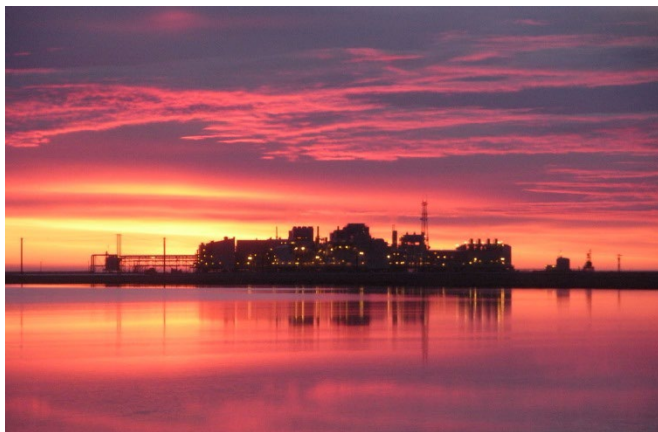# Fall 2018 Production Forecast

*Senate Finance Committee*

Maduabuchi Pascal Umekwe, PhD
Alaska Department of Natural Resources, Division of Oil and Gas

January 16, 2019

# Outline

- Overview and Highlights on Production
  - Fall 2018 forecast: Comparing recent actuals vs forecast
  - North Slope Projects Highlights
  - Fall 2018 forecast: The State's Overall Production Outlook

- 2018 Production Forecast
  - Objectives
  - Overview of Methodology
    - Current Production, Under Development, Under Evaluation
  - Near-term and longer-term results

# FALL 2018 PRODUCTION FORECAST: FY 2019 OUTLOOK
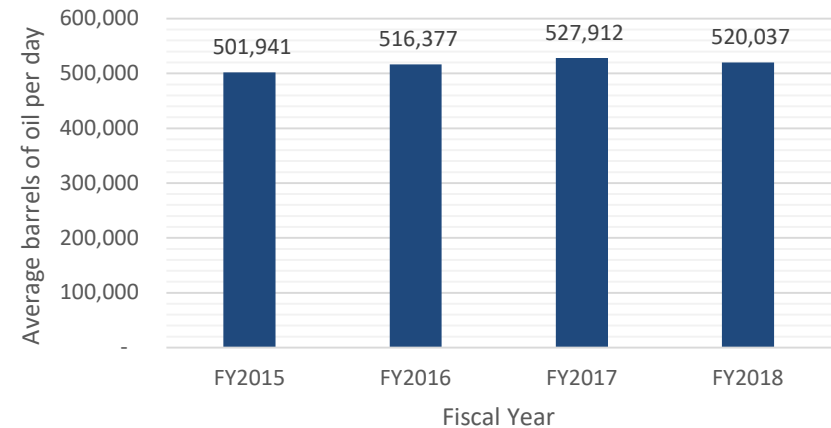
## Forecast vs Actual
## (July - Nov 2018)



**Current departure from actual: <0.5%**
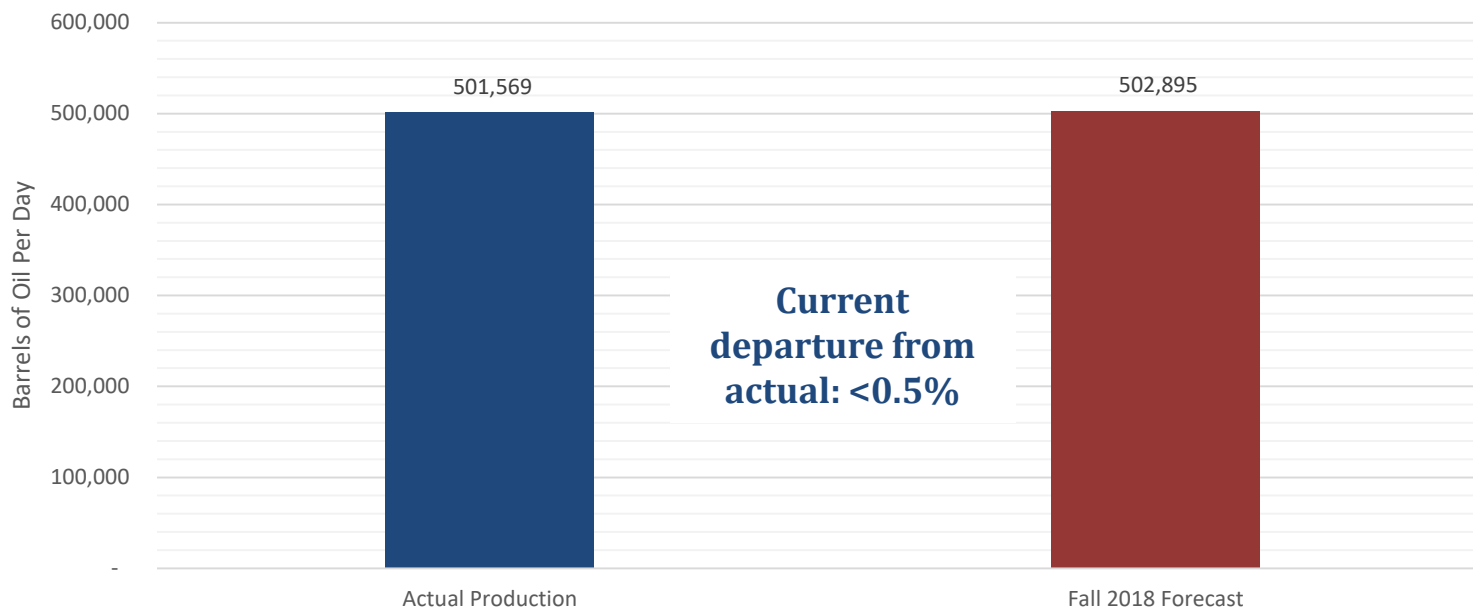
**Daily production difference between forecast and actual production: <1,500 bbl**
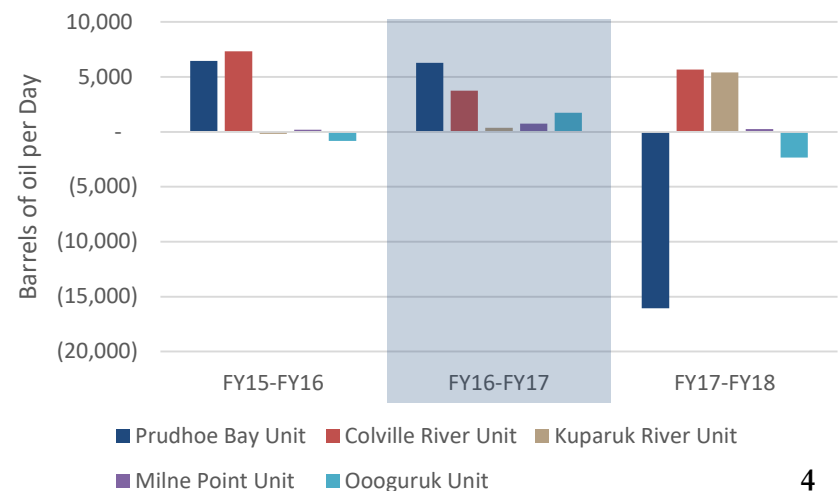
# OVERALL PERSPECTIVE: NORTH SLOPE

- Production is relatively flat:
  - FY15 to FY17 increase in production (~2-3% per year)
  - FY17 to FY18 decrease in production (~1.5%)

- Recent Major Changes in Production
  - Prudhoe Bay Unit
    - Non-rig workovers → increase active well count
    - Reservoir modeling → identifying targets
    - Facilities modeling → planning maintenance
    - Doing more with less → operational efficiency
  - Kuparuk Unit
    - DS-2S (Sharks Tooth)
    - 1H-NEWS
  - Colville River Unit
    - CD5
  - GMT1:
    - First oil Oct 2018

- Future Projects coming in:
  - Near future:
    - Milne Point Moose Pad, CD5 Expansion, GMT2
  - Farther out:
    - Exciting discoveries moving forward (Pikka, Willow)
    - Old discoveries now moving forward (Liberty)

### Production: Relatively flat

Average barrels of oil per day

| FY2015 | FY2016 | FY2017 | FY2018 |
|--------|--------|--------|--------|
| 501,941 | 516,377 | 527,912 | 520,037 |

Fiscal Year

### Change across some fields

Barrels of oil per Day — FY15-FY16, FY16-FY17, FY17-FY18

Legend: ■ Prudhoe Bay Unit ■ Colville River Unit ■ Kuparuk River Unit ■ Milne Point Unit ■ Oooguruk Unit
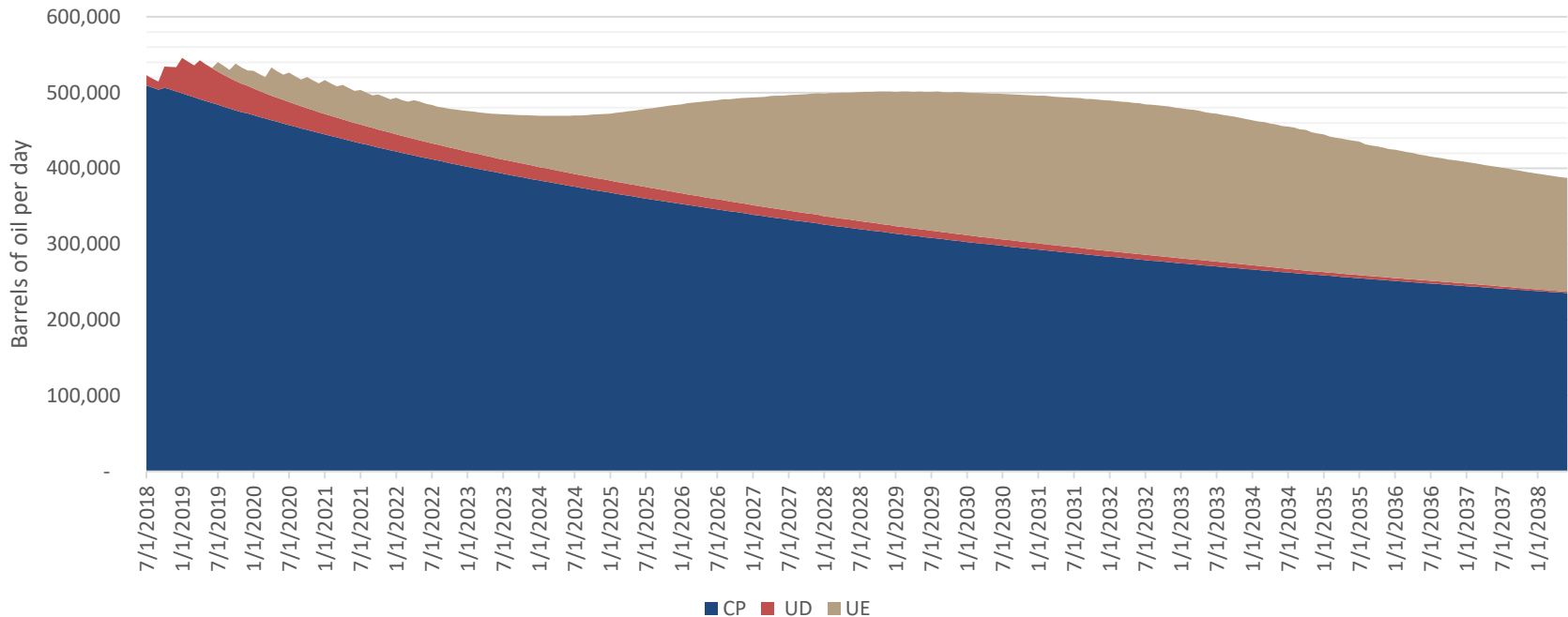
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# 20-YEAR PRODUCTION OUTLOOK: PRODUCTION CATEGORIES

**North Slope Production 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

# FALL 2018 PRODUCTION FORECAST

# FALL 2018 FORECAST OBJECTIVES

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

- Maintain focus on near-term accuracy
  - More emphasis on most recent history in projections for the near future
  - Include seasonal changes in production to improve near-term view

- Increase 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 by 6/18**
  - Oil from existing wells in currently producing pools

- **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 | First Oil Time Range | | Fiscal Year |
|---|---|---|---|---|---|
| | | | Start July 1 | End June 30 | |
| CP | Production online at 6/18 | | | | |
| 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* |

# 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 financial and reservoir performance risks
  - Probabilistic type wells

- **Projects Under Evaluation (UE):**
  - More uncertain than CP and UD
  - Financial risk: using project breakeven price and State official price forecast
  - Other uncertainties include
    - Chance of occurrence in the 10-year forecast window
    - Timing; start of sustained production
    - Production profile/reservoir performance (probabilistic type wells)

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

- DOG Forecast maintains balanced focus on near and long term accuracy, and continues to evaluate underlying assumptions for its 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
  - Field level accuracy required for realistic assessment of impact of near- and long-term development plans on non-state land (NPRA development, etc.)

# Near-term Focus

- Ensuring clearest possible outlook in the near term
  - Near term guidance is based on the most recent pool information, operational practices and performance

- 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

- Full credit to planned UD production
  - Makes for more accurate near-term production forecast and helps account for rate additions due to field efficiency improvements

# NEAR-TERM FOCUS: NORTH SLOPE
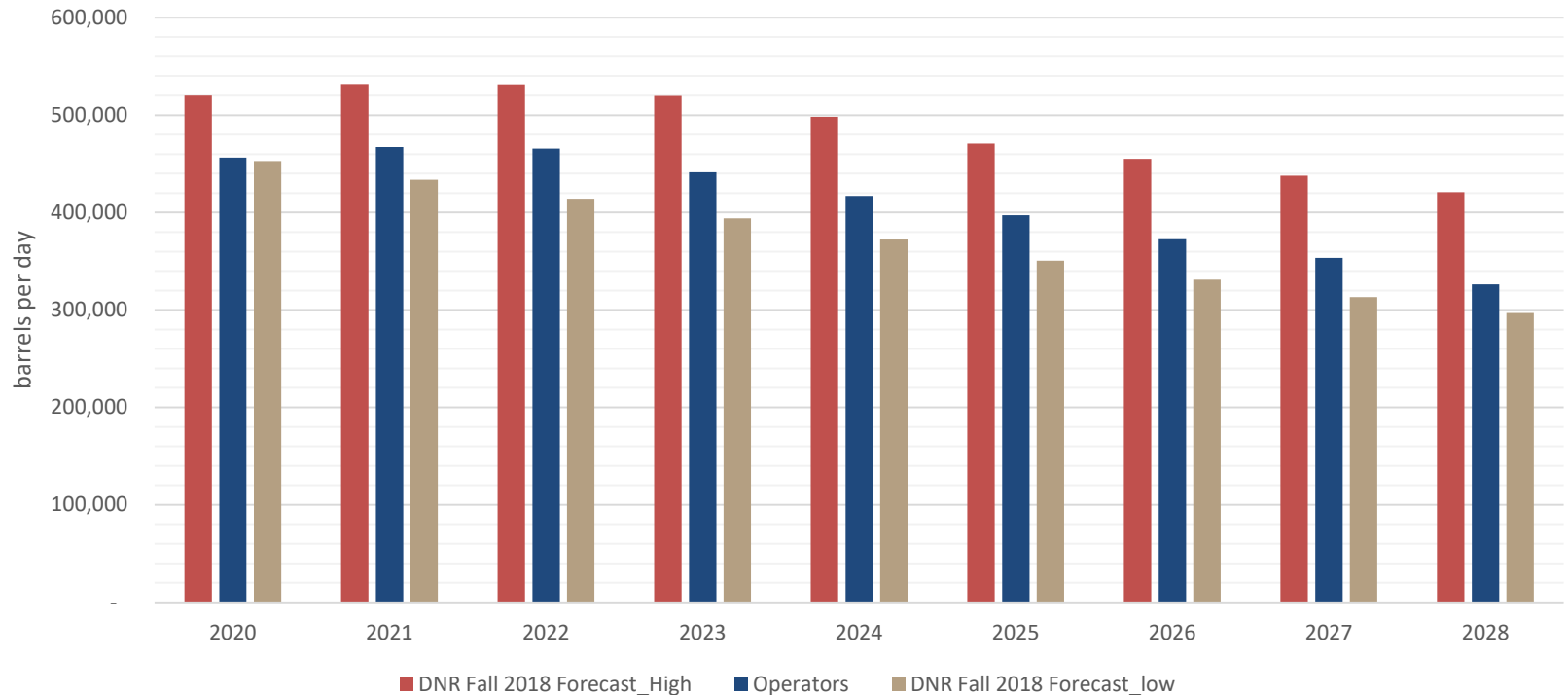


North Slope: Forecast vs Actual Production
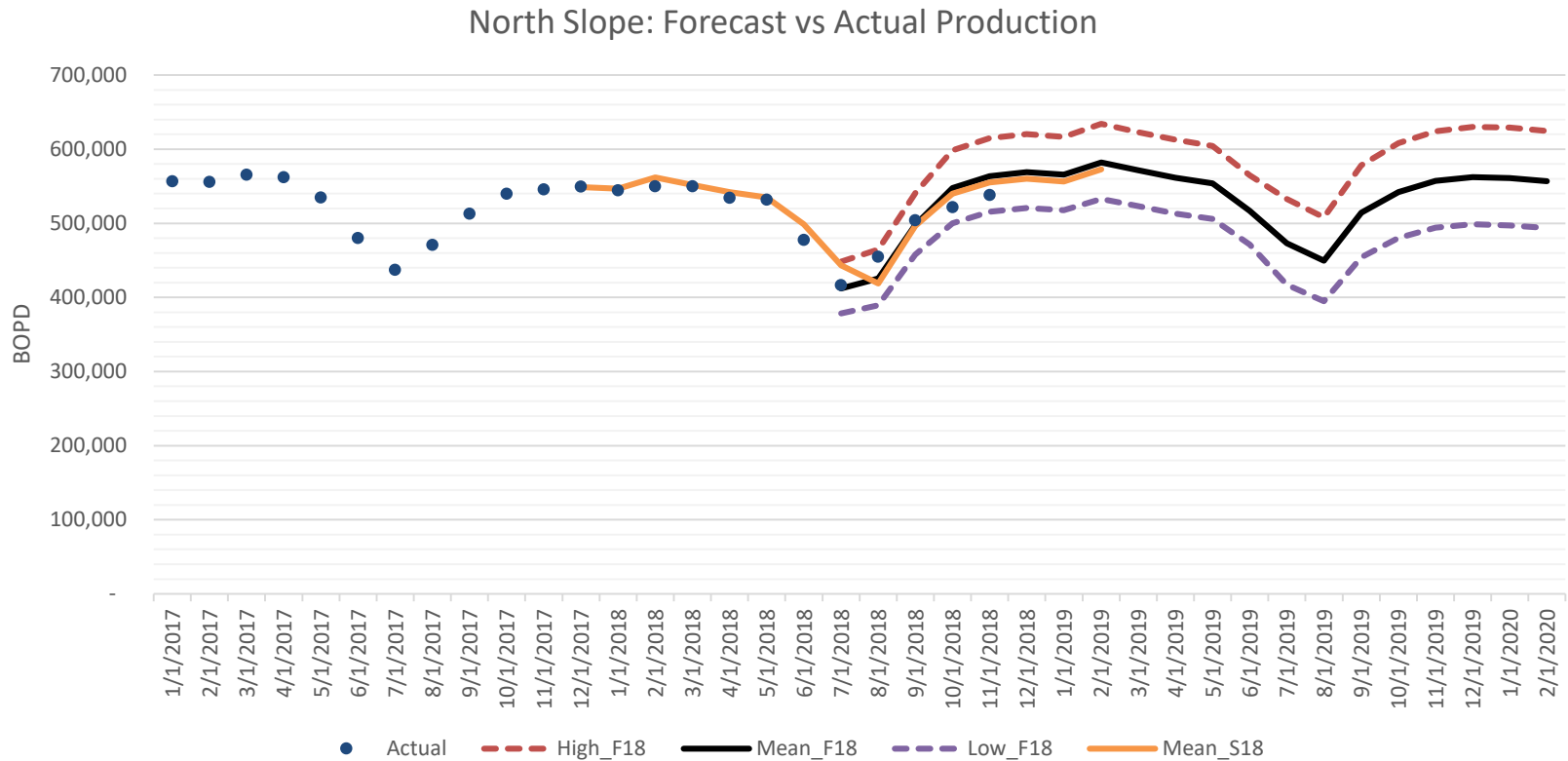
- Ensuring accurate forecasts in the near term to support revenue planning in the next fiscal year
- Also, tracking observed monthly production variations

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# Realistic long-term projection

- Attention to realistic long-range outlook for the fields reflecting 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
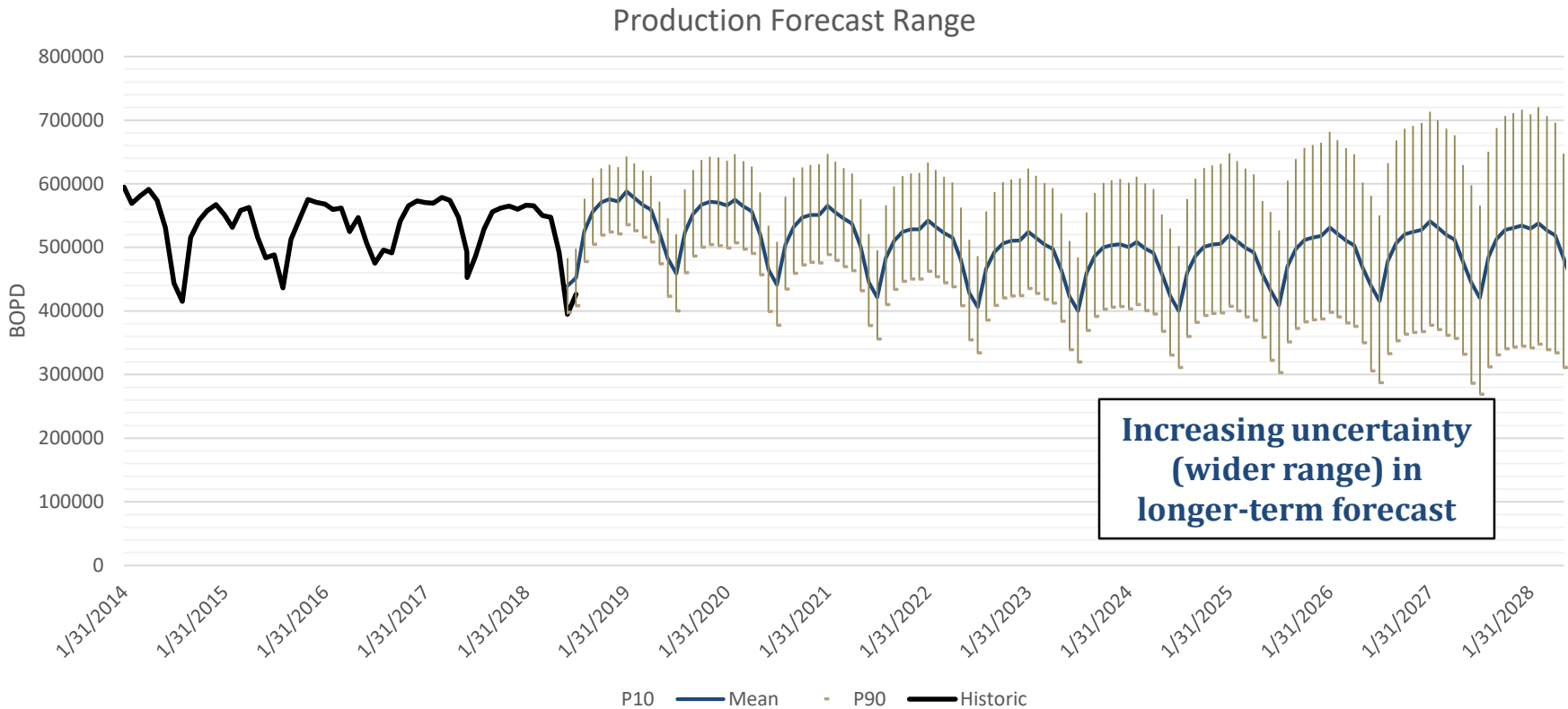
# Comparing long-term projections



Operator vs DOG Forecast (2020 through 2028)*
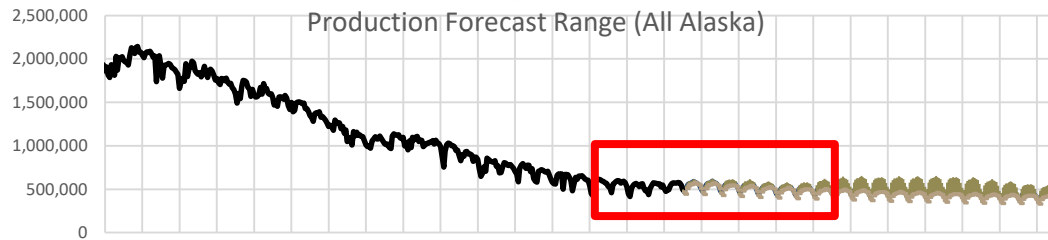
Legend: DNR Fall 2018 Forecast_High · Operators · DNR Fall 2018 Forecast_low

y-axis: barrels per day
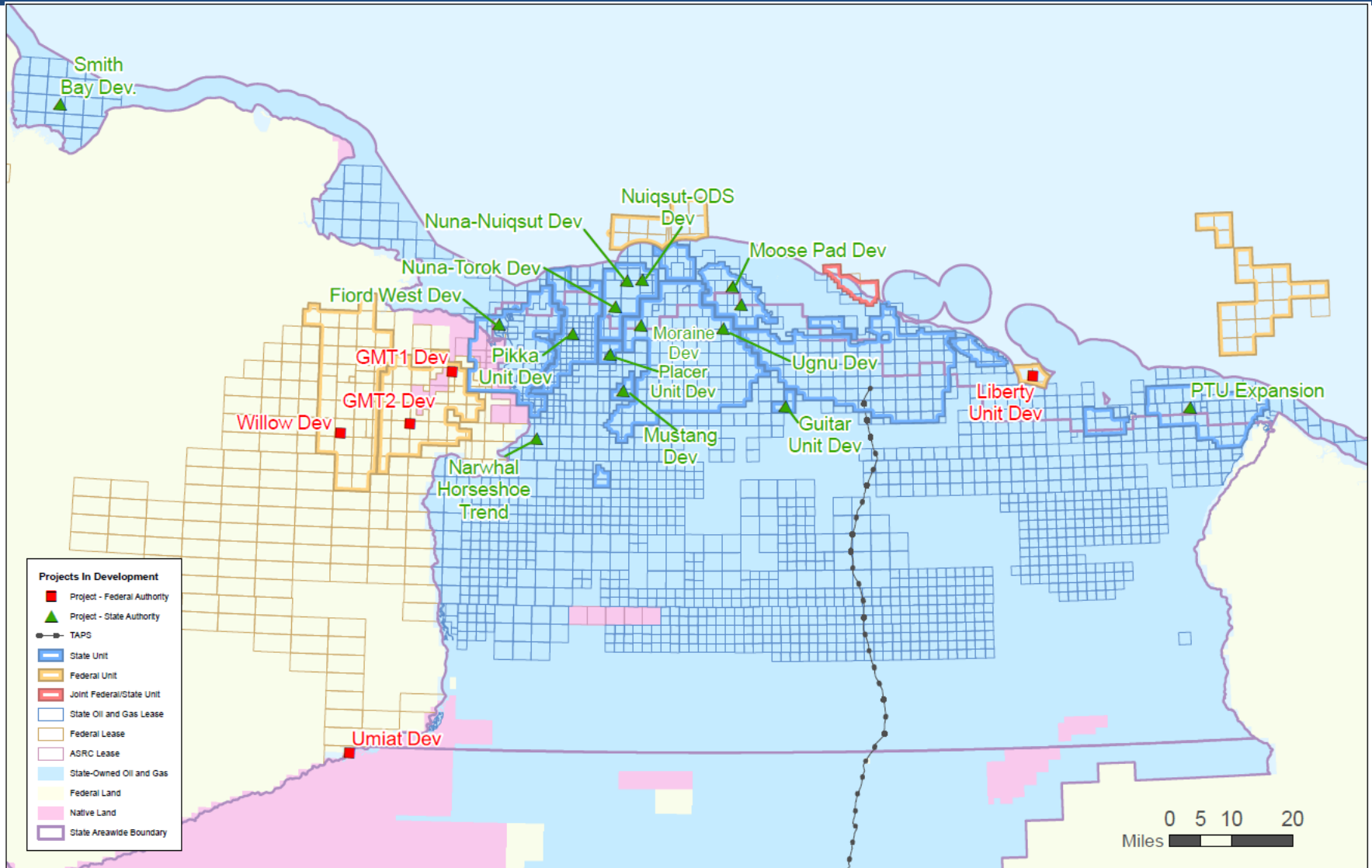
* Same aggregate of five units

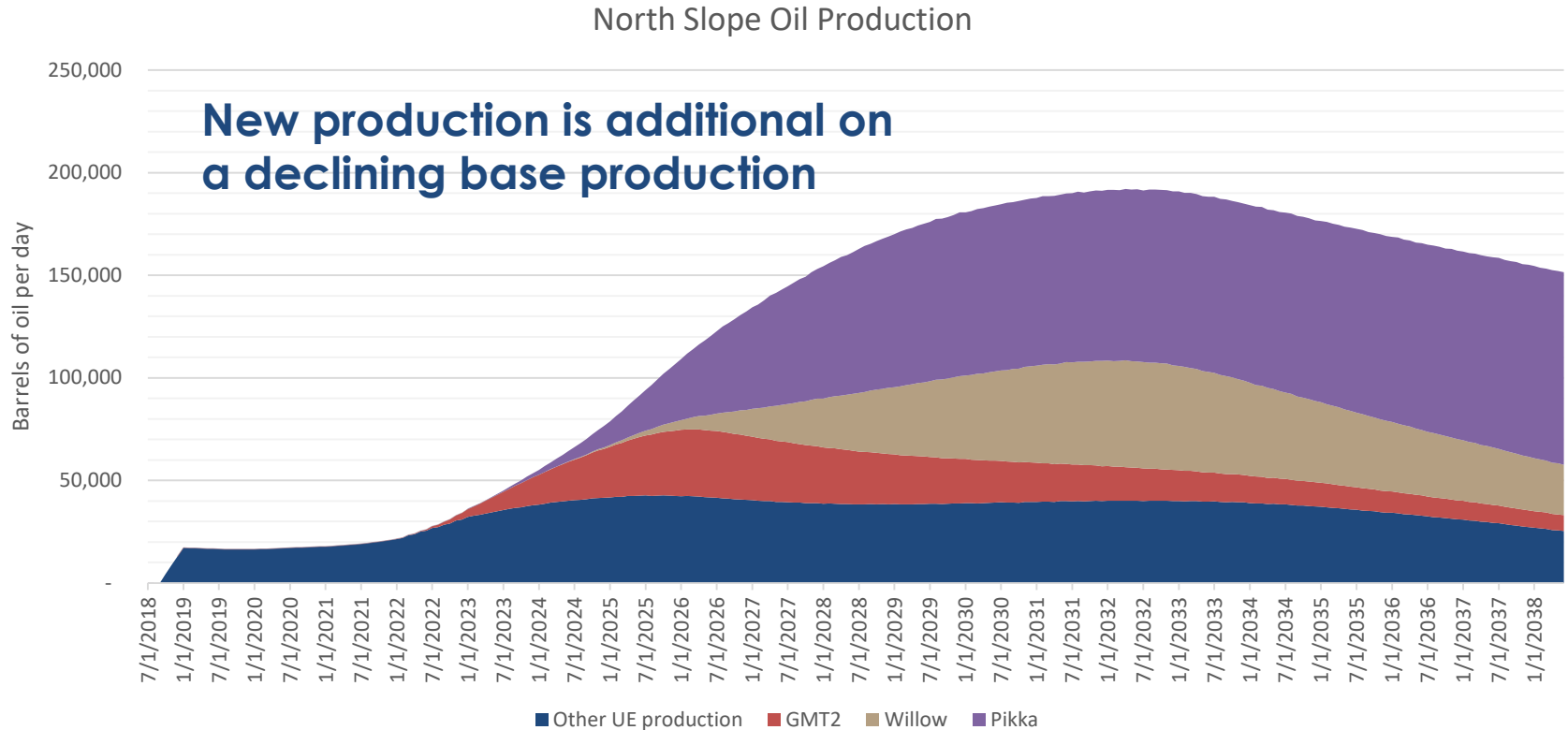- Fall 2018 Forecast: Producers' outlook/forecast falls within DOG production forecast range

Production Forecast Range (All Alaska)

Production Forecast Range

# PROJECTS UNDER EVALUATION
## MEDIUM TO LONG TERM

Smith Bay Dev.

Nuiqsut-ODS Dev

Nuna-Nuiqsut Dev

Moose Pad Dev

Nuna-Torok Dev

Fiord West Dev

Moraine Dev

GMT1 Dev

Pikka Unit Dev

Placer Unit Dev

Ugnu Dev

Liberty Unit Dev

PTU Expansion

GMT2 Dev

Mustang Dev

Guitar Unit Dev

Willow Dev

Narwhal Horseshoe Trend

Umiat Dev

**Projects In Development**

- ■ Project - Federal Authority
- ▲ Project - State Authority
- ●—● TAPS
- State Unit
- Federal Unit
- Joint Federal/State Unit
- State Oil and Gas Lease
- Federal Lease
- ASRC Lease
- State-Owned Oil and Gas
- Federal Land
- Native Land
- State Areawide Boundary

0 5 10 20
Miles

**DOG Leasing Section (2019)**

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# RISKED UNDER DEVELOPMENT/EVALUATION PROJECTS



*Portfolio-scale rollup of all projects anticipated to begin production in years 2-10 of the forecast. While this is the best risk-weighted prediction of how the entire portfolio will perform, it does not necessarily reflect how any individual field would perform if it came online in the forecast period.*

# QUESTIONS?

Thank you on behalf of the DOG 2018 Production Forecasting Core Team:

Chirag Raisharma, John Burdick, Jim Young, Steve Moothart