



Declining Arctic Ocean oil and gas developments: Opportunities to improve governance and environmental pollution control



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ARTICLE INFO

Keywords:

Arctic
Oil and gas development
Arctic Council
Governance
Environmental pollution

ABSTRACT

There has been global interest in the exploitation of rich hydrocarbon resources in the Arctic for decades. However, recent low oil prices, a low carbon economy climate agenda, and technical challenges of Arctic oil extraction have curbed interest in these Arctic resources. Despite a recent reluctance to explore and develop an offshore Arctic drilling industry, a resurgence in oil and gas prices could spark renewed interests that could pose unacceptable risks of pollution from oil spills. These risks are further compounded by complex governance and sovereignty issues between circumpolar nations. This paper (i) compares cycles of Arctic hydrocarbon exploration and exploitation activity with global energy prices; (ii) outlines current pollution abatement techniques under pan-Arctic national regulations to identify potential gaps; (iii) describes current international frameworks for Arctic governance to highlight how problems could arise if offshore oil drilling returns to the Arctic and associated spills migrate to international waters; and (iv) provides policy recommendations to aid both national and international policy-makers regarding pollution abatement methods for future Arctic drilling.

1. Introduction

The Arctic is rich in hydrocarbon resources [1]. Despite the harsh climate, offshore Arctic drilling began in the 1970s [2,3]. Until recently, global interest in exploitation of these resources were fueled by relatively high global energy prices and declining Arctic sea ice cover [4–7]. However, offshore drilling activity has seen cycles of exploration and development, largely due to wide fluctuations in global energy prices [6,7]. Recent low oil prices combined with Western sanctions policies against Russia's Arctic oil and gas industry [8], the new Conference of Parties 21 (COP21) low carbon economy climate agenda [9], and logistical and technical challenges of Arctic oil and gas operations [10] have curbed interest in the Arctic. Despite the cyclical nature of Arctic hydrocarbon exploitation, a resurgence in oil and gas prices could spark renewed interest, that could pose unacceptable risks of pollution from oil spills [11,12].

Five countries with coastal access to the Arctic Ocean (Canada, U.S., Russia, Norway, and Denmark) have long sought opportunities to explore and extract or extend their exclusive rights to these resources [13]. The United Nations Convention on the Law of the Sea (UNCLOS), established by the United Nations (UN) in 1984, is a quasi-constitutional treaty that grants certain areas of the Arctic seafloor to the five circumpolar nations [13]. The UNCLOS states that exclusive economic zones (EEZs) shall not extend beyond 200 nautical miles (nm) from

which the breadth of the territorial sea is measured [14]. Upon ratification of the UNCLOS, Arctic coastal countries have 10 years to make scientifically proven claims to an extended continental shelf which, if validated, provide exclusive rights to resources on or below the seabed of that extended shelf area [13]. The U.S. signed, but has not ratified the UNCLOS, so cannot formally assert any rights to resources beyond their EEZ, nor join the UN commission that adjudicates these claims [13,15]. Norway, Russia, Canada, and Denmark launched projects to provide a basis for seabed claims on extended continental shelves beyond their EEZ [13]. For example, the Lomonosov Ridge extending 2000 km across the Arctic Ocean from Russia to Canada is currently claimed by Russia as an extension of the Asian continental shelf, while both Canada and Denmark claim it is an extension of the North American continental shelf [Fig. 1]. Although Arctic coastal states have made different claims as to the outer delimitation of their continental shelves, sovereignty issues are regulated under UNCLOS rules.

To date, hydrocarbon activity has been focused in relatively shallow water in jurisdictional waters of individual Arctic nations. However, most offshore Arctic hydrocarbon resources remain unexplored, with extensive Arctic continental shelves (7 million km²) and international waters beyond continental shelves (6 million km²) [1], Fig. 2. Recent estimates of total global undiscovered Arctic Ocean oil and gas reserves are 13% and 30%, respectively, with much of this extending beyond

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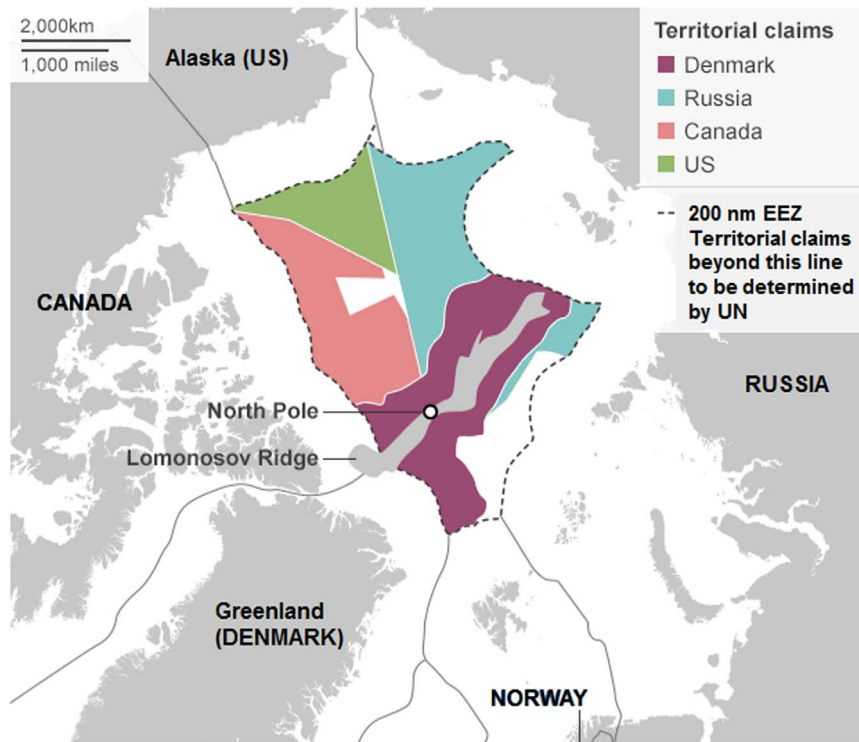


Fig. 1. Arctic Ocean potential offshore petroleum resource development areas (adapted from USGS, 2008).

Arctic nations' jurisdictional waters [1]. Complex sovereignty issues are further compounded because future Arctic hydrocarbon resource development poses extreme logistical and environmental challenges

[2]. Risks from blow-outs and pollution from offshore drilling, production, and transportation are widely recognized [2,11]. The Arctic is particularly vulnerable because of extreme seasonality, fragile ecosys-

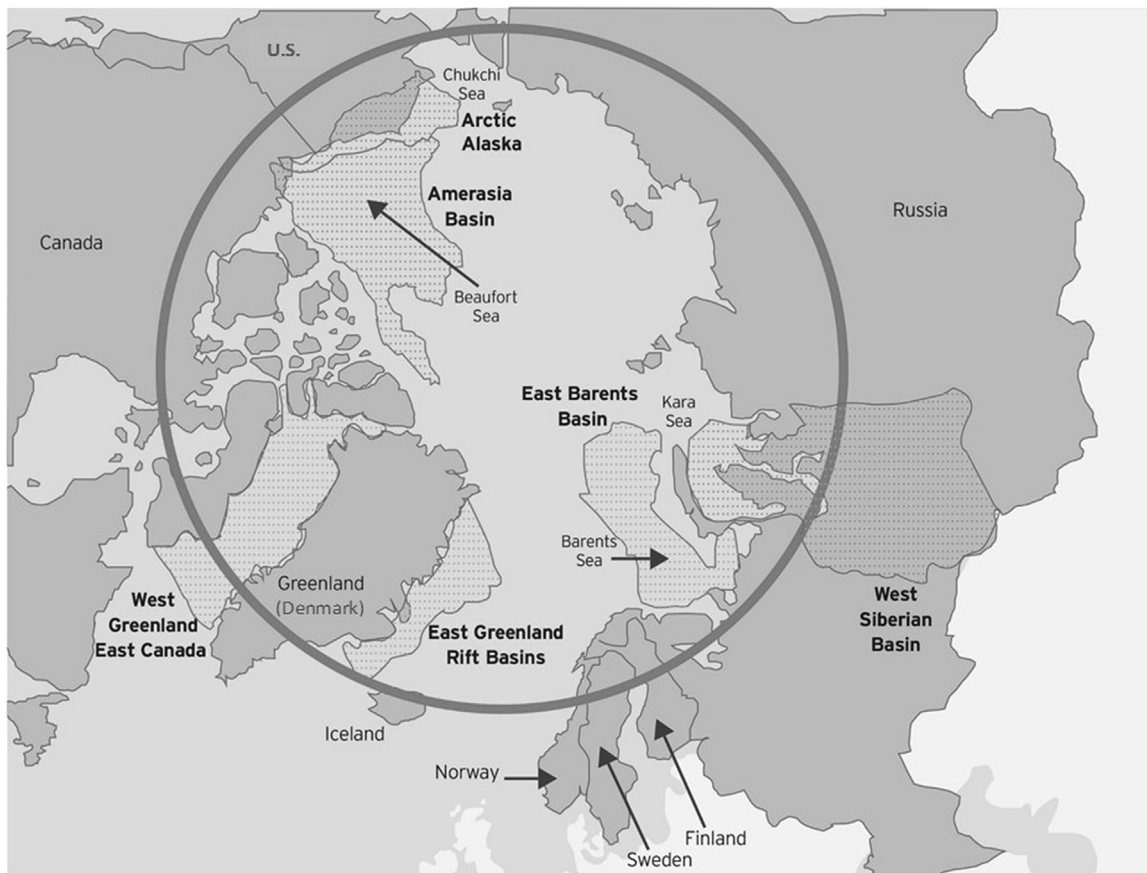


Fig. 2. Five Arctic Ocean nations showing 200 nm EEZ jurisdiction and unresolved territorial claims to be determined by the UN (adapted from USGS, 2008).

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