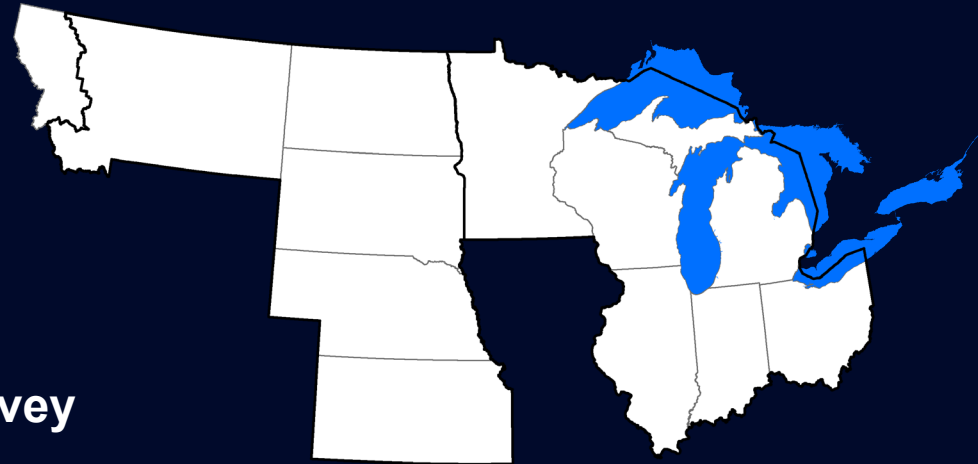




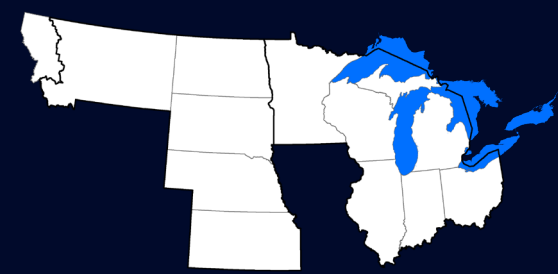
# U.S. Geological Survey (USGS) Mid-Continent Drought Update

**October 13, 2022**

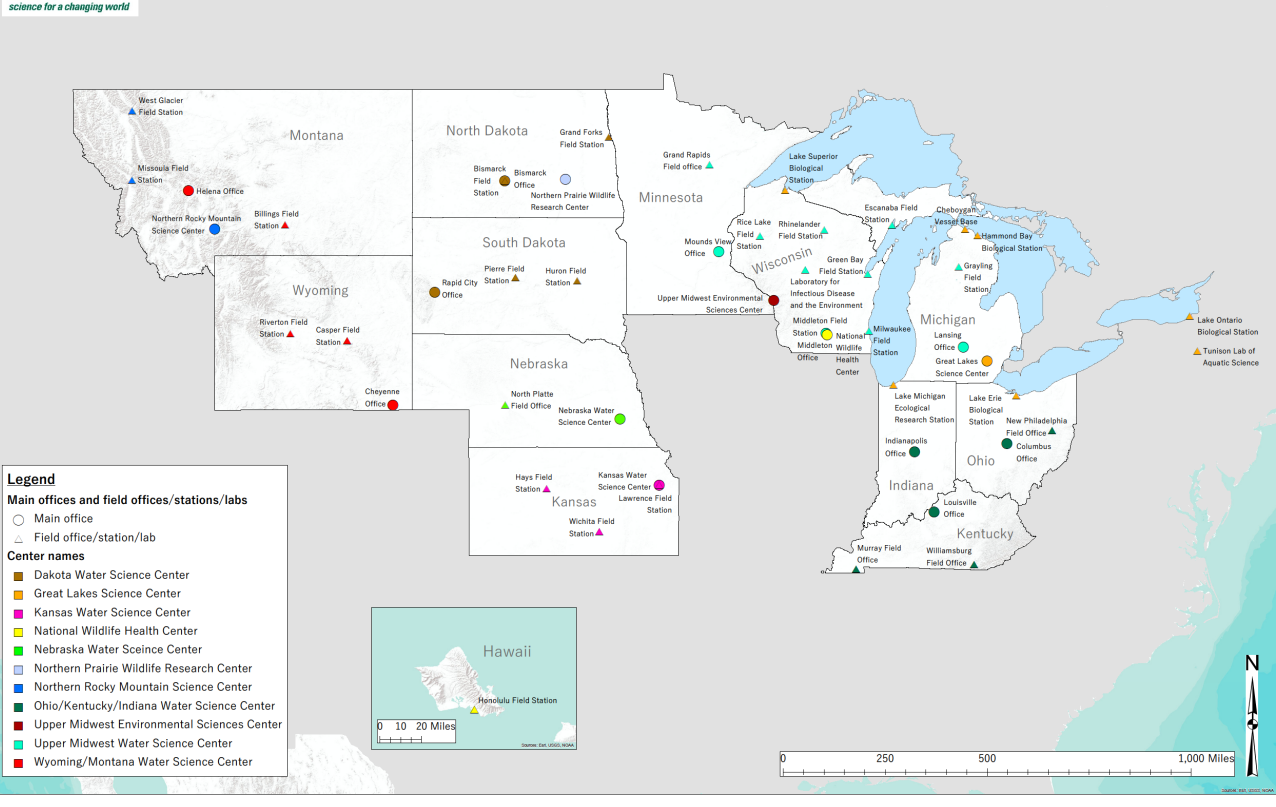
**Chris Hobza**  
Lead Hydrologist, Nebraska Water  
Science Center, U.S. Geological Survey



# Regional Overview



USGS Mid-Continent Region Main Office and Field Office Locations



11 Centers  
(6 WSC and 5 ECO) – 4 of the 6 WSCs are merged centers

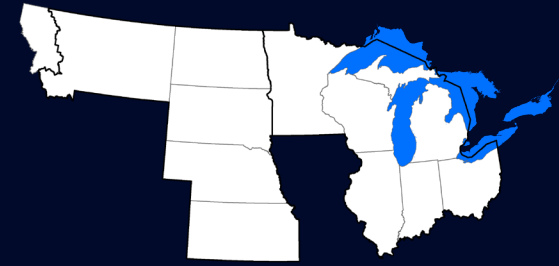
35 field stations

13 states

~1,000 employees

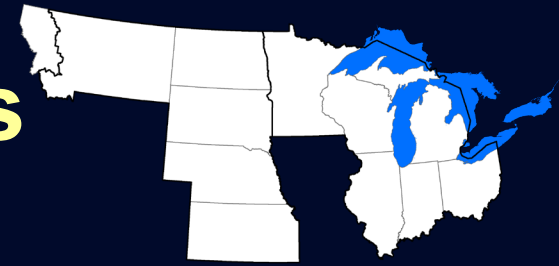


# Regional Science



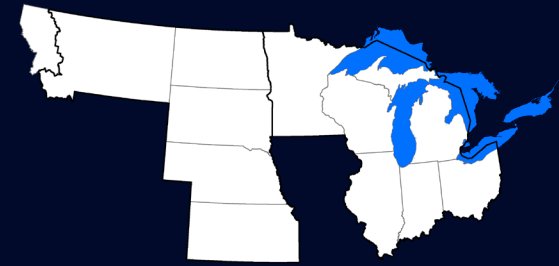
- **Interagency and local coordination**
- **Monitoring and modeling**
- **Ecosystem health and effects on habitats**

# Regional Drought Activities



- **Interagency and local coordination (examples)**
  - **WY-MT WSC presenting streamflow data to the Montana Governors Drought and Water Supply Advisory Committee**
  - **WY-MT WSC presenting streamflow data at Wyoming Drought Committee monthly meetings**
  - **NEWSC collecting additional low-flow measurements at state-line gages for Blue River Compact (NE-KS) and Republican River Compact (NE-KS-CO)**

# Monitoring and modeling



- Hydrologic Imagery Visualization and Information System (HIVIS)
  - Example Platte River near Columbus, Nebr.

A screenshot of the HIVIS Dashboard. The top left features the USGS logo with the tagline "science for a changing world". The top right says "HIVIS Dashboard" and "Hydrologic Imagery Visualization and Information System". Below the header is a search bar with "457 Cameras" and a "Filter Cameras" dropdown set to "State". A map of the United States shows numerous camera locations marked with blue and green pins. Below the map is a list of camera feeds with thumbnails and titles: "Yahara River at McFarland GATES", "KK11th", "Green Bay Oil Depot", and "Mantowoc River at Mantowoc". A URL <https://apps.usgs.gov/hivis/> is displayed in red text below the map.

USGS 412403097171001 Platte River ab Loup Power Canal nr Columbus, Nebr viewing downstream (southeast) 2022-05-01T14:26:10-0500

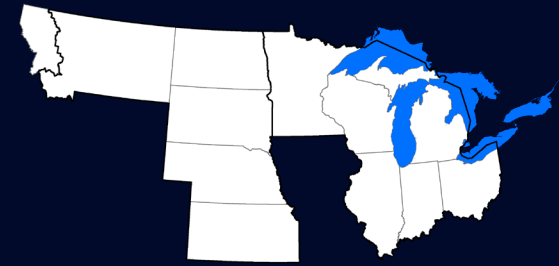
May 1, 2022



USGS 412403097171001 Platte River ab Loup Power Canal nr Columbus, Nebr viewing downstream (southeast) 2022-08-08T14:25:13-0500

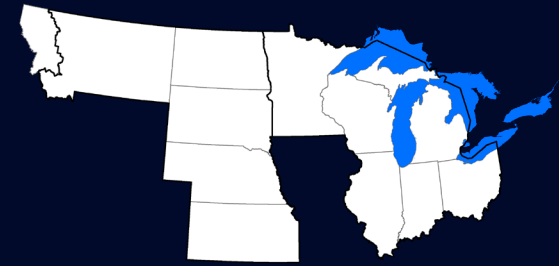
August 8, 2022

# Monitoring and modeling



- **WY-MT WSC is involved in the Data-Driven Drought Prediction Project:**
  - **Model streamflow drought using random forest and long short-term memory neural network approaches for gaged watersheds**
  - **Develop a national operational model that provides predictions of streamflow drought onset, duration, severity for gaged locations**

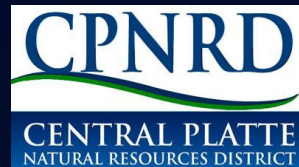
# Monitoring and modeling



- **Central Platte Natural Resources District  
Integrated Hydrologic Model Study**

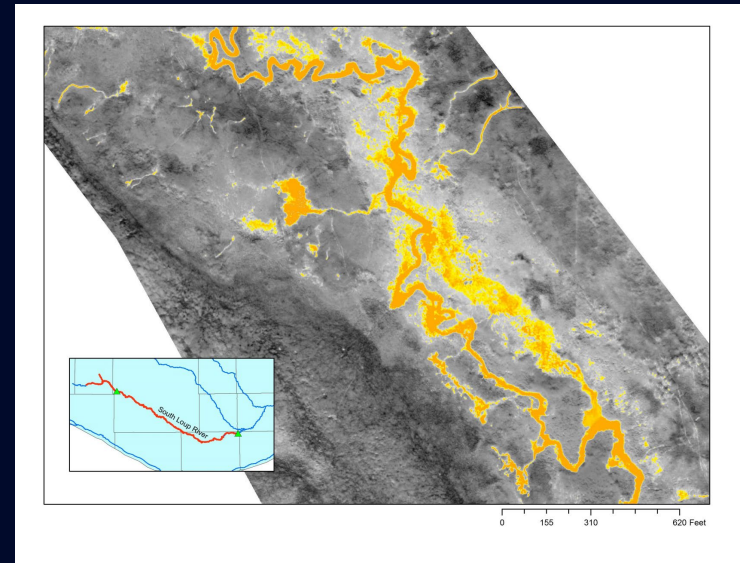


How would **future droughts and irrigation management decisions** affect **groundwater-levels** in the Central Platte Natural Resource District?



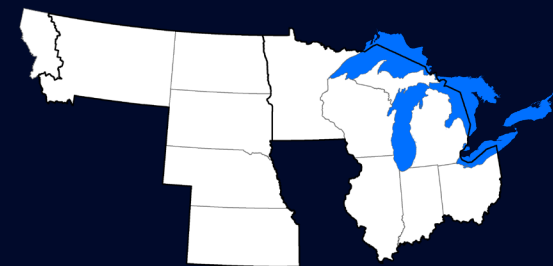
# Monitoring and modeling

- **Drought resilience of the South Loup River, Nebraska**
  - Age of groundwater discharge was determined from mapped springs along the South Loup River
  - Reaches sustained by older base flow more resilient to drought as year-to-year changes in precipitation dampened
  - Information used by Upper and Loup Loup Natural Resources who conjunctively manage water resources in basin





# Ecosystem health and effects on habitats



- **Northern Prairie Wildlife Research Center:**
  - Using data from GPS-marked whooping cranes, 2010–2022, to determine how the birds modify their migration and habitat use strategies during varying drought conditions and in conjunction with anthropogenic land uses and other stressors
- **USFS Rocky Mountain Research Station (Rapid City, SD)**
  - Pilot-study experiment investigating the effects of common grazing management strategies during and after drought on post-drought forage production recovery.



# U.S. Geological Survey (USGS) Mid-Continent Drought Update

## QUESTIONS ?

**October 13, 2022**

**Chris Hobza**

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