

Comprehensive Monitoring System for the Mississippi River Basin

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The Nature
Conservancy





Our Mission

To conserve the lands and waters on which all life depends

Our Team



3,600
conservationists

1,300
prominent
volunteer leaders

72
countries

400
scientists

A FAR-REACHING ALUMNI NETWORK
of leaders in the
conservation
community

50
U.S. states

1 MILLION
dedicated members

Risks to the Basin



- Increased frequency and intensity of weather and climate extremes, impacts to infrastructure and communities
- Health hazards to people and wildlife from nitrogen and phosphorus runoff
- Invasive species that displace native species
- Loss of natural coastal wetlands
- Inadequate navigation data



The Question

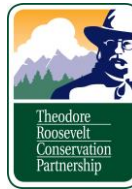
Is the current monitoring system in the Mississippi River Basin adequate to determine levels of risk and the effects of actions to mitigate those risks?

Building a Coalition for Action

Purpose

Speak as a unified voice and acquire the support and public funding necessary to meet monitoring goal for the MRB

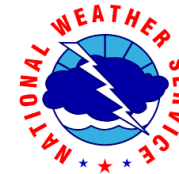
- Spring 2021: Built and launched the coalition
- Fall 2022: Technical coalition members designed the system and identified cost
- Spring 2023 to Present: Advocating for funding



BIG RIVER COALITION



US Army Corps of Engineers®



The National Academies of SCIENCES ENGINEERING MEDICINE
GULF RESEARCH PROGRAM



MISSOURI DEPARTMENT OF NATURAL RESOURCES



LMRCC LOWER MISSISSIPPI RIVER CONSERVATION COMMITTEE



ADEQ ARKANSAS DEPARTMENT OF ENVIRONMENTAL QUALITY



Priorities determined by the Coalition

Leverage systems in place and available funding

Water Quality & Hypoxia

Flood Risk Management & Resilience

Navigation safety

Ecosystems and Habitat Quality

Technical Design Elements



Accessible, efficient, equitable



Multi-use, scalable, modular



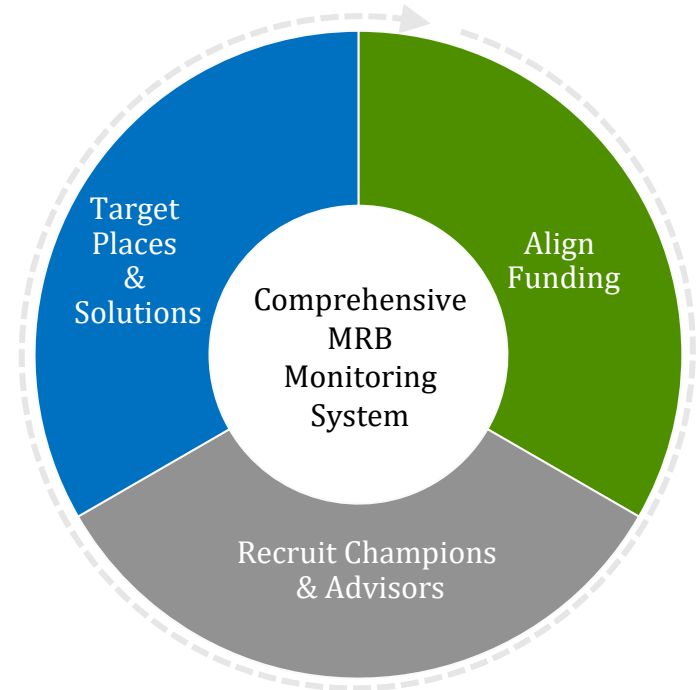
Real-time data, trends analysis,
integrated reporting



A fully-funded sentinel monitoring system across the Mississippi River in the next five years.

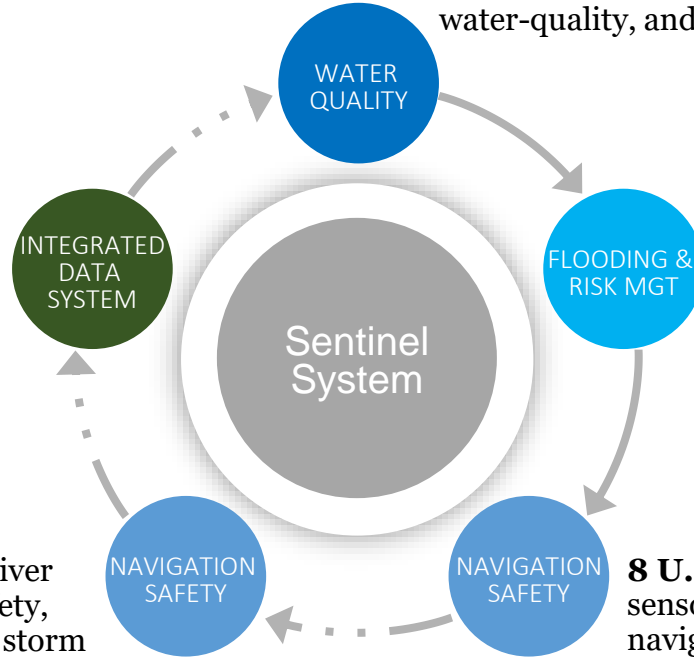
Objectives

1. Obtain consistent, comparable information on loads and trends in streamflow, water-quality, and sediment to understand how changes in climate, land-use, and landscape management affect the Mississippi River, major tributaries, and the Gulf of Mexico.
2. Provide real-time information to guide decisions on flood risk management and resilience, navigation safety, and diversions on the Mississippi River.
3. Develop interfaces to provide transparent and timely data to the public.



Design at a Glance

Timely, consistent data that meets the needs of multiple users.



38 U.S. Geologic Survey stations along the Mississippi River mainstem and major tributaries that monitor streamflow, water-quality, and sediment.

1,414 U.S. Army Corps of Engineers stations and gages within the Corps' 10 districts responsible for monitoring flooding and navigation along the Mississippi River mainstem and major tributaries.

12 National Oceanic and Atmospheric Administration stations in the Lower Mississippi River Basin that support navigational safety, coastal resource management, and storm flood forecasting.

8 U.S. Geologic Survey CODAR sensors for monitoring high priority navigation points along the Mississippi River mainstem and major tributaries.

Objective 1: Water Flow, Quality & Sediment

Parameters: Stage, Flow, Velocity, Nitrate probe, Nutrient Samples, Suspended sediment, bed material, sand breakdown & bedload samples, pH, Temp, SC, DO, Turbidity



- Priority sites at every 5% of the maximum load
- USGS: 35 existing sites, gage and infrastructure upgrades + 3 new sites
- Year One Startup Cost: \$7.55 M (new funds)
- Total 25-year cost: \$313 M

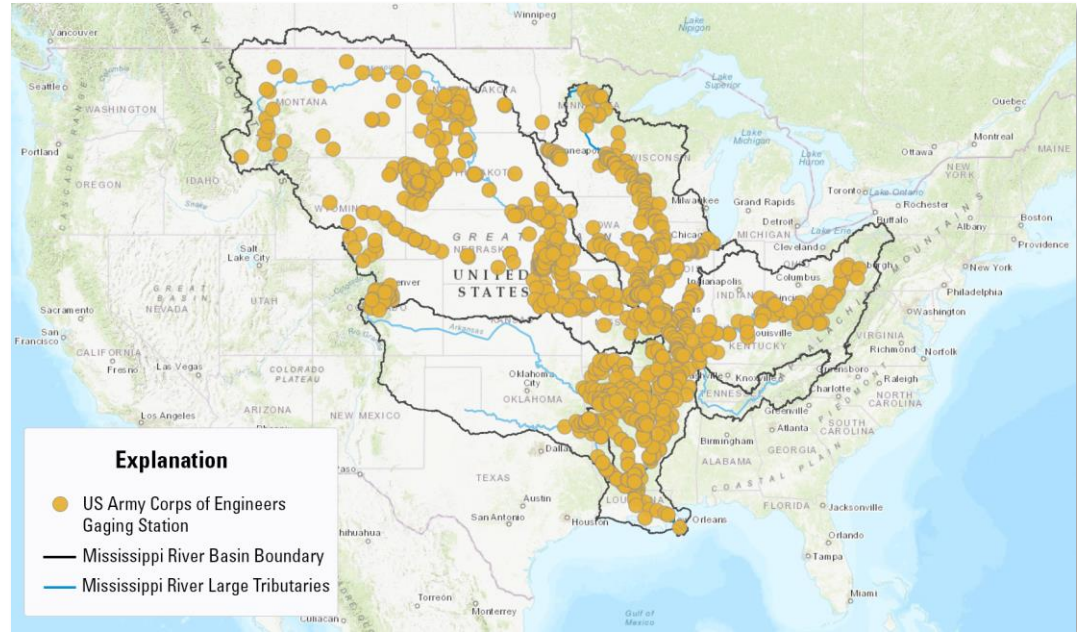


Objective 2: Flood Risk Management & Resilience

Flow and Q gages for flood modeling and navigation safety



- Priority sites identified by USACE experts and NWS flood modelers.
- USACE: 1,414 existing flow and Q gages along major tributaries and the Mississippi Mainstem
- Year 1 Cost: \$17.5 M (currently funded)
- Total 25-year cost: \$675 M



Objective 2: Navigational Safety

CODAR systems, Air gap sensor systems, Flow gages

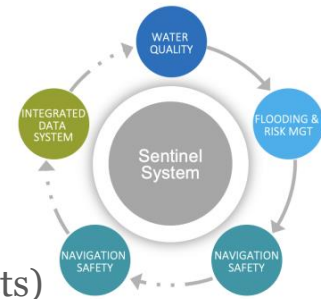


- Site needs identified from USGS and Big River Coalition proposals.
- Priority sites add to existing air gap station network already in place.
- USGS – 8 new CODAR systems at key navigational choke points.
- NOAA Ports System (lowermost river) – 3 new air gap gages and 6 new current meters at key bridges.
- Year One Startup Cost: \$2.4 M (new funds)
- Total 25-year cost: \$26 M



Objective 3: Data Interfaces

- Publicly accessible, supports multiple users
- Built by USGS Wetlands and Aquatic Research center
- Input data from multiple federal agencies
- Provides key data products (maps, charts, graphs, key stakeholders design key data products)
- All data must be collected and displayed to the USGS data standard



- Actual design will be done through a stakeholder process
- System will support machine (e.g., models) and human users.
- Year 1 Start-up Cost: \$7.4 M
- Periodic update cost: \$4 M (every 6-7 years)
- Total 25-year cost: \$117 M



Estimated Cost at a Glance




Year 1:

- Cost to operate and maintain the current piecemeal system: \$20 M
- Additional investment needed to build the sentinel system: \$23.4 M

25 years:

- Cost to operate and maintain the current system: \$771.4 M
- Total development and O&M cost for a sentinel system: \$1.13 B

Investing another \$358.8 M over 25 years will create an integrated monitoring system that meets quality standards and provides timely, readily accessible data to multiple public users.



What We Need...

1. Funding to build the system.
2. Funding to maintain the system over 25 years.
3. An accountable process to ensure funds allocated to the Sentinel System go to priority needs.

Thank you!
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Link: to Comprehensive Monitoring Initiative Technical Design reports:
<https://tnc.box.com/s/8lvpqrdtajtdjxha5nwo6scm521la8bw>

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