



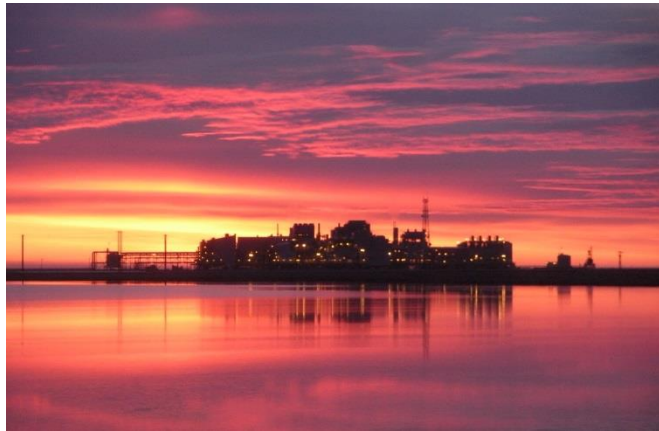
Fall 2018 Production Forecast

House Finance Committee

Maduabuchi Pascal Umekwe, Ph.D.

Alaska Department of Natural Resources, Division of Oil and Gas

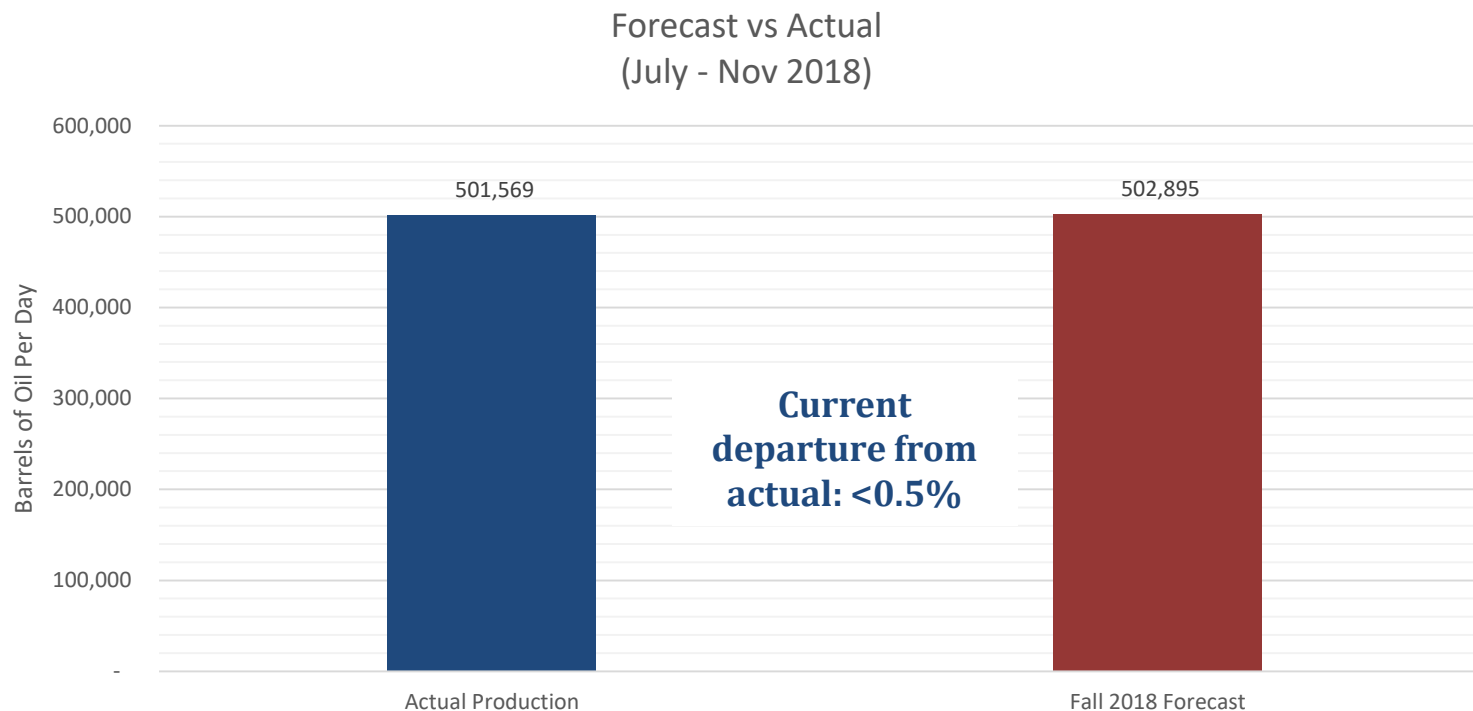
February 27, 2019



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

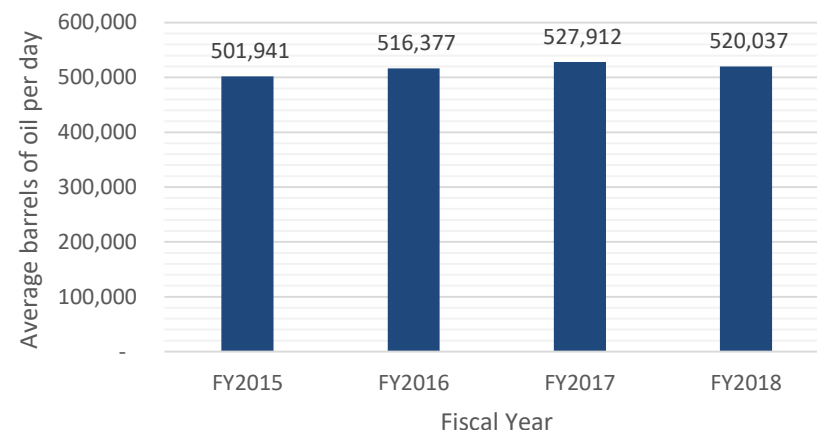


**Daily production difference between forecast and actual
production: <1,500 bbl**

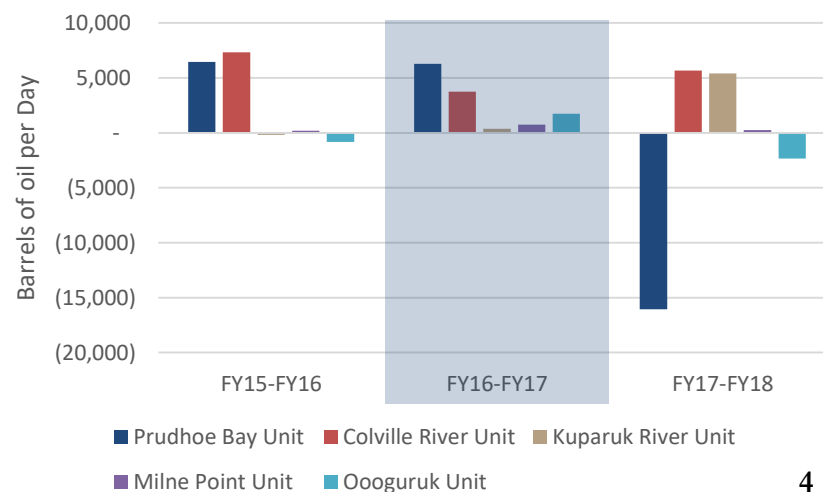
OVERALL PERSPECTIVE: NORTH SLOPE

- 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)

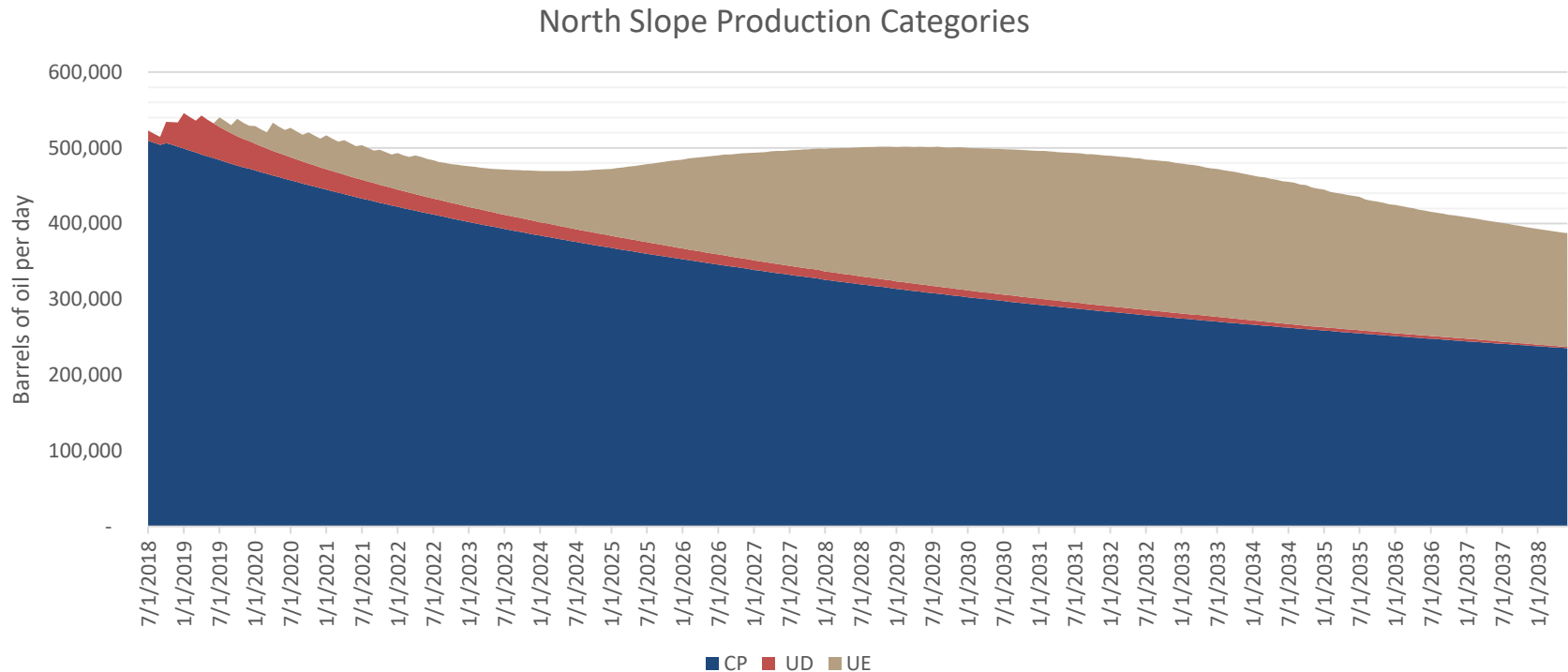
Production: Relatively flat



Change across some fields



20-YEAR PRODUCTION OUTLOOK: 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): < 12 months**
 - 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

| | | First Oil Time Range | | | |
|---------------------|---|----------------------|--------------|-------------|-------------|
| Production Category | | Forecast Year | Start July 1 | End June 30 | Fiscal Year |
| 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)

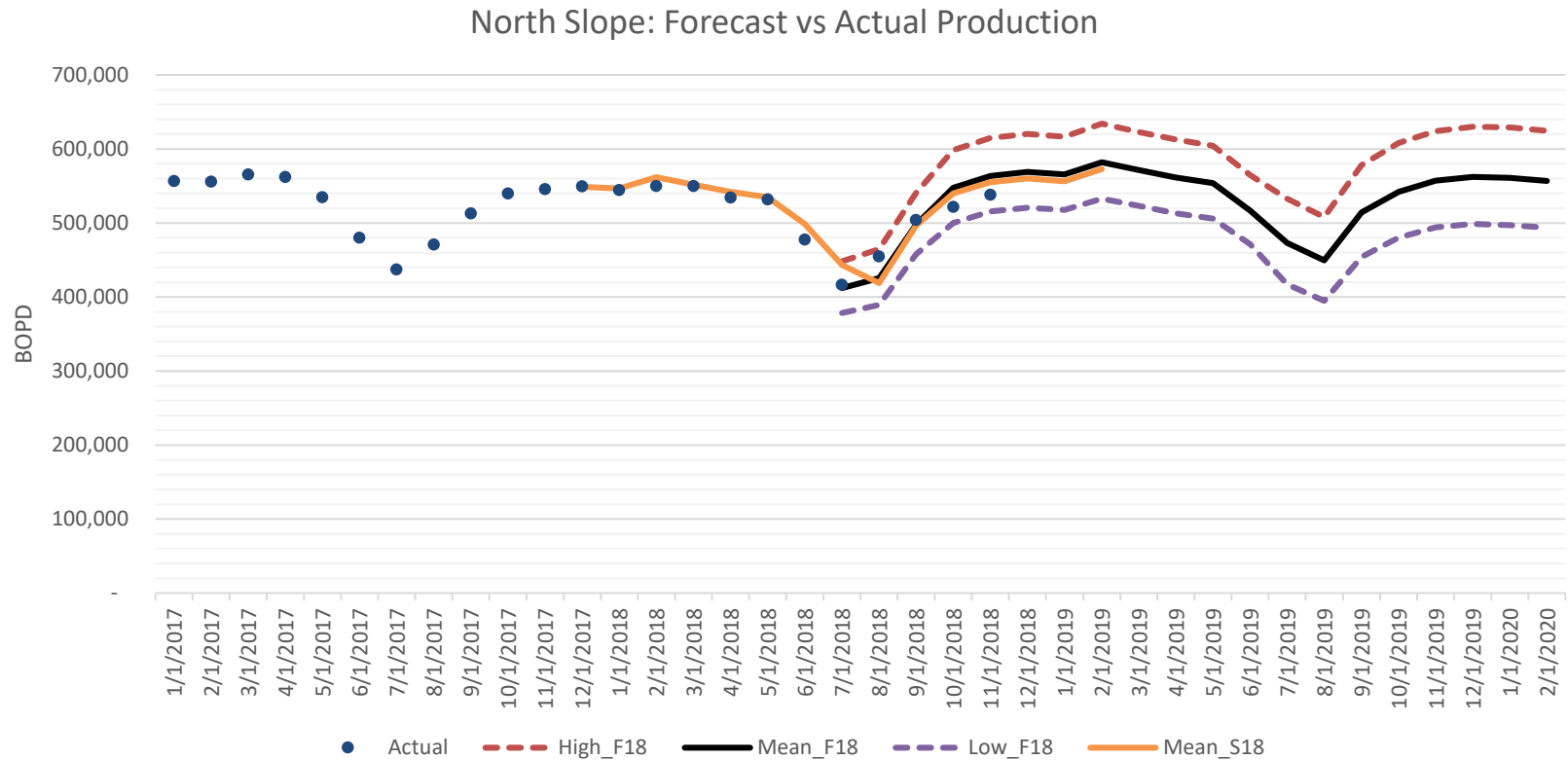
CONTINUED FOCUS ON BOTH SHORT-AND LONG-TERM FORECAST ACCURACY

- 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

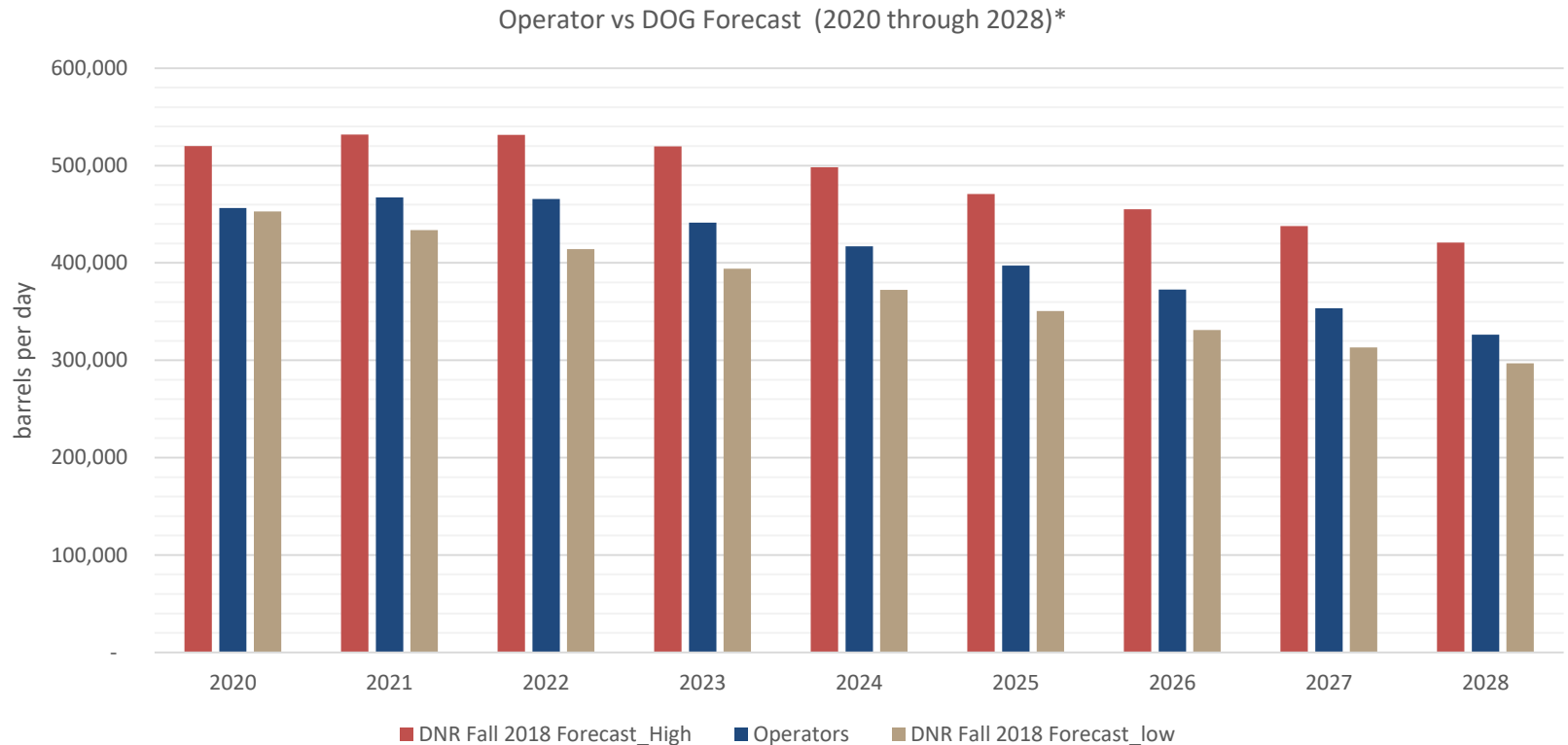


- Ensuring accurate forecasts in the near term to support revenue planning in the next fiscal year
- Also, tracking observed monthly production variations

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

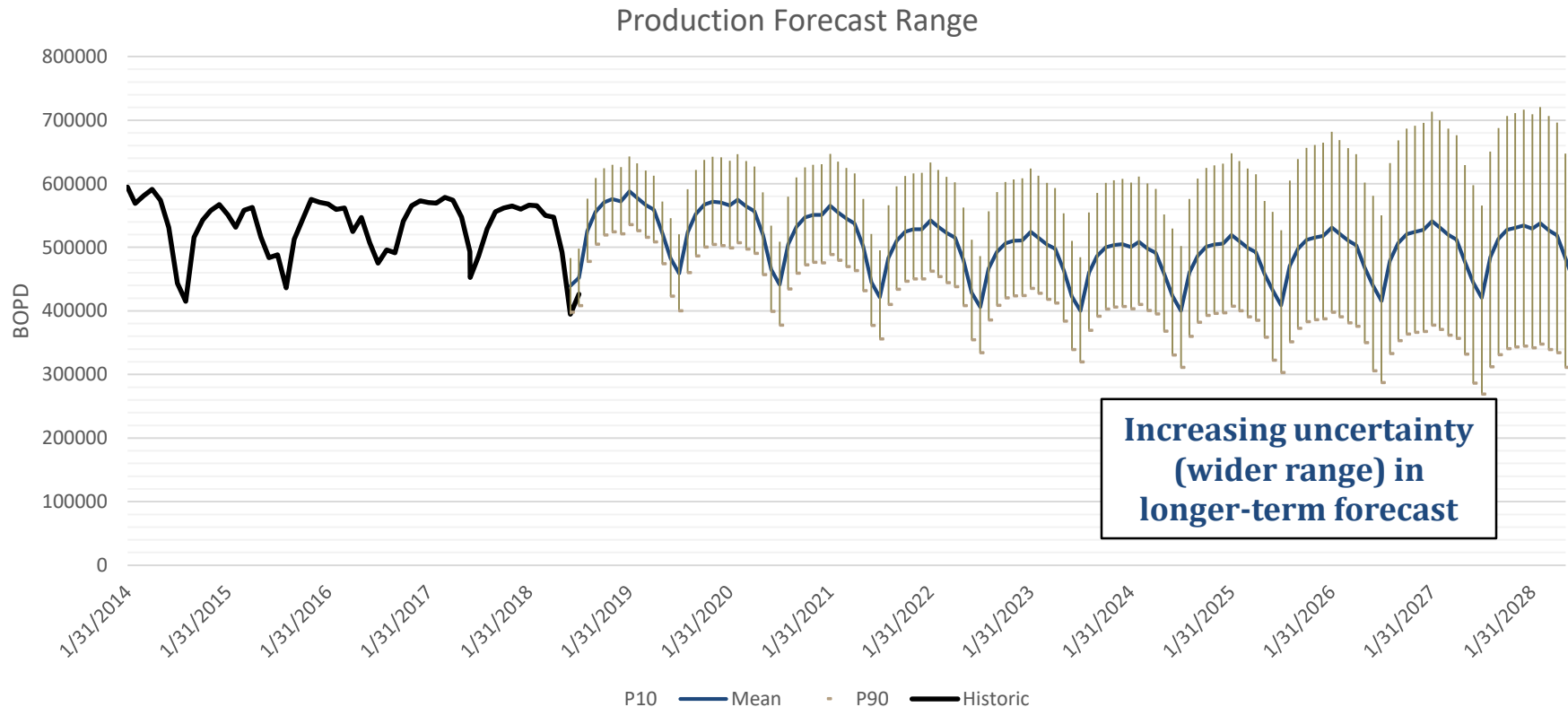
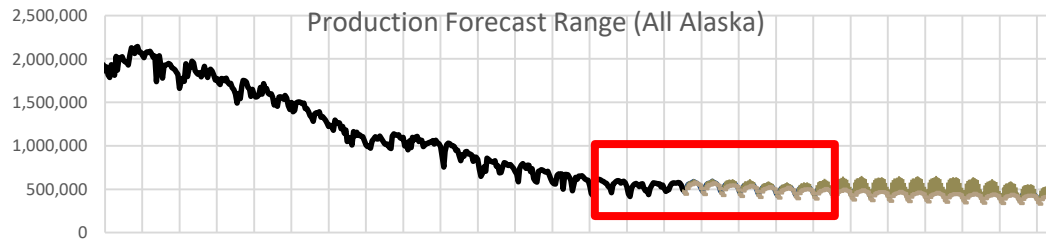
COMPARING LONG-TERM PROJECTIONS



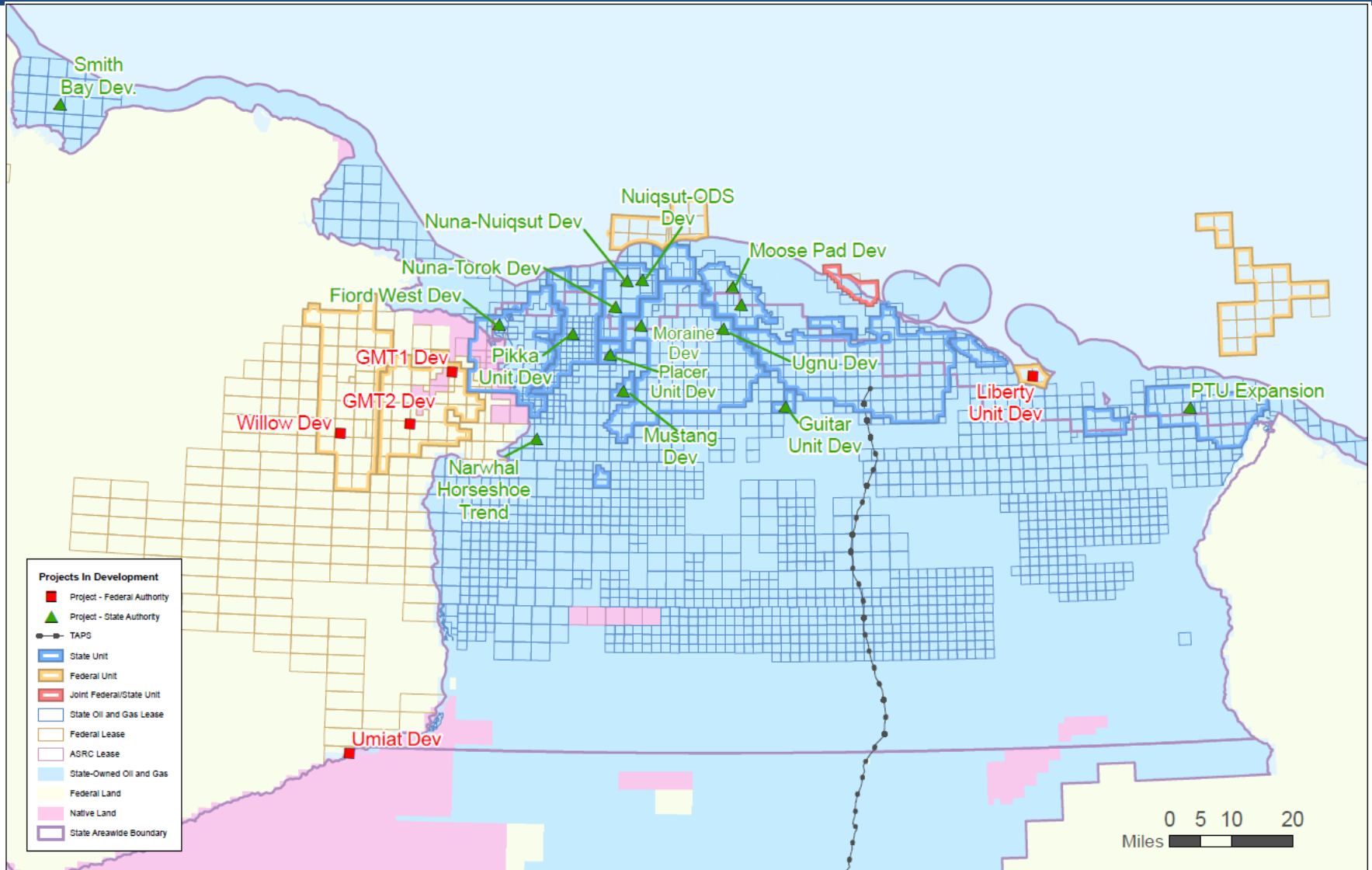
* Same aggregate of five units

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

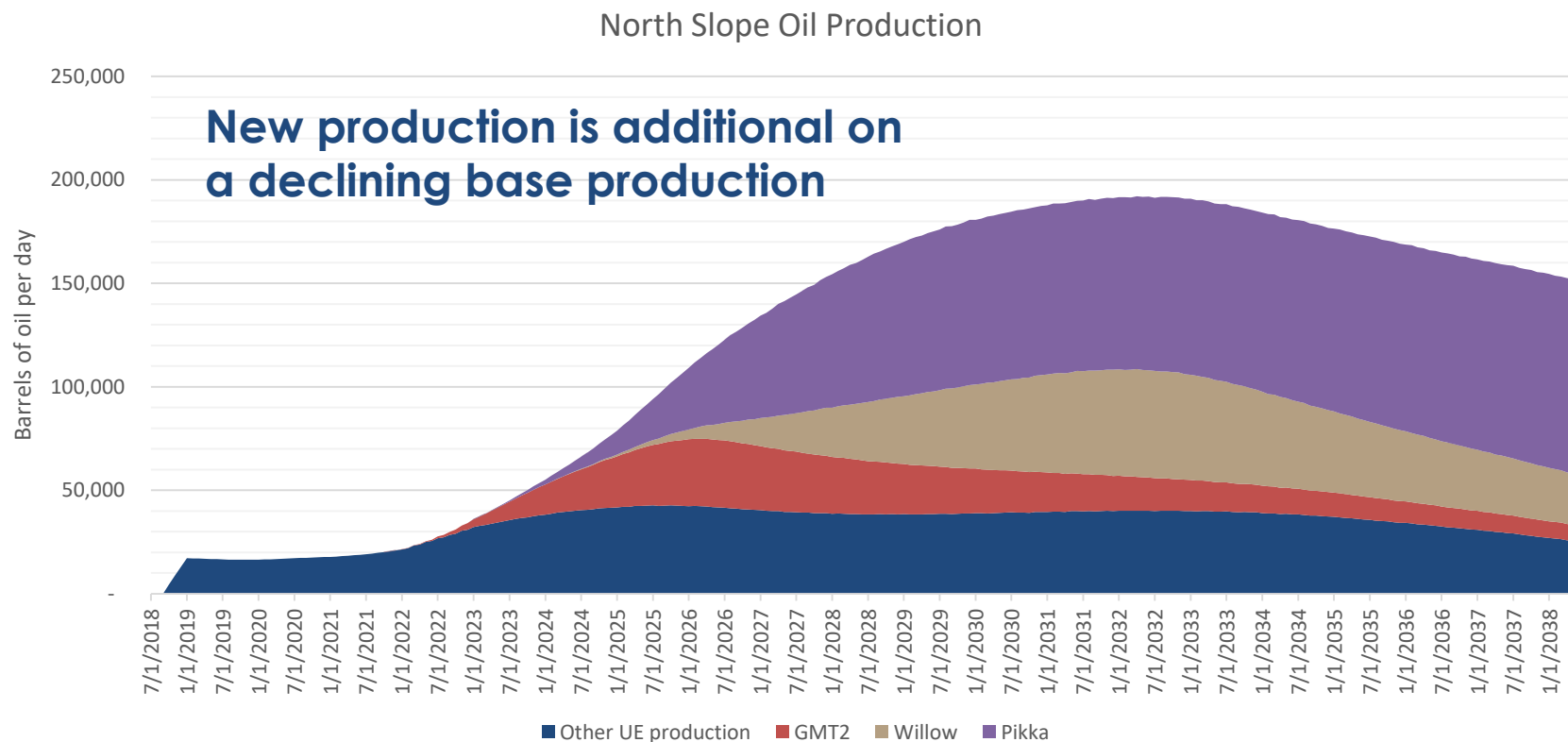
INCREASING UNCERTAINTY AS NEW FIELDS/PROJECTS COME ONLINE



PROJECTS UNDER EVALUATION MEDIUM TO LONG TERM



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

