DIGITAL MAPPING TECHNIQUES 2020

The following was presented at DMT '20
(June 8 - 10, 2020 - A Virtual Event)

The contents of this document are provisional

See Presentations and Proceedings
from the DMT Meetings (1997-2020)

http://ngmdb.usgs.gov/info/dmt/

BOEM

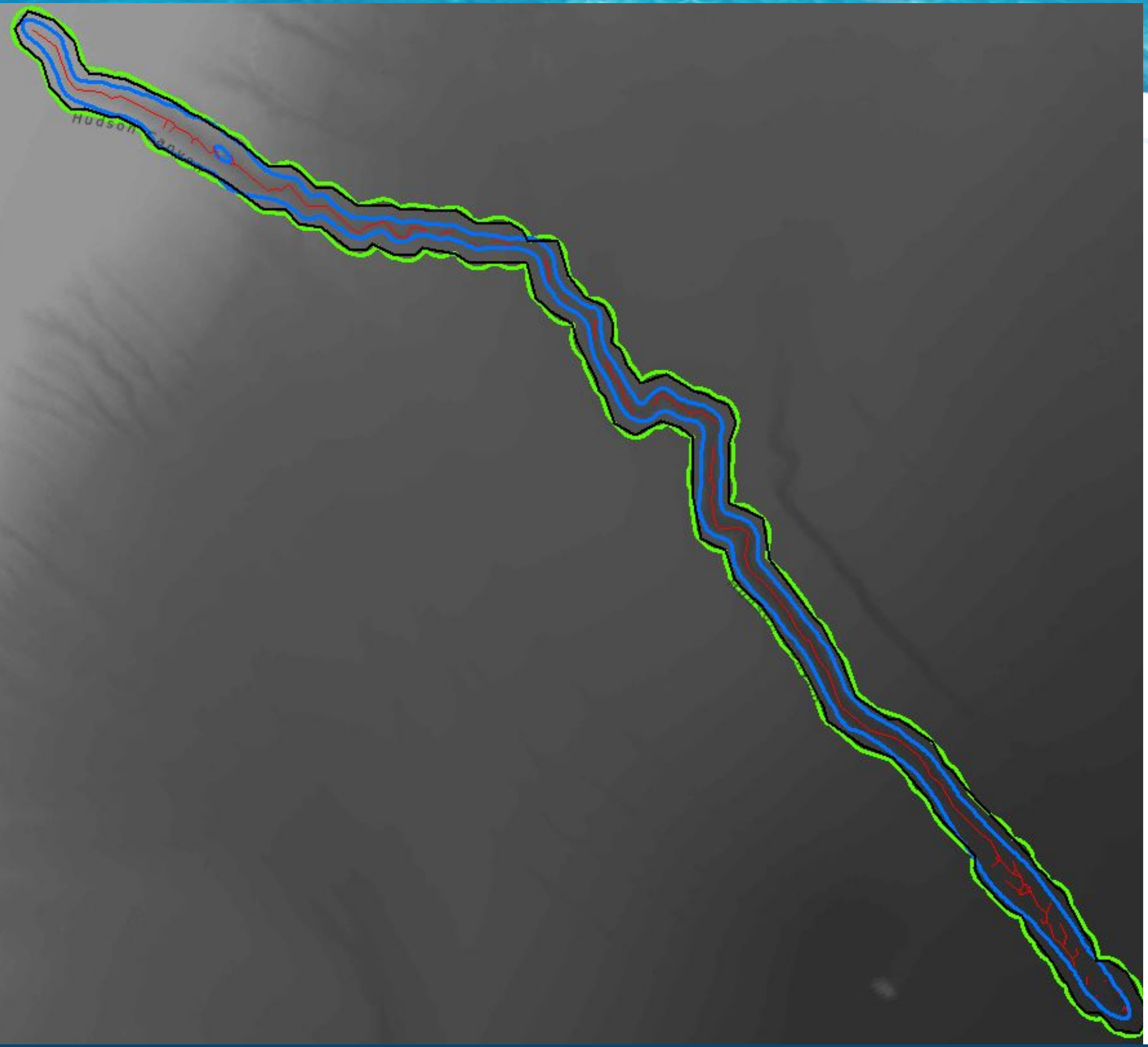
Bureau of Ocean Energy Management

Large Submarine Canyons of the Outer Continental Shelf

An aid to stewardship of federal marine oil and gas, renewable energy, and mineral resources

Paul O. Knorr, DMT ‘20

Submarine Canyon Delineation Method

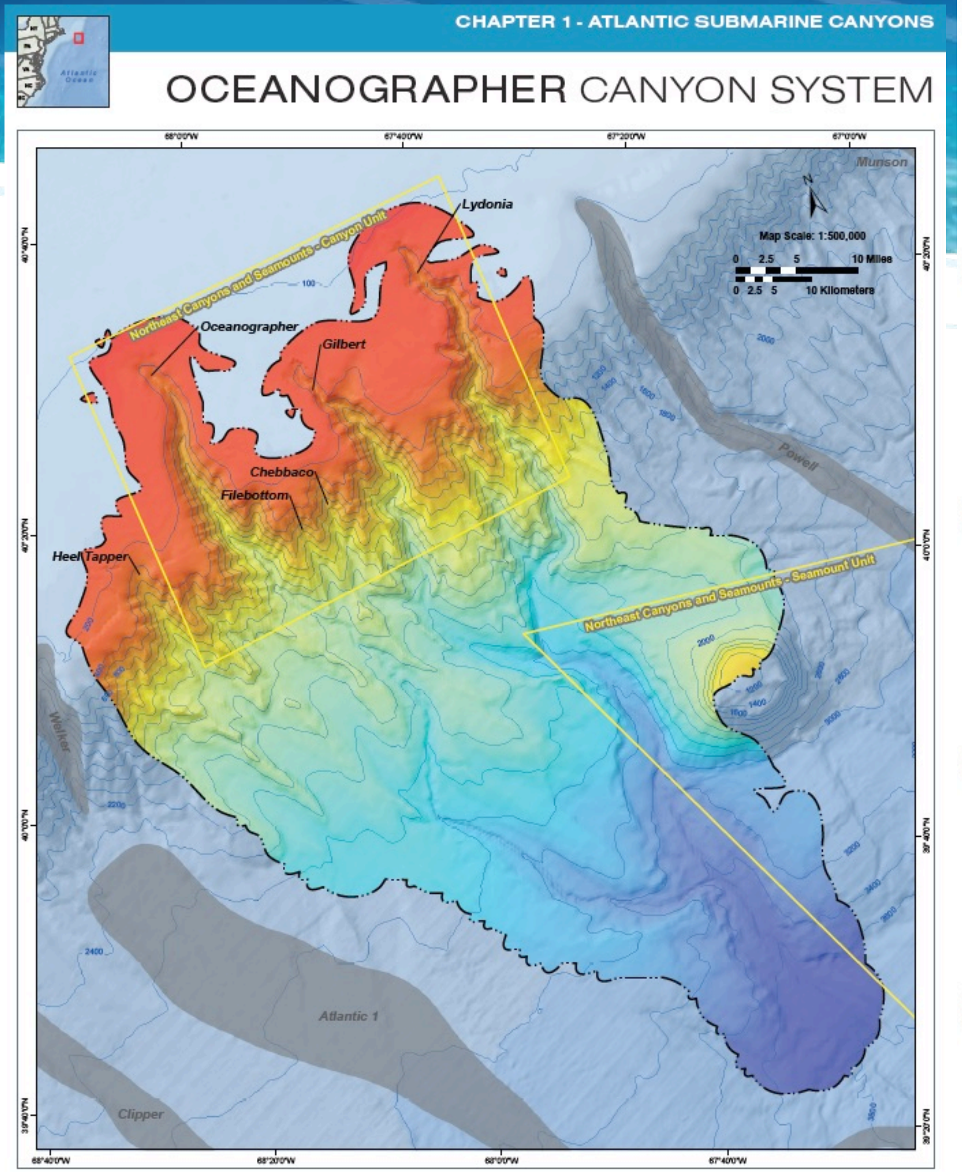


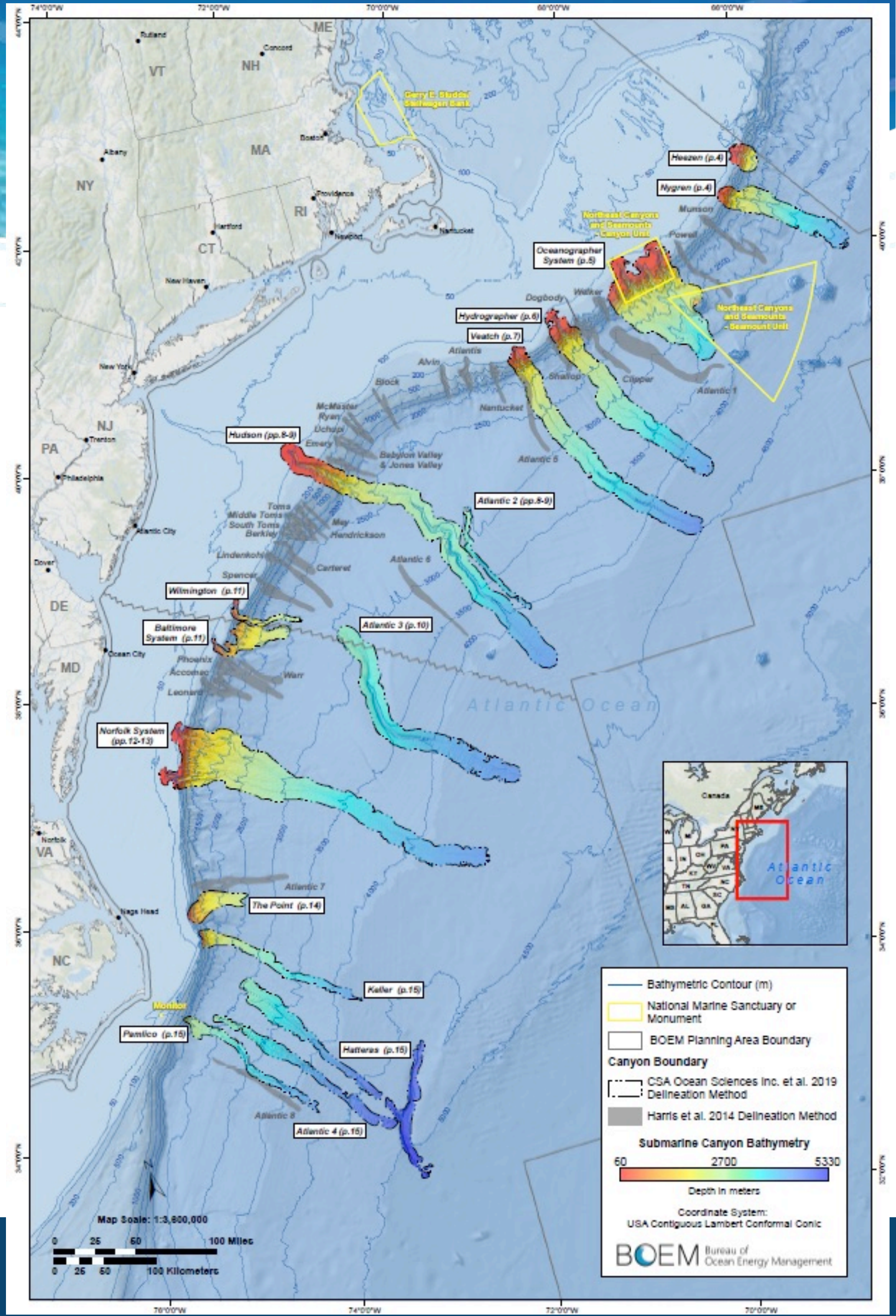
- SRTM bathy data with superimposed Hudson Canyon boundaries.
- Central red line is canyon thalweg from stream order computations.
- Blue line is the Harris et al. (2014) boundary.
- Outermost Green line is 5 km buffer.
- Black line is the effect of removing the lowest 4.6% (2 Standard Deviations) of slopes from within the 5-km buffer area.

CSA Ocean Sciences Inc.

Atlantic

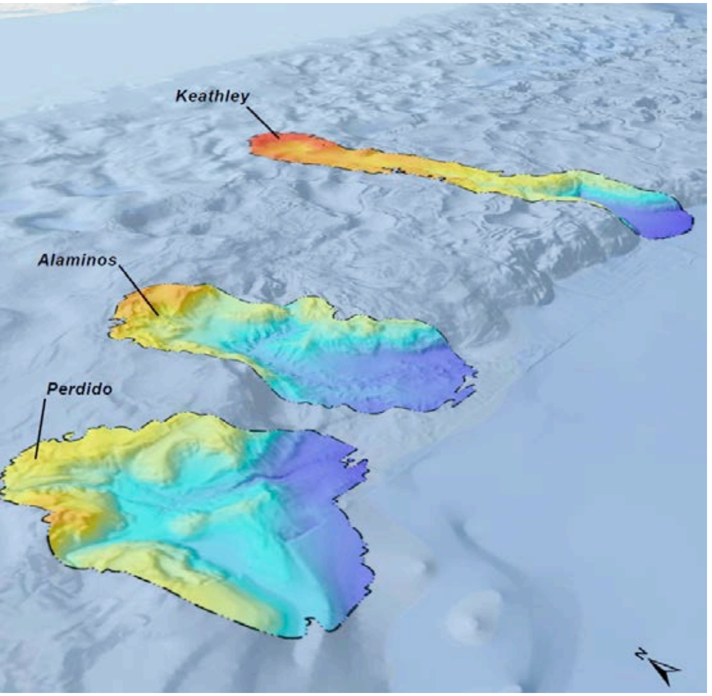
Detailed views of each canyon



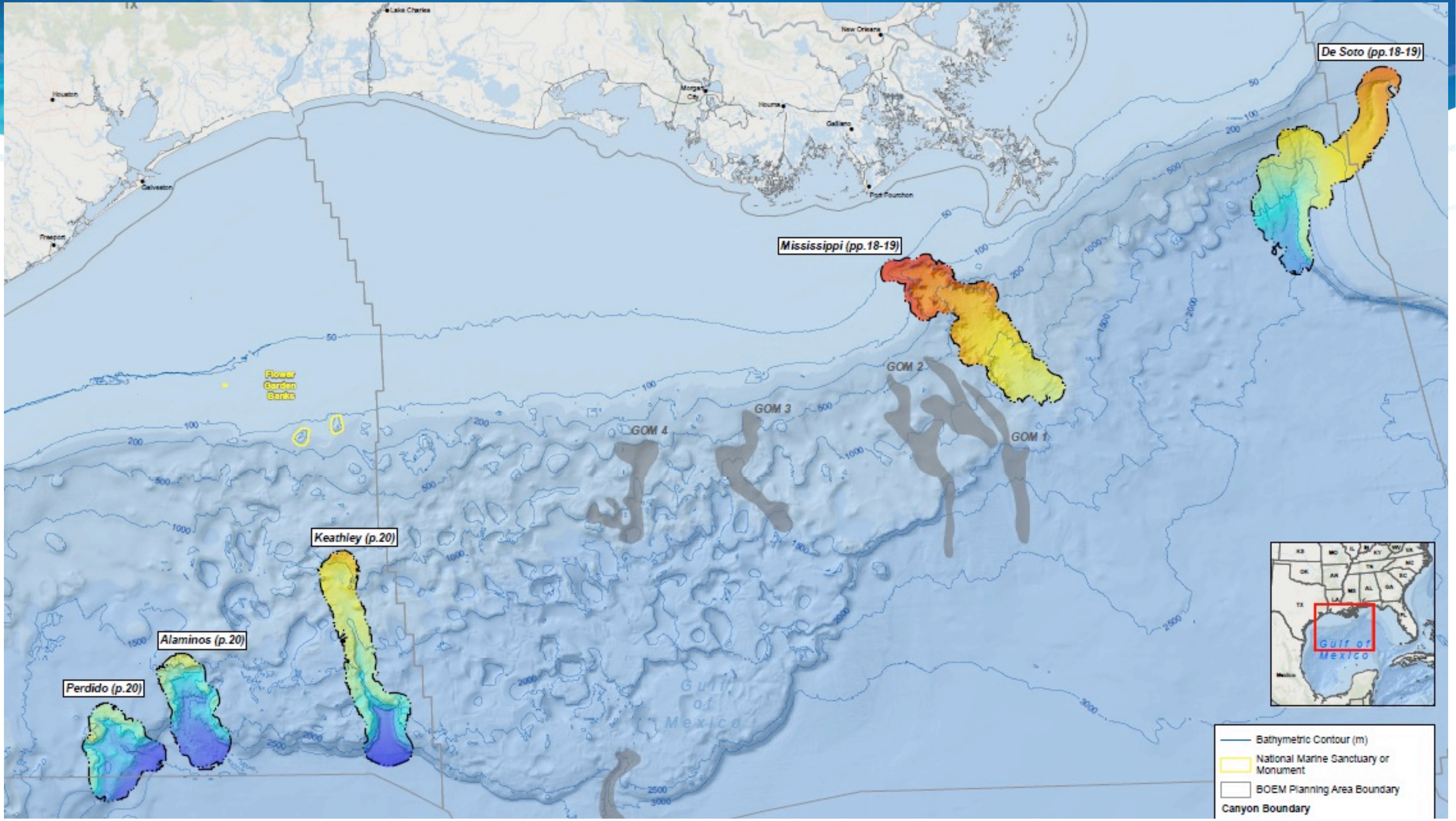


Region	*n*	Avg Area (km²)	Avg Depth -min (m)	Avg Depth -max (m)	Avg Length (km)	Notes
Atlantic	16	3,306	877	3,936	180	Longer, deeper canyons

Gulf of Mexico



3-D view of each canyon



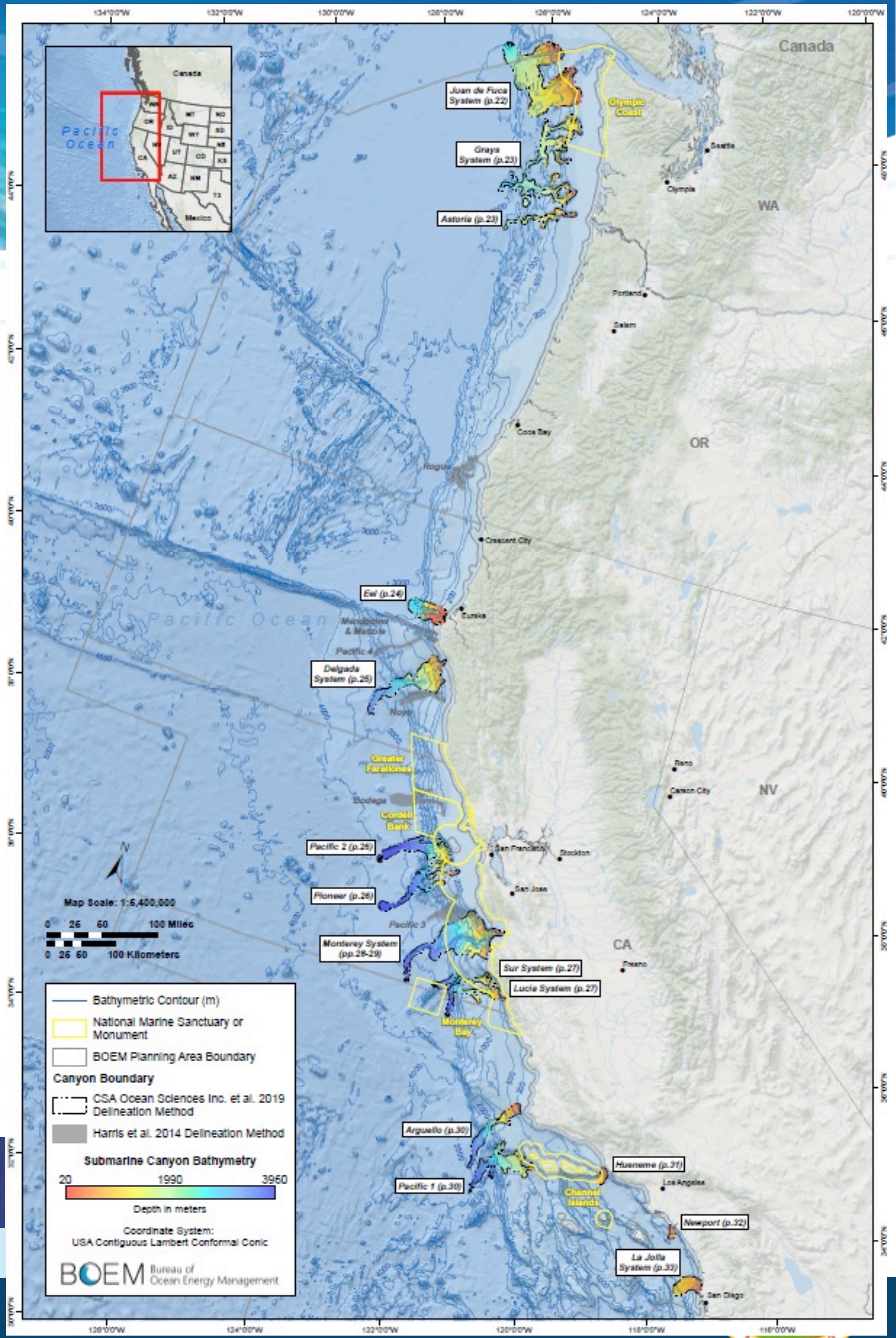
Region	n	Avg Area (km²)	Avg Depth -min (m)	Avg Depth -max (m)	Avg Length (km)	Notes
Gulf of Mexico	5	3,072	717	2,687	109	Fewest canyons

Pacific

Useful scientific facts for analysts, fully-referenced

NOTABLE FACTS

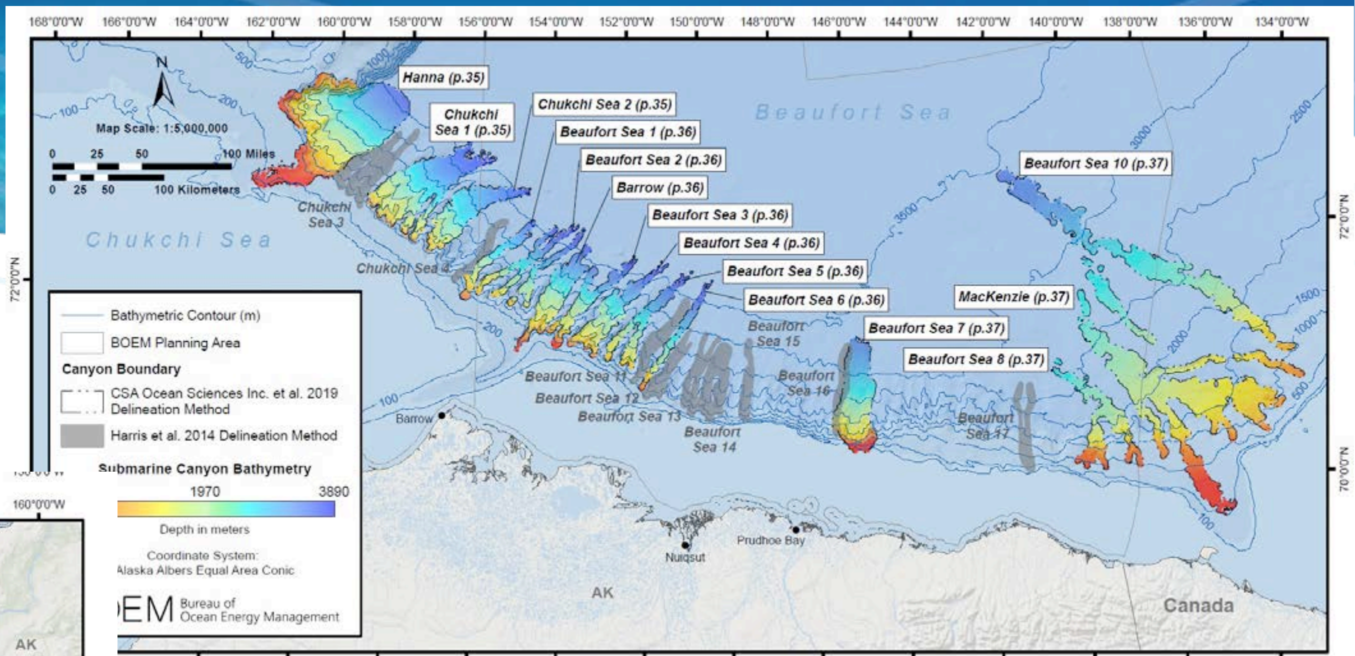
- Juan de Fuca Canyon has been identified as the most important source for the net upwelling of nitrate onto the Washington shelf (Hickey and Banas 2008). The canyon is also known to have high krill biomass concentration (Santora et al. 2018).
- Large deep-sea communities were discovered in Juan De Fuca Canyon in 2017, including long-lived species of coral and sponges (Raineault et al. 2018).
- The trawling fleet in Washington focuses their efforts around the Juan de Fuca Canyon to catch rockfish, Pacific hake, arrowtooth flounder, and Dover sole (Tagart 1997).
- The *Coast Trader* was sunk in 1942 by a Japanese submarine, and the shipwreck lies at the head of Juan de Fuca Canyon (NOAA 2019).

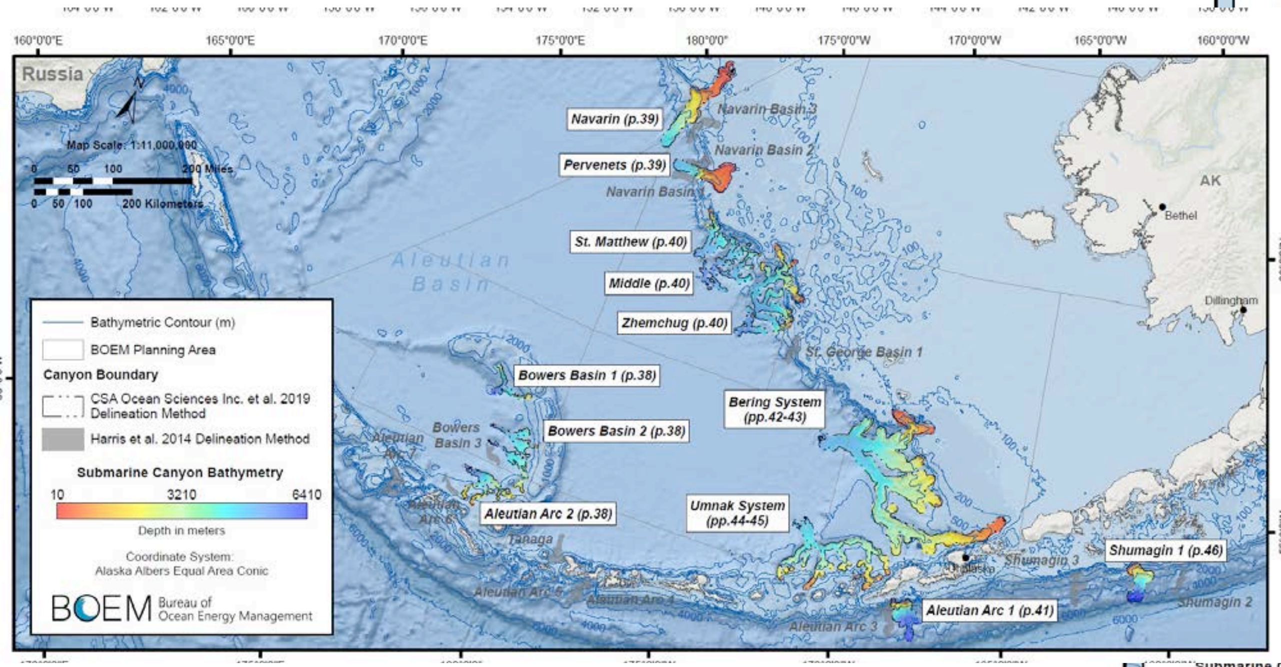


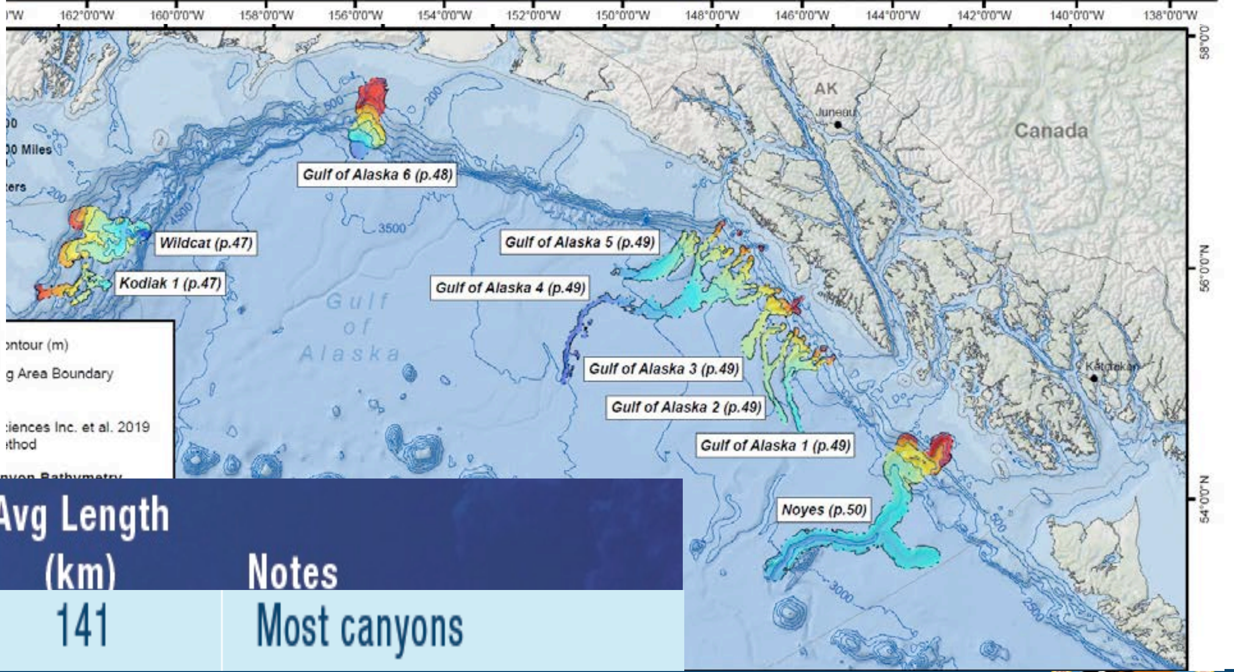
Region	*n*	Avg Area (km²)	Avg Depth -min (m)	Avg Depth -max (m)	Avg Length (km)	Notes
Pacific	15	2,002	93	2,848	98	Shorter, shallower canyons

Alaska

Alaska needs three overview maps



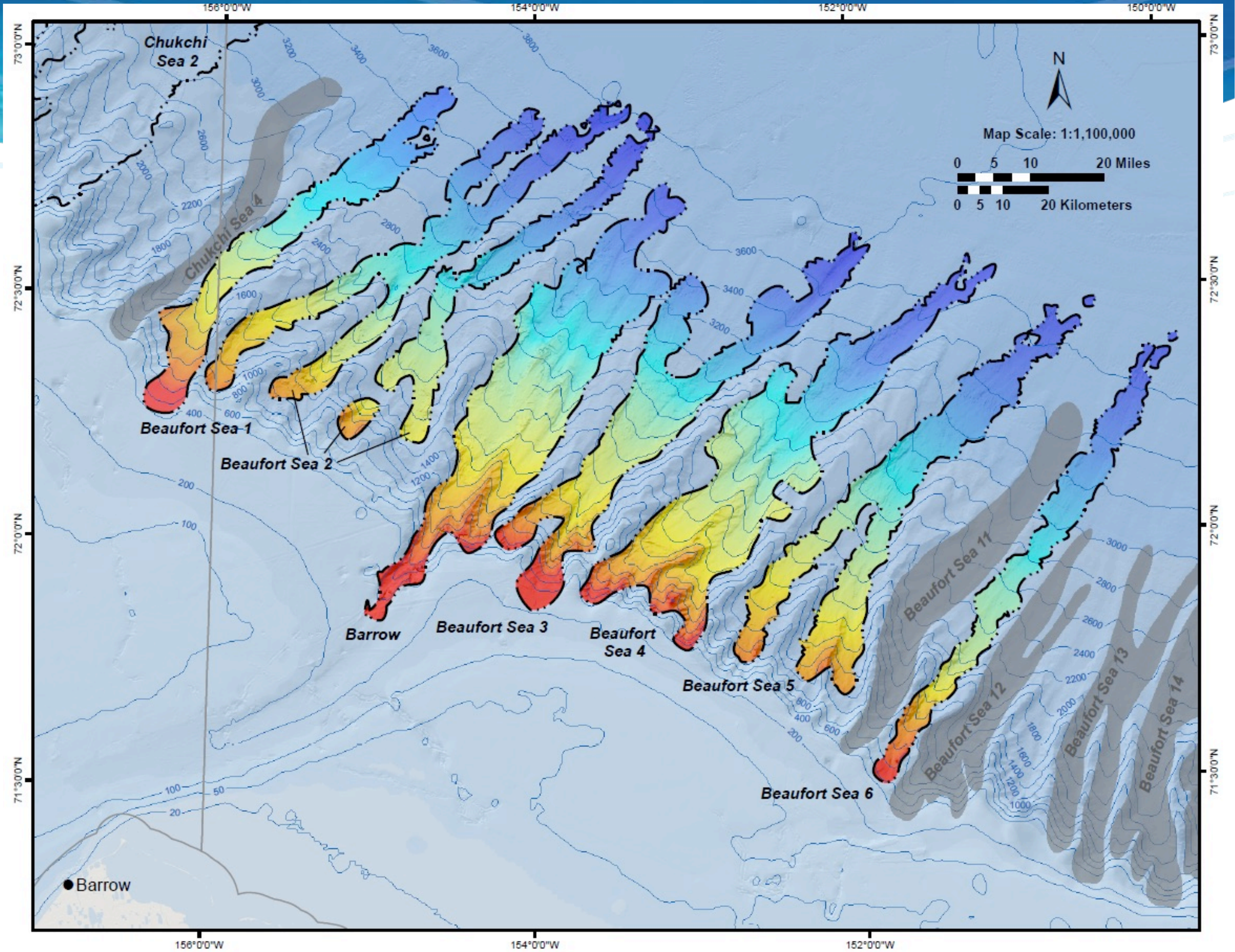




Region	n	Avg Area (km²)	Avg Depth -min (m)	Avg Depth -max (m)	Avg Length (km)	Notes
Alaska	35	3,902	444	3,588	141	Most canyons

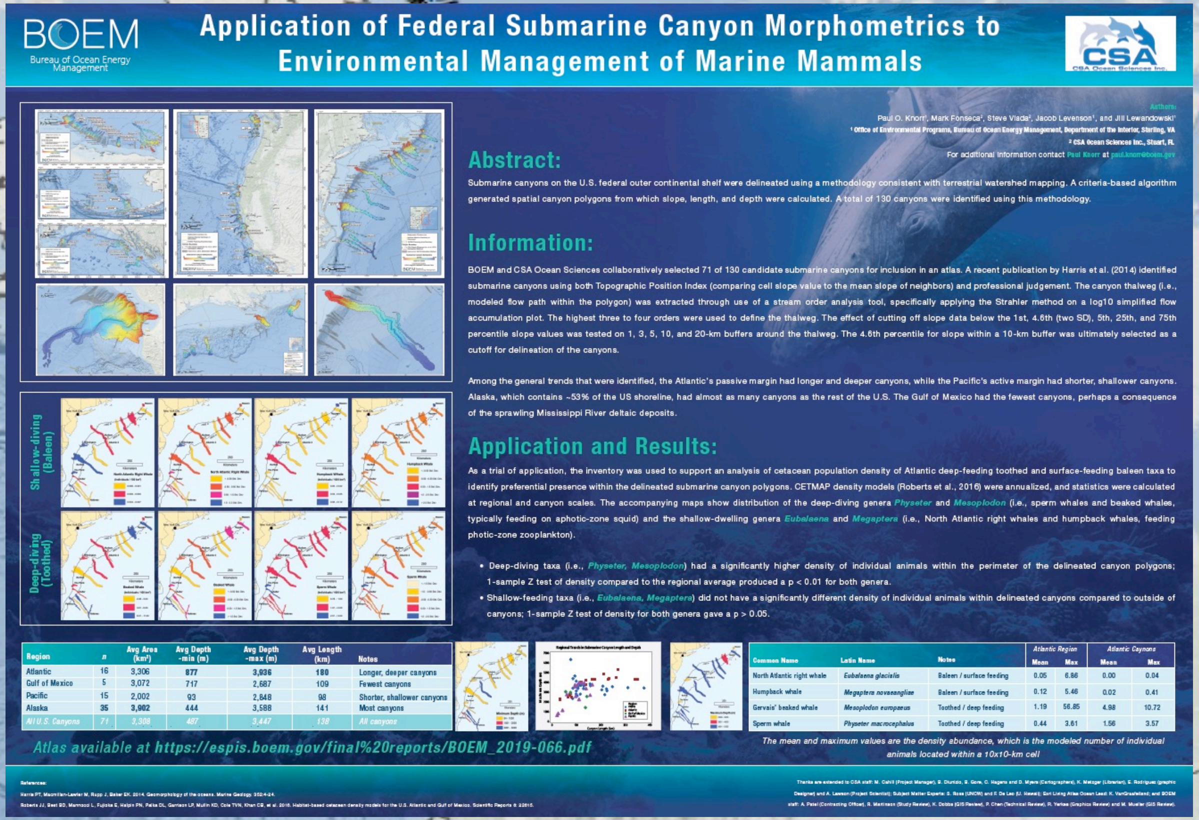
Barrow / Alaska

Unexpected concentration of canyons along Alaska's northern slope



Submarine Canyons - Application

- Aid to research & assessment
- 52 pages
- 11x17
- Printed and pdf
- References
- GIS files




OCS EIS/EA
BOEM 2016-001

Outer Continental Shelf
Oil and Gas Leasing Program: 2017-2022

Draft Programmatic Environmental Impact Statement

March 2016

Volume I: Chapters 1-6

U.S. Department of the Interior
Bureau of Ocean Energy Management
www.boem.gov

BOEM
Bureau of Ocean Energy Management

Region	n	Avg Area (km²)	Avg Depth -min (m)	Avg Depth -max (m)	Avg Length (km)	Notes
Atlantic	16	3,306	**877**	**3,936**	**180**	Longer, deeper canyons
Gulf of Mexico	5	3,072	717	2,687	109	Fewest canyons
Pacific	15	2,002	93	2,848	98	Shorter, shallower canyons
Alaska	**35**	**3,902**	444	3,588	141	Most canyons
All U.S. Canyons	*71*	*3,308*	*487*	*3,447*	*138*	*All canyons*

https://espis.boem.gov/final%20reports/BOEM_2019-066.pdf

BOEM
Bureau of Ocean Energy Management

BOEM.gov

Paul O. Knorr, PhD – paul.knorr@boem.gov – DMT '20