



# Permafrost and Culture

—Global Warming and the Republic of Sakha (Yakutia), Russian Federation—  
(Study Guide for Environmental Education)

Edited by: Hiroki Takakura, Yoshihiro Iijima,  
Vanda Ignatieva, Alexander Fedorov,  
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# CONTENTS

<b>FOREWORD</b>	<b>3</b>
About this book	4
<b>I            The Origin of Permafrost and the Human History in the North</b>	<b>5</b>
Chapter 1    Global Warming and the Republic of Sakha (Yakutia)	6
Chapter 2    Ice Age and Permafrost	9
Chapter 3    The History of Humankind in the Arctic	12
<b>II            Permafrost and Culture</b>	<b>17</b>
Chapter 4    Alases and Ecosystems	18
Chapter 5    Permafrost as a Space of Human Activity	21
Chapter 6    The Impact of the Soviet Union Dissolution on Villages	24
<b>III           Global Warming and Ice</b>	<b>27</b>
Chapter 7    Warming and Permafrost	28
Chapter 8    The Impact of Environmental Changes and the Reaction of Local Residents in East Siberia	32
Chapter 9    Greenland	37
<b>IV            Perspectives for a Sustainable Future</b>	<b>43</b>
Chapter 10   The Reasons for Warming from a Global Perspective	44
Chapter 11   Political System and Sustainable Future in the Arctic	48
Chapter 12   The Arctic and Asia	51
<b>Reference</b>	<b>55</b>



## Chapter 12

# The Arctic and Asia

## Energy Resources and Asia

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So far, we have discussed the impacts of global warming on the Arctic's nature and society. But the changing Arctic, in turn, influences many world regions in various ways. Therefore, we will discuss some current aspects related to Asia.

Nearly all oil and natural gas consumed by Japan is imported from abroad, with approximately 87% of Japanese oil imports coming from the Middle East and about 6% coming from Russia. In addition, Japan is entirely reliant on imported liquefied natural gas (LNG), 9% of which comes from Russia.

In recent years, because of climatic Arctic Ocean changes, the sea ice area has decreased, simplifying delivery of machinery and equipment to the Arctic to facilitate producing and developing resources, and simplifying oil and LNG exports. Consequently, oil and natural gas production in the Arctic is developing at an unprecedented pace.

## Construction of New Pipelines and LNG Plants

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Being a great oil and gas power, Russia has been laying gas and oil pipelines for European export from Siberia—the main location of their oil and gas production. Around the mid-2000s, Russia began actively increasing exports to Asia. For example, an oil pipeline connecting the Siberian fields with a port near Vladivostok is now used to export oil to China, Japan, Korea, and other countries. Currently more than a quarter of Russian oil exports go to East Asia, meaning that part of the oil produced in the Republic of Sakha's Talakan field is also consumed in Japan. A new plan is also being developed to implement natural gas exports to China from Siberia, particularly from the Chayanda gas field in the Republic of Sakha.

In 2009, for the first time in Russia, an LNG plant was built on Sakhalin Island, with most of the LNG produced there exported to Japan. At the end of 2017, a second plant was built on the Yamal Peninsula. When the ice thaws in summer, the LNG produced there is exported to Asia along the Northern Sea Route; in the winter the LNG is exported to Europe. It appears that Russia is striving to establish a leading position among the world's major LNG exporters.



Fig. 12-1: Gas tanker carrying LNG from Sakhalin (photo by S. Tabata, 2011).

## Northern Sea Route

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The Arctic Ocean's sea ice extent continues to decline. Consequently, in recent years coastal waters along the Russian Arctic coast are ice free for a certain period in summer. This has increased Russian Arctic coastal waters' navigable period, while the navigational risk related to sea ice is decreasing. This provides new opportunities for the Northern Sea Route, which passes through the Arctic Ocean along the Russian coast and connects the Atlantic and Pacific Oceans. The Northern Sea Route functions as both a maritime transport artery for Russia's coastal regions and a global maritime transport route between Europe and Asia.

For example, transporting LNG from the Yamal Peninsula is expected to involve over 160 round-trip voyages per year (15 specialized gas tankers will operate between Yamal, Europe, and Asia). By facilitating Russian LNG production in the Arctic, the Northern Sea Route will become an important new transport corridor for energy resources. Currently, the Northern Sea Route is also being used for sea freight transport between Europe and Asia and tourist cruises in the Arctic Ocean. Using the Northern Sea Route for shipping between European and Asian ports reduces the distance by 30–40% compared to the usual route through the Suez Canal. However, safe navigation of the Northern Sea Route requires specialized cargo ships that can navigate in ice infested waters, and when the sea ice is severe, Russian nuclear icebreaker support, provided on a paid basis, will be required.

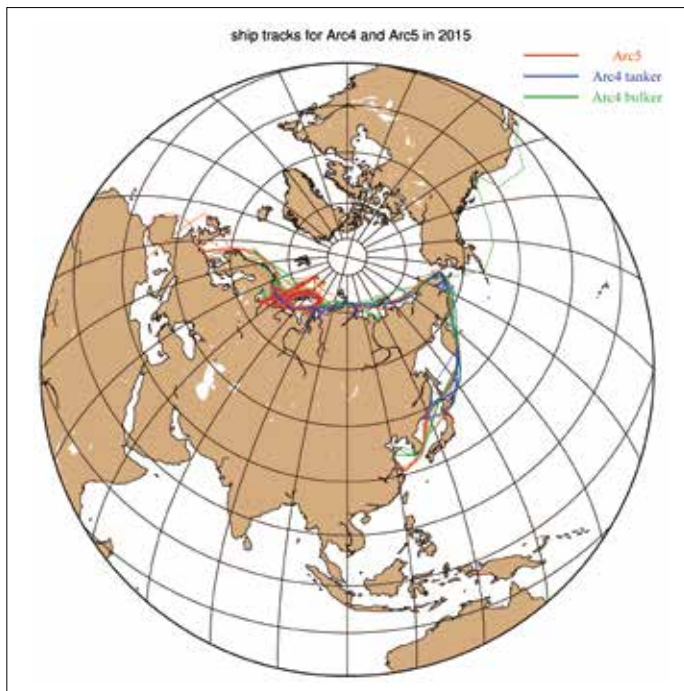


Fig. 12-2: Navigation routes for cargo ships across the Northern Sea Route in 2015 (Otsuka et al., 2019).

## Exchange between Siberia and Asia

Increased numbers of cargo vessels passing through the Northern Sea Route will facilitate its use as an important logistic route linking regions along the Arctic Ocean coast, as well as the large river basins that flow into it. Connecting the Lena, Yenisei, and other rivers, which are still used as river transport routes to the inland regions, with the Northern Sea Route will link the internal water transport routes with the external regions. However, this will require improved infrastructure, such as upgraded ports and related facilities, and planning, such as identifying goods with prospective market value and sufficient demand. Despite these challenges, it is clear that new windows of opportunity are opening.

There are still many uncertainties and unresolved problems surrounding Arctic Ocean mining and development. Creating solutions will require new research and development, discussions, cooperation, flexible thinking, and innovative technologies, along with a willingness to accept the challenge. It is clear that future relations between Siberia and Asia will be built using a new format. We believe, first and foremost, that we must connect this process with creating a sustainable, peaceful, and rich future for the entire world.



Fig. 12-3: Port on the Lena River in Yakutsk and a cargo ship (photo by N. Otsuka, 2004).

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