

10.0 Sediments Challenge

USEPA, Environment Canada, and the Great Lakes Commission, in cooperation with the GLBTS, sponsored a two-day workshop on “Treating Great Lakes Contaminated Sediment,” on April 24-25, 2001, in Ann Arbor, Michigan. The first day included presentations of environmental and industry perspectives on treatment technologies, a history of sediment treatment in the Great Lakes, and various existing and emerging sediment treatment technologies. The second day featured panel discussions focused on solutions to overcoming barriers to sediment remediation and implementation of treatment technologies. The agenda for this workshop is shown in Appendix B. For further information contact E. Marie Phillips, EPA/GLNPO at (312) 886-6034 or Alan Waffle, EC at (416) 739-5854.

Over 100 participants from government, industry, environmental organizations, and consulting and technology firms attended the workshop. The workshop was a milestone in developing and implementing solutions to achieve the challenge to “Complete or be well-advanced in remediation of priority sites with contaminated bottom sediments in the Great Lakes Basin by 2006”.

Relationship with Great Lakes Areas of Concern (AOCs)

The 1987 Great Lakes Water Quality Agreement specifies that Remedial Action Plans (RAPs) be developed to restore and protect beneficial uses in Great Lakes Areas of Concern (AOCs). Forty-two AOCs were identified in Canada, the U.S., and in shared waters. The RAP process involves three stages: problem identification (Stage 1), plan preparation (Stage 2), and implementation (Stage 3). Development and implementation of a RAP involves public participation throughout the process. The International Joint Commission serves in an advisory capacity in the RAP process, providing

review and comment on RAP documents.

Much has been accomplished since the RAP program began in 1987, though more work remains to be done. The GLBTS considers the RAP process a valuable means of addressing the GLBTS challenge. To maintain the momentum established through the RAPs in achieving long-term restoration goals, the GLBTS will continue to capture and report out, on an annual basis, Great Lakes basin-wide contaminated sediment remediation activities.

Table 10-1 presents a format for reporting progress on sediment remediation in the Great Lakes for both the U.S. and Canada. This table illustrates sediment remediation projects at both Areas of Concern and non-Areas of Concern, beginning in 1997 and continuing through 2000. The maps on the following pages illustrate the progress and achievements made in sediment remediation activities in the Great Lakes from 1997 to 2000. Figure 10-1 presents the cumulative volume of sediment remediated in the U.S. since 1997.

Update on Sediment Issues in Areas of Concern (Canada)

The following information updates information contained in the *GLBTS Progress Report of February 20, 2001*. That report should be referred to for additional information on sediment issues in Canadian AOCs.

Port Hope Harbour: Port Hope Harbour is located on the shoreline of Lake Ontario approximately 100 km east of Toronto. Harbour sediments contain elevated levels of some heavy metals and PCBs but due to contamination by uranium series radionuclides, the sediments have been designated as low-level radioactive wastes. The contamination is attributed to historic discharges from the Port Hope refinery of the former federal crown corporation,



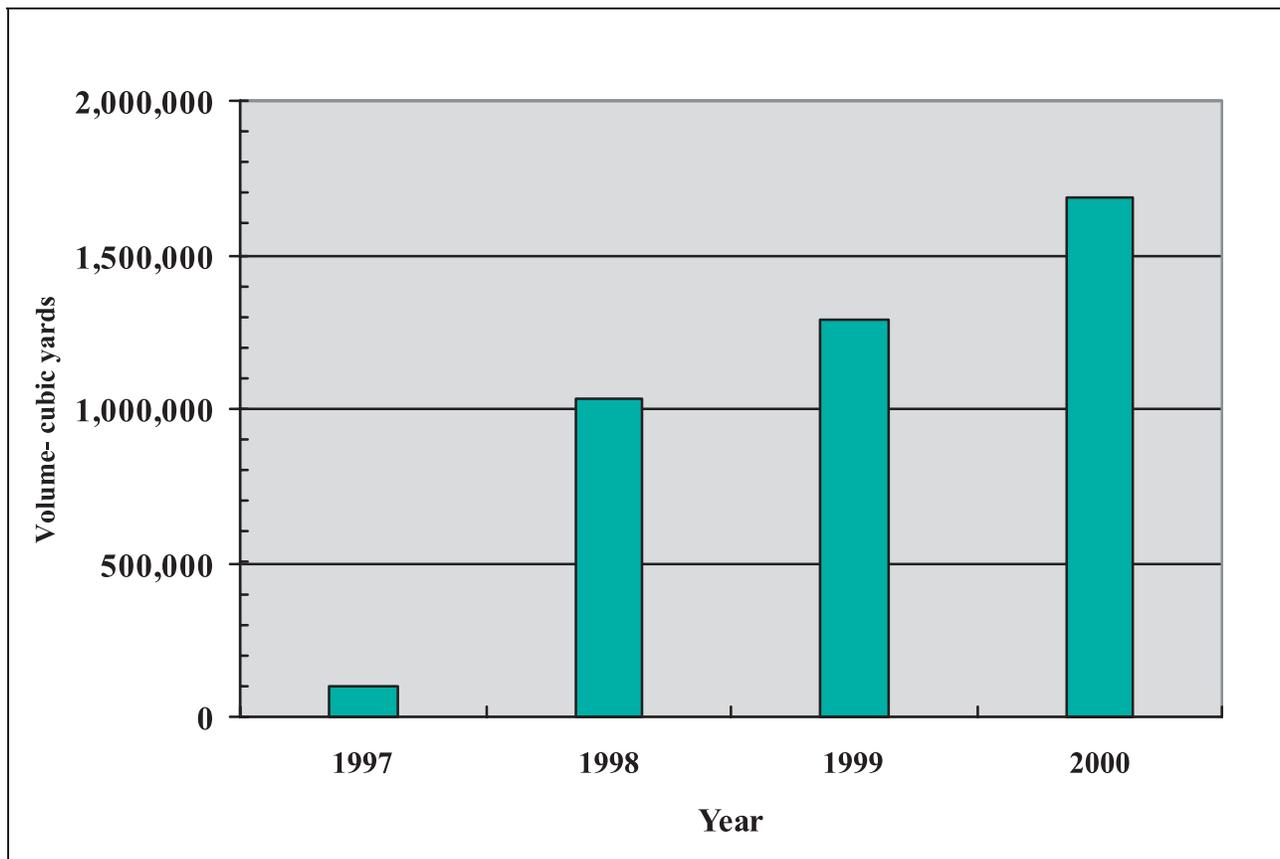


Figure 10-1. Cumulative Volume of Sediment Remediated in the U.S. Since 1997

Eldorado Nuclear Limited. There are other low-level radioactive wastes at disposal sites in the Port Hope area, and efforts by the Government of Canada have been underway since 1988 for the cleanup and long-term storage and management of these wastes. Harbour sediment remediation has been contingent on this initiative.

An agreement between the federal government and the Town of Port Hope and adjacent municipalities was reached in March 2001 on the development of facilities for the long-term management of low-level radioactive wastes. The initial preconstruction and regulatory phases, including a full environmental assessment, are expected to take approximately five years with the implementation of the cleanup taking another projected five years. Implementation of the estimated \$260 million project is managed by Natural Resources Canada through the Low-Level Radioactive Waste Management Office.

St. Clair River: Dow Chemical Canada Inc. announced March 22, 2001, its intentions to remediate an area of the St. Clair River adjacent

to its property where chemicals associated with historical operations can be found in the sediments. A preliminary estimate of 35,000 cubic metres of sediment contain elevated levels of mercury, hexachlorobenzene, hexachlorobutadiene, octachlorostyrene and PCBs. Further site assessment work has been completed, and Dow has evaluated several remedial options and will identify a preferred option in early 2002. The company anticipates that the entire project from design through consultation, engineering and construction will be completed by the end of 2002.

Thunder Bay Harbour: The Thunder Bay AOC extends approximately 28 km along the shoreline of Lake Superior and up to 9 km offshore from the city of Thunder Bay. There are two areas within the AOC with significant sediment contamination.

1) Northern Wood Preservers. Approximately 21,000 cubic metres of contaminated sediment (total PAH levels between 30 and 150 ppm) were contained within a rockfill berm and capped using



Table 10-1. Progress on Sediment Remediation in the Great Lakes*

Site/AOC/non-AOC	Cumulative Mass of Contaminant Removed (kg)												Cumulative Volume Sediments Removed 1997 to 2000 (cy)	Volume Sediments Removed 2000 (cy)	Ultimate Disposition	
	aldrin/ dieldrin	benzo(a) pyrene	chlordane	DDT (+DDE/DDD)	hexachloro benzene	alkyl-lead	mercury & compounds	mirex	octachloro styrene	PCBs	Dioxins and Furans	toxaphene				
U.S. Sites																
Ashtabula River, OH																
Black River-S. Branch, MI																
Black River, OH																
Buffalo River, NY - Buffalo Color - Area D													45,000			capped
Chicago River, IL																
Clinton River, MI																
Cuyahoga River, OH																
Deer Lake-Carp River, MI																
Detroit River, MI - Monguagon Creek													25,000			landfilled
Eighteen Mile Creek, NY																
Fox River, Green Bay, WI - Deposit 56/57 - Deposit N										50 — 50			87,500 80,300 7,200	50,300		landfilled
Grand Calumet, IN																
Kalamazoo River, MI - Bryant Mill Pond										10,000			150,000			landfilled
Manistee Lake, MI																
Manistique River, MI													123,000	33,000		landfilled



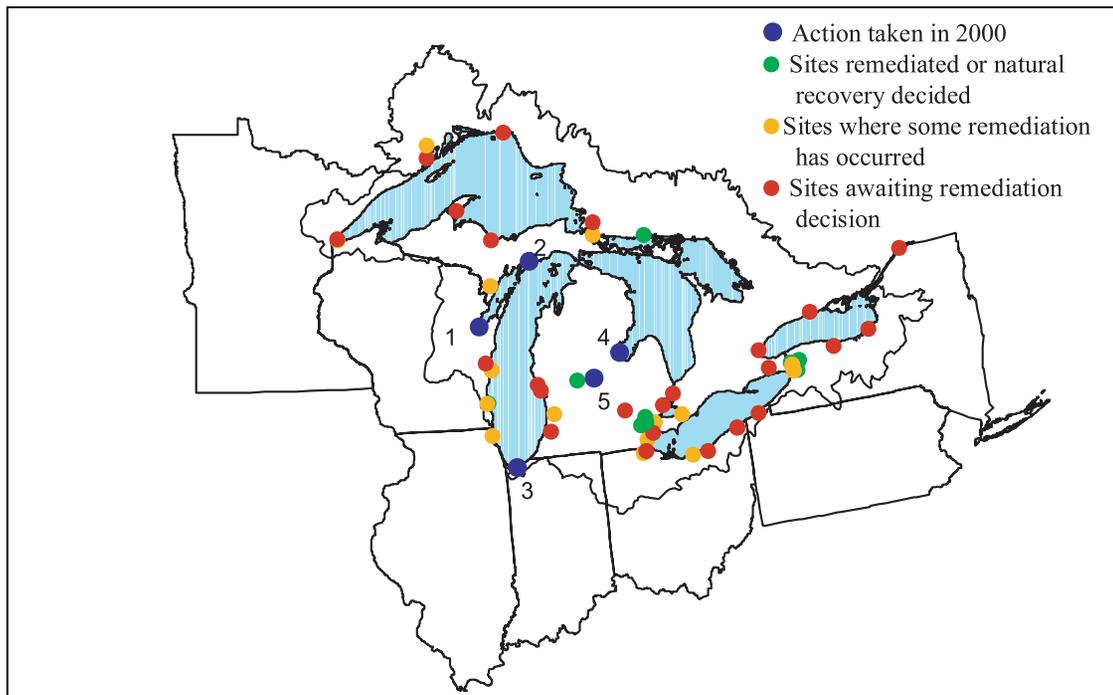
Site/AOC/non-AOC	Cumulative Mass of Contaminant Removed (kg)												Cumulative Volume Sediments Removed 1997 to 2000 (cy)	Volume Sediments Removed 2000 (cy)	Ultimate Disposition
	aldrin/ dieldrin	benzo(a) pyrene	chlordane	DDT (+DDE/DDD)	hexachloro benzene	alkyl-Head	mercury & compounds	mirex	octachloro styrene	PCBs	Dioxins and Furans	toxaphene			
U.S. Sites															
Manitowoc River, WI															
Maumee River, OH - Fraleigh Creek									25,400				8,000		landfilled
Menominee River, MI/WI - Anslu Eighth Street Slip													13,000		landfilled
Milwaukee Harbor, WI - North Ave. Dam													8,000		landfilled
Muskegon Lake, MI															
Alpena, MI – National Gypsum															
Niagra River, NY - Scajaquada Creek - Cherry Farm/Rivcer Road - Niagra Transformer													71,000 17,500 42,000 11,500		landfilled
Pine River, MI				203,708									140,000	110,000	landfilled
Presque Isle Bay, PA															
River Raisin, MI													27,000		on-site TSCA facility
Rochester Embayment, NY															
Rouge River, MI - Evan's Product Ditch - Newburgh Lake									250,000 4,000 246,000				407,000 7,000 400,000		off-site TSCA facility and landfilled
Saginaw River/Bay, MI													205,000	205,000	off-shore CDF

Site/AOC/non-AOC	Cumulative Mass of Contaminant Removed (kg)											Cumulative Volume Sediments Removed 1997 to 2000 (cm)	Volume Sediments Removed 2000 (cm)	Ultimate Disposition	
	aldrin/ dieldrin	benzo(a) pyrene	chlordane	DDT (+DDE/DDD)	hexachloro benzene	alkyl-lead	mercury & compounds	mirex	octachloro styrene	PCBs	Dioxins and Furans				toxaphene
Canadian Sites															
Thunder Bay - Northern Wood Preservers		2,700											11,000 21,000		Thermal treatment Berm enclosed & capped
Nipigon Bay															
Jackfish Bay															
Peninsula Harbour															
St. Marys River															
Spanish River															
Severn Sound															
St. Clair River															
Detroit River															
Wheatley Harbour															
Niagara River (Ontario)															
Hamilton Harbour															
Metro Toronto															
Port Hope															
Bay of Quinte															
St. Lawrence River (Cornwall, Ontario)															
TOTALS		2,700											32,000		

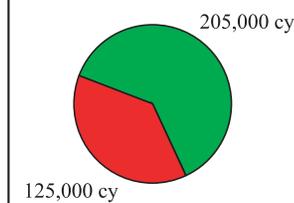
*Information included in matrix reports quantitative as reported by project managers. No attempt has been made to evaluate chemical data quality or verify calculations of mass removed.



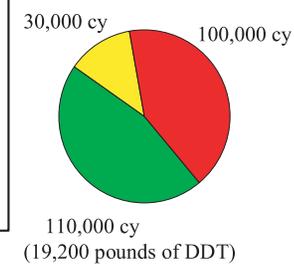
Great Lakes Sediment Remediations in 2000



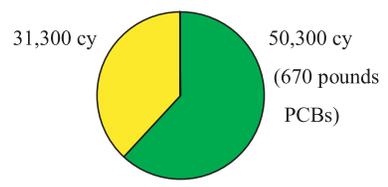
4. Saginaw River & Bay



5. Pine River

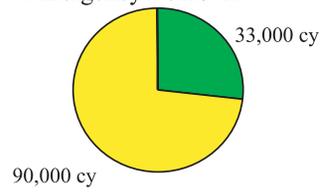


1. Fox River – Deposit 56/57

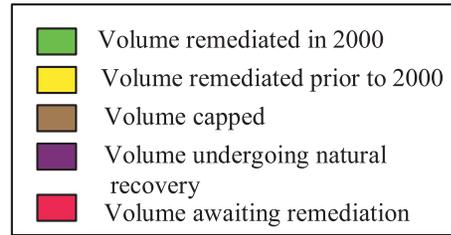
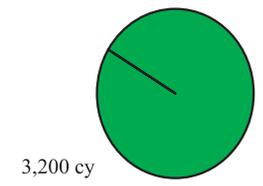


10,900,000 cy total in Fox River

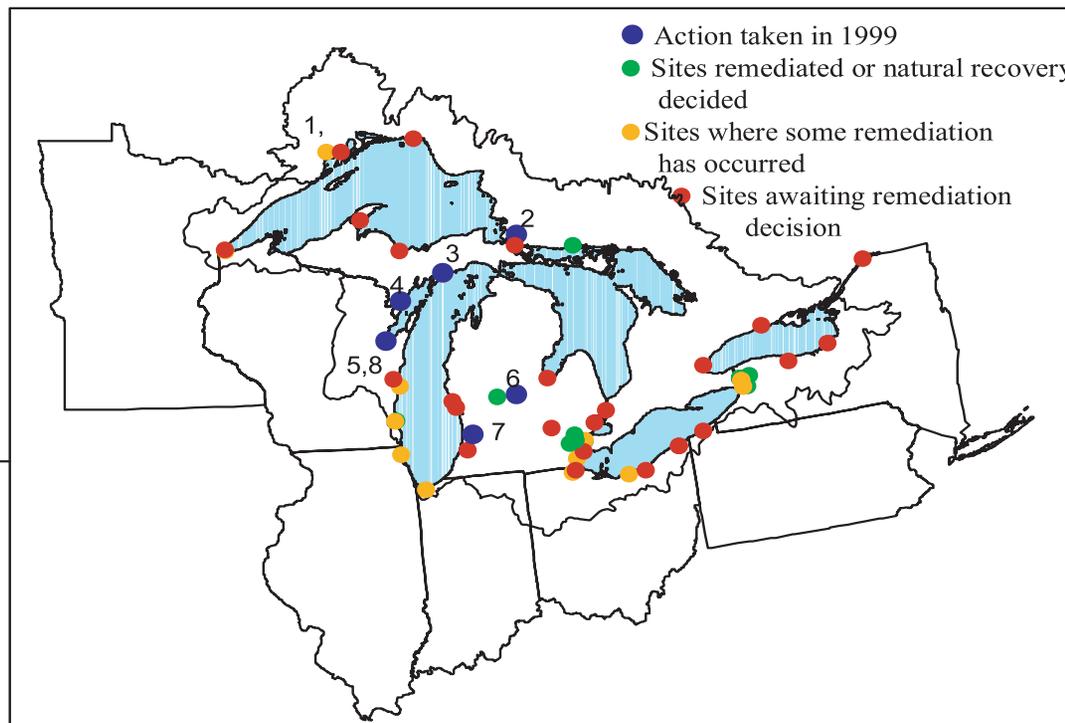
2. Manistique River & Harbor Emergency Removal



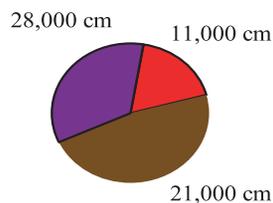
3. USX Vessel Slip Project – Lake Michigan



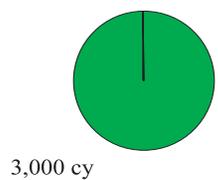
Great Lakes Sediment Remediations in 1999



1. Thunder Bay – Northern Wood Preservers

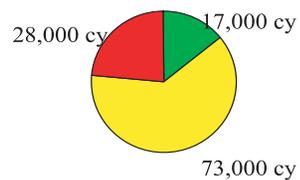


2. St. Marys River

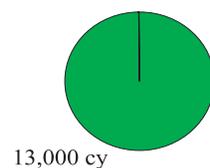


Remainder of contaminated sediments undergoing natural attenuation

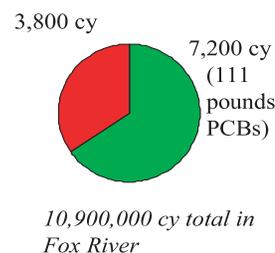
3. Manistique River and Harbor



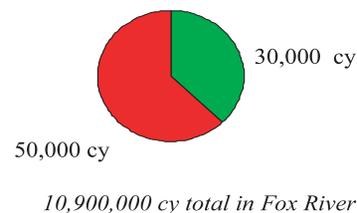
4. Menominee River - Ansul Eighth Street Slip



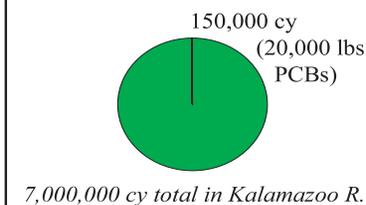
5. Fox River -Deposit N



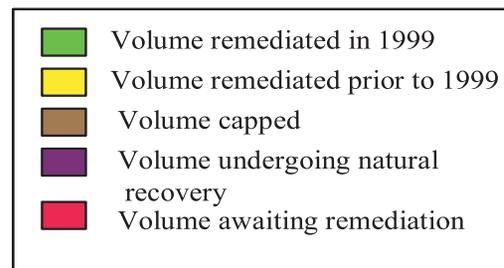
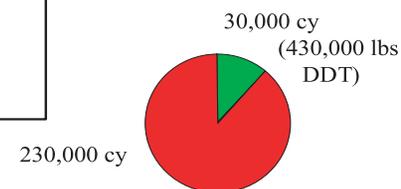
8. Fox River - Deposit 56/57



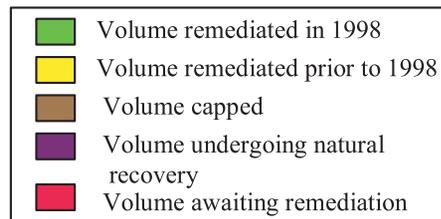
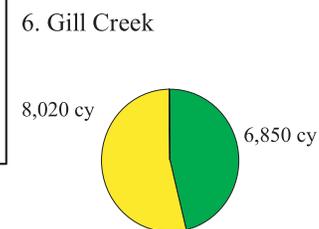
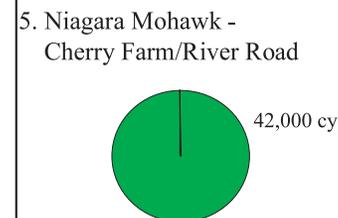
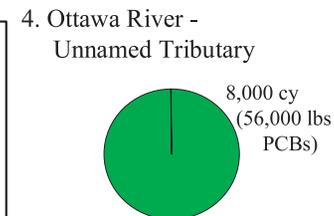
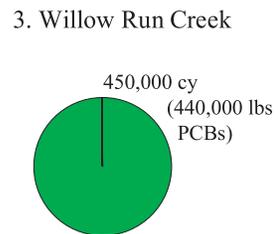
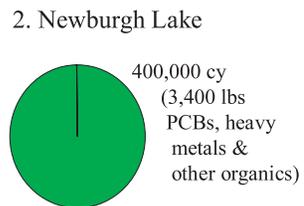
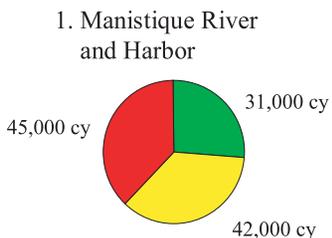
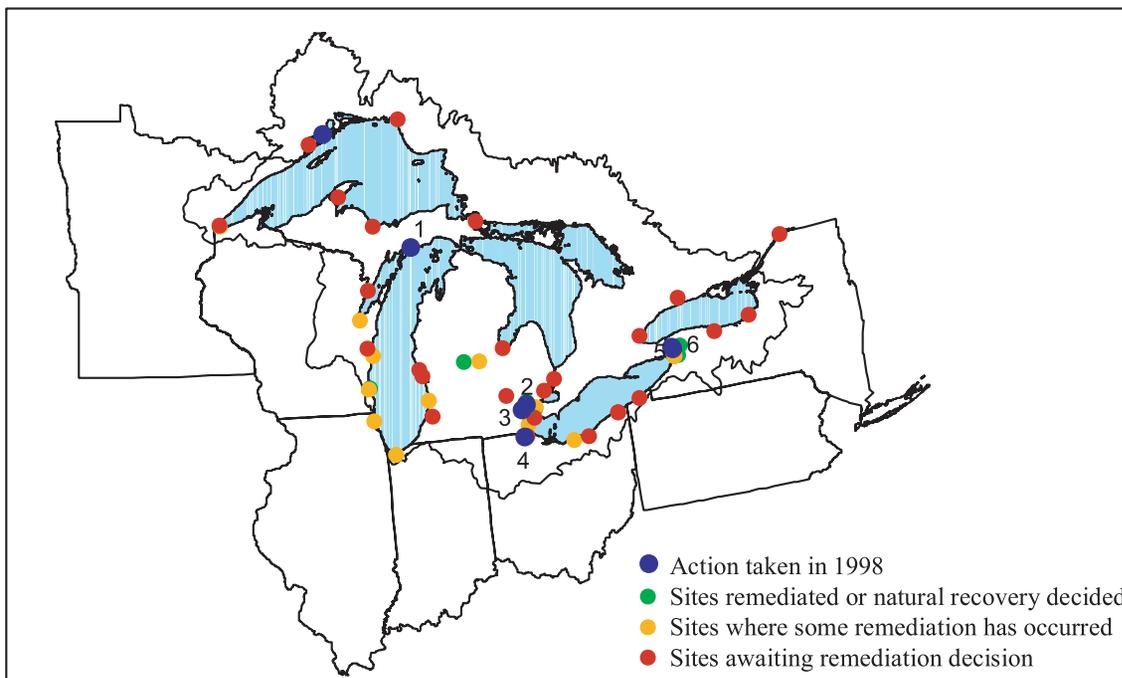
7. Kalamazoo River - Bryant Mill Pond



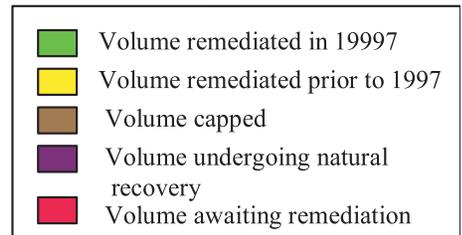
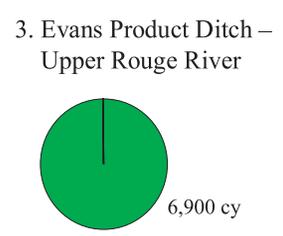
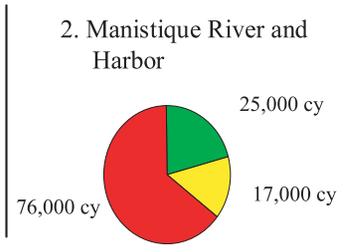
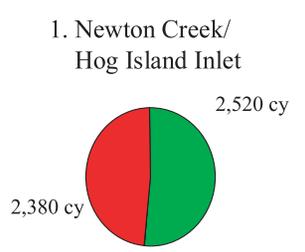
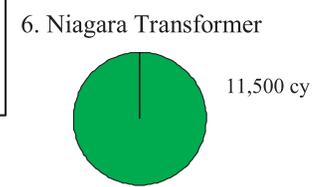
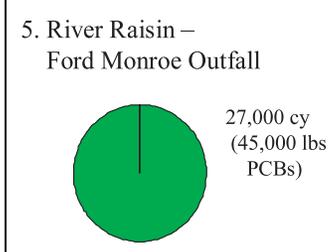
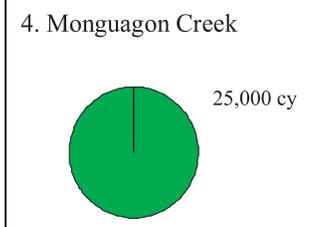
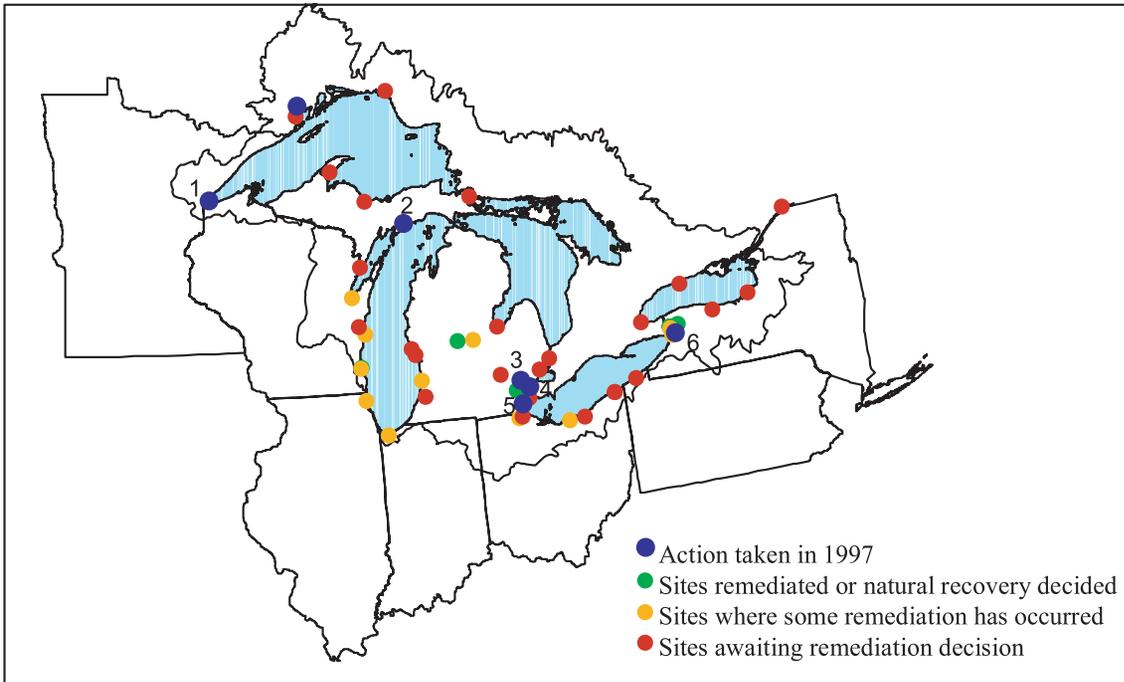
6. Pine River



Great Lakes Sediment Remediations in 1998



Great Lakes Sediment Remediations in 1997



clean fill. Approximately 11,000 cubic metres of the most highly contaminated sediment (above 150 ppm total PAH) were dredged, and thermal treatment is underway (Fall 2001). The remaining 28,000 cubic metres of contaminated sediment (80% of which is less than 50 ppm total PAH) outside the berm is undergoing natural recovery.

2) Provincial Papers. There are an estimated 18,000 cubic metres of mercury-contaminated sediment. Remediation options are under assessment.

Peninsula Harbour (Marathon): Peninsula Harbour is located on the northeast shore of Lake Superior at Marathon. Sediments with elevated levels of mercury and PCBs extend approximately 3 km from Marathon to a depth of 2 to 36 metres. This sediment exceeds guidelines for open water disposal of dredged materials. There is an estimated volume of 55,000 cubic metres of sediment in the shallow water areas of the Harbour (Jellicoe Cove) that exceeds Provincial Sediment Quality Guidelines, with approximately 10,000 cubic metres residing in the area of highest concentration. Assessment and remediation studies are underway.

Hamilton Harbour: The amounts and concentrations of heavy metals, PAHs, and PCBs in the Harbour are the result of discharges over several decades from industrial and urban sources. The Harbour is considered an excellent sediment trap, retaining about 85 percent of all suspended sediment discharged into it. Priority has been given to establishing standards, dredging techniques, risk analysis, and treatment technology for an area called Randle Reef where PAH concentrations are of greatest concern. Remedial options are being assessed for approximately 20,000 cubic metres of contaminated sediment at this site.



Peregrine Falcon

Photograph courtesy of Canadian Wildlife Service

