Executive Summary—National Assessment of Oil and Gas Project: Geologic Assessment Of Undiscovered Gas Hydrate Resources on the North Slope, Alaska

Click here to return to
Main Contents

By U.S. Geological Survey Alaska Gas Hydrate Assessment Team

Digital Data Series DDS–69–CC

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
SALLY JEWELL, Secretary

U.S. Geological Survey
Suzette M. Kimball, Acting Director

U.S. Geological Survey, Reston, Virginia: 2013

Suggested citation:
U.S. Geological Survey Alaska Gas Hydrate Assessment Team, 2013, National Assessment of Oil and Gas Project—Executive Summary—Geologic assessment of undiscovered gas hydrate resources on the North Slope, Alaska: U.S. Geological Survey Digital Data Series 69–CC, 2 p., *http://dx.doi.org/10.3133/ds69cc*.

ISSN 2327-0271 (print)
ISSN 2327-132x (online)

Contents

Figure

Table

Executive Summary—National Assessment of Oil and Gas Project: Geologic Assessment of Undiscovered Gas Hydrate Resources on the North Slope, Alaska

By U.S. Geological Survey Alaska Gas Hydrate Assessment Team

The U.S. Geological Survey (USGS) has completed the first assessment of the undiscovered technically recoverable gas-hydrate resources on the North Slope of Alaska. Using a geology-based assessment methodology, the USGS estimates that there are about 85 trillion cubic feet (TCF) of undiscovered, technically recoverable gas resources within gas hydrates in northern Alaska.

Introduction

U.S. Geological Survey (USGS) assessment of the undiscovered, technically recoverable gas-hydrate resources beneath the North Slope of Alaska indicates the existence of technically recoverable gas-hydrate resources—that is, resources that can be discovered, developed, and produced using current technology. The assessment is based on the geologic elements used to define a Total Petroleum System (TPS), including hydrocarbon source rocks (source-rock type and maturation and hydrocarbon generation and migration), reservoir rocks (sequence stratigraphy, petrophysical properties, seismic attribute development, and prospecting), and hydrocarbon traps (trap formation and timing). The area assessed in northern Alaska (fig. 1) extends from the National Petroleum Reserve in Alaska (NPRA) on the west through the Arctic National Wildlife Refuge (ANWR) on the east and from the Brooks Range northward to the State-Federal offshore boundary (located three miles north of the coastline). This area consists mostly of Federal, State, and Native lands covering about 55,900 mi^2. The Northern Alaska Gas Hydrate Total Petroleum System (fig. 1) includes Cretaceous and Tertiary reservoir rocks that have been divided into three assessment units (AUs)—from oldest to youngest, the Nanushuk Formation Gas Hydrate AU, the Tuluvak-Schrader Bluff-Prince Creek Formations Gas Hydrate AU, and the Sagavanirktok Formation Gas Hydrate AU.

Resource Summary

For the Northern Alaska Gas Hydrate TPS, the USGS estimates that the total undiscovered natural gas resources in gas hydrate deposits range between 25.2 and 157.8 trillion cubic feet (TCF; 95-percent and 5-percent probabilities of greater than these amounts, respectively), with a mean estimate of 85.4 TCF (table 1). Of this mean estimate, (1) 24 percent (20.6 TCF) is in the Sagavanirktok Formation Gas Hydrate AU, (2) 33 percent (28.0 TCF) is in the Tuluvak-Schrader Bluff-Prince Creek Formations Gas Hydrate AU, and (3) 43 percent (36.9 TCF) is in the Nanushuk Formation Gas Hydrate AU (table 1).

U.S. Geological Survey Alaska Gas Hydrate Assessment Team

Timothy S. Collett, Warren F. Agena, Myung W. Lee, John J. Miller, Kristen A. Lewis, Thomas D. Lorenson, Margarita V. Zyrianova, Kenneth J. Bird, Ronald R. Charpentier, Troy Cook, David W. Houseknecht, Timothy R. Klett, Richard M. Pollastro, and Christopher J. Schenk.

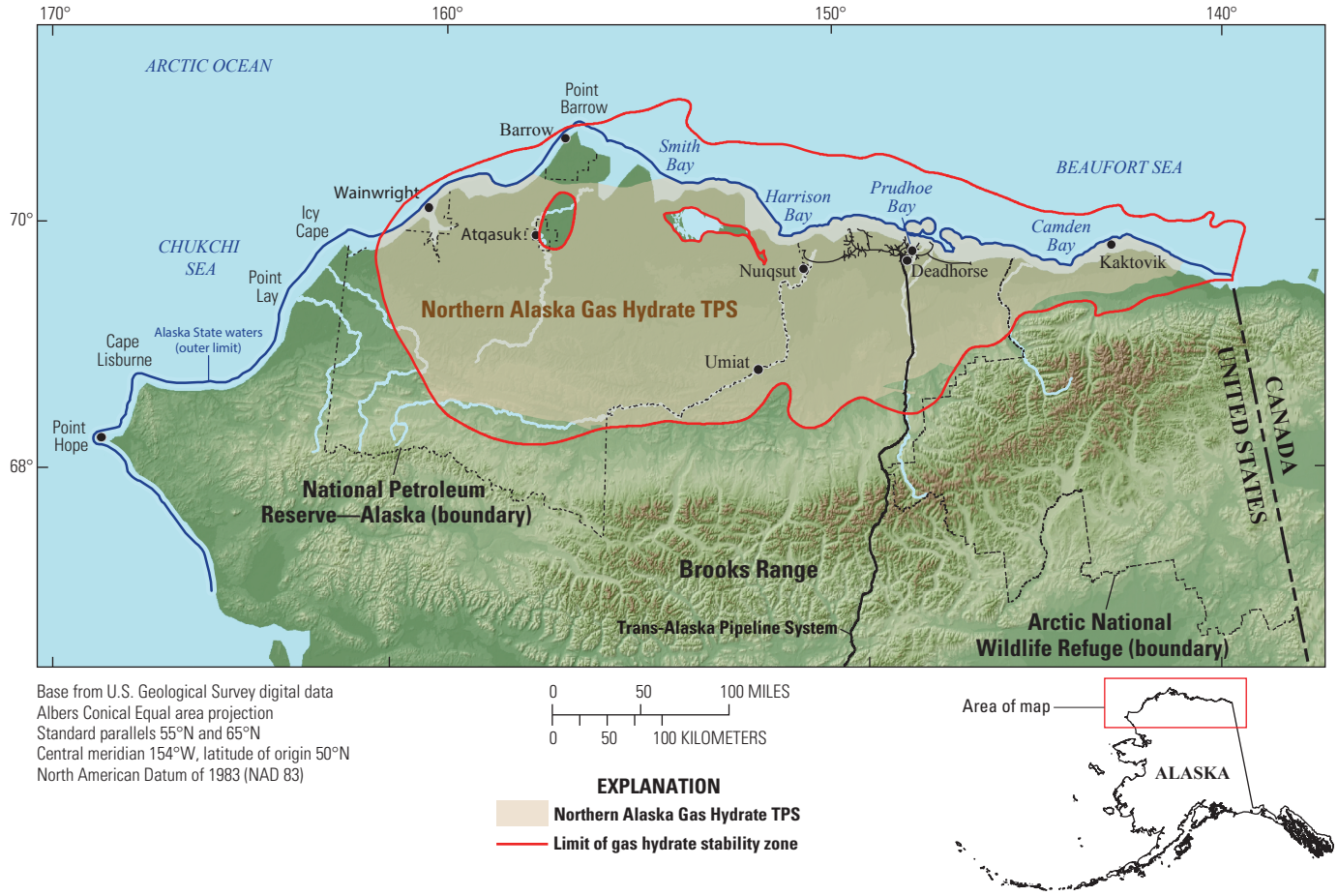
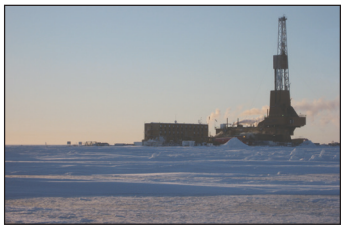


Figure 1. The Northern Alaska Gas Hydrate Total Petroleum System (TPS) (shaded in tan), and the limit of the gas hydrate stability zone in northern Alaska (red outline).

Table 1. Alaska North Slope–Gas hydrate assessment results.

[BCFG, billion cubic feet of gas. MMBNGL, million barrels of natural gas liquids. Results shown are fully risked estimates. F95 represents a 95-percent chance of at least the amount tabulated; other fractiles are defined similarly. Fractiles are additive, assuming perfect positive correlations. NGL, natural gas liquids; TPS, total petroleum system; AU, assessment unit.]

Total Petroleum System *and Assessment Unit*	Field type	***Total undiscovered resources***							
		Gas (BCFG)				***NGL (MMBNGL)***			
		F95	F50	F5	Mean	F95	F50	F5	Mean
Northern Alaska Gas Hydrate TPS									
Sagavanirktok Formation Gas Hydrate AU	***Gas***	6,285	19,490	37,791	20,567	0	0	0	0
Tuluvak-Schrader Bluff-Prince Creek Formations Gas Hydrate AU	***Gas***	8,173	26,532	51,814	28,003	0	0	0	0
Nanushuk Formation Gas Hydrate AU	***Gas***	10,775	35,008	68,226	36,857	0	0	0	0
Total Undiscovered Resources		**25,233**	**81,030**	**157,831**	**85,427**	**0**	**0**	**0**	**0**



Click here to return to
Main Contents