

**Legislative Issues for Consideration**

**Based on input from Subcommittee Members, Legislators, and Stakeholders.**

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**Potential Bills Summaries**

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3. Defining sustainable groundwater limits using technological advances.
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48. Forever chemicals (PFOA and PFOS)
49. Impact of wake boats

## Description of potential bills

1. Needed Update of the 1989 Groundwater Protection Act--Making minor changes to the 1989 Groundwater Protection Act: In 1989, the Groundwater Protection Act became law. The Act solidified efforts to protect Minnesota's groundwater and set the future course for improved protections focused on preserving groundwater. The Act has been a positive influence. However, the Act is now more than 30 years old. Consequently, it does not address many of the emerging threats to groundwater. There is need to address emerging groundwater issues not recognized when the Act passed as well as specific issues recognized in the Act that are yet to be accomplished. Priority actions are grouped into three categories shown below. The Minnesota Groundwater Association has a detailed report on suggestions for a Legislative update. Their suggestions are as follows:
  - a. Ensured Stable Funding: Funding for critical groundwater activities must be ensured for the future. Reliance on the Clean Water Land and Legacy Amendment will be problematic if the Amendment sunsets in 2034.
  - b. Groundwater Sustainability: Sustainable groundwater management should be based upon water budgets, where thresholds leading to unacceptable effects are understood, the DNR defined groundwater sustainability in statute; this definition could be made more useful through adoption of operational definitions.
  - c. Water Governance: Coordination among water agencies has increased since the Act was passed. However, broader coordination is fundamental to sustainable use of the state's water resources.
2. Addressing Areas of Groundwater Scarcity: There are several areas of the state where water use exceeds natural recharge. This addresses two of the state's most critical areas of concern (Revised, 9/22/2022)
  - a. Little Rock Lake: The Minnesota Department of Natural Resources (DNR) completed the Sustainable Use study of groundwater in the Little Rock Creek area. The plan focuses on ensuring that groundwater uses do not have a negative impact on the creek. The DNR determined that permitted groundwater use has, at times, had an adverse impact on the creek (DNR, 2021a and 2021b). DNR's analysis concluded that groundwater use diverted groundwater discharge to the stream network and reduced stream habitat, particularly during periods of low flow. DNR is considering imposing sustainable diversion limits at three streamflow monitoring stations on Little Rock Creek to avoid future adverse impacts to stream habitat. The diversion limits would be set to about 15 percent of the reference August median base flow at each of the three continuous stream gauges. The DNR has evaluated options for water management that could increase base flow during summer low flow periods. These actions include stream augmentation with groundwater; enhancing water conservation; increasing groundwater recharge; supplying irrigation water from wells that are far away from the creek; and modifying existing water appropriation permits. Each option offers possible management opportunities as well as possible implementation concerns. A preferred option likely involves replacing several wells, near Little Rock Creek, with more distant wells. This could supply affected irrigators with imported water and would reduce base-flow diversions from discontinued irrigation wells. Costs associated with this option need to be determined. (Source: Minnesota Department of Natural Resources, 2022, Evaluation of Conceptual Groundwater-Use Management Actions, Little Rock Creek Area. This bill proposes the construction new wells and a pipeline to provide water that replaces irrigation wells in the immediate vicinity of Little Rock Creek. It is likely that the bill would need to be included in the bonding bill.
  - b. NE Metro Water Scarcity: The DNR, and other water-related agencies, have been working on groundwater management the northeast metro for years. They have determined that groundwater use, as it affects White Bear Lake, is not sustainable. In response to litigation, the Ramsey County District Court has given the DNR the

specific orders. Without changes to the Court order, the DNR will not be able to authorize any additional groundwater use within five miles of White Bear Lake. The court order includes the following:

- i. The DNR is prohibited from issuing new groundwater appropriation permits or increases within five miles unless certain conditions are met:
  1. A residential irrigation ban is in effect when White Bear Lake water levels drop to 923.5 feet.
  2. Public water suppliers must implement a residential goal of 75 gallons per person per day and a total of 90 gallons per person per day.
  3. Public water suppliers must develop contingency plans to shift their water source from groundwater to surface water; and
  4. The DNR is required to set a collective annual withdrawal limit for White Bear Lake and adjust permits accordingly.

DNR analyses indicate that limiting total water use to the equivalent of about 55 gallons per person per day would maintain lake levels near or above 922 feet. This limitation would only provide water for priority uses for domestic supplies. Other uses of water for schools, hospitals, medical offices, and other commercial entities would not meet the definition of domestic supplies as outlined in the state water use priorities. Any increases in domestic use or allowing lower priority water use (i.e., commercial, industrial, agricultural, institutional, etc.), more than 55 gallons per person per day would not maintain lake levels above 922 feet.

The Metropolitan Council has provided a review of the 2014 northeast metro water supply feasibility study. Three options were developed for communities that involve connecting to the St. Paul Regional Water Services system. The three options that include: 1) connecting to the St. Paul Regional Water Services system, with three points of connection; 2) constructing a new surface water treatment facility for northeast metro communities; and lake augmentation of White Bear Lake.

This bill proposes the construction and operation of a pipeline, and treatment facility, to provide water to augment the level of White Bear Lake, as needed. This pipeline and plant's footprint could provide land for a more sophisticated treatment plant that might be needed, in the future, for augmenting municipal water supplies. The proposed facility would be operational only when White Bear Lake requires augmentation, while providing supplemental water as a source of water for the municipalities in the future. It is likely that the bill would need to be included in the bonding bill.

3. Define Sustainable groundwater limits using technological advance—Applying new tools to define groundwater limits: This bill would provide limited funds to support a pilot that defines sustainable water limits in a one-water/one plan watershed. The Minnesota Geological Survey (MGS) has advanced the science of analyzing geologic data to the extent that it can now be used to efficiently define water bank accounts for aquifers and for watersheds. This kind of effort is a priority as described in the University's water sustainability report. Technological advances can now be used to enhance water management for the one watershed/one plan process being implemented across the state. The bill would support a pilot that would combine geologic data analyses, by the MGS, with modeling by the DNR. The product would increase water budget information to manage on a sustainable basis. It would serve as a pilot for watersheds and aquifers across the state. The Clean Water Council has proposed \$4M for aquifer monitoring for water supply planning. This bill would fit well with that funding and would provide a proof of concept application of a method that would complement this funding.

- 2022 Bill: Define Sustainable groundwater withdrawal limits using technological advances--define limits in a pilot one-watershed/one plan (UM Sustainability report): Eken/Fisher (Eaton, Wiger, Poston)

4. Voluntary private well testing: Water from domestic wells needs to be safe for all of Minnesota's Citizens. Private wells supply over a million Minnesotans with drinking water. Yet, there are no state requirements for water safety testing. A program is needed to support systematic testing of the water quality in private wells, including the notification of testing results, and education on possible actions. Periodic testing of private wells that provide drinking water to rental properties also is needed. The bill would provide minimal funding to assist non-profit organizations, who are volunteers, in conducting local testing. The bill could also provide funding for analyses of lead and arsenic,

provide assistance for water treatment, and include well safety education. Water safety for private wells is called out as a priority in a recent report to the legislature, by MDH and the UM. The allocation would be to the MDH, or the University of Minnesota, to support the cost of water testing, educational materials, and information storage. The bill would also include periodic testing of private wells that provide drinking water to rental properties and require notification of the results before rental property owners can rent to new tenants or enter into new lease agreements. The bill would include funds for the notification of testing results and education on possible actions. There was some pushback from the Minnesota Water Well Association. They argue that samples should be collected by licensed well drillers and analyses done in certified labs. The Clean Water Council has proposed funding of three million dollars for the activity in FY 24-25. This likely would not include lead or arsenic, however. There is a need for legislative support beyond that proposed by the Clean Water program)

- 2022 Bill Safe drinking water—allocation to MDH/UM to support private well safety water testing clinics by a non-profit (UM report) Wiger/Acomb (Eaton, Eken, Lippert, Torkelson, Heintzeman, Poston, Fisher). Has been heard in the House--Preventative Health)

5. Ensuring the Safety of Private Wells by Identifying and Monitoring Vulnerable Aquifers-- Involves water safety for those using private wells. This bill would identify and monitor aquifers vulnerable to being contaminated. Several state agencies have programs for groundwater monitoring. However, support is needed to coordinate water sampling and testing from those networks, and in some areas, expand the networks over the most sensitive aquifers. A plan is needed to identify areas requiring additional attention because aquifers that supply water to private wells are particularly vulnerable to contamination. In these areas, increased monitoring, and education for well owners, is needed to ensure water safety. Funding, and a report from the MDA and MDH, is needed that outlines the need for additional testing and the development of a well network to document trends and changes in water quality over time. The effort would identify aquifers that are most vulnerable to contamination and would design a sentinel monitoring well network in those areas, as an early warning system. The resulting effort, coordinated across the agencies (MDH lead) and the MGS, would provide a means to increase source-water protection safety of those using private wells. The bill simply directs the preparation of a plan. (From Jim Lundy, MGWA: Description refers to "aquifer vulnerability", but I think the more useful concept is "aquifer setting" with respect to vulnerability. My example is the Mt. Simon Aquifer. Certainly, in some places where it sub-crops, the Mt. Simon is vulnerable. But across most of its mapped area in Minnesota, it occurs many formations down (1000 feet below St. Paul), with many laterally extensive confining layers intermixed. "Recent" water can be measured in the vulnerable parts of the Mt. Simon. But across much of its mapped area where it is overlain by other fine-grained formations, carbon 14 indicates 35,000+ years since water fell as rain. So, in these cases the aquifer is non-vulnerable. Same aquifer, two very different settings. So, the aquifer setting with respect to vulnerability is the controlling factor, not the geologic layer. Most in our business would agree. I am just putting a finer point on it for clearer thinking. But I think it will help lead to a better assessment.) The CWC has proposed \$2 million for groundwater assessments. That funding could be used to address this issue.

- 2022 Bill: Ensure safety of private wells--identify vulnerable aquifers: coordinate and supplement agency monitoring Eken/ Torkelson (Fischer, Eaton, Wiger, Lippert, Poston)

6. Improved Water and Agriculture: Precision agricultural research and outreach: This bill would include funding, to the University of Minnesota, to improve agricultural production and water quality by advancing research and outreach related to precision agriculture. Outcomes would include pilot studies and recommendations regarding data privacy, public-private partnerships, and needed technical assistance focused on the most challenging agricultural and water issues. Funding would be directed to the University of Minnesota.

- 2022 Bill: Improving water quality: Allocation to the UM for research/outreach for precision agriculture: Weber/Lippert (Eken, Eaton, Wiger, Poston, Fisher) (Not introduced in the House)

7. Tax credit for private riparian buffer lands: This bill would involve a tax credit to landowners for riparian buffer lands taken out of agricultural production. The buffer law provided a major step in improving the waters of the state. It required buffer strips along lakes, rivers, streams, and some ditches to filter phosphorus, nitrogen, and sediment. The bill would provide a tax credit, for land lost to farming, as well as policy to propose a compensation mechanism and process.

- 2022 Bill: Tax credit for private riparian buffer lands: Goggin/ Heintzeman (Eken, Wiger, Eaton, Weber, Poston, Fisher). Heard in Taxes in the Senate.

8. Water safety plans for cities— a pilot: This includes water-safety planning for cities. It would involve an effort described, in detail, in the recent UM drinking water report to the legislature. Source-to-tap water safety assessments would provide a flexible approach to local drinking-water-safety planning, resulting in water safety plans that would be approved by the MDH. The bill would simply direct the preparation of a prototype plan for one or two cities, coordinated by the MDH. (Dakota County staff objected because treatment plants and well-head protection plans are already required. Are there just too many plans required from the state. Consideration should be given to plan consolidation. (CGMC supports water safety plans for cities; a pilot program could be helpful. It may make more sense to choose two cities—one in greater Minnesota and one in the metro—before developing the proposed sentinel network.)

- 2022 Bill: Water safety plans for cities—appropriation for a plan and pilot (UM/ MDH recommendations) Eaton/ Poston (Eken, Wiger, Fisher)

9. Soil-health action plan including research, implementation, and outreach: Provides an allocation the UM to advance and implement a soil health action plan. It would include research, implementation, and outreach. The Clean Water Council has proposed funding of 14 million dollars for the activity in FY 24-25.

- 2022 Bill: UM allocation-- prepare a soil-health action plan including research, implementation, and outreach Eken/Lippert (Poston, Wiger, Eaton, Fisher). According to Rep. Lippert, the bill was heard last session and will be held over for inclusion.

10. Water Commission and the Wastewater Advisory Council: This bill would call for the reactivation of the Legislative Water Commission as well as reactivation of the Water Supply Systems and Wastewater Treatment Advisory Council. The reactivation of both groups had strong support from surveys and during stakeholder meetings.

- 2022 Bill: Reactivation of the LWC and the Water and Wastewater Advisory Council Eaton/Poston (a and b) (Rest)

11. Complete land management preservation goals for water quality and quantity for the Upper Mississippi: WP16: Preserving and protecting Priority Lakes and Rivers: A comprehensive program is needed to provide policy and plans protect our waters for future generations. Minnesota is a water-rich state with a great deal of water stored in aquifers, lakes, streams, and groundwater. All these waters interact within the context of the total landscape and are impacted both positively and negatively by our land-use choices. Healthy lakes enhance our quality of life. They support complex and important food web interactions and provide habitat for many types of fish and wildlife. Lakes contribute to a healthy economy; they are an important draw for tourism and provide recreational opportunities for our state's residents and our visitors. Unfortunately, some of our past and present land-use choices are damaging our water resources where we've made our landscapes and water flow paths vulnerable to erosion and contaminants. We can reduce and reverse these vulnerabilities through thoughtful planning and land management. We need to protect our lakes for the future. There is now a great opportunity to rapidly and strategically implement conservation programs that are intended to preserve high quality lakes for habitat and water-quality in the Upper Mississippi River Watershed. Research, by the Minnesota Department of Natural Resources, suggests that protecting 60 to 75 percent of land in a watershed from disturbance is sufficient to protect the habitat of lakes and of streams. The objective of this effort would be to prioritize and to increase funding for the state's SFIA program for the greatest impact on priority lakes. If funding is increased, it is likely the Federal matching funds would be available through the NRCS programs. There are 104 high-priority lakes in Minnesota. Twenty-six of these lakes meet state and local priorities in the Upper Mississippi River watershed. The effort also would help to evaluate progress made by state, federal and private organizations in meeting lake preservation goals and would assess opportunities for high impacts at low costs. It also would define a strategic path forward to attain those goals (funding to the DNR and BWSR). The CWC has recommended \$4.3 million for watershed restoration and protection. These funds could be used to help address this important issue. This request is for bonding dollars to focus specifically on preserving priority lakes.

The Sustainable Forest Incentive Act (SFIA) provides annual incentive payments to encourage private landowners to keep their wooded areas undeveloped. Private landowners can receive a payment for each acre of qualifying forest land they enroll in SFIA. In return, enrollees agree not to develop their land and to follow an active woodland management plan for a minimum of either 8, 20, or 50 years, depending on the covenant set with the parcel. SFIA is jointly administered by the Department of Revenue and the DNR Division of Forestry. Department of Revenue oversees SFIA applications, payments, penalties, and covenants. The DNR handles woodland management plans and land eligibility.

- 2022 Bill: Complete land preservation objective to preserve high-valued lakes in the Upper Mississippi—reaching the goal: Eaton/ Poston (Lippert, Wiger, Eken, Fisher) (HF3476)

12. Enhanced Groundwater Recharge: Natural groundwater recharge occurs as precipitation falls on the land surface, infiltrates into soil, and moves to the water table. Groundwater levels in some parts of the state are declining because withdrawals exceed the rate at which aquifers are naturally replenished. In areas of groundwater depletion, artificial recharge could supplement natural recharge. This could be accomplished using injection wells or surface infiltration. Artificial recharge is a common practice in many parts of the country. However, the practice has generally been discouraged in Minnesota. The legislature funded, through the Freshwater Society and the University of Minnesota, an effort to examine the feasibility of expanded groundwater recharge. In order to capitalize on this study, policy and funding to the DNR and MDH is needed to allow and to encourage groundwater recharge, where needed.

- 2022 Bill: Policy and an appropriation to encourage groundwater recharge where needed, with restrictions: Weber/ Fischer (Eken, Wiger, Eaton, Poston) Was not introduced.

13. Keeping Water on the Land: WP9: Water Retention: Agricultural drainage has provided many benefits that allow farmers better access to croplands and to complete farming operations in a timely manner. Without agricultural drainage, increases in soil productivity and crop yields would be difficult and economic returns would be diminished. While drainage of Minnesota's croplands provides benefits, several environmental concerns are associated with drainage. The installation of agricultural drainage, both surface ditches and sub-surface drainage accelerates transport of water from farm fields. There are downstream issues with unmanaged or uncontrolled agricultural drainage, which may increase flooding, may affect available water recharge to wetlands, may impact migrating waterfowl population, and may degrade downstream water quality and increase flooding. Increased funding would be included to advance and to increase existing programs (BWSR). The CWC has proposed \$1M for water storage to enhance wildlife and recreation in lakes in southern Minnesota. This bill would complement that request to other portions of the state.

- 2022 Bill: Keeping water on the land, water retention Weber/Torkelson (Eken, Wiger, Eaton, Poston, Lippert, Fischer) Heard in the Senate Env and Natural Resources.

14. Water Retention—Urban Storm Water: We need to evaluate, prioritize, and promote water retention in urban area storage facilities. Water retention reduces erosion, improves soil health and water quality, and increases groundwater recharge. However, the water quality impacts of stormwater capture and retention, in urban areas, is not well understood. There is need to assess and quantify the cumulative impacts of water storage and flood retention structures in urban areas in order to provide direction and policy for locating the structures in the right places. Research and policy are needed to ensure the quality of groundwater is not degraded because of leakage from these storage facilities. Funding is needed to increase efforts to create policy and funding programs to understand water storage, water quality, reduction of flood peaks, and to changes to groundwater recharge. MPCA and BWSR

- 2022 Bill: Keeping water on the land, water retention Weber/Torkelson (Eken, Wiger, Eaton, Poston, Lippert, Fischer) Heard in the Senate Env and Natural Resources.

15. Appropriation to support fixed costs for watershed districts. It would change in statute to increase the general fund allocation limit to keep up with inflation. The issue involves the cap (ceiling) that was placed on watershed districts' general fund levy decades after the original legislation for watershed districts was passed into law in the mid-1950s. The ceiling has made it very difficult for watershed districts, outside the metro area, to raise the necessary revenues to fully fund and implement their comprehensive 10-year water management plans. All watershed districts outside the seven-county metropolitan area do not have that ability under the current statute. Metro watershed districts are not restricted in this way. MAWD is of the opinion that this was unintentional when a correction was made to

allow watershed districts in the metro area to levy the funds needed to execute their comprehensive plans based on the annual budget process, the same process used by all Local Government Units (LGUs). To allow this operating correction to occur for watershed districts, a few technical changes to Chapter 103D Water Law must occur.

- 2022 Bill: Watershed Districts- changing the general fund appropriation limit to support fixed costs Eaton, (Eaton, Eken Wiger, Poston, Fischer). Heard in Senate, Env and Natural Resources, 3/16/2022

16. GW Assessing Emerging and Unregulated Contaminants in Drinking Water: Contaminants of emerging concern (CECs) are usually synthetic compounds that unexpectedly occur in water. An example is the occurrence of perfluorochemicals (PFCs) across much of Washington County. Other examples of CEC contaminant groups include pesticide metabolites, endocrine disruptors, and pharmaceuticals. There is an ever-increasing number of drinking-water contaminants related to industrial, agricultural, and domestic sources. These chemicals threaten drinking water, and the problem is exacerbated by population pressure, climate change, and aging water infrastructure (University of Minnesota, 2020). Population shifts, from rural to urban areas, have created financial challenges for small communities which need to make purchases of sophisticated and costly water-treatment equipment. Because many emerging contaminants are not fully addressed at the Federal level, it is important to provide funds, to the MDH, to prioritize the contaminants and to develop a management plan in order to make sound decisions about optimizing treatment between the source and the tap. (Regarding issue 6, DW1: Assessing Emerging and Unregulated Contaminants in Drinking Water, addressing both emerging and known contaminants in drinking water is challenging for local governments, especially smaller ones. CGMC supports funding to prioritize addressing those challenges as well as to help the Minnesota Department of Health address those challenges.

17. Addressing Water Utilities Staffing Shortage: Safe and effective delivery of drinking water depends on professional and well-trained staff. There is a significant lack of qualified water-utility professionals. The greatest needs are with small utilities in rural areas who struggle to recruit and retain staff (University of Minnesota, 2020). Legislative direction and funding are needed to promote training and to ensure retention of water-treatment plant staff, to encourage sharing of staff among utilities, and to encourage efficiency and consolidation of infrastructure and of staff. Legislation also is needed to provide support for curriculum programs at colleges, to establish a professional accreditation program, and to provide tuition support. This legislation also would provide support to the MDH and to the MPCA in providing assistance that encourages cost-effectiveness measures, and alternative arrangements for affordable water treatment and distribution systems, as well as means to encourage the sharing of staff between communities (University of Minnesota, 2020)

18. Upgrading Drinking Water Infrastructure: Inadequate water infrastructure is a growing threat to the delivery of safe drinking water. It can lead to additional sources of water contamination (University of Minnesota, 2020). Minnesota's water-related infrastructure is aging and threatens our economic and public health. The state needs to consider ways to encourage cost-effectiveness reviews, alternative best-management practices, asset-management reviews, efficient infrastructure alternatives, and water-quality trading options. Programs are also needed to identify and improve leaking septic systems and to fix inflow and infiltration infrastructure leaks. Funding to the MDH is needed to prepare plans for to upgrade facilities through bonding and other programs.

19. Increase Citizen Involvement in Drinking Water Safety: Increased emphasis for safe drinking water needs to include citizen empowerment and education. This would result in more public participation in defining governance criteria as well as setting goals. It would also foster greater involvement in monitoring home tap water (University of Minnesota, 2020). Legislative support is needed to encourage greater citizen engagement in advocating for improved drinking-water safety. MDH could expand drinking water safety by leveraging partnerships with trusted organizations (such as health care professionals and teachers) and receptive audiences (such as expectant parents, trusted leaders and by targeting the media). Funding to the MDH is needed to prepare a pilot effort.

20. Water Education: The Minnesota Groundwater Association's White Paper #02 ("Minnesota's Groundwater Education Gap", 2016) discusses how to meet missed opportunities within the K-12 and post-secondary educational system. However, timely, accurate communication of technical groundwater information to decision makers and the public is a critical need. The Minnesota Water Sustainability Framework (WRC, 2011) noted a lack of a

comprehensive strategy for public engagement in water planning and policy. Failing to provide accurate, understandable technical information in a timely way risks misunderstanding, poor decisions and withdrawal of public support for work involving groundwater. A pilot program to develop a comprehensive strategy for public engagement in water planning and policy is needed. Water education requirements are outlined in Article 2 of the 1989 Groundwater Protection Act. Some requirements around communication could include using geologic maps. A plan for a water education program is needed as described in the recent Minnesota Groundwater Association White Paper.

21. **Prioritizing for Environmental Outcomes:** The state's general funding for the environment is declining. Even with dedicated funds, conservation spending has decreased in the last twenty years: A plan is needed to ensure that general and dedicated funding will meet the state's future needs for ensuring our water needs (Conservation Minnesota). There is a need to measure the effectiveness of the dedicated funds programs for water (Environmental Spending). We need to determine how Minnesota's environmental spending compares to other states. We also need to tune the approach that balances funds spent for water protection, preservation, and restoration. The lack of stable funding can be particularly disruptive because of the time needed to complete hydrologic studies and investigations can be lengthy. The Clean Water Act does not provide stable funding mechanisms for several significant programs, including the Source Water Protection (MDH), the Minnesota Water Well Construction Code (MDH), County Geologic Atlases (MDNR and MGS), and ACCRA (MDA). The Clean Water Land and Legacy (CWLL) Amendment does provide funds for many efforts, especially the essential function of long-term ground water monitoring. However, the amendment could sunset in 2034, and options for continued funding needs to be considered. The following critical activities should be considered for reliable funding:

- a. Long-term water quality data collection, with emphasis on interactions between aquifer systems and surface water systems, time-series assessments, and support for modeling that will guide decision making into a sustainable groundwater future.
- b. Local water planning activities;
- c. Nitrogen fertilizer non-point program; and
- d. Citizen and decision-maker education on the groundwater resource

22. **Increased Technical Proficiency:** There is significant need to increase technical proficiency among state and local agency staff, and within the water profession at large. Models make it possible to create accurate predictions of future conditions given an array of inputs. This capability makes flow modeling a powerful tool for planning and management. Future capabilities might include reliable transient groundwater flow modeling, and models that couple groundwater flow and groundwater quality. State agency programs need to maintain and increase databases for modeling and GIS. Even though scientists know that the technical basis for water modeling is sound, water scientists must become proficient at communicating their results to non-expert decision makers and to the public. Through clear communications with these groups and others, Minnesota's water professionals must accurately convey the strengths and challenges of the use of advanced computer modeling to solve Minnesota's groundwater problems. Increased funding also is needed for research for Smart Technology for Agriculture. This would promote and fund additional research and applicable methods to encourage the use of smart technology to reduce water consumption and application rates for fertilizer and pesticides without reducing crop yields. Funding is needed, for the EQB, to develop a plan for increasing technical proficiency

23. **Increase Efforts to Encourage Wastewater and Storm-Water Treatment Options:** Small towns and cities struggle with costs associated with maintaining and upgrading water supply and wastewater-treatment facilities. The state needs to support innovative water-treatment processes. We need to explore ways to encourage and to provide funding for new technology as well as alternatives. This could include innovative technology, regional partnerships, improved asset management, coordinated administrative and operational activities, shared wastewater operators, and when appropriate, as well as ways to decentralize utility services. We need to encourage and provide funding for new technology, alternative approaches and opportunities for water supply and wastewater treatment. An assessment, and pilot testing of innovative approaches, is needed. Funding is needed for the MDH and for the MPCA to explore and facilitate options and opportunities. (The CWC has proposed \$200,000 for grants to small communities. This bill would provide resources to increase efficiencies for small towns and cities)



24. Address Disconnect Between Land Use and Water Quality Management Issue: Land use planning and water policy and management are not well connected although they influence each other. Although the connection between land use and water quality has long been recognized, the effects of land use change on water quantity and quality are not fully understood (WRC, 2011). As statewide demographics shift, partially in response to climatic change, water quantity, quality and recharge will be affected. Current policy and management do not recognize that land use affects water quality and quantity.

25. Plan for Changes to Water Resulting from Climate Change: All but two years since 1970 have been wetter and warmer than 20th century averages, and the 10 combined wettest and warmest years on record occurred after 1998. During 2019, more precipitation fell across the state than any other year on record, back to 1895. Minnesota has experienced 11 mega-rains in the 20 years since 2000 as compared to six in the 27 years from 1973 through 1999. Minnesota has warmed considerably, but mostly during nights and winter. Annual temperatures have climbed 2.9 °F since 1895, but winter low temperatures have increased by 6.1 °F. Climate model projections, made specifically for Minnesota, suggest we will see more precipitation by the end of this century, with continued increases in heavy rainfall and more frequent intervening dry spells. All for these changes will affect water resources and we need to plan for these continued changes. Climate change will likely affect groundwater quality and quantity. A plan is needed to address how climate changes will affect water across our landscapes. Planning for Climate Change and Drought: Drought planning is not as clear and robust as we need. The development of an expanded drought plan is needed, with funding, provided to the DNR, MPCA, MDA and to the EQB.

26. Statewide Policy on Manure Management: Manure handling is not addressed specifically in the Groundwater Protection Act of 1989. Rules remain unclear on this issue and the topic is the responsibility of the MPCA under the NPDES facility regulation rules or with the MDA as part of their nutrient management requirements. An assessment of impact draft policy needs to be prepared by the MDA and MPCA

27. Water Appropriations: Inter-basin Transport and Protections: Inter-basin water transfers have recently become an important issue. The inter-basin transfer situation involving the Missouri River opened the discussion (Lewis and Clark). Recently, a Lakeville-based railroad company filed an application to drill wells in Dakota County. Water from the wells, 500 million gallons a year, was proposed to be shipped, by train, to the Southwest United States. The proposal was not approved because the aquifer involved (Mt Simon and Hinckley) has unique legislatively mandated protection. However, that may not be the case for other aquifers. The commerce clause may prohibit future appropriation denials. The proposal was the first of its kind in Minnesota and could set a precedent about similar projects that could be allowed based on state statutes and rules. There is a need to revise water appropriation policy, based on the recent water train controversy. We need to continue to explore statutes and suggest policy needed to protect the state from future similar initiatives through a report to the Legislature (DNR).

28. Adjusting water appropriation priorities for commercial entities with conservation plans: Golf courses, and other commercial entities, who focus on water conservation and water-quality improvement, should be allowed to water for operations during times of drought. The Minnesota golf industry has been working to financially support the University of Minnesota's research to develop drought-resistant and water conserving turf varieties, pursue new technologies to reduce the need for irrigation, to conserve water and to develop drought management practices. A bill could change the appropriation permit hierarchy to "water conservation" commercial entities during times of drought.

29. Require Labeling for Wipes to Improve Wastewater Treatment Operations: Flushable wipes clog our wastewater treatment plants and decrease the efficiency of the plants. This is a significant issue for the Metropolitan Council and for other wastewater treatment facilities. Policy is needed to ban flushable wipes, or to change labeling language, and to provide accurate consumer education. A pilot program needs to be developed by the MPCA.

30. State Assumption of Federal Wetlands Permit Responsibilities (Clean Water Act, Section 404)  
The EQB received funds to plan for assumption. BWSR has received an EPA grant to supplement funding for the assumption-application process. Law and rule changes are needed including costs and staffing needs.

31. Emerging Contaminant Sentinel Monitoring Program: We don't know the extent and threat of forever chemicals in drinking water used by citizens of the state. There is a great need to address drinking-water safety by expanding an LCCMR-MDH project into a program at the MDH, focused on emerging contaminants in drinking water. The occurrence and distribution of unregulated contaminants, including the forever chemicals (PFOA and PFOS), is mostly unknown outside of Washington County. It is likely that this suite of chemicals is widespread in groundwater. This proposed program would build on results from an on-going LCCMR- MDH project. The initial step would be the development of a sentinel network of monitoring sites that includes community and non-community (transient and non- transient supply wells) as well as lakes and river that are sources of drinking water to supplement the LCCMR project network. This network would monitor waters that residents (particularly children by including schools) drink. By strategically developing a sampling network, and an appropriate list of chemicals for sampling, results could be extrapolated to identify and prioritize areas where contaminants may be found in other wells (sensitive areas). Results would be able to be used to identify aquifers where these emerging contaminants may be found in aquifers that supply private drinking-water wells. Therefore, the program would address the problem of water safety for those using private wells and municipal wells. Funding would be provided to the MDH to develop a program that supplements current MDH monitoring efforts. The CWC has proposed \$10 million for an emerging contaminant program. That funding would provide the funds needed to address this issue.

32. Water Quality Trading: Watershed-scale pollutant trading and banking programs could be an effective management practice in reducing nutrients and sediments in rivers and lakes. Water Quality trading offers a method of meeting water-quality standards in waters of the state. Policy is needed to build a reliable method to conduct trades. Funding to the MPCA, is needed to define and to initiate a process to facilitate third-party brokers.

33. Streamline Irrigation Water Appropriation Process: The time required to obtain an irrigation appropriation permit is of concern. As a state, we should ensure that the process for obtaining water appropriation permits, and the environmental review of proposed project is as efficient and timely as possible. Other states have streamlined their processes. Are there ways that this process could be more efficient? If so, what would be required by the agencies? Funding would be provided to the DNR for a feasibility study.

34. Groundwater Quality-- Pesticide and Nutrient Policy and Management in Groundwater: Groundwater quality protection was a significant driver for the 1989 Groundwater Protection Act (Act). As a result, the MDA proposed budget increases to fund the pesticide and nutrient rule development, following passage of Act. However, the Legislature funded only one chemical program. The MDA chose to continue development of a pesticide program. This meant that nutrients (nitrogen) lagged until Legacy funds became available. The ACT gave the MDA the opportunity to develop and establish additional rules, in addition to those that have been implemented. However, MDA has less authority for nutrients as compared to pesticides. A gap-review of policy is needed, related to a full management approach for pesticides and nutrients. This review would identify gaps, in MDA authority, to regulate and to develop BMPs for nutrients and for pesticides. Funding and policy development is needed by at the MDA. From Dan Stoddard (Focus on Gaps. UM was viewed as educators and that was reduced in the 1990s through Extension. MDA develops BMPs for pesticides and UM for nutrients. MDA has authority to regulate pests but lesser authority for nutrients. The MDA should review and identify gaps for funding and work and policy. The CWC is proposing \$700,000 in FY24-25 to increase monitoring for pesticides in water. The proposed gap review would complement the funding increased provided by the CWC. (CWC has proposed \$6M to address nitrate in groundwater). This bill would direct the MDA to use some of these funds for conduct a needed gap review of policy as described above.

35. Chloride Reduction and the MPCA Report: We overuse deicing salt, and it degrades the waters of the state. De-icing roads, parking lots, and sidewalks, water softening, and dust suppression each introduce chloride to lakes, streams, and groundwater. Chloride degrades our waters, and it is difficult and expensive to remediate. It is feasible to reduce the use of salt. Legislation would provide for additional applicator training. There also is a one-time need to determine the significance of other sources of chloride, such as water softening and dust suppression. The most pressing need is for grant funding to cities and towns to implement recommendations from a recent MPCA report. Legislation could also be directed to the following issues:

- a. Recommend continued general budget funding for long-term applicator training.
- b. Support and provide funding for a research plan to address alternatives to using salt (University of Minnesota)
- c. Includes policy to prepare a process for salt-use reporting for cities, counties and agencies
- d. Grants to cities to assess the scope and impact of centralized softening.
- e. Plant operators and training is a growing problem. A plan is needed to address this issue.
- f. A plan is also needed to explore feasibility of eliminating the sale of water softeners that cannot be programmed to reduce the use of salt.

From Brooke at the MPCA: What's needed is grant funding for cities.

CGMC believes that addressing chloride reduction should be a top priority at the legislature, but the described legislative goals may be too broad to address all at once. It is well known that chloride from water softeners can be and already is a problem in numerous cities, but the depth of the problem varies by city. Quantifying the amount at this point seems redundant because there are already cities that have chloride limits in their permits or have proposed to include them. Funding for this issue should be prioritized towards chloride reduction grants for the removal or upgrade of softeners. Additionally, CGMC is unsure of what the purpose of a) assessing the potential for centralized softening statewide currently is. Chloride reduction could first be evaluated at the community level when a city is facing a chloride limit to determine whether it is the best solution while considering all known local factors. Cooper T. Silburn, Legal Associate Flaherty & Hood, P.A. (The CWC has proposed \$1.3 Million for the grant effort)

36. Forever Chemicals (PFOA and PFOS) in Food Waste Compost: Forever chemicals in food packaging threatens the organic composting industry and presents a threat to organic recycling. There is a long list of forever chemicals that are used in food packaging. As a result, they contaminate food and food packaging waste at composting sites and make the food packaging compost unusable for land application. The chemicals are in the process of being phased out by the food industry. However, the problem at composting sites likely will continue for some time. There are options to keep from derailing efforts to compost food waste and to keep the composting industry viable. Options would include limited sampling to determine whether compounds are leaching into groundwater at compost-application sites to determine whether there is a significant problem at these sites. If so, a temporary ban on food containers containing these compounds may be needed. Another option may be a temporary ban on composting food packaging. Funding is needed as well as policy to support the continuation of the food compost industry and the continued recycling of food waste. (MPCA) This would include water sampling at selected sites as well as a temporary ban on the composting of food packaging materials

37. Encourage Efficient Wastewater and Storm-Water Technology and Treatment Options: Cities struggle with maintaining and upgrading water supply and wastewater-treatment facilities. There is an urgent need to support, encourage and provide new technology and alternative approaches, particularly for small cities. Legislation could support innovative technology, regional partnerships, improved asset management, coordinated administrative and operational activities, shared wastewater operators, and decentralized utility services. This initiative would create and fund additional regional wastewater coordinator positions (MPCA) to assist in regional training programs, to encourage cross-jurisdictional cooperation, and promote cost effective and innovative waste-water practices. Policy and legislative direction are needed to facilitate, implement and develop an adaptive approach for pollutant trading or pollutant banking at a watershed scale. Expanding the ability for cities to participate in water-quality trading is needed by creating policy. Establish a means for third-party credit seller and credit seller brokers for trading. There is an estimate that the state has 100,000 failing individual septic systems. Generally, areas with the greatest problems are known (MPCA). Support (funding) is needed to provide funds for low-income households with assistance for fixing failing systems. Support is needed for regional facilitators (UM or Minnesota Rural Water Association) to provide advice and coordination with homeowners and county staff to navigate options that exist for upgrading systems. (The CWC has proposed \$3 million for this effort as funding to local government. This bill would provide policy and direction for the wise use of those funds).

38. Long Range Water Planning. Last session, two water-planning bills were introduced: HF 3888 would have appropriated monies for a plan ensure that Minnesota has an abundant supply of clean water for the next 50 years. HF 4204 proposed an Office of Water Policy (the companion bill was SF 4310). The first of the bills would have established an Office of Water Policy to provide research and to evaluate policies and practices relating to groundwater and surface water use, protection, and enhancement, including:

- a. improved methods for planning and assessing the water balance between major aquifer systems and between groundwater and surface water and shared that information with state agencies, the legislature, and local governmental units;
- b. proposed methods for securing private and public drinking water supplies by developing an assessment and management plan for public sources of drinking.

The second bill would have appropriated funds to the University of Minnesota to develop a plan to ensure that the state has an abundant supply of clean water for the next 50 years. The plan would have:

- a. assessed the current state of Minnesota's waters, both surface water and groundwater throughout all geographic regions;
- b. identified gaps in data or information with respect to the quality and quantity of Minnesota's waters and provided recommendations to obtain any necessary data and information; and
- c. identified opportunities for Minnesota to act proactively to ensure that the state has an adequate supply of clean water for the next 50 years.

Both plans have merit and should be consolidated in a planning effort conducted by the University of Minnesota and the water agencies of the state.

39. Future of drinking water: Minnesota is a leader in providing safe drinking water. However, it needs to develop drinking water policy that recognizes future challenges. One of these, aging infrastructure, as a source of contamination, is increasingly being acknowledged as a problem here and throughout the US. Additionally, an ever-increasing number and diversity of drinking water contaminants, arising from industrial, agricultural, and domestic sources will contaminate source waters. Anticipated extreme weather events associated with climate change may compromise wastewater treatment and lead to further contamination. The recommendations of a recent UM/MDH legislative report focuses on changing governance systems to respond, an integrated and flexible fashion to emerging challenges and do so in a way that commands public confidence. Key to this will be coordination between the agencies involved with water governance to provide a holistic response to drinking water. The report recommends statues that would clarify agency responsibilities to provide a safe and sufficient drinking water. The report also suggests that the MDH should guide the development of these principles into prioritized actions to better manage risks to Minnesota's drinking water. The report recommends the development of a state drinking water plan coordinated by MDH. Options, for consideration, are included in the Minnesota Groundwater Association's White Paper on the 1989 Groundwater Protection Act. (The CWC has proposed \$500,000 for a "Future of drinking water Program. However, this effort is focused on lead exposure)

40. Culvert Replacement Program: Many of the culverts in rural Minnesota are old, under-sized and improperly designed for fish migration. Ongoing state, county and township roadway improvements provide opportunities to create sites for water storage (needed to retain sediment and retain waters to reduce flood peaks, to right-size culverts for flooding and to allow for fish passage. As culverts are replaced, opportunities exist to improve culvert design. Legislation could provide funds to evaluate reconstruction and to fund the new design of culvert in areas where opportunities exist, coordinated by MDOT and the DNR. This would encourage coordination of ongoing programs that would improve continuous flow for water quality, encourage water retention and improve fish passage. The CWC has proposed \$2.5 million for conservation drainage management. These funds could be used to leverage and begin this important issue.

41. Encouraging Regionalization of Municipal Water Supply Systems: The Twin Cities Metropolitan Area is a growing. The population is predicted to reach 4 million in 2050, and the region may need to supply an additional 10 million gallons per day at that time. The Metropolitan Council, and its advisory committees, have recently identified and clarified the major challenges. These challenges include contamination and water quality; managing complex system of interactions between water supply and land use; groundwater and surface water interactions; stewardship of public infrastructure; responding to changing conditions and emergencies and coordinating work among

overlapping jurisdictions. Regionalization of municipal water utilities presents opportunities do address some of these challenges in specific subregions of the TCMA. Policy is needed to plan and to incentivize cooperation among certain municipal water utilities. (The CWC has proposed \$ 2.5 M for a Metro Water Sustainability efforts. An evaluation and recommendations regarding regionalization should be built into this effort)

42. Stop the Carp: Invasive carp are now in Minnesota, in the Mississippi River. It is important to stop the migration of the fish before they advance farther in the river system. By using a combination of three available techniques at Lock and Dam 5, near Winona, over 95 percent of the Bighead carp could be stopped. This likely would spare Lake Pepin, and the St Croix River. Carp control can be achieved with little effect on native game fish. A decision for funding the installation of a carp barrier is needed in 2022 in order to start in 2023. (University of Minnesota and the DNR)

43. Shallow Lake Management: While all lakes support wildlife needs, it is the shallow water zone, characterized by aquatic plants and generally less than 15 feet deep, that provides the most important wildlife habitat. There are more than 5000 shallow lakes over 50 acres in size in Minnesota. These lakes have permanent or semi-permanent water regimes and are typically dominated by wetland habitat (less than 15 feet deep). Although water quality degradation, altered watersheds, modified outlets, urban development, intensive agriculture, and exotic species have reduced their wildlife benefits, shallow lakes remain a critical habitat component for Minnesota's wildlife. DNR's goals for management and protection of shallow lakes is to protect and manage shallow lakes for their ecological, recreational, and economic importance, with particular emphasis on wildlife and wildlife-based recreation. The plan's focus is to maximize waterfowl and wildlife habitat on shallow lakes associated with public wildlife lands. Because shallow lakes are managed differently than other lakes in the state, consideration should be given to management practices that would allow for greater control of aquatic vegetation, including algae, in shallow lakes that are used primarily for water-based recreation other than water-fowl production.

44. Statewide Mining Policy: The Rainy River-Lake of the Woods and Lake Superior watersheds contain some of the greatest reserves of iron and sulfide-based metals in the world. Mining has been, and continues to be, important to the economy and to the welfare for those living in Minnesota. Iron ore has been mined in the watersheds for over 100 years, and the watersheds continue to support taconite mining and processing facilities. They contain vast areas of active and abandoned mines as well as areas of mineral potential for additional mining. In 2010, approximately fifteen percent of the economy of northeastern Minnesota's economy was based on taconite (iron) mining (Skala and others, 2012). There is significant interest in sulfide-metal mining. The world demand for copper (Cu), nickel (Ni), and platinum-group elements (PGEs) is growing (Wilburn and Bleiwas, 2004) and likely will continue to grow due to an increasing world population and high-technology applications. However, the development of mines presents potential human, water quality, and ecosystem impacts. Proposed mines are generally evaluated on a site-specific process. This leaves both environmental and mineral development groups without policy that addresses the state's goals and objectives regarding how mining fits into the best interests of the state. State-wide policy is needed regarding the risks and potential economic benefits of new mines. This would give direction for new mine proposals so that the mining industry, the environmental community, and state agencies can understand where mineral development might be allowable, based on potential benefits and risks. Funding to the DNR and to the MPCA would be needed to develop criteria for a statewide policy.

45. Carbon Capture in Mine Waste Rocks: As concentrations of carbon dioxide increase in the atmosphere, attention is now being paid to the benefits of removing and storing it in rocks that are common to Minnesota. The USGS has published a comprehensive review of geologic carbon storage: carbon mineralization. Carbon mineralization is the process by which carbon dioxide becomes a solid mineral, such as a carbonate. It is a chemical reaction that happens when certain rocks are exposed to carbon dioxide. Carbon mineralization involves exposing carbon dioxide to ultramafic rocks or basalt. The biggest advantage of carbon mineralization is that the carbon cannot escape to the atmosphere. Most of the rocks that have the potential for carbon mineralization are igneous and metamorphic rocks common to northern Minnesota. At least one of the proposed sulfide mineral mines in the state have expressed interest in carbon capture by using crushed mining waste. State policy is needed to consider or to encourage, or discourage, this practice in the state.

46. Keep our Lakes Clean Initiative: Ice fishing on Minnesota’s lakes has changed and the winter has become a popular time to recreate on lakes. Wheeled fish houses and other amenities have created a cultural shift in the way people fish. Winter fishing on Lake of the Woods has tripled compared to 20 years ago. Lakes have become recreational vehicle campgrounds. However, there are no ground rules or services for trash and human waste. Waste being left on the lake is becoming more and more of an issue. The Keep It Clean Initiative was started in 2012 on Lake of the Woods after a volunteer group hauled trailers full of trash off the shoreline of Lake of the Woods following the winter fishing season. Since that time this initiative locally seeks solutions to address trash and human waste left on the lake. In 2022, local stakeholders from Red Lake, and Mille Lacs have identified this issue and have joined the Keep It Clean Initiative, forming a Regional Keep It Clean Committee. This committee has worked to address the local needs with the increase of trash and human waste being left on lakes in Minnesota. The committee is seeking to address the following three issues:

- a. Local and state changes in ordinances and laws are needed to make it unlawful to place trash on frozen lakes;
- b. Technical and financial support is needed for local infrastructure to assist local communities: and
- c. State agency partnership to provide a statewide program. Currently it is difficult for Conservation Officers to issue citations for littering on the ice.

The DNR has suggested that amending statutes would be a way to address the enforcement issue. Specifically, this could be addressed within the Water Surface Use Ordinance. This activity could be address as outlined in statute 6110.3700 Water Surface Management standards Sub. 8. Conduct of other activities on a body of water. This subpart references the goal of water surface use management in 6110.3200. These statutes provide the opportunity to address trash and human waste on the lake, however the scope of what DNR Conservation Officers can enforce is very narrow and is limited by 86B.205 Sub. 9. c. 1-5. These only refer to soft water issues related to watercraft uses. An expansion of the scope of the statutes to include a way for counties to prohibit human waste and trash on the ice could address this issue. The water surface use ordinance would be a good vehicle because counties could propose ordinances that the DNR Commissioner would have to approve prior to the adoption of the ordinance. This would show that changes would need to be requested locally, and then with the approval by the DNR Commissioner, enforced by DNR Conservation Officers. Action by the legislature is needed along with local efforts like the Keep It Clean Initiative to keep our waters free of trash and human waste.

47. St Anthony Falls Cutoff Wall: There was widespread agreement that the cutoff wall is at significant risk of failure and that the consequences of a wall failure could be severe for surrounding infrastructure such as the Third Avenue bridge and the Metro’s water intakes. The Army Corps recorded instances of water running over, under, and through the wall within the first year after its construction. Others have seen water leaking through the wall and believe the leaking is piping sediment from above the wall to below it, which means cavities could be forming above the wall. A proposal has been discussed for an initial study of the wall’s condition. The initial study would be non-invasive and would identify areas that need further study (like borings). Drilling would have to be done very carefully but can be done with low risk. Drilling could be set up to create wells that can be closed and reopened for subsequent monitoring. The Army Corps says the cutoff wall is “unique” and they haven’t studied another wall like this. The Corps’ interest is only in examining the wall itself, not in the surrounding geology or structures. The Corps has said its monitoring proposal is to run fiber optic lines along the wall; this would have an initial cost \$5M and annual cost of \$1M. Hennepin County has proposed to conduct a hazard assessment as a first step towards getting a better understanding and more public awareness of the risks posed by the cutoff wall. This project would require a special budget allocation and likely consultants to complete, depending on the desired project timeline. A hazard assessment would study the potential consequences to the falls area should there be a dam structural failure. Impacts considered would include life safety, transportation, energy, water supply, groundwater, storm sewers, historic structures, and other infrastructure and potential impacts. A hazard assessment could include a non-invasive geophysical investigation. The hazard assessment would not address responsibility for or ownership over the cutoff wall. Hennepin County supports a big-picture study. Minneapolis Emergency Management could be an important partner. SAFL could model some of the risks and appears to be interested in doing so. A bill would provide funds for an initial reconnaissance study. (New, September 29, 2022)

48. Forever Chemicals (PFOA and PFOS): Although PFAS chemicals are a big problem in food containers, these materials are found in a myriad of products including things like pesticides and artificial turf. To protect our surface

and groundwaters, we need to seriously consider a ban on all non-essential uses. These chemicals, especially the long-chain versions, accumulate in the body. This means that serum levels can build up to be 1000 times higher than the concentration in the water one is drinking -- parts per trillion in the water can mean parts per billion in the blood. Both the EPA and MDH are recommending levels in the low parts per trillion range. (Tannie Eshenaur and Jim Kelly, from the Minnesota Department of Health, have an excellent presentation on PFAS chemicals) Sophie Greene, who is the PFAS coordinator for the MPCA also has very complete information. In 2021, Maine passed the first bill to ban PFAS except for essential use. In 2020, the European Commission adopted the strategy to ban PFAS except for essential use because of their persistence in the environment. One study estimated the cost of PFAS contamination to the EU is between \$60-\$100 billion per year. Here is a study that was published in 2019 outlining a strategy for determining what essential use means: [10.1039/c9em00163h](https://doi.org/10.1039/c9em00163h). Many actions will be required to protect the public and the environment from PFAS contamination, but one significant step is to reduce the amount produced and to limit the products where it is found. Just limiting its use in food products will probably be inadequate. (Steve Ring, Sierra Club)

49. Study of Water Quality Impacts from Wake Boats: Wake boats are made to produce a wake that one can surf on without using a tow rope. Generally, they have powerful motors, large ballast tanks in the back for additional weight, and downward facing propellers. They can have big impacts on shallow waters. Their impacts include:
- a. Shoreline erosion and wave impacts can damage spawning fish, waterfowl and aquatic vegetation. It also leads to armoring (adding concrete and riprap) of the shoreline which exacerbates wave impacts by reflecting the waves
  - b. The downward facing propellers resuspend the sediments. This can introduce toxic metals (mercury), nutrients (phosphorus and nitrate), and other particles that increase turbidity into the water column. The nutrients can lead to algae blooms and eutrophication of the lake.
  - c. Aquatic plants can also be damaged. As the large wakes reduce the number of plants growing in the shallows, there are fewer plants to help dampen the impact of the waves.
  - d. The large ballast tanks are also an invitation to invasive species.
  - e. We recently have heard about possible impacts on wild rice beds.
  - f. The physics principle of superposition means that waves from two or more wake boats can occasionally combine to produce very large waves.

Other states are studying and proposing regulations for these boats (Michigan, Vermont, and Maine, for instance). Regulations include use in more than 15-20 feet of water and stay 500 feet from shore. Cook County has banned them from Caribou Lake. Lake Minnetonka is trying to rein them in.

A recent study from the U of M Lab at St. Anthony Falls found that wake boats had to be 500 ft away to equal the wake energy from a normal powerboat at 200 ft. We need funding to develop and execute a study of the impacts of wave energy and the downward facing propellers on the water quality of our lakes. The legislature proposed in 2022 licensing of powerboat operators. This is laudable, but probably inadequate. (Steve Ring, Sierra Club)