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Data Sources and Methods for the Managing Disposal at Sea Indicator

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1 Introduction

The Managing Disposal at Sea Indicator is part 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 2001–2010. The indicator 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* (http://www.imo.org/ourwork/environment/pollutionprevention/pages/1996-protocol-to-the-convention-on-the-prevention-of-marine-pollution-by-dumping-of-wastes-and-other-matter,-1972.aspx). Each year in Canada, between 2 and 4 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]

Before a permit is issued, an assessment is conducted to ensure that disposal at sea is the environmentally preferred option and that no harm to human health or the marine environment will result from the disposal. To ensure that 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 the timing or the mechanism by which the waste is deposited at the site, changing the site boundaries or even closing 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 that 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.

[1] Environment Canada (2010) Disposal at Sea: General Public. Retrieved on 6 September, 2012. Available from: http://www.ec.gc.ca/iem-das/default.asp?lang=En&n=55A643AE-1.

Environment Canada's Marine Protection program 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.

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, which is sent to permit holders and submitted to the International Maritime Organization annually (http://www.ec.gc.ca/iem-das/default.asp?lang=En&n=F25958B2-1#a4).

3.2 Spatial coverage

For this indicator, disposal sites in the Pacific, Atlantic and Arctic oceans were 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
2001	Atlantic	2	0
	Quebec	5	0
	Pacific and Yukon	4	0
Total 2001	**All Regions**	**11**	**0**
2002	Atlantic	3	0
	Quebec	1	0
	Prairie and Northern	3	0
Total 2002	**All Regions**	**7**	**0**

[2] Environment Canada (1999) National Guidelines for Monitoring Dredged and Excavated Material at Ocean Disposal Sites. Retrieved on 6 September, 2012. Available from: http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=E94D9F26-D0A1-479B-BE61-C4226EDB413B.

2003	Atlantic	3	0
	Quebec	5	0
	Pacific and Yukon	6	0
Total 2003	**All Regions**	**14**	**0**
2004	Atlantic	2	0
	Quebec	6	0
	Pacific and Yukon	4	0
Total 2004	**All Regions**	**12**	**0**
2005	Atlantic	1	0
	Quebec	1	0
	Prairie and Northern	1	0
	Pacific and Yukon	9	1
Total 2005	**All Regions**	**12**	**1**
2006	Atlantic	2	0
	Quebec	3	0
	Prairie and Northern	1	0
Total 2006	**All Regions**	**6**	**0**
2007	Atlantic	6	0
	Quebec	9	0
	Prairie and Northern	4	0
	Pacific and Yukon	1	0
Total 2007	**All Regions**	**20**	**0**

2008	Atlantic	2	0
	Quebec	4	0
Total 2008	**All Regions**	**6**	**0**
2009	Atlantic	1	0
	Quebec	7	0
Total 2009	**All Regions**	**8**	**0**
2010	Atlantic	2	0
	Quebec	3	0
	Prairie and Northern	2	0
Total 2010	**All Regions**	**7**	**0**

Source: Environment Canada (2001-2010) Annual Compendium of Monitoring Activities. Marine Protection Program.

3.3 Temporal coverage

All stations monitored from 2001 to 2010, 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[2] and technical guidance on physical, chemical and biological monitoring.[3,4]

3.5 Data timeliness

There is a time lag of two years between 2010, 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.

[3] Environment Canada (1998) Technical Guidance for Physical Monitoring at Ocean Disposal Sites. Retrieved on 6 September, 2012. Available from: http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=B021E854-65B0-4526-B5A3-35FD2816138B.

[4] Environment Canada (1994) Guidance Document on Collection and Preparation of Sediments for Physicochemical Characterization and Biological Testing. Retrieved on 6 September, 2012. Available from: http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=8F61B510-EFAA-4041-8FFF-BC7B99CC6B8B.

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 2001 and 2010.

5 Caveats and limitations

Disposal sites are monitored on a representative basis. Not all disposal sites used each year are monitored. Between 2001 and 2010, the number of monitored sites per year has fluctuated from 6 to 20. In 2005, 12 sites were monitored and one has required a management action, resulting in 92% of monitored sites requiring no management action for that year.

6 References and further reading

6.1 References

Environment Canada (1994) Guidance Document on Collection and Preparation of Sediments for Physicochemical Characterization and Biological Testing. Retrieved on 6 September, 2012. Available from: http://www.ec.gc.ca/Publications/default.asp?lang=En&xml=8F61B510-EFAA-4041-8FFF-BC7B99CC6B8B.

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