



**BUREAU OF WATER QUALITY
WATER EVALUATION SECTION**

**2021-2023 TRIENNIAL STANDARDS REVIEW (TSR)
PRIORITIES FOR THE WATER QUALITY STANDARDS PROGRAM**

PUBLICATION NUMBER: WY-102-2021

EFFECTIVE DATE: March 19, 2021

APPROVED:

Adrian Stocks, Director
Water Quality Bureau

3/19/2021

Date

2021-2023 TRIENNIAL STANDARDS REVIEW (TSR) PRIORITIES FOR THE WATER QUALITY STANDARDS PROGRAM

Table of Contents

EXECUTIVE SUMMARY	3
TSR PURPOSE	4
TSR PROCESS	4
TOPIC SOLICITATION	5
TOPIC SOLICITATION FORM.....	5
TOPIC RANKING FORM	6
TOPIC RANKING RESULTS	7
TOPIC CATEGORIZATION & FINAL WORKPLAN	8
RATIONALE FOR TOPIC CATEGORIZATION & TOPIC DESCRIPTIONS	9
CATEGORY A: WORK IS CURRENTLY IN PROGRESS.....	9
CATEGORY B: PRIORITIES FOR THE UPCOMING CYCLE	11
CATEGORY C: SHOULD BE ADDRESSED, BUT ARE NOT PRIORITIES FOR THE UPCOMING CYCLE.....	13
VARIANCES	16
APPENDIX A. 2018-2020 TSR: TOPICS THAT WERE COMPLETED OR ARE CLOSE TO COMPLETION	17
RULES/TOPICS THAT WERE COMPLETED	17
RULES THAT WILL BE RE-SUBMITTED TO THE LEGISLATURE	17

AUTHORS

Marcia Willhite, Meghan Williams, Kristi Minahan, and Ashley Beranek
Water Quality Bureau, Water Evaluation Section

EXECUTIVE SUMMARY

Every three years the State of Wisconsin is required by the Clean Water Act to review its water quality standards (WQS) and related guidance. This process, called the Triennial Standards Review (TSR), occurs in two phases. The first phase and focus of this report is to determine which WQS or related guidance will be priorities for the next three years. Wisconsin Department of Natural Resources (WDNR) solicited input from staff, partners, and the public to gather topics, and then asked these parties to rank the topics using an online ranking form. The results from the survey were used to determine the final work prioritization for 2021-2023.

The final list of topics included six new priorities: Development of Criteria for Nitrogen/Nitrate, Development of Criteria for PFAS Compounds other than PFOS and PFOA, Development of Criteria for Neonicotinoid Insecticides, Aquatic Life Criteria Revision/Development, Outstanding/Exceptional Resource Waters Process Revision, and Development of Criteria for Total Suspended Solids.

The next step, the second phase of the TSR, is to revise or develop WQS or guidance for the selected topics.

TSR PURPOSE

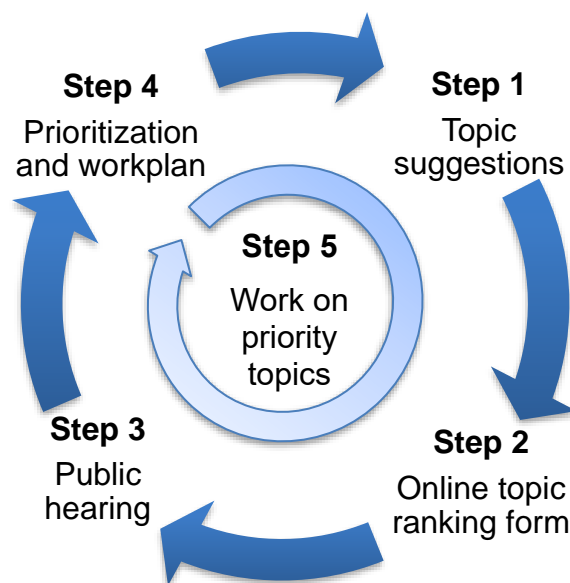
The Clean Water Act section 303(c) requires that the State of Wisconsin review its water quality standards and related guidance every three years. Water quality standards (WQS) are composed of three parts that are outlined in detail in 40 CFR § 131: 1) Use Designations: determination of how a waterbody is used by people, aquatic communities, and wildlife; 2) Water Quality Criteria (WQC): a quantitative amount of a certain pollutant that is allowable in a waterbody or a narrative, qualitative statement of unacceptable conditions in a waterbody, set to be protective of the designated uses; and 3) Antidegradation: protection for high-quality waterbodies. Related guidance provides direction on applying or implementing a surface WQS. The TSR does not focus on topics outside of WQS and related guidance (e.g. it does not include Best Management Practices, TMDL implementation, watershed permitting). This review helps focus Wisconsin Department of Natural Resources (WDNR) efforts to integrate the latest science and technology and federal requirements into how the State regulates surface water quality.

TSR PROCESS

The State of Wisconsin’s TSR process occurs in two phases. The first phase, described in Steps 1-4 of the graphic below, helps WDNR to identify what will be worked on. It is not possible to review, develop, or revise all WQS and related guidance due to the large number of WQS and limited staff and funding. Topics are gathered from the public, WDNR staff, and external partners. Once compiled, these groups are asked to rank the importance of these topics. These rankings are used to determine what topics will be addressed over the next three years.

The second phase, represented in Step 5 of the graphic below, is to do the work of revising or developing WQS or guidance for selected topics. The process for any given topic potentially includes an Advisory Committee, coordination with the United States Environmental Protection Agency (EPA), and legal and administrative approval. Any changes to WQS include public hearings. If rulemaking is needed, all requirements for the administrative rulemaking process will be followed.

The focus of this document is phase one of the TSR process in which topics are identified and prioritized.



TOPIC SOLICITATION

The topic solicitation period ran from August 25 – September 14, 2020. WDNR’s WQS program compiled an initial list of topics for consideration, and invited others to contribute to the list. A Topic Solicitation Form was sent out to WDNR staff, external partners, and the public. Seventy-three topics were submitted by 49 submitters. Similar topics were combined, and topics not suited for a TSR (CAFOs, shoreline zoning, wetlands) were not included. The end result was 14 topics for ranking.

Topic Solicitation Form

TRIENNIAL STANDARDS REVIEW: Topics for Consideration
Due Date: September 14, 2020

Submit To: Meghan Williams, meghanC3.williams@wisconsin.gov

Fill out this form to submit one or more topics for consideration for the 2021-2023 Triennial Standard Review. Please include a detailed description of your topic to facilitate decision-making.

Further information on the Triennial Standards Review process can be found on our website at <http://dnr.wi.gov/topic/SurfaceWater/TSR.html>. This includes a list of topics that the DNR already plans to include for consideration; those topics do not need to be resubmitted.

Topics that may be included in this review include those related to the following surface water quality standards:

- Designated Uses such as recreation, public health, and the health of aquatic life and other wildlife
- Water Quality Criteria (for pollutants, biological assessments, etc.)
- Antidegradation policy or procedures
- Variances to water quality standards

Topics that are outside the scope of this review and cannot be considered include:

- Concentrated Animal Feeding Operations (CAFOs)
- Groundwater
- Dams
- Wetlands
- Shoreline Zoning

Please contact Meghan Williams with any questions or comments via email at meghanC3.williams@wisconsin.gov.

We greatly appreciate your input and thank you for being a part of the Triennial Standards Review!

Enter topic suggestions on the next page.

Name:	Click here to enter text.	
Organization: (if DNR, specify Section)	Click here to enter text.	Position/Title: Click here to enter text.
Email:	Click here to enter text.	Phone: Click here to enter text.
New Topics For Consideration		
	Topic	Reason for Consideration/Topic Description
1	Click here to enter text.	Click here to enter text.
2	Click here to enter text.	Click here to enter text.

TOPIC RANKING FORM

WDNR asked staff, the public and partners to rank their top 5 topics from the list of 14 possible topics (below) via an online ranking form. The form was administered through SurveyMonkey and was open from October 13 – December 4, 2020. A brief description of each topic was provided. A public hearing was held on November 16, 2020 in order to provide additional information on the topics to be ranked and to receive oral comments. Written comments were also accepted during the time that the topic ranking form was open.

Topics to be ranked:

- Aluminum Criteria Development
- Ammonia Criteria Revision
- Aquatic Life Water Quality Criteria Revision/Development
- Bifenthrin Criteria Development
- Chlorantraniliprole Criteria Development
- Copper Criteria Revision
- Neonicotinoid Insecticides Criteria Development
- Nitrate/Nitrogen Criteria Development
- Outstanding/Exceptional Resource Waters Process Revision
- PFAS Compounds (other than PFOS and PFOA) Criteria Development
- Pharmaceuticals Criteria Development
- Sulfate Criteria Development
- Total Suspended Solids Criteria Development
- Wild Rice Designated Use Development

Variance questions:

Respondents were also asked whether they were aware of any new or updated information or data pertaining to individual variances for arsenic, chloride, copper, mercury, or phosphorus.

For the phosphorus multi-discharger variance, WDNR asked whether respondents had comments indicating the need for a formal review of the Department of Administration's 2017 determination that attaining the phosphorus water quality standard is infeasible because it would require major facility upgrades that would cause substantial and widespread adverse social and economic impacts.

Topic Ranking Results

WDNR received 118 responses to the online topic ranking form. Eighty-three responses were from members of the public, 6 responses were from representatives of environmental groups, and 29 responses were from WDNR staff and its partners. The table below shows respondent groups in more detail.

Public	Environmental Groups	WDNR & Partners
83 responses	6 responses	29 responses
'Public' (78)	Clean Wisconsin	WDNR (22)
Delavan Lake Sanitary District	WI's Greenfire	WDHS
Green Lake Association	Milwaukee Riverkeeper	UW Extension
Wolf Lake Property Owners Association	Midwest Environmental Advocates	Great Lakes Indian Fish and Wildlife Commission
Chippewa Flowage Area Property Owners Association	Midwest Environmental Justice Organization	Southeastern WI Regional Planning Commission
Little Tamarack Lake District	River Alliance of WI	Buffalo County
		Barron County
		Bayfield County

Respondents were asked to rank their top 5 topics from the list of 14 possible topics. WDNR then used individual respondents' rankings to determine overall topic rankings using a weighted approach (a respondent's first priority received 5 points, down to their fifth priority receiving 1 point, so that scores could be summed and ranked). This generated the information in the table below.

Topic	Rank			
	All	Public	Env. Groups	WDNR & Partners
Nitrate/Nitrogen Criteria Development	1	1	3	1
PFAS Compounds (other than PFOS & PFOA) Criteria Development	2	2	1	4
Neonicotinoid Insecticides Criteria Development	3	4	2	3
Aquatic Life Criteria Revision/Development	4	3	7	7
Outstanding/Exceptional Resource Waters Process Revision	5	5	10	5
Total Suspended Solids Criteria Development	5	7	6	2
Wild Rice Designated Use Development	7	6	4	6
Pharmaceuticals Criteria Development	8	8	5	8
Sulfate Criteria Development	9	11	10	9
Chlorantraniliprole Criteria Development	10	9	10	13
Bifenthrin Criteria Development	11	10	10	12
Ammonia Criteria Revision	12	12	8	10
Aluminum Criteria Development	13	14	8	11
Copper Criteria Revision	14	13	10	14

WDNR also received 6 comment letters that did not provide topic rankings but provided other comments related to water quality standards. Some of these were from organizations representing municipalities or businesses, such as Municipal Environmental Group, the National Council for Air and Stream Improvement, the American Forest and Paper Association, and Wisconsin Paper Council, and others were submitted by individuals. Where comments were relevant to the Triennial Standards Review, these comments were considered in conjunction with the prioritization process.

TOPIC CATEGORIZATION & FINAL WORKPLAN

The overall topic rankings, combined with staff technical knowledge and a feasibility analysis, were used to categorize each topic into Categories B, C, or D below. Category A represents work that is currently in progress. Note that the category descriptions were modified from those used in the last TSR cycle, 2018 – 2020, to provide better clarity. Topic descriptions and rationale for each placement are provided in the next section. Topics that were completed during the 2018-2020 TSR cycle, or are close to completion, can be found in Appendix A.

Category A: Work is currently in progress

Topics in Group A were not ranked. These are topics that are already being worked on by WDNR staff, many of which were identified as priorities through previous TSR cycles.

- Antidegradation Criteria Revision
- Chloride Variance Streamlining
- Cyanobacteria (Harmful Algal Blooms) Guidance
- Designated Uses Structure/Process Revision
- Human Health Criteria Revision/Development
- Mercury Variance Streamlining
- PFOS/PFOA Criteria Development

Category B: Priorities for the upcoming cycle

These are topics that WDNR is prioritizing for work over the next three years. Topics in this group were high priorities based on input from staff, partners, and the public. WDNR expects that it will be feasible to begin work on these projects during the upcoming cycle based on WDNR resources (staff availability, funding, scientific knowledge). Work will begin as resources allow.

- Aquatic Life Water Quality Criteria Revision/Development
- Neonicotinoid Insecticides Criteria Development
- Nitrate/Nitrogen Criteria Development
- Outstanding/Exceptional Resource Waters Process Revision
- PFAS Compounds (other than PFOS and PFOA) Criteria Development
- Total Suspended Solids Criteria Development

Category C: Should be addressed but are not priorities for the upcoming cycle

These topics would be useful to address in the future, but WDNR currently does not have the resources (staff time, funding, scientific knowledge) to work on them in addition to the priorities in Category B.

- Aluminum Criteria Development
- Ammonia Criteria Revision
- Bifenthrin Criteria Development
- Chlorantraniliprole Criteria Development
- Copper Criteria Revision
- Pharmaceuticals Criteria Development
- Sulfate Criteria Development
- Wild Rice Designated Use Development

Category D: Barriers to work currently exist

No topics were placed into this category during this TSR cycle.

RATIONALE FOR TOPIC CATEGORIZATION & TOPIC DESCRIPTIONS

This section explains why topics were placed in the various categories.

Category A: Work is currently in progress

Antidegradation Policy and Implementation Revision

Status: On hold; Scope Statement expired

Antidegradation is a policy designated to protect high quality waters from degradation due to new or increased discharges to surface waters. Updates to this policy and associated procedures are needed to clarify when antidegradation review is required and to make Wisconsin's rules consistent with federal antidegradation requirements. A Scope Statement was approved to begin work on these rules in 2016, and work was done during this time frame but not completed. The Scope Statement expired in 2020. To continue work on this rule, WDNR plans to submit a new Scope Statement to the Governor's office to seek its approval for moving ahead.

Chloride Variance Streamlining

Status: In progress

WDNR and EPA have implemented improvements and are continuing to identify several areas within the chloride variance process that could be improved or updated to help streamline the variance process for permittees, WDNR, and EPA. WDNR has developed documents to enable consistent review of Annual Reports and a general Source Reduction Measure (SRM) plan template (applicable to any substance, including chloride). Improvements currently in progress include updates to the facility specific data sheet and creation of SRM Annual report templates. Updates to the variance application has also been identified as an area for improvement.

Cyanobacterial (Harmful Algal Blooms) Guidance

Status: Review of EPA recommendations complete; guidance to be developed

EPA released human health recreational ambient water quality criteria or swimming advisory values for microcystin and cylindrospermopsin in May 2019. The criteria are for use as the basis for swimming advisories for notification purposes and are designed to protect children from the harmful effects of chronic exposure to microcystin and cylindrospermopsin. States may apply the recommendations as advisory levels or may adopt them as state water quality standards.

WDNR completed a review of EPA's recommendations and determined to apply the values as swimming advisories rather than as statewide criteria. This decision was made because harmful algal blooms that result in algal toxins are often a response to other water quality impairments/issues for which criteria already exist or are potentially forthcoming (i.e., phosphorus, chlorophyll, nitrogen). WDNR recommends that local and tribal public health agencies use these swimming advisories for notification purposes in recreational waters to protect the public. WDNR plans to develop guidance to assist with implementation of these recommendations.

Designated Uses Structure/Process Revision

Status: On hold; Scope Statement expired

Under the Clean Water Act, WDNR assigns all waterbodies a set of designated uses to protect human health and aquatic life. WDNR has been working on a rule package to update the state's designated use classification system for aquatic life. This rule package would revise the categories to better capture the various types of waters found in Wisconsin. Draft rule language was prepared, and WDNR met with an advisory committee of stakeholder representatives from 2017 to 2019 to obtain feedback on the

proposed rule changes. However, in early 2019 WDNR determined that due to legislative deadlines and staff workload, the designated uses rule would need to be put on hold in order to focus on completing the biological threshold and phosphorus site-specific criteria rules before their Scope Statements expired. Therefore, the designated uses rule effort was allowed to expire in February 2020. As part of its prioritization process, WDNR is considering whether to continue work on the designated uses rule in the near future, which would require approval of a new Scope Statement by the Governor's office.

Human Health Criteria Revision/Development

Status: In progress

WDNR has begun a review of EPA's 2015 recommendations on how states should calculate human health criteria (HHC) – i.e., water quality standards that protect human health while swimming or eating locally-caught fish. This review encompasses multiple efforts, including: 1) making updates to Wisconsin's existing HHC based on the latest toxicological information, 2) adopting HHC for chemicals which EPA has criteria and/or a drinking water standard and Wisconsin does not, 3) evaluating the most appropriate fish consumption rates to be protective of all state and tribal fish consumers, and 4) updating water consumption rate and average body weight to be consistent with EPA's latest recommendations.

Work is currently underway on all four efforts described above. Revisions to existing criteria were first prioritized based on the magnitude of the proposed changes, and each of the revised criteria are being individually evaluated. WDNR received fish consumption information from tribal representatives, environmental justice organizations, and the Great Lakes Consortium for Fish Consumption Advisories, and conducted a literature search to gather information on fish consumption rates. WDNR has also worked with the Department of Health Services (WDHS) to gather body weight data.

Due to the broad scope and large effort that goes into each of these tasks, criteria revisions (efforts 1 and 2) and exposure parameter revisions (efforts 3 and 4) will be accomplished in two separate rulemaking efforts, which will likely begin in 2021.

Mercury Variance Streamlining

Status: In progress

Mercury, mainly from air deposition, has accumulated in fish tissue so that there are fish consumption advisories in place for many Wisconsin waterbodies. Individual mercury variances for facilities discharging wastewater have been processed since the early 2000s, using a 1997 report as the basis for saying that no economically feasible treatment exists. A streamlined variance process is currently under development that would include an updated justification for variances and standardize the factors used for variance approvals statewide. A pollutant minimization plan (PMP) would continue to be required for all facilities with a mercury variance.

Per-and polyfluoroalkyl substances (specifically PFOS/PFOA) Criteria Development

Status: In progress

WDNR is working on developing surface water quality criteria for two types of per- and polyfluoroalkyl substances to protect human health: perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). These manmade substances have been used to repel oil and water in a variety of industrial and consumer products, such as carpet and clothing treatments, food packaging, and cookware. They are also contained in firefighting foams. They are extremely persistent in the environment and bioaccumulate in humans and wildlife. Health-based advisories or screening levels have been developed by EPA and other states.

A Scope Statement to begin work on PFOS/PFOA surface water criteria was approved in November 2019. This work included review of toxicological data in partnership with WDHS in order to develop toxicity values for PFOS and PFOA. These toxicity values form the basis of both WDNR's surface water criteria and WDHS's recommended groundwater standards. WDNR is also using data on PFAS in fish and water samples collected from Wisconsin and other Great Lakes states to develop bioaccumulation factors (BAFs) for PFOS and PFOA. The rule will also include updates to the procedures for implementing the new criteria in Wisconsin Pollutant Discharge Elimination System (WPDES) permits.

Stakeholder meetings are being held regularly throughout the rule development process, which is likely to continue through 2022. More information about this rulemaking effort can be found at <https://dnr.wi.gov/topic/SurfaceWater/NR105.html>.

Category B: Priorities for the upcoming cycle

Aquatic Life Water Quality Criteria Revision/Development: A) Develop water quality criteria for the protection of aquatic life for substances for which EPA has developed or revised criteria based on new toxicological data but for which there is currently no Wisconsin standard. Topics that could be considered include acrolein, carbaryl, diazinon, nonylphenol, and tributyltin. B) Revise existing Wisconsin water quality criteria for the protection of aquatic life for substances for which EPA has new toxicological data. Topics that could be considered include cadmium and selenium. [Note: Individual substances that are listed as stand-alone topics (i.e., aluminum, ammonia, copper) could also fall under this category.]

Rationale: This topic was rated 4th of 14 and because there is sufficient staff time WDNR considers this topic to be a priority to begin within this TSR cycle. Updating and/or revising criteria to protect aquatic life will be beneficial for Wisconsin's aquatic ecosystem health.

Neonicotinoid Insecticides Criteria Development: Agricultural use of neonicotinoid insecticides like clothianidin, imidacloprid, and thiamethoxam has been implicated in global reductions in pollinator populations and they are thought to be similarly toxic to aquatic invertebrates. EPA's Office of Pesticide Programs (OPP) released revised aquatic life benchmarks for aquatic invertebrates for clothianidin and imidacloprid in 2016 and thiamethoxam in 2017. Although aquatic life benchmarks are not water quality criteria, the data contained within OPP's risk assessments undergo rigorous peer-review and can be used to develop water quality criteria for the protection of aquatic life. WDNR plans to review OPP's aquatic life benchmark data and other available toxicity data to determine whether it is feasible to develop surface water criteria to protect aquatic life.

Rationale: Neonicotinoids are used extensively in Wisconsin agriculture and have been detected with increasing frequency in groundwater and surface water, particularly in the Central Sands region of the state. This topic was ranked highly (3rd of 14) in the 2021-2023 TSR. It is deemed to be a priority because of its widespread use and pervasiveness in the environment, impacts to aquatic insects, and availability of national and local research to draw on for criteria development.

Nitrate/Nitrogen Criteria Development: The EPA water quality criteria guidance requires all states to develop nitrogen criteria as well as phosphorus criteria. Currently, WDNR regulates nitrogen only as a toxic substance through implementation of surface water quality criteria for ammonia. However, nitrogen also

acts as a nutrient for many plant species and can contribute to nuisance plant and algal growth in surface waters. The result of these conditions may be depletions of dissolved oxygen or extreme pH conditions which are not supportive of a balanced fish and aquatic life community. Nitrogen can also contribute to harmful algal blooms that can release algal toxins, which can pose a health risk through recreational exposure. There are some studies indicating that nitrate can be harmful or toxic to aquatic life.

Rationale: Nitrogen/nitrate criteria development was ranked as the highest priority topic in the 2021-2023 TSR. This topic has ranked highly in other TSRs, but previously WDNR did not feel that there was sufficient data to begin work. However, in summer 2020 EPA released draft recommendations for numeric nutrient criteria in lakes, and with these models WDNR now feels that there may be sufficient data to calculate a scientifically defensible water quality standard for nitrogen. WDNR plans to investigate whether EPA’s models are appropriate for Wisconsin lakes, and will consider whether additional data should be collected for input into the models. As resources allow, WDNR may also assess whether these models could be used to develop numeric nitrogen criteria for flowing waters and/or whether to develop nitrate surface water quality criteria for the protection of human health.

Outstanding/Exceptional Resource Waters Process Revision: Federal law requires states to identify and protect “High Quality Waters”. In Wisconsin, these waters are referred to as Outstanding or Exceptional Resource Waters (ORW/ERWs) and are enumerated in sections NR 102.10 and NR 102.11, respectively. Waterbodies that are assigned the special ORW/ERW designation have additional protections afforded them that are not automatically provided for waterbodies not given these designations. The WDNR has not standardized the ORW/ERW designation process.

Rationale: The department’s existing guidance on classifying waters as ORW/ERW is outdated, and these methods should be updated so that the process is clear and based on current scientific understanding. This topic was tied with TSS criteria development as the 5th priority and because there is sufficient staff time WDNR considers this topic to be a priority to begin within this TSR cycle. This topic was also identified as a priority in previous TSR cycles but was not begun due to workload issues.

Per- and polyfluoroalkyl Substances (other than PFOS and PFOA) Criteria Development: Develop new water quality criteria for PFAS substances other than PFOS and PFOA. These manmade substances have been used to repel oil and water in a variety of industrial and consumer products, such as carpet and clothing treatments, food packaging, and cookware. They are also contained in firefighting foams. They are extremely persistent in the environment and bioaccumulate in humans and wildlife. Health-based advisories, criteria, and screening levels for other PFAS compounds have been developed by other states. Contaminated sites are actively being investigated/managed in Wisconsin and criteria for other PFAS compounds would be helpful in assessing risk to human health.

Rationale: Addressing potential public health risks from sites contaminated with PFAS is a high priority for WDNR. PFAS compounds are under active evaluation by EPA and WDHS. WDNR is in the middle of the rulemaking process to develop criteria for two PFAS compounds, PFOS and PFOA, but there may be sufficient data available to develop criteria for other PFAS compounds. This topic was ranked highly (2nd out of 14).

Total Suspended Solids Criteria Development: Excess suspended solids in waterbodies can be caused by a number of factors including excess soil erosion, wastewater discharge, snowmelt, and stormwater runoff.

In the water column, suspended particles scatter and absorb light rays instead of transmitting them, thus decreasing light penetration. Less light penetration may adversely affect aquatic ecosystems by reducing the number of rooted plants which yields less protective in-water habitat for fish/aquatic life. WDNR has assessed sedimentation impairments in streams based on best professional judgment of total suspended solids (TSS). As of the 2020 Integrated Report, TSS is listed as a pollutant on 113 waterbodies on the States' 303d list (9% of all sites). This accounts for 609 impaired stream miles due to TSS (10% of total impaired stream miles). Water quality criteria for TSS would provide clear delisting guidance for stream segments that have shown considerable improvement but for which there is no clear target to make this determination.

Rationale: This topic was tied with ORW/ERW process revision as the 5th priority topic, and because there is sufficient staff time WDNR considers development of TSS criteria to be a high priority topic to begin work on during the 2021-2023 triennia. WDNR plans to explore development of a numeric criterion and assessment methodology, which will incorporate preexisting standard sampling protocols and analytical methods. WDNR further plans to potentially expand upon analyses of statewide drivers of TSS that have been conducted.

Category C: Should be addressed, but are not priorities for the upcoming cycle

Aluminum Criteria Development: In December 2018, EPA published national recommended ambient water quality criteria for the protection of aquatic life from the toxic effects of aluminum. The 2018 criteria incorporate more recent toxicity studies conducted since the previous recommended criteria published in 1988. EPA's 2018 recommended criteria are equation-based and account for the effects of pH, hardness and dissolved organic carbon on aluminum toxicity. Wisconsin's water quality standards currently do not include aluminum criteria to protect aquatic life.

Rationale: Development of aluminum criteria was ranked 13th out of 14 topics. This topic was categorized into Category C due to its low priority ranking, and because there are some concerns (shared by many states) relating to the use of total aluminum, rather than bioavailable aluminum, to assess toxicity. EPA is currently in the process of reviewing comments received on their draft technical support document for aluminum criteria implementation. If WDNR's concerns are sufficiently addressed by EPA and/or if this topic becomes a higher priority due to the need to address wastewater discharges, development of aluminum criteria could be addressed as part of the Category B topic of Aquatic Life Criteria Revision/Development as time and resources allow.

Ammonia Criteria Revision: In August 2013, EPA published national recommended ambient water quality criteria for the protection of aquatic life from the toxic effects of ammonia, a type of nitrogen pollution. Federal acute and chronic criteria were revised to consider the sensitivity of mussels to ammonia. States are expected to revise their criteria accordingly in order to be protective of all aquatic organisms. Wisconsin has widespread occurrence of unionid mussels that are sensitive to ammonia.

Rationale: Revision of ammonia criteria was ranked 12th out of 14 topics. WDNR anticipates significant issues related to implementation of the revised ammonia criteria, particularly for small facilities. EPA is currently finalizing implementation guidance and WDNR plans to review EPA's guidance when it is published. Revision of ammonia criteria could be addressed as a part of the Category B topic of Aquatic Life Criteria Revision/Development as time and resources allow.

Bifenthrin Criteria Development: Recent research has suggested that the pesticide bifenthrin is contributing to reduced macroinvertebrate numbers and species richness in Midwestern waters. For example, the Mississippi River is experiencing a decline in the population of burrowing mayflies, which has important implications for ecosystem health due to their importance as a food source for fish and wildlife. Bifenthrin use continues to increase in Wisconsin and the Midwest.

Rationale: Development of water quality criteria for bifenthrin was ranked 11th out of 14 topics. Although this topic warrants further consideration, at this time WDNR does not have sufficient staff time and resources to begin criteria development. Development of bifenthrin criteria could be addressed as part of the Category B topic of Aquatic Life Criteria Revision/Development as time and resources allow, although WDNR plans to first focus efforts on development of criteria for neonicotinoid insecticides before considering whether there is enough available data to develop criteria for other insecticides like bifenthrin and chlorantraniliprole (below).

Chlorantraniliprole Criteria Development: Chlorantraniliprole is an insecticide used on agricultural crops, turf grass and in lawn and landscape products and applications. In EPA's Office of Pesticide Programs' ecological risk assessment for chlorantraniliprole, risks to freshwater invertebrates from chronic exposure were identified. Chlorantraniliprole has been detected in numerous groundwater samples in sandy irrigated agricultural areas and in stream water samples collected by the Department of Agriculture, Trade, and Consumer Protection.

Rationale: Development of water quality criteria for chlorantraniliprole was ranked 10th out of 14 topics. Although this topic warrants further consideration, at this time WDNR does not have sufficient staff time and resources to begin criteria development. Development of chlorantraniliprole criteria could be addressed as part of the Category B topic of Aquatic Life Criteria Revision/Development as time and resources allow, although WDNR plans to first focus efforts on development of criteria for neonicotinoid insecticides before considering whether there is enough available data to develop criteria for other insecticides like chlorantraniliprole and bifenthrin (above).

Copper Criteria Revision: EPA recommends that states use the Biotic Ligand Model (BLM) for calculating site-specific criteria for copper. The BLM characterizes the impacts of local water conditions on copper bioavailability by incorporating additional water conditions (e.g., temperature, pH, DOC, alkalinity) as inputs within the model and mechanistically modeling their impacts on bioavailability. A limited pilot study of this model has been done using Wisconsin data, but further study would likely be needed to determine the feasibility of using this model to calculate criteria, given its extensive data requirements. New methods for combining multiple linear regressions with the BLM (similar to regressions used with aluminum) have recently become available and may warrant further investigation.

Rationale: Revision of water quality criteria for copper was ranked 14th out of 14 topics. This topic has been a low priority due to the substantial data needs required to apply the BLM, coupled with the small number of facilities whose WPDES permits contain copper limits. It should be noted, however, that revision of copper criteria could be addressed as part of the Category B topic of Aquatic Life Criteria Revision/Development as time and resources allow.

Pharmaceuticals Criteria Development: Pharmaceutical byproducts and personal care products (PPCPs) have been found throughout the Great Lakes. Existing research illustrates that these products are a cause

for concern as they have been linked to several problems such as intersex fish. Developing water quality standards for pharmaceuticals and their byproducts would be proactive and protective of humans and wildlife.

Rationale: Development of water quality criteria for pharmaceuticals and personal care products was ranked 8th out of 14 topics. Although WDNR recognizes that PPCPs in Wisconsin waters is of potential concern, this is a very broad topic and there is not yet enough information available on the toxic effects and/or prevalence of individual PPCPs or classes of PPCPs to begin work. WDNR plans to periodically review published scientific literature and government white papers to stay informed on this topic. If more information about individual PPCPs or classes of PPCPs becomes available, this topic may become a higher priority in future TSR cycles.

Sulfate Criteria Development: Wild rice (*Zizania palustris*) is a critically important natural resource, particularly to the Native American Tribes of Wisconsin who depend on it for subsistence and whose lifeway and history are inseparable from the traditions of harvesting and consuming this food. It is also a key food source for wildlife. Wild rice seedling emergence, seedling survival, biomass, growth, viable seed production, and seed mass have been shown to be negatively correlated with sulfate concentrations in water. Development of water quality criteria for sulfates may support the preservation and restoration of wild rice in Wisconsin.

Rationale: Development of water quality criteria for sulfate was ranked 9th out of 14 topics. As with the Wild Rice Designated Use topic listed below, this topic is still being considered but more work is needed before considering whether to begin the formalized criteria derivation process. Also mentioned below, WDNR is nearing completion of the Wild Rice Strategic Analysis and the next major project will be developing a WDNR State Wild Rice Management Plan. The Strategic Analysis document will outline department actions and activities that could affect wild rice, and may provide recommendations on the utility of a sulfate criterion to protect wild rice waters. We plan to review these recommendations and participate as needed to determine the best course forward.

Wild Rice Designated Use Development: Wild rice is an important ecological and cultural resource in Wisconsin, particularly in tribal areas. However, the distribution of wild rice has been greatly reduced from its historical range within Northern Wisconsin. The wild rice Area of Special Natural Resource Interest (ASNRI) classification under Wis. Stat. s. 30.01(1am)(d) provides some protection for wild rice waters for some permitted activities, primarily in the ceded territories in the northern half of the state. However, a designated use could be applied more broadly than the ASNRI classification, to all relevant surface waters of the state, and would support the preservation and restoration of wild rice in Wisconsin.

Rationale: Establishment of a wild rice designated use was ranked 7th out of 14 topics. Although this topic was not ranked in Category B for this cycle, it will be reconsidered as related work currently underway is more fully developed. This work should inform the utility and effectiveness of establishing a formal designated use. Needs for establishing a use and assessment program include: 1) determining which waters would be classified under a wild rice designated use; 2) monitoring protocols to determine the quality of wild rice populations or population changes over time, and 3) approaches for developing restoration plans. The joint Wild Rice Committee has made significant progress over the last several years that may move the department closer to making a wild rice designated use feasible. The committee has finalized a list of wild rice waters in the ceded territory, and WDNR is nearing completion of the Wild Rice Strategic Analysis. The next major project will be developing a WDNR State Wild Rice

Management Plan, and whether a designated use would be a useful management tool will be discussed as part of that Plan development. It is hoped that the Management Plan will provide restoration strategies and may result in funding for wild rice management. Having these implementation opportunities in place would enhance the utility of a wild rice designated use.

VARIANCES

WDNR received 6 comments related to individual variances and 17 comments related to the phosphorus MDV. WDNR reviewed these comments and concluded that they did not contain new technical information that would lead to a review of individual variances or the phosphorus MDV.

APPENDIX A. 2018-2020 TSR: TOPICS THAT WERE COMPLETED OR ARE CLOSE TO COMPLETION

The status of and updates on Surface Water Quality Rules can always be found at:

<https://dnr.wisconsin.gov/topic/SurfaceWater/RuleUpdates.html>

Rules/Topics that were Completed

Revision of water quality criteria for bacteria to protect recreation

Revisions to the state's bacteria criteria were promulgated and became effective May 1, 2020. The rule revises Wisconsin's bacteria criteria to better protect recreation and public health. It changes the bacterial indicator from fecal coliform to E. coli, because E. coli better predicts the risk of human illness caused by exposure to human fecal contamination. The rule also revises the permit effluent limit calculation procedures for wastewater treatment facilities discharging bacteria.

Site-Specific Criteria for Phosphorus in the Wisconsin River Basin

This rule became effective in summer of 2020. The rule created site-specific phosphorus criteria for three waterbodies, Petenwell Lake located in Wood, Juneau, and Adams Counties, Castle Rock Lake located in Adams and Juneau Counties, and Lake Wisconsin located in Columbia and Sauk Counties. Analyses during the development of the Wisconsin River Basin Total Maximum Daily Load (TMDL) concluded that the statewide phosphorus criteria for Petenwell Lake and Castle Rock Lake were more restrictive than needed to protect the lakes' recreation and aquatic life designated uses, and the phosphorus criterion for Lake Wisconsin was not sufficiently protective of its designated uses.

Wetland Floristic Quality Assessment benchmarks

WDNR developed the Wisconsin Floristic Quality Assessment (WFQA) Method as an intensive, site-level, vegetation-based approach for monitoring and assessment of wetlands in Wisconsin. WDNR and partners from the WDNR Natural Heritage Conservation Bureau and Lake Superior Research Institute conducted nearly 1,100 WFQA surveys across Wisconsin from 2012-2018 to develop WFQA Benchmarks. The resulting provisional Benchmarks are numeric ranges of weighted mean coefficient of conservatism scores that correspond to five quality/condition categories for commonly-occurring wetland communities in each of the four EPA Level III Ecoregions of the state - the Northern Lakes and Forests, the North Central Hardwood Forests, the Driftless Area, and the Southeast Wisconsin Till Plains.

Rules that will be re-submitted to the Legislature

Waterbody Assessments & Biological Thresholds

This rule covers a range of topics related to assessing waterbodies using biological metrics, including the following:

- "Narrative" biological thresholds, which set expectations for the level of health of aquatic communities like fish, insects and plants.
- Biological "phosphorus response indicators" to be used in conjunction with phosphorus criteria to evaluate whether phosphorus-related impacts are occurring. This will enable impairment listing decisions to be based on whether an actual phosphorus-related biological response is occurring within the waterbody.

- Algae thresholds (measured using chlorophyll-a) to protect recreation and the health of aquatic communities.
- Criteria to protect lakes that have coldwater fish, based on the temperature and oxygen needs of these fish.
- An overview of the department's obligations under the Clean Water Act to assess Wisconsin's waterbodies every two years and report to EPA.

An external advisory committee met from 2016 to 2018 to help develop the draft rules. The public comment period closed in September 2019, and this rule was submitted to the legislature in late 2019. WDNR recalled the rule for further review and expects to resubmit the rule in 2021.

Phosphorus Site-Specific Criteria Process

This rule package establishes protocols for developing site-specific criteria (SSC) for phosphorus. SSC can be applied to individual waterbodies where the statewide phosphorus criteria are over- or under-protective of a waterbody's designated uses. The protocols for developing SSC refer to the rule package above on Waterbody Assessments, because the SSC process relies on biological metrics and phosphorus response indicators to determine when an SSC is needed and to develop the appropriate phosphorus criterion for a waterbody.

An external advisory committee met from 2016 to 2018 to help develop the draft rules. The public comment period closed in September 2019, and this rule was submitted to the legislature in early 2020. WDNR recalled the rule for further review and expects to resubmit the rule in 2021.