2008-2009 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 (Coast Guard)
and the
Department of Fisheries & 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 2007 through August 2009. This report addresses Annexes 4, 5, 6 & 9 which relate primarily to toxic and pollutant threats from shipping activities.

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 reports.

The Canadian portion of this report has been prepared by Transport Canada Marine Safety 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). As a reminder to the Commission, under an Order in Council dated December 12, 2003, a number of responsibilities have been transferred to Transport Canada Marine Safety from the Canadian Coast Guard. Inclusive of these responsibilities are those specific to Annex 6, 7 and part of 9 of the GLWQA.

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 for 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 for Canada and http://www.uscg.mil/ 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), the Department of Fisheries and Oceans Canada -

[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.

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 Marine Community Days, the Great Lakes Regional Waterways Management Forum, the Great Lakes Panel on Aquatic Nuisance Species and other ongoing forums.

§ 120. The Great Lakes Water Quality Agreement Review

At the September 26-27, 2007 meeting in Toronto, the Canada-U.S. Binational Executive Committee (BEC) approved the final Agreement Review Report, noting that it accurately reflected the deliberations and findings of the review participants and that it satisfied the mandate to undertake the required technical review of the operation and effectiveness of the current Great Lakes Water Quality Agreement. In giving their approval, the BEC noted that it was consistently impressed by the level of involvement, passion, ideas and commitment concerning the Great Lakes and the Agreement review process in particular.

The Review Report was prepared in fulfillment of Article X, Section 4 of the Canada-U.S. Great Lakes Water Quality Agreement (GLWQA), which requires the Parties to the Agreement (governments of Canada and the United States) to conduct a comprehensive review of the operation and effectiveness of this Agreement following every third biennial report of the International Joint Commission (IJC).

Canada and the United States commenced the required binational review in January 2004 with the development of a publicly acceptable review process.

The Review itself was conducted through a series of binationally co-chaired Review Working Groups (RWGs) comprised of over 350 federal, provincial, state and non-government issue experts and non-experts alike, representing a broad cross-section of the Great Lakes community. Similarly, a workshop was conducted in November 2006 to review governance and institutional aspects of the Agreement. The findings of this report were included in the Agreement Review Report.

Since the review operated under the guiding principles of openness, inclusiveness and transparency, the Agreement Review Report represents a synthesis of the findings, results and recommendations from the wide range of views represented in the RWGs and the Workshop. Therefore, the views expressed in the Agreement Review Report are not necessarily the views of the Government of Canada or the Government of the United States of America, their Departments or Agencies, the States or Provinces or of any other organization or entity.

Before the report was finalized, the BEC endorsed the release of a draft for a 60-day public consultation period that ran from May 14 to July 14 2007. A total of forty-six sets of comments were submitted by a variety of Great Lakes stakeholders during the sixty-day public consultation period. Some suggested changes that clarified and strengthened the Agreement Review Report were incorporated (all the comments received are available in volume 3 of the final Report). The revised Report was presented to the BEC at their September 26-27, 2007 meeting in Toronto where their approval was given.

The recommendations made and presented to the Binational Executive Committee may be found at http://www.binational.net/glwqa_2007_e.html

Path Forward

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 announcement communicated that the U.S. and Canada have agreed to begin negotiations to update and strengthen the Agreement, which was last amended in 1987.

The Agreement has guided the binational environmental protection programs of the two countries since 1972. The Agreement with Canada is not an advice-and-consent treaty under U.S. law, but is an executive agreement. The two countries amended the Agreement in 1978 and 1987.
Much progress has been made over the Agreement's history, yet further efforts are needed to protect and restore the Great Lakes. The current negotiations would bring the 1987 Agreement up to date and advance efforts to address current environmental problems.

§ 130. Reorganizations

Transport Canada/ Fisheries and Oceans Canada

The Canada Shipping Act 2001 is now fully in effect since July 1, 2007. While not specifically regional in nature, nor limited to the Great Lakes, the overall result will expand Transport Canada's activities to areas that may have some positive environmental impact on the 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/mediaroom/backgrounders/b05-M005e.htm

The regulatory provisions applicable to ships discharges are now contained in the *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* under the Canada Shipping Act.
http://laws.justice.gc.ca/en/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. They are being re issued 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 the port state control boardings.

http://www.tc.gc.ca/marinesafety/oep/inspection/psc/menu.htm

Canada is in the process of ratifying Annex 4, Annex 5 and Annex 6 of MARPOL along with the Anti Fouling Convention and the Ballast Water Convention. TC and DFO regionally have continued the cost sharing arrangement described in the last report with respect to the GLWQA /AIS file with the addition of 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.

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. Appendices 1-4 detail recent studies in these areas. 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.

§ 140. Overall Effects of Shipping on the Great Lakes

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 13-17 July 2009 and a report of this session is found in Appendix 5.

§ 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/marinesafety/oep/environment/prevention/menu.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/marinesafety/oep/environment/sources/oil.htm

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

http://www.tc.gc.ca/marinesafety/oep/environment/sources/nls.htm

The Canadian statistics for spills of oil or hazardous chemicals from commercial ships sources for the period covered by this report may be found in Appendix 6.

The number of oil and hazardous chemical discharges from both commercial and recreational vessels in the Great Lakes are low and have 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 Materials Pollution Response

Canada

As noted in the 2006-2007 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/marinesafety/oep/ers/menu.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 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 Steamship Inspection Form 7 (S.I.7), or defect list issued by TCMS to be remedied by the time set out on the S.I.7. Failure to comply with parameters set out in the S.I.7 may result in detainment and/or charges being laid.

No violations were reported in the timeframe of this report.

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

Final Vessel General Permit

On December 18, 2008, the EPA issued a final Vessel General Permit (VGP) to reduce releases of 26 types of discharges from vessels operating in U.S. waters. The permit regulates discharges incidental to the normal operation of vessels operating in a capacity as a means of transportation. The VGP includes general effluent limits applicable to all discharges; general effluent limits

applicable to 26 specific discharge streams; narrative water-quality based effluent limits; inspection, monitoring, recordkeeping, and reporting requirements; and additional requirements applicable to certain vessel types. The VGP also contains conditions implementing additional requirements as submitted by States under the Clean Water Act Section 401 certification process for federal permits.

Recreational vessels as defined in section 502(25) of the Clean Water Act are not subject to this permit. With the exception of ballast water discharges, non-recreational vessels less than 79 feet (24.08 meters) in length, and all commercial fishing vessels, regardless of length, are not subject to this permit. For more information visit:

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

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 coli form 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 coli form 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.

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.

The USCG is aware of one incident of alleged garbage dumping from a commercial vessel that took place during the timeframe of this report. The incident is currently under investigation.

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. Under MARPOL interpretive guidelines, incidental dry cargo residues and cargo sweepings are considered to be garbage. 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 in 1993 an ''enforcement policy'' CCGD9 INST 16460.1 (http://www.uscg.mil/hq/cg5/cg522/cg5224/docs/DCR%20History.pdf) that has been revised over the years, and 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 contracted the completion of a study on the discharge of dry cargo residues by vessels on the Great Lakes, mandated by Congress in Public Law 106-554. This study is available at http://edocket.access.gpo.gov/2004/04-28227.htm

Again, in 2004 the Coast Guard was given an extension until September 2008 and was mandated to begin an environmental assessment by November 2004. The Coast Guard initiated a rulemaking, and as part of the rulemaking process, began an Environmental Assessment in conjunction with other regulatory assessments. 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 Fed. Reg. 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) (Appendix 7). These records must be kept on board the vessel a minimum of two years.

The latest information regarding the Dry Cargo rulemaking can be found in Appendix 8.

§ *400. Annex 6 Aquatic Invasive Species Organisms in Ballast Water/ Research & Development*

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/marinesafety/oep/environment/ballastwater/menu.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 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 is engaged in a rulemaking that would set a performance standard for the quality of ballast water discharged in U.S. waters. Additionally, the U.S. Environmental Protection Agency recently began to regulate ballast water discharges through the National Pollutant Discharge Elimination System (NPDES). Their recent Vessel General Permit incorporates the Coast Guard's mandatory ballast water management and exchange standards and supplemental ballast water requirements for vessels that discharge ballast water. A reference to the report of the most recent summary is found in Appendix 9.

§ 410. Regulations - Canada

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

http://www.tc.gc.ca/publications/EN/TP13617/PDF/HR/TP13617E.pdf

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

http://www.tc.gc.ca/marinesafety/tp/Tp13617/menu.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.

§ 420. Regulations - USCG

Following the invasion of the Great Lakes by zebra mussels, 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, 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 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. These regulations appear in CFR, Title 33, Part 151, Subpart D.

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

Joint Ballast Water Program

The U.S. and 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.

The 2008 Summary of Great Lakes Seaway Ballast Water Management report was compiled by the Great Lakes Seaway Ballast Water Working Group (BWWG), 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 full report is available at

http://www.d9publicaffairs.com/posted/443/Document.261306.pdf

The group's mandate is to develop, enhance, and coordinate bi-national 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.

In 2008, there was marked improvement over the prior year's inspection program statistics in a number of areas, including ship compliance rates. In 2008, 99% of ships bound for the Great Lakes Seaway received a ballast tank exam. A total of 6704 ballast tanks, onboard 364 different ships, were sampled and had a 98.6% compliance rate. Ships that failed to properly manage 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. In addition, 100% of ballast water reporting forms were screened to assess ballast water history, compliance, voyage information and proposed discharge location. The BWWG anticipates continued high ship compliance rates for the 2009 navigation season.

Today, ballast water management requirements in the Great Lakes and the St. Lawrence Seaway System are among the most stringent in the world. Mandatory ballast water regulations that include saltwater flushing, detailed documentation requirements, increased inspections, and civil penalties provide a comprehensive regulatory enforcement regime to protect the Great Lakes Seaway System. U.S. Coast Guard regulations, Transport Canada's Ballast Water Control and Management regulations, and the Seaway NOBOB regulation, require all ships destined for Seaway and Great Lakes ports from beyond the exclusive economic zone (EEZ) to exchange all their ballast tanks at sea. As a result, the risk of a ballast water mediated introduction of aquatic invasive species into the Great Lakes has been mitigated to extremely low levels.

§ 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. They are now posted on the docket and may be accessed at http://www.regulations.gov by entering docket # USCG-2001-10486 in the search area.

This rulemaking is being carried out under the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA), as reauthorized and amended by the National Invasive Species Act of 1996 (NISA). These statutes authorize the Coast Guard to approve alternative ballast water management systems (BWMS) that are found to be at least as effective as mid-ocean ballast water exchange in preventing nonindigenous species introductions.

The proposed rule deals 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 implementation timeline, and defining the process for the Coast Guard approval of BWMS.

The standard implementation will come in two phases. The phase-one standard is based upon the International Maritime Organization (IMO) "Regulation D-2" standard of the Ballast Water

Management Convention. The phase-two standard is based on the most stringent proposed U.S. state regulations that are based on quantitative limits. This limit is generally described as 1000x more stringent than the IMO standard.

The implementation dates can best be summarized in a table available in the rulemaking. To briefly summarize, depending upon the vessel's size they will need to meet the phase-one standard between 2014 and 2016. New vessels (constructed after January 1, 2012) would need to meet this standard upon delivery. The proposed timeline for phase-two implementation would be less than 5 years after installation of the BWMS meeting the phase-one standard.

The rulemaking contains a practicability review into the phase-in schedule for the phase-two BWDS. The purpose of the review is to determine whether technology to achieve the performance standard can practicably be implemented, in whole or in part, by the applicable compliance dates. The initial review will occur in early 2013. While the results of this review may result in an extension of the compliance date, the possibility exists that the review may determine that a higher discharge standard is achievable. If a practicability review finds that no systems can meet the entire phase-two standard, but a significant improvement over phase-one can be practicably achieved, then the Coast Guard will propose intermediate standards and their associated timeline. Public comment will be solicited in the preparation and evaluation of the practicability review results.

The proposed rule would apply to all vessels that operate in U.S. waters and are equipped with ballast tanks, unless they are truly in innocent passage. Crude oil tankers engaged in coastwise trade, and vessels of the U.S. Armed Forces are exempt from the regulations. By discretion, the proposed rulemaking would not apply to vessels that operate exclusively in one Captain of the Port Zone, due to the short nature of these voyages.

Approvals of BWMS would be based on efficacy tests by certified Independent Laboratories; criteria for acceptance of BWMS approved by other countries; and engineering and operational requirements. Biocides used in BWMS may require independent registration by EPA under the Federal Insecticide, Fungicide, and Rodenticide Act. Vessels will also need to meet various Federal and State water quality criteria established in the EPA Vessel General Permit under the Clean Water Act. The proposed rule also adds requirements to 46 CFR Subchapter Q for the approval of BWMS. These regulations would establish an approval program, including requirements for designing, installing, operating, and testing BWMS to ensure these systems meet required safety and performance standards. These proposed approval requirements use information from the IMO G8 Guidelines for type approval of BWMS under the BWM Convention, the EPA's Environmental technology Verification protocols for ballast water treatment systems, and existing Coast Guard approval requirements for equipment installed on vessels.

§ 450. Proposed U.S Federal Legislation

Legislation currently before Congress

Visit http://www.thomas.gov/ or click on the links below to view legislation on AIS and ballast water that have been introduced in the 111th session of Congress, including:

1.) H.R.500: To establish a collaborative program to protect the Great Lakes, and for other purposes. Latest Major Action: 2/4/2009 Referred to House subcommittee. Status: Referred to the Subcommittee on Insular Affairs, Oceans and Wildlife. http://www.thomas.gov/cgi-bin/query/F?c111:1:./temp/~c111qY6NaM:e1562:

2.) S.237: A bill to establish a collaborative program to protect the Great Lakes, and for other purposes. Latest Major Action: 1/14/2009 Referred to Senate committee. Status: Read twice and referred to the Committee on Environment and Public Works. http://thomas.loc.gov/cgi-bin/bdquery/z?d111:SN00237:|/bss/111search.html|

§ 460. State Legislation

In the absence of a Federal standard, individual states have passed regulations regulating ballast operations in their waters. Michigan and Minnesota both have a ballast water permitting program in place. Other states including Wisconsin have regulations in varying stages of approval. 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. Coast Guard marine inspectors have been requested to assist both in enforcing these new state rules and in training state inspectors. The Coast Guard marine inspection program in the Great Lakes is not staffed to complete these inspections or spend significant time liasioning with the states to get them up to speed.

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 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

§ 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 US agencies such as the Smithsonian Environmental Research Center (SERC), NOAA and the USCG. For the time frame of this report the following scientific studies have been undertaken:

1) Publication of the results of mesocosm studies undertaken to evaluate the appropriateness of the IMO D2 Discharge Standard for ships entering the Great Lakes (*Canadian Journal of Fisheries and Aquatic Sciences* 66: 261-276)

2) Evaluation of the impact of ballast water dispersion after discharge in relation to the appropriateness of the IMO D2 standard for ships entering the Great Lakes

3) Evaluating compliance with and efficacy of current ballast water enforcement program

4) Effectiveness of manufactured sodium chloride (NaCl) brine as an emergency biocide

5) Evaluation of the importance of domestic commercial shipping activities as a vector for introduction and spread of nonindigenous species in the Great Lakes (Appendices 1-4)

In conjunction with SERC, DFO, Transport Canada and the Ontario Ministry of Natural resources fund the Canadian Aquatic Invasive Species Network. http://www.caisn.ca/

A number of scientific studies have been undertaken across Canada. Specific Great Lakes appropriate science has been conducted to examine:

1) Hull Fouling studies on vessels entering the Great Lakes from outside the exclusive economic zones. See Appendix 11.

2) Laboratory Studies on the effectiveness of brine as a biocide in emergency situations.

3) Biological sampling of ballast water and sediments of vessels to examine the current propagule pressure presented by transoceanic ships having conducted BWE.

United States

Non-indigenous species (NIS) are being introduced into U.S. waters from vessels originating in or transiting foreign waters. The primary medium of introduction is ballast water. While many non-indigenous species might be harmless in their native habitats, their introduction into non-native habitats can have a highly deleterious effect on local fish and plant populations, leading to significant economic and environmental disruptions.

To meet this challenge, the Coast Guard Research & Development Center is continuing to study the ways to better control shipboard ballast water. Current initiatives include:

- The Ballast Water Exchange project, which is developing lightweight, portable tools for determining if ballast water has been exchanged appropriately in mid-ocean.
- The Ballast Water Treatment project, which is evaluating candidate systems to safely and effectively treat ballast water to the effect of it being lethal to AIS in ballasted water yet benign to the environment upon discharge.
- The Ballast Water Standards project, which is specifically addressing treatment efficacy.

The Coast Guard has partnered with an established EPA program to develop standard procedures for testing the efficacy of Ballast Water Treatment (BWT) 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 is developing 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.

After a significant effort to construct and optimize a test pad for conducting the tests and identifying a suitable ballast water treatment system to use in the pilot tests, shakedown testing of the installed system was done at the Naval Research Laboratory's (NRL) Center for Corrosion Science and Engineering in Key West, Florida. Information on NRL is available at http://ccse.nrl.navy.mil/default.aspx.

Of note, the NRL Key West site is not intended to be the place where all systems will be tested for approval. The Key West site will serve as a model facility for others testing locations, as a site for continued refinement of methods and techniques, and as a test facility to the degree other NRL mission responsibilities allow. Other federal agencies, including the National Oceanic and Atmospheric Administration (NOAA) have funded the start-up of several other ballast water testing facilities around the country.

The first formal test run under the test protocol challenge conditions began in September 2006, and the full pilot test was completed in October 2006. The tests were conducted on the BalPure Ballast Water Treatment System which was selected based on its appropriateness for use in a pilot test, and not on its capabilities for ballast water treatment. NRL has prepared a report to the Coast Guard on the validation testing, including recommended refinements and revisions.

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

Bi-national Studies

Canadian and U.S. Scientists from the Great Lakes Research Laboratory of NOAA and the University of Windsor have been long-term collaborators on assessing the effectiveness of Ballast Exchange for ships bound for the Great Lakes and the role of sediment in No Ballast on Board Vessels entering the Great Lakes have been reported in the 2006-2007 report.

In April 2008 the Transportation Research Board of the National Academies of Science released TRB Special Report 291: Great Lakes Shipping, Trade, and Aquatic Invasive Species, which reviews existing research and efforts to date to reduce aquatic invasive species introductions into the Great Lakes and identifies ways that these efforts could be strengthened toward an effective solution. The report can be found at appendix 12.

DFO, SERC, the USCG and Transport Canada collaborated on the providing data to the report on the role of the domestic fleets and are currently collaborating at examining the role of vessels entering the Great Lakes after undertaking Coastal Voyages.

§ 480. International Considerations

On the international front, USCG, DFO and TC personnel have been active in the technical and organizational aspects of the 16th International Conference on Aquatic Invasive Species held in Montreal in April 2009. DFO and NOAA co hosted this very successful conference. The IJC provided sponsorship and support. http://www.icais.org

Similarly, USCG, , EPA, TC and DFO personnel attend the Ballast Water Working Group at the Bulk Liquid and Gases (BLG 13) Sub Committee of the International Maritime Organization as well as the Ballast Water Review Group of the Marine Environmental Protection Committee (MEPC 58). Canada has taken over the Chairmanship of both these groups. A reference to the report of the most recent meeting (*BLG 13*) is found in Appendix 13.

The 6th International Conference on Marine Bio-invasions was held in Portland State University in Portland, Oregon from August 24-27, 2009. Please visit http://www.clr.pdx.edu/mbic/ for more information.

§ 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 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, as the lead agency with respect to Aquatic Invasive Species, has been the formation of a Center of Expertise for Risk Assessment. Personnel from the center of expertise have carried out a number of species specific risk assessments. Risk assessments for non-ballast water pathways are also underway, including live trade and bait industry.

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/CEPARegistry/documents/agree/Fin-COA07/toc.cfm

United States

The U.S. Coast Guard Office of Operating and Environmental Standards, http://www.uscg.mil/hq/cg5/cg522/ provides generic preventive guidelines to minimize the transport of AIS through recreational activities occurring in marine and inland waters.

§ 500. Annex 9 Joint Contingency Plan

The CANUSLAK annex will be reviewed this fall taking into consideration any changes in law, policy, organization, environmental factors, socio-economic development, and the results of two 2009 joint exercises located in Toledo and Thunder Bay and/or any actual pollution incidents.

§ 510. Oil Pollution Response Exercises

CANUSLAK

U.S. Coast Guard
The full-scale CANUSLAK exercise to occur in the Detroit River was postponed due to Hurricane Ike. A Coast Guard Marine Safety Unit Toledo government-led prep exercise occurred in June and a CANUSLAK exercise was completed in Thunder Bay, ON in September. Both exercises involved significant participation by applicable participants from both the U.S. and Canada. All of the CANUSLAK exercise objectives were met during the 2009 exercise season.

Specific exercise objectives relative to a coordinated response include:

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) Integration of Planning and Operations – Collocated Responses (Annex VI) Trans-border transfers of resources (JCP 600, Annex VIII and XI - D) Procedures for non-application of Coasting Trade Laws (Annex IX) Joint Response Team (JCP 304 and Annex XI – H) Public Information Coordination (JCP 700 and Annex XI – I) Countermeasure approval coordination

Canadian Coast Guard
All internal CCG objectives were met at last summer's CANUSLAK; which included vessel and equipment deployment in cooperation with the Response Organization.

§ 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 Technology
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 Technical Verification
GLWQA	Great Lakes Water Quality Agreement of 1978
GSI	Great Ships Initiative
IJC	International Joint Commission
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	Nonindiginous 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 Ballast Water 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/envhome.html

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/oceans-habitat/index_e.asp

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 Sea Grant Network
http://www.seagrant.wisc.edu/research/

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 Association for Great Lakes Research Aquatic Invasive Species Page
http://www.iaglr.org/scipolicy/issues/ais.php

International Conference on Aquatic Invasive Species
http://icais.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.michigan.gov/

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/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/

Unites States Geological Survey Water Resources of New York
http://ny.water.usgs.gov/

USGS General Non-indigenous Species References
http://nas.er.usgs.gov