



Fall 2022



Early fall in the Appalachian Mountains

Hello again! It's been a while since the last newsletter and hopefully this one finds you after a summer packed full of fun. My family and I spent lots of time on the water this summer including both coasts and a bunch of rivers in between. Key topics in this newsletter include upcoming officers' elections and the planning of symposia for the 2023 annual meeting in Grand Rapids, MI. If anyone has an interest in helping keep the Water Quality Section chugging along and getting fisheries folks to keep thinking about water quality, please reach out!

- Paul Kusnierz

Officers' Elections

I know this topic is a frequent one in the newsletter, but having the Section's officer positions filled are essential to maintaining a functional section. This spring we will be holding elections for the positions of President-Elect and Communications Officer. Information about both positions can be found in the Section's bylaws (<https://waterquality.fisheries.org/bylaws/>). If you would like to run or nominate someone (with their permission of course) for either or even are

curious to know more, please contact pkusnierz@alumni.nmu.edu.

2022 Section Business Meeting

The Section held its business meeting on August 22 during the Annual AFS meeting in Spokane, WA and virtually. The meeting agenda and notes are posted on the website at:

<https://waterquality.fisheries.org/wp-content/uploads/2022/11/WQ-Section-Meeting-Agenda-and-Notes-8.22.22.pdf>. If you have questions, comments, or recommended edits, please contact pkusnierz@alumni.nmu.edu.

Symposia for the 2023 AFS Meeting in Grand Rapids, MI



The Section has begun planning symposia for the next annual meeting. One symposium is likely to cover the importance of collaboration between Clean Water Act implementation and fisheries management.

The other would highlight water quality in disadvantaged communities. We are looking for folks to help get these symposia off the ground and to contribute presentations. Please contact Jonathan Leiman (jonathan.leiman@maryland.gov) if you are interested in helping with or contributing to the first topic and Yetta Jager (myjgoo@gmail.com) if you are interested in the second.

Awards

AFS Award of Excellence

Dr. Bob Hughes, longtime member of the Water Quality Section and former president received the society's highest award for scientific achievement. The Award of Excellence is presented to a living person for original and outstanding contributions to fisheries and aquatic

biology. <https://fisheries.org/2022/09/robert-hughes-receives-the-award-of-excellence-from-the-american-fisheries-society/>



Water Quality Section Student Poster Award

Congratulations to Emily Andrade (Delaware State University) who received the Water Quality Section's Student Poster Award at the annual meeting in Spokane, WA! Her

poster was titled *Investigating Relationships between Physical Water Quality Parameters and Chlorophyll-A in Rehoboth Bay, Delaware* and was coauthored by Robert Allison, Aaron Bland, Mohana Gadde, Memory Nakazwe, Dr. Theresa Venello, and Dr. Gulnihal Ozbay. A pdf of her poster can be found on the Section website at: <https://waterquality.fisheries.org/wp-content/uploads/2022/11/Andrade-WQ-poster.pdf>

AFS Fellows

Two past-presidents of the Section, Margaret Murphy and Yetta Jager, were nominated by Dr. Bob Hughes and elected as 2022 AFS fellows. Fellows are members who have made outstanding or meritorious contributions to the diversity of fields that are included in the AFS. Contributions can include, but are not restricted to, efforts in leadership, research, teaching and mentoring, resource management and/or conservation, and outreach/interaction with the public.

Active involvement in the section (and society) is a pathway to professional recognition. We encourage you to review the criteria for nomination to these and other AFS awards here: <https://fisheries.org/?s=2022+fellows> and to contact section leadership or fellows for guidance and/or help with the nomination process.

Member Spotlight

Please visit the link below and check out the Section's member spotlight featuring Gregg Lomnicky:

<https://waterquality.fisheries.org/member-spotlight/>. Gregg joined the Section in 2003 and since then has served as both President and Secretary/Treasurer.

Water News

AFS Supports EPA Restrictions on Pebble Mine

A copy of the letter AFS sent to Michael Regan, Administrator U.S. Environmental Protection Agency, can be found at:

https://fisheries.org/2022/09/afs-supports-epa-restrictions-on-pebble-mine/?utm_source=mailpoet&utm_medium=email&utm_campaign=Newsletter+09-09-2022.

US seeks to invalidate Idaho water rights forfeiture laws

<https://apnews.com/article/lawsuits-legislature-idaho-constitutions-c0d117e4967500542dbcc499e02b3376>

A Fresh Perspective—Ohio River

https://wvliving.com/a-fresh-perspective-ohio-river/?utm_source=rss&utm_medium=rss&utm_campaign=a-fresh-perspective-ohio-river

Tennessee Aquarium-Led Partnership Secures \$10 Million in Federal Funds to Improve Water Quality, Farming in Southeast TN

<https://tnaqua.org/newsroom/aquarium-led-partnership-secures-10-million-in-federal-funds-to-improve-water-quality-farming-in-southeast-tn/>

Dead creek revival: Blacklick has flowed orange for as long as locals can remember.

***Can a coal-killed waterway live again? ***
<https://www.publicsource.org/coal-mine-pollution-pennsylvania-blacklick-ghost-town-trail-indiana-county/>

'Forever Chemicals' Found In 67 Of State's Drinking Water Systems

<https://www.wvpublic.org/energy-environment/2022-08-29/forever-chemicals-found-in-67-of-states-drinking-water-systems>

Natural Resource and Water Quality Assessments in the Cannonball and Missouri Rivers

In summer 2021, the Standing Rock Game and Fish Department, informed tribal biologists that additional natural resource information was needed to inform the current deliberations with the U.S. Army Corps of Engineers and the current Environmental Impact Statement. Over the course of four months, new and confirming information was collected regarding the existing condition of flora and fauna near the confluence of the Cannonball River and the Missouri River below the Dakota Access Pipeline (DAPL) crossing (Figures 1 and 2). In 2017 the original baseline study to determine ecological impacts from the DAPL pipeline revealed numerous flora and fauna species that would be at risk in the event of a spill.

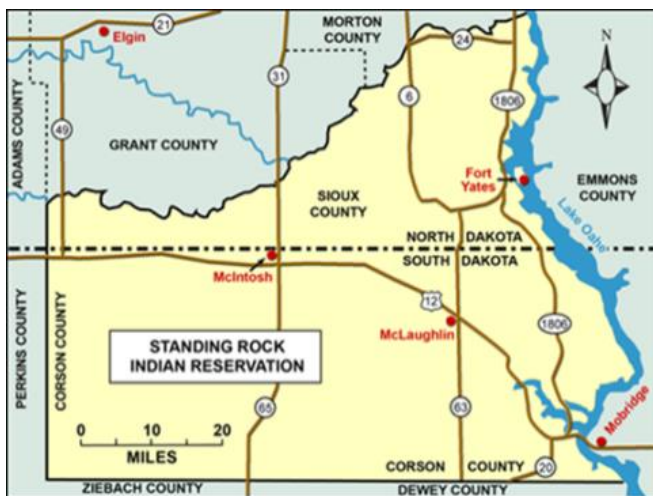


Figure 1. Map showing location of the Standing Rock Indian Reservation

The Dakota Access Pipeline is **Not** on Standing Rock Sioux Land

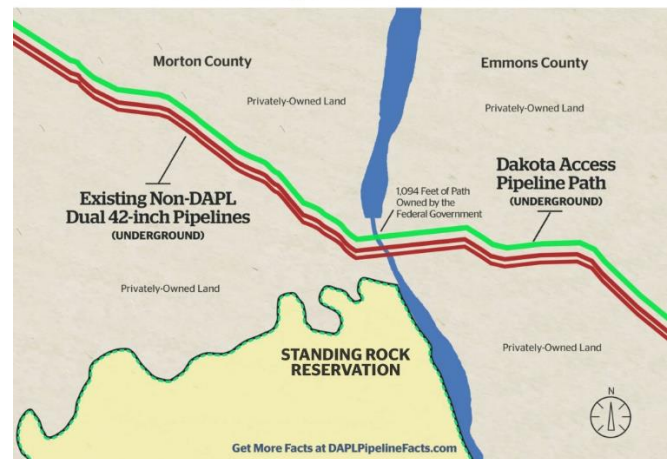


Figure 2. Shows where the DAPL Pipeline was going to cross just North of the Reservation

The Missouri River basin in its entirety is the second largest river basin in the U.S. (followed by the Mississippi River basin), draining about one-sixth of the continental United States (Pegg et al. 2003). In 2021, June through August flows were in the 25th to 75th percentile range of monthly discharges, with the Cannonball River having a 16.3 cubic feet per second discharge rate recorded into the Missouri River in late August. The reduced flow regime in 2021 resulted in dewatered shallow areas that contained extensive submergent aquatic vegetation in 2017 with several different species represented. In 2017, July flows were above normal and were within the 75th to the 90th percentile range of monthly discharges. In 2021, many substrate features in the confluence of the Cannonball River were dry and reduced spawning habitats were noted for Missouri River fish populations representing numerous species.



Figure 3. Most common submergent aquatic plant, curly leaf pondweed, *Potamogeton crispus* observed in Missouri River wetland macrophyte expressions, 2021.

Submergent macrophyte growth was limited in 2021; however, curly-leaf pondweed (*Potamogeton crispus*) was still present in shallow water areas near the shore in the Missouri and lower Cannonball Rivers (Figure 3). The submergent plant community has undergone a shift in species expression in association with the lower water levels. As many as six *Potamogeton spp.* were documented in the original baseline effort in 2017. In 2021, reduced water levels limited access to the confluence area of the Cannonball River, with extensive sediment flats observed with scant flora evident in June, and some re-establishment in July and August. The exposed sediment flat areas at the mouth of the Cannonball River are now becoming established with hydrophytic species of more emergent plants like *Persicaria spp.* and *Rumex maritimus* var. *fueginus* (golden dock).

Shoreline fringe areas were also exposed with a different flora expression as well. Hydrophytic and aggressive flora species are invading once-submerged locations. Stressed wetland flora such as smartweed species like *P. pennsylvanicum* and *P. lapthifolium* were prominent in certain locations. There are increased exposed rock and gravel bars in the Missouri River (between DAPL crossing and Fort Yates, North Dakota) and this condition has provided additional nesting areas for shorebirds

like the interior least tern, piping plover and killdeer.

Sediment dewatering and subsequent desiccation stimulates macrophyte species propagation and enhances nutrient cycling (Keddy and Reznicek 1986; Hill et al. 1998; Baldwin and Mitchell 2000). Through the interplay of direct (e.g., physiological stress) and indirect (e.g., habitat alteration) mechanisms, water level fluctuations create temporal and spatial heterogeneity that structures littoral zone communities (Hofmann et al. 2008). This certainly helps explain the reduced presence of macrophyte species in the submergent community observed below the DAPL crossing in 2021.

References

- Baldwin, D. S., and A. M. Mitchell. 2000. The effects of drying and re-flooding on the sediment and soil nutrient dynamics of lowland river-floodplain systems: a synthesis. *Regulated Rivers Research and Management* 16:457–467.
- Carmignani, J. R., and A. H. Roy. 2017. Ecological impacts of winter water level drawdowns on lake littoral zones: a review. *Aquatic Sciences* 79:803–824.
- Hill, N. M., P. A. Keddy, and I.C. Wisheu. 1998. A hydrological model for predicting the effects of dams on the shoreline vegetation of lakes and reservoirs. *Environmental Management* 22:723–736.
- Hofmann, H., A. Lorke, and F. Peeters. 2008. Temporal scales of water-level fluctuations in lakes and their ecological implications. *Hydrobiologia* 613:85–96.
- Keddy, P. A., and A. A. Reznicek. 1986. Great Lakes vegetation dynamics: the role of fluctuating water levels and buried seeds. *Journal of Great Lakes Research* 12:25–36.
- Pegg, M., C. Pierce, and A. Roy. 2003. Hydrological Alteration Along the Missouri River Basin: A Time Series Approach. *Aquatic Sciences - Research Across Boundaries* 65:63–72.

- Michael P. Gutzmer PhD FP-C
and Jordan Kort

Triploid Grass Carp- Can They Help Control Weeds on my Lake?



The grass carp has been introduced throughout the world for aquatic weed control. The grass carp was considered for introduction into the United States primarily because of its plant-eating diet, which

was thought to have great potential for the control of aquatic weeds. Wide-scale use of the grass carp in Florida and many other states from 1970 to 1984 was limited and closely regulated due to fears about its reproduction and negative impact on sport fish. Since the grass carp's potential for causing such problems was evident, early research focused on developing a fish that would be non-reproductive but would retain the grass carp's herbivorous diet.

Research with the grass carp resulted in the production of a sterile triploid grass carp, which has an extra set of chromosomes. The triploid grass carp is produced in the same way as the diploid, except that fertilized eggs are subjected to heat, cold, or pressure shock resulting in the formation of fish with an extra set of chromosomes for a total of 72. The extra chromosomes make these fish sterile.

The grass carp is primarily a "grazer"; it tends to feed on the surface and in shallow water. The ability of grass carp to consume and utilize aquatic plants depends on the size of both the plants and fish. Additional factors which influence the feeding behavior of grass carp include their size, age, gender, population density, species, abundance, and location of plants within a body of water.

In Florida, a permit is required by law for the use or possession of grass carp. Only grass carp certified as triploid can be used in an aquatic weed management program. Allstate Resource Management recommends triploid grass carp be used in combination with a lake management program.

- Allstate Resource Management
info@allstatemanagement.com

Recent Member Publications

The most up to date list can be found at: https://waterquality.fisheries.org/wp-content/uploads/2022/11/Water-Quality-Section-Publications_11.8.22.pdf

Corsi, C. E., M. P. Corsi, K. E. Wallen, K. A. Bouwens, P. C. Kusnierz, K. E. Shaw, N. E. Hall, J. S. Maroney, and J. S. Williams. 2022. From fragments to connections to restoration: A case history of emergent sociocultural services in the Clark Fork River and Lake Pend Oreille fishery. *Aquatic Ecosystem Health and Management* 25(1):6–15.

Linares, M. S., D. R. Macedo, M. Callisto, R. M. Hughes, and D. M. P. Castro. 2023. The past is never dead: legacy effects alter the structure of benthic macroinvertebrate assemblages. *Limnetica* 42(1).

Salvador, G. N., L. F. de A. Montag, R. M. Hughes, S. M. Almeida, B. S. Prudente, T. C. Pessali, T. A. Barroso, M. V. Cianciaruso, R. L. B. Santos, L. Juen, and M. B. Carlucci. 2022. Influences of multiple anthropogenic disturbances, coupled with a tailings dam rupture, on spatiotemporal variation of fish assemblages in a tropical river. *Freshwater Biology* 67(10): 1708–1724.

Vadas, R. L., Jr., R. M. Hughes, O. Bello-Gonzales, M. Callisto, D. Carvalho, K. Chen, P. E. Davies, M. T. Ferreira, P. Fierro, J. S. Harding, C. J. Kleynhans, D. R. Macedo, N. Mercado-Silva, N. Moya, S. J. Nichols, P. S. Pompeu, R. Ruaro, R. J. Stevenson, B. F. Terra, C. Thirion, D. Ticiani, and C. O. Yoder. 2022. Assemblage-based biomonitoring of freshwater

ecosystem health via multimetric indices: a critical review and suggestions for improving their applicability. Water Biology & Security:100054.

In Closing

I hope you have found this newsletter informative. I rely on members for much of what you see. If there is something you'd like to see in the newsletter, please do not hesitate to reach out with suggestions or to send material along to me.

Happy Holidays!

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<https://waterquality.fisheries.org/>