GIS TAG Session

1. **Do you have any suggestions on available environmental datasets or other information sources that should be accessed and used in the RA, or around key data gaps?**

- DND dumpsites
- NAFO datasets - https://www.nafo.int/Data/GIS; https://www.nafo.int/Data/STATLANT,
- Marine traffic - https://www.marinetraffic.com/en/ais/home/centerx:-9.3/centery:22.3/zoom:2
- Whale monitoring - https://whalemap.ocean.dal.ca/
- Protected areas and sensitive benthic areas documents (DFO): http://www.dfo-mpo.gc.ca/oceans/publications/index-eng.html#other
- IUCN – Environmental data and geospatial analysis heat maps
- Links to Climate Atlas, NOAA - https://www.canada.ca/en/environment-climate-change/services/climate-change/canadian-centre-climate-services.html, ClimateData.ca, Canadian Centre for Climate Modelling and Analysis, Climate Data Online
- Databases of non-DFO protected areas (e.g. NAFO): www.mpatlas.org
- Oil spill data
- Ocean Networks Canada, which uses observatories to collect data about the oceans surrounding Canada: http://www.oceannetworks.ca/
- Ocean Tracking Network
- Ocean Frontier Institute, Dalhousie University: https://oceanfrontierinstitute.com/about-ofi/our-team.
- Canadian Integrated Ocean Observing System (under development but worth talking to)
- Global Marine Data Map - https://gis.ncdc.noaa.gov/maps/ncei/marine
- Multibeam data
- North-East Atlantic Fisheries Commission in Norway – closure maps - https://www.neafc.org/managing_fisheries/vmec
- Emergency response data

2. **Do you have any suggestions around the analytical capabilities that the GIS tool should include, related to the presentation and analysis of environmental data, and/or to the potential environmental effects and required mitigation?**

- Climate change analysis (e.g. modeling biological effects under different emissions scenarios)
- Cumulative effects mapping and analysis
- Sensitivity analysis
- Red alerts/flags for new data that would indicate potential significant effects of drilling on ecosystem components

- Alerts for areas with no data or insufficient data
- Areas of influence/overlays of protected areas from national and international bodies

3. Do you have any suggestions around the nature and format of the eventual product that the Committee will develop and submit to the Minister?

- Include the governance structure and update capabilities of the system.
- Ensure a proper working prototype with fully functional live data for TAG feedback
- More fulsome comparison to other GIS systems.

4. Do you have any suggestions on where the GIS platform should be housed, such that the system gets maintained and updated at regular intervals?

- The Expert Panel on Sustainable Finance is building a comprehensive climate data portal. https://www.canada.ca/en/environment-climate-change/services/climate-change/expert-panel-sustainable-finance.html
- Wherever the system is housed, it should allow the data to be fully accessible to the public

5. Do you have any other input or recommendations that you would like to provide to the Committee on this topic?

- The Committee should release the RFP, the vendors, and the reasons for the selection of the vendor.
- The GIS is a critical component of the RA. Necessity of getting it right should overwrite the timing of the RA – you may need to ask for more time.
- The GIS system should be robust to conduct analytics

Cumulative Effects TAG Session

- Although a large body of research has assessed the effects of oil and gas exploration and extraction on marine organisms and communities, there remains a paucity of information on cumulative effects involving oil and gas activities, particularly in temperate deep-water ecosystems.
- GIS platform should map distribution of human activities whose biological effects could potentially interact with the effects of exploratory drilling (e.g. overfishing or use of destructive gear types)
- GIS platform should be a living document that facilitates regular updates to this mapping to identify potential cumulative and chronic effects as they emerge
- The assessment should consider potential interactions of exploratory drilling with:
    - climate change (temperature, acidity, de-oxygenation)
    - fishing (e.g. bottom trawling)
    - shipping and transportation
    - other exploratory drilling and future production wells
    - underwater noise from seismic, drilling and other human sources
    - microplastics (e.g. nutritional stress in turtles, mammals, fish, seabirds)
- Species/communities of particular concern include:
    - deep-sea invertebrate communities, especially sensitive coral and sponge species
    - demersal fish assemblages
    - species at risk (e.g. skate, wolfish) and depleted commercial stocks
    - marine mammals and seabirds
- Careful attention should be paid to the spatiotemporal coverage and quality of datasets, and their appropriateness for rigorous cumulative effects assessment
- Uncertainty must be respected, and the precautionary principle must be followed where knowledge gaps are identified

Marine Fish TAG Session

- In 2014, AMEC released the Strategic Environmental Assessment. Although plankton are widespread across the SEA Study Area, the Southeast Shoal and Tail of the Banks Ecologically and Biologically Significant Area (EBSA) was identified in part based on its high primary productivity. Other benthic species are also at risk. The SEA noted a number of ecologically important habitats that have been identified through the EBSA process and are also reflected in the designation of Vulnerable Marine Ecosystems based on sensitive coral areas and NAFO coral, seamount and sponge protection zones.
- From our understanding, DFO is current undertaking a peer review process to review data sets, including mitigations on corals and sponges for exploratory drilling, including the presence/absence of species and areas suitable for trawling. The committee should take part in these reviews to ensure that all data and datasets are included in the RA.
- Unless data indicate otherwise, assessments should start with the assumption that many fish populations and habitats are stressed already as a result of overfishing and use of destructive gear types, climate change, marine pollution and other human stressors; the burden of proof should lie on demonstrating that fish populations and habitats are healthy as opposed to the reverse.
- The assessment should acknowledge and respect protected areas that have been established to protect vulnerable sea-bottom habitats used by fish including:
    - Coral Closure
    - Funk Island Deep Closure
    - Northeast Newfoundland Slope Closure
    - Jordan Basin Conservation Area
    - Division 30 Coral Closure
    - Northeast Newfoundland Slope Closure
    - NAFO also has several areas closed to shrimp trawling in the area of the Flemish Cap and the Nose of the Grand Banks (NAFO 2013a) and the organization has highlighted several areas of importance that remain unprotected. These include the southern slope of the Flemish Pass (sponges), the eastern slope of the Flemish Cap (large Gorgonian corals) and the Tail of the Grand Banks (small gorgonian corals) where various VMEs indicator species occur at high concentrations
- Additional research should focus on:
    - Understanding trends in depleted fish species in the study area, and the potential effects of exploratory drilling on recovery of these species
    - How exploratory drilling may interact with fish stock rebuilding plans currently underway or being planned by DFO

Climate Change TAG Session

- Like cumulative impacts, 100 projects has far more climate change risks than 10 projects. Drivers and processes inhibiting attribution include demographic, resource, and land-use changes. Risk related to sea level rise (including erosion, flooding and salinization) is expected to significantly increase by the end of this century along all low-lying coasts in the absence of major additional adaptation effort.
- Ensure that production data is included in GIS analysis. In the context of cumulative effects, the impacts of exploratory drilling cannot be analyzed in isolation from the intended goal of production.
- Offshore oil and gas will increase Canada's GHG emissions. Thus, a coordinated effort is required to oversee, measure and monitor all GHG emissions from exploratory and production wells in the RA area. Offshore oil will not only contribute to climate change, but be affected by climate change as well.
- Scenario analysis of one production well per one exploration well.
- Use available data sources - Canadian Centre for Climate Modelling and Analysis (CCCma) within Environment and Climate Change Canada (ECCC), which develops and applies computer models of the climate system to simulate global and Canadian climate, and to predict changes on seasonal to centennial timescales. Analysis of these simulations, together with observations, is used to provide science-based quantitative information to inform climate change adaptation and mitigation in Canada and internationally, and to improve our understanding of the climate system. ClimateData.ca provides high-resolution climate data to help decision makers build a more resilient Canada.
- Include effects of shipping and supply chain management in analysis
- Ensure firms properly measure and monitor GHG emissions
- Include leakage, flaring, minor spills into analysis
- Review the latest IPCC reports, available at https://www.ipcc.ch

Resources

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Fraser, G.S., Russell, J. & Von Zharen, W.M. 2006. Produced water from offshore oil and gas installations on the Grand Banks, Newfoundland: are the potential effects to seabirds sufficiently known?. *Marine Ornithology* 34: 147-156.

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Murray CC, Agbayani S, Ban NC (2015) Cumulative effects of planned industrial development and climate change on marine ecosystems. Global Ecology and Conservation 4: 110-116

National Academy of Sciences: Cumulative Environmental Effects of Oil and Gas Activities on Alaska's North Slope, online: http://dels.nas.edu/resources/static-assets/materials-based-on-reports/reports-in-brief/north_slope_final.pdf

Ellis JI, Fraser G, Russell J (2012) Discharged drilling waste from oil and gas platforms and its effects on benthic communities. Marine Ecology Progress Series 456: 285-302

Any questions about this response may be sent to Keith MacMaster at keithinhalifax@gmail.com, or Jordy Thompson at jordy.thompson@ecologyaction.ca