

Information and Indicators Needs and Recommendations

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Coastal Health (CH) Strategy Team Information and Indicator Needs and Recommendations

The table below summarizes the needs and recommended actions of the Coastal Health Strategy Team regarding indicators, monitoring, research, and communications. The Indicators and Information Strategy Team (I&I ST) is compiling this information for each of the other Strategy Teams to identify overlapping issues and to ensure that the I&I ST's recommendations are consistent with those of other Strategy Teams.

Need or Recommended Action	Suggestions for Implementing
Indicator Needs and Recommendations	
Establish and continually assess indicators (particularly <i>real-time</i> indicators) for pollutants entering and/or in near-shore waters, e.g.: <ul style="list-style-type: none"> – Bacterial and chemical contamination – Biological oxygen demand [BOD] – Presence of biological and bacterial indicator organisms such as blue-green algae (as a "symptom" of ecosystem health) and green algae (as in large blooms) – Phosphorus, nitrogen, and other nutrients – Viral contaminants – Inadequately treated sewage. 	
Establish indicators for beach contamination, e.g., bacterial, algal, and chemical contamination (see indicators above); whether beaches have "good" water quality; number of contamination events per bathing season.	
Establish indicators for risk/safety of Great Lakes fish consumption (see additional detail under Monitoring and Observation Needs and Recommendations).	
Establish indicators for drinking water quality, e.g., chronic and episodic threats of biological and chemical contamination; ambient water quality criteria for parasites, pathogens, and disinfectant by-product precursors.	
Establish indicators for drinking water and wastewater treatment infrastructure, e.g., indicators for aging system deficiencies and success of security measures for vulnerable resources/facilities (see additional detail under Monitoring and Observation Needs and Recommendations).	
Establish indicators for communications, e.g., whether info crucial to Great Lakes coastal health is "consistently visible" in media, brochures, signs, education curricula, etc.; changes in the knowledge of coastal decision makers and the general public.	
Establish indicators for administrative measures, e.g., whether the Safe Drinking Water Act amendments adopted, whether storm water control plans are in place,	

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updating wastewater discharge permits, etc.	
Develop alternative indicators for increased human health risk as identified by epidemiological studies. (Current bacterial indicators can be found environmentally and may not accurately reflect human health risk.)	
Monitoring and Observation Needs and Recommendations	
Conduct a thorough review of Great Lakes States' ongoing wet weather control programs to identify and correct deficiencies and to ensure that programs are achieving the requirements of the Clean Water Act.	<ul style="list-style-type: none"> • Program review conducted by the USEPA in partnership with Great Lakes States. • Complete the assessment by 2007.
Strictly monitor wet weather sewage system overflows into Great Lakes waters.	<ul style="list-style-type: none"> • Fund through Federal-State-municipal grant funding partnerships. • Look at compliance of NPDES permit discharge parameter requirements for accurate measurements of concentrations and reporting.
Identify environmental sources capable of adversely impacting Great Lakes coastal health during dry weather (e.g., foreshore beach sands, avian/animal deposition, algal blooms, and submerged sediments) and their relative contributions of sources.	<ul style="list-style-type: none"> • Identify sources based on historical data and annual sanitary surveys of beaches. • Develop predictive models for forecasting or now-casting beach closings at individual beaches (or beach clusters where appropriate). Models should be available on a regional basis, utilizing local data and forecasts of water mass movements derived from the Great Lakes Observation System. • Evaluate impact from boater wastes both in marinas and in the open lake from freighter discharge of sewage holding tanks.
In order to best protect human health and allow for unlimited consumption of Great Lakes fish, increase monitoring in environmental media and fish and biomonitoring of human tissues and reduction of Persistent Bioaccumulative and/or Toxic (PBT) chemicals are needed. Assessments of frequency and type of fish consumed are needed.	<ul style="list-style-type: none"> • Add monitoring sites to the Great Lakes Fish Monitoring Program to detect sport fish contaminant concentration trends. • Strengthen the focus of monitoring programs on PBT contaminants of emerging concern, such as brominated flame retardants. • Identify toxicity information of a larger suite of chemicals found in Great Lakes sport fish. • Identify health effects of multiple contaminants, including endocrine disruptors.
Assess wastewater treatment infrastructure by monitoring substances found (or suspected) to be of concern in wastewater treatment plant effluent and sewage sludge.	<ul style="list-style-type: none"> • Develop a program to assess the presence and significance of substances found or suspected to be of concern in wastewater treatment plant effluent and sewage sludge, but not currently the focus of pollution prevention or formal regulatory programs that reduce their presence in the environment, e.g., pharmaceuticals, personal care products, endocrine-disrupting chemicals. • If threat to human health or the environment is presented by releases of these materials, develop appropriate tools and programs (e.g. treatment requirements, effluent limitations guidelines, pollutant minimization programs, water quality standards) to reduce their releases.

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<p>Standardize, test, and implement a risk-based approach to manage beaches and recreational waters. The approach should build upon existing water quality monitoring programs, employ the latest technology for microbial assessment and standardized sanitary survey criteria based on a holistic watershed assessment, rely on real-time test methodologies and data, and provide forecasting capability. This calls for not just microbial assessment under the BEACH Act, but the use of sanitary inspections to come up with a beach classification system.</p>	<ul style="list-style-type: none"> • This effort should be led by the USEPA. • 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. In some locations, mechanisms are already in place for standardized microbial assessment. • 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. • By 2009, States should add to their existing water quality monitoring programs, real-time analytical tests, a standardized tool for conducting sanitary inspections at beaches, new beach management protocols, and forecasts of water mass movements from the Great Lakes Observation System. • Conduct the survey annually or episodically. • Use the survey as a tool to identify sources of contamination in the event of advisories & closures. • Trial and implement a beach classification system based on standardized microbial assessments and sanitary surveys. • Cost: \$2.0 million annually
<p>Monitor nonpoint contamination at a marine and a fresh water beach.</p>	<ul style="list-style-type: none"> • Conduct epidemiology studies at one marine and one fresh water beach to identify health risks from non-human bacteria sources (i.e., indirect contamination sources such as birds and/or other wildlife).
<p>Monitor nearshore waters that are <i>not</i> beaches (to assess how different sources affect non-beach areas), including monitoring near CSO/SSO outfalls, monitoring near AOCs, industrial discharges, and toxic chemicals.</p>	<ul style="list-style-type: none"> • Support non-profit monitoring efforts (e.g. Beach Association; Grand Traverse Watershed Center; Inland Seas). • Partner with tribal entities to support tribal efforts. • Promulgate data collection protocols/standards.
<p>Monitor nutrients, plankton (zoo & phyto) for HAB precursor conditions using satellite and ground truth from limnology surveys.</p>	<ul style="list-style-type: none"> • Conduct limnology surveys in Lake areas of HAB conditions. Use satellite imagery for rapid detection and warning for partial or full body water users.
<p>Track water quality at select intake points throughout the Basin in order to monitor drinking water quality.</p>	
<p>Establish observations of rainfall, spatially explicit watershed hydrology models, hydrodynamics, harmful algal blooms and their toxins, and bacteria to drive and test the forecasting models.</p>	
Research Needs and Recommendations	
<p>Determine the estimated annual volume of discharge from those 147 CSO communities in the Great Lakes Basin.</p>	
<p>Determine the number of SSO communities in the Great Lakes Basin.</p>	
<p>Determine the number of plants that bypassed partially treated sewage into the Great Lakes in the most recent</p>	

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year.	
Determine the number of water intake temporary closures (and/or boil water alerts) due to known sewage events.	
Determine the number of industrial dischargers and the volumes to sewage treatment plants.	
Gather new and/or identify existing data on heavy metals, industrial chemicals, and pharmaceuticals entering the Great Lakes from sewage treatment plants.	
Identify case studies that enable extrapolation of cost savings from including soft path approaches in comprehensive plans to reduce wastewater overflows.	
Develop habitat modification techniques that reduce the formation of sustainable colonies of resident wildlife, such as gulls, which have an adverse impact on beach and other coastal areas.	
Assess the extent of contaminated sediments, especially in Areas of Concern, that contribute to water quality concerns.	
Conduct research to clarify sources and transport of biotoxins (i.e., botulism) through the food web.	
Conduct comprehensive research studies to determine the relative input of chemical contaminants to the coastal environment.	
Establish process-based and statistical forecasts for beach closures.	
Establish process-based and statistical forecasts for drinking water intakes.	
Establish process-based and statistical forecasts for harmful algal blooms.	
Establish process-based and statistical forecasts for water quality for recreations use of the Great Lakes.	
Determine the trigger mechanisms for beach closures.	
Determine the factors that affect toxin production in algal blooms.	
Communications Needs and Recommendations	
Develop effective public communication regarding water quality, including the risks of transmissible disease.	
Develop effective communication regarding the importance of stakeholder involvement.	
Educate the public about anthropogenic sources of contamination (from boaters, bathers, pets, household products, private septic systems, etc.) and how individuals can reduce their impact.	<ul style="list-style-type: none"> • Federal, State, academic (Great Lakes Sea Grant Network), tribal, local municipalities, and NGOs should partner to conduct public information campaigns to promote sustainable practices. • Institute enforceable city ordinances that call for the placement of signs regarding the health risk associated with bather shedding, availability and importance of proper boater waste disposal, and prohibition of

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	<p>practices that attract nuisance wildlife to which fines are attached for violations.</p> <ul style="list-style-type: none">• The Great Lakes Sea Grant Network should develop education/outreach programs for K-12 schools, colleges, the general public, and coastal decision-makers.• Ask the Great Lakes Sea Grant Network to make this topic an education/outreach priority and to make it a component of a proposed Great Lakes Center for Ocean Sciences Education Excellence (COSEE) funded by the National Science Foundation.• Cost for education campaigns on water quality issues: \$400,000 (\$50,000 per state for eight states).
Provide coordinated and consistent information about fish consumption advisories.	