

Review of Geographic Information System (GIS) Decision-Support Tool of the Regional Assessment of Offshore Oil and Gas Exploratory Drilling East of Newfoundland and Labrador



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Overview

The GIS tool is attractive and seemingly user-friendly.

We do however have some concerns about its capability, utility and real-time relevance.

The data layers in the Physical Environment contain only information on bathymetry and atmospheric light. Layers for ocean temperature, salinity, sea ice, icebergs, etc. need to be included. Without access to these and related data the Physical Environment provides very little environmental information.

Data access is too restricted owing to confidentiality agreements and even unnecessarily restricted. For instance, the GIS tool restricts access to fisheries data, even though these data are available to the public via the NAFO site.

We have concerns about the establishment of the oversight committee and the real-time updating of data.

Many incomplete GIS tool functions indicated in the tool webinar, e.g. lack of layer transparency, need completion.

It is a major concern that there will no longer be an environmental assessment of oil spill scenarios but rather a negotiation between the companies and the C-NLOPB - a vague, far from transparent and questionable process.

The capability to download the text of the tool in a PDF format would be very useful, especially since the option to download the maps currently exists.

Some of the legends do not contain very much detail. For example, Chlorophyll A legend only indicates low to high with no explanation of what this means. This is also the case for all "DFO Fish Density by Species". Units are essential for all legends found in the tool.

Conclusion

While the **GIS tool** is attractive and can be useful for displaying some associations between offshore developments and interventions and biological and socioeconomic variables, **it can in not replace the necessity for comprehensive environmental assessments.**

Detailed Comments and Suggestions

Module 1

Section 1.1

- There is nothing in this section about the need for environmental assessments, only the economic benefits of exploratory drilling.
- There should be a statement about the numerous environmental risks associated with exploratory drilling and with the oil and gas sector, hence the need for a tool to better map the risks and biologically and economically important areas.

Module 2

- When going through the text, it would be useful to have a button/hyperlink for the predicted well scenarios (mild, medium, high) near the beginning. This would allow the reader to better understand where the areas of interest are and how these predicted drill sites overlap with other layers of interest in the tool.

Section 2.1

- "Exploratory drilling is the key focus of the Regional Assessment and its associated analysis and recommendations"
 - Would this tool be later used to enhance environmental assessments conducted for potential oil production sites?

Module 3

Section 3.2.2

- Provide a layer to the GIS tool that shows where all spills have occurred within the study area and temporal footprints. These could be derived from temporal shape files of the oil spills. These could also appear as a heat map showing where most spills have occurred and how the slicks are dispersed.

Module 4

- The layers available in the physical environment section are insufficient.

Module 5a

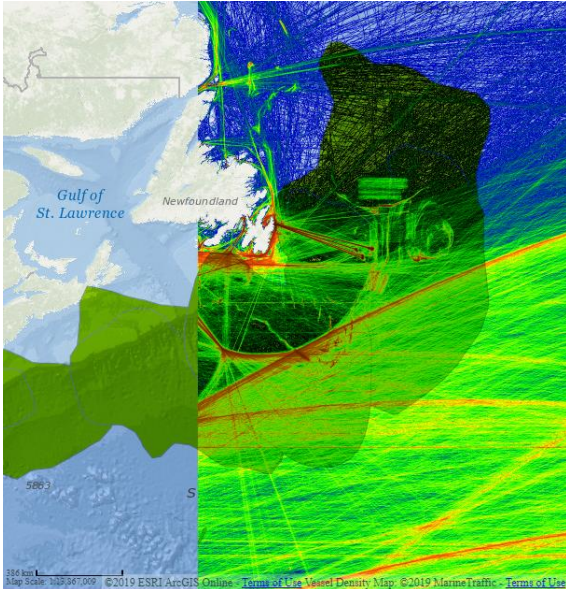
Section 5.1

- More links in the text that will turn on layers in the tool would be useful. For example, a link to the chlorophyll layers in the plankton section would make it easier to navigate the tool. This is already done for some layers (e.g. 5.1.1 Figure 1. Bioregions of Atlantic Canada).
- The chlorophyll A layers for all seasons do not cover the entire study area. If these data are available, extend the area that the layer covers.

Module 5c

Section 5.0

- Figure 32e, core foraging ranges of Leach's Storm-Petrels, is highly informative and detailed. It would be useful if each of the identified foraging ranges from various colonies were coloured differently on the graph portion, or had stronger borders, for identification of the colony-specific ranges. This becomes an issue when overlaying the data to other datasets, particularly with marine vessel traffic (see below), where the distinction between the ranges of Baccalieu Island-breeding individuals and Gull Island-breeding individuals is unclear. An option to show data from each colony, rather than all or none, would be beneficial as well.



- Figure 32e would be valuable for other species as well and these data are available. A possible addition to this tool would be to allow scientists to voluntarily add data to the tool. This would allow up-to-date data to be available to decision-makers through this tool which would increase its value for environmental assessment.

Table 1

- Northern Gannets are highly abundant in August through November, not “Low” abundance. In fact, gannets ranging from their colony would be more likely to enter the study area in late summer/early fall as their foraging trips extend further from colonies in search of prey.
- Great Shearwaters are nearly nonexistent in the study area in December-March, not “Moderate” in abundance. These birds are in the southern hemisphere during this time frame.

Table 2

- Mention of Deserta’s Petrels ranging near the Study Area during their breeding season should be included (Ventura et al. 2020). This species is listed as “Endangered” by the IUCN and has a very small population.

Section 5.2.2 Gannets

- “During the breeding season, Northern Gannets can forage over 100 km from their colony, but they tend to forage in inshore waters (Garthe et al. 2007).”
This is entirely dependent on intra- and inter-annual variation in the availability and distribution of prey fields and whence high period of the breeding season is being considered. Tracking data of parental Northern Gannets ranging from Cape St. Mary’s in 2019 demonstrates that

maximum distance from the colony increases as the breeding season progresses from July - October (K. d'Entremont and W. Montevecchi unpubl. data), and thus more likely to be in the pelagic waters of the Study Area late summer/early autumn. A similar pattern is expected for gannets nesting on Funk and Baccalieu Islands. If the GIS tool had the option to overlay new data on the Study Area this could be easily demonstrated.

Module 5d

- There is no mention of narwhals, yet they occasionally travel south in winter as far as Conception Bay. Narwhal is included in the legend of Figure 3.9 of the Final Report drafted by the committee and sent to the Minister, but not here. This species is also listed as Near Threatened by IUCN (Lowry, Laidre & Reeves. 2017) and Special Concern by COSEWIC (2004).
- “Polar bear (*Ursus maritimus*) is considered a marine mammal and are occasional visitors to the island of Newfoundland and the offshore area. However, polar bear sightings in the Study Area are considered extra-limital observations occurring when individuals drift south to NL on icebergs or pack ice carried southward with the Labrador Current (COSEWIC 2018) and are not discussed further.”
 - This is insufficient, as polar bears occur in the waters around Newfoundland as far south as Bonavista Bay often, and there are no data provided in this GIS decision support tool on pack-ice nor icebergs. Polar bears are listed as Vulnerable on the IUCN Red List (Wiig et al. 2015) and by COSEWIC (2008), and likely occur in the northern waters of the study area yearly. Consider revising.

Table 5

- Include the IUCN Red List Classification for all listed species

Section 5.4

- “The green, hawksbill and Kemp’s ridley sea turtle frequent tropical and subtropical waters, but have very rarely been sighted in the waters off Eastern Canada in the summer months.”
 - At least mention the fact that they are not listed on COSEWIC or SARA registries because they do not breed in Canadian territory. Hawksbill turtles are Critically Endangered on the IUCN Red List (Mortimer & Donnelly 2008), green turtles are Endangered on the IUCN Red List (Seminoff 2004), and Kemp’s Ridley are Critically Endangered on the IUCN Red List (Wibbels & Bevan 2019).

Module 6a

- Very extensive, in-depth section.

- The inclusion of Potential Future Domestic Fisheries is quite prudent.
- The 2019 TAC for Atlantic Cod in 2J3KL in Table 9 needs to be updated, it is no longer “to be determined”, as this Table on DFO’s website was only current until 2019-04-26. The TAC for the northern cod stewardship fishery was set at 12,350 tonnes for 2019 (FFAW, <https://ffaw.ca/the-latest/news/2j3kl-cod-management-plan/>)

Module 7

Table 2

- Well abandonment could alter the habitat. If the wellhead is left in place, this will alter the habitat. A concrete cap might also change the habitat structure by creating an artificial reef which would likely enhance local biodiversity (Inger et al. 2009).
- Wells that are left abandoned in northwestern sections of this proposed study area fall into what’s colloquially known as Iceberg Alley, where icebergs and glacial melt (pack ice, etc.) flow south in the spring and summer months. Without having these ice datasets available to overlay onto the map, the proper management and infrastructure may not be considered prior to the well abandonment to ensure no spills or leakage as a result of ice scouring. Without ice data, one cannot confidently assume well abandonment creates no risk to the marine ecosystem.

Module 8

Table 1

- (Change in mortality/injury levels and health) “These can occur as a result of lighting or flaring, leading to possible effects due to strikes, strandings, incineration, disorientation, increased predation or other interactions.”
 - This is important, and it need not be understated.
 -
- (Change in Avifauna Presence / Abundance and Distributions) “Some birds may be attracted to drilling activities due to increased food availability (including waste discharges or concentrations of certain prey species) or by disorientation due to lighting.”
 - This applies also to related byproduct activities of oil and gas drilling, such as shipping. This is stated in Table 2, but should be included in this section. Falcons, owls, ptarmigan and numerous passerines have been reported on platforms, support vessels, oil tankers and other ships in the offshore, near active wells due light attraction and physical structure (Montevecchi 2006; Burke et al. 2012).

Table 2

- 'Well drilling (exploration and delineation)' can potentially affect 'Change in Presence/Abundance and Distributions (Behavioural Effects)' of seabirds from the light and noise pollution produced during this activity. These effects are detailed in 'Table 3 - Presence and Operation of Drill Rig'.
- 'Supply and Servicing (Vessels and Aircraft Use)' can potentially affect 'Change in Food Availability or Quality'. This is detailed in Module 7, Table 3 that excess boat traffic can repel or attract fish, changing their distribution. As seabirds are mainly piscivorous, this could affect the distribution of their food. In this table, 'Supply and Servicing (Vessels and Aircraft Use)' is not independent of 'Lights, Heat and Noise', 'Underwater Noise', and 'Air Emissions'.

Module 9

This Module as a whole is very well-written, comprehensive and considerate of all factors facing marine mammals and sea turtles.

Table 2

- Above in Table 1 it is mentioned that drill rig operation and associated underwater noise may directly affect the health of marine mammals, yet in this Table it is only indicated that underwater noise will cause health risks, and not the "Presence and Operation of Drill Rig".

Table 3

- In the "Supply and Servicing (Vessel and Helicopter Use)" section, under "Vessel Use – Risk of Injury or Mortality", there is no mention of the risk of vessel strikes to non-cetacean marine mammals, particularly of seals, and yet the busiest vessel routes pass directly through the habitat and range of many pinniped species. Read and use Jones et al. (2017) for reference.
- "There are few studies on sea turtle reactions to vessels although propeller and collision injuries from ships in US waters are common (Schwartz 2009). Hazel et al. (2007) demonstrated the proportion of green sea turtles maneuvering to avoid a vessel decreased with increased vessel speed, suggesting turtles may not avoid faster moving vessels."
 - The first sentence here is misleading, as there are an adequate number of studies that show the effect of commercial shipping vessel traffic on sea turtles. In a statement by NOAA, "It is estimated that hundreds of sea turtles are struck by vessels in the United States every year, and many of them are killed without being observed. Vessel strikes are one of the most common causes of sea turtles stranding in the United States. In Florida alone, injuries consistent with vessel strikes are observed in 20 to 30 percent of stranded sea turtles." (<https://www.fisheries.noaa.gov/insight/understanding-vessel-strikes>). The proposed study area is known to be part of the range of green, hawksbill,

and Kemp's Ridley sea turtles, all of which are in dire conservation status, and this must be restated here.

Module 10

- This section needs development. Either provide citations or provide references to the sections of the report that discuss these concepts in more detail.

Module 12

Section 12.2 and Table 1

- "Temporary loss of access to established fishing grounds due to drilling activities and components" - if these exploratory drilling activities result in the establishment of an oil production well, these effects will no longer be temporary. In the predicted scenarios, there are many wells predicted to overlap with existing high fishing activity.

Module 13

Table 1

- "Expenditure Benefits" - Need to be more explicit in how much money will be returned to the Newfoundland economy. The report specifically states that "These expenditures benefit local, national and international workers and companies as well as governments." but there is no indication of what proportion of the benefits will go to Newfoundland and Labrador, rather than to international parties.
- "Government Revenue Benefits" - it is unclear if the statistics and projected royalties and revenues listed here are from the oil and gas industry as a whole or only exploratory drilling activities. Because the report is careful to only discuss the implications of exploratory drilling in the environmental sections, the economic sections should not be an exception to this. Only provide statistics relating specifically to exploratory drilling.
- "Worker Health and Safety" - The table states: "Of the incidents reported, most appear to have occurred during production operations." 'Most appear to have occurred' is a very vague statement. Provide actual statistics.
- "Public Health Risks" - "Throughout the duration of any offshore drilling program, other marine activity is restricted within a defined area surrounding the drill rig as a safety precaution." Specify this 'defined area'.

Table 3

- As stated above, because this report focused specifically at exploratory drilling activities, the economic statistics presented should only be for exploratory drilling practices rather than the oil and gas industry as a whole. This is an important bias that cannot be ignored.

Table 4

- “Given the distance from activities in the Study Area to land and likely spill trajectories, and the implementation of required spill response procedures, it is considered extremely unlikely that the public would be exposed to hazards from spilled oil.” The study area is within 50 km of shore where fishing and other activities take place. If exploratory drilling is to take place near the western border of the study area, it is not unreasonable to believe that events like oil spills could impact the public. In addition, many predicted well drill sites will overlap with areas of high fishing activity, even for the low well drilling scenario (see image attached in Module 12, Section 12.2). Oil spills in these areas from increased drilling activity would impact fishermen. Most importantly, as public stakeholders in the Canadian ocean all citizens are affected by oil spills within Canadian jurisdiction.

Module 14

- A layer for the tool including current air emissions over Newfoundland and the study area would be useful.

Table 1

- The “Presence and Operation of Drill Rig” produces air emissions that would contribute to “Change in Air Quality” and “Change in GHG Levels”. This should be indicated in Table 1.

Table 3

- Comprehensive, well done.

References

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