

Great Lakes Great Region.

newsletter



Council of
Great Lakes Industries
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MISSION

To promote the economic growth and vitality of the region in harmony with its human and natural resources (sustainable development).

The Council of Great Lakes Industries is a partner organization of the World Business Council for Sustainable Development and the Sediment Management Work Group.

PRESIDENT'S COLUMN

When we look at environmental stressors in the Great Lakes basin through professional eyes, like the State of the Lakes Ecosystem's Conference (SOLEC), it's clear that issues of toxics are not alone. Toxics have been joined, if not exceeded, by other stressors such as land use and invasive species. This change in priorities is partially the result of our collective success in stopping releases of persistent, bioaccumulative toxic substances (PBTs) into the Great Lakes through national legislation and voluntary programs such as the Great Lakes BiNational Toxics Strategy. And, indeed, we are impressively on target for removal of these persistent bioaccumulative and toxic substances from the eco-system. However, there are some parts of the Great Lakes basin where beneficial uses are still impaired by the lingering presence of some of these PBT's from air deposition and in sediments.

This issue of the CGLI newsletter is focused on contaminated sediments. There is no doubt that contaminated sediment issues have presented one of the most 'thorny' of environmental challenges — not only in the Great Lakes, but also across the continent. A group of experts called the Sediment Management Workgroup has reviewed 44 projects throughout the United States dealing with contaminated sediments. Of the 22 largest projects, low clean-up levels were either not achieved, or not

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Contaminated Sediments—Progress Possible



Introduction

Toxics have been a primary concern for those focusing on the environment in the Great Lakes regions for the past three decades. The good news is that, for the most part, point sources of toxic substances in the Great Lakes have been controlled. Non-point sources impacting the region's water are now being addressed based on our current capabilities. The next target to eliminate toxics in the water is the small, remaining source of toxics in the sediment.

Each of the primary sediment organizations and programs that CGLI monitors and works with including the Great Lakes Binational Toxic Strategy and the State of the Lakes Ecosystem Conference (SOLEC), both led by the US EPA and Environment Canada, and the International Joint Commission, is looking closely at resolving sediment issues in the region.

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Elements for Effective Sediment Management



Feature Story

Sediment management is a very complex issue requiring a great deal of technical expertise. This article looks at the basic components needed for effective contaminated sediment management.

There is no single answer for all sediment issues. A proper response to the sediment issue is to develop a scientifically sound, risk-based, contaminated sediment management strategy for each identified area of concern (AOC) in the Great Lakes. And, because no single risk management option is applicable to all contaminated sediment sites, the approach to remediation must be site-specific.

Components of effective contaminated sediment management

An effective sediment strategy must be based on **sound science, be risk-based and be site-specific**. Sediment remediation is needed only if there is **risk** to human or ecosystem health. Each site has its own specific considerations that determine appropriate remediation. Historically, stakeholders have started the process by determining which remediation option to use. Usually the option chosen was dredging. Often these decisions were not based on whether there were risks to human and ecosystem health, the nature of those risks, or the specific characteristics of the site.

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The emphasis has often been on removal of “mass” rather than reduction of risk. Mass removal has been equated with risk reduction, but this assumption is frequently not correct.

Stakeholder decision making

Multi-stakeholder groups are involved in the development of Remedial Action Plans (RAPs) for AOCs. These groups and other stakeholders need a decision-making framework to make critical decisions regarding contaminated sediment. The key elements of a risk-based decision-making framework are:

- Collaboration of stakeholders throughout the process.
- An initial site screening to define the environmental problem.
- Development of risk reduction-based Remedial Action Objectives (RAOs). These objectives must focus on reduction of risks to human and ecosystem health and all remediation work should focus on meeting these RAOs.
- Evaluation of the need for the control of contamination sources or other interim actions and the follow-up actions if necessary.
- A conceptual site model that characterizes the overall dynamics of that sediment site.
- A completed risk assessment that includes whether the contaminants are accessible to humans and fish.
- A comparative evaluation of the net risk reduction of each sediment management option (i.e. evaluating all the advantages and risks of each alternative such as the impact of re-suspension losses and elevated surface sediment residuals in the case of dredging).
- Application of risk management principles to the remediation selection process.
- Remedy selection based on sound-science, focused on risk reduction and consistent with the site-specific RAOs.

In addition, the sediment management decision framework developed by sediment experts includes a comprehensive decision tree process for making long-term sediment management decisions. The decision tree process integrates and draws support from technical papers, provides a framework for developing effective risk management strategies, and follows a general strategic approach. An important component of the process is that if remedy is selected that remedy must address risk-based remedial action objectives.

Key questions

Stakeholders involved with a site being considered for remediation need answers to a number of questions that include:

- Are there continuing sources of contamination that can be readily controlled?

- Does the presence of contamination present unacceptable risk?
- Are there interim measures prior to final remedy selection that will reduce the risks in whole or in part?
- Will risks become acceptable via natural recovery and, if so, during what timeframe?
- Can active remediation significantly shorten the timeframe for achieving acceptable risk?
- Will rare natural events, such as a severe storm, or human activity significantly disrupt conditions?
- What are all of the short-term and long-term risks for each option (including implementation and post-remedial risks since each type of remediation is accompanied by its own risk.)?
- What are the comparative net risk reductions achieved by each sediment management option under consideration for this site?

Cost effective decision making is an additional, important factor.

Remediation options

When remediation is needed there are a number of remediation methods to deal with contaminated sediment.

The most well known and probably most expensive is of course dredging. Dredging removes contaminated sediment and moves it to a containment site or cleans the sediment and replaces it.

Another treatment option is hydraulic modification that can include rerouting a waterway or making dam modifications.

Third is in-place containment or capping to enhance natural recovery process and isolate contamination.

Natural recovery or natural attenuation is a fourth option. Naturally occurring physical, chemical and biological processes can reduce overall risks from contamination. Natural recovery relies on natural processes as the risk reduction mechanism and involves significant long-term monitoring. It is not a “no action” option.

A combination of options may produce the greatest risk reduction.

All remedy selections should be based on the established remedial action objectives (RAOs). These objectives should focus on the reduction of risk to human health and the environment. Sediment management options under consideration should be evaluated against the site-specific objectives.

EPA study

U.S. EPA headquarters is currently reviewing

sediment remedy effectiveness on Superfund sites. They are looking at the effectiveness of each remedy in the context of risk reduction. The study that began in late 2002, is expected to be completed by fall 2003.

SMWG

The Sediment Management Work Group (SMWG) has developed a number of technical initiatives to deal with many of the complex details involved in contaminated sediment management that are not included in this article. These initiatives deal with developing conceptual site models, determining bioavailability and/or bioaccessibility of toxic contaminants, and determining sediment bed stability. More information is available at their website www.smwg.org.

Progress

The International Joint Commission (IJC) has recently released a comprehensive review of the work that has been done to restore AOCs in the Great Lakes region. The report is designed to recount to the public how much has been done in restoring AOCs to beneficial uses. The IJC ranks the general direction toward restoration as “positive” but the report makes nine recommendations to improve the management of restoration efforts. These recommendations for the governments include:

- documenting investment and achievements to date;
- reporting formally every two years on the recovery of ecosystem health;
- ensuring that monitoring, data support and information management systems are in place;
- reporting on the criteria and rationale for selecting natural recovery as a method of sediment remediation;
- providing a schedule for the development of restoration targets;
- ensuring accountability and responsibility for restoration;
- developing maps specifying AOC boundaries;
- reporting on the rationale for determining priorities for remedial measures and identify those priorities within AOCs; and
- reporting on the criteria and rationale for recognizing and designating AOCs in a Recovery Stage.

The full report is available at www.ijc.org.

Future

The focus will continue on contaminated sediment. The strategies for effective contaminated sediment management are of value to all stakeholders involved in sediment issues. Effective strategies will lead to cost effective sediment remediation that will reduce risk to human and ecosystem health. CGLI will share these strategies in the multi-stakeholder forums addressing Great Lakes environmental issues.

Areas of Concern

The U.S. has identified 26 Areas of Concern (AOCs) in the US Great Lakes region, five additional listed AOCs that are in both the US and Canada while Canada has designated 12 AOCs within its borders in the Great Lakes. In these areas, impairments to beneficial use have been identified. Sediments are believed to be the current largest source of these impairments.

The identification of AOCs is not a recent event. AOCs were listed in response to a 1987 amendment to the Great Lakes Water Quality Agreement that committed the two countries to cooperate with state and provincial governments to ensure the development and implementation of Remedial Action Plans or RAPs. RAPs are used for planning the cleanup process to restore AOCs contaminated with toxic substances to their beneficial uses. RAPs usually involve local citizen groups. It is the job of the RAPs to determine if there are risks to human and ecosystem health and to develop plans that are specific to their site. An issue for local RAPs dealing with sediment remediation needs is always money and how to fund the high costs often involved.

Because of the difficulties associated with contaminated sediment issues, progress has been slow. It is difficult for governments, potentially responsible parties (PRPs), and other stakeholders to reach agreement on remediation measures and cost apportion-

ment. Each AOC has different physical, biological and chemical characteristics, making it necessary to tailor remedies for each individual site. Only one U.S. AOC, at Presque Isle Bay, Pennsylvania, has been reclassified as an "Area of Recovery". Two Canadian AOCs, Collingwood Harbour and Severn Sound, have been delisted.

Complex issue

Resolving contaminated sediment issues is, in many ways, far more complex than dealing with point source pollution for the following reasons.

- Contaminated sediment is only an issue when it impacts human and ecosystem health.
- Depending on the technical remediation approach chosen, costs for sediment remediation can be enormous.
- There is no unified or generally accepted 'end-point' for dealing with sediments. Some stakeholders focus on pounds/kilo grams removed and others focus on the outcome-oriented measure of reduction of the risk to the environment.
- Alternative sediment remediation technologies are difficult to evaluate, and are variably effective depending on the characteristics of the site.
- Each site with contaminated sediment is unique and effective plans to address sediment issues must be specific to that site.
- All sediment remediation decisions must be scientifically based.

Great Lakes Legacy Act

In late November 2002, President Bush signed the Great Lakes Legacy Act, providing

a new source of funding for sediment remediation in the basin. Fiscal Year 2004 appropriations are requested at \$15 million although the legislation authorizes \$50 million per year for the next five years to stimulate the clean up contaminated sediment throughout the Great Lakes region. The Sierra Club, the Lake Michigan Federation, CGLI and many other regional organizations actively supported the passage of this act. The US EPA's Great Lakes National Program office will be administering the program. (See Legacy Act Facts page 4)

Many stakeholder groups are looking to these Legacy Act funds for sediment remediation for their local AOC. CGLI believes that it is critical that these funds be used to provide maximum risk reduction.

Priorities and Processes

Priorities and processes are needed to deal with contaminated sediments in these AOCs. Risks must be determined at each site and, if the risk based priority is high enough, must be addressed through remedies selected specifically for each site. With funds becoming available from the Legacy Act, we may have an opportunity to accomplish real risk reduction at one or a few sites. But, this risk reduction potential is possible only if the planning processes apply sound science, and are tailored for each site. The feature article discusses what CGLI believes is a logical, effective approach — drawing on the work of the Sediment Management Work Group and other experts — to deal with these important issues in the Great Lakes region.

verified in 14 of those projects. One example, the Manistique River and Harbor located in the Upper Peninsula of Michigan on Lake Michigan was the site of a six-year dredging effort to reduce PCB's. When the project began PCB levels were 15.2 ppm; after six years and an expenditure of \$48M, PCB levels were 17.4ppm or 18.8ppm!

Given results like these from such an extensive level of effort and money it's no wonder progress on other sediment sites has been slow. Determining how to deal with a sediment situation that is a potential risk to human health or otherwise impairs beneficial use, requires sufficient analysis of the situation to allow good risk-based decisions to be made. The recent passage in the U.S. Congress and signa-

ture by the President of the Great Lakes Legacy Act makes the timing of our approach to managing sediments even more critical. The Great Lakes Legacy Act is expected to provide over \$50M a year in funding to deal with contaminated sediment sites in the Great Lakes basin. The dollars need to be used wisely. We think now is the right time to make sure that all stakeholders in the region become well informed about contaminated sediment remediation options, because new funding can make a major difference in ecosystem improvement, or it can be squandered on ineffective activity. We all want it done right. Now is the time to make those educated decisions.

George H. Kuper



Legacy Act Facts

The Great Lakes Legacy Act (GLLA) of 2002 can have significant impact on sediment remediation in the Great Lakes. Highlights of this legislation signed into law in November 27, 2002, include:

- The GLLA authorizes \$270 Million over five years from fiscal year 2004 – 2008. Of that amount \$50 per year is for projects, \$3 million for technology research and \$1 million for public information program.
- The Act requires a report to Congress on USEPA oversight of Remedial Action Plan by November 27, 2003.
- Projects must be in US AOCs and monitor or evaluate contaminated sediment, implement a plan to remediate contaminated sediment and prevent further or renewed sediment contamination.
- Non-federal cost share must be at least 35% of the total project costs and 100% of operations and maintenance costs.
- Funding is limited to AOC projects where an evaluation or remedial alternatives for the AOC has been conducted including a review of the short-term and long-term effects of the remedial alternatives on human health and the environment. In

addition, a project will receive funding only if sources of the contamination are controlled.

- The Act requires that the non-federal sponsors maintain their aggregate expenditures for the remediation and not pull out because there is federal money.
- Neither the research program funds, nor the public information program funds require non-federal match.
- The key program requirements are source control, non-federal match funds (35%), alternatives evaluation, short and long term effects evaluations, maintenance of effort agreements and implementation of remedial action less than one year from the receipt of funds.
- The President's budget in February 2003 proposes \$15 million in funding.
- Fast track projects for the 2004 fiscal year are projects where source control is complete, remedial alternatives evaluation is complete, stakeholder acceptance is high, remedial boundaries are well-defined. GLNPO grant funds are potentially available to complete these evaluations. The RFP for Legacy Act funding is expected to be released in July 2003.



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