Fall 2019 Production Forecast

House Finance Committee

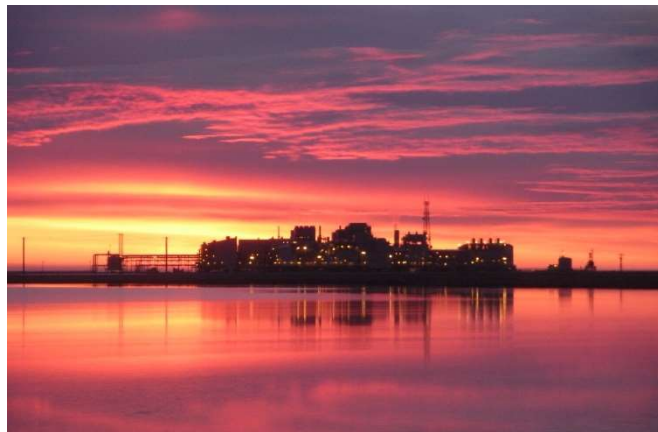Deputy Commissioner Sara Longan, PhD
Maduabuchi Pascal Umekwe, PhD
Alaska Department of Natural Resources, Division of Oil and Gas

January 23, 2020

OUTLINE

- Intro
  - State Resource Potential

- Overview and Highlights on Production
  - Fall 2019 forecast: Comparing recent actuals vs forecast
  - North Slope Projects Highlights
  - Fall 2019 forecast: The State's Overall Production Outlook

- 2019 Production Forecast
  - Objectives
  - Overview of Methodology
    - Current Production, Under Development, Under Evaluation
  - Near-term and longer-term results

STATE OF ALASKA
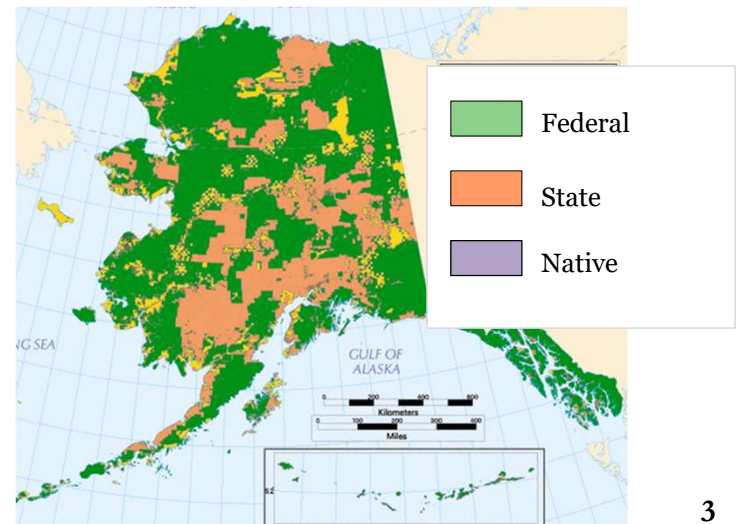## - OIL & GAS RESOURCE POTENTIAL-

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
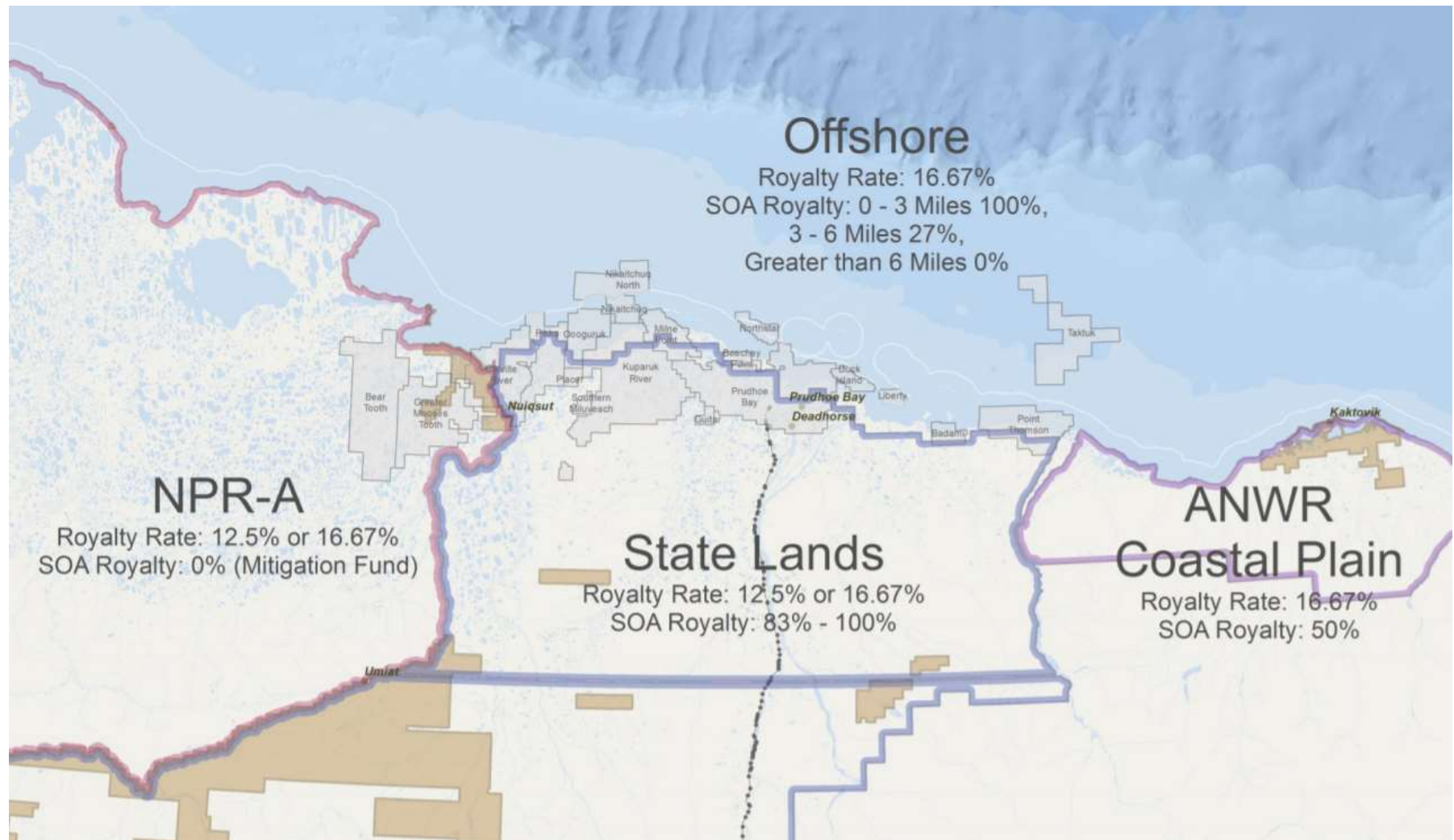- Approximately 40% of the nation's freshwater supply

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

Federal	
State	
Native	

Offshore
Royalty Rate: 16.67%
SOA Royalty: 0 - 3 Miles 100%,
3 - 6 Miles 27%,
Greater than 6 Miles 0%

NPR-A
Royalty Rate: 12.5% or 16.67%
SOA Royalty: 0% (Mitigation Fund)

State Lands
Royalty Rate: 12.5% or 16.67%
SOA Royalty: 83% - 100%

ANWR Coastal Plain
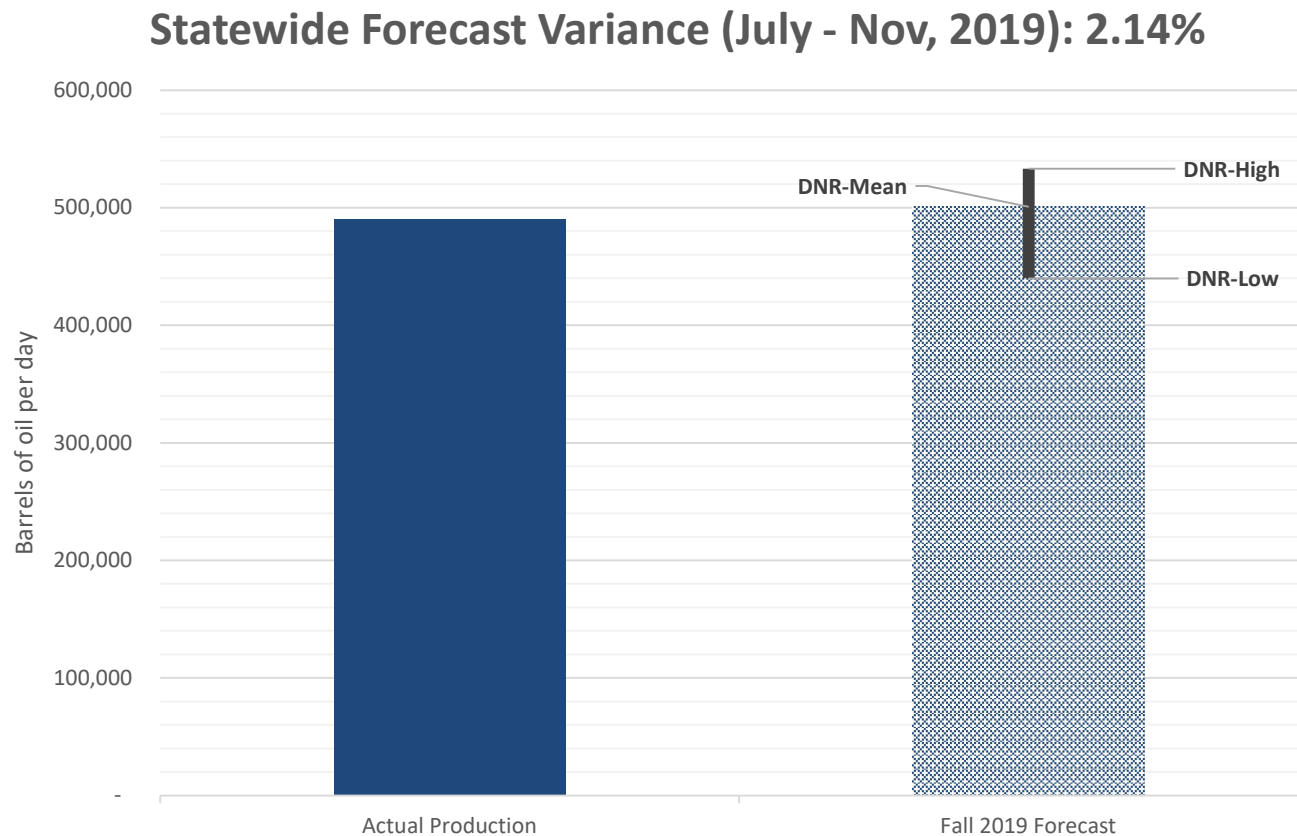Royalty Rate: 16.67%
SOA Royalty: 50%

State's royalty take differs across State land   4

FALL 2019 PRODUCTION FORECAST & NORTH SLOPE PRODUCTION HIGHLIGHTS

FALL 2019 PRODUCTION FORECAST: FY 2020 OUTLOOK

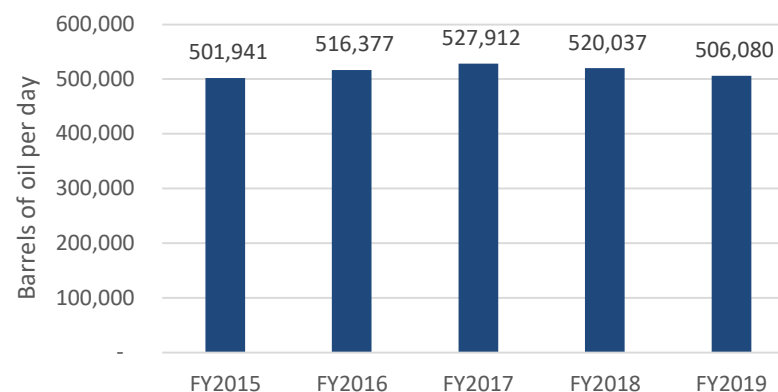## Statewide Forecast Variance (July - Nov, 2019): 2.14%

- For the first 5 months of FY2020 (July 2019 to Nov 2019), on average, daily production has come in within the range forecasted by the DNR.
- Difference between average daily production and mean forecasted statewide production is ~10,500 bbl.
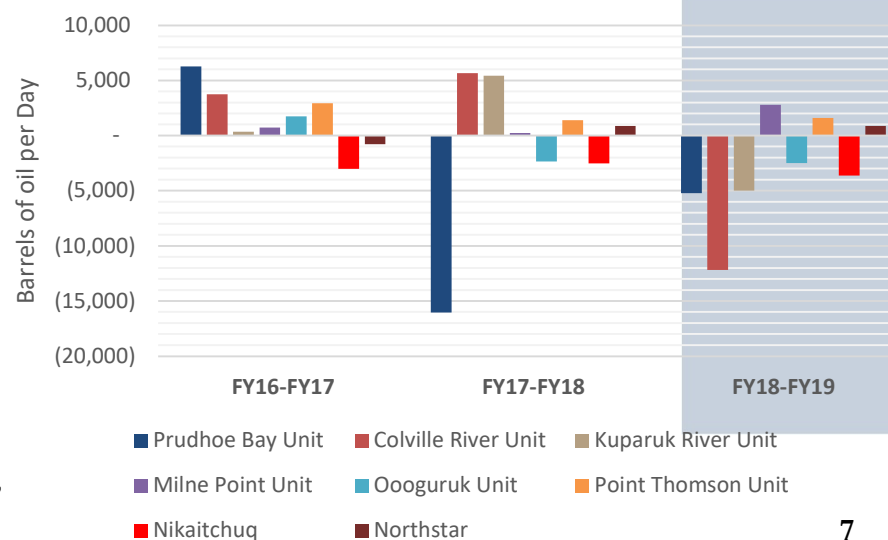
OVERALL PERSPECTIVE: NORTH SLOPE

- Modest decline in production over the last Fiscal Year:
  - FY17 to FY19 on average annual ~2% decline

- Recent Major Changes in Production
  - After gains due to drilling/improvements in operational efficiency in PBU and KRU (2015 through 2018), further efficiency improvements result in smaller production increase
  - **Prudhoe Bay Unit:** PBU returning to pre-2016 decline, albeit modest 2% decline from FY2018-FY2019
  - **Kuparuk Unit:** Strong decline in recent new drills, as well as base production
  - **Colville River Unit**: Decline, pending CD5 2X, Fiord West
  - **Nikaitchuq**: Production upset due to prolonged pipeline repair.
  - **NorthStar**: Two consecutive FY of ~9% growth
  - **Milne Point**: ~14% growth (FY18 to FY 19)
  - **PTU**: Year-on-year growth suggests mitigating facility challenges

- Future Projects coming in:
  - Near future: Raven Pad, CD5 2X, Fiord West, Nuna, GMT2
  - Farther out: Exciting updates from continued appraisal (Pikka, Willow)

Production: 2% decline on average since FY2017

Barrels of oil per day

| FY2015 | FY2016 | FY2017 | FY2018 | FY2019 |
| 501,941 | 516,377 | 527,912 | 520,037 | 506,080 |

Year-on-year change in historical production

Barrels of oil per Day

FY16-FY17   FY17-FY18   FY18-FY19

■ Prudhoe Bay Unit   ■ Colville River Unit   ■ Kuparuk River Unit
■ Milne Point Unit   ■ Oooguruk Unit   ■ Point Thomson Unit
■ Nikaitchuq   ■ Northstar

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PUBLICLY-SOURCED STATUS UPDATE OF KEY FUTURE PROJECTS: NORTH SLOPE

	Status: January 2019	Status: January 2020	Production Rate Estimates
CD5 2nd Expansion	Planned	Ongoing drilling Q1 2020.	Reaching over 10,000 barrels of oil per day
GMT2	GMT2 Sanctioned in Oct 2018	Under construction. First oil expected in YE 2021.	Peak rate: 35,000 to 40,000 barrels of oil per day
Pikka	Single phased development with first oil in 2023	-Now planned for 2-phases; start of production (Phase 1: 2022; Phase 2: 2024); -To move to FEED after 15% divestment of interests	Peak rate: 150,000 barrels of oil per day
Willow	Announced first oil date: Earliest 2023; 2024-2025	Plan to submit Supplemental EIS. Record of decision expected Q4 2020 Announced first oil: 2025-2026	Peak rate: 130,000 barrels of oil per day
Liberty	Final EIS (August 2018). Record of Decision (Oct 2018) Start up in ~2022	Final EIS (August 2018). Record of Decision (Oct 2018) Start up in ~2022, pending litigation on Fed decision	Peak rate: 60,000 to 70,000 barrels of oil per day

LONG TERM PRODUCTION OUTLOOK:
CURRENT PRODUCTION (CP), UNDER DEVELOPMENT (UD), UNDER EVALUATION (UE)

North Slope Mean Production – By Categories
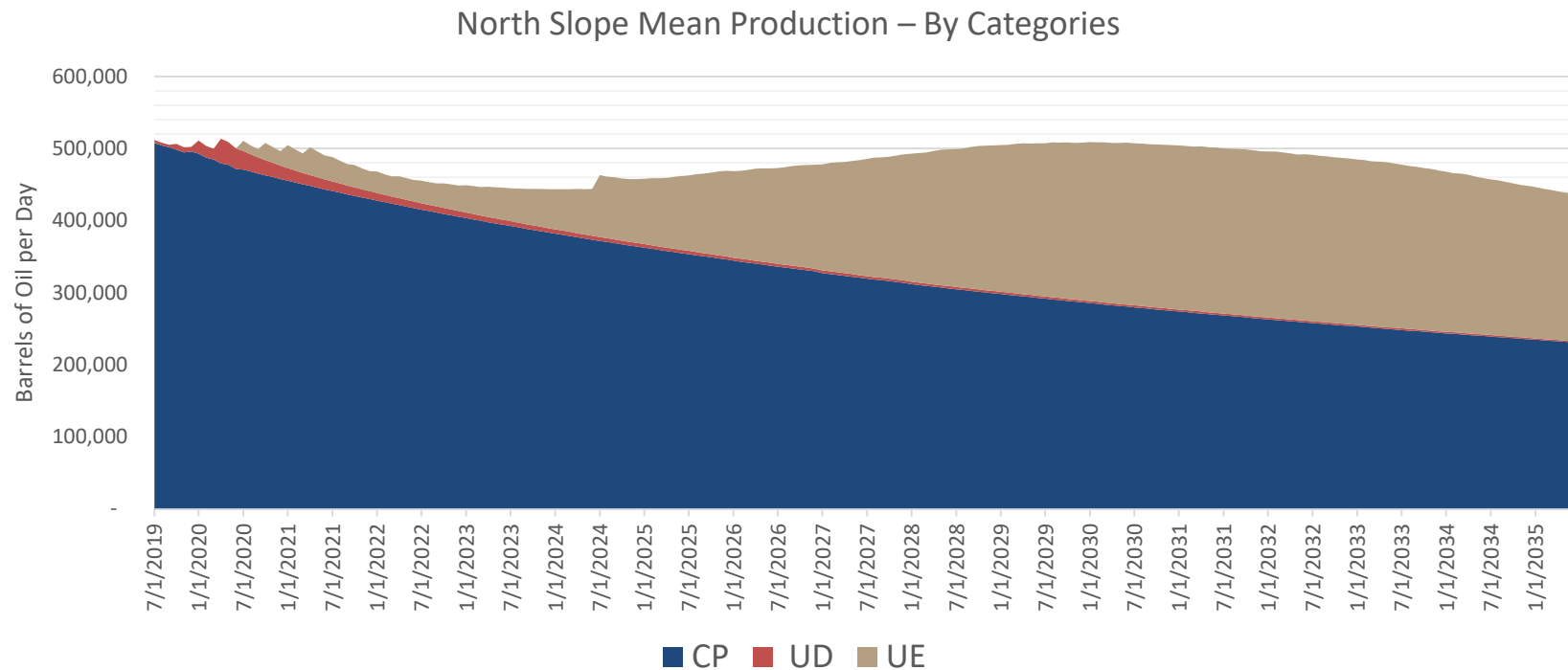
- Currently producing (CP) fields remain backbone of state oil production in near and medium term. Near-term projects under development (UD), often within existing fields, impact 12-month outlook.

- Future fields (UE), which are currently being evaluated by operators, begin to play a more significant role in production in the next 5-6 years

- All new production/projects add to a <u>declining</u> base production

FALL 2019 PRODUCTION FORECAST: APPROACH/METHOD

FALL 2019 FORECAST OBJECTIVES

- Provide a 10-year official production forecast for the State's Revenue planning

- Maintain focus on near-term accuracy
  - Increased attention to production impacts resulting from changes in operational efficiency
  - Continued emphasis on production impacts due to maintenance and other near-term activities

- Maintain focus on longer-term accuracy
  - Ensure product is valid for longer-term projections, based on individual field characteristics and operator plans
  - Apply engineering constraints to ensure realistic projection of near-term production characteristics into the out years

PRODUCTION CATEGORIES – DEFINITIONS

Forecast duration: 10-year official forecast

- **Currently Producing (CP): online in 6/19**
  – Oil from existing wells in currently producing pools such as Prudhoe Bay, Kuparuk

- **Under Development (UD): < 12months**
  – Oil from projects that will add incremental oil to existing fields, or fields with first oil within one year
  – Projects in Plan of Development document, often scheduled and part of operator's annual budget

- **Under Evaluation (UE): >12 months**
  – Oil from projects likely to occur in the future, but which have not met the requirements of the previous category

Production Category		Forecast Year	Start July 1	End June 30	Fiscal Year
			First Oil Time Range		
CP	Production online at 6/19				
UD	Production expected to be online within 1 year	1	2018	2019	*FY2019*
UE	Production expected to be online 2 to 10 years out from forecast start date	2	2019	2020	*FY2020*
		3	2020	2021	*FY2021*
		4	2021	2022	*FY2022*
		5	2022	2023	*FY2023*
		6	2023	2024	*FY2024*
		7	2024	2025	*FY2025*
		8	2025	2026	*FY2026*
		9	2026	2027	*FY2027*
		10	2027	2028	*FY2028*

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PRODUCTION CATEGORIES: ADDRESSING UNCERTAINTY

- **Currently Producing (CP) fields:**
  - Relatively small uncertainty range due to established behavior of producing pools
    - Probabilistic Decline Curve Analysis projections

- **Projects Under Development (UD):**
  - More uncertainty than CP
  - Uncertainties include commercial and reservoir performance risks
    - Probabilistic type wells from analogue developments
    - Mostly approved projects/projects in development plan

- **Projects Under Evaluation (UE):**
  - More uncertain than CP and UD
  - Commerciality risks (oil and gas fiscal structure, oil price, approvals, negotiations)
  - Other uncertainties include
    - Chance of occurrence within the 10-year forecast window
    - Timing; uncertainty in start of sustained production
   - Production profile/reservoir performance (probabilistic type wells)

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CONTINUED FOCUS ON BOTH SHORT-AND LONG-TERM FORECAST ACCURACY

- DNR Forecast maintains balanced focus on near and long term accuracy, and continues to evaluate underlying assumptions for the short and long term outlook on each field

- This approach is important for the forecast to continue to serve multiple purposes
  - Near-term accuracy required to support the State's near-term budgeting goals
  - Long-term accuracy required to support State's long term revenue projections and decisions around long-term fiscal picture

FORECAST ACCURACY: NEAR-TERM

- Emphasis is placed on near-term production to capture impacts of scheduled maintenance/turn-around events

- Probabilistic Decline Curve Analysis weighted toward recent production history

- Engaging operators on near term plans, drilling schedules, rig commitments

- Continued focus on production add due to changes in operational practices vs new wells
  - Emphasis on operator engagement to understand expectations around changes in operational strategy
  - Focus on new wells net of routine development drilling

NEAR-TERM FORECAST ACCURACY: STATEWIDE

Total Alaska (North Slope and Cook Inlet) Daily Production
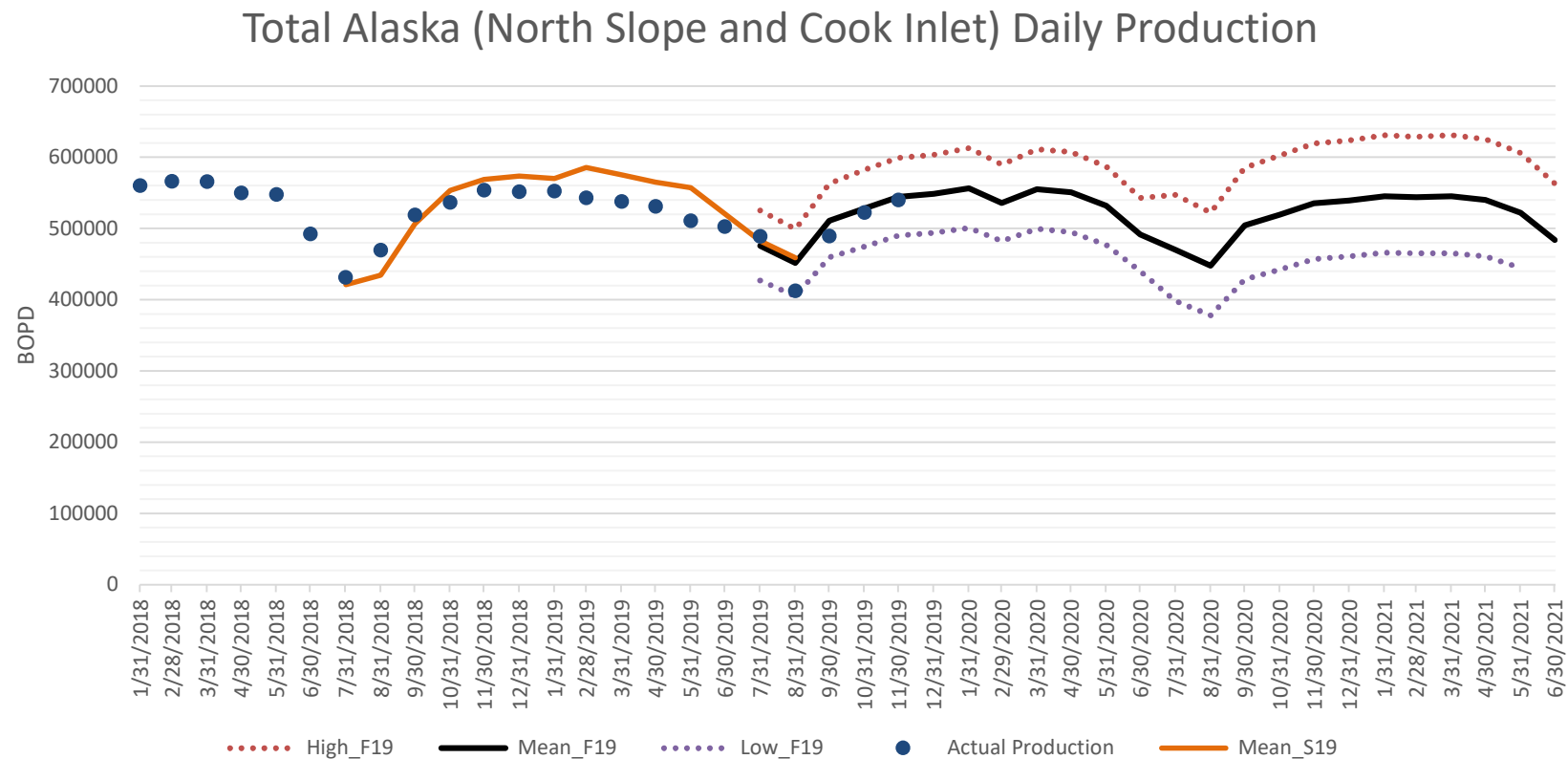
- Actual production falls within DNR range, also tracks DNR's mean forecast
- Accurate near-term forecast allows for state revenue planning in the next fiscal year

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REALISTIC LONG-TERM PROJECTION

- Attention to realistic long-range outlook for the fields, reflecting operators' field development plans

- Decline Curve Analysis on current production emphasizes recent history but also considers previous history of the fields

- Engineering judgement is applied to honor field development and reservoir engineering constraints

- Future projects that add to production in out years are based on current project definition, project characteristics and uncertainty analysis

COMPARING LONG-TERM PROJECTIONS

### ANS Only: Fall - 2019 Forecast - DOG vs Operators
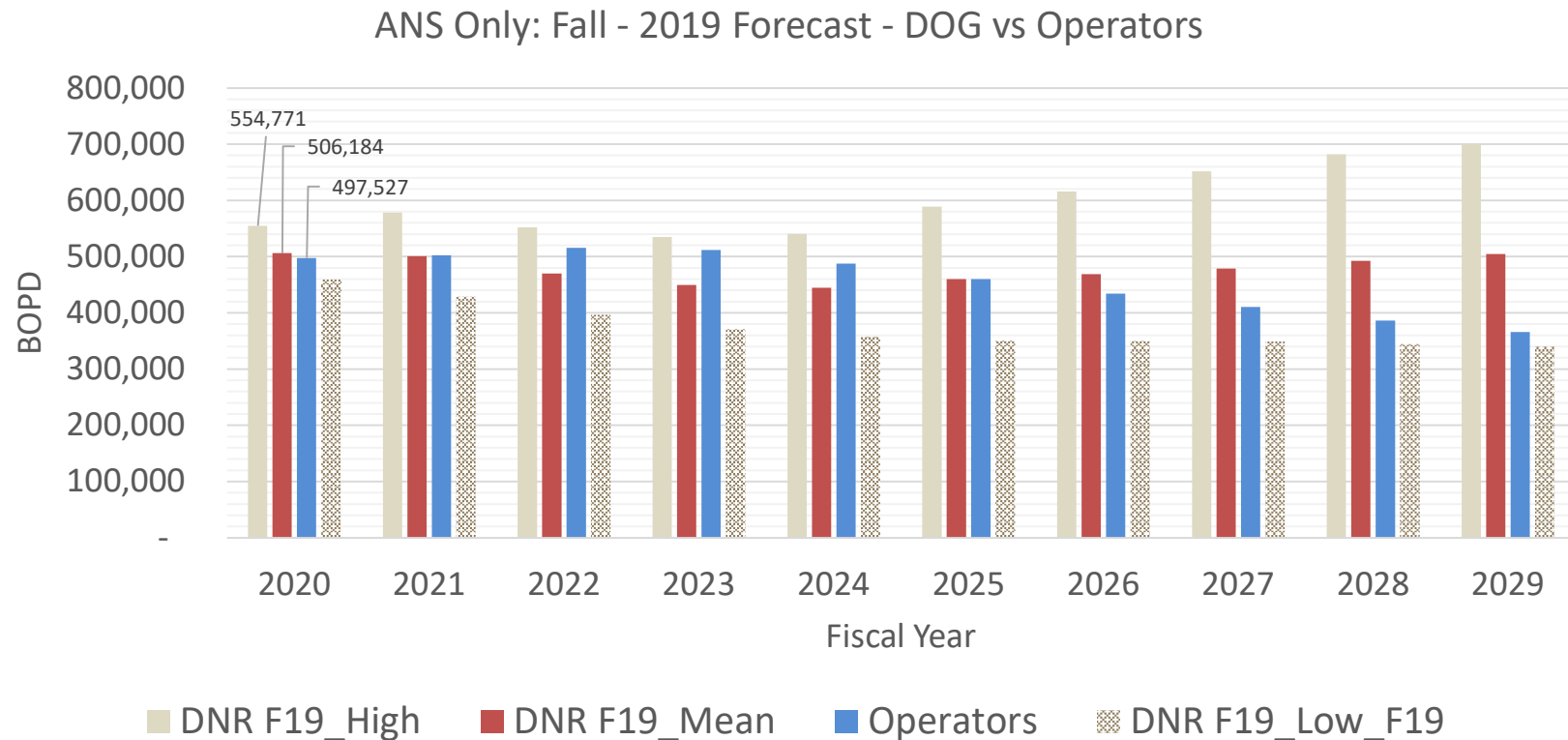
- Fall 2019 Forecast: Producers' outlook/forecast falls within DNR-forecasted range

- Operator vs DNR forecast departure in the outyears: DNR Forecast includes production outlook from *Explorer's* projects not yet in production (*Explorer* production forecasts are absent from "Operators" volumes in graph above)

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INCREASING UNCERTAINTY AS NEW FIELDS/PROJECTS COME ONLINE
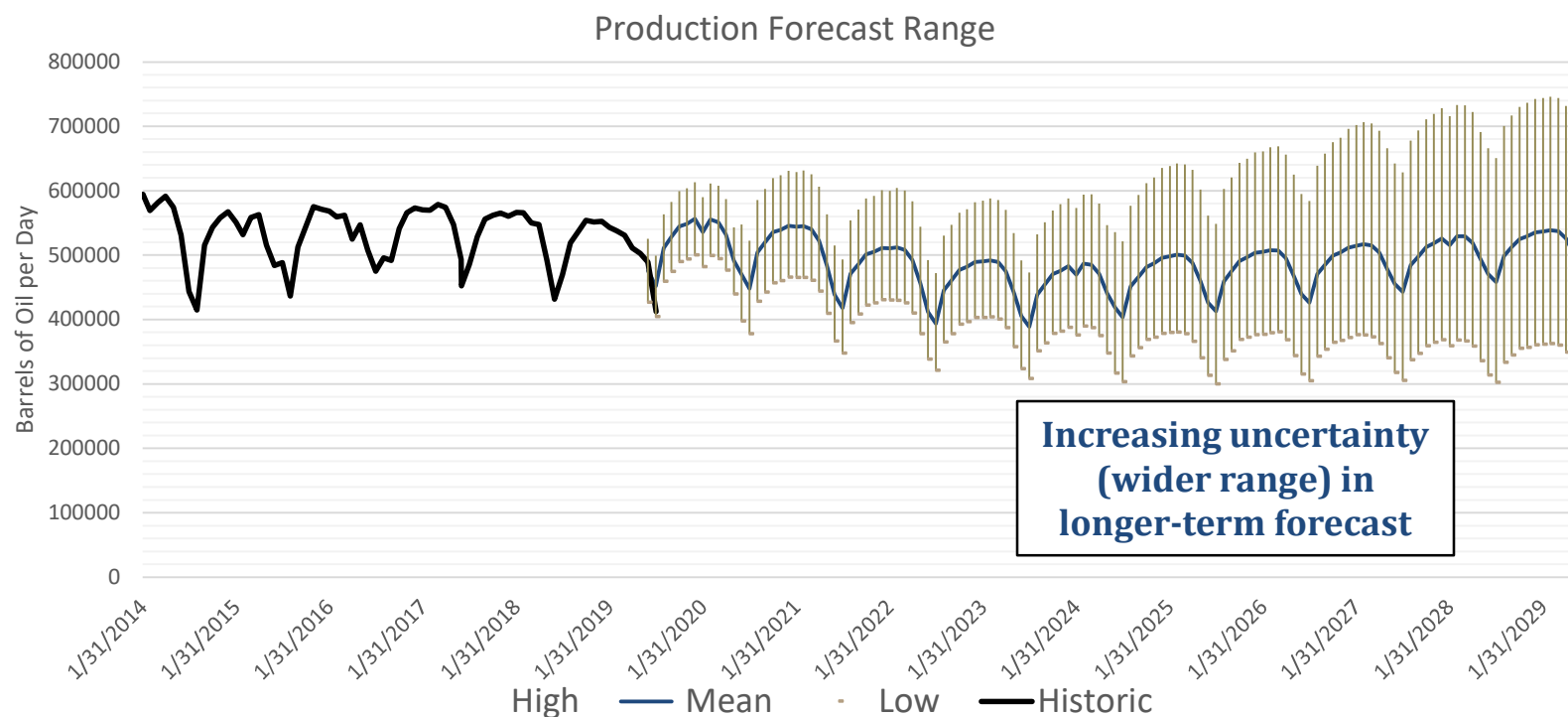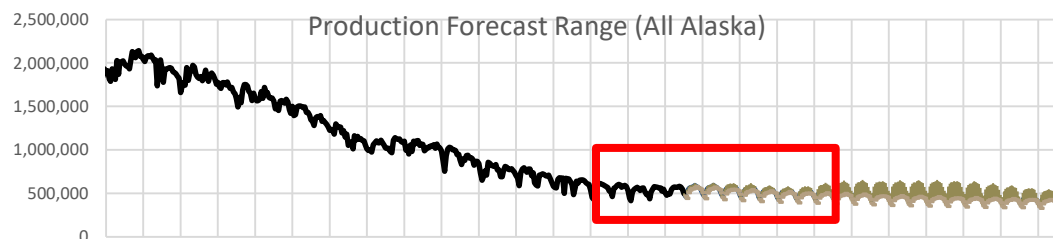
PROJECTS UNDER EVALUATION
MEDIUM TO LONG TERM
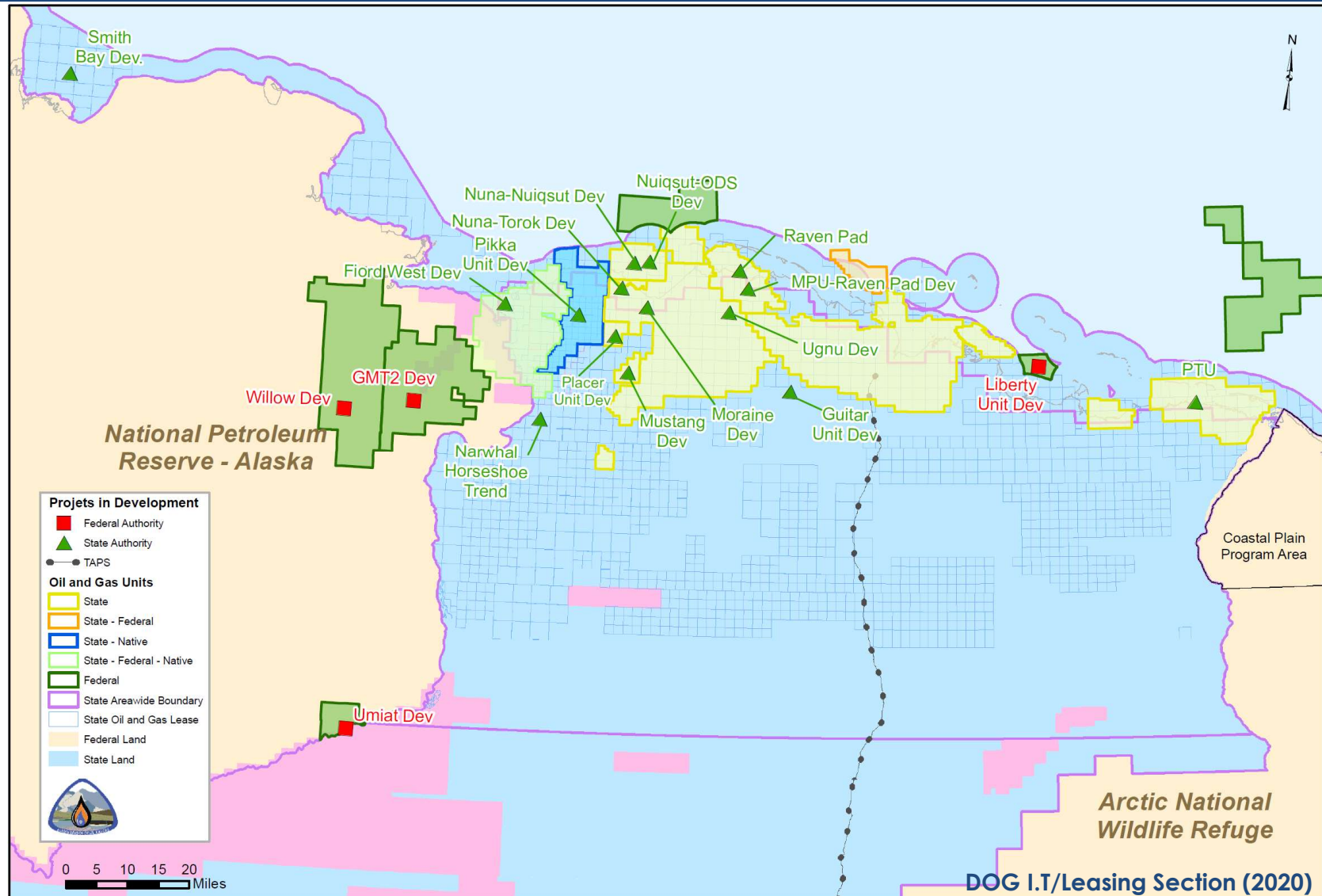
QUESTIONS?

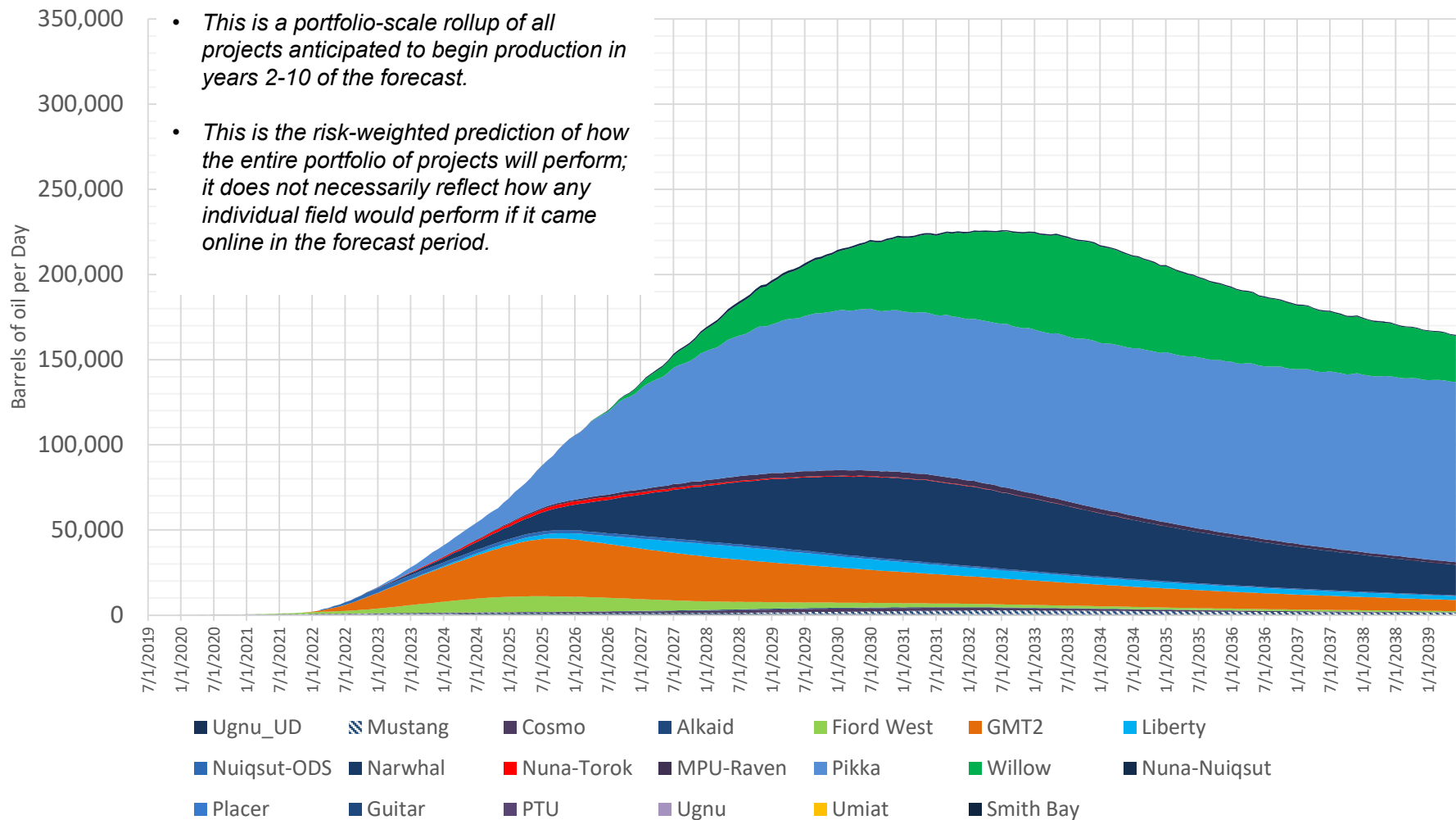Thank you on behalf of the DOG Fall 2019 Production Forecasting Core Team:

John Burdick, Jim Young, Jennifer Mcleod, Matt Snodgrass, PhD., Steve Moothart

NEW PROJECTS UNDER DEVELOPMENT/EVALUATION: ADDING TO A DECLINING BASE PRODUCTION

- *New production is additional on a <u>declining base production</u>*

- *This is a portfolio-scale rollup of all projects anticipated to begin production in years 2-10 of the forecast.*

- *This is the risk-weighted prediction of how the entire portfolio of projects will perform; it does not necessarily reflect how any individual field would perform if it came online in the forecast period.*

Fall 2019 – Mean - Risked production rates

Major contributors: Pikka, Willow, GMT2, Narwhal Trend (south of Pikka)