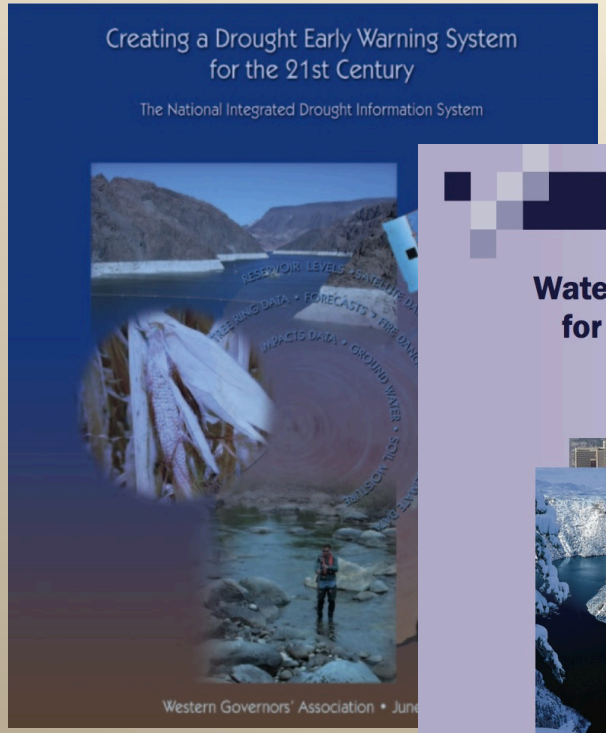
A Partnership in Building a National Integrated Drought Information System

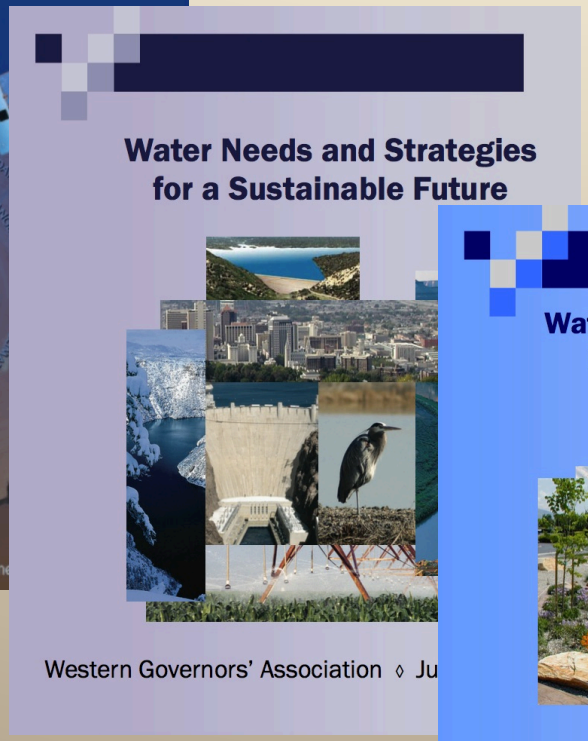
NIDIS Working Groups & Regional Drought Early Warning Systems

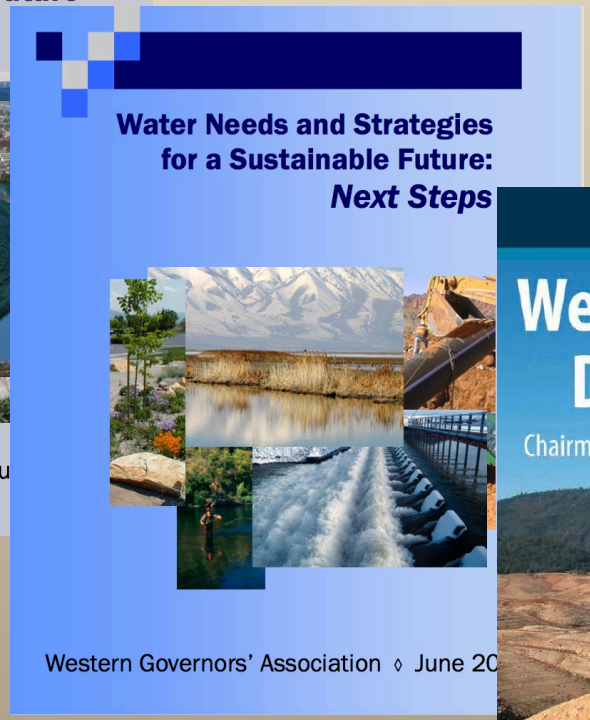
Veva Deheza
Deputy Director
NOAA/NIDIS
Boulder, CO

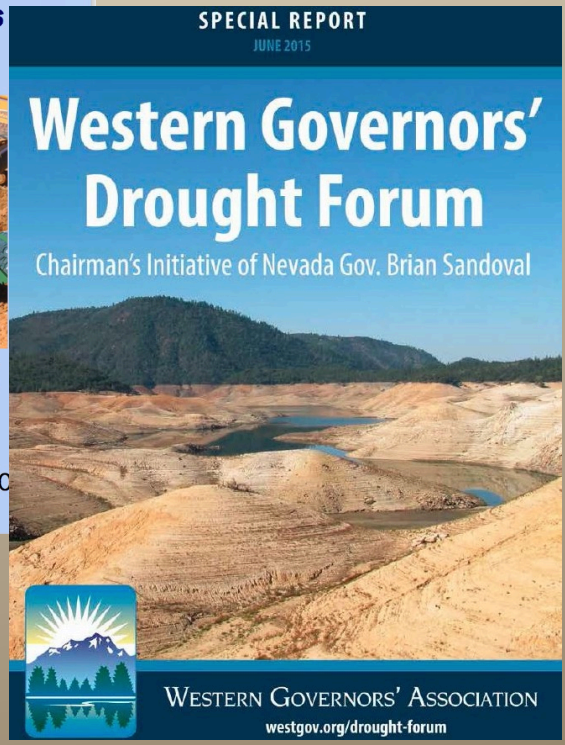
April 26, 2016
Lincoln, NE

The creation of NIDIS began with a partnership









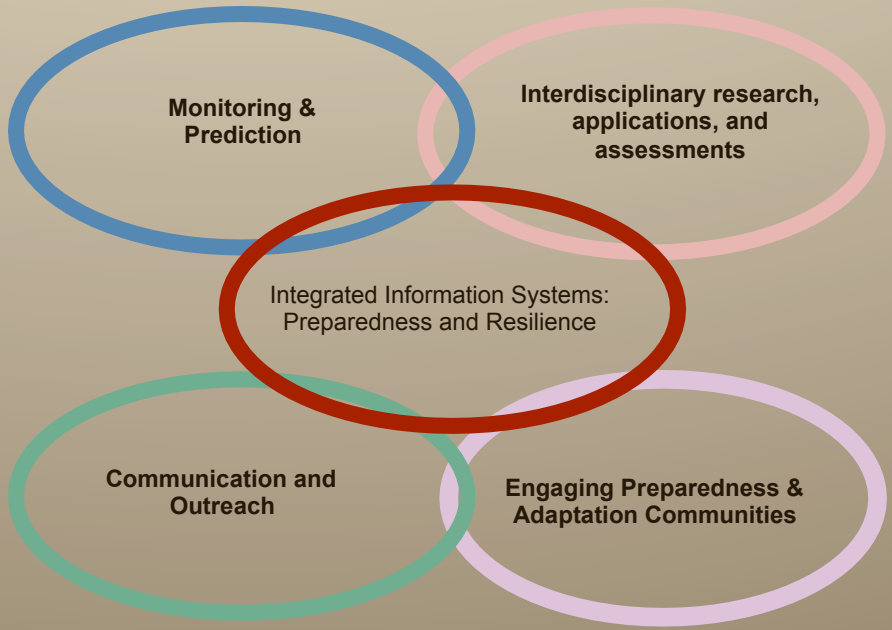
NIDIS 2014: Public Law 113-86

"Today, I signed the National Integrated Drought Information System Reauthorization Act into law.....*to help communities better prepare for droughts…, and prevent the worst impacts on families and businesses"*

March 6, 2014. President Obama

"develop and expand the Regional Drought Early Warning Information Systems"

May, 2014



NIDIS is congressionally authorized and mandated (Public Laws 109-430 and 113-86) to:

1. Provide an effective drought early warning system that:

(A) collects and integrates information on the key indicators of drought and drought impacts in order to make usable, reliable, and timely forecasts of drought, including assessments of the severity of drought conditions and impacts; and

(B) provides such information, forecasts, and assessments on both national and regional levels

NIDIS Public Laws

2. communicates drought forecasts, drought conditions, and drought impacts on an ongoing basis to decision-makers at the Federal, regional, State, tribal, and local levels of government; and the private sector

3. engenders better informed and more timely decisions thereby leading to reduced impacts and costs

4. includes timely (where possible real-time) data, information, and products that reflect local, regional, and State differences in drought conditions and

5. continues research activities relating to length, severity, and impacts of drought and the role of extreme weather events and climate variability in drought.

NIDIS Goals

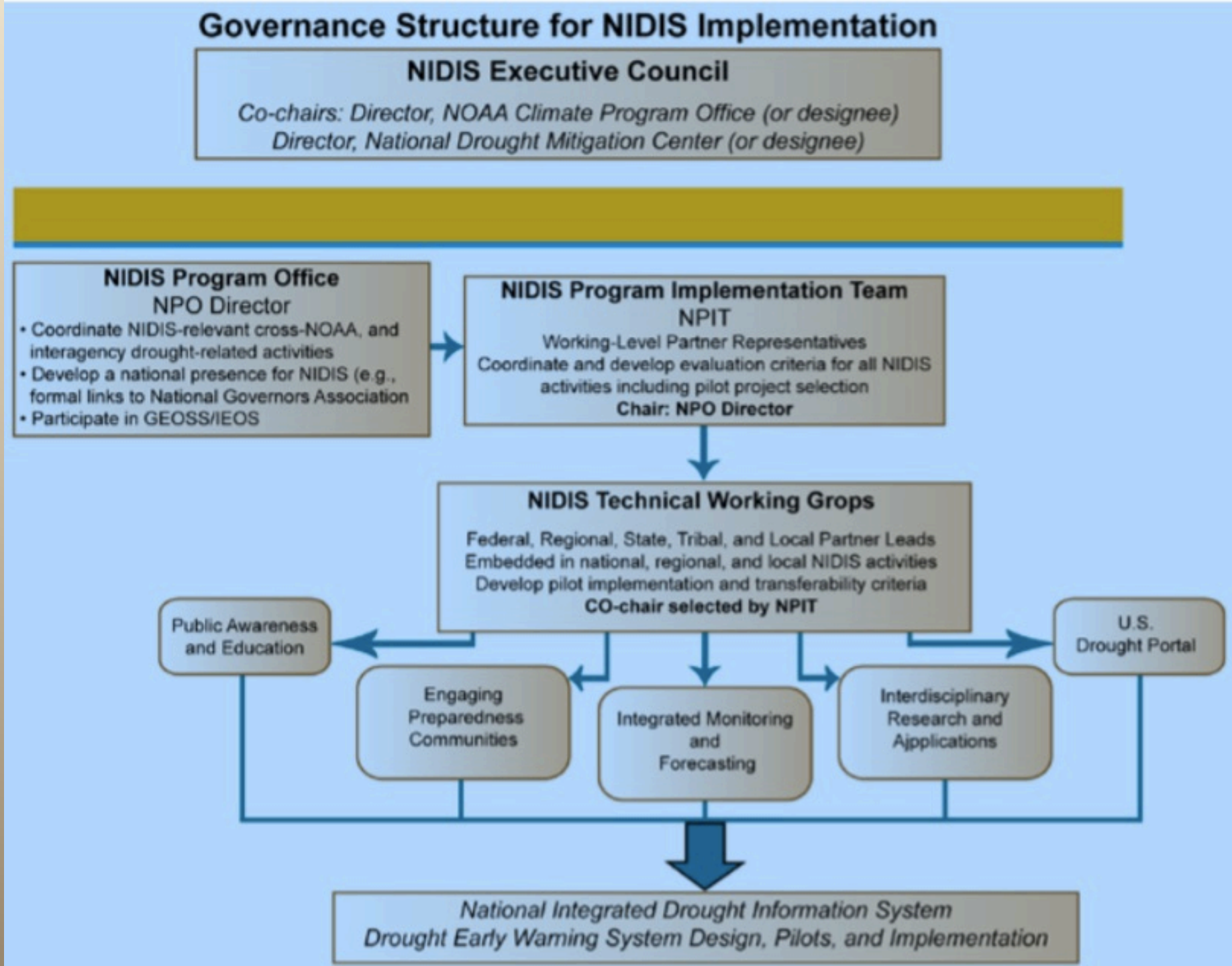
Drought information, research, education, policy and networking come together through the National Integrated Drought Information System.

- Leadership and networking among all sectors of the economy and services to monitor, forecast, plan for and cope with the impacts of drought
- Support for research on the science of drought, including indicators, impacts, risk assessment and resilience
- Creation of regional early warning systems for drought
- Developing educational resources, interactive systems, and tools to promote sound decision making, drought awareness, and response

Core Gaps & Requirements NPIT

- Physical Data System
- Accuracy
- Objective Drought Forecasts
- Triggers
- Socio-Economic Information
- Education Materials
- Communication
- Client-Oriented Tools
- Drought Outlooks/Forecasts

NIDIS Working Groups to address key gaps and requirements


Governance Structure for NIDIS Implementation
NIDIS Executive Council
Co-chairs: Director, NOAA Climate Program Office (or designee)
Director, National Drought Mitigation Center (or designee)
NIDIS Program Office
NPO Director
• Coordinate NIDIS-relevant cross-NOAA, and interagency drought-related activities
• Develop a national presence for NIDIS (e.g., formal links to National Governors Association
• Participate in GEOSS/IEOS
NIDIS Program Implementation Team
NPIT
Working-Level Partner Representatives
Coordinate and develop evaluation criteria for all NIDIS activities including pilot project selection
Chair: NPO Director
NIDIS Technical Working Grops
Federal, Regional, State, Tribal, and Local Partner Leads
Embedded in national, regional, and local NIDIS activities
Develop pilot implementation and transferability criteria
CO-chair selected by NPIT
Public Awareness and Education
Engaging Preparedness Communities
Integrated Monitoring and Forecasting
Interdisciplinary Research and Ajpplications
U.S. Drought Portal
National Integrated Drought Information System
Drought Early Warning System Design, Pilots, and Implementation

NIDIS Executive Council

- Oversight committee for NIDIS.

- Primary role is to address and assure the collaboration among federal and state agencies, including ensuring that drought activities, within each group represented complement the goals of NIDIS (Public Laws).
-
- The Council will recognize and provide guidance to federal and state agencies as needed to assure equal partnership with NOAA in implementation.

- Membership includes senior reps from the lead agencies (such as USDA, DOI, FEMA, and others) and include the Regional Governors Associations, Water Councils, River Basin Commissions, state government, private sector, and academia.

NIDIS Implementation Team

- Established on an interim basis to develop the Implementation Plan.

- Help to coordinate NIDIS activities as well as participate in implementation and governing decisions in regard to NIDIS.

- The NPIT consists of Working Groups focused around critical aspects of:
    - Drought risk management & decision support
    - Drought prediction
    - Impacts assessments & adaptation mechanisms
    - Communication

- Establish Working Groups to ensure the success of regional drought early warning systems.

NIDIS Technical Working Groups

Observations & Monitoring

NRCS, USGS
River Forecast Center, BoR
Climate *Prediction* Center
USDA

Prediction & Forecasting

Regional Drought Early Warning Systems

Interdisciplinary
Needs Assess., Research, Applications

Regional Integrated Sciences and Assessments
Regional Climate Centers
NCAR

NIDIS Implementation

Over 50 Federal, state, tribal and private sector representatives nationally

U.S. Drought Portal

NCDC
NDMC-NOAA,USGS, USDA, USBoR

Public Awareness And Education

State Climatologists, NWS-CSD
USDA Extension

Engaging Preparedness Communities

NDMC
State and Tribal Offices, RISAs
US BoR, USACE, Counties

Table 2. NIDIS Implementation Milestones (*FY 2007 – FY 2013, by year*)

#	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 Interbasin Watershed Commission							
5	Operational workshops to assess national drought monitoring and forecasting gaps							

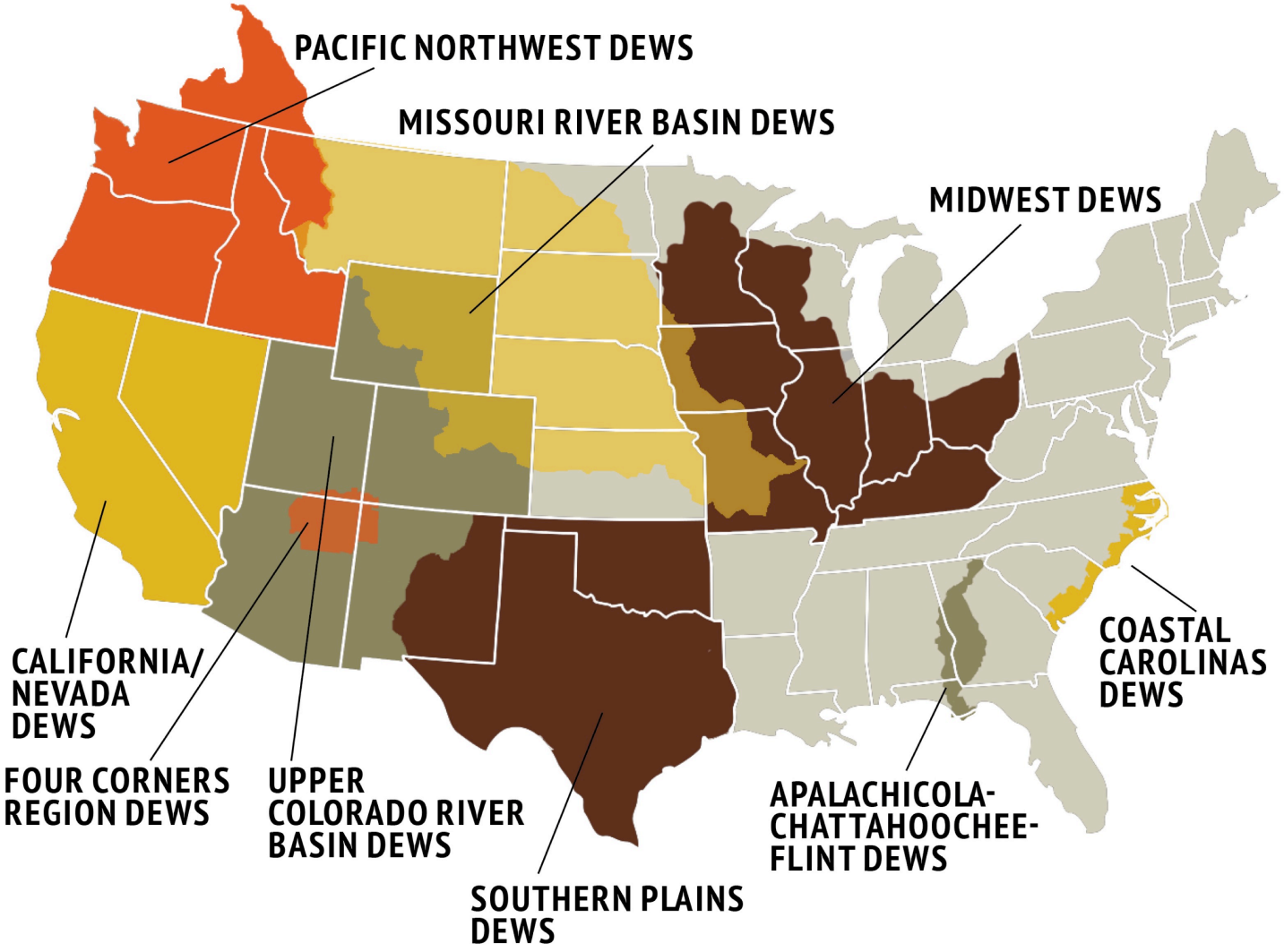
Activity Legend:

1. *U.S. Drought Portal*: Development and tailoring
2. *Climate Test Beds*: Integrating data and enhanced predictions
3. *Coping with Drought*: Integrated research and applications, Engaging preparedness communities, Education and Public Awareness
4. *NIDIS Pilots*: Early Warning System design and implementation in selected locations
5. *NIDIS Program Office*

What is a NIDIS Drought Early Warning System?

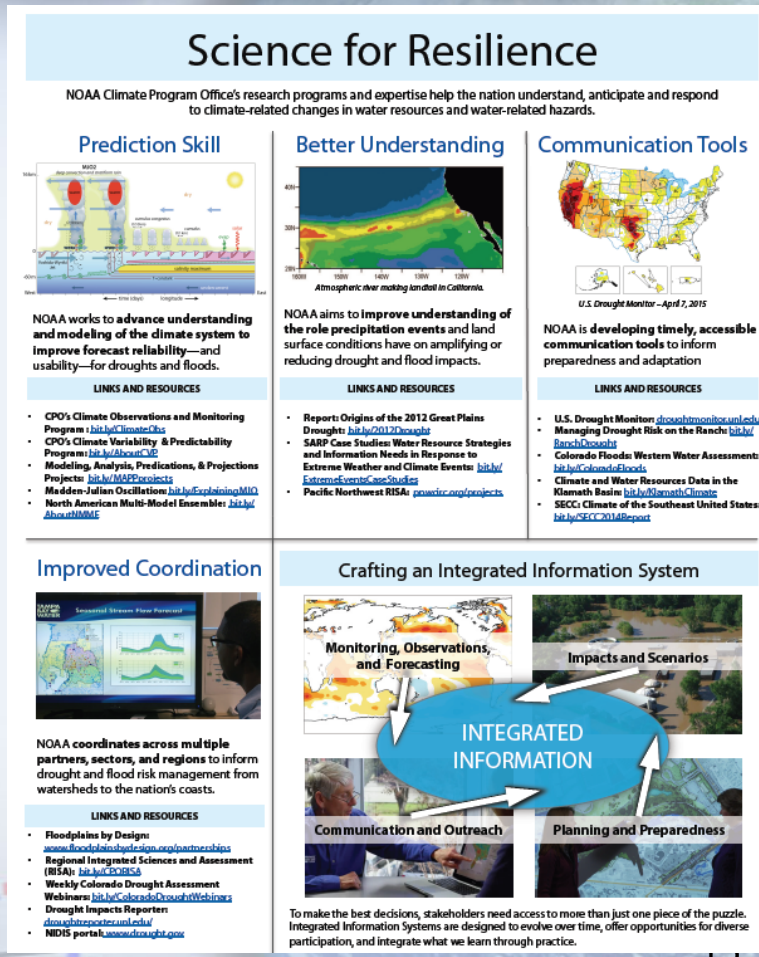
A DEWS utilizes new and existing partner networks to optimize the expertise of a wide range of federal, tribal, state, local and academic partners in order to make climate and drought science and impact data readily available, easily understandable and usable for decision makers; and to improve the capacity of stakeholders and economic sectors to better monitor, forecast, plan for and cope with the impacts of drought at all spatial and time scales.

NIDIS Drought Early Warning Systems



From Risk to Resilience:
Research-based Integrated Information Systems

- Develop and coordinate partnerships: networks of practitioners public-private: map decision-making arrangements
- Advance earth system observations and prediction capabilities
  - Construct risk profiles: the role of rates of change in trends, frequency, and magnitude of extremes at different scales
- Capacity and Coordination: Integrate Research, Observations, and Assessments into early warning information on critical transitions and capacity for response
- **Overcoming impediments**
  - **Do this for a long time**

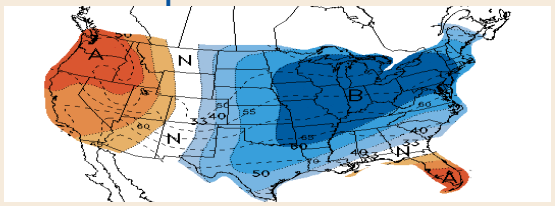


Define Demand

NOAA sustains engagement between climate and public health communities to **identify needs, develop solutions, and inform decisions**.

- **RISA and Heat Health**
  - **In New York City:** www.CCRUN.org
  - **In North Carolina:** www.CISA.SC.edu
  - **In Arizona:** www.CLIMAS.arizona.edu
- **CDC Climate and Health Program:** www.CDC.gov/climateandhealth

Improve Forecasts



NOAA works to **improve current heat forecasts** based on user need and to extend heat projections from weeks to months and beyond.

- **Climate Variability & Predictability Program (CVP):** bit.ly/AboutCVP
- **Modeling, Analysis, Predictions, & Projections Program (MAPP):** bit.ly/MAPPprojects
- **Madden-Julian Oscillation:** bit.ly/MJOandTemp
- **Climate Prediction Center Temperature Outlooks:** www.CPC.NCEP.NOAA.gov

Observe & Monitor

NOAA works to sustain observations that support **improved understanding of the role of climate on extreme heat** and enhance operational efforts.

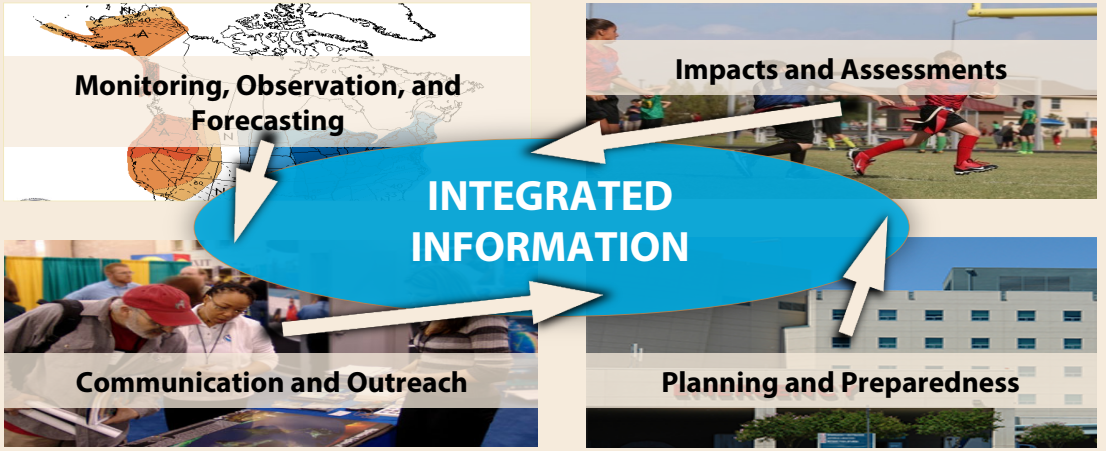
- **Climate Observations and Monitoring (COM):** bit.ly/ClimateObs
- **CDC National Environmental Public Health Tracking Program:** bit.ly/CDC-NEHTP

Understand & Communicate

NOAA research **enhances understanding** and impact of extreme heat events across time scales, **builds capacity** across climate and public health communities, and develops timely and accessible communication tools **to inform preparedness and adaptation**.

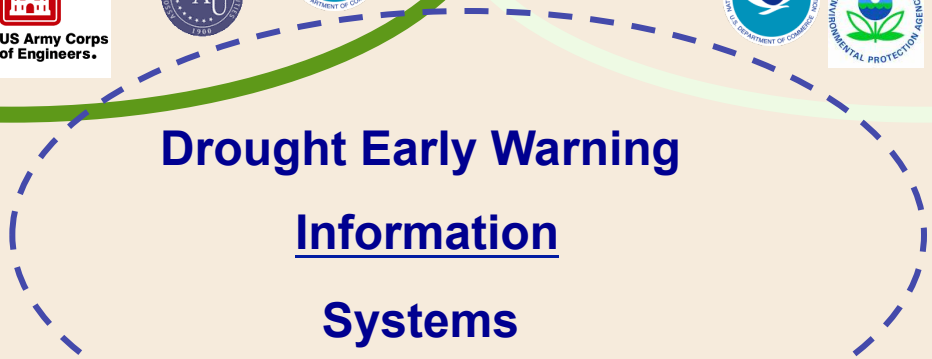
- **U.S. Climate Resilience Toolkit and Human Health:** toolkit.climate.gov/topics/human-health
- **Regional Integrated Sciences and Assessment (RISA):** bit.ly/CPORISA
- **Coastal and Ocean Climate Applications Program (COCA):** bit.ly/CPO-COCA

Crafting an integrated information system



To make the best decisions, stakeholders need access to more than just one piece of the puzzle. Integrated Information Systems are designed to evolve over time, offer opportunities for diverse participation, and integrate what we learn through practice.

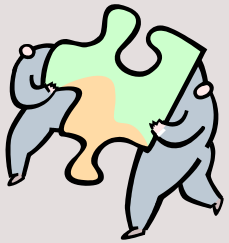
NIDIS Partnerships (Federal, States, Tribes, Private)



Moving Beyond Impact Assessments (and Reports)

Integrated Climate, Ecosystems, Hydrology:Technical Info & Data

+



Watershed, state, tribal, local: Experience & Knowledge

=

Decision Support

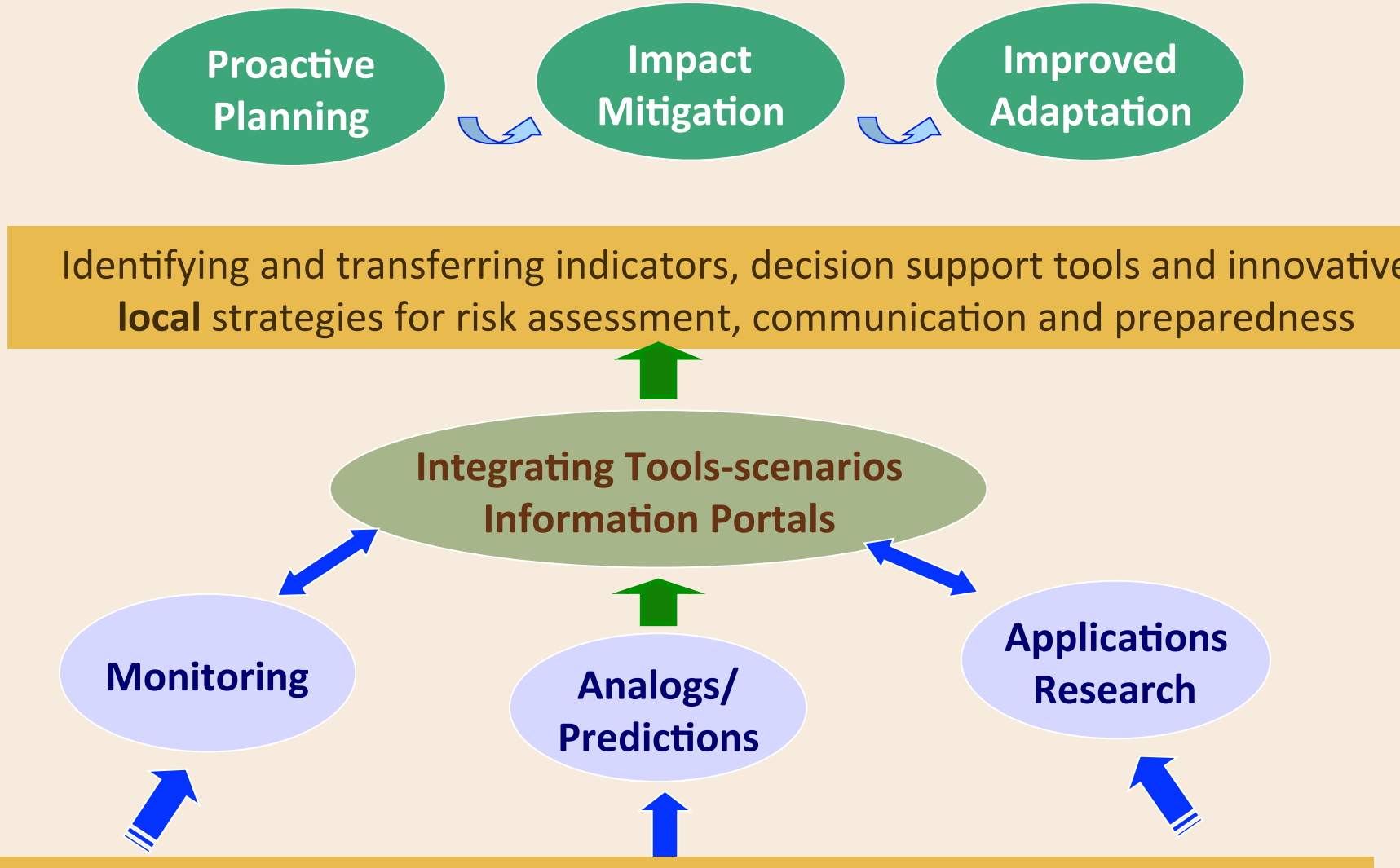
Climate information: Needs,usability,evaluation

Entry points for proactive Planning-triggers and indicators

Enabling adaptation:

Best available drought risk & water supply information Input to drought planning, preparedness and adaptation

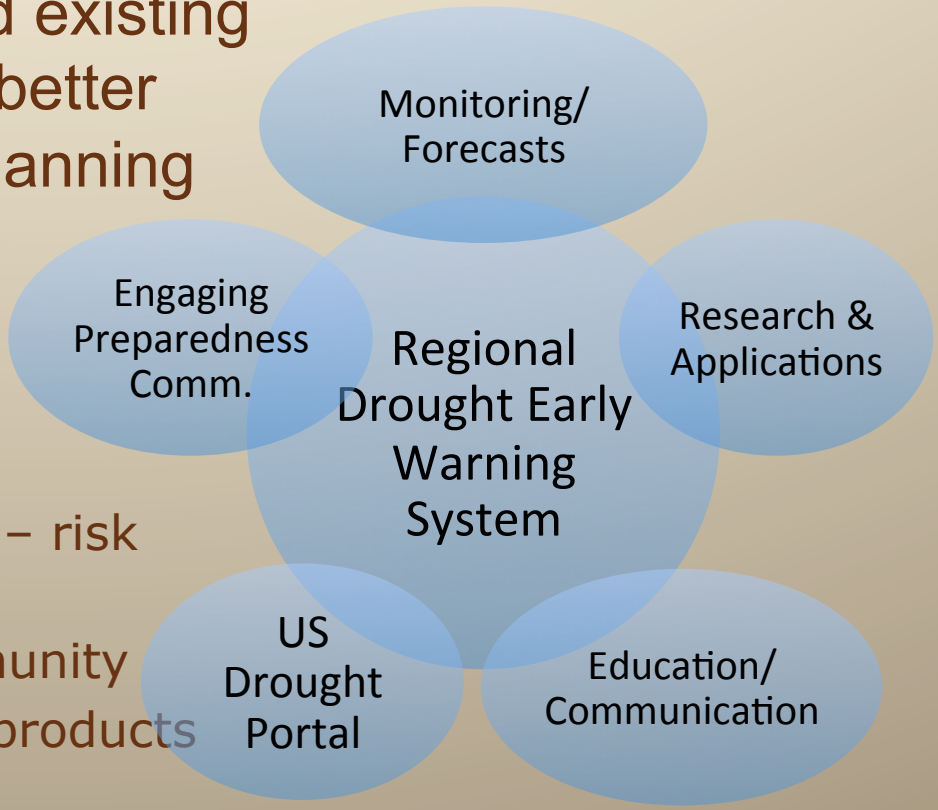
NIDIS REGIONAL INFORMATION MANAGEMENT MODEL



Regional Drought Early Warning Systems (DEWS)

Working with communities and existing networks to build capacity for better decision making for drought planning and mitigation.

- Drought assessments
- Climate outlook forums
- Education and outreach webinars – risk management
- Engaging the preparedness community
- Builds capacity to utilize existing products



Year 1: Scoping the Drought Early Warning Information System	Year 2. Implementation of the Drought Early Warning System (seasonal, multi-year, longer term trends):
Gap analyses: What information exists and how is it being coordinated and used? Characterize and communicate risks across timescales-with existing information for 2-3 critical issues	**Develop drought sub-portals** **Embed information into preparedness and adaptation plans** **Establish network for ongoing briefings on impacts and projections across climate timescales**
Develop subteams to assess (1) Monitoring and forecasting; (2) Impact indicators and triggers (3) Preparedness and education: Assemble drought-sensitive planning indicators and management triggers database; Assess present drought information coordination partnerships and processes Identify Federal and state-level partnerships, decision support tools and actions needed (to improve information development, coordination and flow for preparedness and risk reduction) *Develop an operational plan for designing and implementing an EWS process*	**Initiate development of a region or basin specific Drought Information Monitor and Portal (as a subset of the U.S. Drought Portal)** Develop decision support tools for demand projections and revise triggering criteria Prototyping: **Given better data and information coordination would responses have been improved for past events? Assess (1) value of improved information using past conditions, (2) responses for projections/ scenarios (decadal, climate change), (3) feedback on priorities (e.g. data gaps) to Executive Council.** Feedback into regional Drought Monitor and Portal. Early Warning System maintenance (Fed-state-tribal) and transfer to other sub-basins

Examples of DEWS Activities

- **Upper Colorado River Basin**
  - Snowpack monitoring workshops in CO, UT and WY
  - Monthly/biweekly webinars
  - Capacity development on the Wind River Reservation to support drought planning decision support tools

- **Four Corners/Tribal Lands**
  - Effort to increase monitoring capacity using CoCoRaHS by USDA, NWS and Colorado Climate Center
  - University of Arizona (supported by NOAA SARP/NIDIS) is working with Hopi Dept. of Natural Resources to develop a drought status-monitoring program

- **California**
  - Drought/ENSO outlooks and outreach
  - Sub-regional focus on research and activities

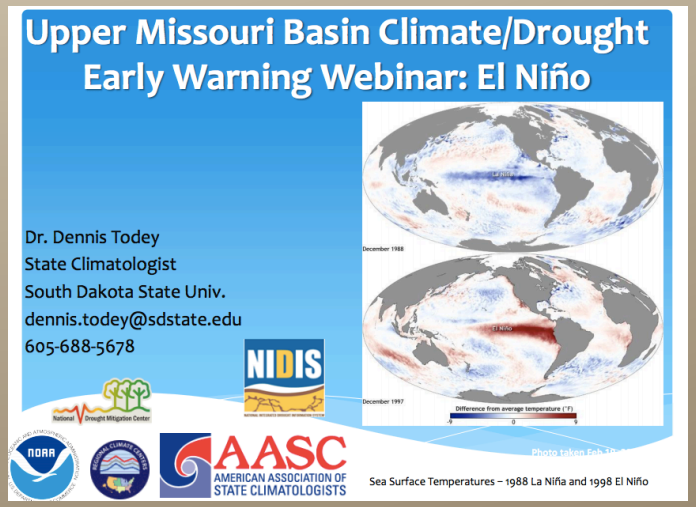
Examples of DEWS Activities

- **Southern Plains**
  - Texas and Oklahoma Inter-agency Climate Extremes Workshop
  - San Antonio Multi-Hazard Tournament

- **Apalachicola-Chattahoochi-Flint (ACF) Basin**
  - Series of sub-regional workshops and one basin-wide workshop
  - Monthly webinar series

- **Coastal Carolinas**
  - CoCoRaHS Citizen Science Conditions Monitoring project
  - Coastal Drought Index

- **Missouri River Basin**
  - Tribal capacity building for drought plans, vulnerability assessment, leveraging federal resources
  - Monthly webinar series



Public Law 113-86 – NIDIS Report to Congress

- An analysis of the implementation of NIDIS, including how the information, forecasts, and assessments are utilized in drought policy planning and response activities
- Specific plans for continued development of such program, including future milestones
- An identification of research, monitoring, and forecasting needs to enhance the predictive capability of drought early warnings that include:
  - the length and severity of droughts
  - the contribution of weather events to reducing the severity or ending drought conditions
  - regionally specific drought impacts

Key issues addressed in Report

- How drought affected the Nation since 2006
- NIDIS partnerships & collaboration
- Core NIDIS activities
  - Regional DEWS
  - Integrating Monitoring & Predictions
  - Research for Coping with Drought
  - The U.S. Drought Portal – drought.gov
- How NIDIS informs drought planning & response
  - Benefits of the regional DEWS
  - The U.S. Drought Monitor
  - Building a coordinated National Soil Moisture Monitoring Network

Key issues addressed in Report

- Future developments and milestones
  - Improving the prediction of drought onset, length, and severity
  - Understanding & enhancing predictions of regionally specific drought impacts
  - Establishing the Drought Risk Management Research Center (DRMRC)

- Implementing the National Integrated Drought Early Warning System – page 16 – Near and long term activities and actions called for in the NIDIS Reauthorization Public Law

Thank You


NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE


NIDIS