Water Quality Issues
Legislative Task Force

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Groundwater and land use in the water cycle
DNR Activities

- Monitor and evaluate surface waters
- Develop standards
- Drinking water and wastewater plan review
- Permit water withdrawal and wastewater discharge
- Drinking water and wastewater monitoring
- Collect, review and manage data
- Compliance inspections
- Technical/regulatory support
- Monitor invasive species and permit aquatic plant management
Water Quality Issues

• Contaminants
  – Lead
  – Nitrate
  – Bacteria, viruses and other pathogens
  – Arsenic
  – Radionuclides
  – Other Inorganic & Organic Compounds
  – Emerging Contaminants
Water Quality Issues

• Effect of groundwater withdrawals on water quality
• Nutrient loading
  – Stormwater runoff
  – Direct discharges
• Harmful algal blooms
• Aquatic Invasive Species
• Contaminated river and lake sediments
• Aging public water/wastewater facilities infrastructure
Lead in Drinking Water

Estimated Number of Lead Service Lines (LSLs)

- **130** systems with LSLs
- **207,5000** total utility-owned LSLs
- **$344 million - $1.23 billion** to replace them all

Image source: WI Center for Investigative Journalism
RECOMMENDATIONS

• Provide additional funds to water utilities specifically for LSL replacements beyond what is currently available in the federal safe drinking water loan program.

• Provide funding for lead removal in schools and daycares to supplement the new U.S. EPA grant program funding for lead testing.

• Leverage the safe drinking water loan program to provide increased capacity for funding of all project types, including LSL replacements.
Nitrate in Groundwater

Figure 1. Typical locations of wells in the shallow ground water of the Mid-Atlantic Region sampled for nitrate.
Current Status

• An estimated 42,000 private wells exceed nitrate level of 10 mg/L. The estimated cost to replace these wells so they have nitrates below 10 mg/L is approximately $446 million.

• Approximately 300 small public water systems currently exceed nitrate standard and about 30 additional public water systems exceed each year.
Recommendations

• Identify sensitive areas based on geology and soils where nitrate is present in groundwater

• Modify well compensation program to allow for funding private well replacement for low-income well owners where nitrates exceed 10 mg/L

• Implement nitrate initiative pilot recommendations, including developing a nitrate fertilizer decision support tool for nutrient management protective of groundwater quality
Percent of Private Wells over Arsenic Standard

![Map of Wisconsin showing the percentage of private wells over the arsenic standard by county. The map uses color coding to represent different percentage ranges.]

**Arsenic**
% of samples >10 ppb
- 0.0 - 1.2
- 1.2 - 3.8
- 3.8 - 7.2
- 7.2 - 13.0
- 13.0 - 17.3
Emerging Contaminants

- Per- and polyfluoroalkyl substances (PFAS)
- Pharmaceuticals, personal care products (PPCPs)
- Legionella
- Strontium
- Next generation pesticides and herbicides
Per- and poly- Fluorinated Alkylated Substances (PFAS)
Environmental impacts

Conceptual site model for how PFAS may enter the environment from one source (firefighting foam applications).

Source: ITRC
Recommendations

• Research staff and funding
  – develop a model to identify and prioritize PFAS contamination sites
  – conduct fire-fighting foam survey and develop best management practices

• Establish multi-media clean-up standards

• Evaluate what other states are doing to identify PFAS sources, impacted citizens and the environment
Nonpoint Pollution

Source: NOAA
Background

• Urban and agricultural storm water carries sediment and other pollutants across cities or fields into waterways.
• Statewide practices and prohibitions are established to reduce pollutants.
• If the statewide standards are insufficient for a sensitive area, then targeted standards are developed.
Targeted Performance Standard (2018)

- 16 counties with shallow soil over Silurian bedrock
- Goal: reduce risk of pathogens in groundwater
- Setbacks and restrictions are applicable to all farms
Recommendations

- Fully implement statewide and targeted performance standards and prohibitions (via NR 151).
- Consider additional targeted performance standards.
- Expand partnerships with DATCP, county governments, and municipalities on outreach efforts and develop innovative practices.
Groundwater Withdrawals
Effect on Water Quality
Nutrient loading comes from a variety of sources.

- Runoff from the landscape
- Background Load:
  - Naturally occurring from wetlands, forests
- TMDL
- Municipal Wastewater
- Industrial Wastewater
- Permitted Municipal Storm Sewer Systems
- CAFO Production Areas
Harmful Algal Blooms (HABs)

More frequent extreme precipitation, warmer water temperatures, and longer ice-free growing seasons promote algae growth in Wisconsin.

Figure from Wisconsin Initiative on Climate Change Impacts 2011: Wisconsin’s Changing Climate: Impacts and Adaptations
https://www.wicci.wisc.edu/publications.php

Lake Superior at Cornucopia, Wisconsin
August 9, 2018
Current Status

Extent of HAB frequency and toxin production in Wisconsin is unknown. Remote sensing can track HABs in large lakes.

Red colors indicate high densities of cyanobacteria.

7-day composite value from August 27, 2017 through September 2, 2017
Hypoxia (Dead Zones)

from “A Science Strategy to Support Management Decisions Related to Hypoxia in the Northern Gulf of Mexico and Excess Nutrients in the Mississippi River Basin” USGS 2004
Green Bay Hypoxia
Wisconsin’s Impaired Waters

- Healthy: 82%
- Impaired: 18%

Legend:
- Stream/River Proposal
- Stream/River Addition
- Lake/Reservoir Proposal
- Lake/Reservoir Addition
- Listed Stream/River
- Listed Lake/Reservoir
- County Boundary
Total Maximum Daily Load (TMDL)

- Clean Water Act required
- State water quality standards set the goal
- Protect public health, recreation, aquatic life
- TMDL is the pollution “budget” for both point sources and non-point sources
Options for Wastewater Permit Holders to Comply with Phosphorus Limits

- Locations Statewide
  - Adaptive Management
  - Water Quality Trading
Multiple Discharger Variance (MDV)
Recommendations

• Funding for planning, outreach, and implementation

• Each point on the map represents a WPDES facility investigating phosphorus compliance options
Aquatic Invasive Species
Clean Boats, Clean Waters includes teams of volunteers, as well as some paid staff from the DNR, Sea Grant and other organizations. Boat inspectors help perform boat and trailer checks, disseminate informational brochures and educate boaters on how to prevent the spread of aquatic invasive species.
Contaminated Sediments

• Legacy sediment contamination.
  – Old problem needing new solutions

• Environmental clean-up & economic recovery.
EPA Great Lakes Areas of Concern in Wisconsin

1. Milwaukee Estuary
2. Sheboygan River
3. Lower Green Bay & Fox River
4. Lower Menominee River (shared with MI)
5. St. Louis River (shared with MN)
Current Status

- $27 million in state-bond leveraged $153 million in cost-share from federal Great Lakes Restoration Initiative (GLRI) and others.
- Sediment bonding to continue making legacy contaminated sediment clean-ups.
Recommendations

• Partnering on legacy contaminated sediment clean-ups.
• Leverage state sediment bonding, local, and other non-federal funds with EPA GLRI Legacy Act funds.
Aging Infrastructure
Community Financial Assistance
Grant Programs

1. Well Compensation
2. Well Abandonment
3. Urban Nonpoint Source & Stormwater Management
4. Municipal Flood Control
5. Targeted Runoff Management
6. Surface Water