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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 (<http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=3316493F-1>) is part of the Canadian Environmental Sustainability Indicators (CESI) program (<http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=47F48106-1>), which provides data and information to track Canada's performance on key environmental sustainability issues. This indicator is also used to measure progress towards the goals and targets of the Federal Sustainable Development Strategy (<http://www.ec.gc.ca/dd-sd/default.asp?lang=En&n=CD30F295-1>).

## 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 2002-2011. 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/LCLP/Pages/default.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.<sup>1</sup>

Before a permit is issued, an assessment is conducted to ensure disposal at sea is the environmentally preferred option and no harm to human health or the marine environment will result from the disposal. To ensure no harm is occurring, monitoring is conducted at a number of disposal sites each year according 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

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<sup>1</sup> Environment Canada (2010) Disposal at Sea: General Information. Retrieved on 22 July, 2013. Available from: <http://www.ec.gc.ca/iem-das/default.asp?lang=En&n=55A643AE-1>.

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 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.

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

### 3 Data

#### 3.1 Data source

Data for this indicator 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 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.<sup>2</sup>

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

Year	Region	Number of sites monitored	Number of sites requiring management action
2002	Atlantic	3	0
2002	Quebec	1	0
2002	Prairie and Northern	3	0
<b>Total - 2002</b>	<b>All Regions</b>	<b>7</b>	<b>0</b>
2003	Atlantic	3	0
2003	Quebec	5	0
2003	Pacific and Yukon	6	0
<b>Total -2003</b>	<b>All Regions</b>	<b>14</b>	<b>0</b>
2004	Atlantic	2	0
2004	Quebec	6	0
2004	Pacific and Yukon	4	0

<sup>2</sup> Environment Canada (1999) National Guidelines for Monitoring Dredged and Excavated Material at Ocean Disposal Sites. Retrieved on 22 July, 2013. Available from: <http://publications.gc.ca/site/eng/82321/publication.html>.

<b>Total -2004</b>	<b>All Regions</b>	<b>12</b>	<b>0</b>
2005	Atlantic	1	0
2005	Quebec	1	0
2005	Prairie and Northern	1	0
2005	Pacific and Yukon	2	1
<b>Total -2005</b>	<b>All Regions</b>	<b>12</b>	<b>1</b>
2006	Atlantic	2	0
2006	Quebec	3	0
2006	Prairie and Northern	1	0
<b>Total -2006</b>	<b>All Regions</b>	<b>6</b>	<b>0</b>
2007	Atlantic	6	0
2007	Quebec	9	0
2007	Prairie and Northern	4	0
2007	Pacific and Yukon	1	0
<b>Total -2007</b>	<b>All Regions</b>	<b>20</b>	<b>0</b>
2008	Atlantic	2	0
2008	Quebec	4	0
<b>Total -2008</b>	<b>All Regions</b>	<b>6</b>	<b>0</b>
2009	Atlantic	1	0
2009	Quebec	7	0
<b>Total -2009</b>	<b>All Regions</b>	<b>8</b>	<b>0</b>
2010	Atlantic	2	0
2010	Quebec	3	0
2010	Prairie and Northern	2	0
<b>Total -2010</b>	<b>All Regions</b>	<b>7</b>	<b>0</b>
2011	Atlantic	3	0
2011	Quebec	3	1
2011	Pacific and Yukon	5	0
<b>Total -2011</b>	<b>All Regions</b>	<b>11</b>	<b>1</b>

Source: Environment Canada (2002-2011) Annual Compendium of Monitoring Activities. Marine Protection Program.

### 3.3 Temporal coverage

All stations monitored from 2002 to 2011, the last year with available data, were used to calculate this indicator.

### 3.4 Data completeness

Details of the monitoring projects and management action taken as a result are published 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<sup>3</sup> and technical guidance on physical, chemical and biological monitoring.<sup>4,5</sup>

### 3.5 Data timeliness

There is a time lag of two years between 2011, 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 results.

## 4 Methods

To calculate the Managing Disposal at Sea indicator (<http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=3316493F-1>), 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 2002 and 2011.

## 5 Caveats and limitations

Disposal sites are monitored on a representative basis. Not all disposal sites used each year are monitored. Between 2002 and 2011, the number of monitored sites per year has fluctuated from 6 to 20.

## 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 22 July, 2013. Available from: <http://publications.gc.ca/site/eng/57184/publication.html>.

Environment Canada (1998) Technical Guidance for Physical Monitoring at Ocean Disposal Sites. Retrieved on 22 July, 2013.

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<sup>3</sup> Environment Canada (1999) National Guidelines for Monitoring Dredged and Excavated Material at Ocean Disposal Sites. Retrieved on 22 July, 2013. Available from: <http://publications.gc.ca/site/eng/82321/publication.html>.

<sup>4</sup> Environment Canada (1998) Technical Guidance for Physical Monitoring at Ocean Disposal Sites. Retrieved on 22 July, 2013.

<sup>5</sup> Environment Canada (1994) Guidance Document on Collection and Preparation of Sediments for Physicochemical Characterization and Biological Testing. Retrieved on 22 July, 2013. Available from: <http://publications.gc.ca/site/eng/57184/publication.html>.

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Available from: <http://www.ec.gc.ca/iem-das/default.asp?lang=En&n=55A643AE-1>.

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