Middle Illinois River Total Maximum Daily Load and Load Reduction Strategy

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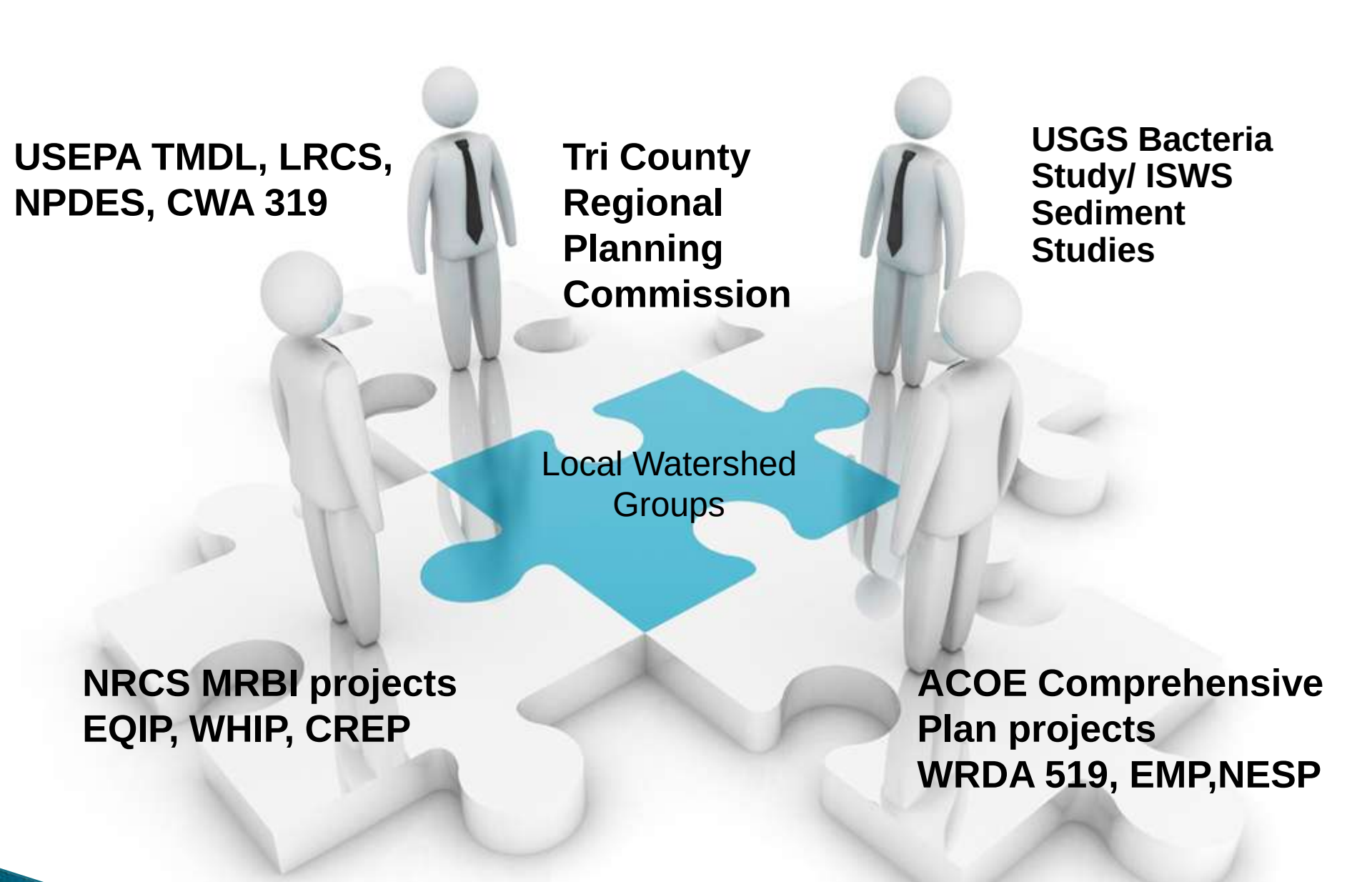
Multiple Interests in Watershed Issues Started the Process

- Impaired streams and lakes on Category 5 303(d) List
  - Mainstem Illinois River, tributaries, backwater lakes

- Higher prioritization for TMDL development may = more project funding opportunities

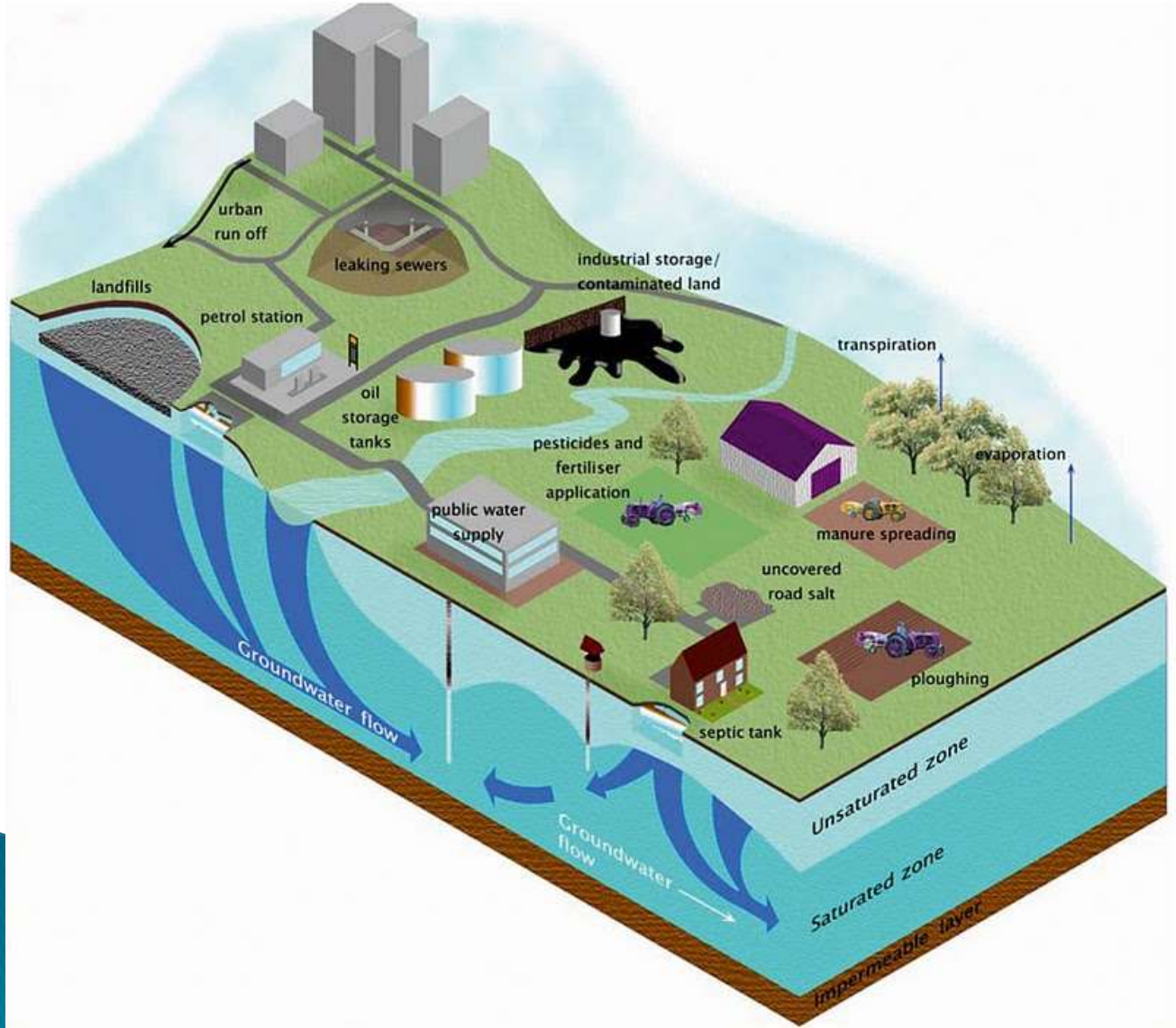


Multiple Interests in Watershed Issues

TMDL and LRS

- Total Maximum Daily Load
  - Maximum amount of a pollutant that a water body can receive and meet water quality standards and support designated uses.
  - Includes both point source and nonpoint source load allocations
- Load Reduction Strategy
  - Allow for same analysis process to identify priority sources, and plan for implementation as TMDL.
  - Targets are based upon scientific information, but are not site-specific standards, are not enforceable under permits and do not count as TMDLs

TMDL and LRS



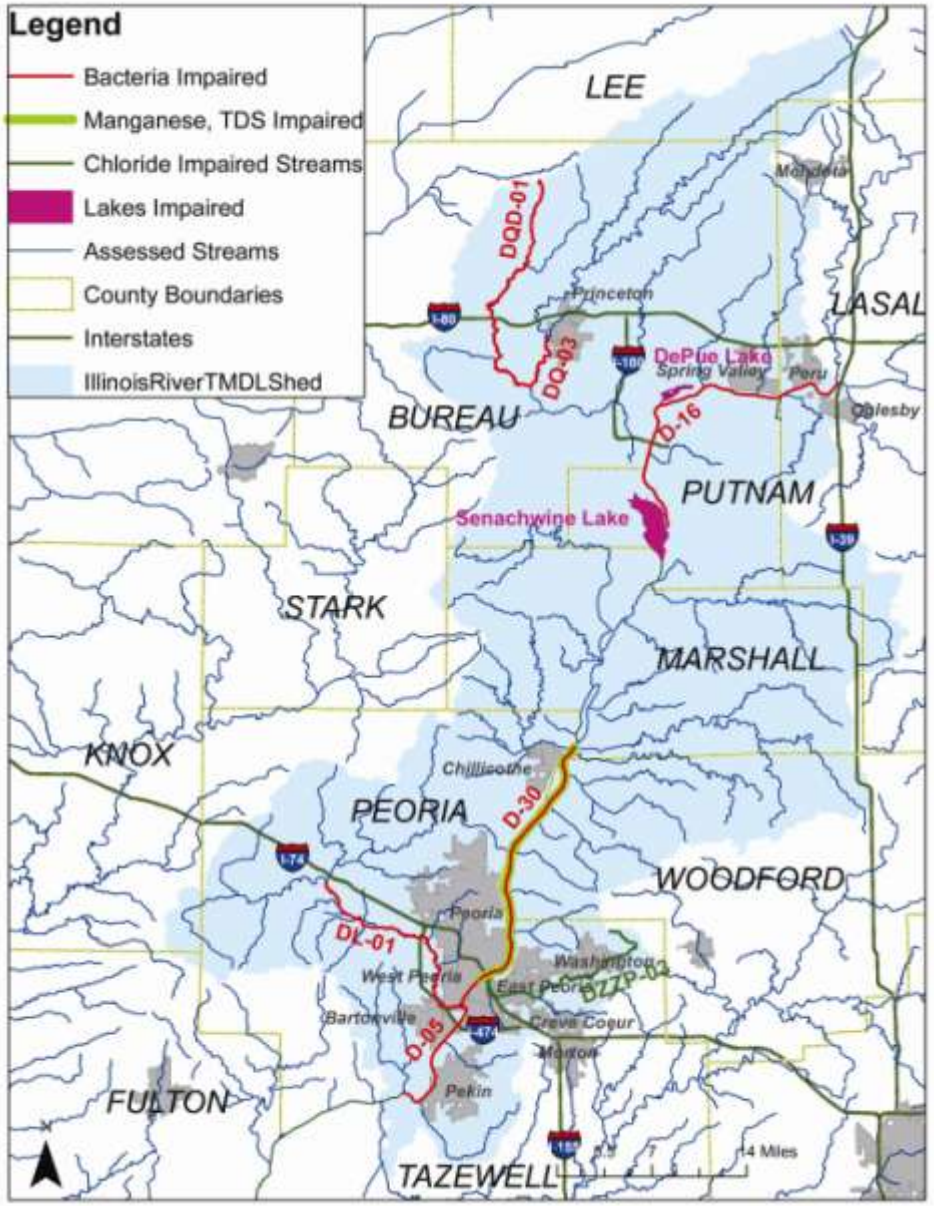
- **Focus on instream water quality**
- Examine **Where** is it coming from? **How much**? **When** is it a problem?

TMDL/LRS Stages

- Stage 1- watershed characterization (landuse, soil, climate, point sources, livestock, etc.), data compilation, model proposals
- Stage 2- data collection (optional)
- Stage 3- load allocations developed that include reductions for stream pollutants and point/nonpoint sources, implementation plan

Middle Illinois River TMDL Impairments

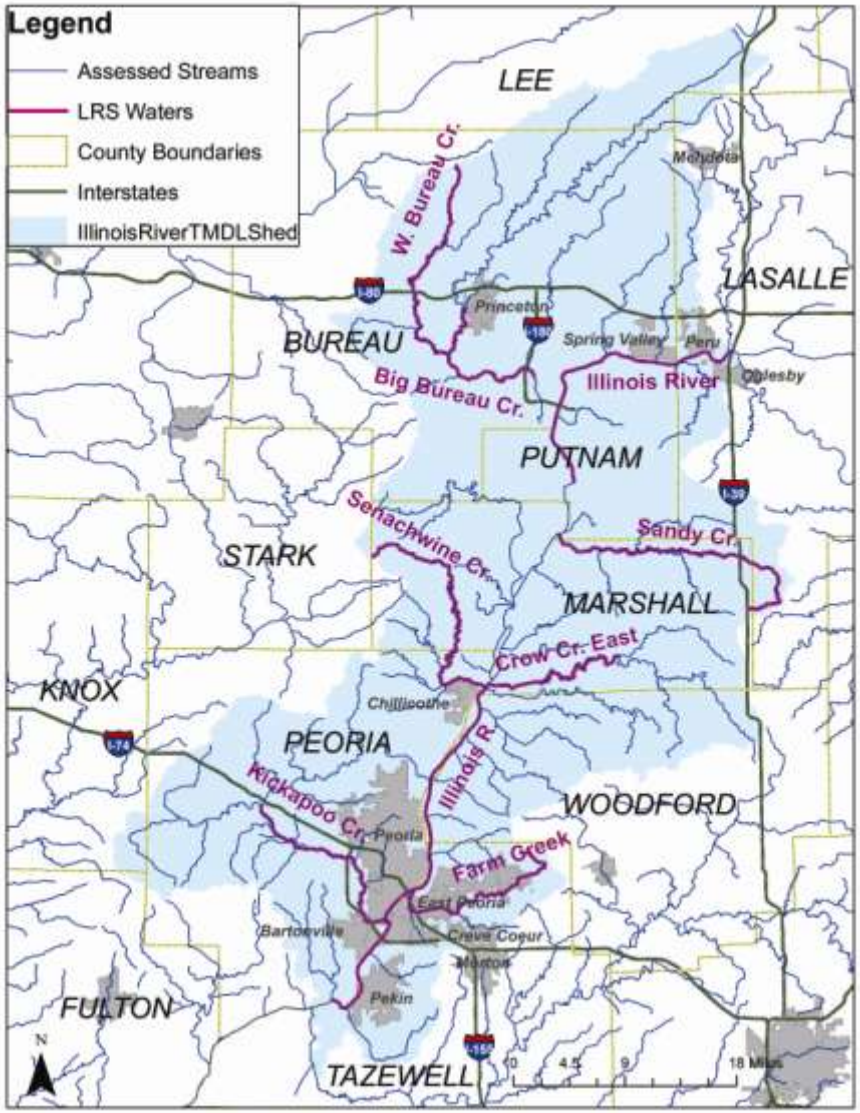
- Illinois River mainstem
  - **D-05, D-30, D-16-**
    - Bacteria
  - **D-30**
    - TDS, manganese
- Tributaries
  - **Big Bureau Cr. (DQ,-01 DQD-01), Kickapoo Cr. (DL-01)**
    - Bacteria
  - **Farm Cr. (DZZP-03)-**
    - Chloride
- Backwater Lakes
  - **Senachwine and DePue Lakes**
    - Phosphorus
    - Dissolved oxygen



Middle Illinois River LRS Waters

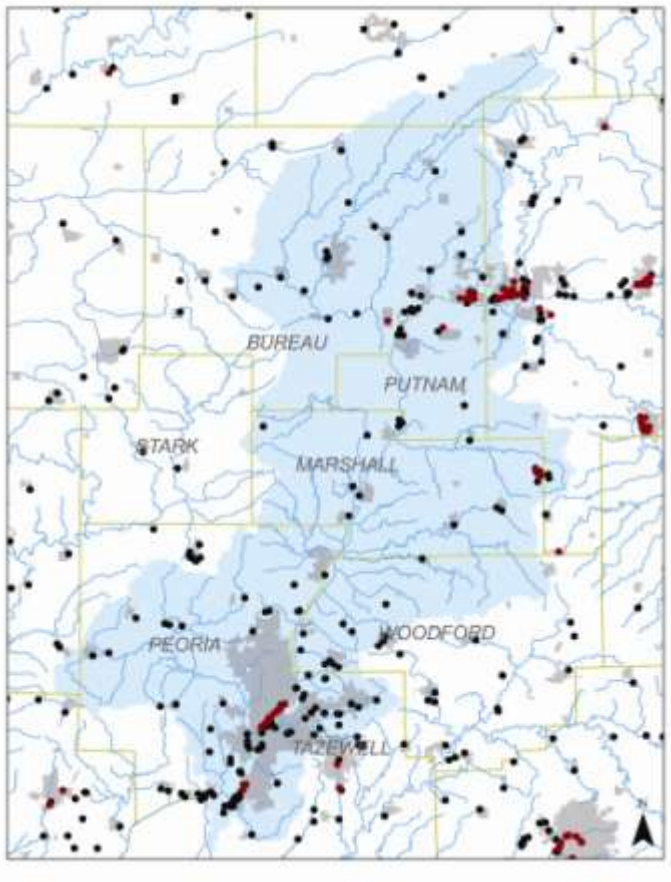
- Sampled waters for bacteria, nutrients (total phosphorus, nitrate-N) and TSS

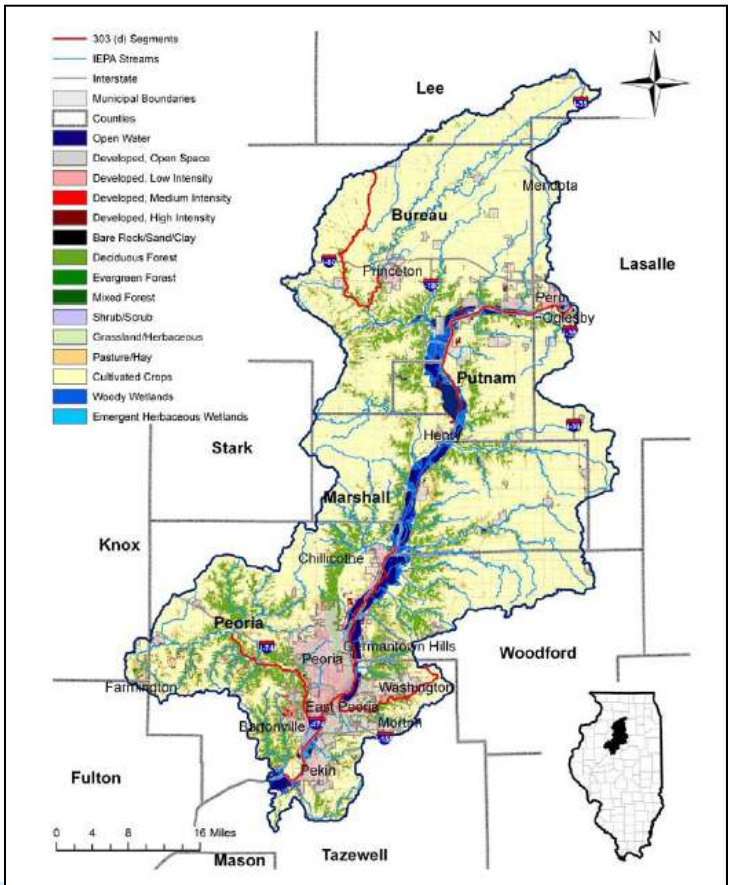
- Mainstem
  - D-05, D-16, D-30
- Tributaries
  - Farm Creek (DZZP-03)
  - Kickapoo Creek (DL-01)
  - Crow Creek East (DO-01)
  - Senachwine Creek (DM)
  - Sandy Creek (DP-02)
  - Big Bureau Creek (DQ-01)
  - West Bureau Creek (DQD)



Potential Sources

- Point- NPDES facilities (STPs, Industrial, CSOs, MS4s)
- Nonpoint- Stormwater Runoff, Sheet and Rill Erosion, Bank and Channel Erosion, Gully Erosion, Failing Septic Systems, Animal Feeding Operations





Total Maximum Daily Load (TMDL)

TMDL Pollutants	Numeric standards
Bacteria	200 cfu/100 ml geometric mean 400 cfu/100 ml instantaneous
TDS	500 mg/L
Manganese	150 mg/L
Chloride	500 mg/L
Phosphorus (lakes)	0.05 mg/L
Dissolved oxygen	5.0 mg/L (Mar- Jul) 3.0 mg/L (Aug- Feb)

Total Maximum Daily Load

Numeric Standards must be met in the waterbody.

Develop waste load & load allocations

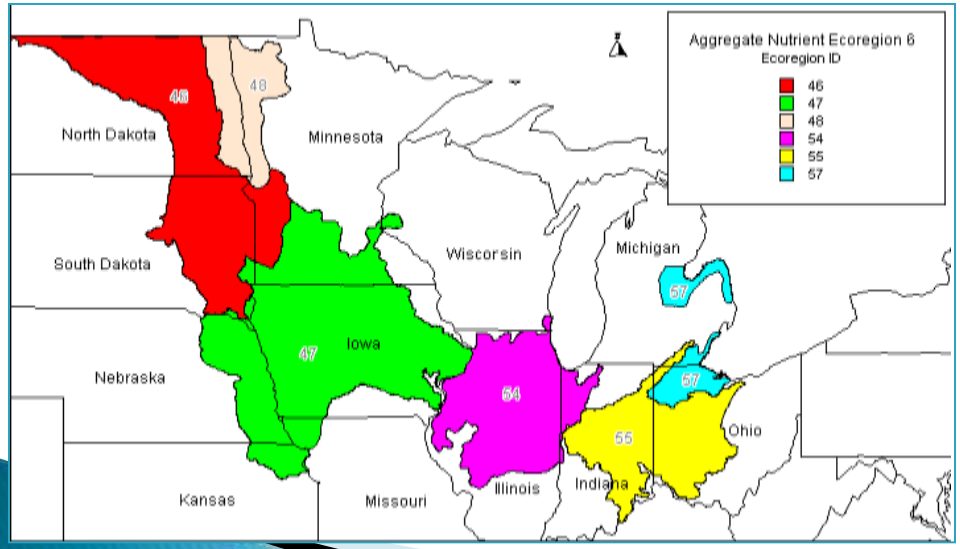
Calculate reduction needed to meet the standard for both point and nonpoint sources

Standards adopted by the IPCB

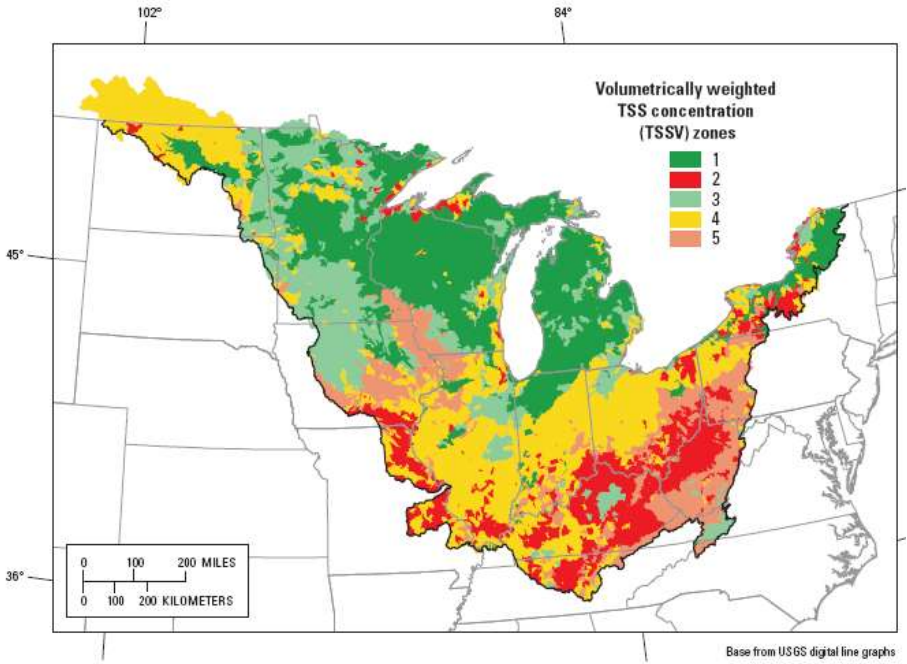
Load Reduction Strategy (LRS)

- Focus on loads of nutrients and TSS in mainstem and tributaries
- Develops load allocations and reductions needed (nonpoint sources)

Nutrient Targets



TSS Targets

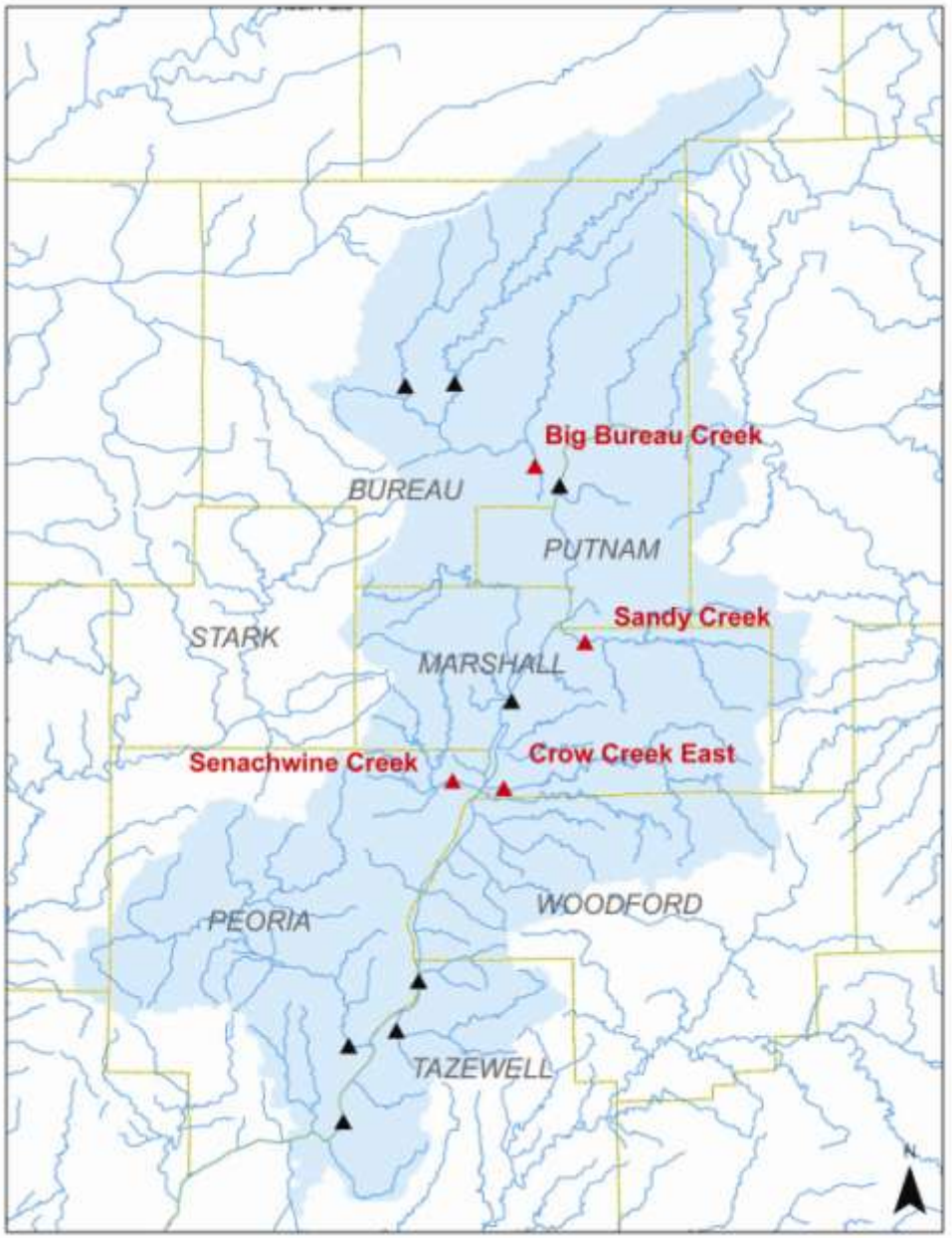


LRS Targets

Pollutant	Target	Reference
TSS	59.3 mg/L, 50.4 mg/L	(USGS 2006-5066)
Nitrate-N	1.798 mg/L	(USEPA 2000-822B00017)
Total Phosphorus	0.072 mg/L	(USEPA 2000-822B00017)

Monitoring Stations

- Regularly monitored sites (Ambient)
  - Mainstem (4)
  - Kickapoo Creek
  - Farm Creek
  - Big Bureau/West Bur.
- Newly monitored sites
  - Sandy Creek
  - Senachwine Creek
  - Crow Creek East
  - Big Bureau Creek



ILLINOIS AMERICAN WATER

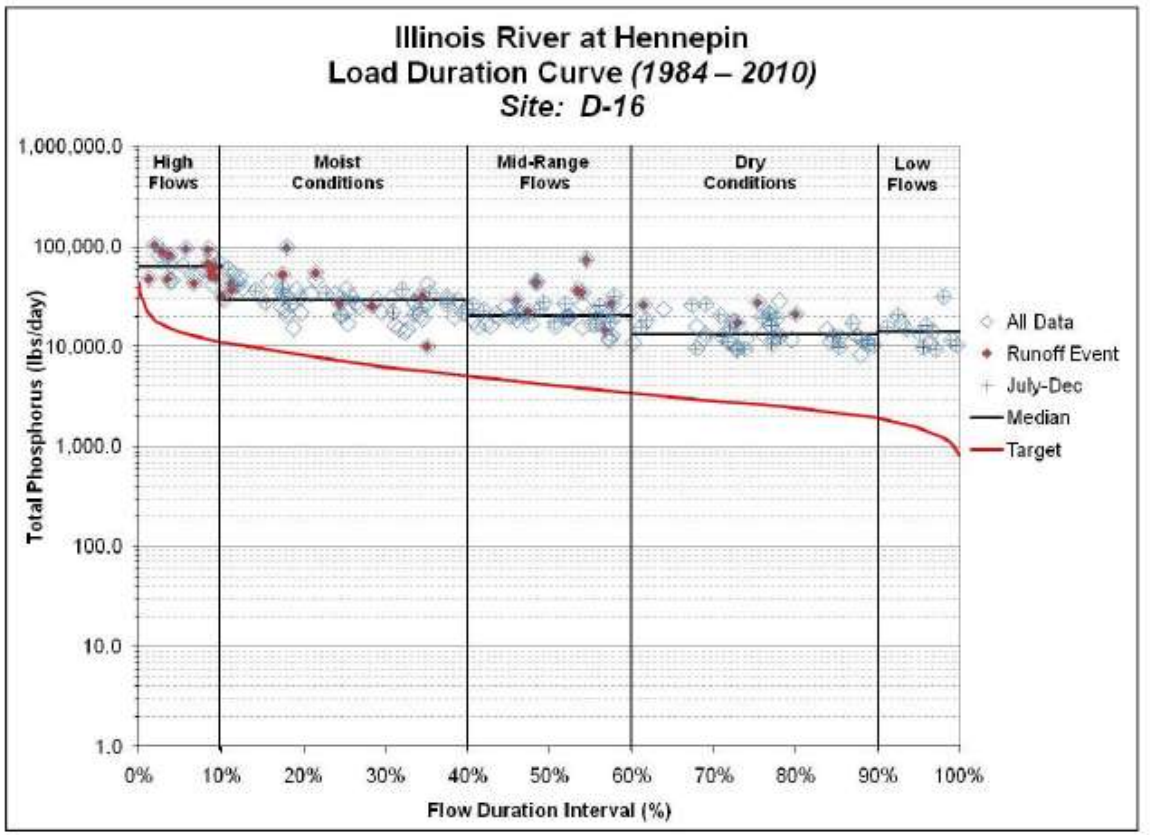
Load Duration Curves

- Analyzes water quality at flow intervals
- Load reductions developed for all flows

Target =
flow x standard

Red diamonds =
storm events

Crosses=
seasonal data



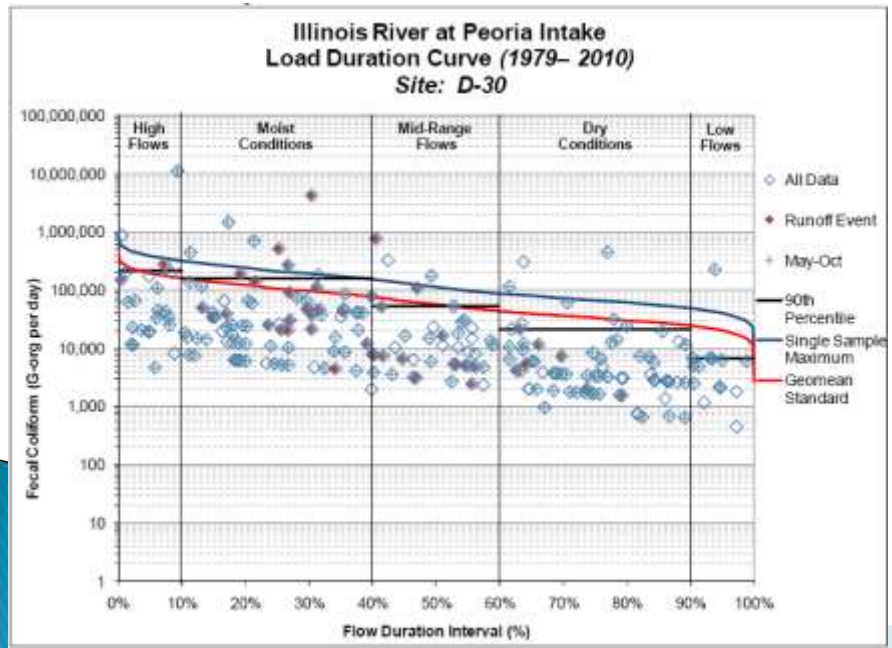
Flow Regime Exceedences

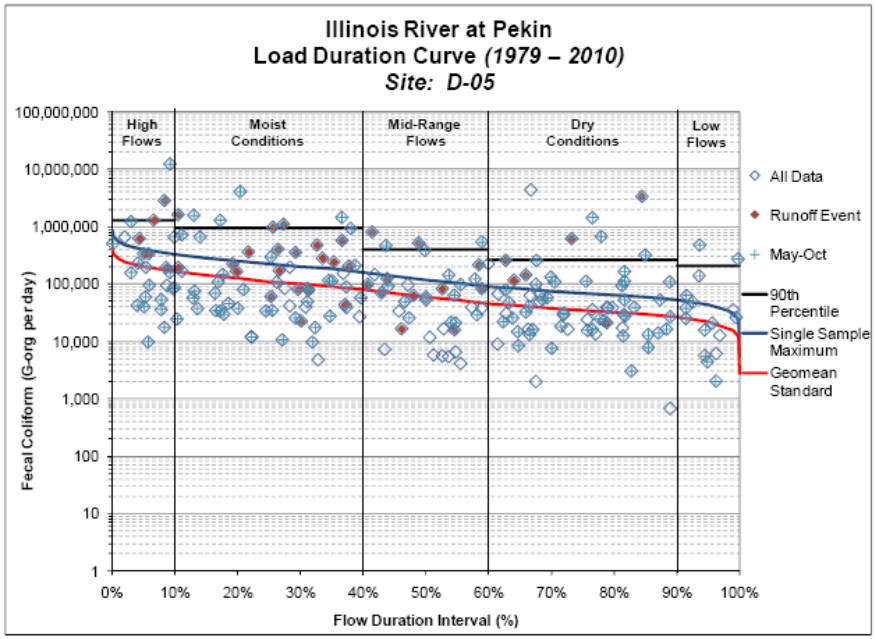
- Exceedences can reveal critical conditions
- Land use in the watershed will help identify potential solutions- rural/urban

TMDL SUMMARY	Loads expressed as *(tons per day)*				
	High	**Moist**	**Mid-Range**	**Dry**	**Low**
TMDL[1]	173.35	67.20	40.21	27.57	18.96
Allocations	118.32	48.24	34.47	21.83	6.90
Margin of Safety	55.03	18.96	5.74	5.74	12.06
Implementation Opportunities	*Post Development BMPs*				
	Streambank Stabilization				
	Erosion Control Program				
		Riparian Buffer Protection			
					Municipal WWTP

Mainstem Data – Fecal Coliform

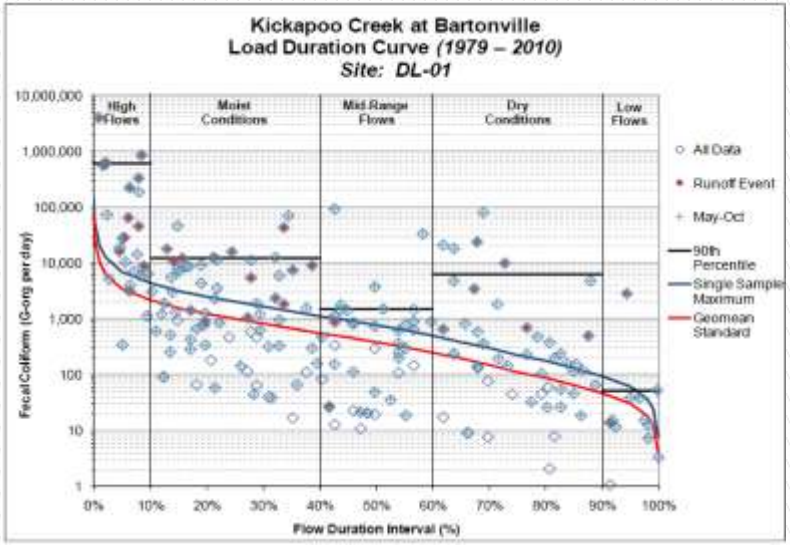
- D-30 (Mainstem) had fewer exceedences, mainly in moist conditions
- D-05 (Mainstem) had exceedences at all flow regimes and mostly during May through October

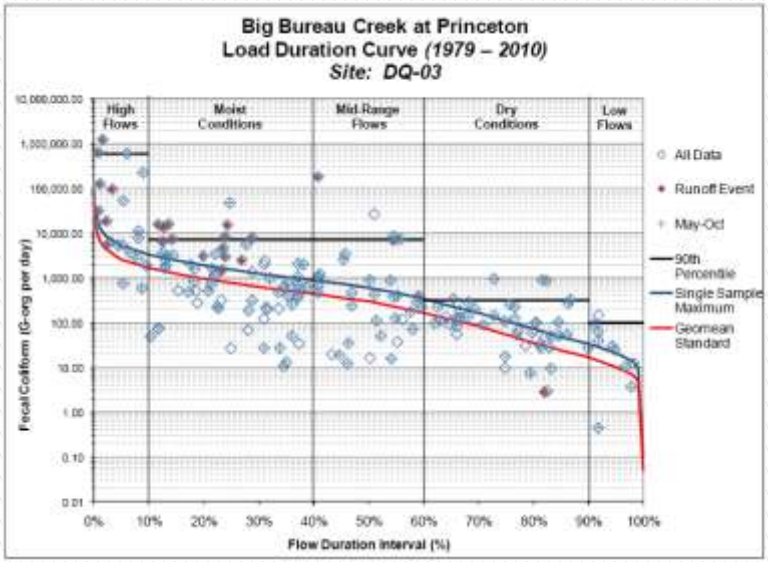


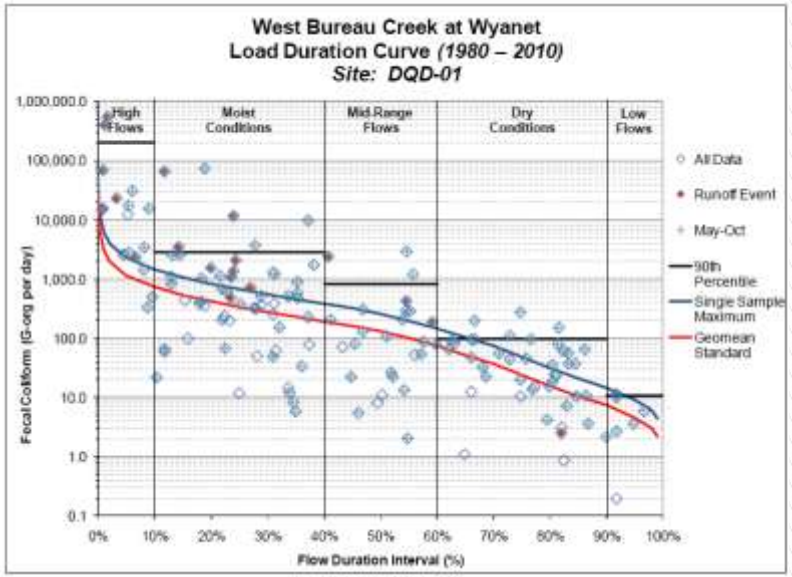


Tributary Data- Fecal Coliform

- Higher flows- stormwater, rural runoff
- Lower flows- failing septic systems, point sources, livestock in streams

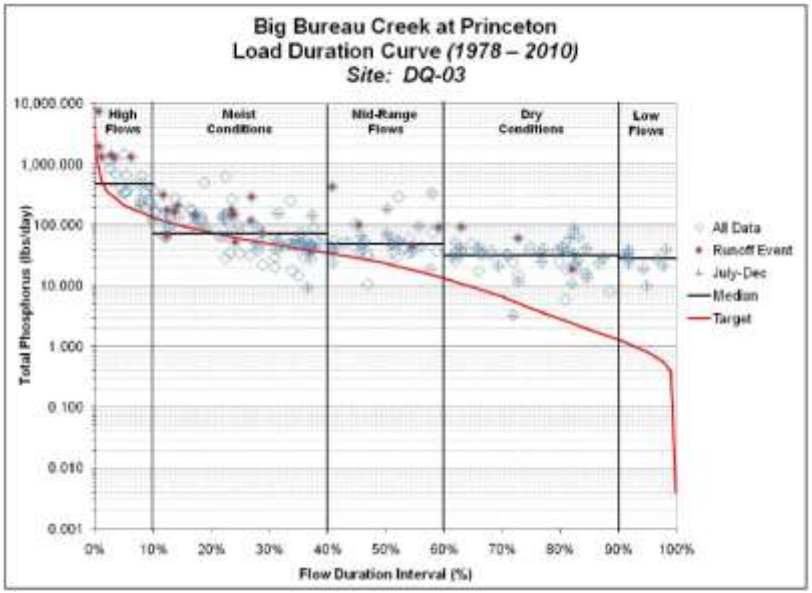


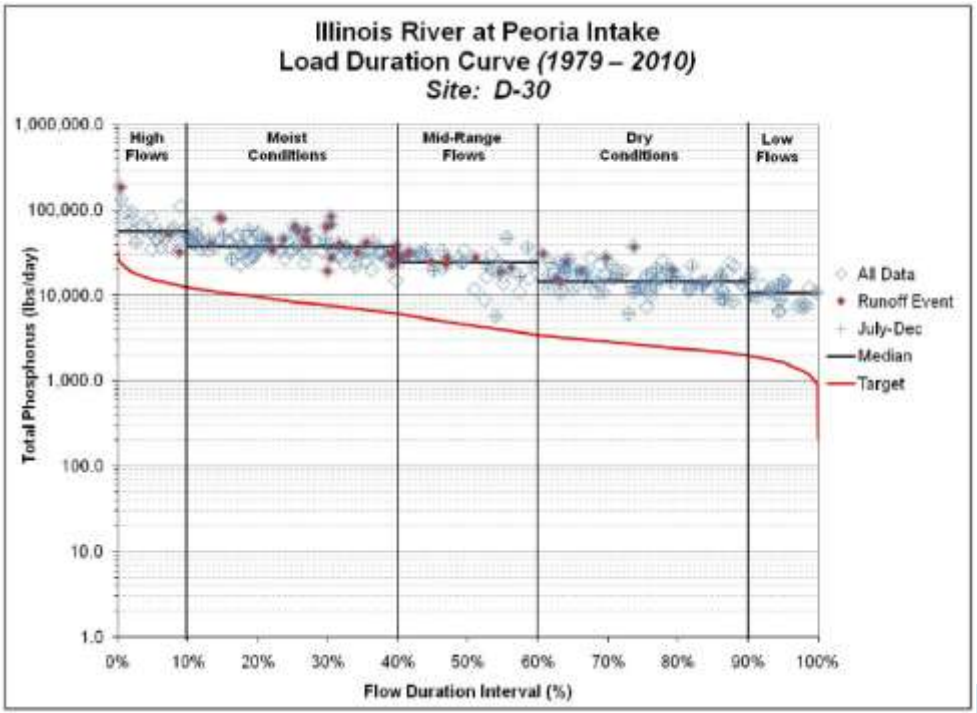


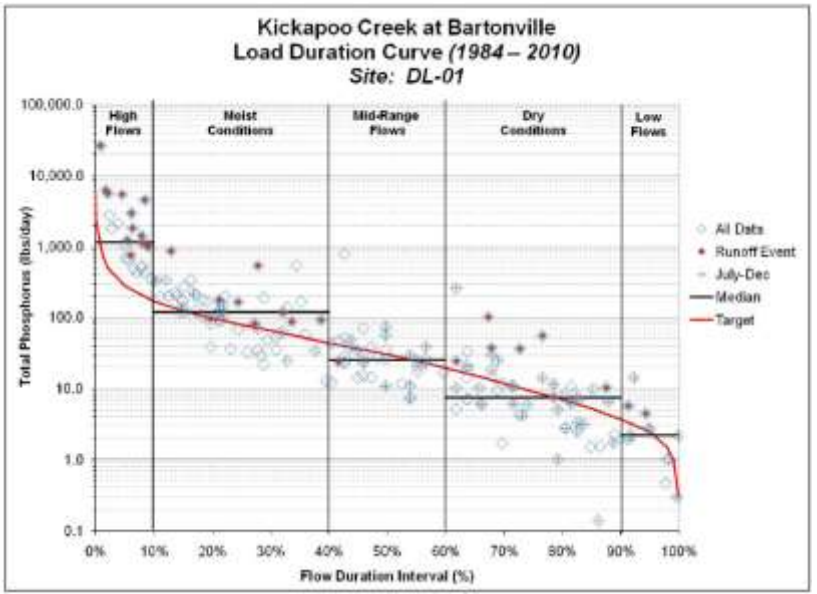


Phosphorus

- Mainstems similar, exceedences at all flows
- Tributaries differed

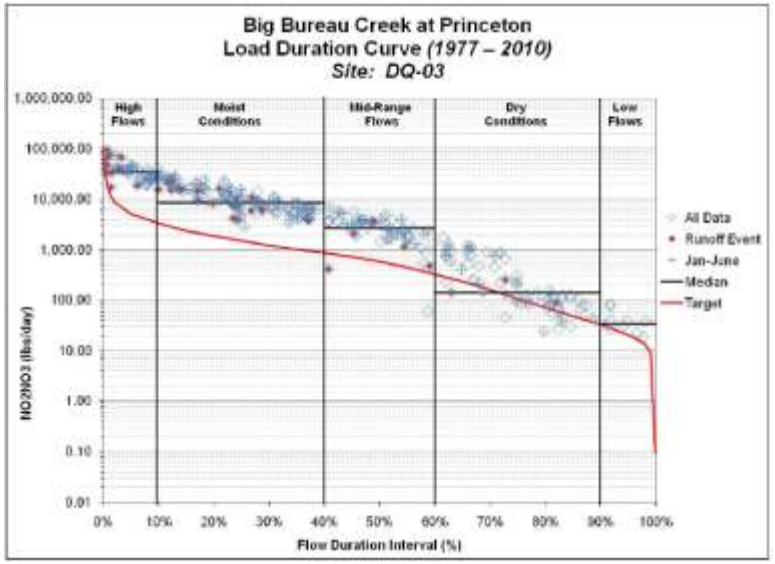


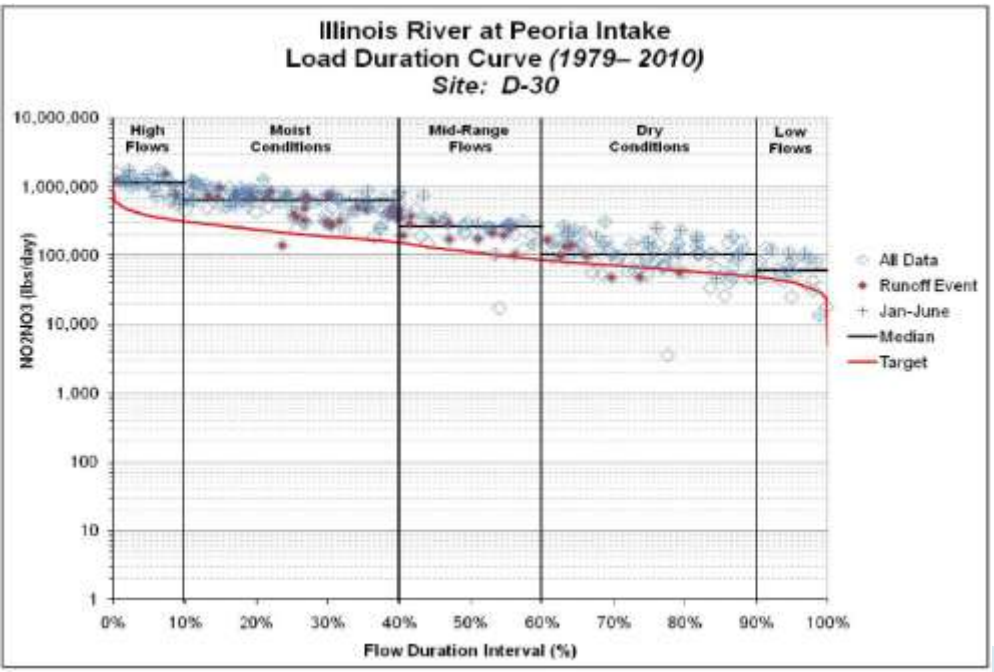


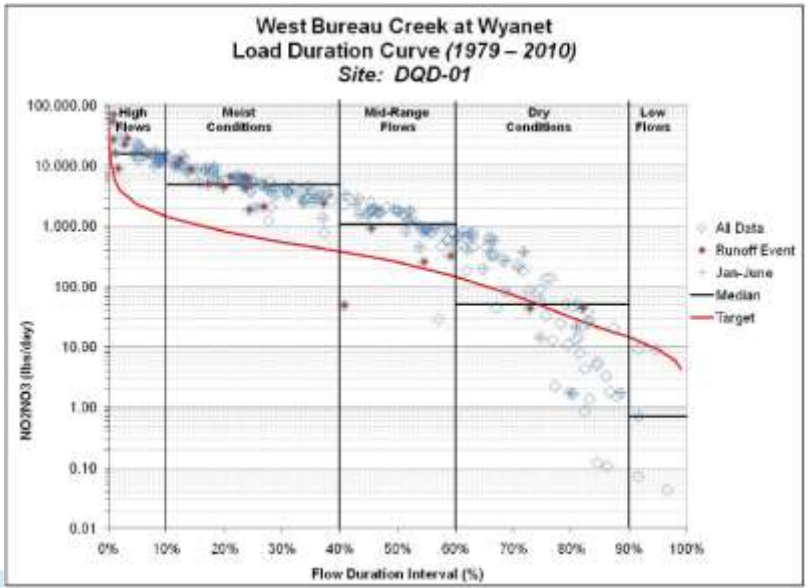


Nitrate-Nitrogen

- Nitrate nitrogen has higher concentration in high to moist conditions/ exceeds all the time
- Mainstem sites had similar data
- Tributaries overall had low levels at lower flows



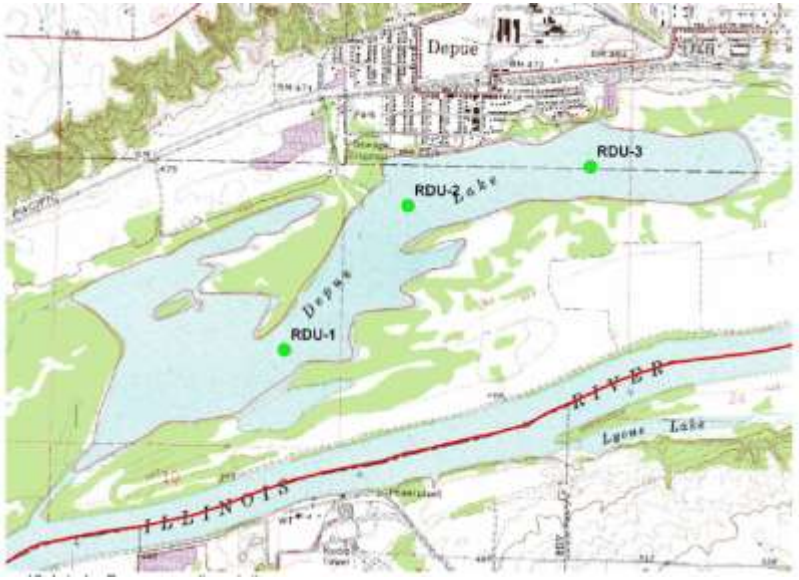




Lake Depue

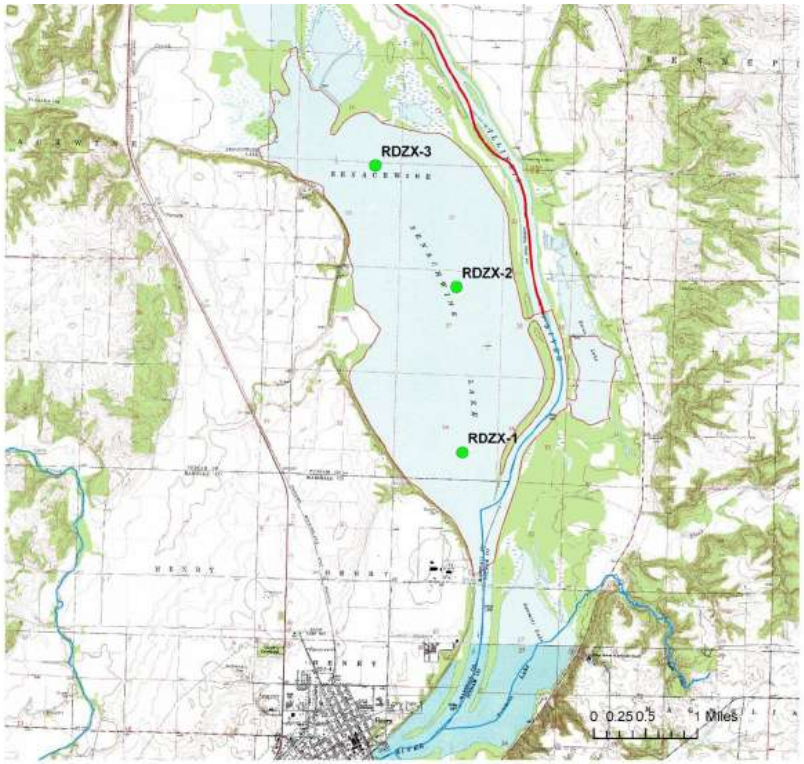
- Needs 91% reduction of phosphorus
- Point source discharges directly to lake
  - WLA based on 1 mg/L phosphorus limit (<1%)
  - Currently not monitored, more data needed to refine contribution
- Backwater that receives IL River water

- Upstream point sources to the Illinois River need phosphorus monitoring to determine source contributions
- 20% reduction in TSS needed



Senachwine Lake

- Backwater that receives IL River water
- Reductions are needed from nonpoint sources in the watershed and spring flows from the Illinois River
  - 70 to 95% reduction needed depending on flow regime
  - 20% reduction in TSS



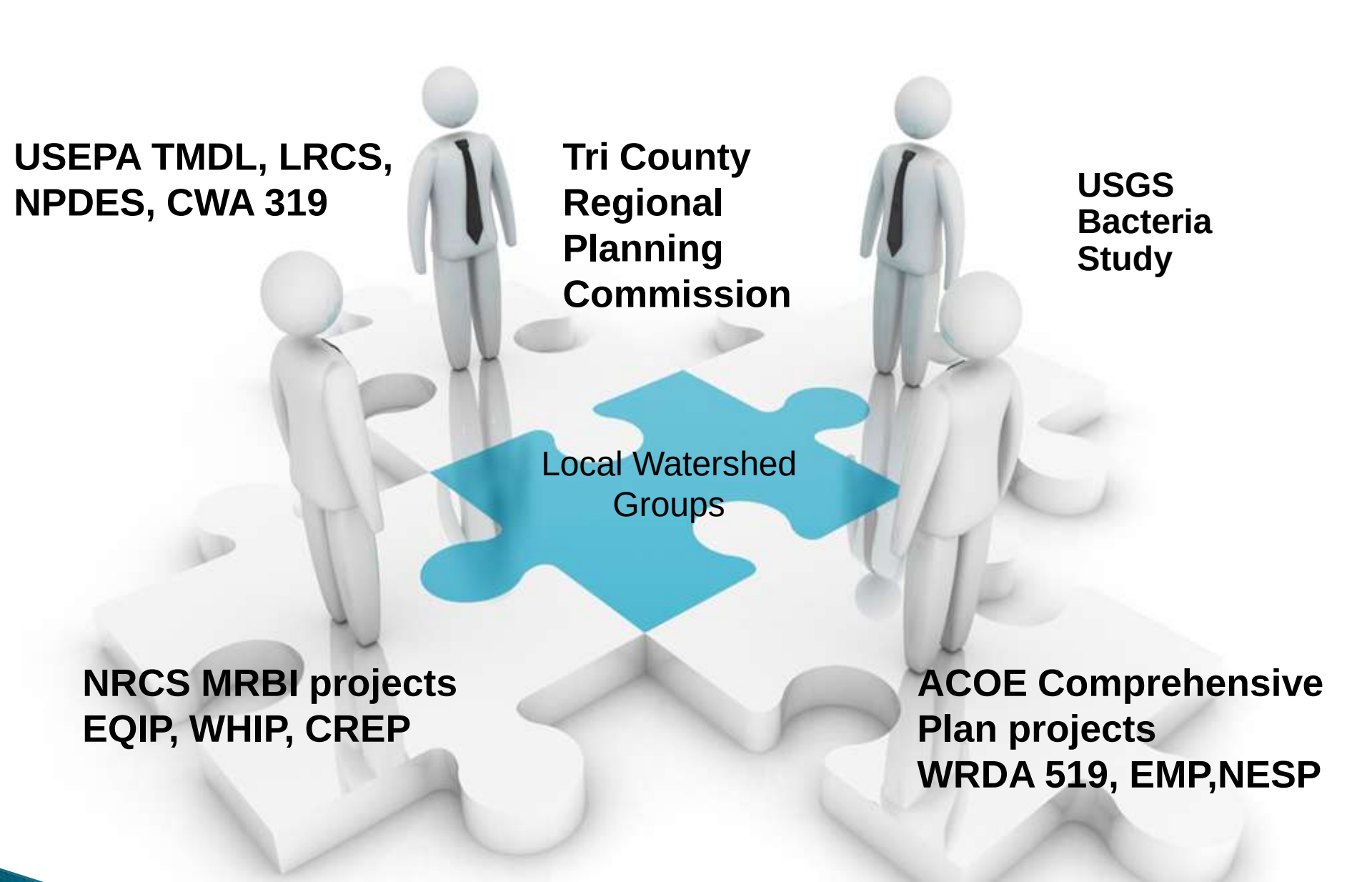
Implementation Plan

- Future Anticipated Activities- planned projects, monitoring, workshops, ordinances
- Implementation Actions for Rural Sources- programs for funding
- Implementation Actions for Urban Sources- green infrastructure, stormwater regulations, NPDEs compliance, septic maintenance
  - Illinois EPA NPDES disinfection exemptions reapplication

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY



Success = Many Partners, Many Tools

Current Projects- IL Comprehensive Plan (USACE)

- Tenmile Creek- bluff stabilization
- Senachwine Creek- BMP installation plan
- Crow Creek East- bluff stabilization
- Turkey Creek- erosion controls/BMPs installed
- Peoria Riverfront- dredging/ island creation
- Pekin Lake North and South Units- water management/ natural floodplain areas
- Middle Peoria Pool Backwater Restoration- monitoring/implementation plan

Additional Projects

- Tri-County RPC Bluff Area Stabilization Projects- Moss Bluffs, Robinson Park, Detweiller Park and Farm Creek
- Tri-County RPC Locally led River Action League Citizen Science Network
- Tri-County RPC Storm Water Video- public access video on stormwater issues
- MRBI Project Watersheds
  - Big Bureau Creek
    - Friends of Big Bureau- American Corn Crows Assoc., the Wetlands Initiative, EDF, Prairie River RC&D, Prairie Rivers Network
  - Senachwine Creek
    - Tri-County RPC, EDF, Iowa Soybean Assoc., the Peoria County SWCD

IEPA provides monitoring

TMDL/LRS Report

- Phase I TMDL/LRS Development
  - Stage 1 public meeting held September 2, 2010
  - Stage 2 monitoring throughout development and will continue for MRBI projects
  - Stage 3 public meeting planned for November

- Phase II Implementation Plan
  - Refined analysis of BMPs for select areas
  - More detailed information to inform decision making

Conference Display

- Middle Illinois River TMDL Information
- Tri-County RPC/Bradley River Action League Citizen Science Network
- DuPage River Salt Creek Workgroup (DRSCW): Applied Science in Action
- Illinois EPA Illinois River 319 Project Showcase- The Grove on Kickapoo Creek
  - Information and video on display

River Action League Citizen Science Network

- Bradley University, Tri-County Regional Planning Commission
- Goals-
  - Increase data in watershed
  - Develop database for decision makers
  - Focus on economic resources in community
  - Engage a broad range of citizen groups
  - Increase scientific and technological literacy

BRADLEY UNIVERSITY

River Action League Citizen Science Network

- Monitor- organizations/citizens collect data
- Educate- scientists develop information packets, training materials
- Analyze- scientist check and oversee data analysis
- Internet used for mapping and data postings

River Action League Citizen Science Network

- Funding- Illinois American Water Company, Tri-County Regional Planning Commission, Bradley University

- Contact Information
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DuPage River Salt Creek Workgroup

- Extensive monitoring throughout watersheds
  - Workgroup charges dues for members and acquired 319 funds
- Modeling and data analysis based on data
  - Dissolved Oxygen Feasibility Studies- Salt Creek and East Branch of the DuPage River
    - Prioritization of dam removal projects
  - Chloride Reduction Study and workshops
  - Developed project prioritization tool based on habitat, landuse, biological and chemical data
- Currently removing dams as TMDL/FS Implementation for DO improvement

319 Project Showcase- The Grove on Kickapoo Creek

- Green infrastructure project for residential development near Bloomington, IL
- Goals- maximize nutrient removal and protect downstream waters
- Outcomes-
  - Restore streams and wetlands
  - Increase aquatic life and dissolved oxygen, decrease nitrate
- Implementation-
  - Phase 1 complete- remeandered stream, installed detention structures and 2 major wetlands
  - Phase 2 complete- East Branch remeandered and wetlands installed
  - Phase 3 complete- Upper West Branch two-stage ditch installed in agricultural field

Contacts

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- DuPage River Salt Creek Workgroup

  http://www.drscw.org/

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