgroups for very specific tasks to standing DWR Committees. The titles reveal the broad range of Sustainability issues being worked on at DWR.
Site Name Site Function
2015 MDP TEAM#5 Temporary Work Site for a Management Development Team
Bike Committee Workspace DWR Committee site
Drought Tolerant Landscaping Interagency Workgroup
ECC Invasive Plant Subcommittee DWR Committee site
Electronic Vehicle Charging Stations Team Site
Environmental Stewardship Implementation Plan and five subgroups. Team site for developing DWR's Environmental Stewardship Implementation Plan
Pesticide & WREM10A Workgroup Team working on updating DWR's Pesticide practices
Sustainability Leads DWR Committee site
Sustainability Workgroup DWR Committee site
Waste & Recycling Workgroup Team Site

o Sustainability Collaboration Portal: A web-based tool containing an array of information, news articles, images, etc. on Sustainability. This site is open to viewers outside of DWR. See https://sustainability.water.ca.gov
• Classes:
o Envision Training: Envision™ is a tool for evaluating and rating the community, environmental and economic benefits of all types and sizes of infrastructure projects. The Envision ™ rating system evaluates, grades, and gives recognition to infrastructure projects that assess the sustainability over the course of the project's life cycle. In a two -day staffs learn how to use the rating system and learn how the Envision Rating System integrates with DWR's sustainability and environmental stewardship policies. Additionally, actual case studies of sustainable infrastructure projects are discussed. To date, 153 people have taken the Envision training.
o Introduction to Sustainability: A new class for non-technical staff reviewing major sustainability issues and offering class discussion on sustainability. Two classes were offered in 2015.
o 2015 Sustainability Section in Climate Change Class 201.
• Outreach:
o 2015 Earth Day Activities: Due to the on-going drought, Earth Day activities were held at the Sacramento Earth Activities which normally draw around 6,000 people and featured a DWR booth with water saving tips and ideas.
o 2015 November America Recycles Day
o Northern Nevada Professional Development Day 2015 at Grand Sierra Resort in Reno, Nevada: Presented a talk entitled "Using the Envision Model to create Sustainable Projects".
• Target: Carbon-
o 50% reduction below 1990 levels by 2020 (consistent with the AB 32 Scoping Plan);
o 80% reduction below 1990 levels by 2050 (EO S-0-05)
• Progress: DWR has achieved its 2020 goal.
o It is anticipated that DWR will meet its 2050 goal by 2035 or sooner.
• Target: Energy- Progressive acquisition of 360 GWh of renewable energy resources by 2020;
o Progress: DWR is on track to exceed its goal of 360 GWh by nearly 140 GWh.

• Target: Energy- Reduce grid-based retail energy demand 20% by 2015;
o Progress: DWR has met this objective.

• Target: Energy- Ensure Energy Star purchasing (EO S-2-04)
o Progress: DWR only purchases Energy Star rated equipment or higher.

• Target: Wastewater- Incorporate recycled wastewater and/or greywater into facilities if technically feasible and cost-effective
o Progress: DWR has reviewed all facilities for recycling wastewater and/or greywater. However, recycled water use is not feasible as insufficient quantities of this type of water are not available.
• Target: Waste- 50% diversion form waste stream by 2020 (AB 1016)
o Progress: DWR has met it waste diversion goal and exceeded it by 20% or more.

• Target: Water- 20% reduction in per employee water use by 2020 (consistent with SB 7x-7)
o Progress: DWR has met it water use reduction by 2015 with a 30% water reduction.

Other 2015 Sustainability Accomplishments
Sustainability activities for DWR in 2015 focused on extending DWR's efforts out to other State Agencies that have a direct impact on DWR operations and objectives, especially the newly formed Government Operations Agency (GOVOps) and the Department of General Services (DGS). These two agencies are responsible for such issues as Information Technology standards, energy, water, building maintenance and other critical aspects relating to Sustainability. Additionally, efforts continued in education and awareness of Sustainability practices and principles, as well as implementing various Sustainability activities. Following is a list of significant 2015 sustainability accomplishments and efforts. (For the reader's convenience, the list is grouped alphabetically by activity.)
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o 2018 California Water Plan- Role of Sustainability Indicators.
 The California Water Plan, updated every five years, presents the status and trends of California's water-dependent natural resources; water supplies; and agricultural, urban, and environmental water demands for a range of plausible future scenarios. The plan also evaluates different combinations of regional and statewide resource management strategies to reduce water demand, increase water supply, reduce flood risk, improve water quality, and enhance environmental and resource stewardship. The evaluations and assessments performed for the plan help identify effective actions and policies for meeting California's resource management objectives in the near term and for several decades to come. The 2013 California Water Plan produced the Sustainability Indicators Framework, which will continue to evolve over time.
• Committees: Updates & Accomplishments
o Agency Sustainability Coordinators.
 Members: Other State Agencies Sustainability personnel

 Purpose: Provide a forum to discuss Sustainability issues within the public sector and coordinate solutions and provide peer-to-peer learning opportunities.
 Meeting Frequency: Monthly
 Accomplishments: Development of a new state-wide exemption process to 2015 landscaping moratorium. Demonstrated need for ecosystem services, public safety and security, and public health in maintaining state agency landscaping.

o Environmental Coordination Committee
 Members: Division chiefs and Executive staff
 Purpose: provide assistance to DWR staff to assure that DWR's activities that involve environmental considerations are in compliance with legal, legislative and policy mandates, and that work products are internally consistent. The ECC is a forum in which DWR staff discusses a wide range of topics from current regulatory issues, document protocols, environmental analyses and mitigation policies. The ECC works closely with DWR's Sustainability program and facilitates various Sustainability working teams as noted below.
 Meeting Frequency: Monthly
 Accomplishments:
• Re-organization and new organizational charter
• Accepted as a working group the Pesticide Reduction and Water Resources Engineering Memorandum (WREM) 10a update. Work proceeded on developing a team to review pesticide use at DWR and to bring the concept of integrated pest management into DWR procedures. Work is ongoing.
• Accepted as a working group the Environmental Stewardship Implementation team
• Accepted as an informational group the Invasive terrestrial species team.

o State Agency Green Employees (SAGE)
 Members: SAGE, originally known as the State Agency Recycling Coordinator's Committee (SARCC), is a group for State Recycling Coordinators and other employees involved with the State's Green efforts.
 Purpose: SAGE communicates with other Agencies regarding meeting State mandates, materials reuse, recycling programs, and Environmentally Preferred Purchasing and provides peer-to-peer learning opportunities.
 Meeting Frequency: Monthly
 Accomplishments:
• Developed a governing structure for the group with CalRecycle as lead agency.
• Set quarterly membership meetings with presentations and speakers.
• Established website and meeting archives format.

o Sustainability Leads
 Members: Business Services, Water and Energy Efficiency, Climate Change, and IRWM staffs.
 Purpose: Develop Sustainability Initiatives and Sustainability Best Practices. This group also makes annual recommendations on Sustainability Policy.
 Meeting Frequency: Minimal
 Accomplishments:
• Many of the functions of this group have been absorbed by other groups. This group will be restructured in 2016.

o Sustainability Working Group
 Members: Mostly Climate Change staff
 Purpose: To discuss Sustainability initiatives, perform pilot projects and make recommendations on DWR's Sustainability policies
 Meeting Frequency: Minimal
 Accomplishments:
• Most of the functions of this group have been taken over by other committees. This group will be restructured in 2016.

o Bike Committee
 Members: Business Services, DWR interested employees, DWR Wellness Program, other interested Resources employees
 Purpose: To promote commuter bicycling at DWR
 Meeting Frequency: Monthly
 Accomplishments:
• Applied for and won Kaiser Permanente BikeShare grant to start a BikeShare Program at DWR.
• Supported May is Bike Month Activities
• Held an October Climate Action Ride in partnership with State Parks and the TMA.

o Sacramento Transportation Management Association (TMA) Commuter Club Committee
 Members: The Sacramento TMA is the oldest TMA in Sacramento and one of the largest in the country. Incorporated in 1989, the TMA has 165 members, representing more than 90,000 commuters. The Sacramento TMA serves employers, commuters and residents from the American River to Elk Grove and from the Sacramento River to 65th Street.
 Purpose: Through DWR's membership in the TMA, DWR offers an employee commute program that puts the Emergency Ride Home vouchers online and offers commute information, incentives, and prizes. By using the incentives that TMA has to offer, DWR continues to promote Greenhouse Gases awareness and encourage alternate transportation.

 Meeting Frequency: Monthly
 Accomplishments: 2015 May is Bike Month
• DWR participated in the Sacramento Transit Management Authority's "May is Bike Month" event. The event is held every May to encourage commuter biking and substitute bike riding for car trips. 2015's participation was less than 2014's with 191 participants in 2015 versus 229 in 2014 and the total miles showed a decrease to 35,552 miles versus 43,057 in 2014.
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o Websites:
 Sustainability Program SharePoint Site. SharePoint allows extensive collaboration across divisions at DWR as well as providing website services and is restricted to DWR employees only.
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Drought Tolerant Landscaping Interagency Workgroup
ECC Invasive Plant Subcommittee DWR Committee site
Electronic Vehicle Charging Stations Team Site
Environmental Stewardship Implementation Plan and five subgroups. Team site for developing DWR's Environmental Stewardship Implementation Plan
Pesticide & WREM10A Workgroup Team working on updating DWR's Pesticide practices
Sustainability Leads DWR Committee site
Sustainability Workgroup DWR Committee site
Waste & Recycling Workgroup Team Site

o Sustainability Collaboration Portal: A web-based tool containing an array of information, news articles, images, etc. on Sustainability. This site is open to viewers outside of DWR. See https://sustainability.water.ca.gov
• Classes:
o Envision Training: Envision™ is a tool for evaluating and rating the community, environmental and economic benefits of all types and sizes of infrastructure projects. The Envision ™ rating system evaluates, grades, and gives recognition to infrastructure projects that assess the sustainability over the course of the project's life cycle. In a two ion da y ses staffs learn how to use the rating system and learn how the Envision Rating System integrates with DWR's sustainability and environmental stewardship policies. Additionally, actual case studies of sustainable infrastructure projects are discussed. To date, 153 people have taken the Envision training.
o Introduction to Sustainability: A new class for non-technical staff reviewing major sustainability issues and offering class discussion on sustainability. Two classes were offered in 2015.
o 2015 Sustainability Section in Climate Change Class 201.
• Outreach:
o 2015 Earth Day Activities: Due to the on-going drought, Earth Day activities were held at the Sacramento Earth Activities which normally draw around 6,000 people and featured a DWR booth with water saving tips and ideas.
o 2015 November America Recycles Day
o Northern Nevada Professional Development Day 2015 at Grand Sierra Resort in Reno, Nevada: Presented a talk entitled "Using the Envision Model to create Sustainable Projects".
• Energy and Water Efficiency Efforts
Energy Efficiency Projects Installed in 2014-2015
Name Estimated Annual kWh Savings
Lake Oroville Visitors Center 40,034
Sacramento Maintenance Yard 631,450
Sutter Maintenance Yard 70,843
Lost Hills O&M Subcenter 80,494
Oroville Field Division Headquarters 133,582
Total Reductions to Date: 1,236,253 kWh

DWR's water and energy efficiency statistics including leased facilities

• Zero Emission Vehicles (ZEVs) and Electric Car Chargers
o In addition to its energy and water efficiency efforts, DWR currently has (7) zero emission dedicated electric vehicles, (12) non plug in hybrid vehicles and (11) plug in hybrid vehicles. In addition, DWR has installed 15 charging stations throughout the State (SFD Pearblossom-3 Chargers, OFD O&M Center- 4 Chargers, OFD Hyatt Pumping Plant- 4 Chargers, JOC- 2 Chargers (can charge four vehicles simultaneously), West Sacramento Industrial Building- 2 Chargers (can charge four vehicles simultaneously)). DWR is showing its commitment to sustainability by purchasing (10) additional plug in hybrids and (3) dedicated electric vehicles for 2016/2017.
• Environmental Stewardship Principles
o DWR adopted Environmental Stewardship Principles in 2010 and in 2012 worked with the Department's Engineering Bulletin, Water Resources Engineering Memorandum (WREM) 58A to assure that the Principles were embedded into the Department's Engineering Practices. One of the significant outreach efforts is the inclusion of Environmental Stewardship Principles in the Envision portion of the Project Management Training. In 2015, 62 people went through the Envision/Environmental Stewardship training.
• Paper Reduction
o Launched in 2010, Documentum is an enterprise system for managing all record types including video, podcast, images and other digital records as well as traditional media storage such as paper and microfilm. As the table below indicates, the paper reduction process is on-going with a reduction of paper files of nearly 7,000 cubic feet, and electronic storage is becoming increasingly main-stream with an increase of over 8,000 terabytes of data. A Department of General Services inventory of public records is required every five years.
Record type 2013/14 2008/2009
Electronic Files 8,671 Terabytes 199 Terabytes
Paper Files 26,785 Cubic Feet 33,743 Cubic Feet

Reporting Sustainability Efforts
• Annual Report
o The 4st sustainability annual report was released in 2015, detailing events and accomplishments from 2013. That report may be accessed at:https://sustainability.water.ca.gov/library/-/document_library/view/3364357
Transportation
o Fuel Management Replacement System (FMRP) was launched in 2008 with the stated goals to identify and select a non-proprietary commercial grade fuel management system with pay-point functions (using the Voyager card) to replace the existing system. The system provides site administrators with the capability to access real-time fuel data from a personal computer as well as provide accurate and immediate capture of fuel disbursement and cost distribution for fuel obtained by Department vehicles. Although not currently required by law, having an updated, integrated fuel management system also helps DWR track its greenhouse gases emitted from DWR's fleet.
o Electric Vehicles – DWR continues to pursue the purchase of electric vehicles as well as provide workplace electrical vehicle charging stations. DWR's vehicle fleet to increase the number of its zero-emission vehicles through the normal course of fleet replacement so that at least 10 percent of fleet purchases of light-duty vehicles be zero-emission by 2015 and at least 25 percent of fleet purchases of light-duty vehicles be zero-emission by 2020. (EO B-16-12) 105 Light duty vehicles were purchased for calendar year 2015 with seventeen vehicles being zero emissions under DGS guidelines. The department is in compliance with B-16-12.DWR will continue to follow the executive order and DGS Office of Fleet and Asset Management guidelines.

Project Deliverables/Timeline

• Carbon- 50% reduction below 1990 levels by 2020 (consistent with the AB 32 Scoping Plan); 80% reduction below 1990 levels by 2050 (EO S-0-05)
• Energy- Progressive acquisition of 360 GWh of renewable energy resources by 2020; reduce grid-based retail energy demand 20% by 2015; ensure Energy Star purchasing (EO S-2-04)
• Wastewater- Incorporate recycled wastewater and/or greywater into facilities if technically feasible and cost-effective
• Waste- 50% diversion form waste stream by 2020 (AB 1016)
• Water- 20% reduction in per employee water use by 2020 (consistent with SB 7x-7)

Customers:

DWR

Annual Reporting Category before 2015

Business Practices & Technical Expertise

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Make Conservation a California Way of Life
Protect and Restore Important Ecosystems

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Utilize Low-impact Development and Other Methods in State and Regional Stormwater Permits to Restore the Natural Hydrograph

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: State Agencies Implement GHG reductions
EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure
EO B-18-12: Reduce Agency GHG Emissions by 10% by 2015 and 20% by 2020 from 2010 Baseline
EO B-18-12: Zero Net Energy Buildings
EO B-18-12: Reduce Grid Based Energy Purchases for State Buildings by 20% by 2018 as Compared to 2003 Baseline
EO B-18-12: LEED Silver
EO B-18-12: Electric Vehicle Charging Stations

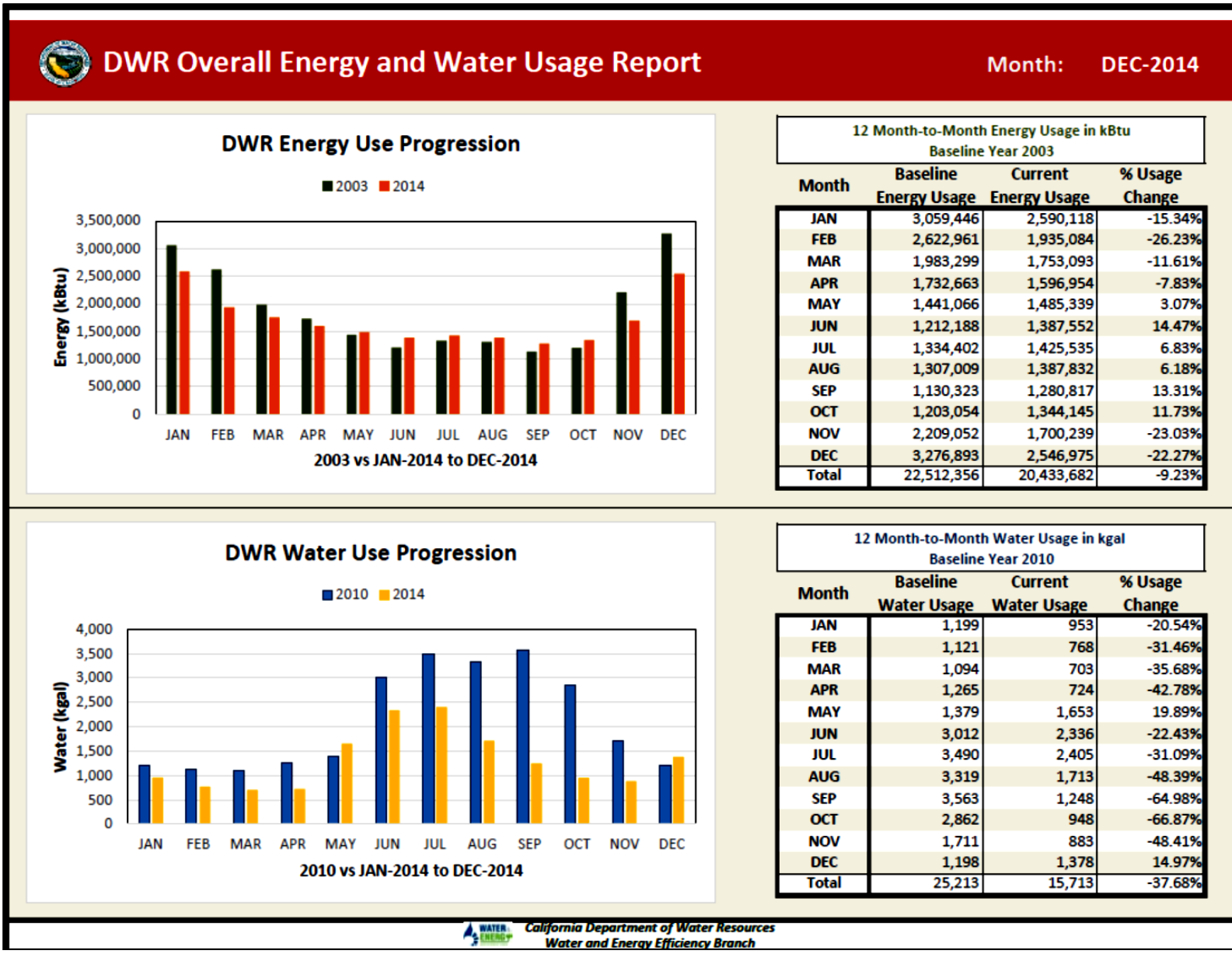

Figure 1. DWR's water and energy use for 2014

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Sustainable Facilities Operations - Greenhouse Gas (GHG) Initiatives

Sponsor/Program Manager	Executive
Project Manager	John Engstrom / Nathanael Frank

Project Status:

On Going

Project Objective:

Reduce GHG attributed to Business Operations

Project Description:

DWR will identify, measure, and implement sustainable facility operation practices to reduce GHG, and educate employees in these practices. The sustainable facilities operations practices will include reducing energy and resource consumption, while lowering greenhouse gas emissions and creating healthier working environments for DWR employees. The development of these enhanced business practices will include:

• DWR has integrated a document management system into its daily business operations. This type of system will reduce paper quantity and create an electronic system for tracking of approvals and electronic retention of documents to save time and resources.
• DWR will continue to promote the Environmentally Preferable Purchasing (EPP) program to utilize procurement methods that provide options for purchasing “green” products.
• DWR will increase its efforts to reduce, reuse, recycle, and rethink in all areas of DWR’s daily business activities. DWR will look at continuing to increase its waste reporting metrics under SB 1016 by using annual waste disposal as a factor when evaluating program implementation.
• DWR will continue to provide an official office supply reuse center (Green Pastures) on the 3rd floor of the Resources Building for new, gently used, or open box office materials that are available to all DWR employees free of charge.
• DWR will promote and implement energy, water efficiency, and conservation in all capital and renovation projects as well as operations and maintenance activities within budgetary constraints and programmatic requirements.
• DWR will promote ways to reduce employee business travel for meetings by use of technology such as teleconference centers or web casting. In addition, training webinars and other online training opportunities will be investigated to reduce training commute for employees.
• DWR will continue to promote the Payroll Deduction Transit Pass Program as part of its alternative commute program which subsidizes alternative transportation.

Other actions in progress or in planning to promote a more sustainable business include:
• DWR will continue to educate through outreach activities like the annual Green Week event, DWR News/People articles and Current announcements.
• DWR is participating in the green building certification program LEED (Leadership in Energy and Environmental Design). The State Water Project Southern Field Headquarters is currently being submitted to LEED to become DWR’s first LEED Gold building.
more

Funding Information:

Project Budget (Total):	$303,360	**Funding Source:**	
Budget Notes:			
Project Start Date:	Continuous Efforts	**Project End Date:**	In Progress

External Partners:

Department of General Services

2015 Project Accomplishments

• May is Bike Month- DWR actively promotes commuting by bicycle. One of the efforts to increase this alternative mode of transportation is to encourage DWR staff to participate in the Sacramento's regional "May is Bike Month". DWR placed sixth in the region with employees logging 34,559 miles for the month of May in 2015.
• DWR participated in Executive Order (EO) B-18-12, Green Building Initiative. DWR is monitoring retail water and energy accounts and recording the usage into Energy Star Portfolio Manager. All State Agencies are required to reduce water use 10% by year 2015, and 20% by year 2020. From 2010-2015 DWR has reduced its water consumption by 65.51% (16.56 Million Gallons). Between 2003 and 2015 DWR has reduced its energy usage by 8.13% (1.76 Million kBtu).
• Bicycle Repair Station- DWR has installed a Dero Bike Fixit Station in front of the Resources Building. The stand is a vertical steel tube bolted to a concrete pad and two smaller tubes parallel to the ground mounted on top. A cyclist can hang his/her bike from the parallel tubes either by the saddle or the top tube. Several crescent wrenches, tire levers, screwdrivers, and Allen keys hang from steel cables inside of the tube and are easily accessible to the user. A durable bicycle pump, compatible with both Presta and Schrader valves, is attached to the side of the stand.
• DWR's Purchasing Services Office will provide purchasing workshops to update the department buyers about the Environmentally Preferable Purchasing Practices (EPP) program and why it is in the best interest for the Department to utilize this opportunity. The purchases are reportable in many cases under the mandated goals outlined in the Public Contract Code (PCC) (12153-12320) for buying recycled-content products (RCPs). The goal of this effort is to increase purchases of RCP's.
• Dhaani Systems Energy Management Software- DWR is in the process of implementing this software to reduce desktop energy loads. This new software continuously monitors individual computer usage patterns (by time of day, day of week, time of year) to minimize energy usage. As usage patterns and users change, Dhaani automatically adjusts each individual energy management profile WITHOUT the need for user or IT input. Energy savings automatically adjust to holiday seasons and other occasions when there are changes to schedules.
• Transit pass Payroll Deduction Program- This program permits purchase of a monthly transit pass using pre-tax funds from the employee's gross pay each month. When Purchasing with pre-tax funds, employees will save money for a monthly transit pass. DWR currently has 306 employees enrolled in the program.
• Bike Share Program- DWR, through a Grant with Kaiser Permanente, now has six urban bicycles, along with a high-quality free-standing bike rack. Additionally, employees will have access to bicycle helmets, safety lights, sturdy bicycle locks, side bags (panniers), and adjustable seat post clamps. The program will help DWR reduce its environmental footprint by reducing vehicle trips, while also promoting worksite wellness, active transportation and environmental stewardship. DWR started developing its roll out plan on how to administer the project in 2015.
• DWR News/People- DWR has promoted sustainability through "DWR News/People" publication. Articles discuss accomplishments by DWR staff related sustainability at DWR. For 2015, DWR published the following articles in regards to sustainability: DWR Conserves water 3.27.2015, Kids learn to be water smart 6.23.2015, Understanding Plug Loads in personal office Space 7.6.2015, Green Power 10.6.2015, DWR Sustainable Groundwater Management Act Implementation Program 10.14.2015.
• Waste Reduction and Diversion Award- The recipient of this Diversion Award disposed the least amount of waste from 18 primary categories and six hazardous waste material categories. For 2015, DWR's Delta Field Division received this award for diverting 84% of the facilities waste totaling 1,360 tons.
• VDI (Virtual Desktop Infrastructure) Zero Client. This desktop-centric service has helped the department reduce energy usage by virtualizing all the components of the desktop.
• DWR currently has (7) zero emission dedicated electric vehicles, (12) non plug in hybrid vehicles and (11) plug in hybrid vehicles. In addition, DWR has installed 15 charging stations throughout the State (SFD Pearblossom-3 Chargers, OFD O&M Center- 4 Chargers, OFD Hyatt Pumping Plant- 4 Chargers, JOC- 2 Chargers (can charge four vehicles simultaneously), West Sacramento Industrial Building- 2 Chargers (can charge four vehicles simultaneously)). DWR is showing its commitment to sustainability by purchasing (10) additional plug in hybrids and (3) dedicated electric vehicles for 2016/2017.

Project Deliverables/Timeline

Continuing GHG Reduction Measures

Customers:

DWR, and State Water Contractors

Annual Reporting Category before 2015

Business Practices & Technical Expertise

Climate Change Objectives

O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Operational and Regulatory Efficiency

Safeguarding California Implementation Plan

N/A

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Sustainable Groundwater Management Act Implementation (climate change objectives)

Sponsor/Program Manager	Dan McManus
Project Manager	Dan McManus / Andrew Schwarz

Project Status:

On Going

Project Objective:

To incorporate climate change by providing guidance and data for Groundwater Sustainability Plans.

Project Description:

DWR's initial role in SGMA is to provide regulations to revise basin boundaries, prioritize the alluvial groundwater basins, provide technical assistance, and evaluate groundwater sustainability plans (GSPs). Considering that SGMA requires that by year 2040 (or 2042, depending on the basin) applicable basins achieve their sustainability goals, DWR recognizes that climate change has the potential to exacerbate many ongoing issues with groundwater within the planning horizon. Climate change assessments will be a requirement and a key component of GSPs to assess future risk and to avoid undesirable results within defined basins under SGMA. DWR will provide technical guidance and data including a climate change assessment of projected future conditions for individual SGMA groundwater sub-basins.

Funding Information:

Project Budget (Annual):	$10,000	**Funding Source:**	General
Budget Notes:			
Project Start Date:	2015	**Project End Date:**	

External Partners:

2015 Project Accomplishments

Outlined 2014 SGMA actions to help implement resilient water management for the Safegaurding California Implementation Plan. Initiated guidance development for GSPs related to climate change Development of technical guidance for assessment of climate variables Process planning to provide climate change data to GSAs

Project Deliverables/Timeline

Establish process and approach for determining the extent and magnitude of climate change and sea level rise impacts to sustainable groundwater management practices at the groundwater basin level.

Customers:

DWR SGMA Branch
Groundwater Sustainability Agencies (GSAs)

Annual Reporting Category before 2015

Field Studies

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk

State Water Project Related? Yes

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management
Provide Safe Water for All Communities

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

SGMA

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Technical Assistance and Outreach for Integrated Regional Water Management (IRWM) Plans, Data Collection, and Other Climate-Related Tasks

Sponsor/Program Manager	John Andrew
Project Manager	Elissa Lynn / Lauma Jurkevics

Project Status:

On Going

Project Objective:

To provide resources, technical assistance, and outreach within DWR and to IRWM planning groups, water agencies, local governments, and other entities to incorporate climate change mitigation and adaptation into their planning efforts

Project Description:

This project involves developing and identifying climate change resources, working on data collection and consolidation, and providing technical assistance and outreach within DWR and to IRWM planning groups, water agencies, local governments, and other entities to mitigate for and adapt to climate change. After the passage of Proposition 84, Water Code Section 10541 was updated to define the elements of guidelines developed for approving and distributing the funds. These elements included requiring IRWM plans to consider greenhouse gas (GHG) emissions of identified programs and projects and to evaluate the adaptability to climate change of water management systems in the region. As a result, DWR 2010 and 2012 guidelines for these Proposition 84 funds required IRWM Plans to address both adaptation to the effects of climate change and mitigation of GHG emissions. Although IRWM has been the initial focus of this project, the technical assistance, data collection, and outreach has expanded to target beyond those already associated with an established Regional Water Management Group (RWMG) working in IRWM.

Funding Information:

Project Budget (Annual):	$160,000	**Funding Source:**	Prop 84 (15/16), GF 16/17
Budget Notes:	SRO: $35,000/yr SCRO: costs for work in Tulare Basin integrated into "Represent DWR in Interagency and Stakeholder Groups" task NCRO: $6,400/yr] NRO: $116,480/yr		
Project Start Date:	January, 2010	**Project End Date:**	In Progress

External Partners:

Local RWMGs and other regional groups; DIRWM

2015 Project Accomplishments

Much of the work in this task was done by regional staff, though coordination with headquarters staff occurred. Assistance throughout the year included distributing information at numerous local IRWM stakeholder meetings, as well as presenting a poster and providing outreach materials at the 2015 IRWM Biennial Conference in San Diego, which occurred in May.

Staff continued to participate in the Government Alliance Meeting of the Santa Ana Watershed Project Authority (SAWPA). This group was originally formed as a pillar in the update of SAWPA's IRWM plan, One Water One Watershed (OWOW). There was interest in continuing to meet to share and network on issues affecting the region and to provide current resources. In addition, staff participated in the initial OWOW Integration meetings, which focused on

starting to implement SAWPA's updated IRWM plan.

Staff continued to be involved in the stakeholder meetings of the Watersheds Coalition of Ventura County (WCVC), Upper Santa Clara River, Upper Santa Margarita Watershed, and the San Diego Regional Advisory Committee and participated in local discussions provided by the Riverside County Water Task Force, General Assembly for the South Bay Cities Council of Governments, and Mojave Water Agency. Staff also assisted the U.S. Bureau of Reclamation in information gathering and connecting them with the Los Angeles Regional Water Quality Control Board to integrate Santa Catalina Island, specifically the City of Avalon, into the IRWM process and provide Basin Study support. Avalon is now a member of the Gateway Water Management Authority.

Most RWMGs finished their climate change work by 2013 with some in 2014. Although staff's work with the Yuba County RWMG wrapped up in 2014, staff reviewed their plan in March 2015. New efforts connecting with RWMGs started occurring where staff is actively involved. An example was the formation of the Tulare Basin Watershed Connections Workgroup (TB WCW), a collaborative of natural resource managers working together to advance watershed planning and resource management in the Tulare Basin. Further information can be found in the "Represent DWR in Interagency and Stakeholder Groups" category.

In 2014, the Climate Change Program contracted work to the lead scientist of Inyo-Mono RWMG in evaluating the utility and use of the Climate Change Handbook for Regional Water Planning that was developed for use by RWMGs statewide. Interviews with selected RWMGs took place in early 2015, followed by a presentation to the Climate Change Technical Advisory Group (CCTAG) and a June final report on the results was developed and placed on the website (http://www.water.ca.gov/climatechange/docs/2015/EvaluateCCHandbookRegionalWaterPlanning.pdf).

In connection with the CA Water Plan Update 2013, the "California Climate Science and Data for Water Resources Management" was released and posted on the website also in June (http://www.water.ca.gov/climatechange/docs/CA_Climate_Science_and_Data_Final_Release_June_2015.pdf). The booklet includes science and data critical for climate change adaptation and mitigation for water management in California and summarizes the latest indicators, implications, and strategies with regard to a changing climate and the water-energy nexus. This resource was shared with local RWMGs in their continuing work to update any of their plans' climate change information in accordance with Proposition 1 funding.

Back in 2014, the Climate Change Program worked with staff from the CA Water Plan in surveying water, irrigation, and flood agencies on their needs for climate analyses. A summary of that survey was presented at that time to the CCTAG. As part of the CCTAG's work, this information (along with other resources) was integrated into the final report of the CCTAG, "Perspectives and Guidance for Climate Change Analysis," released in August 2015 (http://www.water.ca.gov/climatechange/docs/2015/Perspectives_Guidance_Climate_Change_Analysis.pdf).

Staff experts from headquarters and the regional offices continued to update DWR’s climate change website (http://www.water.ca.gov/climatechange/) with new resources and publications and to disseminate the Climate News Digest (http://www.water.ca.gov/climatechange/news.cfm), which posted its Five-Year Anniversary Issue in April 2015. These tasks are now covered under the "Website Updates" and "Climate News Digests" tasks.

Additional work involved outreach on the connections of climate change and water resources that occurred at workshops and conferences and with DWR staff, as well as with local, state, federal, and international entities, and included presentations in Sacramento, Fresno, Whittier, Los Angeles, Redding, San Diego, Costa Mesa, Rancho Mirage, Downey, Bishop, Irvine, Mariposa, and Oakhurst throughout 2015. Overall, around 27 presentations were made on the work described in this task.

In addition, staff actively participated in the October "Listening Sessions for Climate Adaptation in California" held in Oakland and San Diego. These sessions, though can be connected with IRWM work, were focused on receiving input on the draft sector-based implementation action plans for "Safeguarding California: Reducing Climate Risk," the state's climate adaptation strategy.

Regional and headquarters staff continued to work with DWR’s state climatologist on analyzing statewide precipitation data and cataloging the large amounts of climate data stored in the regional offices. This work is now covered under its own category, "Bulletin 195 Update."

Project Deliverables/Timeline

2015:
• Yuba County IRWM Vulnerability Assessment for Climate Change (Spring)
• Inyo-Mono RWMG presentation to CCTAG on results of evaluation of RWMGs use of Climate Change Handbook for Regional Water Planning (April)
• Inyo-Mono RWMG final report on results of evaluation of RWMGs use of Climate Change Handbook for Regional

Water Planning (June)
• Climate Change Tools Table, IRWM Biennial Conference, San Diego (May)

2016:
• WCVC Climate Resilience Workshop (April)
• TB WCW Climate Change Impacts in the Tulare Basin Watershed Workshop (September)

Deliverables to be set each year based on needs determined by IRWM and Climate Change Program managers.

Customers:

DWR, IRWM planning groups, water agencies, and local governments

Annual Reporting Category before 2015

Grantmaking & Technical Assistance

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting IRWM

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Tribal "Climate Conversations" video project

Sponsor/Program Manager	Kamyar Guivetchi, Anecita Agustinez, John Andrew
Project Manager	Elissa Lynn / Emily Alejandrino

Project Status:

On Going

Project Objective:

The purpose of this project is to better understand climate change and how it affects tribal communities. Tribes will have an opportunity to share their perspective on matters related to water and a changing climate. Selected interviews and location video will be edited into short segments for education purposes, similar to Tribal Water Stories collected for California Water Plan Update 2009. Climate Conversations will assist future development of tools and outreach materials to assist both DWR and Tribes in dealing with climate change.

Project Description:

DWR will interview tribes from various part of the state. After receiving appropriate permission, tribal practitioners will be taped on camera by DWR graphic services. Co-sponsors will assist by acting as liaison between DWR and Tribes, developing interview questions, and suggesting appropriate video to include. Selected interviews and location video will be edited into short segments for education purposes.

Funding Information:

Project Budget (Total):	$125,000	**Funding Source:**	Prop 84 Funds in 2015/16 and General Funds in 2016/17 and 17/18.
Budget Notes:	DWR Climate Change Staff Time $50,000. DWR CC Staff Travel $10,000. DWR Picture & Graphic Services Travel/Production $25,000. Academic Liaison Contracts & Travel $40,000 est.		
Project Start Date:	January 2016	**Project End Date:**	Spring 2018

External Partners:

Academic liaisons (UC and/or CSU system).

2015 Project Accomplishments

Project Initiation form developed and finalized.

Project Deliverables/Timeline

* See Project Charter for more details*
http://dwrclimatechange.water.ca.gov/docs/Coordination/Climate_Conversations_Charter_Signed.pdf
Project Initiation and Approval from DWR Motion Picture & Graphic Services Completed.
Charter approval July 2016.
Commitment from academic liaisons August 2016.
Video shoots of interviews and locations fall/winter 2016/17.
Video release at Tribal Water Summit scheduled for spring 2018.

Customers:

Tribal governments and communities. DWR Climate change tribal sub-group and DWR staff. Public for outreach and educational purposes. Government (state and federal) agencies.

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change

IWM Business Categories

Building Capacity for Regional Sustainability

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government

Safeguarding California Implementation Plan

Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Tribal Climate Change Coordination Subgroup

Sponsor/Program Manager	John Andrew, Elissa Lynn
Project Manager	Emily Alejandrino

Project Status:

On Going

Project Objective:

The group is comprised of DWR staff from different programs and classifications. The group objective is to identify potential projects to support tribal engagement on climate change issues related to water management in California. The project must also assist tribal communities in identifying areas where they may be vulnerable to the anticipated impacts of climate change and potential strategies for reducing those vulnerabilities. And serve as an educational piece to non-tribal communities.

Project Description:

The projects will serve one or more of the following purposes: 1) Determine or assess how climate change is and may impact tribal communities in the future; 2) Seek information from the Tribes on their conceptual framework for adapting and mitigating for climate change on a local and region scale; 3) Discover how traditional ecological knowledge is incorporated; and 4) Identify data gaps and opportunities for technical assistance which DWR could provide.

Funding Information:

Project Budget (Annual):	$270,000	**Funding Source:**	Prop 84
Budget Notes:			
Project Start Date:	April 2013	**Project End Date:**	In Progress

External Partners:

California Native American Tribes, CA-LCC

2015 Project Accomplishments

•Sub-group held five meetings on 2/11/2015, 3/11/2015, 4/15/2015, 5/26/2015 and 7/17/2015. • Charter signed on 4/15/2015. • Completed a tribal diagram that illustrates some of the impacts of climate change to tribal communities. Final on DWR's Climate Change webpage. • Co-sponsor with the CA LCC for a Climate Change Workshop in San Diego for southern region tribes convened in September 2015.

Project Deliverables/Timeline

•The tribal communities' vulnerabilities/adaptation matrix went final on June 2014. It is posted on DWR's Climate Change webpage.
•Subgroup charter was drafted in 2014, and signed on April 2015.
• in 2015, Tribal diagram went final and posted on DWR's Climate Change webpage
• Climate Conversations video project charter signed on 6/29/16. Working with UC Davis as a partner and aiming to do one or two video shoots by end of 2016.
• Other deliverables proposed by the group - TEK resources guide; Flood and drought history with a tribal history overlay; develop a tribal youth program melding western science and TEK; host a climate change workshop for tribes; vulnerability, capacity assessment and adaptation planning pilot study; propose a climate change resolution for the Northern, Central and Southern Tribal Chairman's Association.

Customers:

California Native American Tribes, General Public, DWR staff

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change

IWM Business Categories

Ensuring Reliable Water Supply for All Californians

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government

Safeguarding California Implementation Plan

Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Tribal Literacy Class Module for Climate Change

Sponsor/Program Manager	John Andrew, Anecita Agustinez
Project Manager	Emily Alejandrino

Project Status:

On Going

Project Objective:

The goal is to integrate tribal literacy into the DWR climate literacy classes.

Project Description:

Establishing a link between the tribal and climate change programs at DWR would foster education and understanding within the Department. Climate changes can be measured through data and anecdotal evidence, providing a bridge for coordination on water resources issues for the State. DWR employees could benefit from hearing about the tribal perspective on climate change within the current Climate Literacy classes presented by the climate change staff.

The project added a module for Tribal and Climate Change to the current DWR Climate Literacy Class curriculum. This segment was crafted jointly between the tribal policy advisor and the climate change program staff, educating both programs about the other, and benefitting the Department training, with regard to sensitive matters of tribal coordination and climate change and environmental education.

The module consists of a 30-45 minute presentation added to the Climate Literacy classes regularly offered Department-wide, as well as any future Tribal Literacy class developed. The module would be presentable by either program, within or outside the Department.

As of 2015, this project was completed.

Funding Information:

Project Budget (Annual):	$10,000	**Funding Source:**	
Budget Notes:			
Project Start Date:	2014	**Project End Date:**	

External Partners:

Training Office, Tribal Policy Advisor; Tribes, Bureau of Indian Affairs, Landscape Conservation Cooperative

2015 Project Accomplishments

The Tribal Literacy Class Module was integrated in the yearly DWR Climate Litercy classes. Two classes were held in 2015. It is anticipated that continued use of this module within the classes will provide a broader understanding between tribal and climate change programs, as well as within DWR staff as part of the training course and can also benefit tribal outreach in general.

Project Deliverables/Timeline

2015: Tribal Literacy Class Module for DWR Climate Literacy classes (two classes were held in 2015 and included this module)

Customers:

DWR staff

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change

IWM Business Categories

Ensuring Reliable Water Supply for All Californians

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Provide Safe Water for All Communities

Safeguarding California Implementation Plan

Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Twitchell and Sherman Island Subsidence Reversal Projects

Sponsor/Program Manager	Bryan Brock
Project Manager	Bryan Brock

Project Status:

On Going

Project Objective:

DWR has developed several projects to demonstrate the potential for subsidence reversal and carbon sequestration. Sequestering atmospheric carbon via plant photosynthesis and net retention of carbon within the soil by decomposing plant matter will not only reverse subsidence in the western Delta, but also reduce the impacts caused by greenhouse gas (GHG) emissions. Over the past several years there have been four projects developed on Sherman and Twitchell Islands to demonstrate and mitigate subsidence and GHG:

- Wetland Research Facility – Twitchell Island
- Mayberry Farms Wetland Restoration Project - Sherman Island
- Farm Scale Rice Demonstration and Research Facility - Twitchell Island
- Twitchell East End Wetland Restoration Project – Twitchell Island
- Whale's Mouth Wetland Restoration Project – Sherman Island

The Department, working with research institutions and other State Agencies has developed a carbon protocol, which is being considered for adoption by the American Carbon Registry, eventually allowing the sale of carbon credits, and will provide an alternate means of producing income on existing agricultural lands. Through these demonstration projects, DWR will study the costs and benefits of these land use management practices to help define the potential value in a carbon market.

Project Description:

Wetland Research Facility – Twitchell Island
DWR constructed approximately 15 acres of wetlands in 1997 to evaluate land surface elevation changes and carbon accretion due to the accumulation and decay of plant materials. Two ponds were constructed and measurements are taken to determine the amount of accumulating organic matter and land surface elevation change. Ongoing research at this facility has shown that surface elevation changes due to accretion range from 3.2 to 5.6 cm/yr (1.3 - 2.2 in/yr), while surrounding areas used for agricultural purposes lost elevation due to subsidence. GHG monitoring is also being conducted and has shown

Mayberry Farms Wetland Restoration Project - Sherman Island
Mayberry Farms is a 307-acre, permanently flooded wetland completed October 2010. Building upon the successes shown at the Wetland Research Facility, we continue to monitor GHG flux to show benefits of newly established wetlands. Additionally, the Department has monitored methylmercury over the past 4 years, as required by the Regional Water Board, and data has shown that permanently flooded wetlands reduce the concentration of methylmercury in adjacent waterbodies. Data accumulated in this project will be used to develop a GHG protocol and will help establish flux rates in an emergent wetland system.

Farm-Scale Rice Demonstration and Research Facility – Twitchell Island
Similar to growing tules, rice is a wetland crop that the Department has investigated as a potential sustainable crop to reduce subsidence and facilitate carbon sequestration, while maintaining a farm economy. DWR commenced a pilot project in 2009 on an approximately 600-acre farm-scale demonstration rice field in the Delta. Key research components of this project included:

- Demonstrating the feasibility of growing rice in the Delta;
- Quantifying subsidence and carbon sequestration rates; and
- Determining water quality contaminant loading and exports.

While the research aspects of this project ended in 2014, farmers continue to grow rice on the site. Findings show that

crop yields at this site are extremely low, making it hard for a farmer to justify this crop selection. GHG fluxes do show a marginal net sequestration rate, when compared other crops (corn, alfalfa, irrigated pasture, etc.); however, while continued subsidence did not occur, substantial accretion rates were not realized.

Twitchell East End Wetland Restoration Project – Twitchell Island
The Twitchell Island East End Wetland Restoration Project restored approximately 740 acres of palustrine emergent wetlands and approximately 50 acres of upland and riparian forest habitat on Twitchell Island. This property is owned by the Department of Water Resources and previously managed as flood irrigated corn and alfalfa.

Whale's Mouth Wetland Restoration Project – Sherman Island
The Whale's Mouth Wetland Restoration Project restored approximately 600 acres of palustrine emergent wetlands and approximately 150 acres of upland and riparian forest habitat on Sherman Island. This property is owned by the Department of Water Resources and previously managed as flood irrigated pasture.

Funding Information:

Project Budget (Total):	$25,000,000	**Funding Source:**	Prop 84, 1E, Cap and Trade, and SWP
Budget Notes:			
Project Start Date:	1997	**Project End Date:**	In Progress

External Partners:

UC Berkeley, UC Davis, USGS, California DFW, Delta Conservancy

2015 Project Accomplishments

Construction Completion of Whale's Mouth Wetland Restoration Project on Sherman Island
Completion of Draft GHG Protocol, and submission to the American Carbon Registry for Peer Review and Public Notice.

Project Deliverables/Timeline

1. Substantial wetland restoration Development and Operation– ongoing
2. Adopted GHG Protocol by ACR - 2016
3. Continued monitoring of GHG benefits Delta-wide - ongoing

Customers:

1. Island residents, and all asset owners, including CalTrans, PGE, mineral right holders, and the Department of Water Resources.
2. The State Water Project and all water recipients that receive water that passes through the Delta.
3. All those that have potential impacts due to Climate Change including sea level rise and storm severity fluctuations (floods, drought, etc.)
4. Ecosystem beneficiaries including fisheries, waterfowl, endangered species (GGS and Swainson's Hawk)

Annual Reporting Category before 2015

Field Studies

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Managing Floodwaters while Protecting the Ecosystem
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Make Conservation a California Way of Life
Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Identify Sustainable and Integrated Financing Opportunities

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Continue to Mainstream Climate Considerations into Water Management
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Protect and Restore Water Resources for Important Ecosystems

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Video Production

Sponsor/Program Manager	Elissa Lynn
Project Manager	Elissa Lynn

Project Status:

On Going

Project Objective:

To provide public outreach on climate change impacts to California using video production.

Project Description:

Video production on climate change topics. All videos produced are located on the publications page of the climate change program website, at: http://www.water.ca.gov/climatechange/pub_video.cfm

Funding Information:

Project Budget (Annual):	$10,000	**Funding Source:**	Various
Budget Notes:	Average cost per year. Public Affairs Video production team provides in-kind work on videos produced in DWR.		
Project Start Date:	2007	**Project End Date:**	Ongoing

External Partners:

DWR Motion Pictures and Public Affairs Office, CalWater researchers, Water Education Foundation, climate researchers, artists, Tribal members

2015 Project Accomplishments

*Completed video on Atmospheric Rivers; the frequency and intensity of these powerful storm systems also play a role in both flood and drought risk in the State. https://www.youtube.com/watch?v=MgKT__9ThSs&feature=youtu.be * Begun development of the Climate Conversations video project for Tribal-CC Subgroup (see separate project entry).

Project Deliverables/Timeline

Deliverables prior to 2014: "Science on a Sphere - Exhibit Tour" (2007) - "Science on a Sphere - Exhibit Construction Time-Lapse" (2007) "A Climate of Change" (2009) Host Elissa Lynn talks to an array of climate and water resource experts about the impacts of climate change already being felt in California and the adaptation strategies that will be needed to manage the state's water resources in the future. (Produced by DWR, in conjunction with the Water Education Foundation). Future deliverables: Tribal Climate Conversations (See project entry)

Customers:

Public

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O II: Tribal Engagement on Climate Change

IWM Business Categories

Building Capacity for Regional Sustainability

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Continue to Mainstream Climate Considerations into Water Management
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

N/A

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Water Storage Investment Program - Climate Change objectives

Sponsor/Program Manager	WSIP and CC program
Project Manager	Joseph Yun / Andrew Schwarz

Project Status:

On Going

Project Objective:

Develop an appropriate methodology and tools for the consideration of climate change in the Water Storage Investment Program funding application in compliance with Executive Order B-15-30

Project Description:

WSIP staff and CC Program working on behalf of the California Water Commission and in conjunction with stakeholders to develop methodology and tools for consideration of climate change in the WSIP application process.

Funding Information:

Project Budget (Total):	$327,000	**Funding Source:**	Proposition 1
Budget Notes:			
Project Start Date:	January 2015	**Project End Date:**	December 16, 2016

External Partners:

2015 Project Accomplishments

Met with stakeholder advisory group regarding potential methodology. Presented to the Water Commission regarding evaluation of climate change. Work with WSIP staff and consultants to develop tools to support use of CC evaluation.

Project Deliverables/Timeline

CC program consultation on methodologies and approaches. CC program assistance with presentation of climate change technical material to Commission and stakeholder groups. Methodology and tools by August 2016

Customers:

California Water Commission

Annual Reporting Category before 2015

N/A

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Achieve the Co -Equal Goals for the Delta
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods
Expand Water Storage Capacity and Improve Groundwater Management

Safeguarding California Implementation Plan

Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Continue to Mainstream Climate Considerations into Water Management
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-30-15: Planning to Be Guided by Actions That Build Preparedness and Reduce GHG, Flexible and Adaptive Approaches, Protect Vulnerable Populations, Natural Infrastructure

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Water Use Efficiency Assistance

Sponsor/Program Manager	Diana Brooks
Project Manager	Kent Frame / Jim Lin

Project Status:

On Going

Project Objective:

Implementation of Water Conservation Act of 2009 (SBX7-7) to achieve (1) urban water use reduction statewide by 20 percent per capita by the year 2020, (2) to help agricultural water suppliers with efficient water management practices, and (3) response to the Governor's call for Californians to reduce their water usage by 20 percent during the record-set drought years (1/17/2014).

Project Description:

The Water Use and Efficiency Branch completed or made significant progress in five projects in the year 2014 among the total 18 projects for implementation of SBX7-7 (other 12 projects were completed). They included two projects in urban water use (U1, U3), two in agricultural water use efficiency (A6, A7), and two projects in combined urban and agricultural water use efficiency (B1, B3). All of those projects aimed at water conservation and water use efficiency.
U1 – Developed the best management practices in the CII water sector (CII - commercial, industrial and institutional);
U3 – Weather normalization of urban water use (10608.20(h)(1) and (2) in SBX 7-7)
DWR through a public process and in consultation with CUWCC developed a weather normalization technical methodology and criteria for adjusting compliance daily per capita water use. DWR informed the USC (Urban Stakeholder Committee) of progress through quarterly meetings and through the USC weather normalization subcommittee which also met quarterly. The methodology was expected to be completed in summer of 2015.
A6 – DWR, in consultation with the SWRCB, revised the requirements for AWMPs and published the final document under the title of A Guidebook to Assist Agricultural Water Suppliers to Prepare a 2015 Agricultural Water Management Plan. In the Guidebook the impacts of the climate change on the agricultural water use were documented in detail, and DWR required the agricultural water suppliers to include the climate change subject in preparation of their AWMPs.
A7 – DWR developed grant/loan funding criteria to make agricultural water suppliers ineligible for state funding unless they comply with the Water Conservation Act 10608.56(b). These criteria were used in Agricultural Water Use Efficiency funding program in 2013 and will be used in the future funding programs as well.
B1 – WUE Branch has been developing an online submittal tool for the filing of water management plans and is in discussions with the SWRCB to develop an online urban water use data base. (ongoing)
B3 – DWR was required to propose new statewide targets or revise and update existing statewide targets for regional water resources management practices including but not limited to recycled water, brackish groundwater desalination and infiltration and direct use of urban stormwater runoff. New targets for recycled water were included in the California Water Plan Update 2013; DWR has been developing other targets.

Prop 50 funding for agricultural water use efficiency - after holding three workshops and reviewing all proposals received, DWR awarded a total of $15 million grant funding to local water agencies and NGOs. Since year 2014 staff has been developing funding agreements and signing contracts.

Prop 50 funding for water desalination – During the year 2014 staff developed PSP, held three workshops, reviewed all proposals received, and finally selected the award recipients who would receive a total of $8.7 million funding. Staff is currently developing agreements for signing contracts with those recipient agencies.

Water-Energy Fund from Cap and Trade – Staff has been working with the IRWM Branch in PSP development, holding workshops, and reviewing the proposals received. In particular, staff designed a water-energy-GHG calculator which was used in the funding process and will be used in the future funding programs.

Save Our Water campaign and other outreach workshops – In the critical drought year 2014 Staff was actively engaged in Save Our Water campaign and in other state and DWR water saving programs. Staff organized and held 11 workshops for landscape professionals (3 workshops in Spanish), plus 2 workshops for Master Gardeners, 2 workshops for Nursery workers, and 6 workshops for public arranged by Congressman Ami Bera's office.

Funding Information:

Project Budget (Total):	$100,000,000	**Funding Source:**	Prop 1, General Fund
Budget Notes:	Combined total $98 million from Prop 1 an additional drought emergency General Fund of $2 million.		
Project Start Date:	July 2015	**Project End Date:**	December 2018

External Partners:

CUWCC, USBR, SWRCB, CEC, CPUC, CDFA, CCC

2015 Project Accomplishments

Provide drought technical assistance and response to the general public and provided support to the DWR drought management team.

Project Deliverables/Timeline

A Guidebook to Assist Agricultural Water Suppliers to Prepare a 2015 Agricultural Water Management Plan was released in June 2015 and reviewed 2015 plans;
In support of EO B-27-15 supported more than 120 drought related workshops for the landscape initiative;
Implemented turf and toilet rebate and direct install programs;
Partnered with the CEC to implement technology improvements;
Prepared county WSCP;

Customers:

State legislature, Urban water suppliers and agricultural water suppliers, eligible NGOs, universities and research institutes

Annual Reporting Category before 2015

Business Practices & Technical Expertise

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O III: Integrate Climate Change into DWR's Programs and Activities
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? No

Governor's Water Action Plan

Make Conservation a California Way of Life
Manage and Prepare for Dry Periods
Provide Safe Water for All Communities
Identify Sustainable and Integrated Financing Opportunities

Safeguarding California Implementation Plan

Support Regional Groundwater Management for Drought Resiliency
Diversify Local Supplies and Increase Water Use Efficiency
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Utilize Low-impact Development and Other Methods in State and Regional Stormwater Permits to Restore the Natural Hydrograph
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting UWMP
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Water-Energy Calculator and Avoided Water Capacity Cost Model

Sponsor/Program Manager	WUE, Climate Change Program, CPUC
Project Manager	Jim Lin

Project Status:

On Going

Project Objective:

Develop and review water-energy calculators for GGRF (Greenhouse Gas Reduction Fund) applicants to use in their application for GGRF grant. The calculators have been used to estimate water conservation/water saving, energy saving, and GHG emissions reduction in various funding programs.

Project Description:

Develop technical PSP guidelines and water/energy/GHG calculators for agricultural and urban water agencies (and other eligible agencies) to estimate water/energy savings and GHG emissions reductions in their proposals.

Funding Information:

Project Budget (Annual):	$128,000	**Funding Source:**	Prop 84, Prop 1, Cap and Trade (GGRF), State Drought Emergency Special Rebate fund
Budget Notes:	Budget comes from Water Bonds, Cap and Trade Fund (GHG Reduction Fund or GGRF)		
Project Start Date:	1/1/2015	**Project End Date:**	ongoing

External Partners:

ARB, CDFA

2015 Project Accomplishments

1. DWR helped the ARB in the development of GHG Quantification Methodology and Calculator for estimation of GHG emissions reduction and water/energy savings for the GGRF round 2 (total amount of grant: $19 million). 2. DWR staff reviewed another set of GHG Quantification Methodology and calculator which were developed by ARB for the agricultural water suppliers, a GGRF program which was jointly managed by CDFA and DWR. 3. DWR staff also reviewed the CPUC water-energy calculator which at its current status lacks of some key functions to be used in GGRF funding program.

Project Deliverables/Timeline

GGRF round 1 was accomplished in 2015 with total awarding of $28 million to local agencies. The final draft GGRF Round 2 PSP Guidelines and calculator were released and have been under public review, and its final version will be posted in September of 2016 for grant applicants to use.

Customers:

Local agencies, commercials, institutional, and residential

Annual Reporting Category before 2015

Energy & Greenhouse Gas Emissions

Climate Change Objectives

O III: Integrate Climate Change into DWR's Programs and Activities
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Taking Action to Reduce Residual Risk
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Make Conservation a California Way of Life
Manage and Prepare for Dry Periods
Provide Safe Water for All Communities

Safeguarding California Implementation Plan

Diversify Local Supplies and Increase Water Use Efficiency
Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Utilize Low-impact Development and Other Methods in State and Regional Stormwater Permits to Restore the Natural Hydrograph
Require Closer Collaboration and Coordination of Land Use and Water Planning Activities to Ensure that Each Reinforces Sustainable Development That is Resilient to Climate Changes
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-18-12: Reduce Agency GHG Emissions by 10% by 2015 and 20% by 2020 from 2010 Baseline
SGMA
IRWM
UWMP
California Water Code for California Water Plan

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Water-Energy Subgroup of the Governor's Climate Action Team ("WETCAT")

Sponsor/Program Manager	John Andrew
Project Manager	Qinqin Liu

Project Status:

On Going

Project Objective:

Coordinate state-level water-energy planning in support of AB 32

Project Description:

DWR is a principal agency in the Water-Energy Subgroup—known as the "WETCAT"—of the Governor's Climate Action Team. DWR coordinated Water-Energy policy and management actions with other principal WETCAT agencies including State Water Resources Control Board, California Energy Commission, and the California Public Utilities Commission. The WETCAT coordinates and focuses its efforts on GHG emission reduction actions related to the transport, treatment, delivery and use of water for environmental, agricultural, residential, commercial, institutional, and industrial needs. DWR has worked with other principal WETCAT agencies to complete final AB 32 Scoping Plan update to address water and energy efficiency issues. DWR continues to play lead roles using integrated water management for water conservation, and water and energy use efficiency as well as water recycling.

Funding Information:

Project Budget (Annual):	$10,000	**Funding Source:**	ARB
Budget Notes:	cost is $8000 for the staff time in 2015 meetings and tsaks		
Project Start Date:	2006	**Project End Date:**	In Progress

External Partners:

State Water Resources Control Board, California Energy Commission, the California Public Utilities Commission, Other State agencies.

2015 Project Accomplishments

DWR continued to be a key player to coordinate science and policy with other WETCAT principal agencies and to share water-energy data and information. DWR prepared white paper to connect water, energy and food as well as ecosystem process with climate change implication, including WETCAT actions; DWR provided coordination and outreach and policy inputs on water, energy and food at interagency meetings and National science foundation work shop; DWR proved leadership on drought response and water use efficiency programs to implement Governor water action plan in California; DWR also managed water- energy grant program and provided guidance on water- energy reporting in urban water management plan in 2015.

Project Deliverables/Timeline

DWR have completed draft white paper connecting water, energy and food for climate change and related reference information in May 2016, and will complete the white paper and peer reviewed paper including conceptual framework in August 2016. DWR will provide reviews and recommendations for 2030 scoping plan update according to ARB time line in 2016. DWR will coordinate with ARB and other WETCAT agencies to complete final water-energy grant program guideline by Sept 2016 with proposal time line in Nov. 2016.

Customers:

DWR, CEC, CPUC, SWRCB, CARB, CDFA, CALEPA, NRA and public

Annual Reporting Category before 2015

Grantmaking & Technical Assistance

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change
O IV: Advance the Integration of Climate Change at the Local, Regional, State, National and International Levels
O V: Manage, Analyze, and Disseminate Climate Data, Conduct Climate Change Research
O VI: Promote the Mitigation of GHGs in the Water Sector

IWM Business Categories

Ensuring Reliable Water Supply for All Californians
Building Capacity for Regional Sustainability
Planning Priorities and Investments for a Sustainable Future

State Water Project Related? Yes

Governor's Water Action Plan

Make Conservation a California Way of Life
Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Protect and Restore Important Ecosystems
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Diversify Local Supplies and Increase Water Use Efficiency
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

AB32: Reduce GHG Emissions
EO B-30-15: GHG Emissions Reduction 40% below 1990 levels by 2030, 80% below 1990 levels by 2050
EO B-30-15: State Agencies Implement GHG reductions
EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting
EO B-18-12: Reduce Agency GHG Emissions by 10% by 2015 and 20% by 2020 from 2010 Baseline

CLIMATE CHANGE PROGRAM PROJECT SUMMARY AND STATUS

Project Name:

Website Updates

Sponsor/Program Manager	
Project Manager	Emily Alejandrino / Elissa Lynn

Project Status:

On Going

Project Objective:

The goal is to provide a useful, user-friendly website for water managers and the public.

Project Description:

Manage where status of the Dashboard (LifeRay site), external climate change site, and internal climate change site. Respond to staff request on website changes. Maintain communication with Division of Technology Services/Collaboration Services Section staff on the use and maintenance of the website. Have Francisco Guzman be back-up for high importance requests.

Funding Information:

Project Budget (Annual):	$8,320	**Funding Source:**	
Budget Notes:			
Project Start Date:	On Going	**Project End Date:**	On Going

External Partners:

None

2015 Project Accomplishments

Emily Alejandrino took the lead to manage the three climate change websites: external site http://www.water.ca.gov/climatechange/; internal site http://dwrclimatechange.water.ca.gov/index.cfm; and the dashboard https://ccdashboard.water.ca.gov/home. Send Aqua Assist tickets to IT on behalf of program staff for changes to the external site. Made changes to the internal site such as updating the climate literacy materials. Upload documents to the dashboard in preparation for upcoming climate literacy classes.

Project Deliverables/Timeline

Working with program staff and IT to consolidate dashboard and internal site to SharePoint. Work with IT to transfer external site to the new webpage template. Timeline is on-going.

Customers:

DWR staff and public.

Annual Reporting Category before 2015

Public Outreach

Climate Change Objectives

O I. Develop and Improve Communication, Outreach and Education on Climate Change

IWM Business Categories

Building Capacity for Regional Sustainability

State Water Project Related? No

Governor's Water Action Plan

Increase Regional Self-Reliance and Integrated Water Management Across All Levels of Government
Manage and Prepare for Dry Periods

Safeguarding California Implementation Plan

Reduce Sacramento-San Joaquin River Delta Climate Change Vulnerability
Prepare California for Hotter and Drier Conditions and Improve Water Storage Capacity
Address Water-related Impacts of Climate Change on Vulnerable and Disadvantaged Populations and Cultural Resources
Continue to Mainstream Climate Considerations into Water Management
Protect and Restore Water Resources for Important Ecosystems
Better Understand Climate Risks to California Water and Develop Tools to Support Efforts to Prepare for Climate Risks

Legislative and Gubernatorial Mandates

EO B-30-15: Take Climate Change into Account in Planning and Investment Decisions, Full Life-cycle Cost Accounting IRWM
California Water Code for California Water Plan