

2010-2011 Binational Report on Protection of Great Lakes Water Quality

By the
United States Coast Guard,
Environmental Protection Agency,
Transport Canada Marine Safety,
Department of Fisheries and Oceans Canada (Canadian Coast Guard),
And
Department of Fisheries and Oceans Canada (Science)

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§ 100. Introduction and General Developments

§ 110. The Report and the Great Lakes Water Quality Agreement

This report, submitted to the International Joint Commission (IJC) under the Great Lakes Water Quality Agreement (GLWQA),¹ covers the period from August, 2009 through March, 2012. This report addresses Annexes 4, 5, 6 & 9 which relate primarily to toxic and pollutant threats from shipping activities. The report has been delayed from its normal two year reporting structure to allow the latest information with respect to the USCG Ballast Final Rule, the EPA draft Vessel General Permit 2.0 and the renegotiated Great Lakes Water Quality Agreement to be available.

Consistent with both governments' desire to utilize technology to maximize resources and disseminate the spread of information, this report will cite internet resources and provide active links when possible. This report continues the format of the 2000-2001, 2002-2003, 2004-2005, 2006-2007 and 2008-2009 reports.

The Canadian portion of this report has been prepared by Transport Canada Marine Safety (TCMS) in cooperation with Fisheries and Oceans Canada. As in previous reports TCMS has significant responsibilities under Annexes 4, 5 and 6 of the GLWQA for regulation of vessels and marine facilities. The Canadian Coast Guard branch of Fisheries and Oceans Canada has responsibilities under Annex 9 of the GLWQA for response to discharges from vessels, marine facilities when a vessel is alongside, mystery spills that do not originate from land and any spills in Canadian waters that may cross over into / or from American waters (international incidents).

DFO Science has specific responsibilities under Annex 6 with respect to providing scientific research and advice to TCMS in connection with the development of ballast water regulations and standards. Environment Canada is now a player in the Canadian regulation of ballast water. With the advent of specific Ballast Water treatment technologies, some of which use biocides for treating ballast water, Environment Canada provides advice to Transport Canada on the acceptability of discharge of treated water from a toxicological and water quality point of view.

The United States Coast Guard retains its responsibilities for both regulation and response relating to vessels and marine facilities under Annexes 4, 5, 6 and 9.

The Environmental Protection Agency (EPA) has new responsibilities for regulation since issuing the Vessel General Permit (VGP) on December 18, 2008.

The actual legislation and regulations for the responsible agencies may be accessed at <http://www.tc.gc.ca/eng/acts-regulations/acts-2001c26.htm> for Canada, and <http://www.uscg.mil/>

¹ See Annexes 4, 5, 6, and 9 of the Great Lakes Water Quality Agreement of 1978, signed at Ottawa November 22, 1978, as amended by Protocol signed November 18, 1987.

and <http://www.epa.gov/> for the U.S. Coast Guard and U.S. Environmental Protection Agency, respectively.

In this report where used without further qualification, “the agencies” represent the Department of Fisheries and Oceans Canada - Science (DFO Science), the Department of Fisheries and Oceans Canada - Coast Guard (CCG), Transport Canada Marine Safety (TCMS), the U.S. Coast Guard (USCG) and the U.S. Environmental Protection Agency (EPA).

As in previous years, this report reflects the results of a closely focused, substantive, government-to-government consultation to provide an interchange of information, to determine the relative importance of problems requiring further study, and apportion responsibility for further work in accordance with the mandate of Annex 6 to “review services, systems, programs, recommendations, standards and regulations relating to shipping activities for the purpose of maintaining or improving Great Lakes Water Quality.”

Other consultations on these issues continue to be held with our regional partners, marine industry, and other interested organizations at the Canadian Marine Advisory Council (Regional and National), Great Lakes Waterways Management Conference, the Great Lakes Regional Waterways Management Forum, the Great Lakes Panel on Aquatic Nuisance Species, the Great Lakes Ballast Water Collaborative (assisted by the IJC) and other ongoing forums.

§ 120. The Great Lakes Water Quality Agreement Review

Path Forward Ship Source Discharges

U.S. EPA and the Department of State have worked with the Canadian government to secure a commitment to negotiate provisions to update and strengthen the Great Lakes Water Quality Agreement. The two governments announced their intention to negotiate amendments to the Agreement at the International Joint Commission’s June 13, 2009 celebration of the 100th Anniversary of the U.S.-Canada Boundary Waters Treaty at Niagara Falls.

The negotiations to date have included discussions with respect to safety of ships and crew, the role of Standards and Guidelines of the International Maritime Organization and the role of Science. The inclusion of requirements contained in the current Annex 4, 5, 6 & 9 of the existing agreement have been discussed, as has the addition of requirements for antifouling, biofouling, and an expanded clarification of requirement for ballast water.

A draft final text is with State Department and the Department of Foreign Affairs and International Trade. The negotiations took place over two years and included a number of webinars and face to face meetings with stakeholders.

It is hoped that the final release will take place during summer 2012. In Canada, that will require approval in Parliament as the GLWQA is considered a treaty. In the US, the GLWQA is considered an “Executive Agreement” and the Executive branch of the U.S. government may approve the Agreement.

§ 130. Current Agency Responsibilities

Canada: Transport Canada/ Fisheries and Oceans Canada

The Canada Shipping Act 2001 has now been fully in effect since July 1, 2007. The overall result of the act will expand Transport Canada’s activities to areas that may have some positive environmental impact on the lakes, although it is not specifically regional in nature, nor limited to the Great Lakes. Recreational vessels, fishing and small commercial vessels are now covered by TC’s mandate. An overview of the Transport Canada regulatory update program can be found at:

<http://www.tc.gc.ca/eng/mediaroom/backgrounders-b05-m005e-1881.htm>

The regulatory provisions applicable to ships discharges (other than ballast water) are now contained in the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* under the Canada Shipping Act.

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2007-86/>

Of specific interest to the Great Lakes is that both the *Ballast Water Control and Management Regulations* and the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* are still under the authority of the Canada Shipping Act. As discussed in the report, they are being reissued in the context of the Canada Shipping Act 2001. It is not anticipated the Great Lakes will see any difference in context with this administrative action.

Transport Canada inspectors still carry out inspections to the ocean-going fleet in our waters consistent with boarding of the port state control.

<http://www.tc.gc.ca/eng/marinesafety/oep-inspection-psc-menu-1120.htm>

Canada has ratified Annex 4, 5 and 6 of MARPOL along with the Anti-Fouling Convention and the Ballast Water Convention as of April 8, 2010.

TC and DFO Science regionally have continued the cost sharing arrangement described in the last report with respect to the GLWQA /AIS file, including a dedicated research scientist, an assigned marine inspector and a database manager / biologist. Additional marine safety inspectors in Quebec Region are dedicated to the inspection team enforcing the Canadian Ballast Water Control and Management Regulations that came into effect in June 2006. From a Great Lakes perspective, proactive enforcement of the ballast water (BW) requirements before vessels arrive into the Great Lakes is seen as the most efficient means of management.

§ 140. Overall Effects of Shipping on the Great Lakes

All the agencies continue to have a strong commitment to Great Lakes environmental issues. TCMS, DFO Science, CCG and USCG continue to work closely together on issues relating to marine sanitation devices, compliance strategies, ballast water control and other regulatory marine environmental issues. The CCG and the USCG continue their longstanding tradition of close cooperation in pollution response operations on the Great Lakes. The agencies will continue to consult with Canadian and American partners and stakeholders to improve and harmonize ship source pollution regulations with the objective of enhancing the protection of the marine environment.

The pollutants that vessels and marine facilities may discharge into the Great Lakes environment which the agencies are responsible for include (1) oil and hazardous substances, (2) sewage and greywater, (3) garbage, (4) cargo residues, (5) exhaust emissions (6) toxic substances and (7) ballast water.

There is continuing work to be done on all these discharges, and each type of discharge presents a unique set of issues. However, with the exception of aquatic invasive species found in ballast water, the agencies continue to report that the impact on the Great Lakes from all these discharges or potential discharges is low, and existing regulatory programs are adequate to address the threat to the Great Lakes environment.

As discussed in the Great Lakes Water Quality Review, with few regional exceptions, the regulatory regime for ships is global in nature and that both nations are very involved with the international process at the International Maritime Organization in the various subcommittees of the Marine Environmental Protection Committee (MEPC). The MEPC met on from February 27 to March 2nd 2012 and a report of this session may be found at:

<http://www.imo.org/Newsroom/>

§ 200. Annex 4 Discharges of Oil and Hazardous Polluting Substances from Vessels

§ 210. Oil and Hazardous Substances

As above, Transport Canada continues to be active in prevention of oil from a global perspective:

<http://www.tc.gc.ca/eng/marinesafety/oep-environment-prevention-menu-1110.htm>

From a Transport Canada perspective, regulations regarding oil pollution have been modernized and the program is now contained online at:

<http://www.tc.gc.ca/eng/marinesafety/oep-environment-sources-oil-1530.htm>

Similarly the latest information regarding noxious liquid substance can be found at:

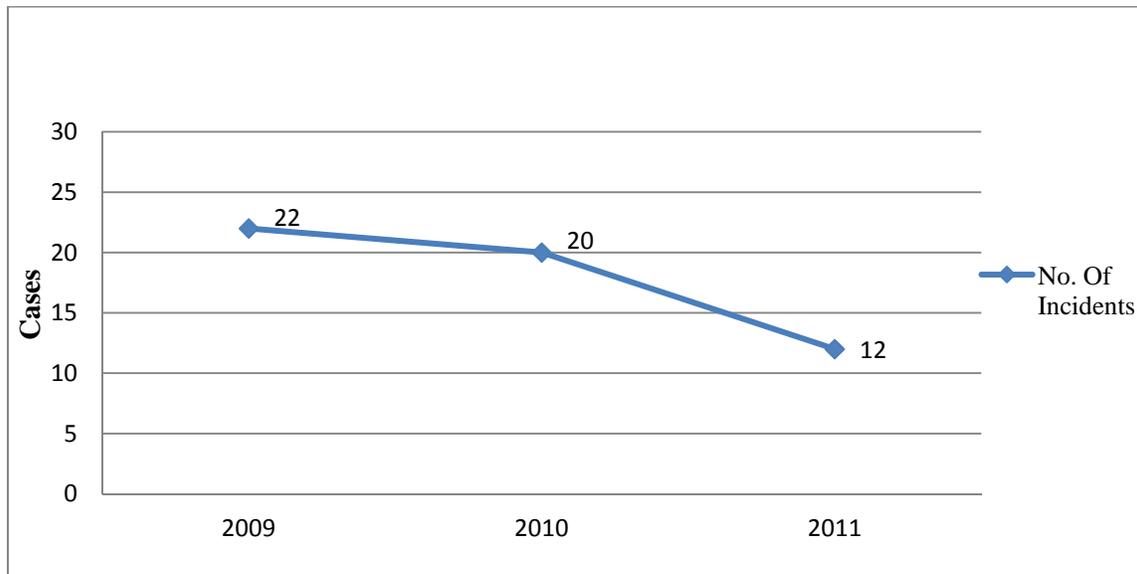
<http://www.tc.gc.ca/eng/marinesafety/oep-environment-sources-nls-313.htm>

2010-2011 Report on Great Lakes Water Quality by the USCG, EPA, DFO Science, CCG, and TCMS

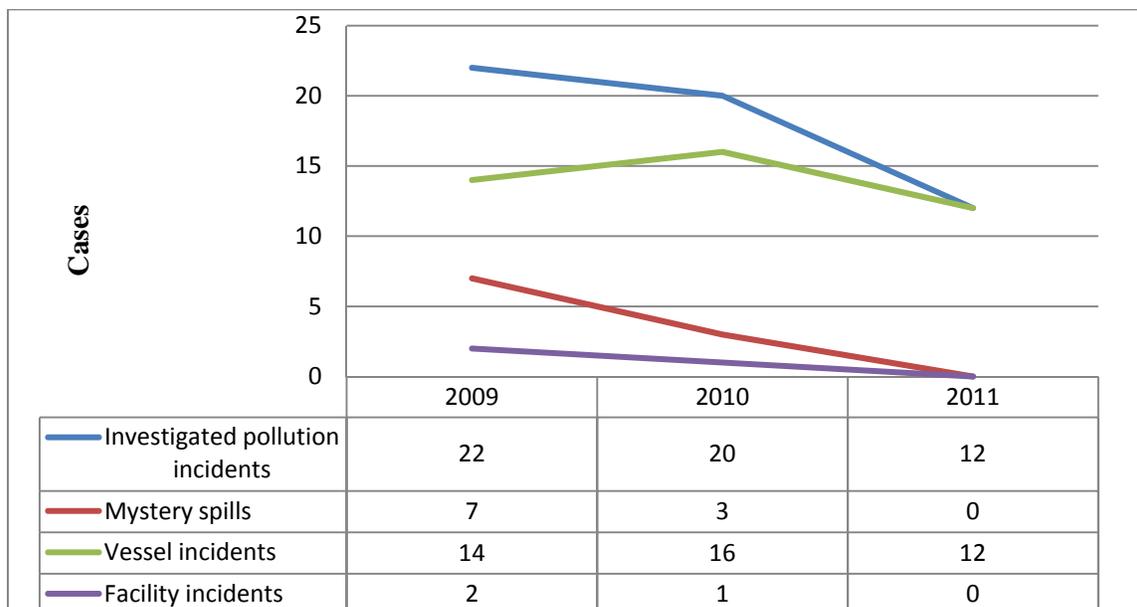
The Canadian and U.S. statistics for spills of oil or hazardous chemicals from commercial ships sources, for the period covered by this report, follow. The Canadian graphs have been altered to ensure compatibility with the U.S. graphs for comparison purposes.

Canada

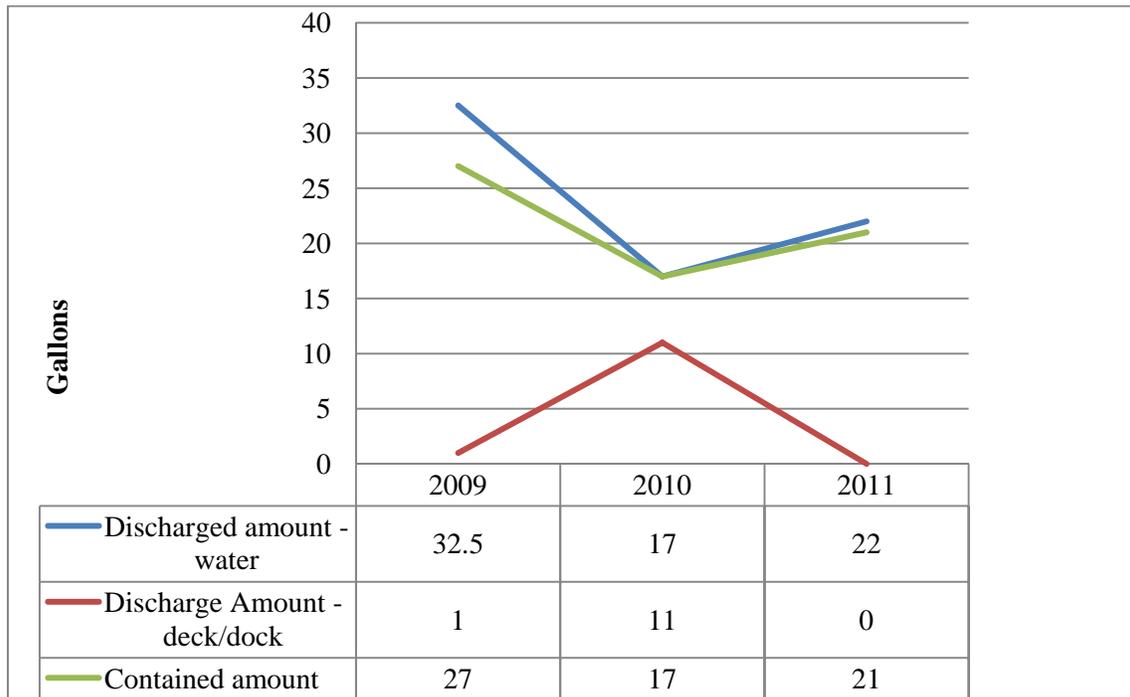
**Transport Canada
Marine Environmental Response Cases – FY 2009-2011**



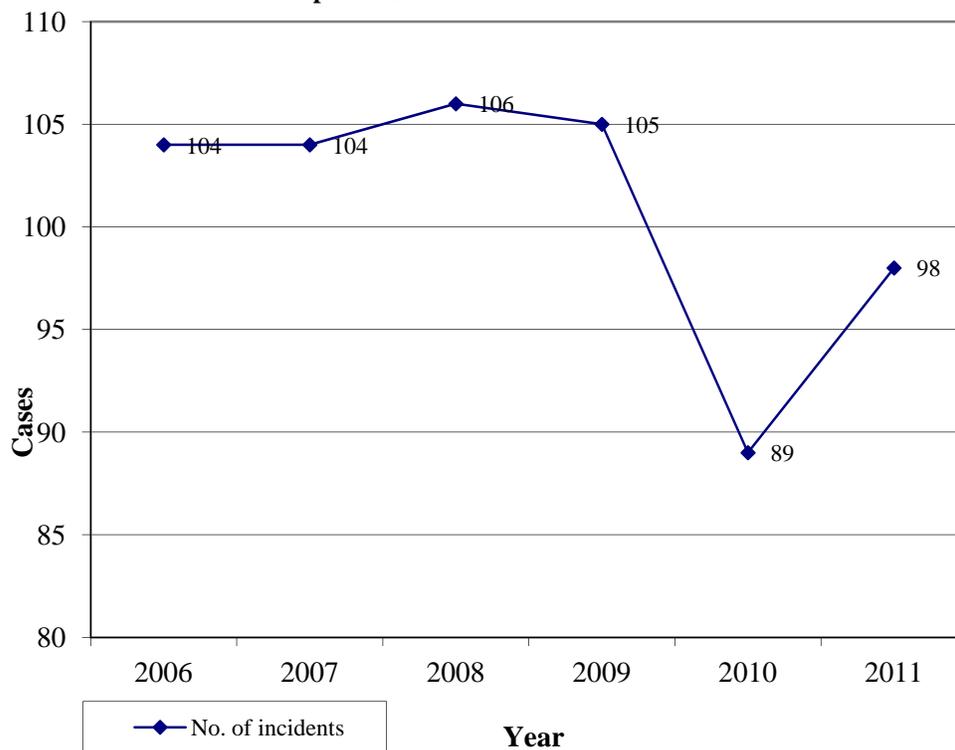
**Transport Canada
Investigated MER Case Types – FY 2009-2011**



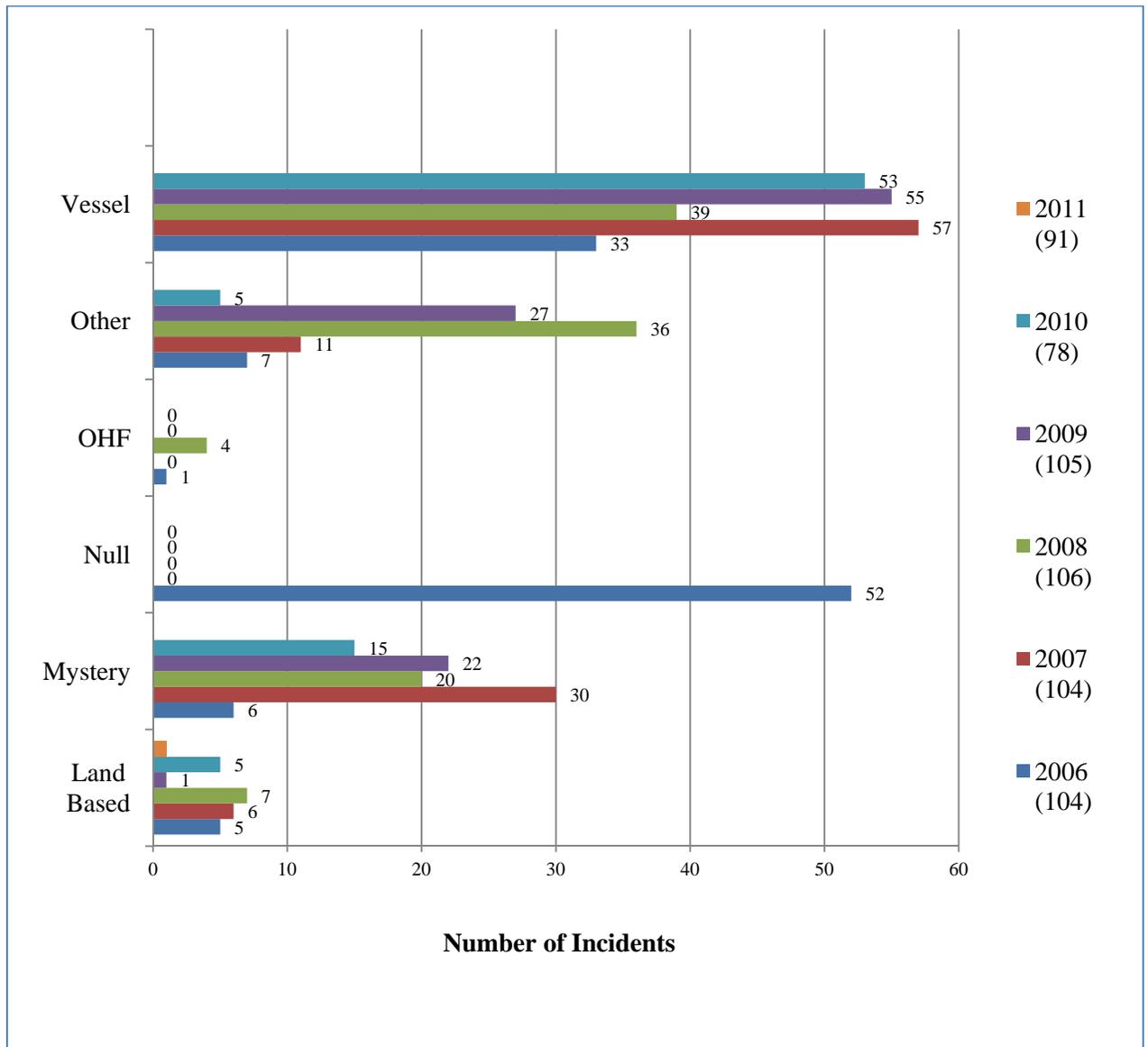
**Transport Canada
Total Discharged Amounts – FY 2009-2011**



**Department of Fisheries and Oceans
Environmental Response Cases – FY 2006-2011**

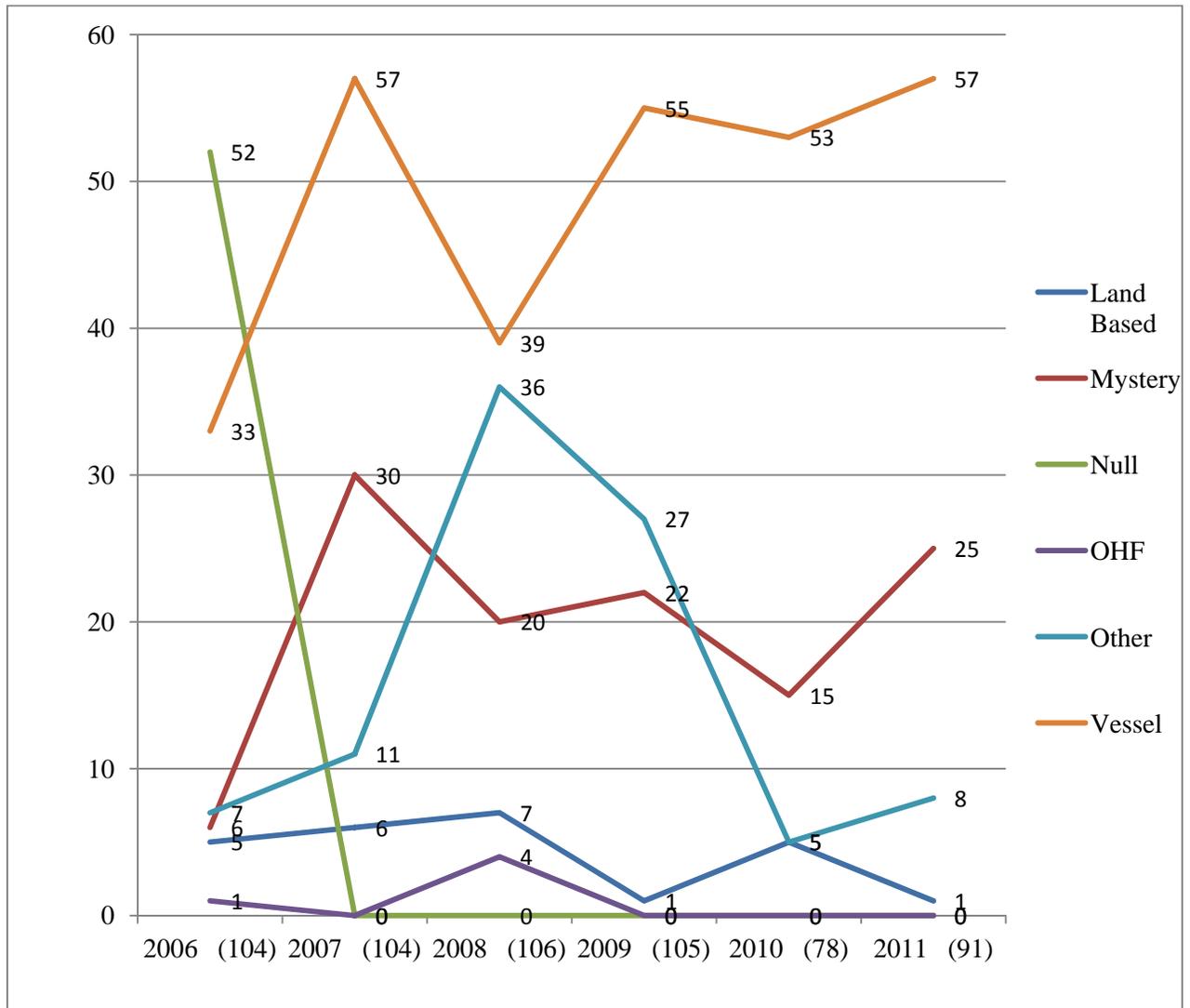


Department of Fisheries and Oceans
 Environmental Response Cases – Number of Incidents – FY 2006-2011



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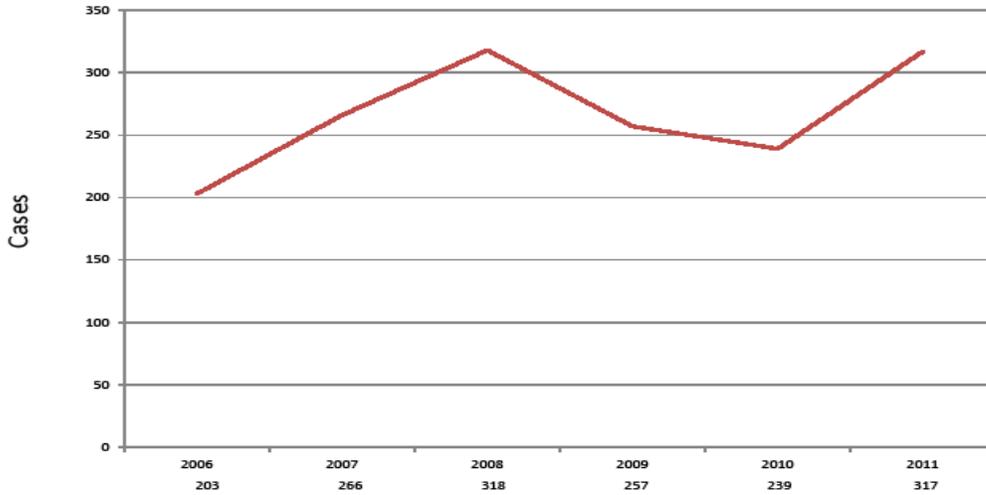
Department of Fisheries and Oceans
Environmental Response Cases by Source of Incident – FY 2006-2011



United States

Ninth Coast Guard District

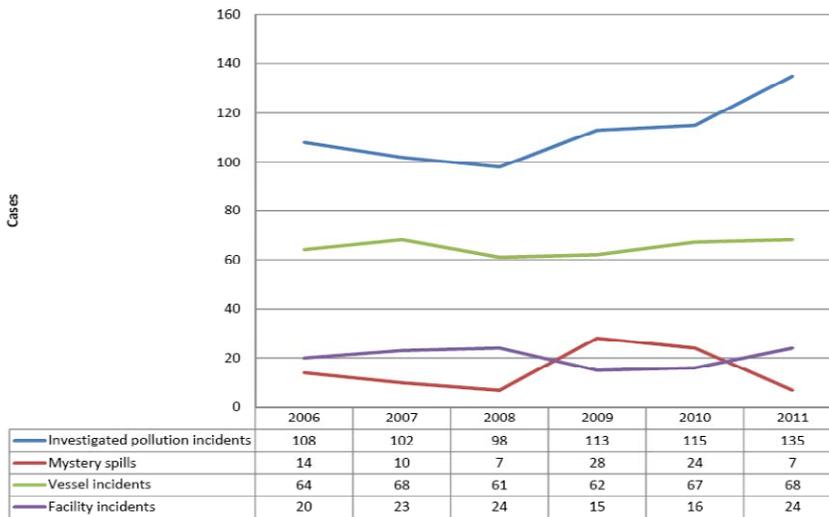
MARINE ENVIRONMENTAL RESPONSE CASES – FY 2006-2011



Source: CGBI MISLE Response Cubes, 11/28/2011

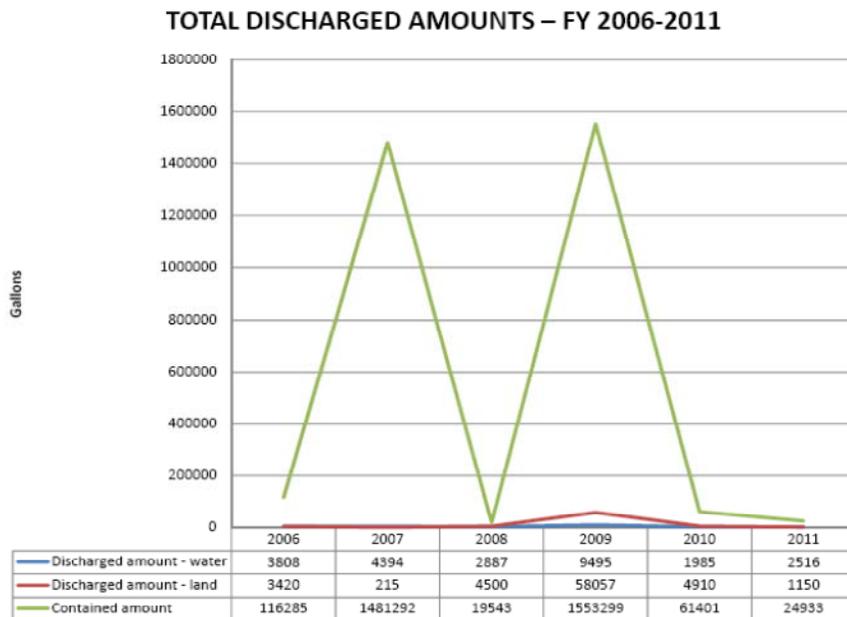
Ninth Coast Guard District

INVESTIGATED MER CASE TYPES – FY 2006-2011



Source: CGBI MISLE Pollution Cubes, 11/28/2011

Ninth Coast Guard District



Source: CGBI MISLE Pollution Cubes, 11/28/2011

The number of oil and hazardous chemical discharges, from both commercial and recreational vessels in the Great Lakes, are low and has had a minimal impact on Great Lakes resources. Comprehensive and comparable U.S. and Canadian regulatory regimes tightly control the marine transportation of oil and chemicals.

§ 220. Oil and Hazardous Substances Pollution Response

Canada

As noted in the 2007-2009 Binational Report, under the business of government, policy with respect to Emergency Preparedness for Oil and Noxious Liquid Substances was transferred to Transport Canada from the Canadian Coast Guard. Information on the current program may be found at:

<http://www.tc.gc.ca/eng/marinesafety/oep-ers-menu-1118.htm>

The Canadian Coast Guard remains responsible for actual response either through response agencies throughout Canada or as an agency in areas where response agencies are unable to respond. Nationally the program can be found at:

http://www.ccg-gcc.gc.ca/eng/Ccg/er_home

United States

The National Response System (NRS) is the government's mechanism for emergency response to discharges of oil and the release of hazardous substances into the navigable waters or environment of the United States and its territories. Initially, this system focused on oil spills and selected hazardous polluting substances discharged into the environment. It has since been expanded by other legislation to include hazardous substances and wastes released to all types of media.

The NRS functions through a network of interagency and inter-government relationships which were formally established and described in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The NCP established three high level organizations and four special force components. More information can be found at the National Response Center's website at:

<http://www.nrc.uscg.mil/nrchp.html>

§ 300. Annex 5 Discharges of Vessel Wastes

§ 310. *Canadian Regulations*

Sewage

Provisions to protect the Great Lakes are listed in Part 2 Division 2 of the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals*. As noted above these regulations were promulgated under the Canada Shipping Act. Administratively, they will be transferred to the Canada Shipping Act of 2001.

It is the owners' responsibility to operate and maintain such equipment in compliance with the regulations. A vessel's Marine Sanitation Device (MSD) is subject to an inspection annually. Failure to operate the MSD in accordance with the regulations may result in the issuance of a notice of violation by TCMS to be remedied in a specified time. Failure to comply may result in detainment and/or charges being laid.

No violations were reported in the timeframe of this report.

It should be noted that the requirements of No Discharge Zones for treated sewage from commercial shipping within the certain US States have been brought to the attention of the International Maritime Organization (IMO) as a matter of concern.

Modern approved MSD's are not designed to be shut down. Doing so kills the bacteria that treat the sewage, which might cause the system to be unable to be resurrected on leaving the No Discharge Zones. This in turn may leave the vessel in extremis for treating sewage and non compliant for the next port of call.

Some vessels have stored sewage in ballast tanks. Over and above the issue of creating "contaminated" tanks, this has major implications on safety as the ship is no longer able

to use that tank for ballast and this could affect its stability. When the Ballast Water Management Systems are installed, such a practice will cause the BWMS to be unusable. The ability for personnel to enter such a tank is problematic as is the ability to pump out the tank.

At the last convening of the Marine Environmental Protection Committee (MEPC 63) there was a general agreement that should treated (or untreated) sewage be pumped to ballast tanks, it is MARPOL Annex IV issue. The issue is expected to be addressed at the next MEPC in October 2012. In the meantime, ship owners have been advised not to fit any connections from the sewage treatment plant or grey water system to the ballast tanks on board ships. While not in contradiction with MARPOL Annex IV, this practice may be in conflict with the BWM Convention when it enters into force.

The issue will be discussed at the next Canadian Marine Advisory Council as Canada is signatory to both MARPOL Annex IV and the BWM Convention.

Garbage

The Garbage provisions to protect the Great Lakes are contained in the Part 2 Division 5 of the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals*.

No incidents of garbage discharge were reported in the timeframe of this report.

Cargo Residues / Cargo Sweepings

Under the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* Part 2, Division 5, Canada has harmonized with the current enforcement regime of the United States Coast Guard for discharges of specific, non-polluting substances within the Great Lakes. It is acknowledged that the US regime may change as a result of additional scientific study and subsequent rulemaking into the process.

§ 320. U.S. Regulations

Vessel General Permit 2.0

EPA Vessel General Permit

EPA released a new draft Vessel General Permit on November 30, 2011, and received comments on the proposed draft until February 2012.

On December 18, 2008, EPA finalized new permitting requirements for discharges incidental to the normal operation of a vessel into inland waters or the 3 mile territorial sea of the United States under the National Pollutant Discharge Elimination System (NPDES) (73 CFR 117). The 2008 Vessel General Permit (VGP) for Discharges Incidental to the Normal Operation of Non-Recreational Vessels covers all non-recreational non-military vessels of 79 feet or greater and any non-recreational vessel less

than 79 feet in length or commercial fishing vessel of any size discharging ballast water. The VGP defines general effluent limits applicable to all discharges; general effluent limits applicable to 27 specific discharge streams; narrative water-quality based effluent limits; inspection, monitoring, recordkeeping, and reporting requirements; and additional requirements applicable to certain vessel types.

With the expiration of the 2008 period of coverage for the original VGP, EPA is proposing changes to the VGP for the next five-year Permit period that will extend from 2013 through 2018.

To obtain authorization under the VGP:

- Vessel operators must meet the VGP eligibility requirements.
- Vessel operators must implement the effluent limits according to the requirements in Part 2 of the VGP, and document the implementation as part of their recordkeeping documentation. If the vessel is equipped to carry ballast water or carries ballast water at any time, it must have a ballast water management plan consistent with part 33 CFR 151.2035(a)(7).
- Operators of some vessels will have to submit Notices of Intent (NOI). If a vessel is at least 300 gross tons or has the capacity to discharge more than 8 cubic meters of ballast water, the operator must submit a complete and accurate NOI.
- If the vessel is not in one of the aforementioned categories, it automatically receives permit coverage under the VGP and is authorized to discharge in accordance with Permit conditions. The owner of a vessel not subject to NOI requirements must instead maintain a Permit Authorization and Record of Inspection form documenting coverage and annual inspections.

http://cfpub.epa.gov/npdes/home.cfm?program_id=350

Sewage

In U.S. waters of the Great Lakes any discharge of sewage or greywater by commercial vessels must be treated in a type I or type II marine sanitation device (MSD). For recreational vessels, only sewage must be treated by a type I or type II MSD before discharge, 33 U.S.C. 1352 (6) and 1322.

A type I MSD is a flow-through discharge device that, under the test conditions described in 33 CFR 159.121, produces effluent having a fecal coliform bacteria count no greater than 1000/100 milliliters and no visible floating solids. A Type I MSD is commonly a physical/chemical type (macerator/chlorinator).

A type II MSD is a flow-through discharge device that, under the test conditions described in 33 CFR 159.121, produces effluent having a fecal coliform bacteria count no greater than 200/100 milliliters, and suspended solids no greater than 150 milligrams/liter. A type II MSD is commonly a biological (aerobic digestion) plant, but several physical/chemical plants are certified at Type II MSDs.

State Sewage

Each state has the ability to regulate its internal waters. The Clean Water Act provides that states may prohibit the discharge of all sewage, whether treated or untreated, from vessels operating in their waters 33 U.S.C. 1322 (f). The definition of sewage for state regulations also includes greywater.

The State of Michigan is the only state that prohibits all discharges of sewage (treated or untreated) in its waters under 33 U.S.C. 1322. In December of 2011, the New York State Department of Environmental Conservation proposed the establishment of a Vessel Waste No Discharge Zone (NDZ) for the New York State portion of Lake Ontario (“Lake”) including the waters of the Lake within the New York State boundary, stretching from the Niagara River (including the Niagara River up to Niagara Falls) in the west, to Tibbetts Point at the Lake’s outlet to the Saint Lawrence River in the east.

Garbage

No garbage or trash may be thrown into the waters of the Great Lakes. Vessels 26 feet or longer must display a garbage discharge plaque in a prominent location notifying all of discharge restrictions. Vessels 40 feet or longer engaged in commerce or equipped with a galley and berthing must have a written Waste Management Plan designating the person in charge and procedures for collecting, storing, and discharging garbage.

Dry Cargo Residues / Cargo Sweepings

Historically, it has been the practice of bulk carriers on the Great Lakes to wash non-hazardous, non-toxic cargo residues – known as ‘dry cargo residue’ (DCR) or ‘cargo sweepings’ – overboard.

In 1987, Congress amended the Act to Prevent Pollution from Ships, adopting Annex V of the International Convention for the Prevention of Pollution from Ships (MARPOL), 1973. Incidental dry cargo residues and cargo sweepings are considered to be garbage under the MARPOL interpretive guidelines. The strict application of the MARPOL interpretive guideline adopted in 1974 (33 CFR 151) banned the discharge of incidental dry cargo residues and sweepings in the Great Lakes.

To ease the difficult implementation issues that the application of the MARPOL guidelines would create within the unique legal, environmental, and economic framework of the Great Lakes, the Ninth Coast Guard District implemented an “enforcement policy” in 1993 that has been revised over the years, and was reissued in 1995 and in 1997.

The Coast Guard was directed by Congress, in the 1998 Authorization Bill, to continue its current policy regarding incidental dry cargo residues on the Great Lakes until 2002. This authorization was subsequently extended until September 30, 2004, pending completion of a study and formulation of a specific regulatory solution to the issue.

The Coast Guard was granted another extension until September of 2008 and, in 2004, began an environmental assessment in conjunction with other regulatory assessments in order to support a rulemaking. The analyses will assist in determining whether the regulations regarding the discharge of dry cargo residues in the Great Lakes should reflect past practice, prohibit discharges altogether, or allow for some other course of action, taking into account all the circumstances and stakeholder interests.

On September 29, 2008 the Coast Guard published an interim rule, amending 33 CFR 151.66 to allow the discharge of dry cargo residues (DCR) in limited areas of the Great Lakes by self-propelled vessels and barges that are part of an integrated tug and barge unit (73 Federal Register 56492).

Only non-toxic and non-hazardous dry cargo residues are allowed to be discharged. This rule adopts the Coast Guard's Ninth District 1997 Interim Enforcement Policy, but adds sensitive and protected areas where discharges are now prohibited (Guide for DCR Discharge Allowances, Restrictions and Prohibitions). These regulations also add new recordkeeping and reporting requirements and encourage dry bulk cargo carriers to adopt voluntary control measures to reduce discharges.

As part of the interim rule, bulk dry cargo carriers are required to keep records of each loading and unloading operation, any DCR control measures used and their associated discharge events, if any, using the [Bulk Dry Cargo Residue Reporting Form \(CG-33\)](#). These records must be kept on board the vessel a minimum of two years.

The Coast Guard accepted comments on the interim final rule through January 15, 2009. The Coast Guard then initiated a supplemental environmental assessment to further examine the impact of the interim rule and potential control measures, for both facilities and vessels, in order to reduce the amount of residue discharged in the Great Lakes. A supplemental notice of proposed rulemaking and associated final environmental impact statement were completed in December, 2012 and are undergoing a final clearance review. The supplemental notice of proposed rulemaking will be promulgated for public comment prior to issuance of a dry cargo residue discharge final rule.

§ 400. Annex 6 Aquatic Invasive Species Organisms in Ballast Water

From a responsible agency point of view, ship ballast water has been recognized as a leading vector of Aquatic Invasive Species (AIS) introductions since the discovery of zebra mussels in the Great Lakes in 1988. The significant and mounting damages and costs associated with AIS have prompted increased activity at the international, national, regional, state and local levels to regulate ballast water.

The current overview of the ballast water issue from a Transport Canada perspective may be found at: <http://www.tc.gc.ca/eng/marinesafety/oep-environment-ballastwater-menu-449.htm>.

Personnel from each agency actively participate in such regional forums as the Great

Lakes Panel of the U.S. Federal Aquatic Nuisance Species Task Force, the Great Lakes Seaway Ballast Water Working Group (BWWG) and regional and national meetings of the Canadian Marine Advisory Council.

Several issues are currently affecting ballast water management on the Great Lakes and the Seaway. The Coast Guard has published its Final Rule on ballast water management that sets a standard for ballast water discharged in U.S. waters. Additionally, the U.S. Environmental Protection Agency began to regulate ballast water discharges through the National Pollutant Discharge Elimination System (NPDES). Their initial Vessel General Permit (VGP) incorporates the Coast Guard's mandatory ballast water management and exchange standards and supplemental ballast water requirements for vessels that discharge ballast water. The proposed VGP 2.0 includes a ballast water discharge standard. Additionally, several Great Lakes states have implemented or proposed ballast water regulatory regimes.

§ 410. Regulations - Canada

The Ballast Water Control and Management Regulations came into effect in June of 2006.

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-2006-129/>

Guidelines (TP 13617E) to assist ship owners, masters etc. to comply with the regulations may be found at:

<http://www.tc.gc.ca/eng/marinesafety/tp-tp13617-menu-2138.htm>

The Canadian regulations apply to all vessels entering waters under Canadian jurisdiction from outside the Exclusive Economic Zone and apply to vessels on both oceanic and coastal voyages. Loaded vessels with residual sediments (NOBOB) are required to flush their tanks with water of a salinity equivalent to ballast exchange.

The above regulations were promulgated under the Canada Shipping Act. The Canada Shipping Act of 2001 has superseded that Act. As a result the wording of the Ballast Water Control and Management Regulations were required to be consistent with the new Act. The new version was published in the Canada Gazette Part II as of Oct 11, 2011 and can be found at:

<http://www.gazette.gc.ca/rp-pr/p2/2011/2011-11-09/html/sor-dors237-eng.html>

No substantive changes have been made. Phase II of the Ballast Water Regulations will include changes to reflect the requirements of ratification of the Ballast Water Convention; specifically the timeline and technical requirements for Ballast Water Management Systems to meet the D-2 Standard. Advice from DFO Science with respect to a relative risk assessment for ballast water transferred within the Great Lakes will also be included.

DFO Science has independently evaluated the effectiveness of the current regulatory and enforcement regime. That report may be found in the sect 470 - Applied Research and

Development. Of note, no introductions of aquatic invasive species attributed to ballast water discharge have been reported in the Great Lakes since 2006.

§ 420. Regulations – United States

Following the invasion of the Great Lakes by zebra mussels, the Nonindigenous Aquatic Nuisance Prevention and Control Act (NANPCA) was enacted and authorized the Coast Guard to develop regulations for a mandatory ballast water management (BWM) program for the Great Lakes and Hudson River. These regulations were established in 1993 and 1994, respectively and appear in Title 33, Part 151, and Subpart C of the Code of Federal Regulations (CFR). Subsequent high profile invasions around the U.S. prompted Congress to reauthorize and amend NANPCA with National Invasive Species Act of 1996 (NISA). Under NISA, national voluntary BWM guidelines for vessels entering all other U.S. regions after operating outside the U.S. Exclusive Economic Zone were promulgated by the Coast Guard in 1999. NISA required the Coast Guard to assess compliance with the voluntary guidelines with the stipulation to convert them into a mandatory BWM program if the Coast Guard determined that the voluntary guidelines were inadequate. In 2002, the Coast Guard submitted a report to Congress stating that compliance with the guidelines was too low to determine its adequacy, and therefore the Coast Guard intended to develop regulations to address these issues.

In 2004, the Coast Guard established regulations for penalty provisions for vessels bound for U.S. ports who fail to comply with the Great Lakes BWM Program and/or that fail to submit their ballast water reporting forms. These regulations, 33 CFR Part 151, also expanded the BWM reporting and recordkeeping requirements. Later in 2004, regulations were promulgated converting the national voluntary guidelines into a national mandatory BWM program.

A large number of vessels calling on the Great Lakes declare no ballast onboard. However, these vessels may contain residual ballast water and/or sediments and have the potential to carry AIS. As these vessels transit the Great Lakes, they off-load their cargo and take on Great Lakes water as ballast water. Once NOBOB vessels take on new cargo, and discharge the mixed (residual and Great Lakes) ballast water, the potential exists for the introduction of AIS into the Great Lakes. In 2005, The Coast Guard established a policy of best management practices for NOBOB vessels entering the Great Lakes. This policy, which strongly encourages NOBOBs to conduct saltwater flushing, was established to reduce the introductions of aquatic AIS into the Great Lakes.

§ 430. Binational Enforcement of Ballast Water Regulations

Ballast Water Working Group

The U.S. and the Canadian St. Lawrence Seaway agencies enacted new requirements effective at the start of the 2008 navigation season that require ships to conduct saltwater flushing of ballast tanks that contain residual amounts of ballast water and/or sediment in an area 200 nautical miles from any shore before entering waters of the Seaway. In 2006, the Great Lakes Seaway Ballast Water Working Group (BWWG) was created.

The BWWG is comprised of representatives of the USCG, the U.S. Saint Lawrence Seaway Development Corporation (SLSDC), TCMS, and the Canadian St. Lawrence Seaway Management Corporation (SLSMC).

The group's mandate is to develop, enhance, and coordinate binational enforcement and compliance efforts to reduce the introduction of aquatic invasive species via ballast water. The BWWG is actively engaged and providing an energetic response to calls for tougher ballast water regulation of ocean-going ships transiting the Seaway.

The BWWG produces an annual report that details its examination and enforcement activity. As in the past three years, for 2011, 100% of vessels bound for the Great Lakes Seaway from outside the Exclusive Economic Zone (EEZ) received ballast management exams on each Seaway transit. All 7203 ballast tanks, during 396 vessel transits, were assessed. Vessels that did not exchange their ballast water or flush their ballast tanks were required to either retain the ballast water and residuals on board, treat the ballast water in an environmentally sound and approved manner, or return to sea to conduct a ballast water exchange. Vessels that were unable to exchange their ballast water/residuals were required to retain them onboard and received a verification boarding during their outbound transit prior to exiting the Seaway. In addition, 100% of ballast water reporting forms were screened to assess ballast water history, compliance, voyage information and proposed discharge location.

The 2011 report can be found at

http://www.greatlakes-seaway.com/en/pdf/2011_BW_Rpt_EN.pdf

§ 440. U.S. Ballast Water Discharge Standard

Status of the Ballast Water Discharge Standard Rulemaking

On August 28, 2009, the Coast Guard published the Notice of Proposed Rulemaking (NPRM) and supporting documents for the Ballast Water Discharge Standard. Supporting documents include the Draft Programmatic Environmental Impact Statement and the Preliminary Regulatory Analysis. In response, the Coast Guard received 662 letters to the docket for the rulemaking, which contained 2,214 individual comments on the NPRM. Six public meetings on the NPRM were held around the country.

On March 23, 2012, the Coast Guard published its Final Rule which establishes a Ballast Water Discharge Standard (BWDS) that is protective of the marine environment and is also consistent with the discharge standard adopted by the International Maritime Organization (IMO) in 2004. The final rule addresses with three specific portions of the ballast water management process: setting a concentration based standard for allowable concentration of living organisms in ships' ballast water discharged in U.S. waters, defining vessel applicability and the rule's implementation timeline, and defining the process for the Coast Guard approval of Ballast Water Management Systems (BWMS).

This rulemaking was carried out pursuant to the authority of the Nonindigenous Aquatic Nuisance Prevention and Control Act, as amended by the National Invasive Species Act

(NISA). In accordance with these statutory authorities, the Coast Guard is authorized to establish a Ballast Water Discharge Standard (BWDS) and to approve alternative methods such as Ballast Water Management Systems that it finds to be at least as effective as mid-ocean Ballast Water Exchange (BWE) in reducing the risk of nonindigenous species introductions. The statutes do not give the Coast Guard authority to prohibit states from setting more stringent standards for state waters.

Ballast Water Discharge Standard - The Final Rule establishes the phase-one standard, the same as what the IMO adopted in 2004: The concentration-based standard requires fewer than 10 organisms that are greater than 50 micrometers per cubic meter of ballast water. For organisms that are between 10-50 micrometers in size, there cannot be more than 10 organisms per milliliter of discharged ballast water.

Applicability - The first group is vessels currently required to conduct ballast water exchange. The second group, which previously was not required to conduct exchange, is comprised of seagoing vessels that do not operate beyond the U.S. Economic Exclusion Zone, that take on and discharge ballast water in more than one Captain of the Port Zone, and are greater than 1,600 gross register tons. U.S and Canadian “lakers” that operate exclusively in the Great Lakes and the St. Lawrence Seaway will not have to comply with the BWMS regulations at this time but could be subject to the BWMS requirement in the future.

Implementation - The rule includes an implementation schedule that gives vessel owners and operators enough time to install necessary equipment without causing significant disruptions to maritime commerce. The Coast Guard and IMO determined that vessel construction dates and ballast water capacity were the appropriate ways to implement the changes. New vessels constructed after December 1, 2013 must have a BWTS installed on delivery. Existing vessels (constructed before Dec 2013) must install equipment at the first scheduled drydocking after January 1st 2014 or January 1st 2016 depending on the ballast water tank capacity. The Coast Guard chose December 1, 2013, to align the Final Rule with the next EPA Vessel General Permit.

Type Approval - The Final Rule has a type-approval process to approve BWMS’ for installation on board ships. This process establishes requirements for designing, testing, installing, and operating shipboard equipment. Type-approval process is expected to be similar to other type-approval activities for marine sanitation devices and oily water separators. Once the approved equipment is installed, Coast Guard Marine Inspectors will enforce compliance with the discharge standard by checking equipment maintenance conditions and records during routine port state and flag state vessel examinations.

Alternate Management System - The Final Rule also includes a bridging strategy for approval of alternate management system (AMS), which allows for foreign type-approved ballast water treatment systems with IMO approval, to be installed prior to the vessel’s compliance date for a period of no longer than five years. Currently, there are 19 ballast water treatment systems that have foreign type-approval.

Practicability Review - The Coast Guard is required to assess the ballast water

management regulations and, if dictated by that assessment, to revise them not less than every three years based on the best scientific information available at the time of that review. Additionally, the Final Rule contains a specific “practicability review” regarding more stringent standards to be completed by January 1, 2016. The Coast Guard’s practicability review will look at a variety of factors, including but not limited to the efficacy and environmental safety of available BWMS technology, as well as economic factors. If the Coast Guard determines a higher standard can be implemented after this practicability review, the Coast Guard, no later than Jan 1, 2017, will initiate a rulemaking project.

The Coast Guard, in coordination with the Seaway organizations and Transport Canada, will continue to enforce the existing ballast water reporting and exchange requirements until the Final Rule is fully implemented and all vessels that are required to treat ballast water to the discharge standard are doing so.

§ 450. Proposed U.S. Federal Legislation

Ballast Water Legislation Currently Before Congress

Visit <http://www.thomas.gov/> or click on the links below to view legislation on AIS and ballast water that has been introduced in the 112th session of Congress, including:

H.R. 2838 - Title VII of the proposed Coast Guard and Maritime Transportation Act of 2011 includes legislation that addresses commercial vessel discharges including ballast water. The bill was passed by voice vote in the House of Representatives and action on the Senate side is pending. The full text of the bill that was referred to the Senate is available at: <http://www.gpo.gov/fdsys/pkg/BILLS-112hr2838rfs/pdf/BILLS-112hr2838rfs.pdf>

§ 460. State Legislation and Regulation

In the absence of a Federal standard, individual states have passed regulations regulating ballast operations in their waters. Michigan, Wisconsin and Minnesota both have a ballast water permitting program in place. Other states including New York have regulations in varying states of implementation. The link below lists the status of ballast legislation for each of the Great Lakes states. Some states endorse discharge standards as much as 1000x that of the IMO standard.

State led discharge enforcement scenarios may have unintended consequences for the states. Their marine inspection programs – in those few states which have them - are not prepared to enforce the new requirements on either U.S. or international ships. The Coast Guard has stated that its inspectors will not enforce the states’ regulations or the states’ certification of the VGP under Sec. 401 of the CWA.

The result of the current situation is a patchwork of regulatory ballast water regimes within the Great Lakes system. The increased legal, operational and administrative burden of inconsistent regulations negatively impacts vessel compliance and operation.

A 2009 summary of State ballast water regulations can be found at:

http://www.d9publicaffairs.com/posted/443/Chart_Comparison_GL_State_BW_Treatment_update_for_GLP_Mtg_June09.295669.pdf

Recently the State of New York modified its requirements to be consistent with EPA's proposed Vessel General Permit.

<http://www.marinelink.com/news/ballast-amends-water342668.aspx>

Great Lakes Ballast Water Collaborative

In 2009, the U.S. Saint Lawrence Seaway Development Corporation initiated the formation of the Great Lakes Ballast Water Collaborative (BWC), in conjunction with the International Joint Commission, in order to bring together industry and state and federal regulators on the issue of ballast water and invasive species in the region.

The primary goal of the BWC is to share relevant, useful, and accurate information and foster better communication and collaboration among the key stakeholders engaged in the effort to reduce the risk of introduction and spread of aquatic nuisance species.

Particular emphasis of the BWC has been to bring state representatives together with marine industry representatives and respected scientists to find workable and effective solutions to the aquatic invasive species challenge as they relate to the Great Lakes St. Lawrence Seaway System.

The work of the BWC informed the State of Wisconsin's decision to change its ballast water discharge standard to the same standard as the EPA's and the Coast Guard's.

http://www.greatlakes-seaway.com/en/environment/ballast_collaborative.html

§ 470. Applied Research and Development

Canada

Transport Canada and DFO Science have collaborated for a number of years on ballast water science – much of it also in collaboration with the Canadian Aquatic Invasive Species Network (<http://www.caisn.ca/>). For the time frame of this report the following scientific studies have been undertaken:

- 1) Research and monitoring to quantify invasion risk associated with different shipping pathways and vectors:
 - Risk assessment for ship-mediated introductions of aquatic nonindigenous species to the Great Lakes and freshwater St. Lawrence River. Can. Sci. Advis. Sec. Res. Doc. 2011/104. vi + 217 p. http://www.dev/csas-sccs/Publications/ResDocs-DocRech/2011/2011_104-eng.html
 - Assessing invasion risk across taxa and habitats: life stage as a determinant of invasion success. Diversity and Distributions 17: 593-602.

<http://onlinelibrary.wiley.com/doi/10.1111/j.1472-4642.2011.00763.x/abstract>

- Invertebrates and their dormant eggs transported in ballast sediments of ships arriving to the Canadian coasts and the Laurentian Great Lakes. *Limnology and Oceanography* 56: 1929-1939. http://www.aslo.org/lo/toc/vol_56/issue_5/1929.html
 - Is vessel hull fouling an invasion threat to the Great Lakes? *Diversity and Distributions* 16: 132–143. <http://onlinelibrary.wiley.com/doi/10.1111/j.1472-4642.2009.00622.x/abstract>
 - Transoceanic ships as vectors for nonindigenous freshwater bryozoans. *Diversity and Distributions* 16: 77-83. <http://onlinelibrary.wiley.com/doi/10.1111/j.1472-4642.2009.00629.x/full>
- 2) Research and monitoring to evaluate the efficacy of current ballast water management strategies:
- Evaluating efficacy of an environmental policy to prevent biological invasions. *Environmental Science and Technology* 45: 2554-2561. <http://pubs.acs.org/doi/abs/10.1021/es102655j>
 - Efficacy of ‘saltwater flushing’ in protecting the Great Lakes from biological invasions by invertebrate eggs in ships. *Freshwater Biology* 55: 2414-2424. <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2427.2010.02449.x/pdf>
- 3) Research on alternative ballast water management methods, such as the use of ballast water exchange in combination with treatment technologies:
- Proposal to utilize ballast water exchange in combination with a ballast water management system to achieve an enhanced level of protection. Submitted by Canada to the 15th session of the International Maritime Organization Sub-Committee on Bulk Liquids and Gases: BLG 15/5/7, 5 pp.
- 4) Research examining the hydrodynamics of ballast water discharge in relation to population dilution rates and probability of invasion success:
- The dilution and dispersion of ballast water discharged into Goderich Harbor. *Marine Pollution Bulletin* 62: 1288-1296. <http://www.sciencedirect.com/science/article/pii/S0025326X11001342>
- 5) Evaluation of different technologies and methods potentially useful for early detection, rapid response and/or compliance monitoring:
- Use of DNA barcodes to detect invertebrate invasive species from diapausing eggs. *Biological Invasions* 13:1325-1340. <http://www.springerlink.com/content/n632774823408101/>

United States

The Coast Guard is one of the agencies participating in the Great Lakes Restoration Initiative (GLRI). For the past three years, the Coast Guard has received funds for ballast water related applied research and to further the development of effective and practical systems to treat ships’ ballast water to prevent introductions and spread of AIS.

Utilizing GLRI funds, the Coast Guard Research and Development Center has been developing methods and tools used to enforce compliance of ballast water discharge regulations on the Great Lakes; continuing work on developing ship-based test protocols for type approval of Ballast Water Treatment Systems (BWTS); continuing investigative work on the effects of BWTS on corrosion aboard Lakers; and investigating the feasibility of developing a protocol for testing BWTS against a significantly more stringent ballast water discharge standard (Phase 2 standard). Previous GLRI funded Coast Guard projects addressed the development of shore-based tests of treatment systems against the Phase 1 ballast water discharge standards.

In addition to the GLRI projects, the Coast Guard has partnered with an established EPA program to develop standard procedures for testing the efficacy of Ballast Water Technology systems. The testing is being conducted under an agreement between the U.S. Coast Guard and EPA to cooperatively utilize the Environmental Technology Verification (ETV) Program.

<http://www.epa.gov/etv/>

This program will develop technical protocols for assessing the performance of commercially-ready ballast water treatment technologies. The ETV process involves convening interdisciplinary technical panels for advice on the appropriate procedures and methods for testing the performance of technologies. For BWT, the breadth of expertise required is extensive and includes ocean engineers, physical oceanographers, microbiologists, marine biologists, independent consultants, instrumental engineers, control and automation engineers, naval architects, marine engineers, and naval architects.

Great Ships Initiative

The Great Ships Initiative (GSI) is an innovative collaboration whose objective is to end the problem of ship-mediated invasive species in the Great Lakes-St. Lawrence Seaway System, including through independent research and demonstration of environmental technology, financial incentives and consistent basin-wide harbor monitoring.

The near-term objective of the GSI is to significantly accelerate research, development and implementation of effective ballast treatment systems for ships that visit the Great Lakes from overseas. To that end, the GSI has established research capabilities at three scales—bench, land-based, and shipboard. Each scale is dedicated to addressing specific evaluation objectives, with protocols as consistent with IMO and federal requirements as practicable.

Developers of ballast water treatment systems apply for GSI research services online, and awards are offered based on an objective review process, regardless of the state of development of the proposed treatment. GSI incubation/testing will assure meritorious ballast treatment systems will progress as rapidly as possible to an approval-ready and market-ready condition.

Further information is available at: <http://www.nemw.org/GSI/index.htm>

Binational Studies

Canadian and U.S. Scientists from the Great Lakes Research Laboratory of NOAA, Smithsonian Environmental Research Center, DFO Science, University of Windsor, and University of Michigan have been long-term collaborators on ballast water research. For the time frame of this report the following scientific studies have been undertaken:

- 1) Research and monitoring to quantify invasion risk associated with different shipping pathways and vectors:
 - Domestic ballast operations on the Great Lakes: Potential importance of Lakers as a vector for introduction and spread of nonindigenous species. *Canadian Journal of Fisheries and Aquatic Sciences* 67:256-268.
<http://www.nrcresearchpress.com/doi/abs/10.1139/F09-180>
- 2) Research on the efficacy of sodium chloride brine as a biocide for use in ballast water management:
 - Efficacy of NaCl brine for treatment of ballast water against freshwater invasions. *Journal of Great Lakes Research*, accepted 3 Oct 2011.
<http://www.sciencedirect.com/science/article/pii/S0380133011002176>
 - Brine-induced mortality of non-indigenous invertebrates in residual ballast water. *Marine Environmental Research* 70:395-401.
<http://www.sciencedirect.com/science/article/pii/S0141113610001182>
 - Concentrated sodium chloride brine solutions as an additional treatment for preventing the introduction of nonindigenous species in the ballast tanks of ships declaring no ballast on board. *Environmental Toxicology and Chemistry* 28: 346-353.
<http://onlinelibrary.wiley.com/doi/10.1897/08-140.1/abstract>

§ 480. International Considerations

On the international front, USCG, DFO Science and TC personnel have been active in the technical and organizational aspects of the 17th International Conference on Aquatic Invasive Species held in San Diego. The IJC provided sponsorship and support.

<http://www.icaais.org>

Similarly, the USCG, TC and DFO Science personnel attend the Ballast Water Working Group at the Bulk Liquid and Gases (BLG 16) Sub Committee of the International Maritime Organization.

http://www.dnv.com/industry/maritime/publicationsanddownloads/publications/newsletters/technical_regulatory/2011/latestnewsabouttheballastwatermanagementconvention.asp

They also attend the Ballast Water Review Group of the Marine Environmental Protection Committee (MEPC 63). Canada has taken over the Chairmanship of both these groups.

http://www.dnv.com/industry/maritime/publicationsanddownloads/publications/newsletters/technical_regulatory/2012/updated_news_ballast_water_management_convention.asp

§ 490. Prevention of AIS from Other Vectors

Canada

As indicated in the last report Canada has adopted an Action Plan to address the threat of Aquatic Invasive Species available at:

http://www.dfo-mpo.gc.ca/science/environmental-environnement/invasive_e.htm

As per the Action Plan, on a national scale the Aquatic Invasive Species Task Group – a federal / provincial body convened under the Canadian Council of Fisheries and Aquaculture Ministers, was tasked with formulating an Implementation Strategy for 2005-07. This was reported on in the previous GLWQA Report. This group has proposed a continuation of its work under a new governance model.

One specific action undertaken as part of the Department of Fisheries and Oceans mandate (the lead agency with respect to Aquatic Invasive Species) has been the formation of The Centre of Expertise for Aquatic Risk Assessment. Personnel from the Centre have carried out a number of species-specific and pathway-based risk assessments. Risk assessments for non-ballast water pathways are underway, including recreational boating and organisms in trade (live bait, live food, aquaria, water garden and biological supply houses).

<http://www.dfo-mpo.gc.ca/science/coe-cde/ceara/index-eng.htm>

Canada / Ontario

The threat of AIS introductions has become a significant aspect of many Federal / Provincial discussions and has been included in the recently negotiated Canada Ontario Agreement 2007 (COA). COA Annex 3, Goal 4 is specific about the efforts to reduce the threat of AIS to the Great Lakes. More information is available at:

<http://www.ec.gc.ca/CEPARRegistry/documents/agree/Fin-COA07/toc.cfm>

United States

The U.S. Coast Guard Headquarters Office of Operating and Environmental Standards, provides generic preventive guidelines to minimize the transport of AIS through recreational activities occurring in marine and inland waters.

<http://www.uscg.mil/hq/cg5/cg522/cg5224/>

§ 500. Annex 9 Joint Contingency Plan

New National Joint Contingency Plan Committee

CCG and USCG Headquarters, CCG Region and USCG District personnel with responsibilities for the JCP and operational annexes met in September 2011. It was agreed that a new national governance structure would be established to provide strategic support to the Regional delivery of the JCP annexes, and to manage issues of national interest to advance the overall spirit and intent of the JCP. This group will be known as the National JCP Committee.

Priority items for the Committee include: updating the Joint Contingency Plan, attempting to resolve responder indemnity issues, considering the expansion of the JCP to include mutual aid support, exploring the impacts of a spill of national significance on a transborder area and its impacts on Unified Area Command (US) and the National Response Team (Canada), re-evaluating training reciprocity and reviewing issues relating to moving resources across the border in an emergency

§ 510. Oil Pollution Response Exercises

CANUSLAK

U.S. Coast Guard

The full-scale 2010 CANUSLAK exercise to occur in the Niagara River was postponed due to the Deepwater Horizon oil spill. A Coast Guard Sector Sault Ste. Marie government-led PREP/CANUSLAK exercise occurred in September 2011. The exercise involved significant participation by applicable participants from both the U.S. and Canada. All of the CANUSLAK exercise objectives were met during the 2011 exercise season.

Specific exercise objectives relative to a coordinated response included:

Notification, Activation & Deactivation (Annex VII) Incident Management Coordination (JCP 203 and 400) US/Canadian Liaison Officer (Annex VI) US/Canadian Communications (Annex XI – A) US/Canadian Safety Coordination (Proposed) Trans-border transfers of resources (JCP 600, Annex VIII and XI - D) Joint Response Team (JCP 304 and Annex XI – H) Public Information Coordination (JCP 700 and Annex XI-I)

Canadian Coast Guard

The 2011 CANUSLAK Seminar and Full-Scale/Combined Management Exercise, held during the week of September 12th, provided an opportunity to share information with local agencies, media and partners on the legislation and policies governing ship-source spills in Canada and the United States and to practice the implementation of spill response plans covering the St. Marys River area. Participants included representatives from federal, state, provincial, tribal, and local communities from both the United States

and Canada. Senior external participants included the Mayor of Sault Ste Marie, Ontario while the Canadian Coast Guard, US Coast Guard's Ninth District and Sector Sault Ste Marie served as both hosts and active participants.

The two day event began with an Orientation Seminar designed to provide attendees with a broad understanding of the existing plans linked to ship-source oil pollution prevention, preparedness and response efforts along our shared waters of the Great Lakes. Short informative briefs were delivered on an array of issues, including; spill prevention, response plans, federal and industry capabilities and priority setting for resources at risk. The presentations were followed by an afternoon of communications training which was provided by the USCG Public Information Assist Team. The training was aimed at introducing participants to some of the complexities on communications during a high risk event and on the establishment and function of a Joint Information Centre within the Incident Command Structure.

The full-scale/combined management exercise was developed with input from a diverse group of stakeholders that used a vessel collision as the catalyst for the response. Starting the exercise at eight hours post-collision, participants addressed concerns and challenges that would surface during joint oil spill response operations along the US/Canada border.

Feedback from both sides of the border specific to the CANUSLAK Annex will be incorporated into a proposal for action into the 2012-2014 *CANUSLAK Two Year Work Plan*. Once signed by the CANUSLAK Joint Response Team co-chairs, this work plan will serve as a roadmap for improvement planning and defining future exercise objectives for the CANUSLAK Annex to the Joint Marine Pollution Contingency Plan.

§ 600. Acronyms

AIS	Aquatic Invasive Species
ANPRM	Advance Notice of Proposed Rulemaking
BW	Ballast Water
BWD	Ballast Water Discharge
BWE	Ballast Water Exchange
BWM	Ballast Water Management
BWMS	Ballast Water Management System
BWT	Ballast Water Treatment
BWWG	Great Lakes Seaway Ballast Water Working Group
CANUSLAK	Annex 1 of the Canada – U.S. Joint Marine Contingency Plan
CCG	Canadian Coast Guard
CFR	Code of Federal Regulations
COA	Canada Ontario Agreement
DCR	Dry Cargo Residue
DFO	Fisheries and Oceans Canada
DPEIS	Draft Programmatic Environmental Impact Statement
EEZ	Exclusive Economic Zone
EPA	Environmental Protection Agency
ETV	Environmental Technology Verification
GLWQA	Great Lakes Water Quality Agreement of 1978
GSI	Great Ships Initiative
IJC	International Joint Commission

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TCMS**

IMO	International Maritime Organization
MARPOL 73/78	IMO Convention on Marine Pollution
MEPC	Marine Environment Protection Committee
MSD	Marine Sanitation Device
NaCl	Sodium Chloride
NAISC	National Aquatic Invasive Species Committee
NANPCA	Nonindigenous Aquatic Nuisance Prevention and Control Act
NCP	National Contingency Plan
NIS	Nonindigenous Species
NISA	National Invasive Species Act of 1996
NOAA	National Oceanic and Atmospheric Administration
NOBOB	"No Ballast on Board," or a vessel reporting such
NPDES	National Pollutant Discharge Elimination System (NPDES)
NRL	Naval Research Laboratory
NRS	National Response System
RIA	Regulatory Impact Analysis
SERC	Smithsonian Environmental Research Center
SLSDC	St. Lawrence Seaway Development Corporation
SLSMC	St. Lawrence Seaway Management Corporation
TCMS	Transport Canada Marine Safety
VGP	Vessel General Permit
USCG	United States Coast Guard

§ 700. Current Web Links

Significant information on ballast water and AIS exists in a number of locations. The following are a number of very useful websites that are frequently updated, accurate and easy to navigate.

Canadian Coast Guard

<http://www.ccg-gcc.gc.ca>

National Pollutant Discharge Elimination System (NPDES)

http://cfpub.epa.gov/npdes/home.cfm?program_id=350

Ecological Monitoring and Assessment Network

<http://www.eman-rese.ca>

Environment Canada

<http://www.ec.gc.ca/stl/default.asp?lang=En&n=A4839BD6-1>

Environment Canada – Canada-Ontario Agreement

http://www.on.ec.gc.ca/coa/intro_e.html

Fisheries and Oceans Canada

<http://www.dfo-mpo.gc.ca/science/enviro/ais-eae/index-eng.htm>

Great Lakes Directory

<http://www.greatlakesdirectory.org/>

http://www.greatlakesdirectory.org/exotic_species/exotic_species.htm

Great Lakes Environmental Research Laboratory

<http://www.glerl.noaa.gov>

Great Lakes Fishery Commission

<http://www.glfc.org/>

Great Lakes Information Network

<http://www.great-lakes.net/>

Great Lakes Information Network: Invasive Species

<http://www.great-lakes.net/envt/flora-fauna/invasive/invasive.html>

Great Lakes Panel on Aquatic Nuisance Species

<http://www.glc.org/ans/panel.html>

Great Lakes Protection Fund

<http://www.glpf.org>

Great Lakes Science Center

<http://www.greatscience.com>

Great Lakes - St. Lawrence Seaway System

<http://www.greatlakes-seaway.com/en/environment/ballast-water/index.html#BalTechPres>

Great Lakes United

<http://www.glu.org/>

International Association of Great Lakes Research

<http://www.iaglr.org/>

International Assoc. for Great Lakes Research Aquatic Invasive Species

<http://www.iaglr.org/scipolicy/issues/ais.php>

International Conference on Aquatic Invasive Species

<http://icaais.org>

Michigan Sea Grant

<http://www.miseagrant.umich.edu/ais/index.html>

Ministry of the Environment

<http://www.ene.gov.on.ca/>

Minnesota Sea Grant

<http://www.seagrant.umn.edu/>

National Aquatic Nuisance Species Task Force

<http://www.anstaskforce.gov/>

National Ballast Water Information Clearinghouse

<http://invasions.si.edu/nbic>

National Invasive Species Council

<http://invasivespecies.gov/>

New York Sea Grant

<http://www.seagrant.sunysb.edu/>

Ohio Environmental Protection Agency

<http://www.epa.state.oh.us/>

Pennsylvania Sea Grant

<http://www.pserie.psu.edu/seagrant/seagindex.htm>

Province of Ontario

<http://www.gov.on.ca/>

Star Tribune

http://www.startribune.com/style/news/metroregion/invaded_waters/invaded.html

State of Michigan

<http://www.mi.gov/ballastwaterprogram>

The Council of Great Lakes Governors

<http://www.cglg.org/>

The Shipping Federation of Canada

<http://www.shipfed.ca/>

Transport Canada Marine Safety

<http://www.tc.gc.ca/eng/marine-menu.htm>

United States Coast Guard

<http://www.uscg.mil/>

US Environmental Protection Agency

<http://www.epa.gov/glnpo/>

<http://www.epa.gov/>

US Geological Survey

<http://water.usgs.gov/>

Unites States Geological Survey Water Resources of Illinois

<http://il.water.usgs.gov/>

Unites States Geological Survey Water Resources of Ohio

<http://www-oh.er.usgs.gov/>

United States Geological Survey Water Resources of Pennsylvania

<http://pa.water.usgs.gov/>

United States Geological Survey Water Resources of New York

<http://ny.water.usgs.gov/>

United States Geologic Survey General Non-indigenous Species References

<http://nas.er.usgs.gov>