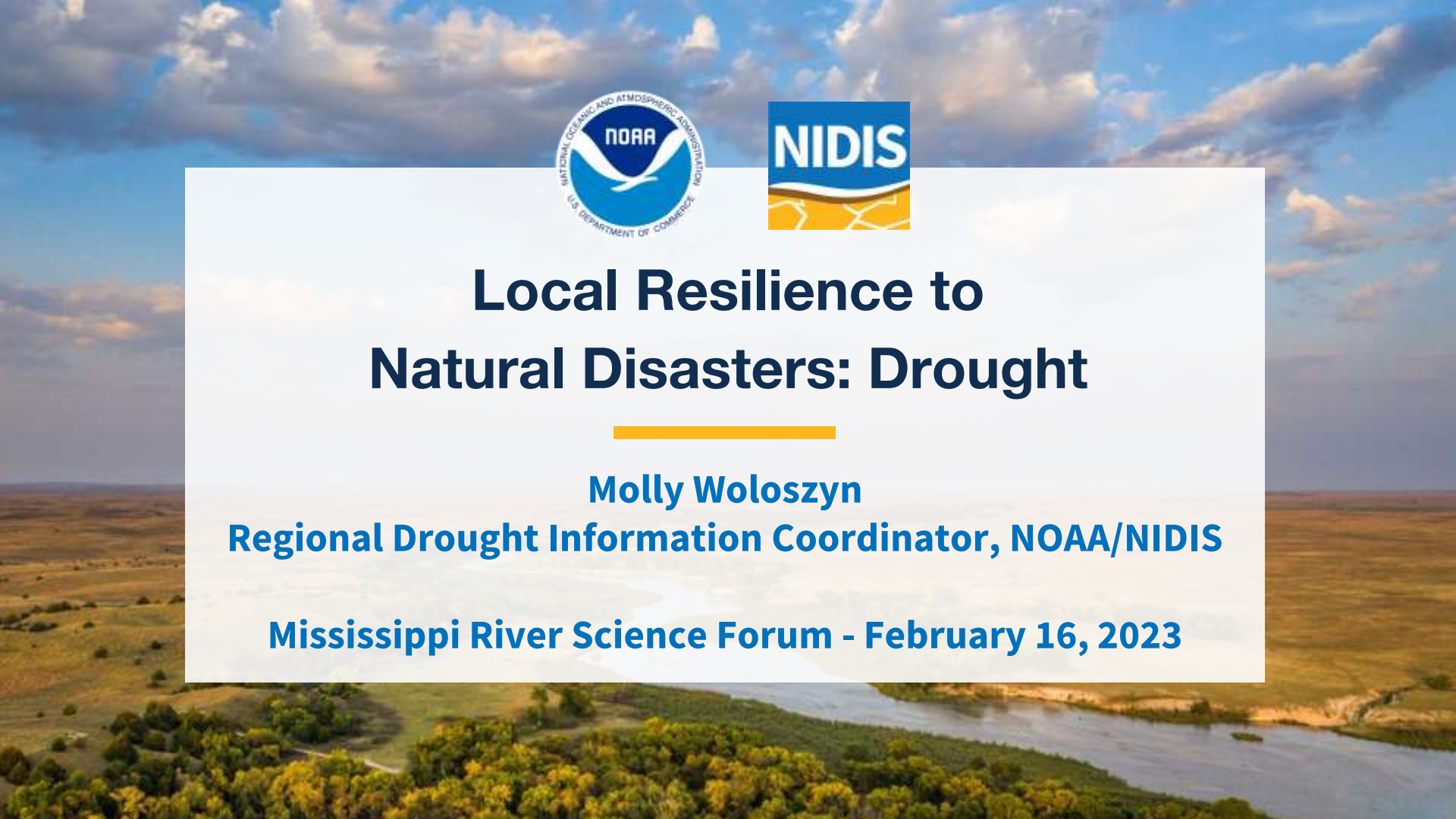


Local Resilience to Natural Disasters: Drought

Molly Woloszyn
Regional Drought Information Coordinator, NOAA/NIDIS

Mississippi River Science Forum - February 16, 2023

Overview of Presentation

- **Drought in the Mississippi River Basin**
- **National Integrated Drought Information System (NIDIS)**
- **Stakeholder-Identified Gaps/Needs**
- **Future Direction**

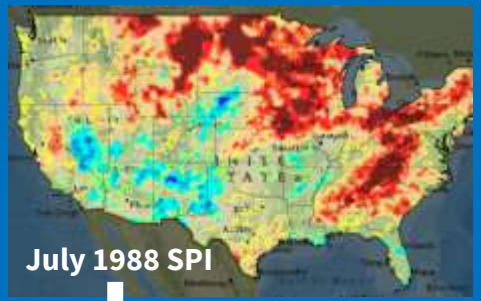
Mississippi River on October 30, 2022 near Memphis, TN

Drought in the Mississippi River Basin

Cascading impacts:
navigation, agriculture, ecosystems, etc.

To understand the impact of drought on the Mississippi River, drought across the entire Mississippi River Basin needs to be understood

Drought in the Mississippi River Basin

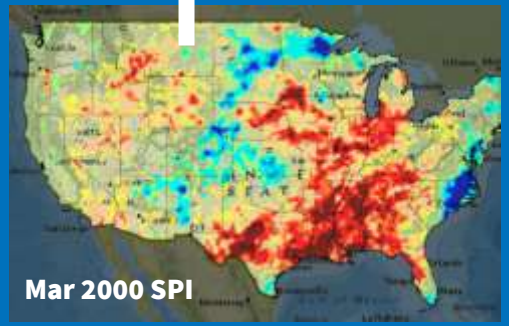


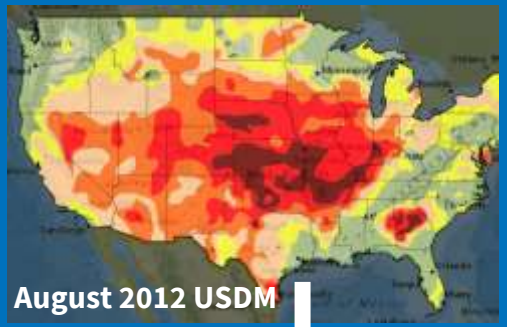
1988

Record lows halted barge traffic; $1 billion total losses to barging industry

2000

4th lowest water level on record at Memphis



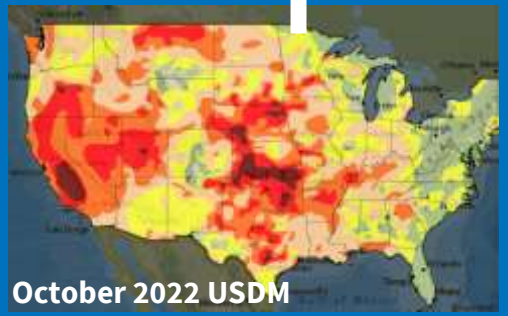


2012

Three closures of MS River; $35 billion losses for U.S.

2022

Several closures on Lower Miss at key time (harvest)



National Integrated Drought Information System

- Act of 2006 (Public Law 109-430) prescribed an interagency approach for drought early warning to help states and local communities cope with the impacts of drought.
- Multi-agency partnership that coordinates drought monitoring, forecasting, planning and information at federal, tribal, state, and local levels across the country.

@DroughtGov

Drought Early Warning Systems (DEWS)

Key Gaps: Monitoring/Observation

- **Increase observational data to improve drought monitoring (and prediction)**
  - In situ data: soil moisture, precipitation
  - Explore satellite/modeled data as well
  - Real-time evapotranspiration data, compared to normal

- **Increase access to drought impact data**
  - More condition monitoring reporting from on-the-ground
  - Identify new sources of drought impact data (e.g., state datasets) for drought assessments and planning

Pilot: Upper Missouri River Basin Soil Moisture and Snowpack Build-Out

- +540 stations
- Improve weather forecasting
- Enhance National Water Model, U.S. Drought Monitor

Key Gaps: Prediction/Forecasting

- **Improve drought forecasts and prediction products** to provide more meaningful and reliable information to manage risk at different scales and sectors.
  - Identify and support research targeted towards…
    - Improving representation of land-atmosphere interactions in models
    - Identifying new sources of predictability for drought

- **Incorporate low-flow information** into federal operational water prediction resources **(e.g., National Water Model** - NOAA/USGS).

- **Improve the visualization and understanding** of drought forecast products.

- **Improve understanding of future drought trends** to assist with decision-making at longer planning scales.

Key Gaps: Research/Applications

- **Build a comprehensive understanding of drought indicators to demonstrate their value, limitations, and sector-specific, seasonal and geographic applications.**

- **Support research to better understand the characteristics, predictability, and risk of future drought in the Mississippi River Basin.**
  - **Short- and long-term drought risk**
  - **Rapid transitions between precip extremes (e.g., too much to too little)**
  - **Flash drought (e.g., rapid onset drought)**

- **Specific need to better understand ecological drought in the Basin.**

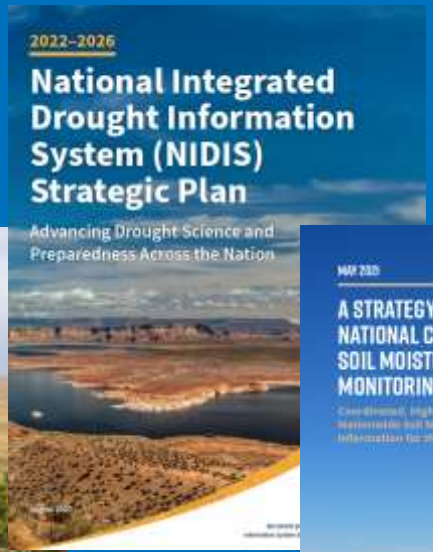
Key Gaps: Planning/Preparedness

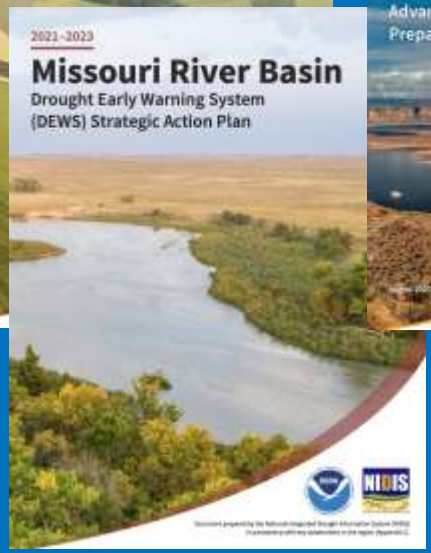
- Increase understanding of drought vulnerability and its impacts across the region and sectors.
  - Economic assessment for the Mississippi River corridor on the impact of drought on the river system and global trade market.
  - Evaluate the economic impact of both short- and long-term droughts in the Midwest.
  - Develop a risk atlas for water systems across the region to identify areas more vulnerable to drought due to various factors (e.g., water source, soil type)
- Support strategic interstate cooperation for watershed management in the Mississippi River.
- Identify effective drought mitigation and response actions to incorporate into drought/water/hazard mitigation plans, including cost-benefit analysis of actions.
- Identify water management strategies that provide mitigation for multiple hazards.

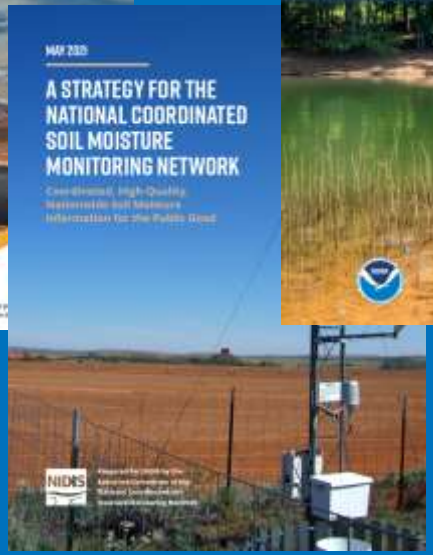
Key Gaps: Communication/Outreach

- Increase understanding of decision points for the navigation sector to ensure drought products and information are aligned to the needs of the navigation sector.
- Utilize Drought.gov as a resource to share drought data, information, best practices, lessons learned, etc.
- Increase outreach with the general public on drought education, awareness, and response actions.
- Increase communication of resources and information to stakeholders when drought is active in the region.
- Provide training opportunities on key drought tools and products for the region.

Sources of Information for Key Gaps & Future Direction







Keys to the River Report
Tools and A Vision for Long Term Planning for Managing Floods, Drought and Sediment

UMRBA

Thank You!

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National Integrated Drought Information System