

COASTAL HEALTH

I. Problem Statement

Contact (including external, ingestion, and inhalation)¹ with nearshore waters of the Great Lakes can pose a risk to human health.² As the primary source of drinking water, supplier of fish for both personal and commercial benefit, and recreational outlet for millions of U.S. residents, the nearshore waters of the Great Lakes should pose a *minimum* risk to human health through contact. (The Great Lakes are a natural body of water and hence the achievement of null risk is unrealistic.) To reduce human health risk, Great Lakes nearshore waters should be drinkable (with conventional treatment), swimmable, and the fish harvested should be consumable at all times. The need to close beaches, issue boil water notices, publish fish consumption advisories,³ and mechanically remove stranded algae should be minimized. These factors have led to the following trends and events in the Great Lakes:

- The estimated volume of combined sewer overflow (CSO) discharges in the U.S. is 850 billion gallons per year, with most of these CSOs located in the Great Lakes and Northeast regions.⁴
- In 2001-2002, 23 States reported 65 waterborne disease outbreaks affecting 2,536 individuals (61 hospitalized; 8 died), which represents the largest number to occur since reporting began in 1978. Five of these outbreaks were attributed to water bodies in Great Lakes States (MN, WI).⁵
- The NRDC's annual survey of water quality monitoring and public notification at U.S. beaches finds that there were 51% more beach closings and advisories in 2003 than in 2002. Across the country, pollution caused more than 18,000 days of closings and advisories at ocean and Great Lakes beaches last year – more than ever recorded in the survey's 14-year history.⁶

II. Goals and Milestones

Goal: By 2020⁷ or sooner where possible, eliminate inputs of untreated or inadequately treated human and industrial waste to Great Lakes basin waters from municipal wastewater treatment systems.⁸

Interim Milestones:

- By 2007, U.S. EPA and Great Lakes States will undertake a thorough review of their ongoing wet weather control programs to identify and correct deficiencies, including adequate staffing and funding, to ensure that programs are achieving the requirements of the Clean Water Act (CWA).
- By 2008, U.S. EPA, in cooperation with Great Lakes States, will promulgate rules governing the disbursement of grant funds towards achieving this goal.
- By 2009, or as soon as possible, all municipalities with wet weather overflows in the Great Lakes basin will have adopted and begun to implement comprehensive storm water control programs with the objective of meeting all appropriate state and federal regulations.
- For communities with wet weather problems that have not proceeded with required planning and implementation by 2009, the States or U.S. EPA will apply necessary enforcement actions (administrative order or judicial action) to require correction of the problems by a date certain with appropriate penalties.

Goal: Achieve a 90-95% reduction in bacterial, algal, and chemical contamination at all local beaches. Steps to achieve this include: identify indirect pollution sources capable of adversely impacting Great Lakes coastal health, educate communities regarding their environmental impact, and remediate all potential indirect pollution sources through identification, estimation of relative contribution (based on historical data and sanitary inspection), and remediation of these sources.

Interim Milestones:

- By 2007, coastal communities will have an education and outreach program in place for K-12, college, the general public, and coastal decision-makers, with assistance of the Great Lakes Sea Grant Network.
- By 2008, enforceable city ordinances will be in place that call for the placement of signs regarding the health risk associated with bather shedding, provision of adequate sanitary facilities for bathers, availability and importance of proper boater waste disposal, and prohibition of practices that attract nuisance wildlife to which fines are attached for violations.
- By 2010, the number of non-rainfall-associated incidents of poor water quality will have decreased by 90-95% (as determined locally based on historic levels in bacterial, algal, and chemical contamination) at all local beaches by remediation of 90-95% of direct and indirect pollution sources identified by sanitary surveys.
- By 2020, nutrient loading will have decreased as evidenced by a decrease in nuisance algal blooms and ambient water concentrations of nitrogen and phosphorous in coastal areas.

Goal: The number of beaches classified as having “good” water quality will comprise 90-95% of all Great Lakes public bathing beaches. At the local level, individual contamination events will occur no more than five percent of available days per bathing season, sources of these contamination events will be identified through standardized sanitary surveys, and remediation measures will be in place to address these events.

Interim Milestones:

- By 2005, the BEACH Act will be fully funded to continue routine compliance monitoring of coastal waters.
- By 2006, real-time testing methodologies will be evaluated and trialed at Great Lakes beaches.
- By 2006, coastal States will have complied with the BEACH Act requirements for public notification.
- By 2006, a standardized sanitary survey form will be drafted.
- By 2007, standardized sanitary surveys will be trialed at select coastal communities.
- By 2009, States will add to their existing water quality monitoring programs a standardized tool for conducting sanitary surveys that will identify sources of contamination at the local level in those instances when bacterial indicator levels exceed published standards.
- By 2010, regional predictive models will be available using local data and forecasts of water mass movements derived from the Great Lakes Observation System.
- By 2011, real-time test methodologies will supplant existing test methods (which take in excess of 18 hours before results become available) under the BEACH Act of 2000.

Goal: The quality of Great Lakes basin drinking water from coastal and tributary sources will be protected from chronic and episodic threats of chemical and biological contamination that pose unacceptable risk following conventional water treatment.

Interim Milestones:

- By 2007, amendments to the Safe Drinking Water Act (SDWA) will be adopted to enhance flexibility in how State Revolving Funds may be used for infrastructure system improvements.
- By 2007, Bioterrorism Act amendments will be adopted to require implementation of security measures that address potential resource/facility vulnerabilities.
- By 2010, States will have strategies for protecting water quality for the intended use of public water supply.
- By 2010, all States and local municipal water supply systems will complete plans for infrastructure upgrades that address aging system deficiencies and integrate security measures for vulnerable resources/facilities.

III. Recommendations

Based on assessments that identify existing pollution sources and potential threats to water quality, multiple actions are available to remediate and prevent adverse impacts on human health in nearshore waters. These include control/abatement and remediation of direct and indirect pollution sources into coastal and tributary Great Lakes waters, and protection of drinking source water quality. The following actions are required to achieve the Coastal Health goals for a minimum risk to human health within the Great Lakes:

1) Eliminate inputs of untreated or inadequately treated human and industrial waste to Great Lakes basin waters through implementation of wet weather programs, including improvements to wastewater treatment systems. Conditions governing this recommended action are presented in Appendix C.

- **U.S. EPA and the States should fully implement, enforce, and report on their wet weather control programs to identify and correct deficiencies to ensure the requirements of the CWA are achieved in a timely manner.**
- **As part of a 55/45 percent federal/local cost share, the federal government should provide 7.535 billion⁹ in federal grants over five years which would then support state and local resources in the amount of \$6.21 billion, thereby raising \$13.70 billion to fund wastewater treatment improvements.**
- **Congress should further appropriate \$10 million⁹ over five years to the three U.S. EPA regions to review and upgrade their Great Lakes wet weather programs – including the CSO Control Policy, NPDES permit issuance and enforcement, and storm water management – to ensure that issues are addressed comprehensively.**
- **Congress should further appropriate \$40 million⁹ over five years to the Great Lakes States to administer a new grants program, review, and upgrade all of their wet weather programs (including NPDES permits and enforcement), and implement anti-degradation rules in relation to sewage system expansions.**

Cost: \$13.75 billion in new funds over five years, with \$7.54 billion provided by the federal government and \$6.21 billion provided by non-federal partners.

Rationale: Direct sources of contamination affecting coastal health are those that originate from a single, identifiable, fixed point such as rivers, streams, sewer pipes, septic systems, or a point of industrial discharge. Aging or overburdened sewage infrastructure, which can release raw sewage to source waters in urban areas through sanitary sewer overflows (SSOs) or CSOs, still exist in many Great Lakes municipalities where storm and sanitary systems remain co-mingled (see *Appendix B*). Substantial reduction of the discharge of untreated sewage into the Great Lakes will reduce health risks for bathers and bacteria load in drinking water supplies. Given the potential impact on human health, overflows of untreated human and industrial waste into Great Lakes waters must be controlled through comprehensive solutions that may include structural controls such as separating storm and sanitary sewers, constructing storage capacity or controlling infiltration/inflow; non-structural controls such as land use planning and aggressive use of best management practices to allow no net increase in storm water run-off; and regulatory controls such as issuing, updating, and enforcing National Pollutant Discharge Elimination System (NPDES) permits.

2) Identify indirect pollution sources capable of adversely impacting Great Lakes coastal health and, upon identification, promulgate and enforce regulations, provide public education, promote research, and initiate remediation to reduce the impact of these sources.

- **These may include but are not limited to bacterial loading from foreshore beach sand and submerged sediments, avian/animal deposition, algal blooms (can appear during dry weather, but are caused by nutrient loading during wet weather and aquatic invasive species), bather shedding, and untreated onboard boater waste.**
- **State and local public health agencies provide public education and/or incentives to reduce impacts from nutrient-loading, household and industrial products, attraction of nuisance wildlife, improper discharge of onboard boater waste, and bather shedding.**
- **Request that the Great Lakes Sea Grant Network make this an education/outreach priority for the region and a component of a Great Lakes Centers for Ocean Science Education Excellence (COSEE) program through NSF.**
- **State and local governments promulgate and enforce existing regulations which take action against boaters who discharge waste to the nearshore or open waters of the Great Lakes.**
- **Require regulations regarding the availability of adequate toilet and shower facilities based on projected bather density to receive BEACH Act grant funds.**
- **Assess extent of contaminated sediments, especially in Areas of Concern, that contribute to water quality concerns. (Addressed in AOC/Sediments chapter.)**
- **Research to clarify sources and transport of biotoxins (i.e., botulism) through foodweb.**

Cost: Depends on indirect pollution sources identified at individual beaches based on annual sanitary surveys (see *Appendix E*). The costs associated with conducting educational campaigns and initiating remediation range between \$20,000 and \$1 million per source identified, based on the size of the population served, the extensiveness of the impact, and the need for infrastructure improvements. The cost would be shared between state and local agencies (possible through fines levied against offenders in some instances) and through the availability of federally approved loans or grant funding.

Rationale: Indirect sources of contamination are sources whose origination cannot be traced to a single point such as a storm drain or sewer outfall (see *Appendix B*). The effects of indirect sources of contamination are diffuse and, therefore, determining their origin may require intensive investigation. For example, determining a correlation between increased bacterial level density at the bathing beach and various coastal processes, predominating weather conditions, and natural and human sources is often difficult. Remediating contamination sources responsible for indirect pollution water quality failures will reduce human health risks, increase availability/access to Great Lakes recreation, improve ecosystem health, promote sustainable practices, decrease economic loss (millions of dollars are lost each year due to beach closures), and increase commercial benefits.

- 3) Standardize, test, and implement a risk-based approach¹⁰ to manage recreational water.**
- **U.S. EPA Build the approach upon existing water quality monitoring programs and employ the latest technology for microbial assessment and standardized sanitary survey criteria, based on a holistic watershed assessment.**
 - **U.S. EPA take responsibility for accelerating the process necessary for field testing and approval of real-time test methodologies.**
 - **Once these two tools are in place they can be tested at the local level, adopted by the federal government, and implemented at the state and tribal level.**
 - **Federal, state, tribal and local municipalities have begun to work together to standardize the microbial assessment of recreational water and these working groups can also standardize the sanitary inspection process.**

Cost: \$2.0 million¹¹ annually to the Great Lake states to standardize, trial, and implement a risk-based approach to beach/coastal assessment, a portion of which could be appropriated from U.S. EPA BEACH Act funds (assuming that they are re-appropriated at the federal level). \$7.2 million¹² for U.S. EPA to

conduct and analyze data from National Epidemiological and Environmental Assessment of Recreational (NEEAR) Water Study (\$9.0 million of the total cost of \$16.2 million has already been funded).

Rationale: Beach and coastal assessment methods (microbial and physical) are the front lines of defense for determining when contaminant influxes are most likely to impact human health in the context of surface water encounters. Tools available to beach managers and authorities responsible for monitoring these water bodies should accurately reflect risk, provide timely notification to the public, and enable investigation of potential contamination sources (both direct and indirect) thus leading to remediation of these sources.

4) Protect drinking source water quality.

- **U.S. EPA will establish ambient water quality criteria for parasites, pathogens, and disinfectant by-product (DBP) precursors for States to implement.**
- **Congress to fully-fund the Clean Water State Revolving Fund (CWSRF), and States implement programs to assure that ambient water quality, following conventional treatment, does not pose an unacceptable risk to consumers.**
- **States should work with public water systems to reduce vulnerabilities identified in the source water assessments.**

Cost: Fund the CWSRF at least to the level appropriated for FY 2004 (\$1.35 billion nationally and \$225 million to the Great Lakes States).

Rationale: In addition to effective implementation and enforcement of existing Safe Drinking Water Act (SDWA) and CWA requirements by EPA and the States, this action requires a combination of enhanced federal policy requirements to include ambient water quality criteria for parasites, pathogens and disinfectant by-product precursors, full federal funding and greater flexibility in how State Revolving Funds may be used. Ambient water quality criteria related to drinking water following conventional treatment are needed to support source water protection programs. Water quality criteria for pathogens, such as cryptosporidium, have not been promulgated under CWA authority, nor have criteria for DBP precursors been developed, while risk-based standards are being developed for finished water supplied by public water systems.

5) Use the Drinking Water State Revolving Fund to improve drinking water infrastructure and support source water protection.

- **Congress to fully-fund the Drinking Water State Revolving Fund (DWSRF) and increase flexibility in how the funds may be used by the States and local municipalities for water infrastructure improvements.**
- **States and local public water supply systems to implement and enforce infrastructure improvement plans that include security measures to address resource/facility vulnerabilities and critical infrastructure facilities governed under the Bioterrorism Act.**

Cost: Fully-fund the DWSRF at levels authorized by the SDWA (\$1 billion/year) through 2010.

Rationale: Protection of drinking water quality by public and private water supply systems throughout the Great Lakes basin must be improved. In addition to effective implementation and enforcement of existing Safe Drinking Water Act (SDWA) requirements by U.S. EPA and the States, this action requires a combination of enhanced federal policy requirements to include full federal funding and greater flexibility in how State Revolving Funds may be used to upgrade drinking water infrastructure systems, and implementation of water infrastructure improvement plans with security measures for vulnerable resources/facilities to reduce chemical contaminant and bioterrorism risks to drinking water supplies.