

## Areas of Concern Restoration

- Addresses Governors' Priority: "Restore to environmental health the Areas of Concern identified by the International Joint Commission as needing remediation."
- Issues to be covered include, but are not limited to: Restoring the health of AOCs through the remedial action program, cleaning up contaminated sediments through implementation of the Legacy Act and other authorities, and delisting of AOCs.

### Introduction: A Debt to Pay—Restoring the Great Lakes Areas of Concern

The Great Lakes region has forged our nation's steel; built bombers and automobiles; milled paper and lumber; and shipped grain to hungry cities. But the Great Lakes suffered as our region prospered. Coastal communities and the rivers and bays around which they were built have been tainted by pollution from industry, agriculture and rampant development. The Areas of Concern (AOCs) are the clearest legacy of our use and abuse of the Great Lakes. The AOCs are testament to our historical impact on the Great Lakes and a present-day embodiment of our debt to the Lakes and these communities. We cannot restore the Great Lakes without restoring AOCs.

### Problem Statement

The United States and Canada committed to restoring the Areas of Concern (AOCs) in a 1987 amendment to the Great Lakes Water Quality Agreement of 1978. The States and Provinces designated 43 AOCs: 26 in U.S. waters, 12 in Canada, and 5 in bi-national waterways. The AOCs were identified based on 14 beneficial use impairments (BUIs) that reflect both human needs -- such as eating fish, drinking water and swimming in local waterways -- and purely ecological impacts, such as degraded benthic communities, loss of fish and wildlife habitat, and bird and animal deformities.

The AOCs include rivers, lakes and bays across the Great Lakes basin. They are found in large cities, such as Detroit and Cleveland, and smaller communities, like Manistique, Michigan and Waukegan, Illinois. Some are confined to small harbors at a river mouth; others encompass an entire river watershed. Each of the eight states that border on the Great Lakes includes at least one AOC.

AOCs vary widely in their mix of environmental problems. Some are impacted primarily by a single, large contaminated sediment site; others face multiple sources of pollution, as well as extensive loss of fish and wildlife habitat. The most common sources of impairment include contaminated sediments; sewage treatment plant discharges or combined sewer overflows; nonpoint source runoff; runoff from hazardous waste sites; and habitat destruction and degradation. (See [attachment X](#) for an overview of impairments in the AOCs and their sources and causes.) Of these, contaminated sediment is the most widespread factor, contributing to 11 of the 14 BUIs. All 43 AOCs have sediment that is considered contaminated based on chemical guidelines. ([Attachment X1](#): A summary of use impairments potentially associated with contaminated sediment and the numbers of AOCs with such use impairments).

Most sediment contamination in the AOCs involves historical discharges of chemicals such as PCBs, DDT and mercury that have since been banned or restricted. Because of the breadth of the problems associated with these “legacy” contaminated sediments, this chapter focuses primarily on this key challenge. Ongoing releases from industrial and municipal discharges, atmospheric deposition and polluted runoff, and other problems that impact the AOCs, such as invasive species and habitat degradation, are addressed in other chapters in this strategy. Further, this chapter addresses only the 26 U.S. and five bi-national AOCs.

The magnitude of the contaminated sediment problem varies greatly among the AOCs. Some have discrete “hot spots” that can be addressed fairly easily and rapidly. Others – particularly those in historically heavily industrialized urban areas -- contain miles of contaminated river bottom, which pose a much more complex, costly, and time consuming challenge.

It is critical that concentrated deposits of contaminated sediments be addressed quickly, because over time they will be transported from a river or harbor to the Great Lakes. Currently, sediments are entering the Great Lakes due to downstream transport and the suspension of sediments by ships that enter harbors that have not been dredged. Once dispersed into the open lakes, cleanup is virtually impossible.

### **Desired State**

The overarching goal of the AOC program is to restore beneficial uses and remove the AOC designation, known as “delisting.” To accomplish this, the U.S. Policy Committee, representing federal, state and tribal agencies responsible for the Great Lakes, developed the *Great Lakes Strategy 2002*, which set the following goals:

- Accelerate the pace of contaminated sediment remediation, working to overcome barriers to progress identified at each site.
- Bring together complementary federal and state authorities, and/or government and private resources to address the contaminated sediment problem and its various sources, so that:
  - Three remedial action starts are initiated each year.
  - Three sediment remedial actions are completed per year until all known sites in the Great Lakes Basin are addressed.
- Complete the cleanup of all known contaminated sediment sites in the Basin by 2025.

In order to delist, there must be clear and achievable targets; research, monitoring, remediation and restoration needed to achieve these targets must be identified; and the resources to implement these actions must be found.

In 2001, the U.S. Policy Committee developed delisting principles and guidelines ([www.epa.gov/glnpo/aoc/delist.html](http://www.epa.gov/glnpo/aoc/delist.html)) that clearly describe the attributes of an acceptable delisting target and the process to totally delist an AOC. The guidance is being used by the states and local Remedial Action Plan (RAP) groups to define delisting targets for the BUIs identified in their AOCs. The guidelines allow for incremental progress towards delisting by BUI or by stream segment, and present a viable option for better measuring intermediate progress in AOCs. Area of Recovery status is available for AOCs that have implemented all feasible cleanup activities, but require time for the ecosystem to respond.

Remediation of contaminated sediments holds the promise of both environmental and economic benefit. In a 2003 study, the Northeast-Midwest Institute estimated that completing the contaminated sediment cleanup of Waukegan Harbor in Illinois could cause property values for the average homeowner to increase by \$21,000 to \$53,000. The delisting of Collingwood Harbour, a Canadian AOC, served as the catalyst for town improvements including a children's environmental playground and a bike path. Innovative conservation programs program contributed to a 35% reduction in residential water use, and a 40% decrease in industrial discharges to the wastewater treatment system. Continuing improvements to the once infamous Cuyahoga River in Ohio have resulted in a change of development along the river from industrial to entertainment and residential. The newest Cleveland Metropark is located along the lower river and planning efforts are underway to better tie environmental cleanup to economic development.

### **Assessment of Ongoing Activities**

When first initiated, the AOC program generated a great deal of enthusiasm. The program outlined a comprehensive, ecosystem-based approach to restoring the Great Lakes' most degraded areas, with a strong emphasis on community leadership and stakeholder involvement. Many participants anticipated the RAPs would leverage resources for cleanup activities, yield measurable environmental improvements, and lead to delisting within a reasonable time period. Federal funding in the early to mid 1990s supported a great deal of planning, including development of Stage 1 RAP documents (identifying impairments and their sources) for all of the AOCs, and Stage 2 documents (identifying restoration measures) for approximately half. During this time local advisory councils were established in most AOCs that have played an important role in engaging community stakeholders in the RAP process and advising state and federal agencies on cleanup issues.

By the late 1990s, progress had stalled. The AOC program has no independent funding source and is not part of a larger, national program with a stable, Congressionally-authorized budget. Federal funding diminished and States' efforts declined proportionally. (This reflected both fiscal constraints among the States as well as their position that the AOC program is primarily a federal responsibility.) In some cases,

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responsibility for RAPs was shifted to local advisory groups that often lacked both the funding and technical capacity to effectively coordinate the process.

Progress was also impeded by the fact that the RAP program has no legal authority to compel cleanup actions; RAPs must look to other authorities or innovative approaches to fund remedial actions. Resources were largely unavailable for designing and implementing costly sediment remediation. Most cleanups that did occur were generated by the Superfund program, itself cumbersome and time-consuming. Further, most beneficial use impairments do not clearly align with existing federal water quality regulations, making it difficult to meaningfully document environmental improvements in the AOCs. Despite the time and effort invested in the AOC program, no US AOCs have been delisted and there is no consistent way to track progress in restoring beneficial uses in the AOCs. (The Presque Isle Bay AOC in Pennsylvania has been designated as being in a recovery stage, and the Black River AOC in Ohio has designated its "Fish Tumors and Other Deformities" impairment as being in a recovery stage.)

Significant developments in recent years have reinvigorated the AOC program. US EPA's Great Lakes National Program Office (GLNPO) has assumed oversight responsibility and appointed liaisons to each AOC, and is emphasizing the development of measurable restoration criteria. In 2004, Congress doubled funding for state and local support for AOC efforts, recognizing the need to rebuild capacity in this critical area.

GLNPO, in concert with the Great Lakes Commission, has held, and will continue to hold regional workshops to address issues related to delisting target development. GLNPO is also working with the Pennsylvania Department of Environmental Protection to set delisting targets for the "fish tumor and other deformities" BUI that can be used in all AOCs. Finally, GLNPO is offering grants to States and local RAP groups to develop statewide delisting criteria and individual AOC delisting targets.

Enforcement actions have achieved significant contaminated sediment cleanups in recent years, as have voluntary actions. Most significantly, the Great Lakes Legacy Act of 2002 (GLLA) provides dedicated funding for sediment remediation, filling an important gap in the Great Lakes program. The Act authorizes \$270 million over five years (beginning in fiscal year 2004) to remediate contaminated sediment in the US or bi-national AOCs. US EPA received \$10 million in FY 2004 and \$22.5 million in Legacy Act funding for 2005. The first project funded was the Black Lagoon in Michigan, with additional projects in other AOCs to follow. The accelerated sediment remediation program envisioned by this Act builds on a considerable amount of preparatory work that has been done by US EPA and other federal, state, and tribal agencies to characterize the nature and extent of contaminated sediments in the AOCs and to evaluate remedial options.

While it is an important addition to the AOC program, the Legacy Act is insufficient to address all sediment and AOC issues, both from a funding standpoint and due to the inability of some projects to meet stringent eligibility criteria.

Significant challenges remain in achieving greater success in cleaning up contaminated sediments. Some of the key challenges include:

- Need for a long-term, strategic approach for restoring the AOCs that crosses program boundaries
- Inadequate resources to remediate all sites completely.
- Recalcitrant potentially responsible parties (PRPs).
- Limited and declining disposal capacity.
- Policy and regulatory challenges to reusing sediments beneficially. Contaminated sediments are often identified as hazardous waste to be disposed of or destroyed, when they could be a resource when used beneficially.

### **Recommended Actions**

The *Great Lakes Strategy* of 2002 recommended these key actions:

- Restore the beneficial uses impaired by sediment contamination in AOCs, as a critical step toward their delisting. Monitor before, during, and after sediment remediation to assess and document remedy effectiveness.
- Track and report on an annual basis the number of sediment remediation project starts and completions in the Great Lakes.
- Each state member of the US Policy Committee, working with US EPA, the US Army Corps of Engineers, the National Oceanic and Atmospheric Administration, and the US Fish and Wildlife Service, will develop an integrated list of sites for remedial and restoration activities, with estimated costs and schedules. These lists will be updated biennially. US EPA will maintain this comprehensive list of known contaminated sediment sites in the Great Lakes, including but not limited to AOCs. The list will help to inform the Great Lakes community on the location and magnitude of remaining sediment contamination that could require remedial and restoration actions.

In addition to the key actions above, the Great Lakes Regional Collaboration has developed broad objectives and a set of targeted recommendations.

### Objectives

AOCs need scientifically justified, measurable delisting targets for the restoration of each applicable BUI. These targets must address AOC specific conditions and be consistent with federal, state and local regulations and policies.

At a regional level, remedial actions should focus on ecosystem stressors which have the most widespread impact on beneficial uses in AOCs. In particular, addressing

contaminated sediments and controlling wet weather events should be a priority for the AOC program.

U.S. EPA and the States, in consultation with local RAP participants, should recommend to the Bi-national Executive Committee revisions to the Great Lakes Water Quality Agreement that provide greater flexibility in achieving the aims of the AOC program. Revisions should structure AOC reporting so that it is efficient and meaningful; minimize requirements that do not directly contribute to planning and implementation of cleanup efforts; and formally recognize alternative approaches currently being utilized. Changes should be directed at minimizing bureaucratic requirements and focusing resources and staff efforts on the most high value activities that contribute to environmental improvements.

Resources should be available to support ongoing watershed stewardship in the AOCs after they are delisted. U.S. EPA, the States, and local RAP participants should establish ongoing mechanisms to build capacity for watershed stewardship in the AOCs focused on both the near-term needs associated with each AOCs cleanup plan, as well as long-term capacity for watershed management.

U.S. EPA, in consultation with the states, should establish a formal system for listing new AOCs.

### Recommendations to Congress

- Congress should support full appropriation for all components of the Great Lakes Legacy Act of 2002 – including the remediation, research and outreach components of the Act. Other programs for managing contaminated sediments should also receive full funding.
- The Legacy Act should be reauthorized beyond 2008 to continue progress in cleaning up contaminated sediment sites in Great Lakes AOCs.
- Since the CERCLA, CWA, OPA, RCRA, and WRDA programs often complement remediation work performed under the Legacy Act, Congress should assure adequate funding for these programs as well.
- Funding should be provided to identify and address wastewater infrastructure needs within the AOCs, particularly the elimination of CSOs.
- Annual federal funding should be provided to the States and local RAP groups to support development of statewide and/or AOC-specific delisting targets for BUIs (e.g., for development of tools or research necessary to define endpoints, conduct peer review, convene expert panels, etc.).
- The “maintenance of effort” language in the Legacy Act should be dropped. It is counterproductive, penalizing States and local communities that undertake major

remediation projects.

- The life of appropriated Legacy Act funds should be extended beyond two years (as envisioned by the Legacy Act) to accommodate both responsible remediation and long-term remedy effectiveness monitoring, which is consistent with the 2002 *Great Lakes Strategy*.
- The current 35% nonfederal match requirement in the Legacy Act should be reduced; or there should be some flexibility in qualification of nonfederal funds as match.
- Administration of AOC programs should be funded at the following levels: \$1.7 million for GLNPO and \$3.75 million for state administration.

Recommendations to federal/state agencies:

- Contaminated sediment sites should be addressed through a cross program/multi-agency strategy and decision-making process. Projects should involve funding from multiple sources using authorities under all applicable statutes (e.g. WRDA, CWA, CERCLA – including NRD provisions, RCRA, OPA, etc.), when necessary, to complete a cleanup. The Great Lakes components of these programs should be fully funded to facilitate the synergistic program coordination necessary to expedite the cleanup and restoration of all Great Lakes contaminated sediment sites.
- The Federal Interagency Task Force should develop effective mechanisms to leverage resources and technical assistance from federal agencies. Each federal agency should ensure that its annual budget request to Congress includes funding for implementation activities anticipated during the fiscal year.
- All US AOCs should develop local, or adopt statewide (as applicable) delisting targets for the restoration of applicable BUIs by the end of 2008. BUI delisting targets should be developed collaboratively by federal, state and local partners in accordance with the *Delisting Principles and Guidelines* adopted by the U.S. Policy Committee in December 2001.
- A performance-based system should be developed to track progress in remediating all contaminated sediment sites in the Great Lakes. Agreement needs to be reached on who is responsible for monitoring. States and local RAP groups should identify monitoring and assessment needs, and use that information to develop and implement AOC monitoring plans. Where necessary, additional funding should be provided to supplement existing programs of pre- and post-remedial monitoring and assessment.
- Ensure that funding is available for pre-Legacy studies and logistical support (i.e. design, pre-project planning) to move projects forward towards remediation.

Preferably, Legacy Act funds that do not require a match can be used to support this pre-remedial work.

- An open solicitation schedule should be maintained under the Legacy Act to facilitate project start-up when a project is deemed to be ready for implementation.
- Guidance on how the Legacy Act Program interacts both with enforcement programs and the polluter pays principle for CERCLA and OPA should be developed. Implications for resolving Natural Resource Damages (NRD) must be weighed in deriving this guidance.
- States should identify options for meeting nonfederal funding requirements under the Great Lakes Legacy Act, Corps of Engineers authorities, and other federal programs.
- There must be multi-stakeholder involvement in the identification and approval of disposal sites within the Great Lakes Basin.
- Approaches to sediment remediation other than removal are important. Flexibility is needed when identifying solutions, including public/private partnerships.
- Explore and implement beneficial reuse of sediment when feasible and practical.
- The RAP process should be revised to ensure appropriate flexibility in planning and implementing restoration activities, and to utilize plans developed under other programs to accomplish RAP goals.
- U.S. EPA and each of the Great Lakes states should establish a five-year agreement for administering the AOC program that outlines their respective roles and responsibilities, priorities, anticipated outcomes, resource needs, staffing levels, and procedures for documenting and reporting progress and clearly communicate this to all interested parties, particularly local stakeholders.
- U.S. EPA should fund each state program on a non-competitive basis based on an annual workplan submitted by the state. States in turn should provide adequate staffing to coordinate funding opportunities for AOC work, either by maintaining adequate professional capacity at the state level or by passing through funding to the local level.
- AOC funding should be established as a separate line item in GLNPO's budget and administered under the direction of an AOC program manager.

### Administrative Funding Requirements for the AOC Program

A summary table of AOC program funding requirements is provided below. This will be supplemented with a more detailed table reviewing state-specific AOC program funding needs, as well as a breakdown of AOC program support functions to be conducted by U.S. EPA, GLNPO, and local RAP groups.

<b>Function/Activity</b>	<b>Agency</b>	<b>Annual Funding Required</b>	<b>Comments</b>
Great Lakes Legacy Act (implementation)	U.S. EPA, GLNPO	\$54 million	Includes \$50 million for sediment cleanup projects, \$3 million for research, and \$1 million for public information
Great Lakes Legacy Act (administration and oversight)	U.S. EPA, GLNPO	TBD	Staff support needed for program direction, project agreement development, project planning and design, technical analysis, project oversight, grants management, and reporting.
U.S. EPA AOC program management, oversight, and reporting	U.S. EPA, GLNPO	\$1.7 million	Staff support needed for program direction, basinwide coordination, federal RAP liaisons, delisting assistance, public outreach, grants management, information management, reporting.
State AOC program administration	U.S. EPA, GLNPO, for pass through grants to the states	\$3.75 million	AOC program management, statewide coordination, RAP preparation and support, technical analysis and assistance, target setting and delisting, grants management, public outreach, and monitoring and reporting.
Local coordination	U.S. EPA, GLNPO,	TBD	Public involvement,

Function/Activity	Agency	Annual Funding Required	Comments
and RAP support	for pass through grants to states to administer to local RAP groups.		strategic planning, target setting, data management, monitoring and assessment, oversee cleanup projects, misc. research, studies.
Army Corps of Engineers Great Lakes Remedial Action Plan Program (Sec. 401, WRDA '90)	U.S. Army Corps of Engineers	\$4 million (increasing per demand)	Technical support for developing and implementing RAPs.
Army Corps of Engineers environmental dredging (Section 312, WRDA '90)	U.S. Army Corps of Engineers	\$5 million (increasing per demand)	Removal of contaminated sediments outside of federal navigation channels for preventative or environmental purposes, as part of operation and maintenance of a navigation project.
Natural Resource Damage Assessments	U.S. Fish and Wildlife Service	\$5 million	Calculate the cost of restoring injuries to natural resources that result from releases of hazardous substances.
<b>Total annual funding required:</b>  U.S. EPA total: USACE total: U.S. F&WS total:		<b>\$73.45 million</b>  \$59.45 million \$9 million \$5 million	Does not reflect funding needed for programmatic support from other federal agencies and programs (e.g., NOAA, USGS, CZM, 319, Superfund, etc.)

### Contaminated Sediment Remediation Funding Requirements

<http://www.glin.net/aocstrategyteam/documents/RemediationEstimatesJan05.xls>

Table 1. Sources of Impairments to Beneficial Use
Combined sewer overflows
Contaminated sediment
Nonpoint source runoff from rural and agricultural areas
Stormwater runoff from urban areas and construction sites
Channelization/alteration of natural stream flow patterns
Point source discharge from sewage plants and industry
Leachate from landfills
Groundwater contamination
Dams and shore structures
Malfunctioning home sewage treatment systems and package plants

**Table 1 - A summary of use impairments potentially associated with contaminated sediment and the numbers of Areas of Concern with such use impairments.**

<b>USE IMPAIRMENT</b>	<b>HOW CONTAMINATED SEDIMENT MAY AFFECT USE IMPAIRMENT</b>	<b>NUMBER OF AREAS OF CONCERN WITH THE IMPAIRED USE (N=42; % in parentheses)</b>
Restrictions on fish and wildlife consumption	Contaminant uptake via contact with sediment or through food web	36 (86%)
Degradation of fish and wildlife populations	Contaminant degradation of habitat; contaminant impacts through direct sediment contact; food web uptake	30 (71%)
Fish tumors or other deformities	Contaminant transfer via contact with sediment or through food web; possible metabolism to carcinogenic or more carcinogenic compounds	20 (48%)
Bird or animal deformities or reproduction problems	Contaminant degradation of habitat; contaminant impacts through direct sediment contact; food web uptake	14 (33%)
Degradation of benthos	Contact; ingestion of toxic contaminants; nutrient enrichment leading to a shift in species composition and structure, due to oxygen depletion	35 (83%)
Restrictions on dredging activities	Restrictions on disposal in open water due to contaminants and nutrients, and their potential impacts on biota	36 (86%)
Eutrophication or undesirable algae	Nutrient recycling from temporary sediment sink	21 (50%)
Degradation of aesthetics	Resuspension of solids and increased turbidity; odors associated with anoxia	25 (60%)
Added costs to agriculture or industry	Resuspended solids; presence of toxic substances and nutrients	7 (17%)
Degradation of phytoplankton or zooplankton populations	Toxic contaminant release; resuspension of solids and adsorbed contaminants, and subsequent ingestion	10 (24%)
Loss of fish and wildlife habitat	Toxicity to critical life history stages; degradation of spawning and nursery grounds due to siltation	34 (81%)

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**Beneficial Use Impairments in the  
Areas of Concern**

- Restrictions on Fish and Wildlife Consumption
- Tainting of Fish and Wildlife Flavor
- Degradation of Fish and Wildlife Populations
- Fish Tumors or Other Deformities
- Bird or Animal Deformities or Reproduction Problems
- Degradation of Benthos
- Restrictions on Dredging Activities
- Eutrophication or Undesirable Algae
- Restrictions on Drinking Water Consumption, or Taste and Odor Problems
- Beach Closings
- Degradation of Aesthetic
- Added Cost to Agriculture or Industry
- Degradation of Phytoplankton and Zooplankton Populations
- Loss of Fish and Wildlife Habitat