

## “Commercially Sensitive” Environmental Data: A Case Study of Oil Seep Claims for the Old Harry Prospect in the Gulf of St. Lawrence, Canada

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**ABSTRACT** We expose the difficulties we encountered to obtain from industry environmental information that is crucial for impact studies and decision-making related to the potential development of offshore oil and gas in the Gulf of St. Lawrence, Canada. This case concerns the information disseminated by the oil company Corridor Resources that there are six persistent, natural oil seeps emanating from the flanks of the Old Harry geological structure in the Gulf of St. Lawrence. According to Corridor, these seeps rise through the water column and appear at the sea surface directly above the prospect, forming permanent oil slicks visible from satellite imagery. Corridor believes this is an indication that the Old Harry prospect contains oil. While this information might be credible, it has been impossible for us to verify its accuracy because the sources are kept secret under the argument of “commercially sensitive.” Yet, such information about the possible presence of natural oil and its sources is essential to obtain and to verify in order to construct a reliable baseline initial state against which any new man-made oil contribution resulting from eventual oil and gas development could be compared with, and impacts on the marine environment, ecosystem, and people be then truly assessed. We describe the legal, economic, and political contexts in which withholding this information might happen, and we take a critical look at its impact on scientific research as well as on decision-making in society.

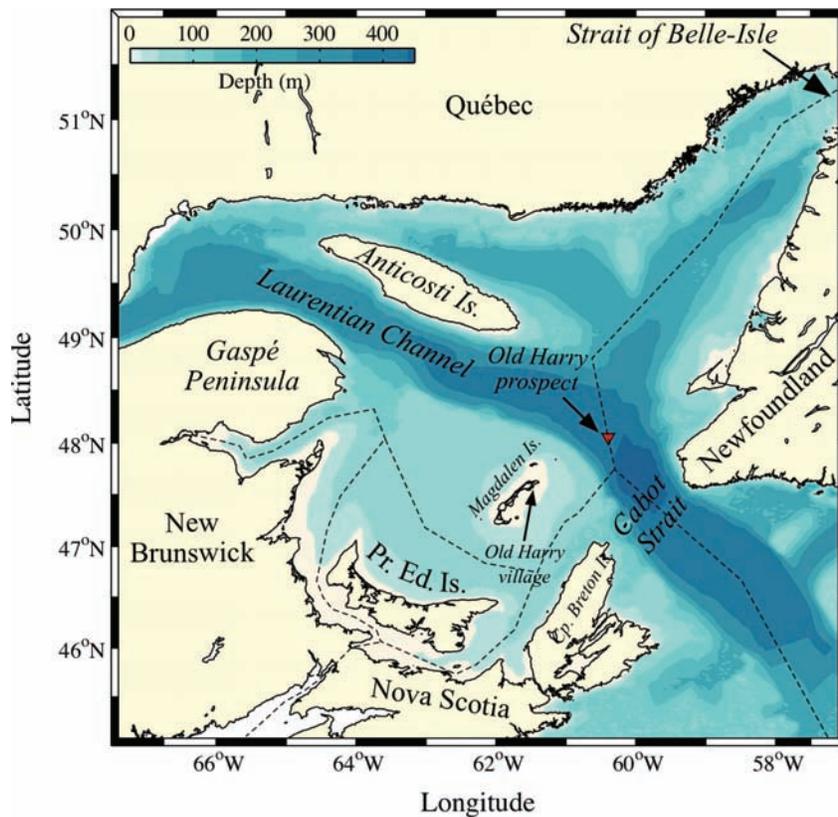
### KEY MESSAGE

Readers will learn how important environmental data and analyses held by the industry regarding offshore oil and gas development may be kept secret under the argument that the data are “commercially sensitive.” Readers will face a number of ethical and societal questions regarding this issue and, towards the end, will be asked whether important environmental issues should also consider a concept of “environmentally and socially sensitive” information.

### INTRODUCTION

Canada was once recognized as an international leader in environmental protection [1]. Yet, while the country continues to assert its commitment to sustainable development [2], in practice, particularly over the last decade,

Canadian environmental policies and practices foster short-term economic development goals (particularly oil extraction) rather than long-term sustainability goals [1, 3]. Here we discuss one specific instance of such dynamics, focusing on a case when environmental information of great relevance to a controversial oil and gas development project in Gulf of St. Lawrence in Eastern Canada (Figure 1) was withheld by the industry in the name of “commercial sensitivity.” This case illustrates how the underlying mechanics of streamlining and impediments that characterizes Canada’s environmental policy on fossil fuel [3] may manifest themselves, for example by raising barriers to scientists’ involvement in policy making or through the creation of development-oriented agencies exempt from disclosure requirements typically applicable to the government institutions.



**FIGURE 1.** The Gulf of St. Lawrence, its bathymetry in meters and the location of the Old Harry prospect (red triangle). Dashed lines are interprovincial boundaries. The Old Harry prospect lies right on the Québec and Newfoundland and Labrador boundary.

The Gulf of St. Lawrence in Eastern Canada (Figure 1) is a semi-enclosed, seasonally ice-covered subarctic sea that is currently under serious consideration by Canadian government for oil and gas development [4]. The most promising site is the Old Harry prospect,<sup>1</sup> located at a depth of 470 m. Corridor Resources, a junior oil and gas development company, holds the exploratory license over that prospect and is waiting for an approval from the Canada-Newfoundland and Labrador Offshore Petroleum Board to attempt to drill an exploratory well. We refer to Bourgault et al. [4] for more details about the history of the regulatory processes that surround this project.

Corridor has been claiming for more than a decade that the flanks (i.e., the sides) of the domelike Old Harry geological structure naturally and persistently seep oil to the point

that it can be detected at the sea surface right above the site by satellite imagery. However, the data source and analyses used to reach this conclusion are restricted and unavailable to scientists or the general public. Yet, this type of information about the potential natural presence of hydrocarbons in the sea environment must be known prior to any oil and gas development, if only to determine the background natural state against which the state of the Gulf under oil and gas development could be compared with in order to assess the cumulative impact on the marine ecosystem [5].

We describe here the deadlock we encountered when attempting to verify Corridor's claims. We also show how the legal context applicable to the oil and gas industry usually place significant restrictions on the diffusion of technical and scientific information, thus implicitly favoring the confidentiality and proprietary nature of industry data over general public information, scientific knowledge, and discerning policy choices.

1. This prospect was named Old Harry in reference to the Old Harry village located on the Magdalen Island, the closest community to the prospect roughly 80 km away (Figure 1).

## CASE EXAMINATION

### *Natural Offshore Oil Seeps*

Nearly half of the oil found in the marine environment comes from natural seeps [6]. These seeps are caused by slow seepage of oil and gas through networks of veins and cracks that naturally occur in sedimentary rock, extending from the deeply buried reservoir up to the seafloor. Once in contact with seawater, the fraction of oil that is heavier than the bottom water is deposited on the sediment near the seep, while the lighter gas and oil rise higher up the water column. Oil rises until it reaches an equilibrium depth, which is where the oil has the same density as the surrounding stratified<sup>2</sup> water. If the oil is light enough, it may rise all the way to the surface. If the amount of light oil released is large enough, it can create a visible slick on the surface. After a certain amount of time, the most volatile part of the oil slick will evaporate, leaving behind heavy oil that may sink and be deposited further away on the seafloor (Figure 2).

Under certain conditions, these slicks generated by natural seeps can be detected by satellite imagery [7]. These observations can indicate the presence of an oil reservoir in the nearby seabed, although it remains difficult to clearly determine the exact source of an oil slick if it is solely detected by satellite imagery.

### *Natural Oil Seeps in the Old Harry Area?*

The geological structures associated with natural seeps are usually found grouped in precise areas around the globe, for example in the Gulf of Mexico [7]. The question here is whether the Old Harry site is such a place.

According to Corridor Resources, Old Harry is indeed such a site. The company has been claiming for the last 15 years that “six natural oil seeps have been detected on the ocean surface by satellite, apparently emanating from the flanks of Old Harry” [8]. This statement appeared in the company’s annual reports from 2000 through 2005 [8] and has been repeated annually in their Annual Information Forms [9]. This information has also been repeated in presentations to the general public, including in the Magdalen Islands, Canada, in April 2011 during a forum on the exploration and development of oil and gas in the

2. The ocean is vertically stratified in density, with lighter water overlying denser water. In the Gulf of St. Lawrence, the stratification is mostly set by salinity differences, with bottom layers being saltier than surface layers. Therefore, oil of intermediate density may well be caught in mid-water.

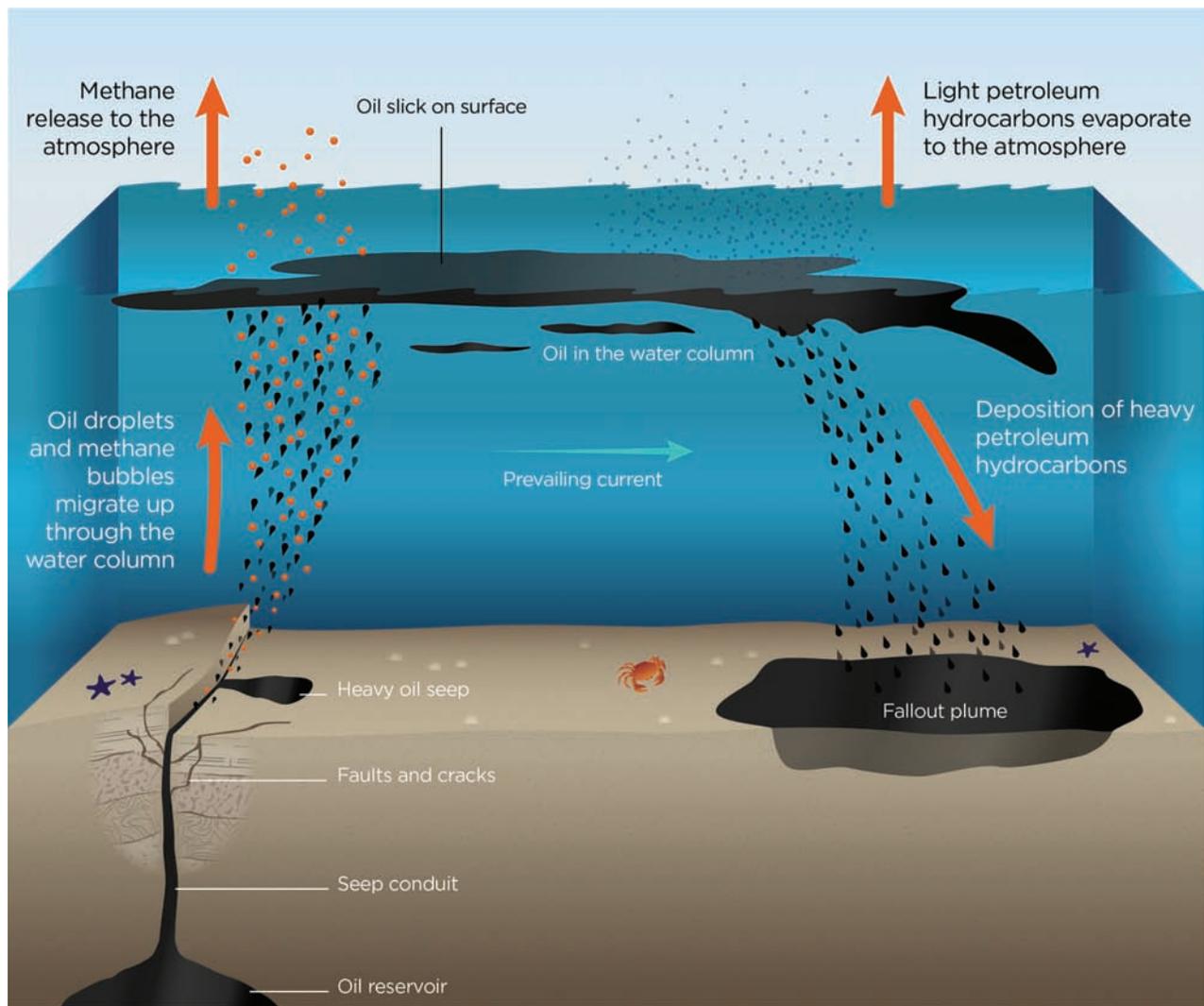
Gulf of St. Lawrence. In addition, during this meeting, Corridor’s representative described these six seeps as being “persistent,” thus suggesting that the Old Harry site naturally leaks oil both continuously and permanently. This oil would seemingly rise up 470 m through the water column and appear directly above the site [10].<sup>3</sup> According to Corridor, the amount of oil released in this way is significant enough to be observable at the surface by satellite imagery. However, Corridor does not give any other information to support this statement, and such information is necessary to assess the impact that oil and gas exploration may have on this environment.

We contacted Corridor’s management to obtain more information on these seeps. We were informed that they were not allowed to disclose further details because they were constrained by an exclusivity contract with Airbus Defence and Space Company which produced the seeps analyses and sold them to Corridor. In fact, Airbus produced the databases on hydrocarbon seeps in the Gulf as part of a contract granted by Nalcor, an independent provincial corporation with a statutory mandate as agent of the Newfoundland and Labrador provincial government to invest in, engage in, and carry out activities in all areas of the energy sector in the province. We then contacted Airbus and were informed that the data in question were “commercially sensitive” and could not be publicly shared.

This situation raises many questions. For example, how does Corridor have the right to disclose the conclusions (“six oil seeps have been detected”), but not the methods used for the analysis or the data? What exactly do the terms “commercially sensitive” mean in this context? Sensitive for whom and for what? In addition, why would Corridor disseminate the conclusions if the information were really commercially sensitive? Is it to convince governments, investors, and the public that there is a substantial hydrocarbon reserve at Old Harry? Or, could it also be to minimize the impact of accidental spills that could be caused by exploration activities, by arguing that natural leaks already existed?

Several other questions come to the critical mind. For example, do these supposed seeps only exist around

3. “We hired a company that uses orbiting satellites to take pictures of the sea surface . . . and what they’ve noticed is that over the Old Harry site there are six persistent oil signatures on the surface. So there’s an indicator from these satellites images that there’s potential oil seeping out of Old Harry at the present day” [10].



**FIGURE 2.** Schematic diagram showing the route traveled by oil and gas released into the ocean by natural seeps. Image redrawn and inspired by a similar illustration by Jack Cook, Woods Hole Oceanographic Institution, <http://www.whoi.edu/oil/natural-oil-seeps>.

Old Harry or do seeps also occur in many other parts of the Gulf? Alternatively, is the Old Harry area really a hot spot for seeps in the Gulf? Depending on the answer, the interpretation and environmental monitoring of these seeps would be approached completely differently. Corridor does not explain whether the satellite analyses have only been focused on Old Harry area or over the entire Gulf. If the analysis is only focused on Old Harry, it seems risky to generalize and conclude that Old Harry is a hot spot for seeps in the Gulf. We asked Corridor these questions but did not receive any answers. We also raised these questions with Airbus, who only partially responded that similar seeps have apparently been detected in other areas of the Gulf. But

where? And, how many? Further information was not provided.

We also asked Airbus how they were able to determine that the identified seeps were coming from the flanks of Old Harry. Airbus informed us that this conclusion was not a result of their analyses. Airbus only provided Corridor with the locations of the seeps they had identified. Thus the claim that the seeps likely come from the flanks of Old Harry would be Corridor's interpretation, but we cannot infer how they have arrived at this conclusion. Given the currents and the water column properties [4], we wonder how oil seeping up from Old Harry through 470 m of water could possibly appear on the surface right above the site.

### *Impacts of Commercial Secrets on Environmental Assessment*

Marine organisms living in environments where oil seeps naturally occur are exposed to so-called chronic petroleum contamination, as opposed to the acute contamination that occurs during major spills, usually associated with accidents during exploration, development, production, or transport of oil and gas. Chronic exposure ensuring that exposed organisms exhibit unique adaptations that allow them to live in contaminated environments, over several generations. These adaptations are probably genetically codified, due to the long-term selection, as shown for crude oil fields [11], allowing organisms to metabolize the oil. Molecular tools would help to understand the physiological mechanisms behind this tolerance. These organisms then become models for the study of the impact of oil and resilience/adaptation in a given environment. In this sense, in the Old Harry site, scientific studies carried out without characterizing the state of the ecosystem before any disturbance due to oil would be biased if no information on potential regular seepage of oil were available. Indeed, little is known about the effects of chronic oil contamination on ecosystems [12]; having the opportunity to study the Gulf of St. Lawrence in this regard would represent an important step in understanding the potential impact of hydrocarbons on the environment.

In addition, organisms around the seeps, especially bacteria, possibly have the ability to degrade oil in their natural environment. Their use in the event of an accident could be an asset to limit the consequences of a spill. Accordingly, the appropriate conditions for these organisms to react should be studied. For instance, it is known that some bacteria can degrade oil only in the presence of inorganic nutrients [13]. Failure to be aware of their potential presence and the conditions needed for them to grow could mean a delay in responding to an environmental emergency. This could also prevent or reduce the emergence of a technical innovation or discovery in the sector. In addition, hydrocarbons oxidized by bacteria can serve as a food source for benthic organisms and this is more important at great depths [14]. On the other hand, the increase in the activity of such bacteria around the deep sources of oil can lead to a decrease in the concentration of oxygen in the sediments. This, in turn, could be affecting the metabolism of benthic organisms [15], and this, in a system where hypoxia is already a source of stress for organisms [16, 17, 18], which would allow to study the affected organisms as if

they were affected by multiple simultaneous stressors, here hydrocarbon and hypoxia. Other affected organisms are cetaceans and sea turtles, some of which have been considered of special concern by the Canadian government, and which are emblematic animals in the Gulf of St. Lawrence [5]. The study of their responses to simultaneous stressors such as oil contamination and seismic testing that could arise from oil exploitation on their behavior would benefit from the knowledge of their preadaptation to hydrocarbon-rich conditions. It should however be noticed that the sublethal effects of chronic exposure to oil of these organisms is still an open question [19, 20].

### *Legal Aspects*

According to the answers provided by Corridor and generally available information, data on oil seeps in around Old Harry belong to Airbus. Oil and gas companies pay Airbus to obtain commercial licenses that grant access to the data for exploration purposes. Otherwise, the contractual relationships among Airbus, Corridor, and Nalcor remain opaque. Neither the general public nor third parties have access to either the contractual arrangements whereby Airbus granted commercial licenses on oil seeps data to Corridor or the financing agreements with Nalcor that led to the establishment of Airbus' databanks. In particular, it is difficult to determine whether Nalcor has a set of the oil seeps data, or without being in possession of the data, has rights over the data.

The opacity over the rights to the oil seeps data translates into uncertainty over the application of the legal framework regarding information disclosure in the Newfoundland and Labrador portion of the Gulf. Because the *Energy Corporation Act* (ECA) establishes Nalcor as an independent agent of the provincial government, Nalcor is not subject to the disclosure requirements applicable to the State and its representatives. According to the ECA, Nalcor may also refuse to divulge data that are "commercially sensitive" for Airbus (see sections 2(b.1) and 5.4 ECA). If Nalcor has rights over oil seeps data, Nalcor may nonetheless decide to make them available to the public depending on its own access to information policy, as already done with respect to aeromagnetic survey data. However, there are no obvious recourses to obtain access to the seeps data if Nalcor opposes its disclosure.

These uncertainties and barriers over access to data should be understood in the context of the oil and gas industry. General practice and norms in the industry usually

consider data related to the discovery and the development of an oilfield as confidential and proprietary information [21]. The protection generally granted to such data reflects into the framework for oil and gas development in the Gulf of the St. Lawrence, as provided for by agreements between the federal government and the coastal provinces of Newfoundland and Labrador, Nova Scotia, and Quebec. These agreements broadly require that information filed by oil and gas companies be treated as confidential and only be disclosed under written permission of the data owner (see *Accord entre le gouvernement du Canada et le gouvernement du Québec sur la gestion conjointe des hydrocarbures dans le golfe du Saint-Laurent*, section 13.2).

The protection for confidential information manifests policy considerations underlying the legal framework. Thus, an administrative agency in charge of applying the legal framework in a portion of the Gulf of St. Lawrence can prevent the disclosure of information about a decision on oil and gas development in a public hearing [22]. The agency's decision is justified when (i) the disclosure could result in a material loss to, or a prejudice to the competitive position of, an oil and gas company, and (ii) the potential harm resulting from the disclosure outweighs the public interest in making the disclosure. The same balance of interests justifies prohibiting the disclosure of financial, commercial, scientific, or technical information that has been consistently treated as such by the industry.

Although far from ensuring transparency, these examples of legal provisions applicable in the Gulf show a somewhat permissive approach to information disclosure within the general context of oil and gas regulation. Federal and provincial laws applicable to the industry usually place significant restrictions on the diffusion of technical and scientific information to protect the confidentiality and proprietary nature of data [23]. For example, security and safety as well as potential loss of profits or competitiveness justify a complete ban on some data disclosure regarding pipelines [24]. Geological data gathered by exploration companies in relation to deposits are usually protected as confidential for several years, since data exclusivity is deemed to encourage resource development [25]. In such a case, it is assumed that restricting disclosure provides a competitive advantage to the company that owns the data, thus stimulating extractive activities, and in turn furthering economic growth and fiscal revenues through increased taxes and royalties.

In Canada, general access to information legislation does not offer alternatives to obtain confidential data protected by oil and gas industry regulation. Access to information legislation target governmental entities rather than private oil and gas companies. In addition, it complements sectoral regulation for the oil and gas industry only when the latter is silent. Finally, provisions for access to information are restricted by numerous exceptions that protect the confidentiality of professional opinion, expert advice, technical, industrial, financial, and commercial data [26, 27]. Environmental legislation broadens access to information to a certain extent, but still relies on a balance that favors non-disclosure because monetary losses to the industries are more easily determined than environmental degradations that are difficult to value, that have multiple and often indiscernible causes, and that materialize over long time scales. Such is the case of information disclosure on pollutants under the *Canadian Environmental Protection Act* (CEPA, sections 52, 315), requiring that the public interest in the disclosure clearly outweighs in importance any material financial loss or prejudice to the competitive position of the polluter, as well as any damage to the privacy of any individual that may result from the disclosure.

The various norms applicable to disclosure and confidentiality in the oil and gas industry reflect a fluid balance between diverse conceptions of the public good. The liberal approach protects commercial and industrial information to encourage economic activity and thus increase well-being and social value. In other words, the profit-making endeavor of individual economic actors within the market maximizes the common good through net social wealth. A public-good viewpoint opposes the private interest that justifies confidentiality to the broader public interest that requires disclosure for public health and safety. This viewpoint recognizes the need for state intervention to remedy free market defects that generate negative externalities, including the environmental impacts of natural resources development. Section 1472 of the *Civil Code of Quebec* illustrates the precarious equilibrium between these two positions:

“A person may free himself from his liability for injury caused to another as a result of the disclosure of a trade secret by proving that considerations of general interest prevailed over keeping the secret and, particularly, that its disclosure was justified for reasons of public health or safety.”

In this restrictive legal context, the challenge is to ensure that the data disclosed about natural resources development are relevant and accurate from both scientific and general perspectives. In turn, this requires that promoted research projects remain legitimate by exploring questions not only related to the commercial interests of the industry but also to the public good and the environment. It might then appear sensible to label some information as “socially sensitive” or “environmentally sensitive” to balance the existing “commercially sensitive information.”

## CONCLUSION

From an environmental perspective, it is crucial that the information provided by Corridor about oil seeps in the Gulf of St. Lawrence be independently, scientifically, and transparently verified. If it is verified that the Gulf of St. Lawrence, or Old Harry, indeed persistently seeps oil, new monitoring and research programs must be developed to monitor the amount of oil naturally released into the system and to identify the seep sources before undertaking any exploration or development activities. This is necessary in order to provide a baseline against which any new man-made oil contribution resulting from eventual oil and gas development could be compared with. Otherwise, the only assumption that could reasonably be made if hydrocarbons substances are detected after oil developments have started would be that the natural baseline oil concentration was nil given that there are currently no open scientific literature that suggests otherwise, despite several decades of oceanographic research in the Gulf of St. Lawrence. In that case, any oil detection would be presumably attributed to oil and gas development activities. Failure to have access to the existing commercially sensitive data on possible natural oil seepages at Old Harry can therefore have consequences on the management and regulations of oil and gas activities and may lead to misinformed decisions.

## CASE STUDY QUESTIONS

Here’s a list of questions, addressed to Corridor and Airbus but that the reader is invited to think about, that naturally arise from this case study, many of which we have already asked without obtaining any response:

1. Why does Corridor be permitted to share the conclusions of a study, but not the details?

2. Why are the satellite data considered “commercially sensitive”? What could be done with those data that would harm the economy or the interests of the private firms holding the data?
3. How many images, over what area, and over what time period were analyzed to detect the six seeps in question? Was there only one image showing six simultaneous seeps? Or, were there six different images? Or, is this information based on statistics made out of the analysis of tens or hundreds of images over decades? In short, what is the statistical robustness of these analyses and conclusions?
4. How was it determined that the detected seeps were natural?
5. How was it determined that the detected seeps were from the flanks of Old Harry and not from elsewhere?
6. On what basis did the study determine that the seeps were persistent?
7. Finally, in such important societal debates, would it not be pertinent to also incorporate a concept of information’s “environmental and social sensitivity”? Could it be that in some situations, like the case study presented here, environmental and/or social sensitivity may indeed have more “costly” consequences than so-called “commercial sensitivity”?

## AUTHOR CONTRIBUTIONS

- Daniel Bourgault: Conceptualization, data curation, funding acquisition, investigation, methodology, project administration, resources, validation, visualization, writing original draft, review and editing.
- Hugo Tremblay: Funding acquisition, conceptualization, writing original draft; review and editing.
- Irene Schloss: Funding acquisition, project administration, writing original draft, review and editing.
- Steve Plante: Funding acquisition, project administration, review and editing.

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## COMPETING INTERESTS

The authors have declared that no competing interests exist.

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