NIDIS Governance: Executive Council

NATIONAL

NIDIS Office

NIDIS Implementation Team:

NIDIS Technical Working Groups

REGIONAL

Public Awareness And Education

Engaging Preparedness Communities

Integrated Monitoring and Forecasting

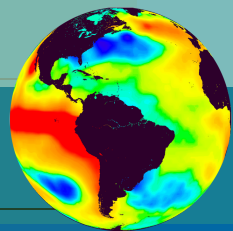
Interdisciplinary Research and Applications

U.S. Drought Portal

WATERSHED/URBAN/LOCAL

Regional Drought Early Warning Systems

Information clearinghouse,prototypes, and Implementation



NIDIS within NOAA:

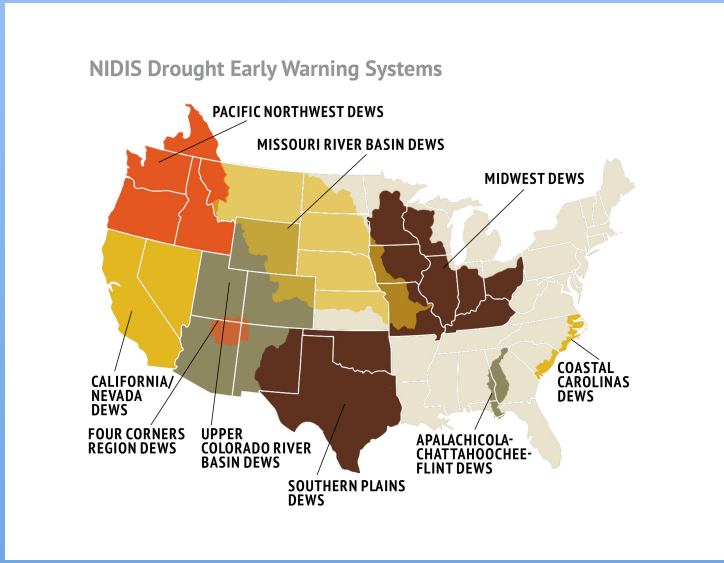
Regional Integrated Sciences and Assessments (RISA)

Modeling Analysis Predictions and Projections (MAPP, NCEP)

- Support cross-regional efforts to assess predictability, user needs Test drought-focused decision support tools

NDMC

Sectoral Applications Research Program (SARP)



Drought.gov. Soil moisture sensors (NCEI, ARL)

- Identify socio-economic effects of drought, data and info needs of resource managers and policy/decision makers

NWS (CPC, RFCs, CSD), NCEI (RCSDs, RCCs), NOS, NMFS

- Transition and communicate drought information products for operations and response

Drought Preparedness planning

- **State-level partnerships**
- **Federal agencies**

Goal	Near term (1-2 years)	Long term (3-5 years)
Develop a fully national integrated drought early warning information system	• Continue established DEWS network for ongoing outlooks and forums on impacts and across timescales (sub-seasonal to decadal etc.). • Initiate additional regional and sub-regional NIDIS systems (Northwest Midwest, Nevada) transferring lessons from existing activities. • Evaluate effectiveness of DEWS.	Complete staging and diffusion of regional DEWS and coordinators to achieve national coverage in partnership with federal, state, regional, private and local agencies.
Advance drought monitoring, forecasts, impacts assessment methodology and reporting requirements	• Improve understanding and improved forecasts of physical and demand factors contributing to droughts, to inform risk assessment and management. • Demonstrate the effectiveness of drought risk reduction strategies using monitoring and prediction information, using lessons and technologies.	Continued drought information system as inputs into watershed, state, and local drought plans and operations.
Improve regional to local capabilities to educate, develop capacity, and communicate drought information, awareness and response	• Initiate process for transferring capabilities to new locations at state and county levels (1) to assess regional and local drought impacts and (2) improving the usefulness of prediction products in drought planning and response • Engage recently developed regional capabilities (USDA Climate Hubs, DoI CSCs) in DEWS development and implementation	Develop an integrated interagency drought information network for education, coordination, capacity building and delivery of products and services at regional to local level.

NOAA AND THE CALIFORNIA WATER ACTION PLAN

Partnering for resilience

Seasonal drought outlook
Drought tendency through May 31, 2015

Drought persists or intensifies

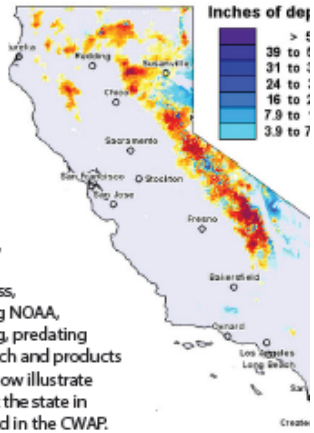
Drought development likely

http://www.cpc.ncep.noaa.gov/

In response to the ongoing California drought, Gov. Edmund G. Brown Jr. released the California Water Action Plan (CWAP) in 2014, directing the California Natural Resources Agency, the California Environmental Protection Agency, and the California Department of Food and Agriculture to identify key actions for the next one to five years, to (1) address urgent needs and (2) provide the foundation for the sustainable management of California's water resources.

NOAA and its partners have been providing California with research, analyses, publications, forecasts, communications and stakeholder engagements to support drought preparedness, mitigation and recovery. Collaborations among NOAA, NIDIS and California partners are long-standing, predating the present drought, focused on linking research and products to management. The NOAA activities listed below illustrate the agency's ongoing commitment to support the state in addressing specific issues and actions identified in the CWAP.

Snow depth: departure from normal
Map compares normal depth of snow pack to current



UNCERTAIN WATER SUPPLIES

NOAA actions:

■ **Analysis of the effects of climate change and climate variability** on water supplies and resources .

■ **Development and distribution of public briefing documents** about the most up-to-date science regarding influences of droughts, atmospheric rivers, and El Niño on water supply variability and reliability.

■ **Construction of future climate scenarios** to assess potential impacts and trajectories.

RESOURCES AND LINKS

California Climate Data Archive;
Great Basin Weather and Climate Dashboard
Will El Niño Make a Difference?
Our Changing Climate 2012: Vulnerability and Adaptation to the Increasing Risks from Climate Change in California
California Climate Extremes Workshop Report 2011
Southwest Climate Assessment Summary for Decision Makers, 2012
Statistical Downscaling Using Localized Constructed Analogs (LOCA)

WATER SCARCITY/DROUGHT

NOAA actions:

■ **Documentation of the surprisingly strong role of major storms and floods** in ending previous droughts in California, and the role of the occurrence or absence of any major atmospheric river storms in cycles of plenty and drought.

■ **Within-season monthly monitoring of fallowed land** extent in the Central Valley using Landsat imagery. Knowledge of the amount and spatial distribution of fallowing helps agricultural communities and government make informed decisions to reduce the impacts of water shortage and have helped the state locate county food banks.

RESOURCES AND LINKS

Atmospheric rivers as drought busters on the US west coast
Drought and the California Delta—A matter of extremes: San Francisco Estuary and Watershed Science
Flooding on California's Russian River—Role of atmospheric rivers
National Geographic issue on the 2014 California Drought

POOR WATER

NOAA actions:

■ **Evaluation of**
major storms on s
and how those imp
with modern water
procedures.

■ **High-resolutio**
saltwater inundati

■ **Quantificatio**
the drought throug
coordination with S
Oceanography.

RESOURCES AND LI

Climate change projec
along the California co
Contemporaneous Sub
Overtopping Potential
Delta
Ongoing drought-indu
United States

(In press): Promoting a
snowmelt fueled biogeo
by restoring river-flood
California's Central Vall

DECLINING GROUNDWATER

NOAA actions:

■ **Development of simulation models** that couple climate change projections directly to and through groundwater flow and storage simulations for the Central Valley.

RESOURCES AND LINKS

Integrated simulation of consumptive use and land subsidence in the Central Valley, California, for the past and for a future subject to urbanization and climate change
A method for physically-based model analysis of conjunctive use in response to potential climate changes

DECLINING NATIVE FISH SPECIES AND LOSS OF WILDLIFE

NOAA actions:

■ **Characterizing the historic role of major atmospheric-river storms** in initiating ecologically beneficial inundations (Yolo Bypass of the Sacramento River, floodplains along the unregulated Cosumnes Riv., as proxies for floodplain habitats in the Central Valley).

■ **Development of indicators** to protect fish populations in the Russian River through work with stakeholders to study hydrologic extremes.

FLOODS

NOAA actions:

■ **Research on atmospheric rivers** to understand and better predict major flood events in California, and help communities to reduce their vulnerability.

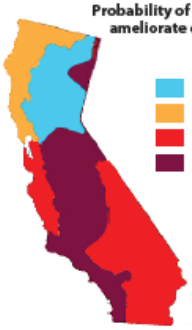
■ **Examination of stakeholder perspectives** on vulnerabilities and preparedness for an extreme storm event in the greater Lake Tahoe, Reno, and Carson City region.

■ **Characterization of the historic role of atmospheric-river storms** in causing levee breaks in the Central Valley and Delta, where levees are still the primary defense against salinity intrusions.

RESOURCES AND LINKS

Flooding on California's Russian River—Role of atmospheric rivers
Atmospheric rivers, floods, and the water resources of California
Storms, floods and the science of atmospheric rivers
Historical and national perspectives on extreme west-coast precipitation associated with atmospheric rivers during December 2010

Probability of precipitation to ameliorate current drought in six months
As of January 2015



Probability of precipitation to end current drought in six months
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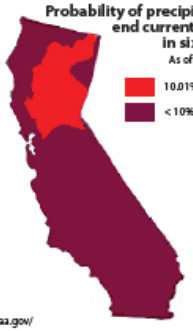


http://www.ncdc.noaa.gov/

LOOKING AHEAD: MANAGING AND PREPARING FOR DRY PERIODS

NOAA actions:

■ **Develop and provide drought early warning information** to decision makers throughout California, including leading drought preparedness activities, involving more than 100 water agencies, organizations, industries, tribes, and other stakeholders. Partners include the California Rural Water Association, California Department of Water Resources, and California-Nevada Applications Program (CNAP).

■ **Address drought issues and water demands in urban areas** of Southern California, where water supplies are primarily imported and water demands are heavily residential. NOAA works with stakeholders to develop indicators for drought assessment and forecasting of direct relevance to stakeholders, and to assess drought conditions.

■ **Characterize and understand historic droughts** using stakeholder-informed indicators. For example, NOAA developed a percentile-based indicator system for assessing present drought in the context of the frequency and severity of historic events. Among the findings: the severity of drought conditions developing in early 2014, based on a 12-month precipitation anomaly, would be expected to occur less than once every 10,000 years.

■ **Development of Forecast-Informed Reservoir Operations (FIRO),** a management strategy that uses data from watershed monitoring and weather and water forecasting to help managers selectively retain or release water in a manner that reflects current and forecast conditions.

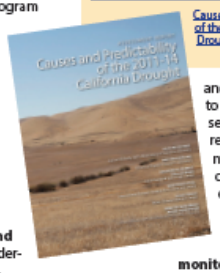
■ **Develop an integrated water resources monitor and outlook** to represent the current and seasonally forecast state of water resources including precipitation, snow, runoff into reservoirs, soil moisture, and other variables important to water management (proposal under consideration).

■ **Refinement to existing drought amelioration tools** to make them more relevant and useful to California's hydrology.

■ **A NOAA drought-related services assessment** (currently under review) to improve decision support for decision makers in the state.

RESOURCES AND LINKS

Improving Drought Predictions April/May 2013
Drought Impacts Reporting, August 2013
Small Water Systems Workshops, California Rural Water Association, California Water Commission 2013; list of events
California Drought Outlook Forum: What's Ahead and What We Can Do; February, 2014
Making Decisions in Dry Times: Science and Strategies for Dealing with Drought; May, 2014
Causes and Predictability of the 2011-14 California Drought, December 2014



NIDIS · DRI Desert Research Institute · CNAP · California natural resources agency · Western Regional Climate Center

Year 1: Scoping the Drought Early Warning Information System

Gap analyses: What data/information exists and how is it being coordinated and used?
Characterize risks across timescales-with existing information for 2-3 critical issues (water, ag, disaster risk reduction etc.)

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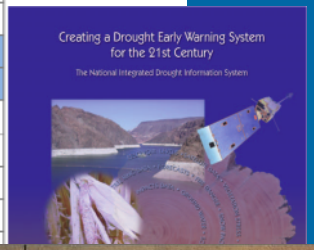
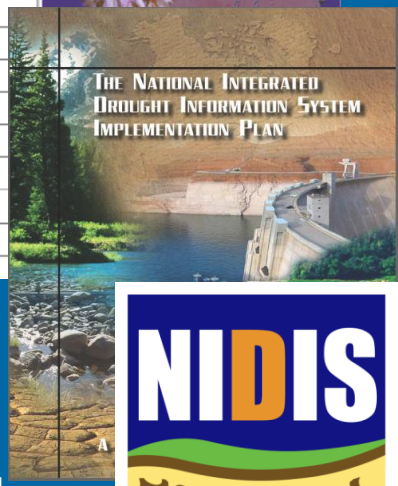
Year 2. Implementation of the Drought Early Warning System (sub)seasonal, multi-year, longer term trends):

Develop drought sub-portals
Embed information into preparedness and adaptation plans
Establish network for ongoing briefings on impacts and projections across climate timescales

Table 1. NIDIS Implementation Milestones (FY 2007-2012, by year)[19]

Activity	Milestone	07	08	09	10	11	12	13
1	Initial portal operational capability at drought.gov							
1	Advanced portal mapping capability with GIS tools							
1	Populate drought.gov website (portal, plans, reports, agency links)							
1	Operational portal communities and collaborations							
1	Enhance data management and distribution							
1	Portal extension to hemispheric and global domains							
2	Drought forecast regionalization studies							
2	Enhance soil moisture and temperature measurements							
2	Forecast verification and calibration to measurements							
3	Coordinate with CPO Program Managers/agencies on interdisciplinary research goals							
3	Inventory drought-related service (federal/state/private)							
3	Assess national status of drought early warning							
3	Inventory drought-related research (federal/state/private)							
3	Coordinate drought preparedness plans							
3	Planning for adaptation							
3	Institutionalize "Drought Coordinator" network							
3	Enhanced regional impacts research							
3	Implement adaptive management strategies							
4	Pilot study scoping and selection							
4	NPIT workshops: Define criteria and assess partner interest and capacity for pilots							
4	First Workshop: Assessment of Drought Early Warning System Status in the United States							
4	Pilot study implementation							
4	Initial early warning prototypes							
4	Pilot study assessment and follow-on work							
5	Establish NIDIS Program Office, governance structure, and final Program Implementation Team							
5	Establish regional sub-team leads within NPIT							
5	Establish initial agency/state rotational assignment to NIDIS Program							
5	Establish NIDIS Interdisciplinary Research Coordination Board							
5	Extend NIDIS to National Governors' Association and Inter-basin Watershed Commission							
5	Operational workshops to assess national drought monitoring and forecasting gaps							





Shift 18-24 mths to the right- delay in funding

PL109-430

$$

Reauth Hearing

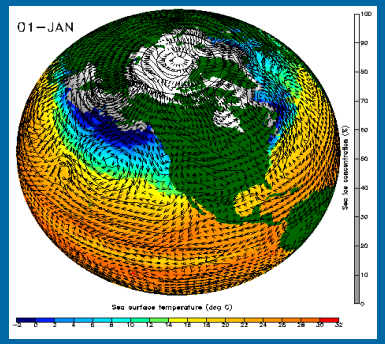
NIDIS

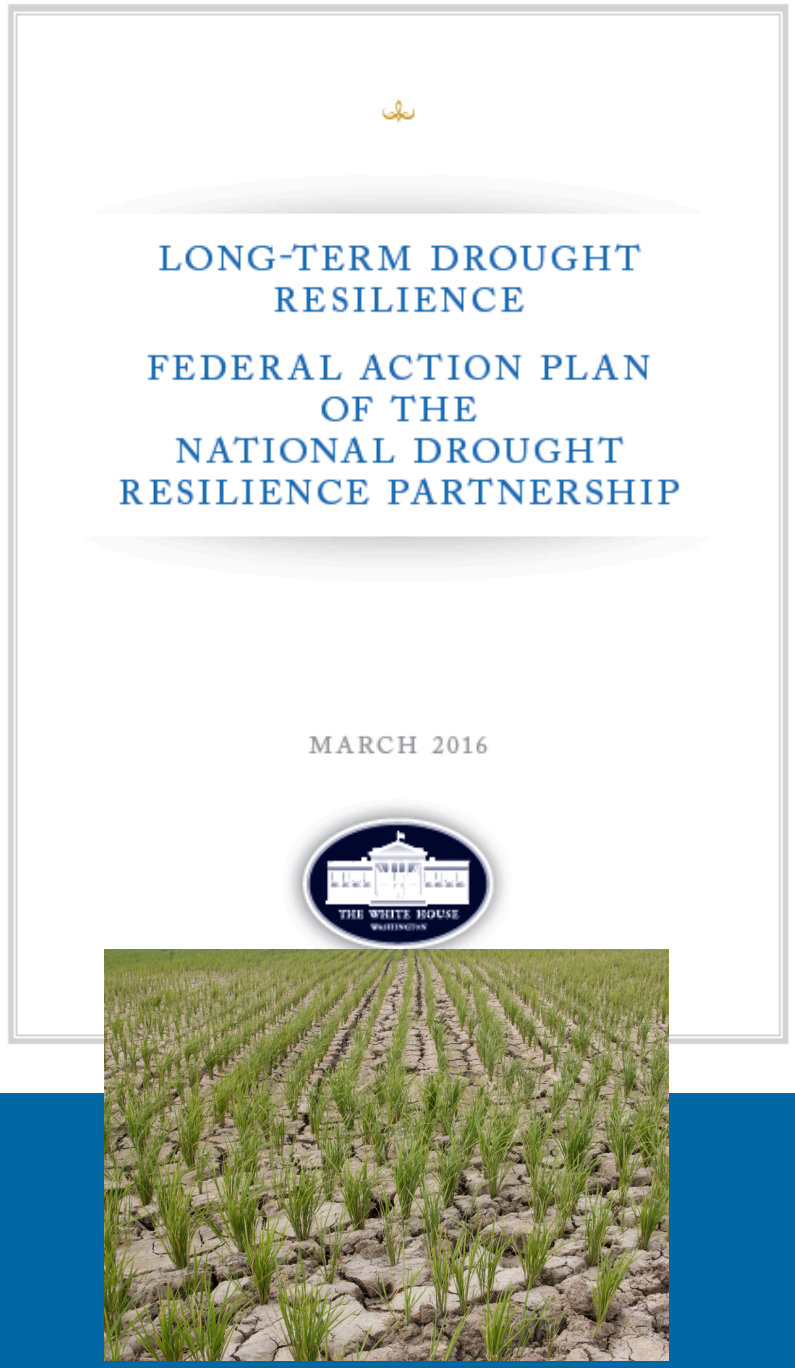
NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM

Implementation Plan Development Tasks	Proposed Date
WG meetings/calls ----------Resources	
Draft text < 2pages, list priority actions-near-term 1 through 3 years and proposed timelines - NIDIS Governance model, Vertical integration of existing, new DEWS, - Existing and new partners (e.g. institutional networks) - Evaluation (see Congressional report, inputs to state, tribal plans)	Check-in
Return to NIDIS Office - Collate-edit-recirculate full - Ensure cross-WG coordination	Jul 1
Incorporate new comments -Prepare near-final version	August 19
Move up the chain clearance as needed	Final Sept 19
Budget discussions……..	
NIDIS Executive Council-late Summer /early Fall	Oct

Challenge: Sustaining networks across Research, Observations, Services and Decisionmaking within regions and countries

- ensure that priorities, smart practices, responses are identified, supported, secured





Drought-Resilience Goals

Goal 1: *Data Collection and Integration –key data platforms, modeling and prediction*

Goal 2: Communicating Drought Risk to Critical Infrastructure

Goal 3: *Drought Planning and Capacity Building*

Goal 4: Coordination of Federal Drought Activity

Goal 5: Market-Based Approaches for Infrastructure and Efficiency

Goal 6: Innovative Water Use, Efficiency, and Technology

Information Systems from intelligence to resilience