

# Water-Quality Monitoring Data: Status and Future Prospects

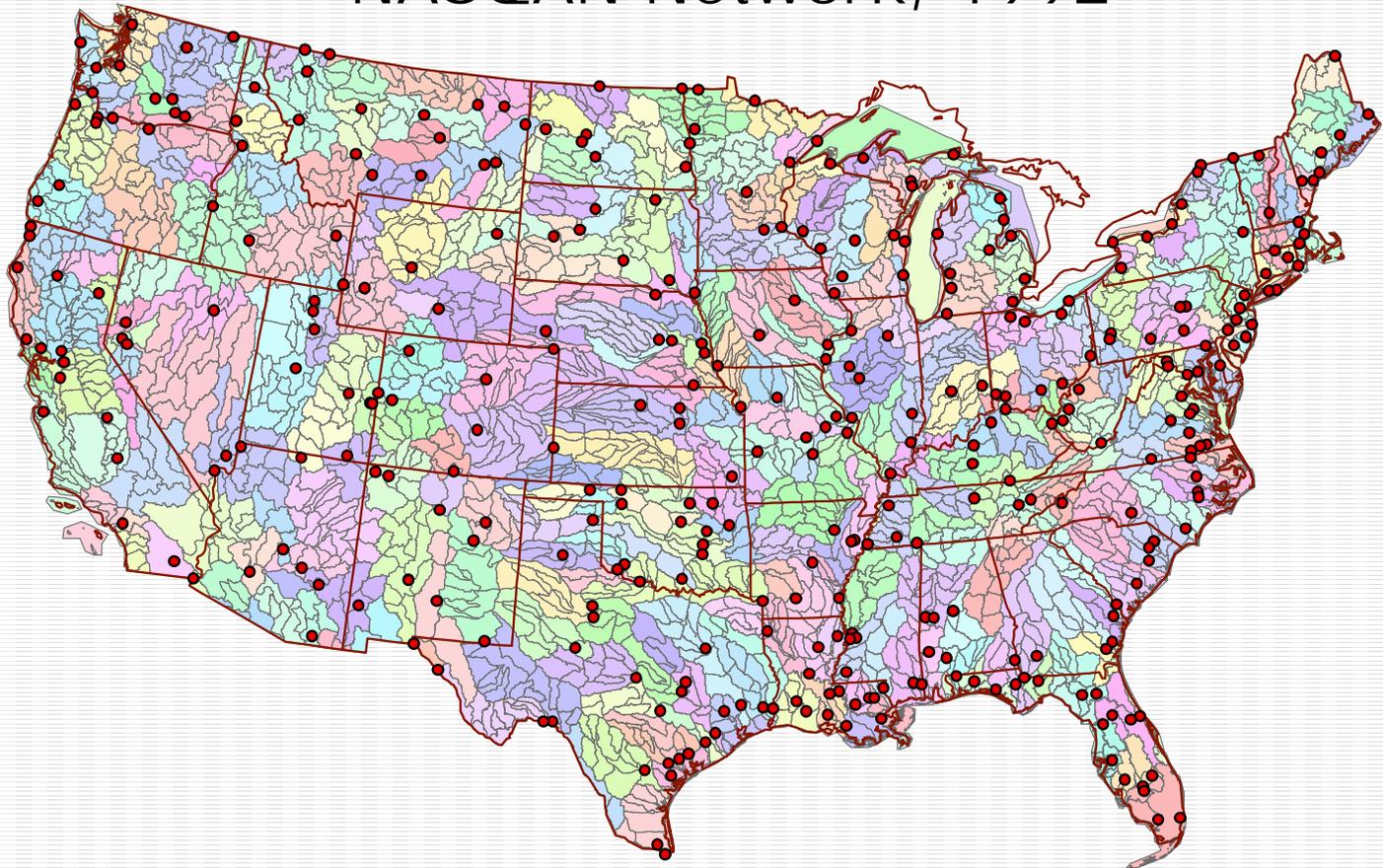
---

Richard P. Hooper  
Office of Water Quality  
U.S. Geological Survey

# SPARROW Calibration Data

---

NASQAN Network, 1992

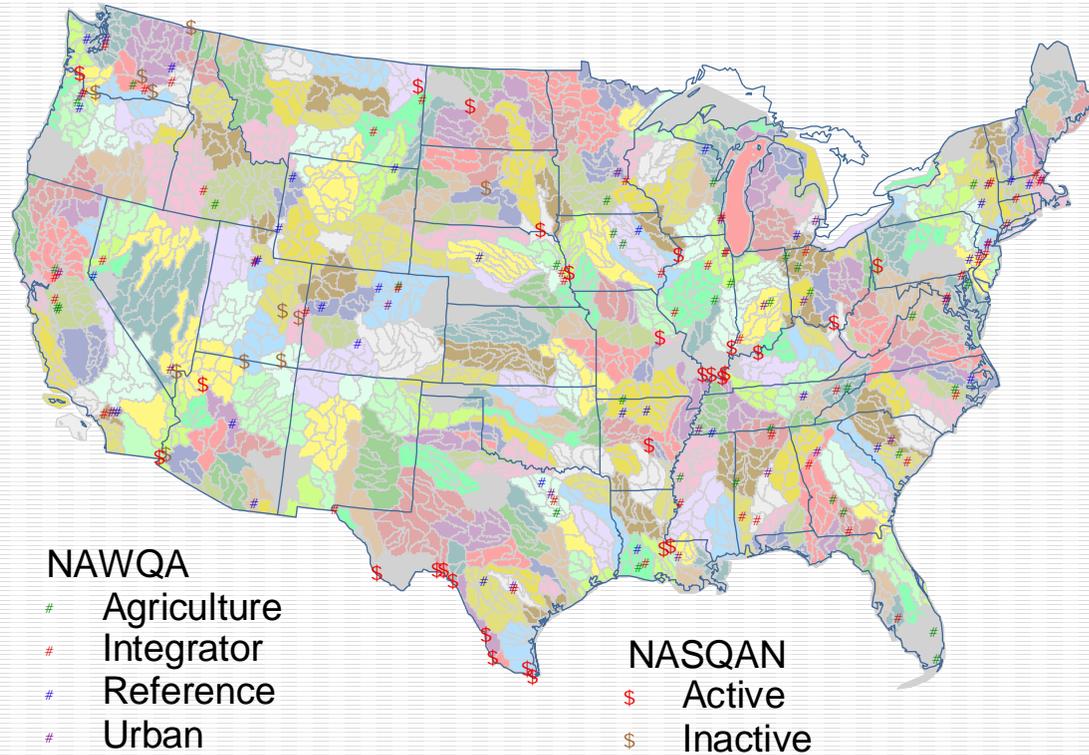


# NASQAN Data Attributes

---

- Continuous station operation
- “General purpose” monitoring
- Consistent, broad constituent coverage
- Monthly to Quarterly sampling
- Data appropriate for long-term (multi-year to decadal) load estimation

# NASQAN/NAWQA 2002



# NASQAN 2002 Attributes

---

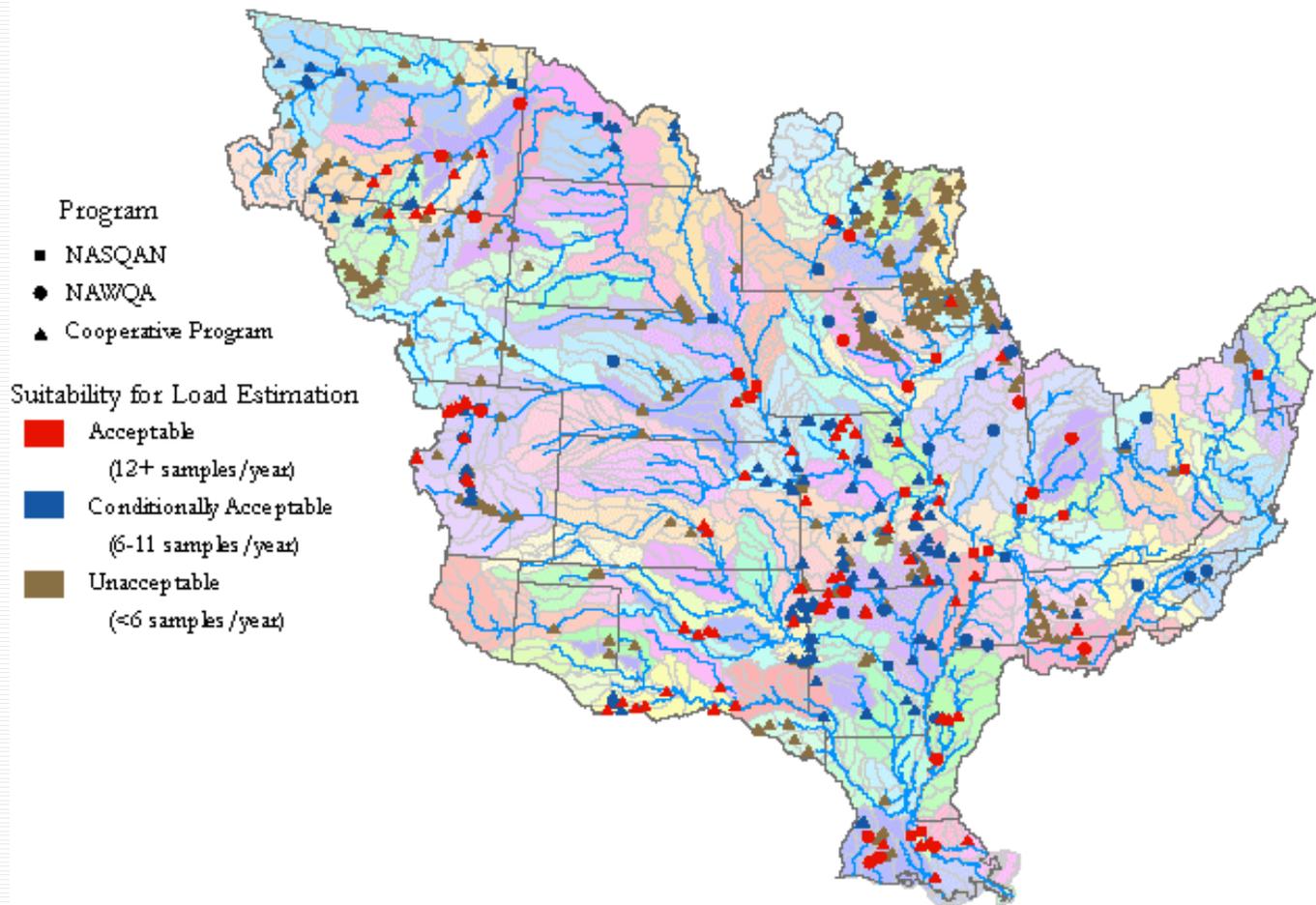
- Operated on 5-yr cycles with constituents tailored to basin
- Mainstems and major tribs of
  - Mississippi (1996-present)
  - Rio Grande (1996-present)
  - Colorado (1996-2000)
  - Columbia (1996-2000)
  - Yukon (2001-present)
- Load Estimation primary objective; targeted high-flow sampling

# NAWQA Cycle 2 Attributes

---

- Approx. 140 stations in 42 basins
- Approx 40 stations operated continuously; 100 operated for 2 yrs out of 10
- Concentration trend is primary objective
- Sampling frequency often bi-monthly to monthly; condition blind

# All USGS-WRD Monitoring in Mississippi Basin



# Observations

---

- Stations are clustered where there are on-going studies
  - MO Ambient QW Network
  - NAWQA Study Units
- Large areas with no USGS data

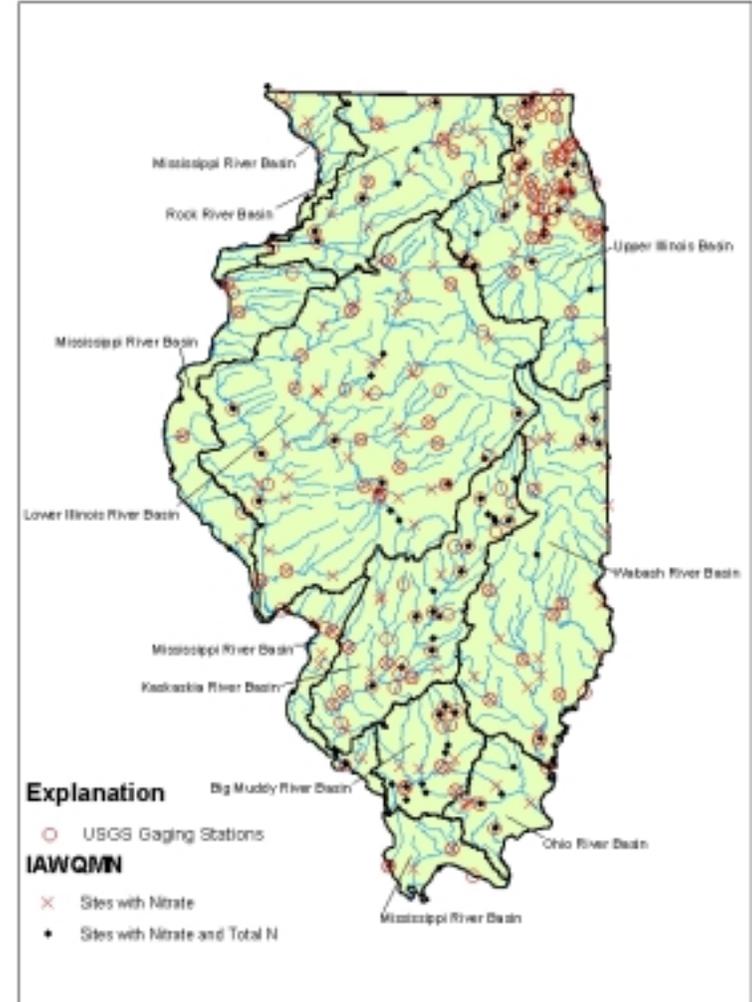
# State Monitoring Networks

---

- Operated to meet CWA objectives
- Emphasis on
  - Synoptic sampling (targeted population)
  - Punctuated sampling (rotating watershed assessments)
- Fixed-station networks the exception
- Dip samples rather than isokinetic, depth- and width-integrated sampling with some exceptions (e.g., Illinois EPA).
- QW stations often not at stream gages

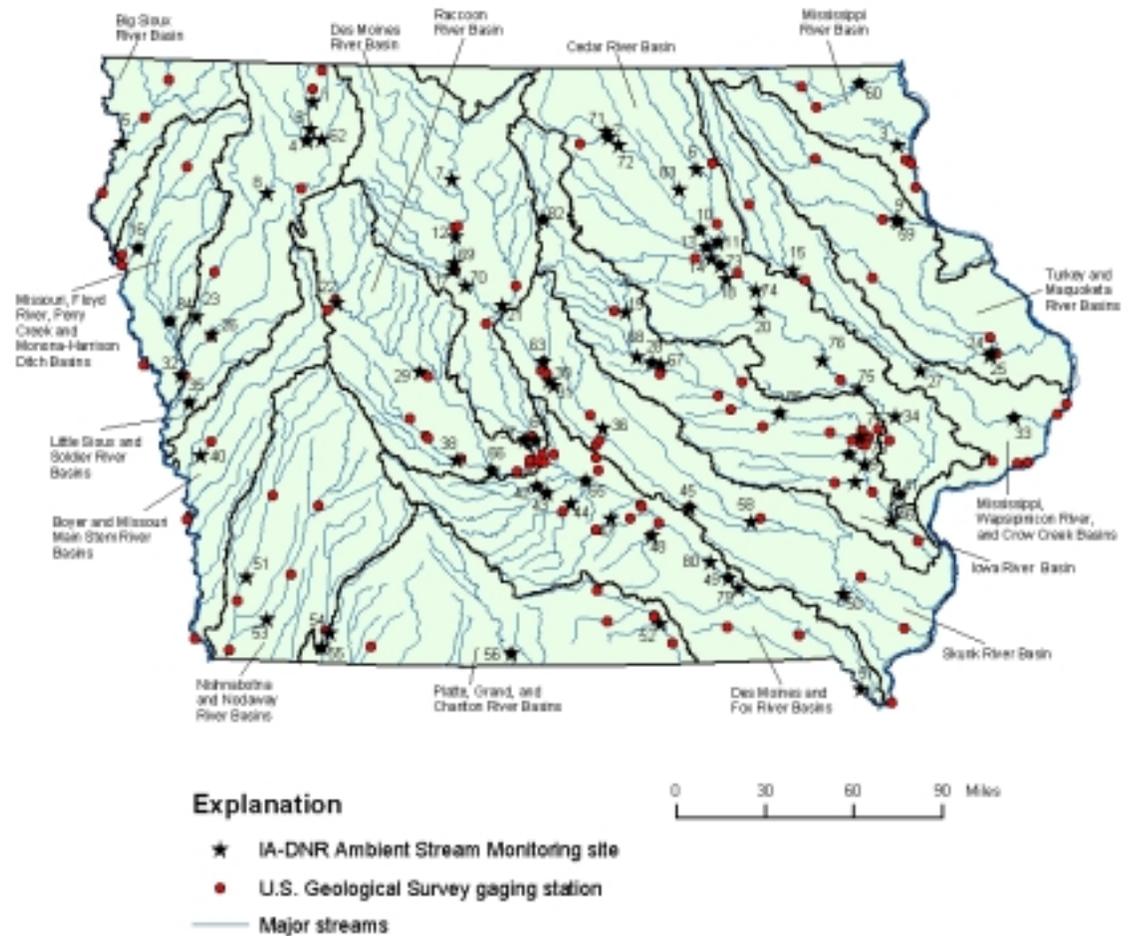
# Illinois State Network

- 226 QW stations
- 86 stations co-located with USGS gages
- 41 co-located stations with total N.



# Iowa Monitoring Network

- 84 sites
- 35 co-located with gages
- Monthly sampling



# Opportunities

---

- Use GIS to select sampling sites
  - Define relevant variables
  - Extrapolate results spatially (SPARROW)
- Take advantage of current data
  - Modify modeling approach
  - Develop framework for synoptic and/or punctuated data
- EPA Nutrient Criteria
  - States collecting more data in advance
  - Creates demand for SPARROW modeling

# Conclusions

---

- Fixed-station water-quality data is expensive and perceived to be less useful than other kinds of data
- SPARROW markedly improves the utility of such data (but need to convince decision makers)
- Current water-quality monitoring is more targeted, and special purpose than in the past