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Data Sources and Methods for the Managing Disposal at Sea Indicator

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Canada

1 Introduction

The Managing Disposal at Sea Indicator forms a portion of the Canadian Environmental Sustainability Indicators (CESI) program, which provides data and information to track Canada's performance on key environmental sustainability issues.

2 Description and rationale of the Managing Disposal at Sea indicator

2.1 Description

The Managing Disposal at Sea indicator reports yearly percentages of monitoring events triggering management action for Canada's disposal at sea sites from 2000-2009. It provides information about whether Environment Canada's permit assessment process is able to sustainably manage Canada's marine disposal sites. Management actions are undertaken to address the sustainability of use at the site.

2.2 Rationale

Disposal at sea is the deliberate discarding of approved material from a ship, an aircraft, platforms or other structures at sea. Without a permit, it is illegal to dispose of any substance at sea. Canada protects its marine environment by regulating disposal at sea through a permit system under the Canadian Environmental Protection Act, 1999 (http://www.ec.gc.ca/lcpe-cepa/default.asp?lang=En&n=24374285-1&offset=1&toc=show). This permit system also allows Canada to meet its obligations on preventing marine pollution by disposal at sea, as set out in the London Convention 1972 (Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter) (http://www.imo.org/OurWork/Environment/SpecialProgrammesAndInitiatives/Pages/London-Convention-and-Protocol.aspx) and the 1996 Protocol to the London Convention. Each year in Canada, between two and four million tonnes of material are disposed of at sea, about 90% of which is dredged sediment from estuarine or marine sources or excavated inorganic material from land-based sources.[1]

Prior to issuing a permit, an assessment is conducted to ensure that disposal at sea is the environmentally preferred option and that the disposal will not harm human health or the marine environment. To ensure no harm is occurring, monitoring is conducted at a number of disposal sites each year in relation to impact hypotheses generated during permit review. If conditions at the disposal site are found to be different from predictions made during the permit assessment, a change in how waste is managed at the site, called a management action, may be necessary. Examples of management actions include changing how the site is managed, changing the site boundaries or even closure of the site. Management action may also be taken based on conditions that do not relate directly to environmental sustainability. For example, physical monitoring may show a site is filling up and reaching its capacity to hold material. Further use of the site could lead to navigational hazards if the overlying water becomes too shallow and therefore the site could be closed.

The Marine Protection program at Environment Canada has an annual target of 85% of sites not requiring management action. This target demonstrates that ocean disposal sites are being used sustainably and impacts on the sites are as predicted.

[1] Environment Canada (2010) Disposal at Sea: General Public. Retrieved on 8 September 2011. Available from: www.ec.gc.ca/iem-das/default.asp?lang=En&n=55A643AE-1

3 Data

3.1 Data source

Data are compiled by the Marine Protection Program at Environment Canada.

Environment Canada conducts monitoring activities in conjunction with researchers from other departments with an interest in ocean sciences, such as Fisheries and Oceans Canada and Natural Resources Canada. A summary of monitoring activities can be found in the annual Compendium of Monitoring Activities at Disposal at Sea Sites (http://www.ec.gc.ca/iem-das/default.asp?lang=En&n=F25958B2-1#a4), which is sent to permit holders and submitted to the International Maritime Organization annually.

3.2 Spatial coverage

For this indicator, disposal sites in the Pacific, Atlantic and Arctic oceans have been assessed (Table 1). The number of sites monitored follows monitoring guidelines developed during permit review to ensure monitoring studies can detect environmental degradation at disposal sites.[2]

Table 1: **Monitoring of disposal at sea sites per year and per region**

Year	Region	Number of sites monitored	Number of sites requiring management action	Total number of sites monitored
2000	Atlantic	1	1	4
	Quebec	2		
	Pacific and Yukon	1		
2001	Atlantic	2		11
	Quebec	5		
	Pacific and Yukon	4		
2002	Atlantic	3		7
	Quebec	1		
	Prairie and Northern	3		
2003	Atlantic	3		14
	Quebec	5		
	Pacific and Yukon	6		
2004	Atlantic	2		12
	Quebec	6		
	Pacific and Yukon	4		
2005	Atlantic	1		12
	Quebec	1		
	Prairie and Northern	1		
	Pacific and Yukon	9	1	
2006	Atlantic	2		6
	Quebec	3		
	Prairie and Northern	1		

[2] Environment Canada (1998a) National Guidelines for Monitoring Dredged and Excavated Material at Ocean Disposal Sites. Retrieved on 12 October 2011. Available from: www.ec.gc.ca/Publications/default.asp?lang=En&xml=E94D9F26-D0A1-479B-BE61-C4226EDB413B

2007	Atlantic	6	20
	Quebec	9	
	Prairie and Northern	4	
	Pacific and Yukon	1	
2008	Atlantic	2	6
	Quebec	4	
2009	Atlantic	1	8
	Quebec	7	

Source: Environment Canada (2000-2009) Annual Compendium of Monitoring Activities. Marine Protection Program.

3.3 Temporal coverage

All stations monitored from 2000 to 2009, the last year with available data, were used to calculate this indicator.

3.4 Data completeness

Full details of the monitoring projects and management action taken as a result are published annually in the annual Compendium of Monitoring Activities at Disposal at Sea Sites (http://www.ec.gc.ca/iem-das/default.asp?lang=En&n=F25958B2-1#a4).
Monitoring follows the national guidelines for monitoring disposal at sea sites[3] and technical guidance on physical, chemical and biological monitoring.[4,5]

3.5 Data timeliness

There is a time lag of two years between 2009, the last year reported, and the publication of this indicator. This time lag is due to the time required to perform the monitoring, compile the data at the national level, and analyze, review and report the data.

4 Methods

To calculate the Managing Disposal at Sea indicator, the number of disposal sites requiring management action in a year was divided by the total number of sites assessed that year for all years between 2000 and 2009.

5 Caveats and Limitations

5.1 Varying sample sizes

Disposal sites are monitored on a representative basis. Not all disposal sites used each year are monitored. Some years have far fewer sites monitored than others, which can skew percentages. Since 2000, two management actions have been required in 2000 and 2005. When

[3] Environment Canada (1998a) National Guidelines for Monitoring Dredged and Excavated Material at Ocean Disposal Sites. Retrieved on 12 October 2011. Available from: www.ec.gc.ca/Publications/default.asp?lang=En&xml=E94D9F26-D0A1-479B-BE61-C4226EDB413B

[4] Environment Canada (1998b) Technical Guidance for Physical Monitoring at Ocean Disposal Sites. Retrieved on 12 October 2011. Available from: www.ec.gc.ca/Publications/default.asp?lang=En&xml=B021E854-65B0-4526-B5A3-35FD2816138B

[5] Environment Canada (1994) Guidance Document on Collection and Preparation of Sediments for Physicochemical Characterization and Biological Testing. Retrieved on 12 October 2011. Available from: www.ec.gc.ca/Publications/default.asp?lang=En&xml=8F61B510-EFAA-4041-8FFF-BC7B99CC6B8B

converted to percentages, the annual variance in sample sizes translates to 75% of sites in 2000 requiring no management action compared to 92% in 2005.

6 References

Environment Canada (1994) Guidance Document on Collection and Preparation of Sediments for Physicochemical Characterization and Biological Testing. Retrieved on 12 October 2011. Available from: www.ec.gc.ca/Publications/default.asp?lang=En&xml=8F61B510-EFAA-4041-8FFF-BC7B99CC6B8B

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