

CA Department of Fish and Wildlife -

What we are working on now

- *State Wildlife Action Plan (SWAP) revision*
 - Objective: **CONDUCT & COORDINATE INFORMATION EXCHANGE BETWEEN SCIENTISTS AND MANAGERS TO ADVANCE DECISION-MAKING AND CONSERVATION AT A LANDSCAPE SCALE.**
 - Strategy: **STRATEGY 3: IDENTIFY AND FACILITATE EFFICIENT WAYS TO ENGAGE PARTNER COLLABORATION TO ACHIEVE SHARED VISION AND GOALS**
- *CDFW Climate College*
 - Objective: **CONDUCT & COORDINATE INFORMATION EXCHANGE BETWEEN SCIENTISTS AND MANAGERS TO ADVANCE DECISION-MAKING AND CONSERVATION AT A LANDSCAPE SCALE.**
 - Strategy: **STRATEGY 4: DEVELOP AND DELIVER RELEVANT TRAINING AND INFORMATION PRODUCTS FOR KEY AUDIENCES USING CLIMATE SMART PRINCIPLES**
- *CA Climate Readiness Strategy: Biodiversity & Habitat Sector*
 - Objective: **ENHANCE CLIMATE-SMART CONSERVATION* (NATURE-BASED ADAPTATION & MITIGATION) ON A LANDSCAPE SCALE.**
 - Strategy: **STRATEGY 2: PROMOTE, SUPPORT, AND COORDINATE CROSS-SECTORAL UNDERSTANDING OF ECOSYSTEM PROCESSES AND SERVICES TO ADVANCE CLIMATE-SMART CONSERVATION AT A LANDSCAPE SCALE.**

Who are your partners?

Instructions: Identify your organization's key partners and collaborators in your work.

- *SWAP revision; ALL (federal, state, NGO, etc.), a lot of support from FWS*
- *DFW Climate College; Carried out in house, Work Group comprised of stakeholders (CA LCC, state agencies, etc.)*
- *Biodiversity & Habitat sector chapter of CA Climate Readiness plan; State agencies plus input from conservation partners (more to come with release of public draft)*

What lies ahead?

Instructions: Describe how your organization – e.g., its mission and projects – will benefit from implementation of the CA LCC Strategic Plan.

- *Information exchange and science delivery*
- *Partner coordination*

What lies ahead?

Instructions: Describe the greatest strengths your organization will bring to implementation of the CA LCC Strategic Plan.

- *Adaptation actions on the ground*
- *Data support*
- *Help provide a conservation vision*

PRBO Conservation Science – Mission and Strategic Goal

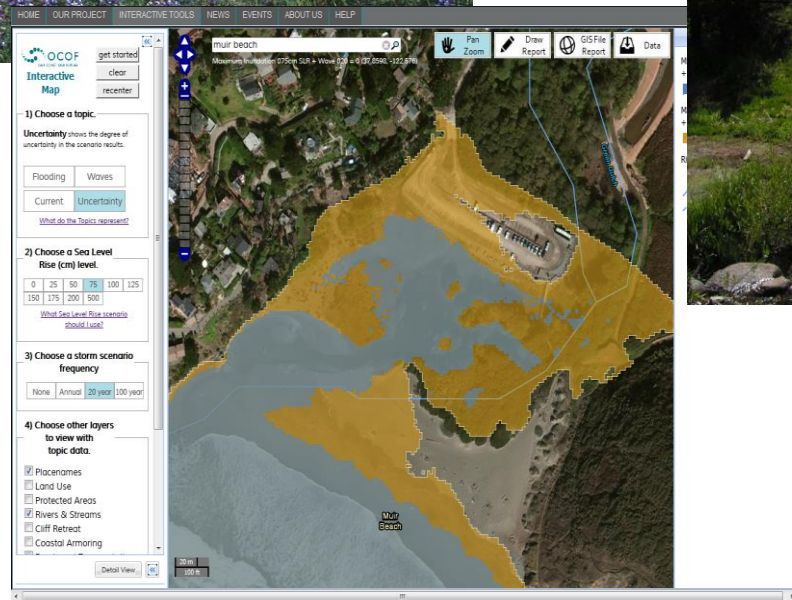
PRBO advances conservation of birds, other wildlife and ecosystems through science, restoration, outreach and partnerships.

Our highest priority is to reduce the impacts of habitat loss, climate change, pollution and other threats to wildlife and people, while preparing for the changes ahead.

1-Addressing impacts of climate change: Re-water CA's rangelands --eco-friendly grazing with NRCS on 1.1m acres



2-Translating science for resource managers- Our Coast Our Future with NOAA GOFNMS, NPS, USGS



3- Applying adaptive management- Mountain meadow monitoring, restoration, with USFS, NRCS, others



Key Partners- all of you and more!



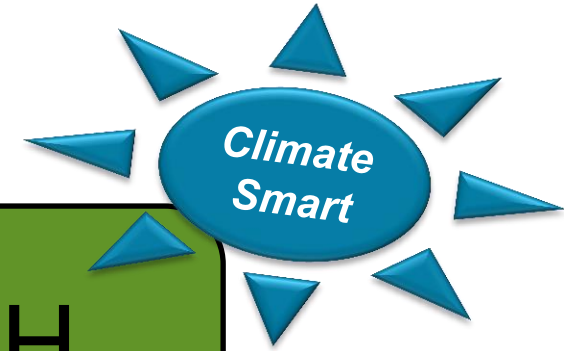
Anonymous (2)
 Audubon California
 Bay Area Ecosystems Climate Change Consortium
 S.D. Bechtel, Jr. Foundation
 Bernice Barbour Foundation
 Bureau of Reclamation
 Bureau of Land Management
 California Coastal Conservancy
 California Department of Fish and Game
 California Department of Water Resources
 California Bay Delta Authority
 California Landscape Conservation Cooperative
 Central Valley Joint Venture
 Faucett Family Foundation
 Richard Grand Foundation
 Marin Community Foundation
 Giles Mead Foundation
 Moore Family Foundation
 Gordon and Betty Moore Foundation
 David and Lucile Packard Foundation
 National Park Service
 National Science Foundation
 NOAA National Marine Sanctuaries
 Natural Resource Conservation Service
 Resources Legacy Fund Foundation
 San Francisco Foundation
 San Francisco Bay Joint Venture
 The Nature Conservancy
 U.S. Fish and Wildlife Service
 USDA Forest Service
 USDA Natural Resources Conservation Service
 US Geological Survey
 and PRBO Board, Members and Staff



Benefits CA LCC plan; what we bring

- 1- Aligned with mission and our goals: Reduce negative impacts of enviro. change on nature and people; Climate-smart conservation will be implemented and tested across all our priority geographies and disseminated globally. **priority geographies: Sierra Nevada, CA Rangelands, Central Valley, SF Estuary/Delta, Coastal California, Greater Gulf of the Farallones*
- 2- Applied conservation science, field scientists, partnership approach, modeling, indicator expertise, community-based restoration and more





LIFE on EARTH

Biosphere

1. Future focused.
2. Ecosystem & watershed context.
3. Flexible, adaptive.
4. Prioritize actions.
5. Collaborate & communicate across sectors.

WATER

C
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BIODIVERSITY

CBI - What are we working on now?

A vertical collage of five nature photographs: salmon swimming underwater, a lynx standing in the snow, a stream with autumn foliage, a dirt road through a field of orange flowers, and a herd of elk in a green field.

Climate Change & California Carnivores

Martens and fishers projected response to climate change in California's Sierra Nevada.

A wide-angle photograph of a desert landscape. In the foreground, several Joshua trees with their characteristic spiky leaves and branching forms are prominent. The background shows rolling hills and mountains under a clear sky.

DRECP

Scientific Guidance for Conservation Plans

A photograph of a dense forest of tall, slender evergreen trees, likely pines or firs, with their green needles creating a textured canopy.

Projected US Carbon Stocks with Land Use

Using MC1 to simulate future carbon cycling with land use.

CBI products available at: www.consbio.org and www.databasin.org

Who are your partners?



Major Agency Partners:

California Department of Fish and Wildlife, US Fish and Wildlife Service, US Forest Service, USGS, BLM, San Diego Association of Governments

NGO Partners

Sierra Forest Legacy, The Nature Conservancy, PRBO Conservation Science, Endangered Habitats League, Endangered Habitats Conservancy, SC Wildlands, Defenders of Wildlife, California Academy of Sciences, Pacific Forest Trust, Sierra Nevada Conservancy, Terra Peninsular (Baja), Pronatura (Baja), Sierra Watch, Earth Discovery Institute, Center for Natural Lands Management, The Trust for Public Land, The Conservation Fund, Tejon Ranch Conservancy, and numerous other land conservancies

Research Institutions:

San Diego State University, UCLA, Arizona State University, San Diego Natural History Museum, Oregon State University, Cornell University, UC Davis, UC Santa Barbara, UC Riverside, Universidad Autonoma de Baja California, Archbold Biological Station





What lies ahead?

- CBI will benefit from implementation of CA LCC Strategic Plan through improved access to datasets, tools, methodologies, and especially expanded partnerships. We hope this will lead to a broader impact of our research, planning, and educational work.
- The greatest strengths CBI brings to implementation include leadership in spatial analysis and ecological modeling, development of innovative decision-support platforms and tools, facilitation of science-advisory processes and providing guidance for conservation plans, and experience in science communication (e.g., webinars, workshops, and online courses).



Central Valley Joint Venture

21 Partners

- Audubon California
- California Waterfowl
- Defenders of Wildlife
- Ducks Unlimited, Inc.
- PRBO Conservation Science
- River Partners
- The Nature Conservancy
- The Trust for Public Land
- CA Association of RCDs
- CA Dept. of Water Resources
- CA Dept. of Fish and Wildlife
- CA Natural Resources Agency
- CA Wildlife Conservation Board
- PG&E Corporation
- US Natural Resources Conservation Service
- US Army Corps of Engineers
- US Bureau of Land Management
- US Bureau of Reclamation
- US Environmental Protection Agency
- US Fish and Wildlife Service
- US Geological Survey



Current Projects

What we are working on now

■ ***Conservation Delivery***

- Managed wetlands = “Climate-Smart”
- Other habitats – riparian, uplands, and agriculture



■ ***Wetland Water Availability***

- CVPIA Refuge Water Supplies
- Modeling climate change impacts on water supply

■ ***CVJV Monitoring & Evaluation Plans***

- Identifies key science needs for conservation of migratory bird groups

What Lies Ahead?

- ***Benefits to the CVJV:***
 - Improve conservation delivery through LCC applied science
 - Coordinated information exchange among scientists and managers
- ***Strengths of the CVJV:***
 - Habitat project design and delivery
 - Avian and habitat expertise
 - Existing partnership network



San Francisco Bay Joint Venture

Coordinating Habitat Delivery Guided by Science

- * Coordinating habitat restoration and enhancement, monitoring response of target species, and tracking net landscape change.
- * Establishing bird population objectives, determining focal species and setting conservation targets for the SFBJV in context with neighboring JV's and the Flyway.
- * Planning for impacts of climate change on wetland ecosystems; coordinating planning and decision-making for climate change adaptation with partners; supporting and promoting development and utilization of decision-making tools by JV partners.



SFBJV Partners

SFBJV Management Board:



Plus almost 100 local & regional implementation partners

What lies ahead?

- * Coordination of SFBJV research and monitoring priorities with those of the LCC*
- * Biological and regional landscape-scale planning through partnerships including the LCC*
- * Habitat planning and delivery, focal species, and net landscape change tracking, monitoring, and evaluation*
- * Planning for and monitoring impacts of climate change through the Structured Decision Making process.*



www.sonoranjv.org

PBP Project – Bi-National Conservation

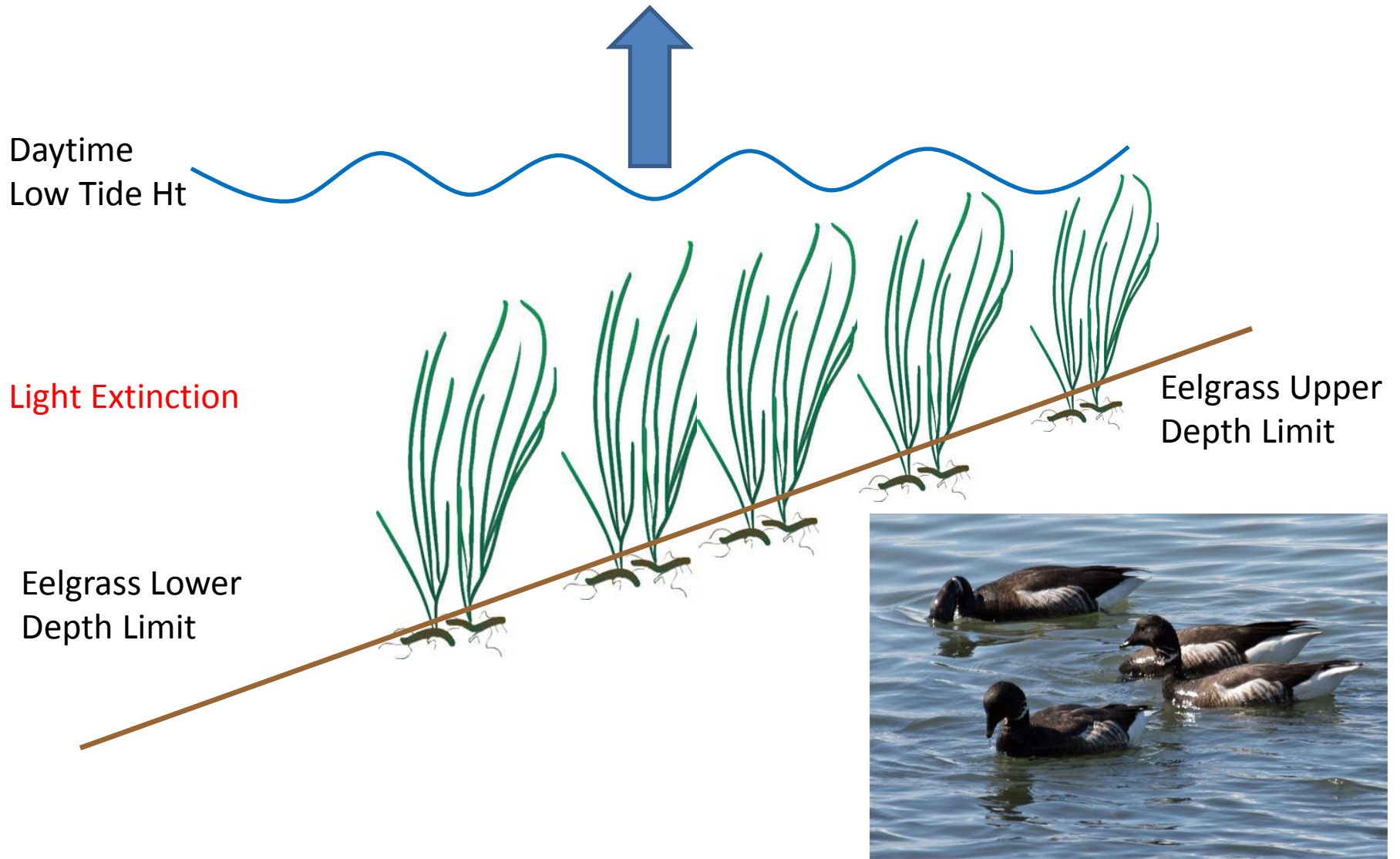
Impact of Climate Change=Sea Level Rise and Brant Food Supplies



- 1-Effect on area of eelgrass available to brant
- 2-Effect on accessibility of eelgrass to foraging brant

Bill German 2008

Sea Level Rise Effects





CLIMATE CHANGE

AT THE DEPARTMENT OF WATER RESOURCES

DWR Sustainability (April 2009) and Environmental Stewardship (Oct 2010) Policy Implementation

DWR Climate Team Initiatives (a sampling below)

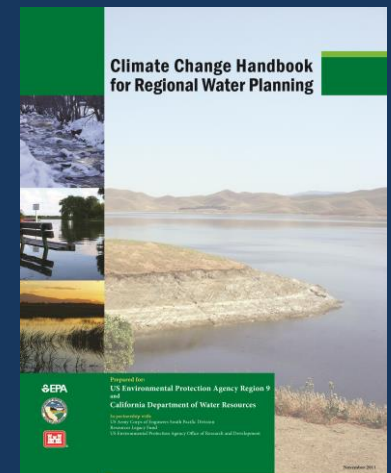
Completed: CC White Paper; CAP Phase 1 (GGERP); NRC SLR study; Climate Change Handbook for Regional Water Planning

Ongoing: Climate Literacy courses; Climate data inventory and archive; CAP Phase 2 (data analysis); CCTAG; tree-ring paleoclimate study

Future: CC Vulnerability Assessment and Adaptation Plan (CAP Phase 3); Climate Resiliency Policy; historical data assessment; connecting with local planning efforts (e.g. incorporating CC into planning in both the built and natural environments); Outreach/Education

"IRWM provides a *critical framework* for actions to address the uncertainties presented by climate change as well as other risks to California's water future."

Water Plan Update 2009



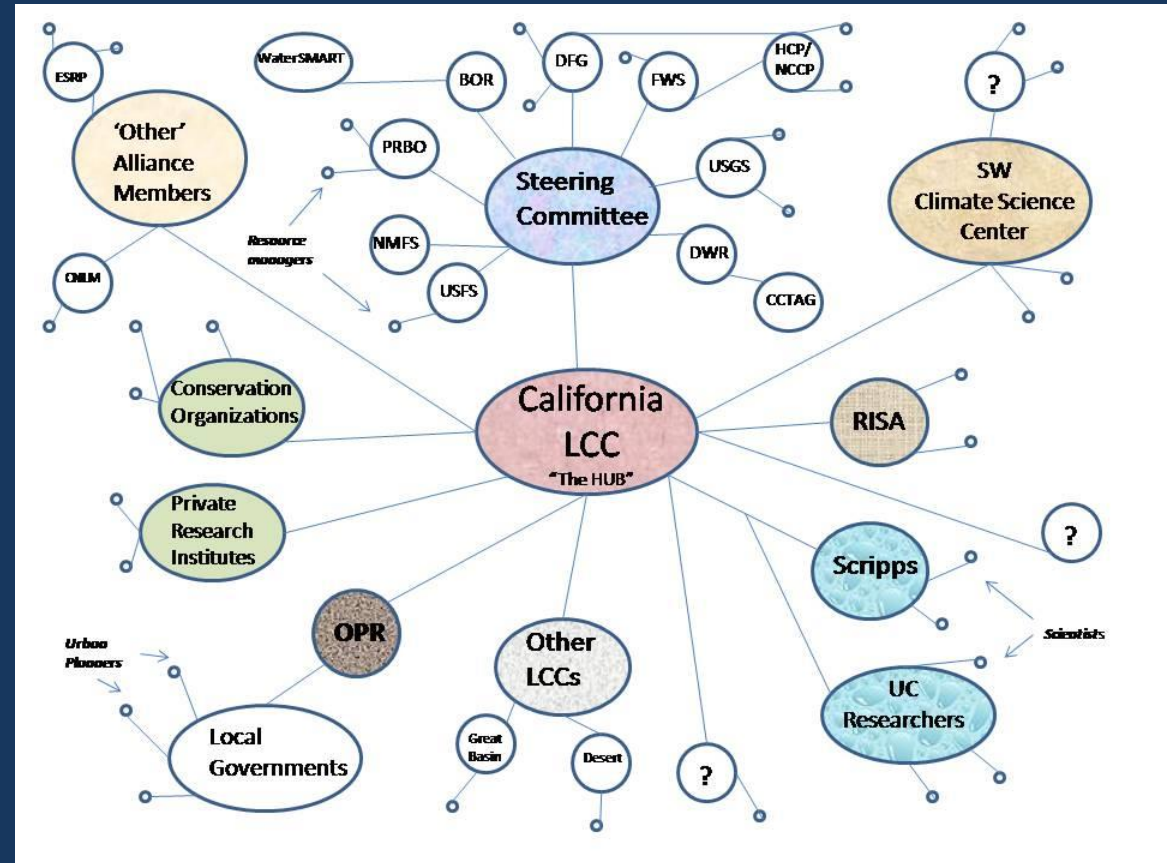


CLIMATE CHANGE

AT THE DEPARTMENT OF WATER RESOURCES

Key Partners?

- US Army Corps Engineers
- US Bureau of Reclamation
- US Fish and Wildlife Service
- US Geological Survey
- US EPA
- Water Boards
- Dept of Fish and Wildlife
- Dept of Conservation
- Coastal Commission
- Energy Commission
- Universities – UC Berkeley; UC Davis; University of Arizona
- water managers (local, regional, state, federal)
- All of **YOU!**





CLIMATE CHANGE

AT THE DEPARTMENT OF WATER RESOURCES

Benefits to DWR from implementation of the Strategic Plan:

- Connection with the *“growing community of managers, scientists, conservation practitioners...successfully collaborating to advance and implement actions that promote resilient and adaptable ecosystems across the landscape”*

Strengths that DWR has to contribute to implementation of the Strategic Plan:

- We have a strong committed team of 12 staffers working full-time on climate change with connections throughout DWR and beyond
- Successful landscape-level conservation requires communication and collaboration between those working in ‘natural’ and ‘built’ environments - DWR works directly with planners/managers in **both** areas to plan for climate change and other future stressors



NOAA's Priority Program Areas

<http://www.noaa.gov/>

Healthy ecosystems, communities, and economies that are
resilient in the face of change

Office of Atmospheric Research



Climate Adaptation and Mitigation

→ An informed society anticipating and responding to climate and its impacts

National Weather Service



Weather Ready Nation

→ Society is prepared for and responds to weather-related events

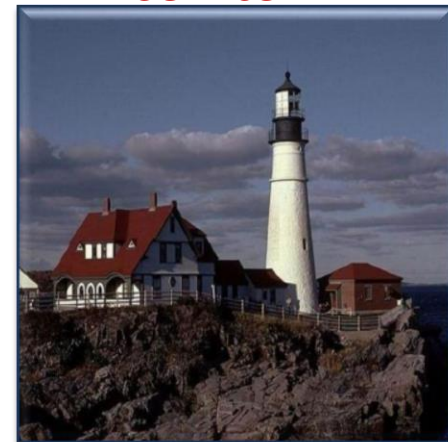
National Marine Fisheries Service



Healthy Oceans

→ Marine fisheries, habitats, and biodiversity sustained within healthy and productive ecosystems

National Ocean Service



Resilient Coastal Communities and Economies

→ Coastal and Great Lakes communities that are environmentally and economically sustainable



Partnerships

- **Federal:** DOI, USDA: e.g. FWS, USGS, NRCS, USFS
- **California:** SCC, OPC, Resources Agency (DFW, OSPR Cal Fire, Parks, CCC), Coastal Comm, DWR, Sea Grant
- **Numerous NGO's:** TNC, TU, DU, PRBOCC, AR, SFBJV, SFEI
- **Commercial and Recreational Fishing Industry**
- **Agriculture (primarily Vineyards)**

NOAA is focusing on landscape scale climate science and services and the need for clear priorities and adaption strategies that are applied and relevant to the public. Partnerships are essential and the LCCs provide a mechanism to make this happen



Habitat Blueprint

<http://www.habitat.noaa.gov/habitatblueprint>

A framework for NOAA to partner with Federal, State and NGO's to address the impacts to freshwater, coastal and marine habitat loss

Benefits of LCC to NOAA:

- Water Resource Mgt. – NIDIS, RISA (two-way)
- Land Use Planning – Risk Management
- Ecosystem Conservation and Restoration
- Communication of Priorities

Strengths of NOAA to LCC:

- Climate Observation and Assessment & Models
- Public Safety and Education - Flood Forecasting
- Drought Research / Water Supply Forecasting
- Regional Climate Science and Services
- Resource Leveraging

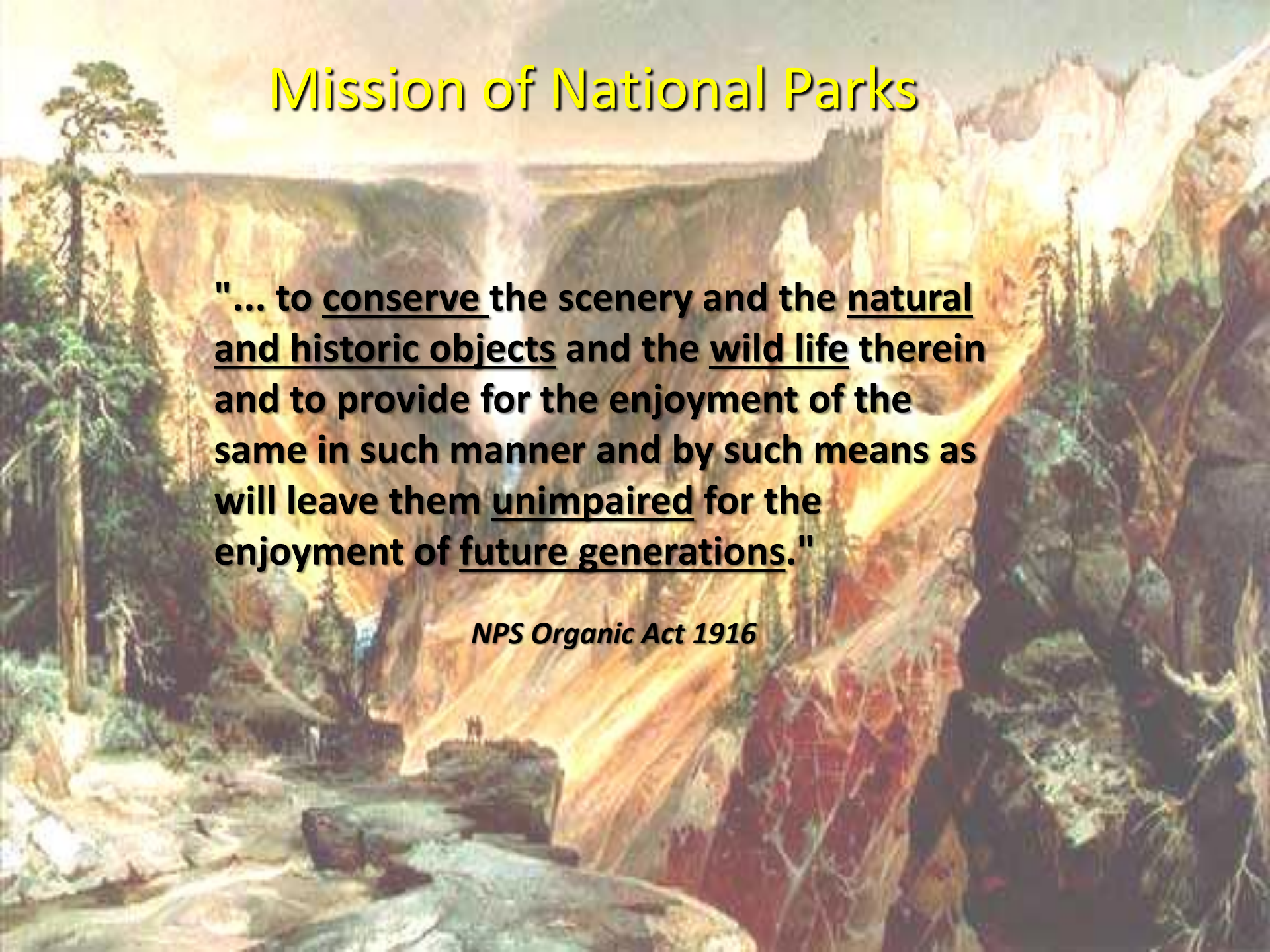
<http://www.legislative.noaa.gov/NIYS/>

<http://www.climate.gov/#climateWatch>

Russian River Basin Focus Area



Mission of National Parks



**"... to conserve the scenery and the natural
and historic objects and the wild life therein
and to provide for the enjoyment of the
same in such manner and by such means as
will leave them unimpaired for the
enjoyment of future generations."**

NPS Organic Act 1916

Mission and projects benefit from CA LCC Strategic Plan

- Mission of NPS is in alignment with that of CA-LCC
- Opportunity for common ground to work at many levels

Strengths NPS brings to CA – LCC

- Communication tools – deliver message to public
 - ✓ Visitor Centers, publications, social media, Science on Sphere
 - ✓ Harpers Ferry Center – develop kiosks and way stations
- Parks are Laboratories for research – baselines for LCC research
 - ✓ CESUs and Research Learning Centers in parks
 - ✓ Inventory and Monitoring Program
 - ✓ Youth Programs
- NPS committed to collaboration with partners – NPS is interconnected within a broader land/seascape
- National and Regional Climate Change Response Strategies

Partners and collaborators

- Usual suspects state and federal - USGS, FWS, NOAA, BLM
BOEM, FS, CDFW, CDF
- CESU – and other academic organizations
- NGOs - NPCA (friends organizations with parks)
Scientific groups such as PRBO Conservation Science
- Other – National Ocean Policy - Regional Planning Bodies
Includes CC objectives in the policy
- NPS created a spatial database and assessment report =
Landscape Conservation and Connectivity database
 - ✓ encourages cooperation and landscape scale conservation
 - ✓ Helps species and habitats critical to national parks respond to stressors
 - ✓ Provides tools and share information about large-scale conservation and habitat connectivity projects
 - ✓ Facilitates dialogue and partnerships
 - ✓ Provides resource for LCC participants to support planning, awareness, integration, and cooperation

NPS - What working on now?

- National
 - ✓ Climate Change Implementation Strategy
 - ✓ NPS Call to Action – 2nd Century Stewardship Plan
 - Revisiting Leopold Report – Commitment and philosophy to create vision for next 50 years – how to adaptively respond to CC
- Regional - C4 – Climate Change Communication Committee
 - ✓ Climate Change Response Strategy and Action Plan for PW Region
 - ✓ Organized to address CC across all divisions and programs
 - ✓ Objectives: 1) Communication 2) Coordination 3) Improve effectiveness
 - ✓ Creating organizational structure to work with LCC
 - Staff; sharepoint site to share information for all NPS regional LCC's
 - NPS-LCC coordinators working with the National Climate Change Response Program to develop a reporting tool/template.
- Climate Friendly Parks – Reduce carbon footprint - check list template
- Examples of projects in region
 - ✓ Southern Sierra Adaptation Workshop
 - ✓ Our Coast our Future – decision support tool for responding to SLR and storms in central coastal California and SF Bay

Natural Resources Conservation Service -

What are you working on now?

- NRCS Actions
 - Climate Change Discipline Lead working to integrate GHG considerations into NRCS Conservation Planning
 - Conservation Innovation Grants for GHG
 - Free Online Tools: Comet-Farm

Who are your partners?

Conservation Innovation Grants:

- EDF, the Rice Commission, Marin Carbon Project, CalCAN

Multiple agencies and organizations across disciplines.

What lies ahead?

Interties with soil health, nutrient and carbon management and benefits of resiliency for agriculture, rangeland, and forestland.

Continued work to refine planning and assessment tools for conservation planning.

USGS - Western Ecological Research Center (WERC)

Tom Suchanek, Ph.D.
Lead Scientist & Climate Change Coordinator

How will WERC benefit from implementation of the CA-LCC Strategic Plan?

- Provide a means by which our USGS research can be applied effectively to natural resource management issues.
- Provide additional opportunities to learn about and collaborate with other research organizations to accomplish natural resource management goals.

What are greatest strengths that WERC will bring to the implementation of the CA-LCC Strategic Plan?

- Our greatest strength is the quantity and especially the quality of our diverse research scientists and programs in national parks, state parks, national wildlife refuges, military bases and other public lands

PARTNERS:

- USFWS, NPS, BLM, BOR, BOEM, BIA, DOD, NOAA, USDA-FS, CDFW, CEC, DWR, CalTrans, Coastal Conservancy, UC Berkeley, UC Davis, UC San Diego, UC Santa Cruz, UCLA, Point Blue, TNC, PWA, Ducks Unlimited, California Waterfowl Assoc, CBI, CVJV, SFBJV

Summary of WERC's Research at National Parks

- Alcatraz Is. NP, CA (Night heron population ecology and breeding) [Golden Gate NP Conservancy] Hothem
- Cabrillo Nat Mon, CA (Monitoring Avian Productivity & Survival) [US Navy] Kus
- California National Parks (Border impacts to National Parks) [NPS] Esque
- California National Parks (Joint Fire Science - ecosystem impacts) [NPS, FWS, USFS, BLM, CalFire] Keeley
- Channel Is. NP, CA (Fog hydrology influence on listed plant species) [NPS/USGS] McEachern
- Eureka Dunes/Death Valley NP, CA (Human impacts on endangered dune vegetation) [NPS] DeFalco
- Klamath & San Francisco National Park Networks, CA (Vital Signs- Climate Change Impacts) [NPS] Madej
- Klamath River System, CA (Remote sensing and river dynamics) [USGS] Madej
- Klamath NP, CA (Quantifying tree mortality & forest dynamics in the Klamath) [NPS, USGS] Van Mantgem
- Klamath NP, CA (Climate change impacts on western forests) [USGS] Van Mantgem
- Lake Mead Nat Rec Area, NV (Habitat mgmt plan for River Mt. bighorn sheep) [NPS, BLM, BOR] Longshore
- Redwood NP, CA (Modeling carbon sequestration) [USGS] Van Mantgem
- Sequoia/Kings Canyon NP, CA (Global climate change impacts on Sierra Nevada forests) [USGS] Stephenson
- Sequoia/Kings Canyon NP, CA (Western Mountain Initiative - forest ecology) [USGS] Stephenson
- Sierra Nevada National Parks, NV (Sierra Nevada Agency Partnership-Synthesis document) [NPS] Brooks
- Yosemite NP, CA (Yosemite Toad genetics) [NPS] Brooks
- Yosemite NP, CA (Yosemite Climate Change) [NPS] Brooks
- Yosemite NP, CA (Impacts of pack-stock in the Sierra Nevada) [NPS] Brooks
- Yosemite NP, CA (Vulnerability of tree-line ecosystems) [NPS] Brooks
- Yosemite NP, CA (Yosemite Toad monitoring) [NPS] Brooks
- Yosemite NP, CA (Yosemite fire impacts on meadows) [NPS] Brooks
- Yosemite NP, CA (Impacts of climate change on fire and carbon loading) [NPS] Brooks
- Yosemite NP, CA (Endangered Big Horn Sheep population protection) [NPS] Brooks
- Yosemite NP, CA (Botany monitoring program) [NPS] Brooks
- Yosemite NP, CA (Spotted owl population assessments) [NPS] Brooks
- Yosemite NP, CA (Mountain yellow-legged frog surveys) [NPS] Brooks
- Yosemite NP, CA (Ecological relevance of forest gaps) [NPS] Brooks
- Yosemite NP, CA (Bat population ecology) [NPS] Fellers

Summary of WERC's Research at National Wildlife Refuges

- Alaska Maritime NWR, AK (Gene expression in sea otters as a health bioindicator) [USGS] Miles
- Antioch Dunes NWR, CA (Lange's Metalmark butterfly habitat studies) [FWS] Takekawa
- Ash Meadows NWR, NV (Conservation of *Amargosa* niterwort) [FWS] DeFalco
- Desert Range NWR, NV (Fire effects) [Joint Fire Science Program] Brooks
- Don Edwards San Francisco Bay NWR, CA (South Bay salt pond restoration [FWS] Takekawa
- Don Edwards San Francisco Bay NWR, CA (Bird population dynamics, diet) [CALFED, FWS] Ackerman
- Don Edwards San Francisco Bay NWR, CA (Contaminants in birds/fish) [CALFED, FWS] Ackerman
- Don Edwards San Francisco Bay NWR, CA (Ecology of California Clapper Rails) [FWS ++] Casazza
- El Toro {Proposed NWR}, CA (Habitat connectivity for bobcats and coyotes [Orange Co] Boydston
- Humboldt Bay NWR, CA (Training docents on dune geology and leading field trips) [none] Madej
- Klamath Basin NWR Complex, CA (Agricultural food resources for migrating birds) [FWS] Fleskes
- Klamath Basin NWR Complex, CA (Mallard molting & ecology) [FWS ++] Fleskes
- Kofa NWR, AZ (Effects of fire on soils & vegetation) [FWS] Esque
- Malheur & Klamath Basin NWR, OR & CA (Spring waterfowl food resources) [FWS ++] Fleskes
- Nisqually NWR, WA (Tidal marsh restoration monitoring) [FWS] Takekawa
- Palmyra Atoll NWR, Pacific Islands (Parasites in coral reef ecosystems, invasive rats) [USGS] Lafferty
- Palmyra Atoll NWR, Pacific Islands (Terrestrial invasive spp, forest ecology) [USGS + TNC] Fisher
- Red Rock Lakes NWR, MT (Migration and breeding of lesser scaup [USGS SSP] Takekawa
- Sacramento NWR Complex, CA (Duck body condition, migration, nesting, AI) [FWS, USGS ++] Ackerman
- Sacramento NWR Complex, San Luis, & Kern NWRs, CA (Waterfowl body condition) [FWS ++] Fleskes
- Sacramento NWR Complex, CA (Avian influenza detection) [FWS ++] Fleskes
- Sacramento NWR Complex, CA (Giant Gartersnake ecology) [FWS] Casazza, Wylie
- San Diego NWR Complex, CA (Response of riparian birds to wildfire) [San Diego Co. - SanDAG] Kus
- San Diego NWR Complex, CA (Effects of 2003/2007 wildfires on wildlife) [USGS + SanDAG] Fisher
- San Luis NWR Complex, CA (Mercury in avian invertebrate prey species) [FWS] Miles
- San Pablo Bay NWR, CA (Climate change in tidal marsh vertebrates) [USGS NCCWSC] Takekawa
- Sonny Bono Salton Sea NWR, CA (Selenium contaminant assessment) [FWS ++] Miles
- Stone Lakes NWR, CA (Sand hill crane use of agricultural lands) [CALFED] Casazza & Fleskes
- Tijuana Slough NWR, CA (Salvage of animals prior to construction of border fence) [USGS] Fisher

WESTERN ECOLOGICAL RESEARCH CENTER

Funded Climate Change Projects (2010 – 2013)

Ackerman: (CA-LCC – 2010) {\$99,925} – Avian demographic response to climate change: a multi-species and multi-landscape approach to synthesizing risk factors.

Brooks/Berlow: (NRPP – 2011-2013) {\$209,300} – Scenario modeling of Yosemite Toad responses to climate change.

Brooks/Klinger: (NCCCWSC – 2010-2012) {\$801,809} - Can mammals mediate climatically- induced vegetation transitions in alpine ecosystems of the western United States?

Brooks: (NPS – 2010-2012) {\$104,558} – Impacts of fire management on carbon stock stability in Yosemite, Sequoia & Kings Canyon National Parks.

Casazza: (FWS – 2010-2013) {\$387,913} – Effects of sea-level rise and habitat disruption on clapper rail survival in San Francisco Bay marshes.

Fleskes: (CA-LCC – 2010/2011/2012) {\$287,185} – Understanding impacts of climate change on ecology and habitats of waterfowl, shorebirds, and other waterbirds: Guidance for the California LCC and other wetland habitat conservation programs in the Pacific Flyway.

Fleskes [Co-PI with Reiter – Ducks Unlimited]: (CA-LCC – 2010/2011) {\$140,000} – A broad-scale, multi-species monitoring protocol to assess wintering shorebird population trends in response to future land use and climate change.

McEachern: [Co-PI with Thompson – Claremont McKenna College] (NSF – 2010-2014) {\$274,359} Interacting effects of climate and invasive herbivores on island plant populations and communities: Santa Rosa Island as a model system.

McEachern: (NRPP – 2010-2014) {\$368,286} – Understanding the hydrologic regime of Santa Rosa Island, Channel Islands National Park: Interacting Effects of Climate and Vegetation Recovery.

Stephenson: (BASE appropriated – 2010-2013) {\$785,145} – Response of western mountain ecosystems to climatic variability and change: The Western Mountain Initiative.

Stephenson: (USGS-Climate & Land Use Mission Area – 2010-2013) {\$1,045,776}
The Western Mountain Initiative: Vulnerability and adaptation to climate change in western mountain ecosystems.

Stephenson [Partner with Schwartz - UCD]: (SWCSC – 2012) {\$149,760} - Climate change vulnerabilities and adaptation strategies to wildlife in the Southwestern U.S.

Takekawa: (NCCWSC – 2010-2012) {\$606,548} – Fate of endangered species in San Francisco Bay tidal marshes with sea-level rise.

Takekawa: (CA-LCC - 2011) {\$95,000} – Sea-level rise monitoring across the California salt marsh gradient for resource managers: evaluation of methodology.

Takekawa (Co-PI with Jaffe) (CA-LCC – 2012) {\$82,425} – Climate-driven geomorphic alteration of intertidal foraging habitats for migratory birds in the San Francisco Bay Estuary.

Takekawa: (USFWS – R8-I&M – 2012) {\$15,000} – Humboldt Bay National Wildlife Refuge salt marsh baseline elevation and vegetation data collection for sea-level rise modeling.

Takekawa: (NWCSC – 2012/2013) {\$300,000} – Marshes to mudflats: climate change effects along a latitudinal gradient in the Pacific Northwest.

Takekawa: (SWCSC – 2012/2013) {\$450,000} – Downscaling climate change models to local site conditions: effects of sea-level rises and extreme events to California coastal habitats.

Thorne/Takekawa: (NP-LCC – 2011) {\$28,000} – Sea-level rise elevation and vegetation baseline data collection in the Humboldt Bay National Wildlife Refuge.

Thorne/Takekawa: (USFWS – R8-I&M – 2011) {\$20,000} – RTK GPS science support to purchase a Leica base station for San Diego NWR complex and Humboldt NWR.

Thorne/Takekawa: (USFWS – 2011) {\$50,000} – Expansion of sea-level rise mapping of salt marsh habitats in San Diego National Wildlife Refuges Complex.

Thorne/Takekawa: (USFWS – R8-I&M – 2012) {\$45,000} – Seal Beach National Wildlife Refuge sediment monitoring to inform sea-level rise modeling.

Vandergast: (BASE appropriated – 2010-2013) {\$280,391} Impacts of siting new alternative energy facilities in Mojave desert ecosystems on genetic diversity.

Vandergast: (Cyclical – 2011) {\$86,787} Impacts of siting new alternative energy facilities in Mojave desert ecosystems on genetic diversity.

van Mantgem: (BASE appropriated – 2010-2013) {\$227,741} – Climate change impacts on western forests.

van Mantgem: (NPS/BLM – 2011-2012) {\$74,000} Effects of climate and climate change on forest dynamics across the Klamath Region.

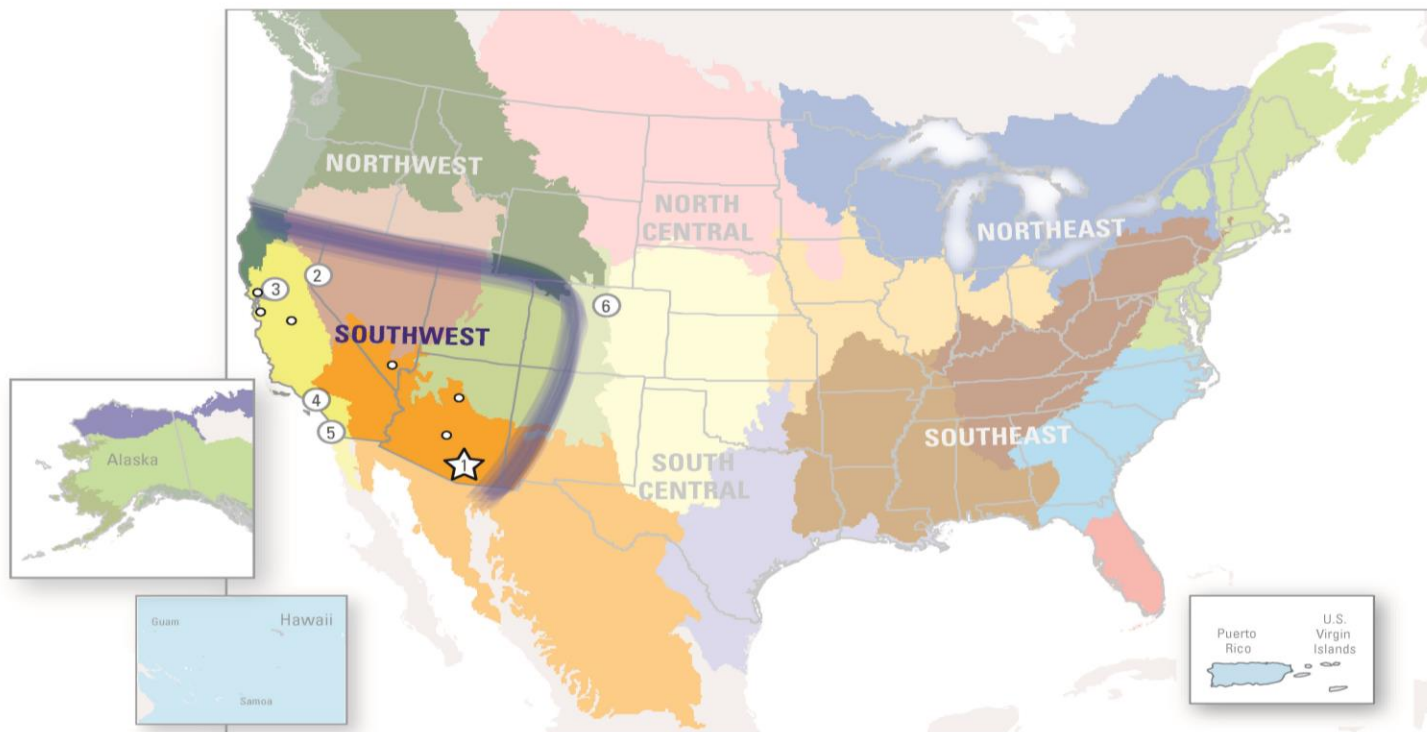
van Mantgem: (Joint Fire Science Program – 2009-2012) {\$127,426} Can climate change increase fire severity independent of fire intensity?

A photograph of a desert landscape. In the foreground, there are large, reddish-brown rocks and some low-lying green and yellow shrubs. In the middle ground, numerous tall, columnar saguaro cacti are scattered across the terrain. The background shows a steep, rocky hillside with more cacti and sparse vegetation. The sky is not visible.

The Department of the Interior
Southwest Climate Science Center
U.S. Geological Survey

Steve Jackson --
University of Arizona

Tom Suchanek
USGS-WERC



Southwest Climate Alliance

- 1 University of Arizona
- 2 Desert Research Institute (NV)
- 3 University of California - Davis
- 4 University of California - Los Angeles
- 5 Scripps Institute of Oceanography
- 6 University of Colorado - Boulder

Center Affiliates

Arizona State University
 Northern Arizona University
 University of California, Merced
 University of Nevada, Las Vegas
 NASA Ames Research Center
 U.S. Institute for Environmental Conflict Resolution

EXPLANATION

Landscape Conservation Cooperative in the Southwest area

- | | | |
|---------------|----------------|------------------|
| North Pacific | Great Northern | Desert |
| Great Basin | California | Southern Rockies |

Approximate boundary of Climate Science Center (CSC)

Vision for the Southwest Climate Science Center:

- foster effective collaboration between scientists and resource managers in anticipating, monitoring, and adapting to climate variability and change in the Southwest
- identify and apply best practices for translational climate science

Guiding principles:

- *Focus on management outcomes and solutions*
- *Co-production of knowledge by stakeholders and scientists*
- *Coordination of the different calendars of decision-making and research*
- *Clear communication of scientific capacities and uncertainties*
- *Utilization of experiential and local knowledge*
- *Commitment to span professional and disciplinary boundaries*
- *Development and application of metrics for gauging success*

Goals of the Southwest Climate Science Center

Leadership goal: Match the information needs of stakeholder communities with the scientific capabilities of research communities

Research goal: Foster development of interdisciplinary science to support resource management

Synthesis goal: Make relevant scientific and management information available to stakeholders and researchers

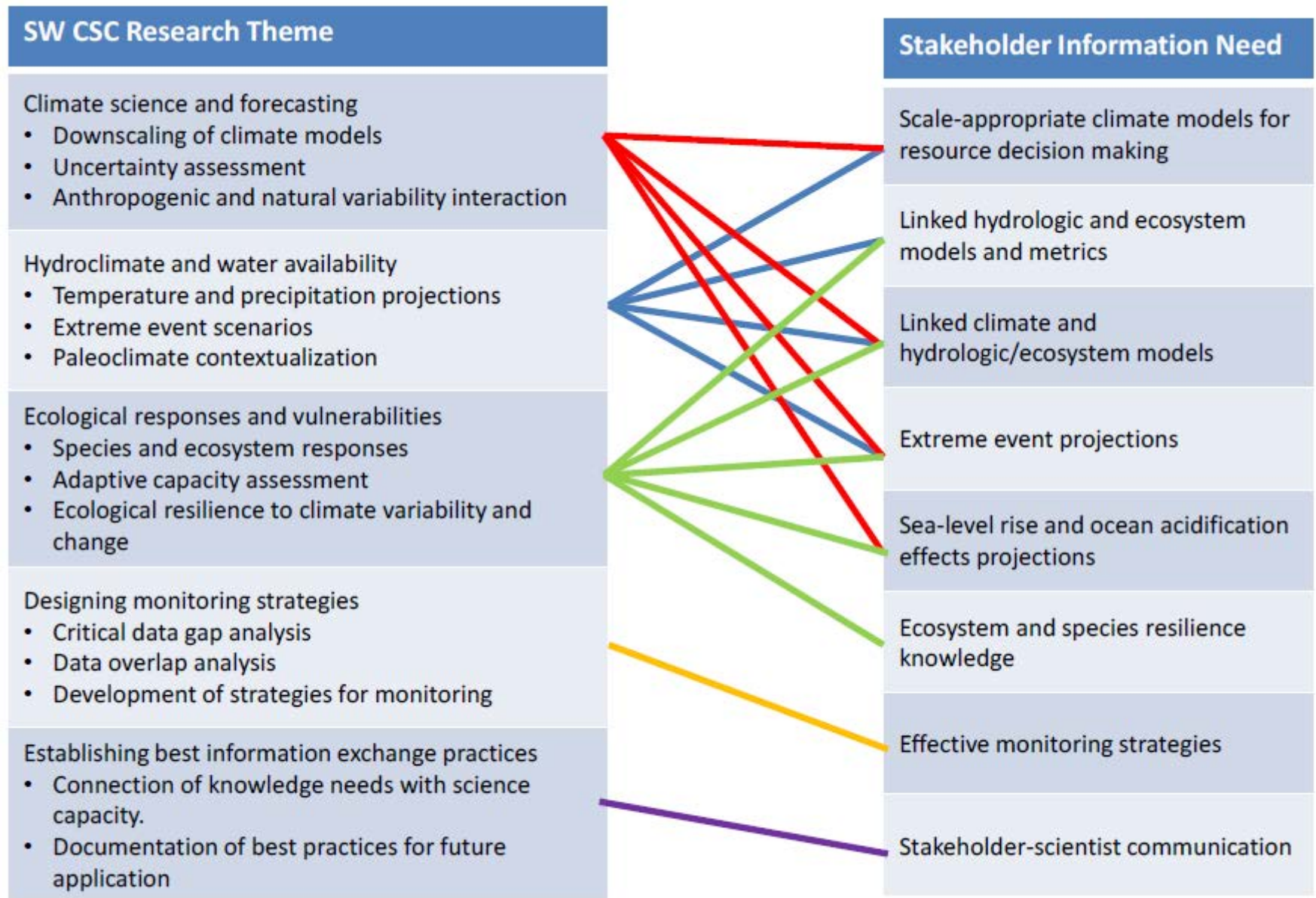


Figure 6. Relation between Southwest Climate Science Center (SW CSC) research themes and stakeholder information needs.

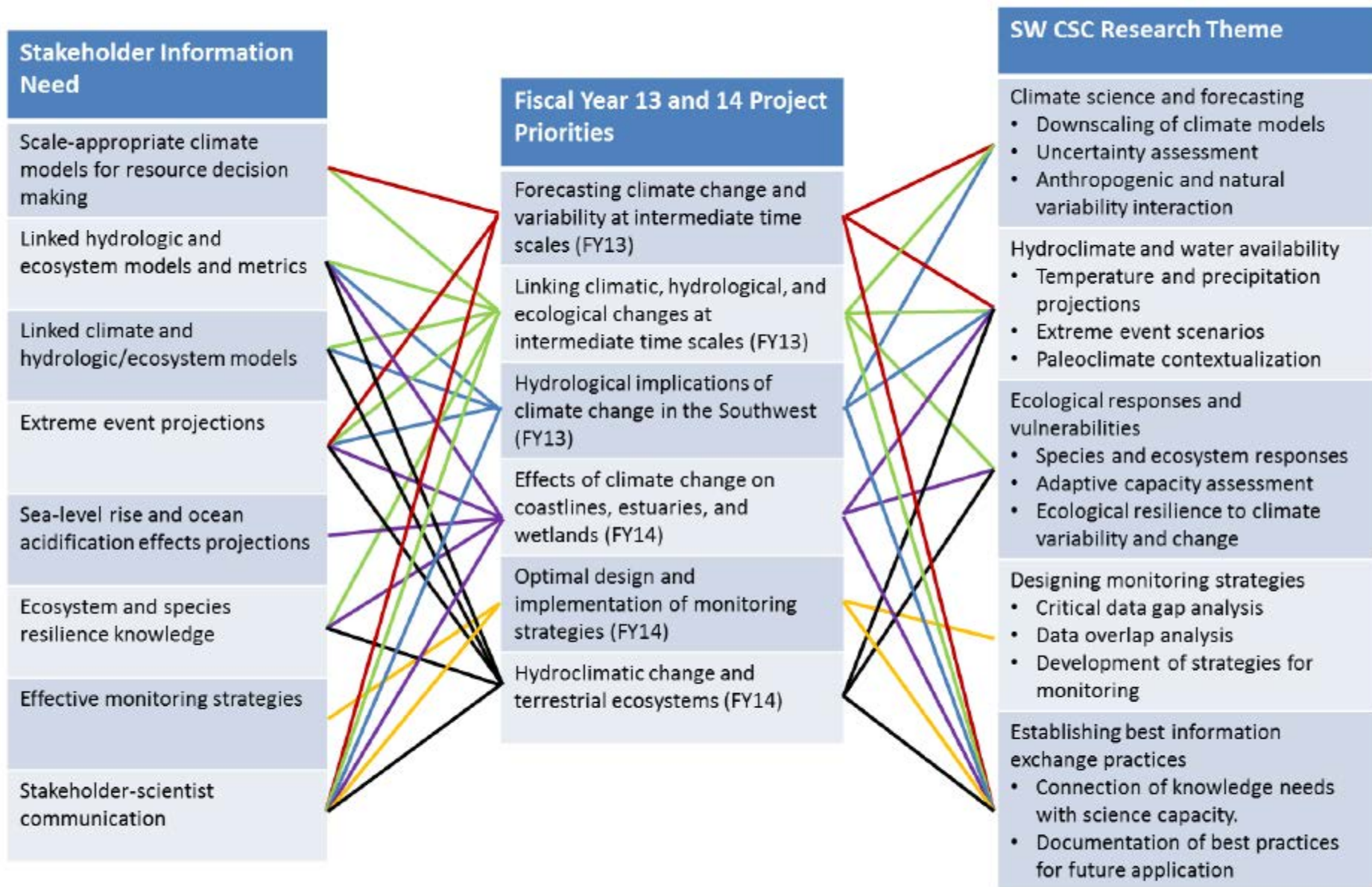


Figure 1. Relations between fiscal year 13 and 14 project priorities, stakeholder information needs, and Southwest Climate Science Center research themes.

Southwest Climate Science Center FY 13 RFP Update (March 2013)

- **Anticipated funds:** ~\$ 400,000
- **Total FY13 SOI requests:** \$8,100,000
- **Statements of Interest received:** 50
 - **USGS-led SOIs:** 32 (20 with consortium partners)
 - **Consortium-led SOIs:** 18 (8 with USGS partners)
- **Full proposals invited:** 9
 - **USGS-led:** 3 (1 with consortium partner)
 - **Consortium-led:** 6 (4 with USGS partners)

SOI match with science priorities identified in the SW CSC FY13 RFP:

- *Anticipating climate change and variability at intermediate timescales:* 3 (1)
- *Linking climatic, hydrological, and ecological changes at intermediate timescales:* 25 (6)
- *Hydrological effects of climate change in the Southwest:* 7 (2)
- *Did not match any SW CSC FY13 priorities:* 15 (0)

(Numbers in parentheses denote SOIs called back for full proposals)

Review Process:

- **Review team included 14 scientific experts from:**
 - **USGS (4)**
 - **FWS (4)**
 - **Bureau of Reclamation (1)**
 - **Bureau of Land Management (1)**
 - **Forest Service (1)**
 - **Tribes (1)**
 - **NGOs (1)**
 - **Universities (1; located outside the SW region)**
- **All five LCCs (Southern Rockies, Desert, Great Basin, California, North Pacific) were represented on the review team**
- **Each SOI was reviewed by 5 to 8 review-team experts (a few SOIs that did not meet length/format criteria specified in the RFP were not reviewed)**
- **N.B. Review team for full proposals will include the original review team, plus one additional university scientist and one additional USGS scientist, both from outside the SW region.**

The Nature Conservancy – California Chapter Activities

Initiatives:

Climate—AB 32, forest carbon, adaptation

Water—GW, floodplains, env flows, BDCP

Energy –siting and mitigation

Marine fisheries—central coast groundfish

Salmon—coastal coho, shasta, LWD, vineyards

Migratory Birds—refuges, rice

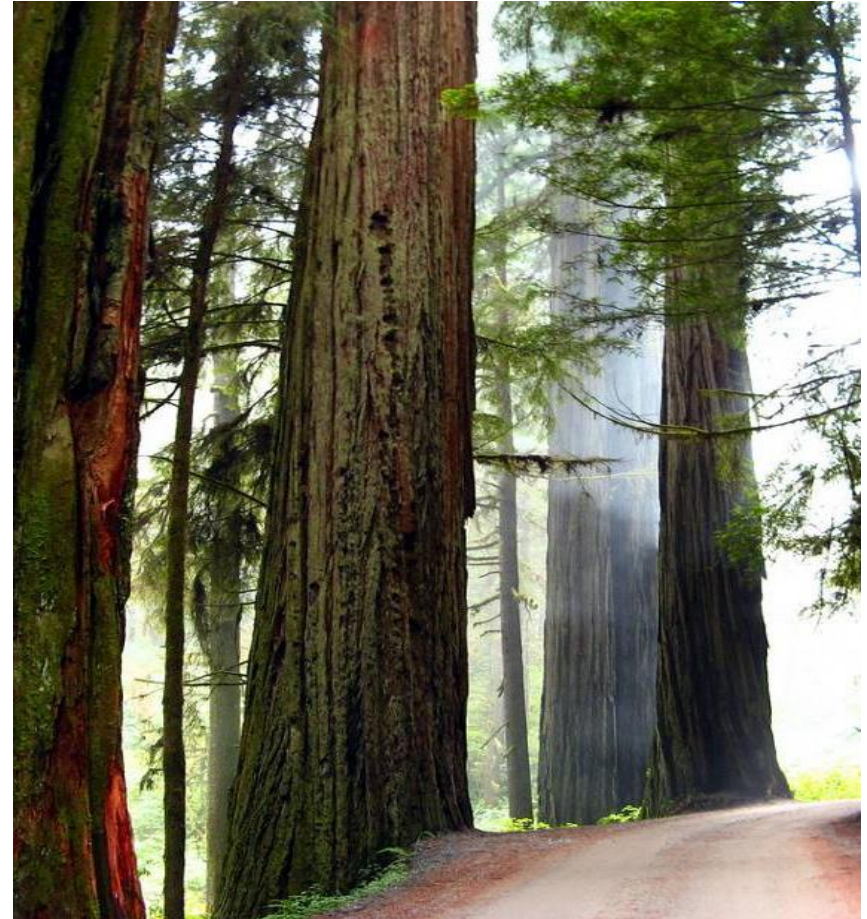
TNC California Chapter Activities

Other important efforts:

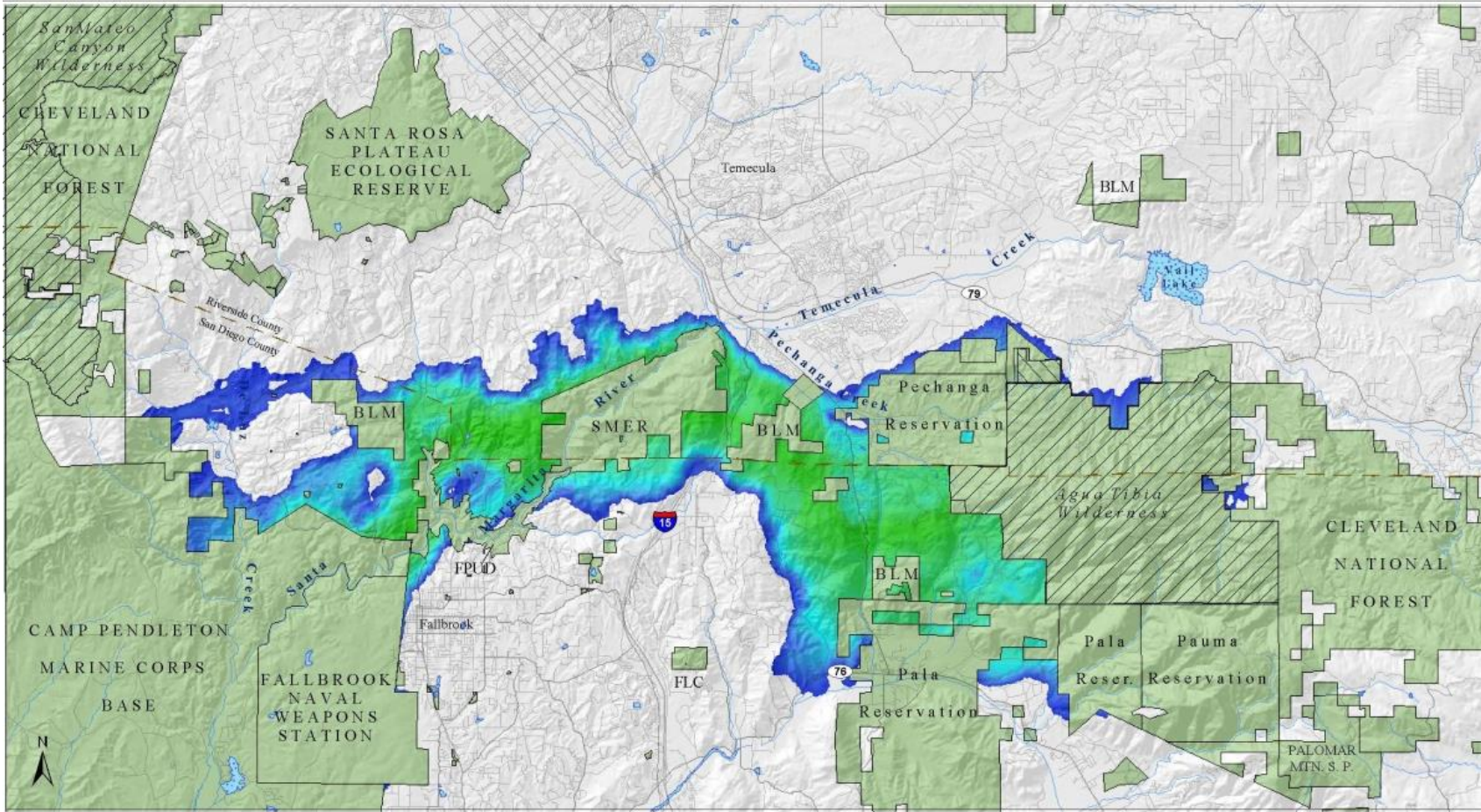
- Land use and infrastructure planning**
- Regional Advance Mitigation**
- Working Lands**
 - Rangeland conservation**
 - Food safety**
- Wildlife corridors**
- Northern Sierra**
- Mojave “whole system”**

Climate Program Key Priorities

- Address the cause -
Implement CA climate
law – AB 32
- Reduce climate risk to
people from impacts



Linkages



US Forest Service

What are you working on now?

- *Forest Plan Revision / Bioregional and Forest Assessments*
- *Climate Change Integration (“Scorecard”)*
- *Project Focus on Ecological Restoration*

Who are your partners?

- *Other State & Federal Agencies (CDFW, FWS, NMFS, DWR, NPS, BLM, CDPR, SNC, COE, BOR....)*
- *Environmental NGOs (TWS, TNC, Eco-Adapt, PRBO, IBP, NFWF, NFF, RMEF, NWTF, DU, CBI...)*
- *Industry representatives and organizations (timber companies, range permittees, ski resorts...)*
- *Tribes*
- *Research institutions (universities, NGOs...)*
- *Businesses (PGE, Coca-Cola, Disney, Municipal Water Districts...)*

What lies ahead?

- ***Benefits to USFS from CA LCC Strategic Plan***
 - *Science Delivery focus*
 - *Climate integration*
 - *Restoration projects – design & implementation (e.g., Collaborative Forest Landscape Restoration projects)*
 - *Plan Revision*
- ***USFS strengths to implementing Plan***
 - *Multi-use organization managing land throughout the LCC*
 - *Additional research capacity (PSW, TACCIMO,...)*
 - *Outreach (S&P Forestry, International Programs)*

US Fish and Wildlife Service – What are you working on now?

- *Climate Adaptation in Coastal Refuges.*
- *Central Valley Waterfowl Management and Native Fish Restoration.*
- *Landscape Conservation Cooperatives.*



LANDSCAPE CONSERVATION
COOPERATIVES

Who are your partners?

- *FWS Mission Statement:*
Working with others to conserve, protect,....
- *Local, State and Federal Agencies*
- *Tribes*
- *Universities*
- *Non-profit organizations*
- *Private landowners*

What lies ahead?

- *Use of tools, data, decision support mechanisms, and partnerships which support our mission.*
- *Our Mission (Working with others) directs us to be actively engaged*

- *Verbal presentations by*
 - *State Coastal Conservancy and*
 - *Bureau of Reclamation*
- *Check the meeting notes for their key points*