

Northwest Atlantic



Fisheries Organization

Serial No. N195

NAFO SCR Doc. 21/051

**Information on *activities other than fishing* (offshore oil and gas) in the NAFO Convention Area:
Implications for the development of the Ecosystem Summary Sheets (Divisions 3LNO and 3M)**

by

P. Durán Muñoz and M. Sacau
Instituto Español de Oceanografía (IEO)
Centro Oceanográfico de Vigo
P.O. Box 1552. Vigo, Spain
e-mail: pablo.duran@ieo.es

Abstract

Updated available information on *activities other than fishing* in the NAFO Convention Area - with focus on oil and gas - was collected and summarized from publicly available data sources (e.g. websites and project reports). This information is relevant not only to produce advice on Commission Request #14, but also to the development of the ecosystem summary sheets for Divisions 3LNO and 3M (Commission Request #15). In general, data on geographical location of oil and gas activities is available (including spatial location and technical details of a development project in the Flemish Pass), but information on the adverse impacts of such activities (e.g. routine operations, accidental events, unauthorized discharges, exploratory drilling on VME closed areas, etc.), as well as mitigation measures, is scarce or difficult to obtain. Based on the available information, it is observed that offshore oil and gas activities in NAFO Divs. 3LNM increased in recent years, including drilling activities on NAFO VME closed areas (Areas 2 and 10). Moreover, a number of different types of “incidents” have occurred during the period 2015-2020 (e.g. the Hibernia oil spill in 2019, a transboundary incident, in which the oil was extended into the NAFO Regulatory Area).

Keywords: adverse impacts, ecosystem summary sheets, exploratory drilling, Flemish Pass, NAFO, oil and gas activities, oil spill, VMEs.

1. Introduction:

Since 2018 (i) maps showing the spatial overlap of human activities other than fishing (particularly offshore oil and gas activities) and ecosystem components (particularly VMEs) as well as (ii) data on seabed litter, have



been presented to NAFO (NAFO, 2018, 2019a, 2019b, 2020), based on the results from the ATLAS¹ project (Durán Muñoz *et al.*, 2020). These maps were useful to visualize issues related to:

- (i) the existing or potential conflicts between users of the NAFO marine space (e.g. oil and gas activities vs. deep-sea fisheries) and between users and ecosystems (e.g. oil and gas activities, deep-sea fisheries and VMEs),
- (ii) the overlap and potential conflicts between the different regulatory frameworks that affect fisheries and oil and gas activities in NAFO Regulatory Area.

The objective of this document is to present updated information on oil and gas activities with focus on Divisions 3L and 3M. Such information could be useful to produce advice on NAFO Commission Requests (#14)² *human activities other than fishing in the NAFO Convention Area*, and (#15)³ *development of the ecosystem summary sheets for 3LNO⁴ and for 3M*.

2. Methodology

This is a desk-based research. The information presented here was obtained through a literature review of publicly available information (e.g. available shapefiles for illustrative purposes, published material and data on official websites, published reports etc.). Available data was collected mainly from the Canada-Newfoundland and Labrador Offshore Petroleum Board (C-NLOPB)⁵ and the Impact Assessment Agency of Canada (IAAC). Georeferenced information was organized and integrated into a GIS using the open source software QGIS.

3. Results and discussion

3.1 Overview of oil and gas activities

The map of the geographical location of oil and gas activities in NAFO Divs. 3LNM is presented in Figure 1. The yellow star indicates the location of the proposed production installation within the Bay du Nord Development Project in the Flemish Pass (outlined in blue). This map shows the potential conflicts between oil and gas activities and NAFO fisheries (e.g. reduction of fishing opportunities), as well as between oil and gas activities and VME areas closed by NAFO (Areas 2 and 10).

Updated spatial data (licences and wells⁶) was available this year. In comparison with the information assessed previously reported by WG-ESA (NAFO, 2020), there are two new “exploration wells” in Division 3L, one of them located inside NAFO fishing grounds. The information assessed since 2018, indicates that offshore oil and gas activities in NAFO Divs. 3LNM increased in recent years.

¹ ATLAS (www.eu-atlas.org) is a multidisciplinary international project funded by the EU Horizon 2020 program.

² Com. Request #14 The Commission requests the Secretariat and the Scientific Council with other international organizations, such as the FAO and ICES to inform the Scientific Council's work related to the potential impact of activities other than fishing in the Convention Area. This would be conditional on CPs providing appropriate additional expertise to Scientific Council.

³ COM. Request #15. The Commission request that Scientific Council proceed with developing the ecosystem summary sheets for 3M and 3LNO move toward undertaking a joint Workshop with ICES (International Council for the Exploration of the Sea) as part of a peer review of North Atlantic ecosystems.

⁴ Information on oil and gas activities and seabed litter derived from ATLAS project, was already included in the Ecosystem Summary Sheet for 3LNO.

⁵ <https://home-cnlopb.hub.arcgis.com/>

⁶ *Exploration well*: A well drilled on a geological feature on which a significant discovery has not been made; *Delineation well*: Normally, a well drilled on a significant or commercial discovery of petroleum, drilled in order to determine the commercial value; *Development well*: Drilled for the purpose of production or observation or for the injection or disposal of fluid into or from the accumulation of petroleum; *Dual classified wells*: e.g. Exploration/delineation wells.

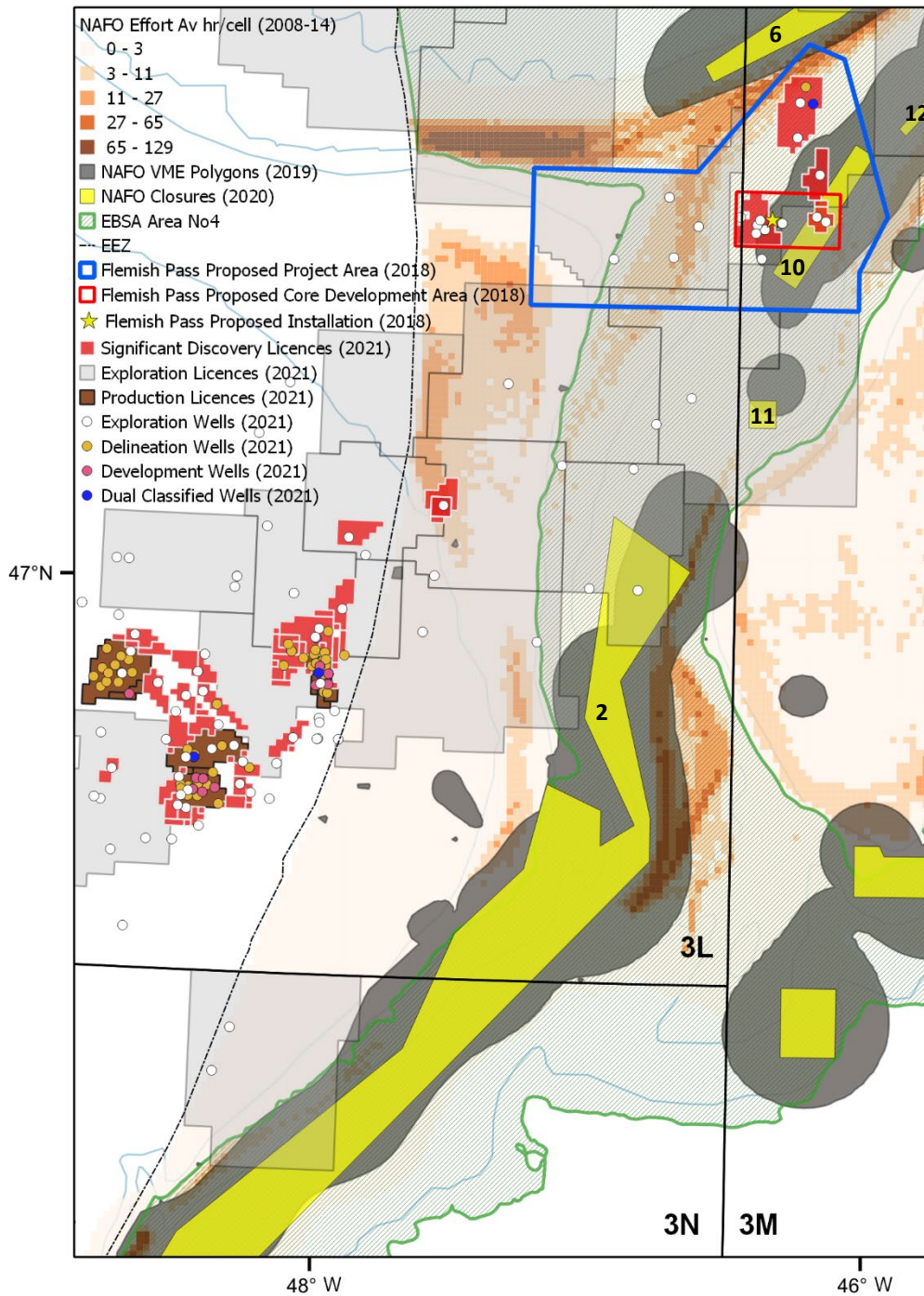
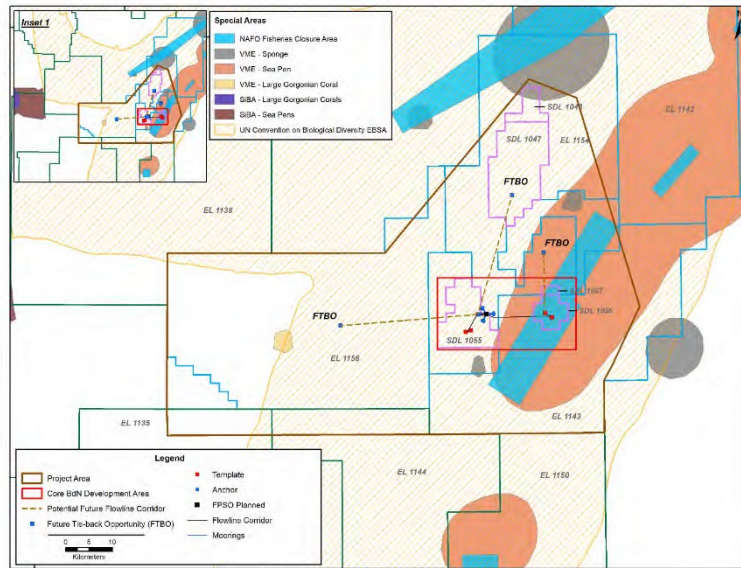


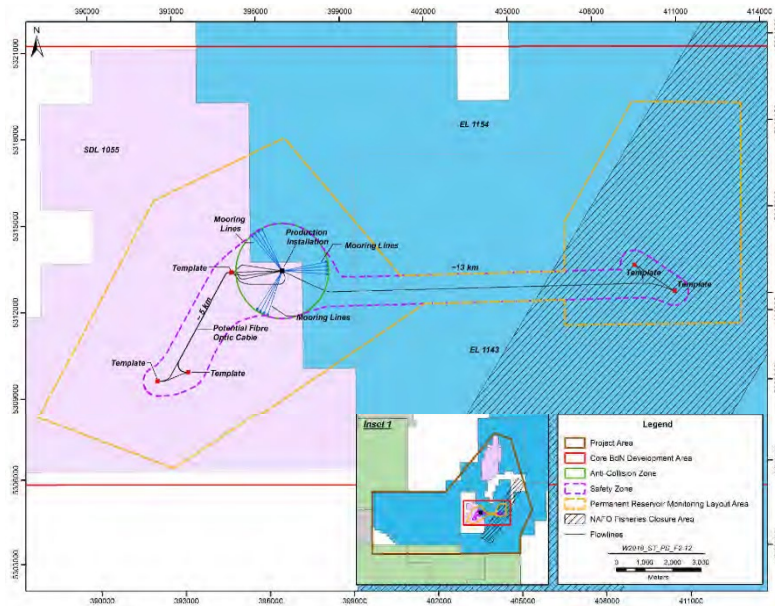
Figure 1. Updated map showing the geographical location of oil and gas activities in NAFO Divs. 3LNM. The map shows the potential conflicts between different users of the marine space (e.g. oil and gas vs. fisheries) and between users and marine environment (oil and gas vs. VMEs). The yellow star indicates the location of the proposed production installation within the Bay du Nord Development Project in the Flemish Pass (outlined in blue). Available spatial information on oil and gas activities – at the reporting date, November 2021 – is noted in brackets (2021). Sources: NAFO, C-NLOPB and CBD.

3.1.1 Oil and gas development project in the Flemish Pass

A report on a development project located in the Flemish Cap (Bay du Nord Development Project) is publicly available (Equinor, 2020). Some of the exploration and proposed production activities related with this project, appear to have significant spatial overlap with NAFO bottom fisheries, NAFO closures and VMEs in Division 3L and particularly in Division 3M (Figures 1 and 2).



(a)



(b)

Figure 2. Details of the oil and gas development project in the Flemish Pass: (a) Project area tiebacks and special areas. (b) Proposed project conceptual safety zone and anti-collision zone – Core Bay du Nord development area (source Equinor, 2020).

3.2 Oil spills and other relevant incidents

At the reporting date (November 2021), according to the information available from C-NLOPB website ("Incident Disclosure 2021" in <https://www.cnlopb.ca/incidents>), no relevant environmental incidents occurred during 2021. Nevertheless, during the period 2015-2020 there have been 12 reported incidents of different nature (Table 1), with a major oil spill in 2018 (250,000 L), and one in 2019 that occurred into the EEZ of the coastal state, but was extended outside the EEZ, and into the NAFO Regulatory Area⁷. Another type of incidents, such as the iceberg affaire (a near-miss incident) occurred in March 2017, illustrate the potential risks of deep-water offshore oil and gas activities in the NW Atlantic.

Table 1. List of offshore oil spills and other relevant incidents in the NW Atlantic. 2015-2020 period (source: C-NLOPB).

Date	Incident description	Observations
20/07/2020	Unauthorized Discharge (Hibernia Platform)	Produced water discharge (mixture of seawater from the reservoir/used in injection, drilling and production fluids). The volume of the discharge and its composition are being determined
18/06/2020	Unauthorized Discharge (SeaRose FPSO)	1,098 litres of an anti-microbial agent (X-Cide 450) was released along with 1,916,000 litres of water that were intended for reservoir injection.
17/08/2019	Hibernia Oil Spill	Estimated volume of oil on the water was 2,184 L at that time
17/07/2019	Hibernia Oil Spill	Oil expressed on the water could be in the order of 12,000 L. It occurred inside Canadian EEZ, but the analysis indicated that the oil was extended outside the EEZ and into the NAFO NRA (see foot note)
16/10/2018	White Rose Field Oil Spill	250,000 L of oil were released to the environment
27/04/2018	Unauthorized discharge of Synthetic Based Mud (SBM) (Transocean Barents platform)	28,000 L of SBM was released to the environment
29/03/2017	Near Miss - Iceberg Approaches Close to the SeaRose Floating Production, Storage and Offloading (FPSO) Vessel	A medium size iceberg came within 180 meters of the FPSO (about 340,000 barrels of crude oil on board at that time)
15/07/2016	Unauthorized discharge/Impairment of safety critical equipment (Henry Goodrich drilling)	Approximately 1,800 L of hydraulic fluid was released to the environment
15/02/2016	Unauthorized discharge of glycol (West Aquarius)	1,317 L of glycol was released to the sea
30/09/2015	Unauthorized discharge of methanol (Terra Nova field)	3,000 L of methanol was released to the sea
31/08/2015	Major hydrocarbon gas release (Southern drill center)	8,938 kg of natural gas was released to the sea
28/07/2015	Major hydrocarbon gas release (Terra Nova FPSO)	10,000 kg of gas was released

⁷ According to the letter from Fisheries and Oceans Canada sent to NAFO, 23rd July 2019 (Ref.NAFO/19-205).

3.3 The issue of the routine operations

In addition to the impacts of accidental events, there is a concern about the effects of routine operations on the ecosystems. According to Cordes *et al.* (2016), routine oil and gas activities can have detrimental environmental effects during each of the main phases of exploration, production, and decommissioning. Figure 3 shows the diagram of the impacts from typical deep-sea drilling activity.

Environmental effects include impacts from routine operational activities such as drilling waste and produced water discharges (Neff *et al.*, 2011; Neff *et al.*, 2014), accidental discharges and spills (e.g. Cordes *et al.*, 2016), long-term impacts on deep-sea corals (e.g., Girard and Fisher, 2018) and impacts on deep-sea sponges and their associated habitats (Vad *et al.*, 2016).

There is a need to assess the cumulative impacts of human activities (e.g., fisheries and oil and gas exploration/exploitation) on the NAFO ecosystems. Moreover, in order to have a better understanding of the contribution of each anthropogenic activity, impacts should be assessed both inside VME polygons and VME closure areas (NAFO, 2020).

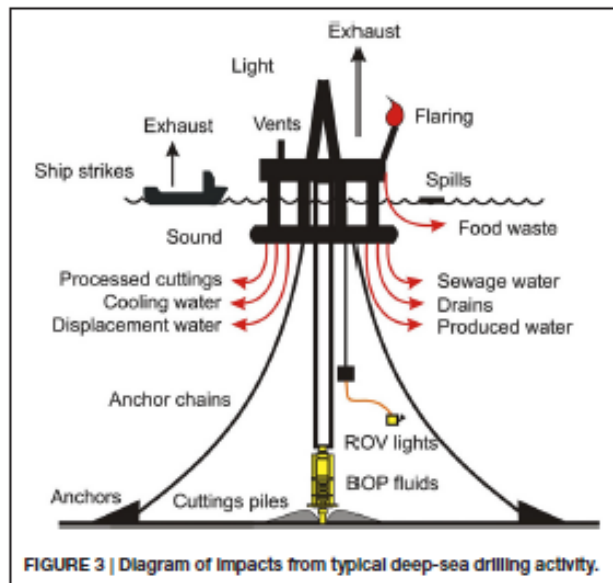


Figure 3. Diagram of impacts from typical deep-sea drilling activity (Source: Cordes *et al.*, 2016)

3.4 Data availability and data gaps

In general, data on geographical location of oil and gas activities is available in websites and project reports (including location and technical details of a development project in the Flemish Pass). In contrast, information on the adverse impacts of such activities (e.g. routine operations, accidental events, unauthorized discharges, exploratory drilling on VME closed areas, etc.), as well as details on mitigation measures, is scarce, less visible or difficult to obtain from such sources.

3.5 Implications for the development of ecosystem summary sheets (Divisions 3LNO and Division 3M)

In 2019, information on oil and gas activities was included for the first time in the ecosystem summary sheet for Divs. 3LNO (NAFO, 2020).

In 2021, a similar exercise is needed for Division 3M, considering that, at present, most of the oil and gas activities in NAFO Regulatory Area are located in Division 3M (see Figure 1). Some of these activities – particularly wells (Table 2) and Licences (Table 3) – overlap fishing grounds, VME polygons (e.g. sponges, sea pens and black corals) and VME closures (e.g. Areas 6, 9, 10, 11 and 12).

Table 2. List of wells located in NAFO Division 3M (source C-NLOPB) indicating their spatial location with respect to the NAFO VME closures (2020) and/or VME polygons (2019).

Well Name	Well #:	Surface Lat. (NAD 83)	Surface Long. (NAD 83)	Well Classification ⁸	Water Depth (m)	Observations
Baccalieu F-89	426	47° 58' 24.63"	46° 12' 52.29"	Exploration	1,146	Inside VME polygons (sponges and sea pens) and VME Closed Area 10
Baccalieu I-78	109	47° 57' 41.49"	46° 10' 46.76"	Exploration	1,092.8	Inside VME polygon (sea pens) and VME Closed Area 10
Bay de Loup M-62	425	47° 51' 48.70"	46° 25' 19.42"	Exploration	1,170	Inside VME polygon (sponges)
Bay de Verde F-67	404	47° 56' 18.98"	46° 24' 42.04"	Exploration	1,165	Inside VME polygon (sponges)
Bay du Nord C-78	391	47° 57' 00.24"	46° 26' 28.67"	Exploration	1,166	--
Bay du Nord L-76	415	47° 55' 43.94"	46° 26' 42.66"	Exploration	1,177	--
Bay du Nord P-78	412	47° 57' 46.71"	46° 25' 44.93"	Exploration	1,173	--
Bonaventure O-96	441	48° 15' 47.11"	46° 14' 09.32"	Exploration / Delineation	1,116	--
Harpoon O-85	385	48° 04' 52.00"	46° 12' 18.87"	Exploration	1,160	Inside VME polygons (sponges and sea pens)
Mizzen F-09	369	48° 18' 21.68"	46° 15' 52.73"	Delineation	1,067	--
Mizzen L-11	234	48° 10' 31.75"	46° 17' 35.55"	Exploration	1,153	--
Mizzen O-16	342	48° 15' 55.52"	46° 17' 06.67"	Exploration	1,095	--
Portugal Cove E-38	440	47° 57' 21.34"	46° 20' 44.45"	Exploration	1,169	Inside VME polygon (sponges)

⁸ *Exploration well*: A well drilled on a geological feature on which a significant discovery has not been made; *Delineation well*: Normally, a well drilled on a significant or commercial discovery of petroleum, drilled in order to determine the commercial value; *Dual classified wells*: e.g. Exploration/delineation wells.

Table 3. List of Licences located in NAFO Division 3M (source C-NLOPB) indicating their spatial location with respect to the NAFO VME closures (2020) and/or VME polygons (2019). SDL: Significant discovery licences; EL: Exploration licences.

Licence	Observations
SDL-1047	Overlap with fishing grounds
SDL-1058	Overlap with VME polygons (sponges and sea pens) and VME Closed Area 10
SDL-1057	Overlap with VME polygons (sponges and sea pens) and VME Closed Area 10
SDL-1056	Overlap with VME polygons (sponges, sea pens and black coals) and VME Closed Area 10
SDL-1055	Overlap with VME polygons (sponges and black corals)
EL-1139	--
EL-1140	--
EL-1141	Overlap with fishing grounds, VME polygon (sponges) and VME Closed Area 6
EL-1142	Overlap with fishing grounds, VME polygons (sponges, sea pens and black coals) and VME Closed Areas 6, 9 and 12
EL-1143	Overlap with fishing grounds, VME polygons (sponges, sea pens and black coals) and VME Closed Area 10
EL-1150	Overlap with fishing grounds, VME polygons (sea pens and black corals) and VME Closed Area 11
EL-1144	Overlap with VME polygons (sea pens and black corals)

4. Conclusions

1. Information on geographical (spatial) location of oil and gas activities in the NRA is publicly available from several sources.
2. Conversely, information on the potential impacts of such activities, as well as mitigation measures, is scarce, less visible or difficult to obtain.
 - a. Based on the publicly available information, offshore oil and gas activities in NAFO Divs. 3LNM increased in recent years. Moreover, environmental “incidents” have occurred in NAFO CA in recent years.
 - b. Ecosystems inside “NAFO VME closures” and outside “NAFO footprint” are currently protected against SAI from bottom fishing, but they are unprotected regarding potential threats from activities other than fishing (e.g. drilling activities inside VME closures in Divisions 3L and 3M).
 - c. In addition to the “ecosystem issues”, there are other issues related with the “use of the marine space” (e.g. potential conflicts between NAFO bottom fisheries, fisheries research, and oil and gas activities).
 - d. Information on “activities other than fishing” (e.g. spatial location, overlap with NAFO fisheries and VMEs, potential impacts, etc.) should be considered for the development of the ecosystem summary sheets for Divisions 3LNO, and particularly for Division 3M, as most of the oil & gas activities in NAFO RA are located in Division 3M.

Acknowledgements

The authors were supported by ATLAS project. This work contributes to the European Union’s Horizon 2020 research and innovation programme under grant agreement No 678760 (ATLAS). This output reflects only the author’s view and the European Union cannot be held responsible for any use that may be made of the information contained therein.

References

- Cordes, E.E., Jones, D.O.B., Schlacher, T.A., Amon, D.J., Bernardino, A.F., Brooke, S., Carney, R., DeLeo, D.M., Dunlop, K.M., Escobar-Briones, E.G., Gates, A.R., Génio, L., Gobin, J., Henry, L.-A., Herrera, S., Hoyt, S., Joye, M., Kark, S., Mestre, N.C., Metaxas, A., Pfeifer, S., Sink, K., Sweetman, A.K., Witte, U. (2016). Environmental impacts of the deep-water oil and gas industry: a review to guide management strategies. *Frontiers in Environmental Science* 4. 10.3389/fenvs.2016.00058.
- Durán Muñoz, P., Sacau, M., Román-Marcote, E. and García-Alegre, A. (2020). A theoretical exercise of Marine Spatial Planning in the Flemish Cap and Flemish Pass (NAFO Divs. 3LM): implications for fisheries management in the high seas. NAFO SCR Doc. 20/022. pp 25.
- Equinor Canada Ltd. (2020). Bay du Nord Development Project – Environmental Impact Statement. Prepared by Wood Environment & Infrastructure Solutions and Stantec Consulting. St. John's, NL Canada. July 2020.
- Girard, F. and Fisher, C. (2018) Long-term impact of the Deepwater Horizon oil spill on deep-sea corals detected after seven years of monitoring. *Biological Conservation* 225, 117-127. 10.1016/j.biocon.2018.06.028.
- NAFO (2018) Report of 11th Meeting of the Scientific Council Working Group on Ecosystem Science and Assessment (WG-ESA). Northwest Atlantic Fisheries Organization. 13-22 November 2018, Dartmouth, Canada. NAFO SCS Document 18/23.
- NAFO (2019a) Report of the 12th Meeting of the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WG-ESA). Northwest Atlantic Fisheries Organization. 19-28 November 2019, Dartmouth, Canada. NAFO SCS Document 19/25.
- NAFO (2019b) Report of the NAFO Joint Commission-Scientific Council Working Group on the Ecosystem Approach Framework to Fisheries Management (WG-EAFFM) Meeting. Northwest Atlantic Fisheries Organization. 16-18 July 2109, Dartmouth, Canada. NAFO COM-SC Doc. 19-03.
- NAFO (2020) Report of the 13th Meeting of the NAFO Scientific Council Working Group on Ecosystem Science and Assessment (WG-ESA). Northwest Atlantic Fisheries Organization. 17-26 November 2020, By WebEx. NAFO SCS Document 19/25.
- Neff, J.M., K. Lee and E.M. DeBlois (2011) Produced water: overview of composition, fates and effects. In: *Produced Water: Environmental Risks and Advances in Mitigation Technologies*. K. Lee and J.M. Neff (eds.), Springer Press, NY. pp. 3-54.
- Neff, J., K. Lee, E.M. DeBlois and G.G. Janes (2014) Environmental Effects of offshore drilling in a cold ocean ecosystem: A 10-year monitoring study at the Terra Nova offshore oil development off the Canadian east coast. *Deep Sea Research II: Topical Studies in Oceanography* 110: 1-3. (DOI: 10.1016/j.dsr2.2014.10.018).
- Vad, J., Kazanidis, G., Henry, L.A., Jones, D.O.B., Tendal, O.S., Christiansen, S., Henry, T.B. and Roberts, JM (2016) Potential Impacts of Offshore Oil and Gas Activities on Deep-Sea Sponges and the Habitats They Form. In *Advances in Marine Biology* 79, Elsevier, pp. 33-60. 10.1016/bs.amb.2018.01.001.