Lakes are Important Resources and are at Risk

Lakes are highly valued natural resources that provide critical ecosystem services, including:

- *provisioning* (fisheries and aquaculture, water for drinking and non-drinking, raw materials, energy);
- *regulation and maintenance* (water and air quality regulation, erosion and flood prevention, maintaining ecological populations and habitat, pest and disease control, soil formation and composition, carbon sequestration, and local climate regulation); *and*
- *cultural* (recreation; intellectual, spiritual, and aesthetic appreciation) (Reynaud and Lazanova 2017).
- Lakes can serve as a healthy source of food and drinking water, and offer recreation opportunities that can be accessible to traditionally underserved communities.

Lakes contribute to local, regional, and national economies.

- Lakes with high quality water add economic value (estimated average annual value of $442.50 USD per property in the U.S. (Reynaud and Lazanova 2017)) to nearby homes, especially homes with a lake-view (estimated average of $79,000 USD in 2021) (Doss and Taff 1996).
- Lakes bring significant tourism and recreation spending to the surrounding communities (Voigt et al. 2016).
- Losing one meter depth of water clarity was estimated to cost Vermont lakeside communities $16.8 million in economic activity and 200 full-time jobs during the summer season, and a three percent depreciation for single-family homes and 37% depreciation for seasonal homes (Voigt et al. 2016).

Lakes are currently threatened by many factors, which can be challenging to mitigate without a clear, unified funding mechanism and coordinated effort among agencies.

- Deicing salts are contributing to the increase in salinity of many lakes in the Midwest and Northeast North America (Dugan et al. 2017).
- Summer surface water temperatures in lakes are increasing globally in connection with climate change and land use changes in the lake watershed (O'Reilly et al. 2015).

- Long-term increases in nutrients (i.e., eutrophication) in lakes have resulted in over half of lakes in the U.S. classified as eutrophic or hypereutrophic according to the 2012 NLA (USEPA 2016).
- The number of clear, blue (oligotrophic) lakes has been declining since 2007 (Leech et al. 2018).
- As of 2012 only 10% of the nation's lakes remain oligotrophic (USEPA 2016).
- Nutrient pollution not only contributes to the loss of high-quality lakes but exacerbates the release of greenhouse gases (Beaulieu et al. 2019) and risk of harmful algal blooms (Cheung et al. 2013) and their public health and economic impacts (Wolf and Klaiber 2016).
- The 2012 EPA National Lake Assessment found the algal toxin microcystin present in 39% of the nation's lakes (USEPA 2016).

Current Funding Strategies are not Meeting the Needs to Monitor and Restore Lakes

- Section 314 of the CWA was designed to provide support for states to monitor and manage lakes but has not been funded in the last 25+ years.
- Section 314 is authorized to provide grant funds for all four elements of successful lake management, including 1) lake monitoring and assessment, 2) diagnostic/feasibility studies to determine cause of poor water quality trends or status, 3) funding for interventions and, importantly, 4) funding to determine if interventions worked (program evaluation) (USEPA 2012). A total of $145 million was awarded by Congress for the Section 314 program from 1976 to 1995 (U.S. EPA. 2012a).
- Reduced staff support across all lake-related programs, including Sections 319, 303, and 106, at EPA led to a redirection of 314 funds into other programs.
- Funding was increasingly diverted to other programs until 314 was no longer funded after 1995 (Borre and Merrell 2020).
- As of November 2019, only 19% of the total 319 funding is going to lake, reservoir, or pond projects (Curtis and Flaherty 2019).

EPA, state, tribal and other partners have made, and continue to make, considerable progress in reclaiming waters and addressing pollution. However, existing funding strategies do not appear to be enough to reverse the declining lake quality trends.

- Long term changes in land use and climate change have led to a global crisis in freshwater biodiversity loss (Albert, J.S. et al. 2021). Freshwater biodiversity is declining at twice the rate of land or ocean invertebrates (Tickner et al 2020).

- US protected areas not meeting international conservation targets for lakes (McCullough et al. 2019).
- As of 2012, 71% of the nation's lakes scored poor or fair for Lakeshore Disturbance (USEPA 2016).
- Shoreline alteration is a higher indicator of biodiversity distress than eutrophication or acidification (Whittier et al. 2012).
- Scientifically justified in-lake projects that address internal nutrient loading and HABs are generally not supported in Sections 319 or 106, which has led to some shortsighted practices and inconsistent mitigation strategies.
- In absence of 314 funding, states, such as NY, VT and MN are spending large sums of state tax revenue for lakes, while other states do not have resources available to address threats to lakes. States need more resources for monitoring, diagnostic studies, protection, and restoration interventions and follow up monitoring.
- Intervention programs (projects) lacking long-term monitoring and post intervention diagnostics cannot effectively evaluate the success of the intervention.

An enhanced 314 Clean Lakes Program with a component to protect lakes (i.e., Healthy Lakes component) is needed.

- The current 314 was focused on monitoring and restoring lakes but was insufficient to protect lakes with high quality water.
- The primary focus of EPA's water quality programs in the past four decades has been to restore impaired waters and reduce pollutant levels in waterways. The priority to maintain clean waters has taken a backseat to priority of restoring impaired waters (Glicksman and Zellmer 2012).
- Few resources have been allocated to protect and preserve lakes with existing high-quality waters. It is CRITICAL to also *protect and maintain* the chemical, physical and biological integrity of our Nation's waters (CWA Section 101(a) objective) as intended by Congress. Sections 319, 303, 106, and others generally cannot do this.
- Lake monitoring and class assessment are important tools for designing interventions and can help prioritize lakes with high quality waters for protection (i.e., Healthy Lakes component).
- "A holistic approach to climate adaptation for inland lakes includes protecting intact resources (resistance), improving the capacity of lakes to return to their prior condition (resilience), and accommodating changes while minimizing impacts (response)." (Magee, M.R, et al. 2019).

The current program does not consider environmental justice in its implementation.

In conclusion, significant new funding needs to be allocated to support a coordinated effort to address the many threats to lake water quality and prevent further deterioration of existing healthy lakes.

- **We recommend Congress reauthorize funding for the Section 314 Clean Lakes Program and significantly increase annual appropriations over previous funding levels**.
- **We recommend revising the implementation of the Clean Lakes Program by adding a Healthy Lakes component to protect high quality lakes and prioritize lakes with significant cultural heritage value and lakes in communities where there are environmental justice concerns.**
- **We recommend evaluation of existing programs like 319 Nonpoint Source Program, Healthy Watersheds, Urban Waters, and 106 Monitoring Program to identify additional opportunities to advance lake restoration and protection.**

Given the backdrop of climate change, environmental justice concerns and current trends, the lack of redirection could lead to considerable loss in valuable ecosystem services provided by lakes. Restoration and protection of lakes is essential for current and future generations of Americans to continue to enjoy the ecological services that healthy lakes and lake watersheds provide.

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