Alaska Oil and Gas

Secure, Predictable, Prolific

A World Class Investment Opportunity



Office of the Commissioner Alaska Department of Natural Resources March 2019







DEPARTMENT OF NATURAL RESOURCES - LAND BASE & OWNERSHIP -



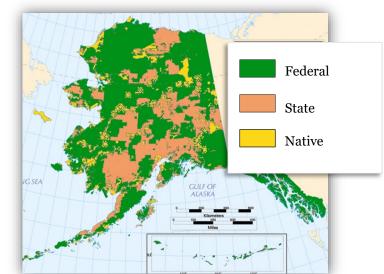
Land Base

- 586,412 sq. miles—more than twice the size of Texas
- Larger than all but 18 sovereign nations
- More coastline than all other 49 states combined
- More than 3 million lakes; half of world's glaciers

Approximately 40% of the nation's freshwater supply

Land Ownership

- Federal Land: more than 200 million acres
- State Land: Approx. 100 million acres of uplands, 60 million acres of tidelands, shore lands, and submerged lands, and 40,000 miles of coastline
- Native Corporation Land: 44 million acres



OPEN FOR BUSINESS

"... The road to energy dominance goes through the great state of Alaska ..."

-Ryan Zinke, US Secretary of Interior

- Alaska is a premier petroleum province
- Safe investment climate
- Stable business environment
- Established and predictable permitting system
- Decades of experience with oil, gas, and natural resource producers



- Established oil-field service companies
- Well-trained arcticexperienced workforce

STATE OF ALASKA - OIL & GAS RESOURCES -

North Slope

USGS estimates that Alaska's North Slope has more oil than any other Arctic basin

- OIL: Est. 49 billion barrels of conventional oil (USGS & BOEMRE, 2018)
- GAS: Est. 194 trillion cubic feet of conventional natural gas (USGS & BOEMRE, 2018)

Alaska has world-class unconventional resources, including tens of billions of barrels of heavy oil, shale oil, and viscous oil, and hundreds of trillions of cubic feet of shale gas, tight gas, and gas hydrates

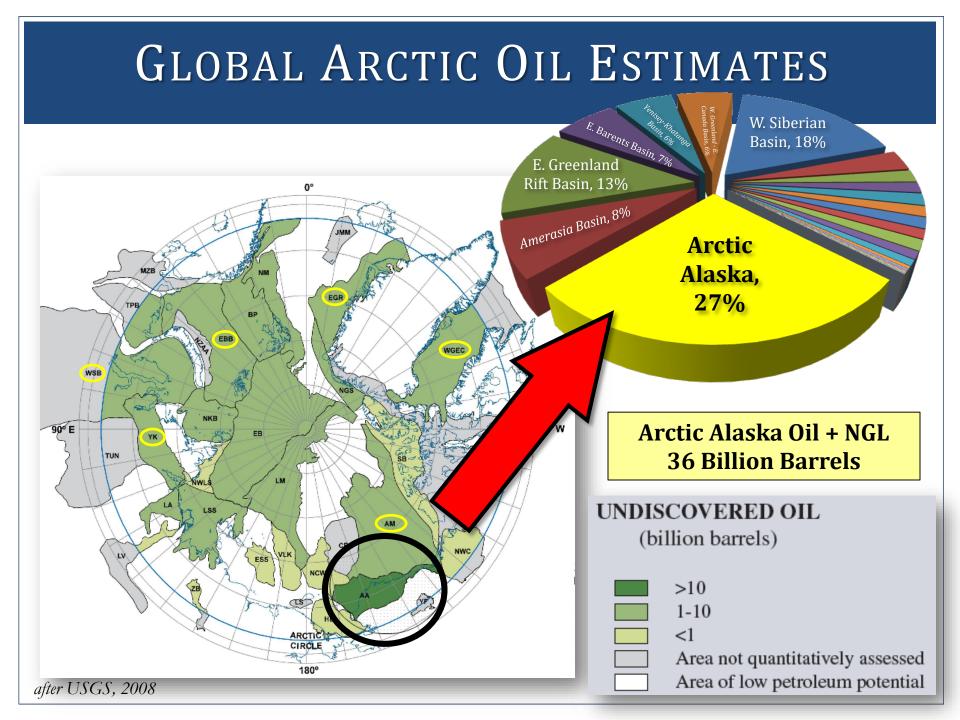
Cook Inlet

USGS estimates that significant undiscovered volumes of hydrocarbons remain to be found in the Cook Inlet:

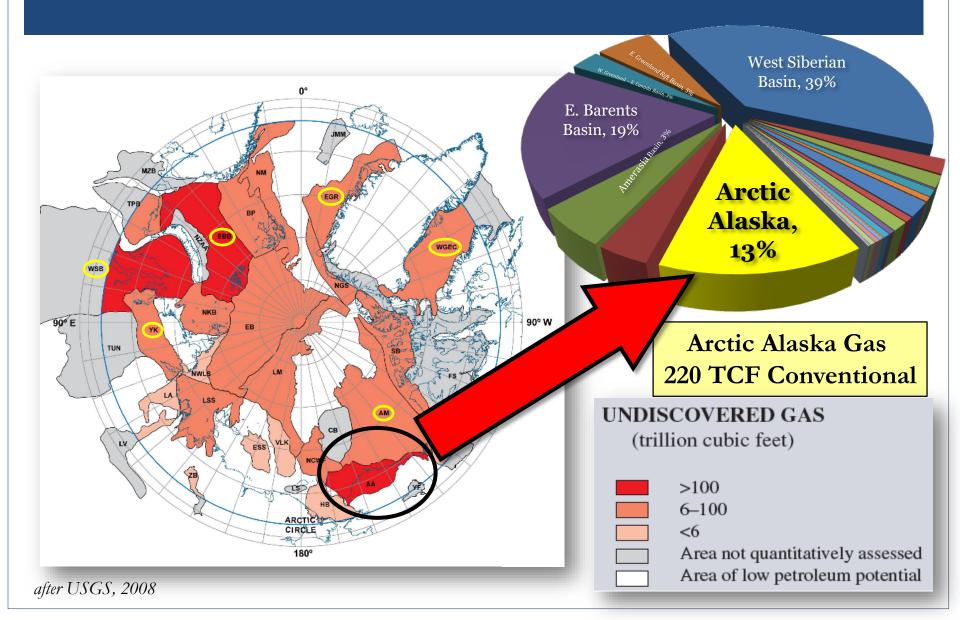
- 19 trillion cubic feet of natural gas
- o 600 million barrels of oil
- 46 million barrels of natural gas liquids

Compared to most petroleum underexplored, Alaska is relatively slope, compared to Wyoming's

Alaska is one of the few places to explore <u>both</u> conventional and unconventional resources in the same basin



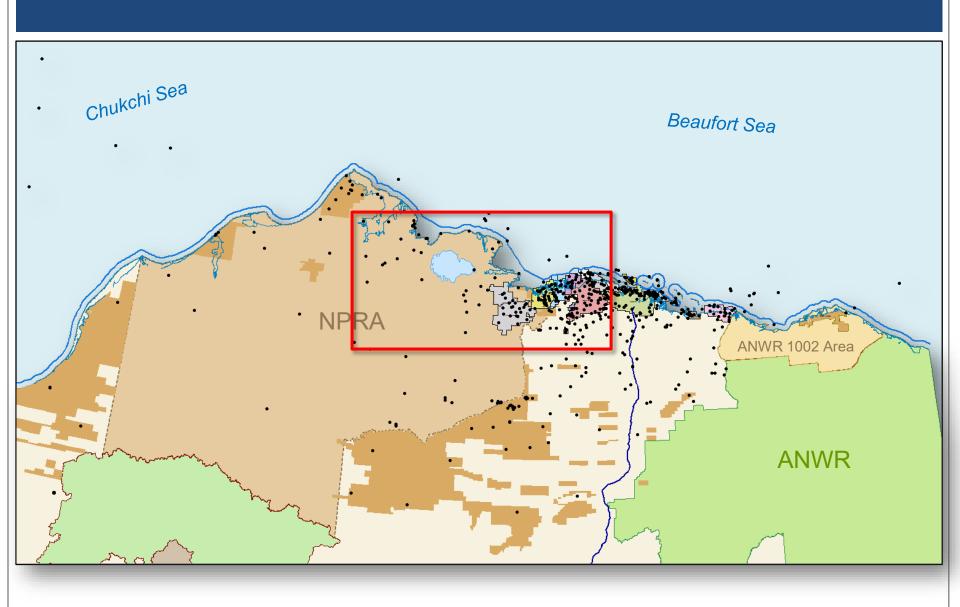
GLOBAL ARCTIC GAS ESTIMATES



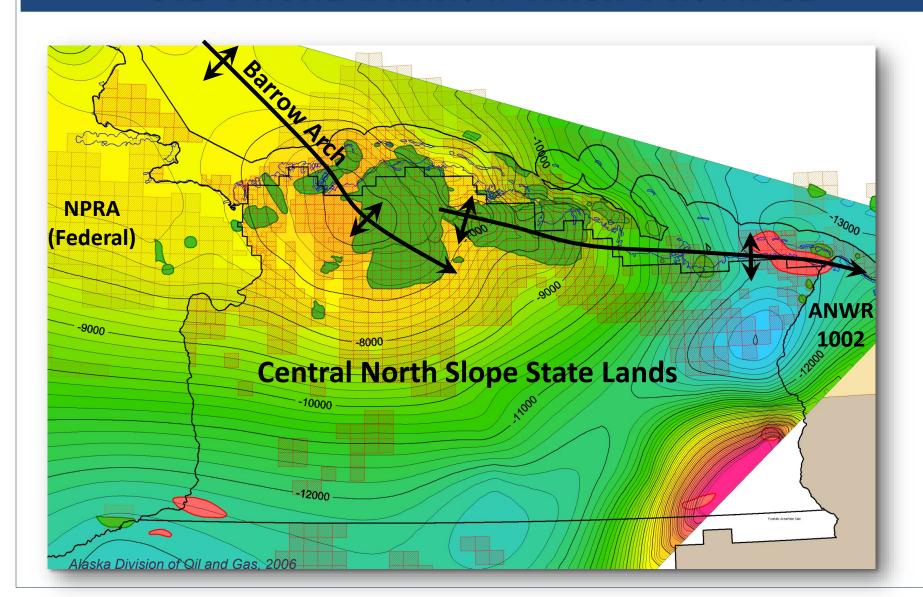
SEDIMENTARY BASINS IN ALASKA



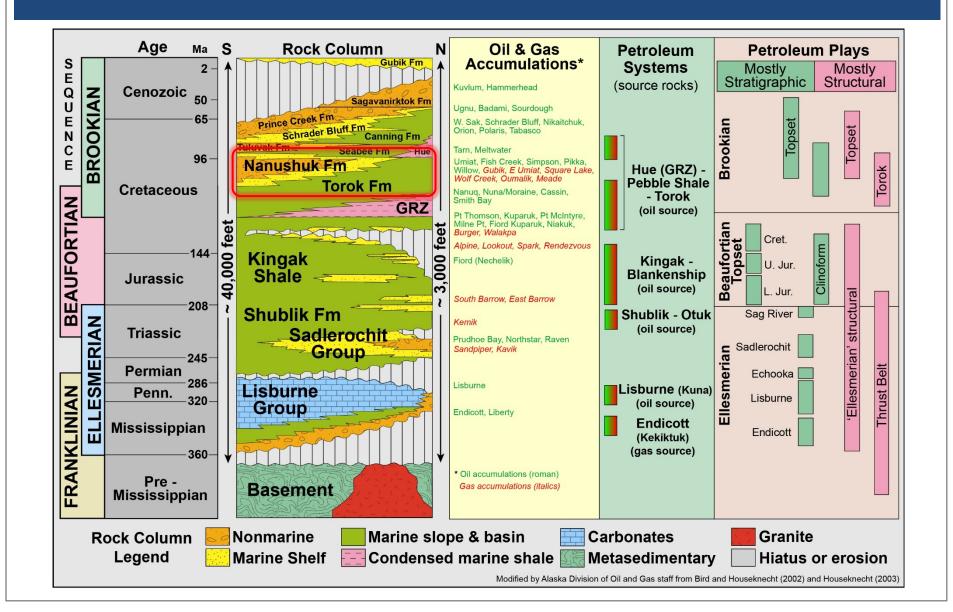
NORTHERN ALASKA LOCATOR MAP



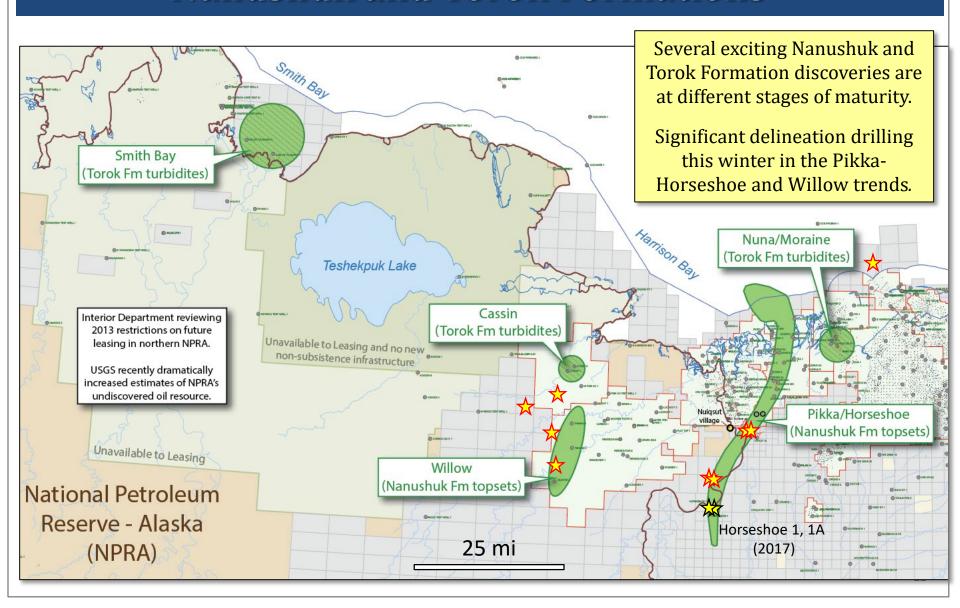
MAJOR NORTH SLOPE OIL FIELDS - OIL-PRONE BARROW ARCH PROVINCE -



NORTH SLOPE PETROLEUM SYSTEMS



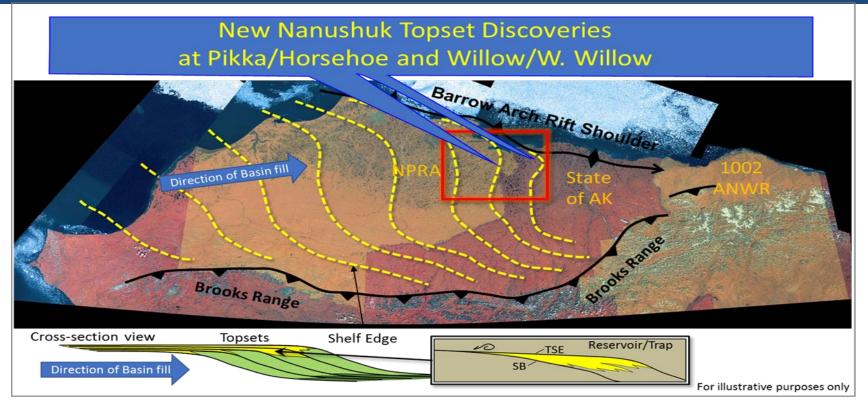
North Slope Brookian Discoveries -Nanushuk and Torok Formations-



MAJOR RECENT BROOKIAN DISCOVERIES

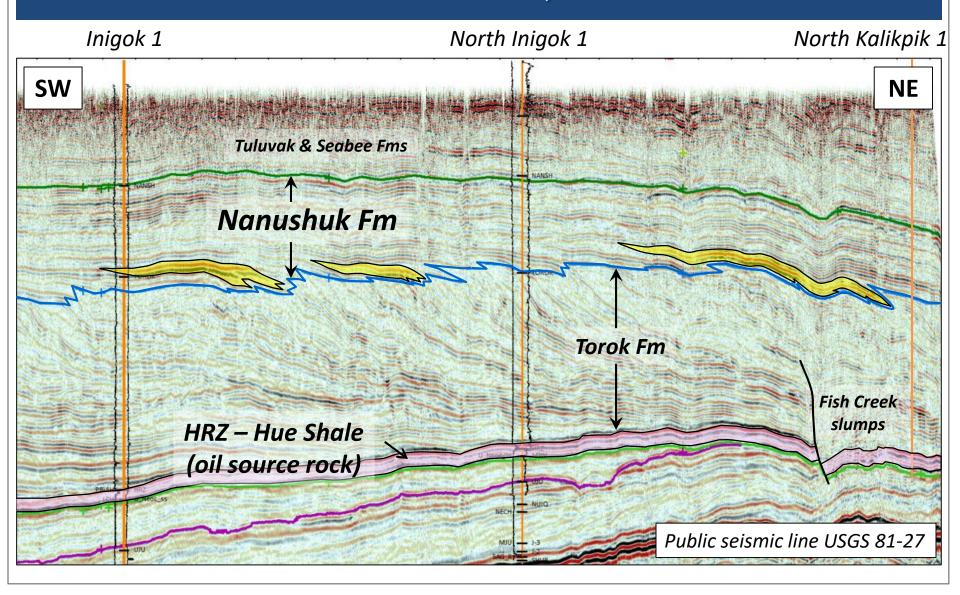
	Smith Bay	Willow	Pikka/Horseshoe	
Operator	Caelus	ConocoPhillips	Armstrong	
Reservoir Formation	Torok Fm	Nanushuk Fm	Nanushuk Fm	
Location	State Waters Offshore of NPRA	Federal Onshore Northeast NPRA	Onshore Colville Delta	
Road/Pipeline Tie-in	~ 125 miles	~ 28 miles	~ 20 miles	
Trap type	Turbidite Stratigraphic	Topset Stratigraphic	Topset Stratigraphic	
Net Pay	183-223 ft (unconfirmed)	42-72 ft	< 225 ft	
Oil Gravity	40-45 deg API (est)	44 deg API	30 deg API	
Test Rate	No Flow Tests	< 3,200 bopd vertical	~ 2,100 bopd vertical; 4,600 bopd horizontal	
Contingent Recoverable Resource	1.8-2.4 BBO (est)	300 MMBO	1.2 BBO	
Expected Production (Operator Releases)	< 200,000 bopd	40,000-100,000 bopd	< 120,000 bopd	

LOWER BROOKIAN DEPOSITIONAL SYSTEMS

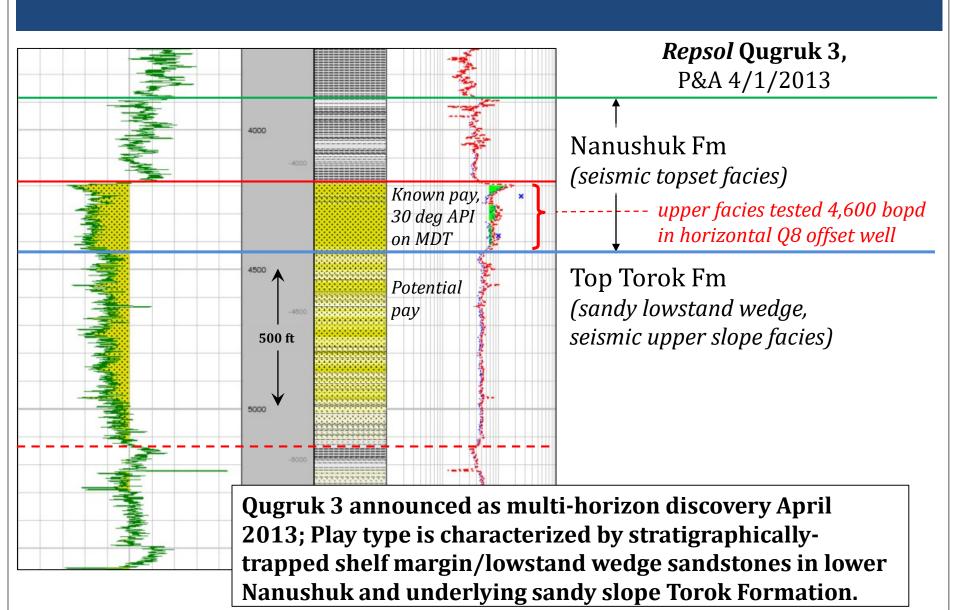


- Overall progradation of Nanushuk-Torok clinothem across foreland basin illustrated schematically as series of advancing shelf margins.
- Numerous higher-order sea-level fluctuations repeatedly set up potential for enhanced reservoir and stratigraphic traps.
- Play extends across central and western North Slope.

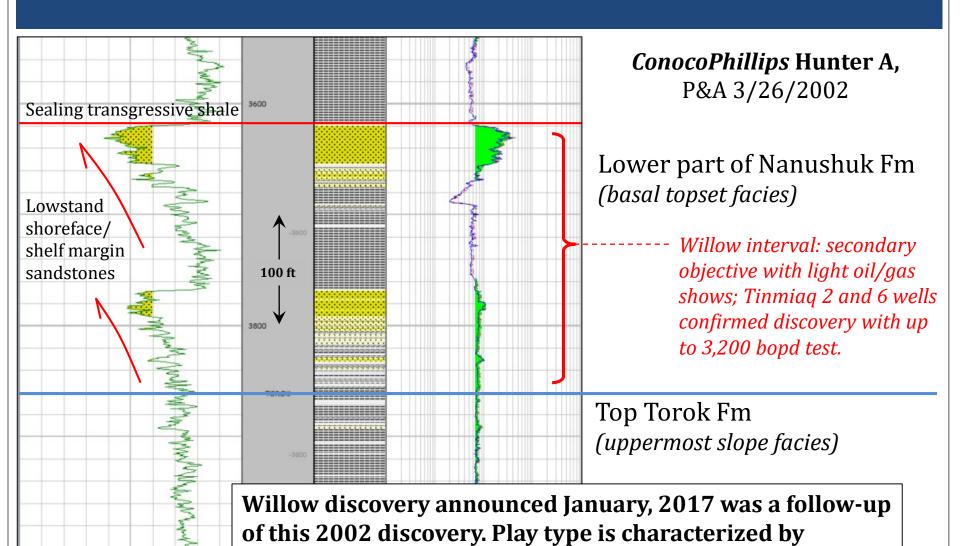
BASAL NANUSHUK SEISMIC ANOMALIES - 1981 2-D DATA, NPR-A -



PIKKA DISCOVERY - NANUSHUK FM



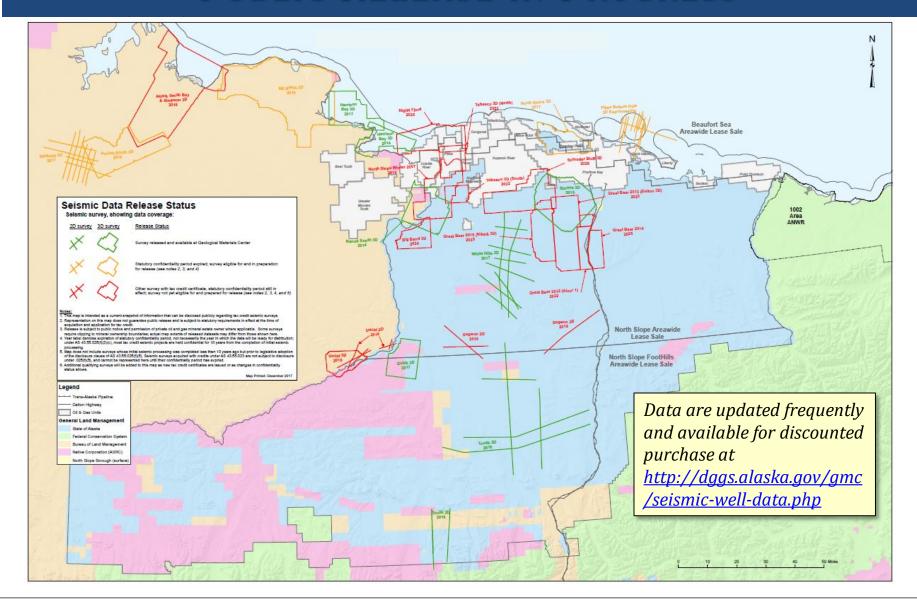
WILLOW DISCOVERY - NANUSHUK FM



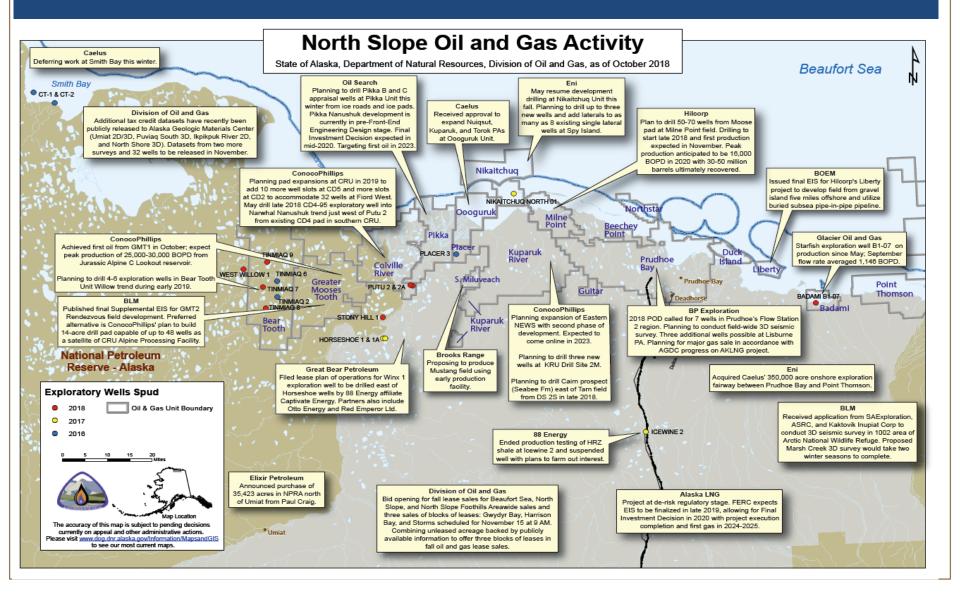
sandstones in lower Nanushuk Formation.

stratigraphically-trapped lowstand shoreface shelf margin

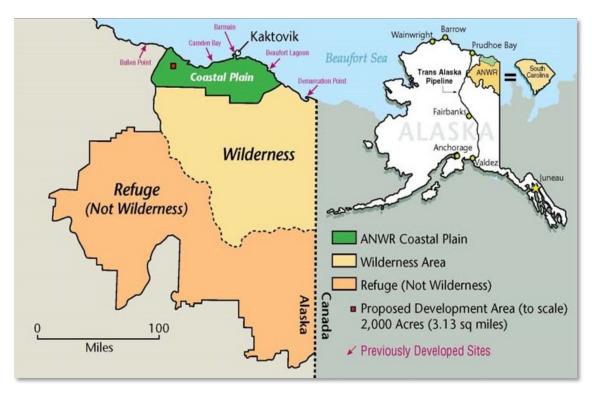
ALASKA SEISMIC SURVEYS - PUBLIC RELEASE IN PROGRESS -



NORTH SLOPE -CURRENT ACTIVITIES-



ARCTIC NATIONAL WILDLIFE REFUGE -ANWR-



For decades, Alaska governors, lawmakers, and citizens alike have worked to open ANWR

- Recently passed legislation calls for two lease sales within 7 years
- Mean case of economically recoverable oil estimates over 600,000 barrels/day from ANWR.

More good news from Alaska's Outer Continental Shelf:

- Eni permitted to expand Nikaitchuq
- Liberty teed up for development
- ASRC advancing Beaufort Sea plans

Huge opportunities for new investment

RESOURCE POTENTIAL FROM -FEDERALLY MANAGED LANDS-

Tax Act - Coastal Plain Activity

- BLM to administer an oil and gas leasing program in the Coastal Plain of ANWR
- Section 200001 PL 115-97 requires at least 2 lease sales to be held by 2024
- Each sale must offer 400,000 acres of highest hydrocarbon potential, up to 2,000 surfaces acres of Federal land to support production and support facilities
- SOA Royalty 50%

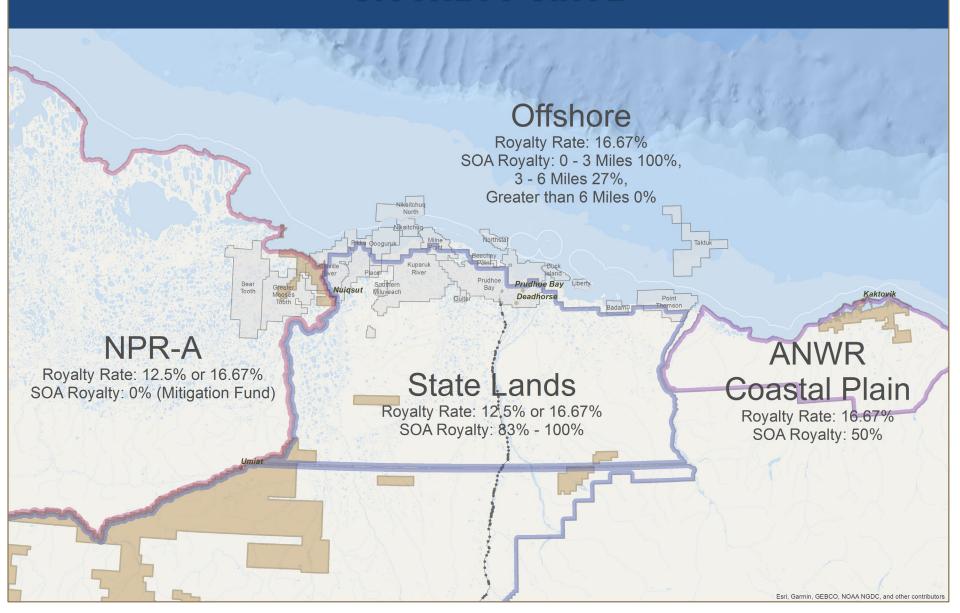
SOA authorizes water withdrawal & fish habitat permits for activities on federal lands

NPR-A Activity

- Oil and Gas Leasing
- ConocoPhillips(AK) continues progress
 - CD-5 production
 - GMT-1 began production October 2018
 - GMT-2 & Willow Development



STATE OF ALASKA - ROYALTY RATE-



GROWING ALASKA: INFRASTRUCTURE

Arctic Strategic Transportation and Resources - ASTAR

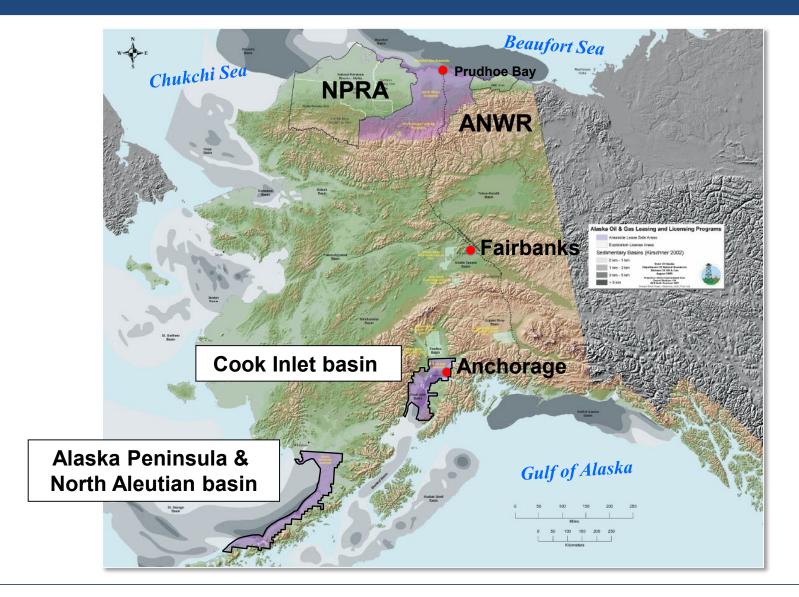
- One of the primary **challenges** in producing resources in our state its vast **size**.
- Arctic resource development is especially dependent on infrastructure for spill response, mobilization, sealifts, etc.
- Lower the cost of energy, basic goods, & utilities across the NS
- Improve infrastructure to provide community security and improve public safety



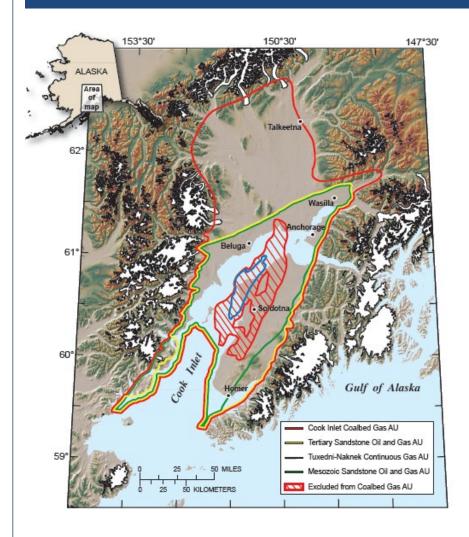
Enhancing access to create opportunities to strengthen cultural exchange and community connectivity

Southern Alaska Oil and Gas

- Annual Areawide Lease Sales -



COOK INLET OIL AND GAS - UNDISCOVERED RESOURCES (USGS) -

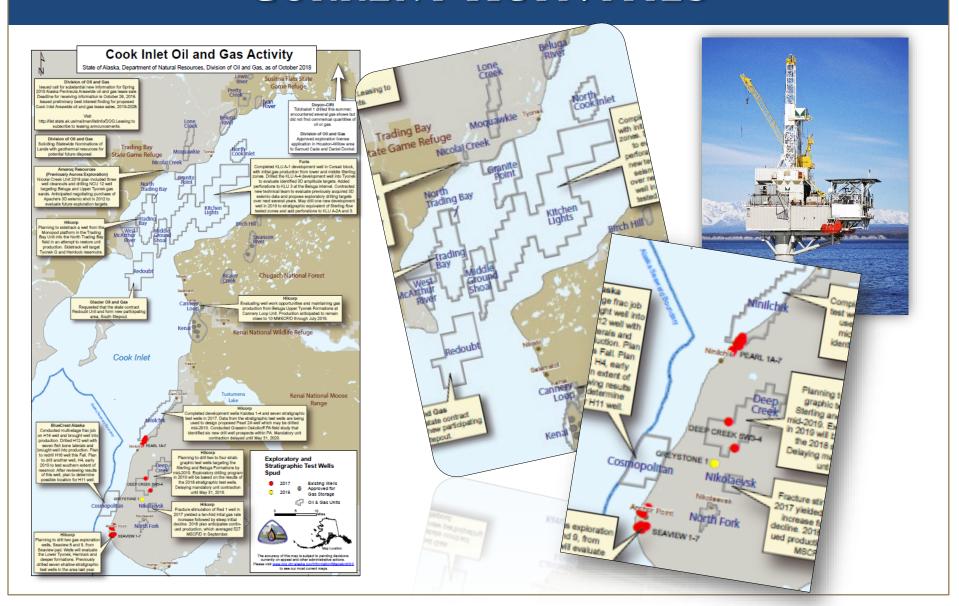


<u>Undiscovered, Technically</u> Recoverable Oil and Gas

- Mean conventional oil 599 MMBO
 - 372 MMBO in Tertiary Ss play
- Mean Conventional gas 13.7 TCF
 - 12.2 TCF in Tertiary Ss play
 - 1.5 in Mesozoic Ss play
- Mean unconventional gas 5.3 TCF
 - 0.6 TCF Mesozoic tight ss play
 - 4.7 TCF tertiary Coalbed play

Note: 1.2 TCF additional mean resource assessed in OCS waters (BOEM, 2011)

COOK INLET -CURRENT ACTIVITIES-



DNR RESOURCES

DNR is a **one-stop shop** for **investors & operators** seeking to develop natural resources in Alaska

- DNR/ Division of Oil and Gas (DOG) holds lease sales twice annually
- North Slope exploration season takes place in winter to minimize tundra impacts as authorized by Division of Mining Land and Water (DMLW)
- DNR Office of Project Management and Permitting (OPMP) assists companies navigating the federal and state permitting process

- Division of Geologic and Geophysical Surveys (DGGS) provides seismic and geological data, available to the public, across the state
- The State Pipeline Coordinator (SPC) will provide all necessary assistance to permit pipelines to carry product



THANK YOU!

For more information contact:

DNR Commissioner's Office

• 907-269-8400

Division of Oil & Gas

• 907-269-8800



Division of Geological & Geophysical Surveys

• 907-451-5000

END OF PRESENTATION

>>>> EXTRA SLIDES<<<<<

FEDERAL PROCESSES CAN DRIVE -TIMELINES / NEPA -

MULTIPLE PERMITTING/APPROVAL PROCESSES RUN IN PARALLEL

EIS	Fe	ederal	Sta	te	Loca	al
Notice of I	ntent	WetlandsPlan of	DNR Operations	R Plan of s/Developmer	nt Boroug	n Plan
Scopin	ng .	erations . 13175		Financial urances	City Plar	
Draft El	18	Consultation		tegrated anagement	Tribal Vill	age Plan
Final El	Endangered	S/NMFS d Species Act ultation	Manageme	C Waste ent, Air Qualit er Quality	Σy,	
		NMFS ssessment	DF Fish Habita			
Recor of Decision	Autho	ederal rizations & provals	Sta Authoriza Appro	ations &	Loc Consist Appro	ency &

Prudhoe Bay Field and Satellites

