Mapping coastline sensitivity to oil pollution in the Antarctic Peninsula region

Mapping coastline sensitivity to oil pollution in the Antarctic Peninsula region

**A Working Paper submitted by the United Kingdom**

***Summary***

This paper describes a pilot project to develop an oil spill sensitivity map for the coastline of the Antarctic Peninsula region. The United Kingdom recommends to the Committee that it:

* considers the usefulness of the preliminary oil spill sensitivity map to assist with oil spill contingency planning and response; and
* encourages Members, Observers and Experts to provide suggestions for improving the accuracy and utility of the map with a view to enhancing management of potential oil spills in the Antarctic Peninsula region.

***Background***

Antarctica is often considered to be a remote and pristine environment. However, it is subject to increasing levels of human activity including tourism, fishing and national governmental operator activity (ATCMXXXI IP58). This activity has led to increasing levels of ship traffic, with estimates of c. 200 vessels operating in the region and >500 voyages occurring annually. Antarctic waters are poorly charted, compared to other parts of the world, and transient sea ice conditions can make the waters treacherous and increase the likelihood of marine accidents that can severely impact local biodiversity (ATCMXLIII IP4) Previous shipping incidents involving the sinking or holing of fishing, tourism or national operator vessels have resulted in the release of fuel oil and other lubricants (see ATCMXXXVI IP90; ATCMXXXI IP11; ATCM XXXV IP53; ATCMXXX IP119; ATCM XXIV IP62). Spilled oils can have serious negative impacts on affected biodiversity including birds, seals and fish and benthic and intertidal communities.

***Recent developments***

Steps have been taken to reduce the likelihood and impact of fuel spills resulting from marine incidents. The ATCM welcomed the introduction of the [Polar Code](https://wwwcdn.imo.org/localresources/en/MediaCentre/HotTopics/Documents/POLAR%20CODE%20TEXT%20AS%20ADOPTED.pdf) by the IMO in Jan 2017 (Resolution 6 (2017)), which amongst other things prohibited the use of heavy fuel oils in Antarctic waters which are considered to have greater polluting impact than lighter grade fuels. The ATCM has also encouraged Parties to support further bathymetric charting of Antarctic water to further reduce the risk of groundings (Resolution 6 (2019)). Earlier studies modelling the spread of oil resulting from a spill in the marine environment have been presented to the ATCM (ATCMXX IP47). However, little work has been done to identify areas of coastline that may be more vulnerable to oil spills due, for example, to the presence of concentrations of wildlife, or Antarctic station infrastructure. An assessment of the susceptibility of coastline would allow better contingency planning or facilitate the most effective implementation of a response should an oil spill have occurred.

***Oil spill sensitivity mapping***

Oil spill sensitivity mapping of coastline is commonly undertaken in other part of the world, and in particular, in areas where spills would have serious implications for biodiversity and humans. The British Antarctic Survey (BAS) and Oil Spill Response Limited (OSRL) have undertaken a pilot project to develop an oil spill sensitivity map for the Antarctic Peninsula region, which is an area of the continent subject to some of the highest levels of ship traffic. BAS has extensive knowledge of environmental management, mapping and logistics in Antarctica. OSRL has completed numerous sensitivity mapping projects around the globe and has contributed to several International Petroleum Industry Environmental Conservation Association (IPIECA) Good Practice Guides.

The method was based upon the one recommended by the IPIECA but adapted for use in Antarctica. Using available geospatial datasets on features including Antarctic facilities, penguin colonies, Important Bird and Biodiversity Areas (IBAs), protected areas, visitor sites and CCAMLR Ecosystem Monitoring Programme (CEMP) sites, an on-line Geographical Information System map was produced. The on-line map is available at: <https://bas.maps.arcgis.com/apps/instant/media/index.html?appid=4161f3abc00c4b47a200d4acba6ea2ce>. A more detail report on the method employed is available at Attachment A.

Approximately 24,985 kms of coastline were assessed with 807 km (3.2%) allocated to the highest sensitivity category (e.g., see Figures 1 and 2). Locations considered of highest sensitivity included the coastal area around southern Anvers Island, the South Shetland Islands (Deception Island, in particular) and the South Orkney Islands.

The GIS map was a product of a pilot study and there is scope for further developments concerning the method used and the inclusion of geospatial dataset. The United Kingdom would welcome comments from CEP Members, Observers and Experts regarding the usefulness and accuracy of the map and suggestions for improvement. Examples might include the provision of sea ice data, an estimate of seasonal variability in coastline sensitivity to oil spills (e.g., sensitivity may temporarily decline at locations where wildlife have migrated due to the onset of winter) or ocean current data to show the potential movement of oil following a spill.

***Recommendations***

The United Kingdom recommends to the Committee that it:

* considers the usefulness of the preliminary oil spill sensitivity map to assist with oil spill contingency planning and response; and
* encourages Members, Observers and Experts to provide suggestions for improving the accuracy and utility of the map with a view to enhancing management of potential oil spills in the Antarctic Peninsula region.

Map

Description automatically generated

Figure 1. On-line map modelling coastline sensitivity to marine pollution in the Antarctic Peninsula region. The on-line map can be accessed [here](https://bas.maps.arcgis.com/apps/instant/media/index.html?appid=4161f3abc00c4b47a200d4acba6ea2ce).

Map

Description automatically generated

Figure 2. Example section of the oil spill sensitivity map for the Antarctic Peninsula region showing Snow Island, Deception Island and Livingston Island, including Byers Peninsula.