Viscous Oil Polymer EOR in the Challenging Alaskan Arctic - It Works! But will it for the Heavy Oil in Ugnu?

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Outline

- ANS' (Heavy) Oil Resource Base
- Why is this important?
- Our Success To Date – The ANS Field Laboratory
- Oil Recovery Forecasts
- Polymer alone for the Heavy Oil in Ugnu?
- Building on Current Success
- Heavy Oil Recovery Research Roadmap

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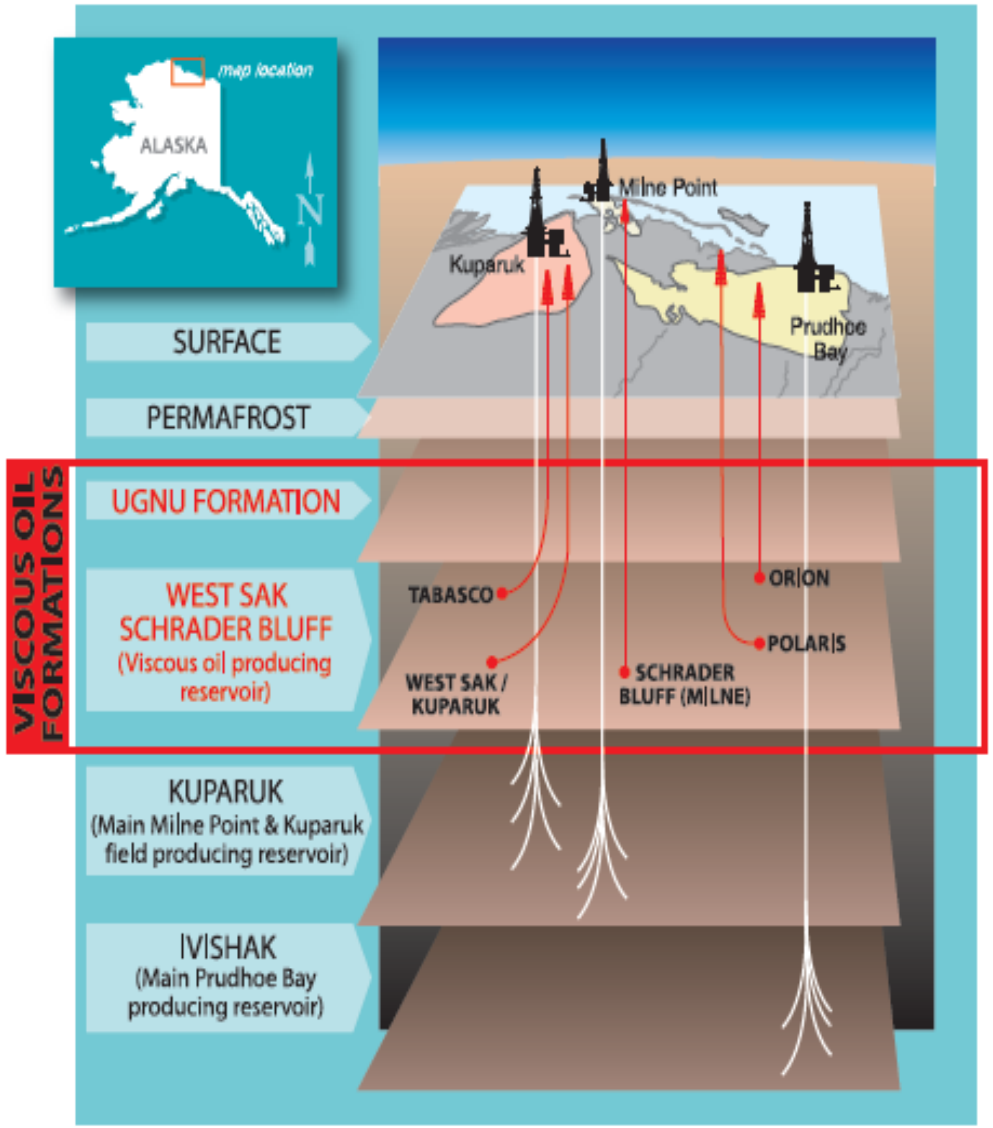
ANS' (Heavy) Oil Resource Base



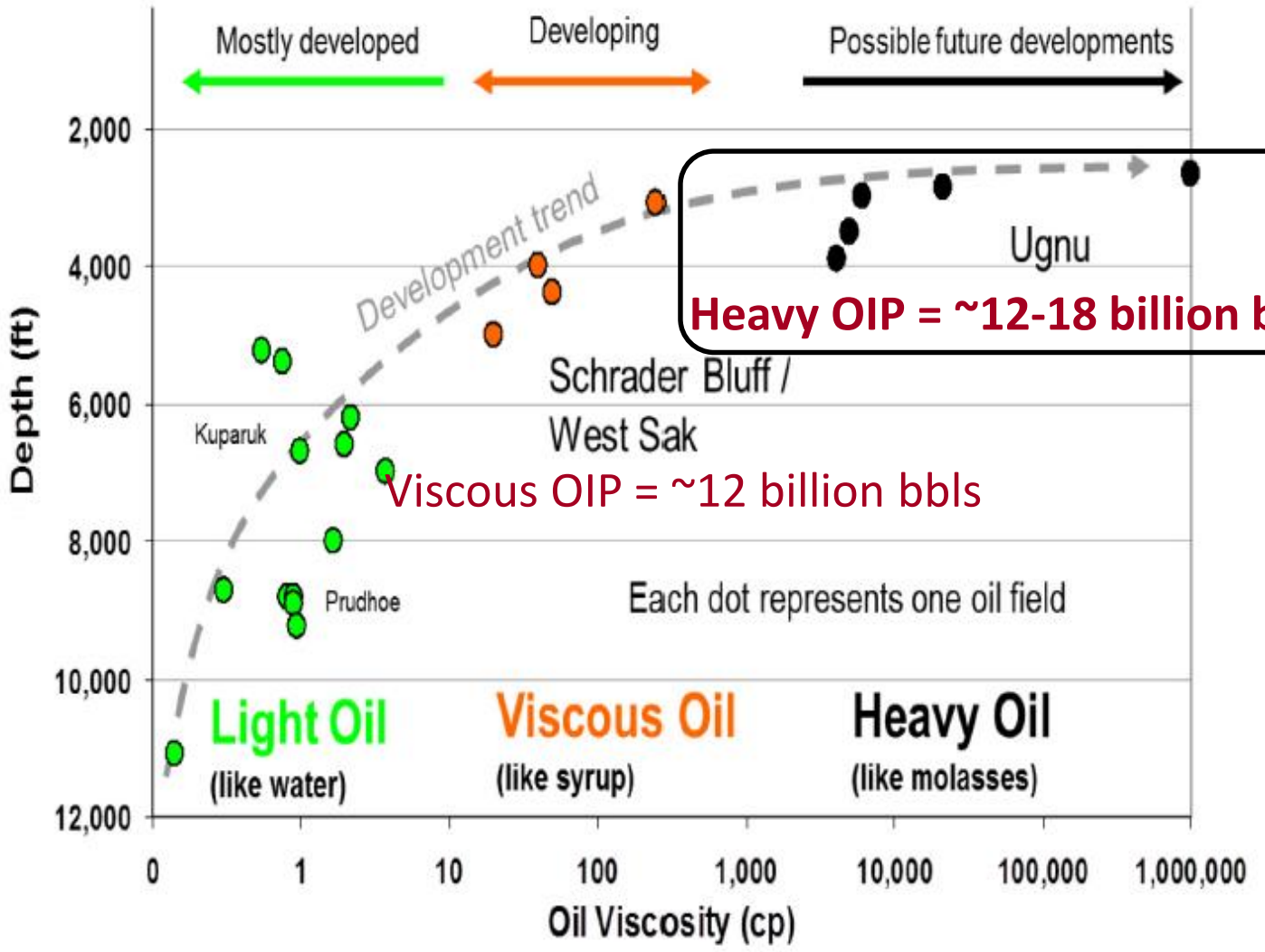


Figure sources: BPXA and Paskvan et. al. (2016)

Why is this important?

- Strategic importance to the State of Alaska and the Nation
- Technology development “in Alaska for Alaska”
- Resource too large to ignore, and within established infrastructure
- Prudhoe Bay type diluent crude still available for heavy oil transport through TAPS

Figure source: Alyeska Pipeline Service Company

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U.S. DEPARTMENT OF ENERGY | Fossil Energy
OFFICE OF OIL & NATURAL GAS

NETL NATIONAL ENERGY TECHNOLOGY LABORATORY

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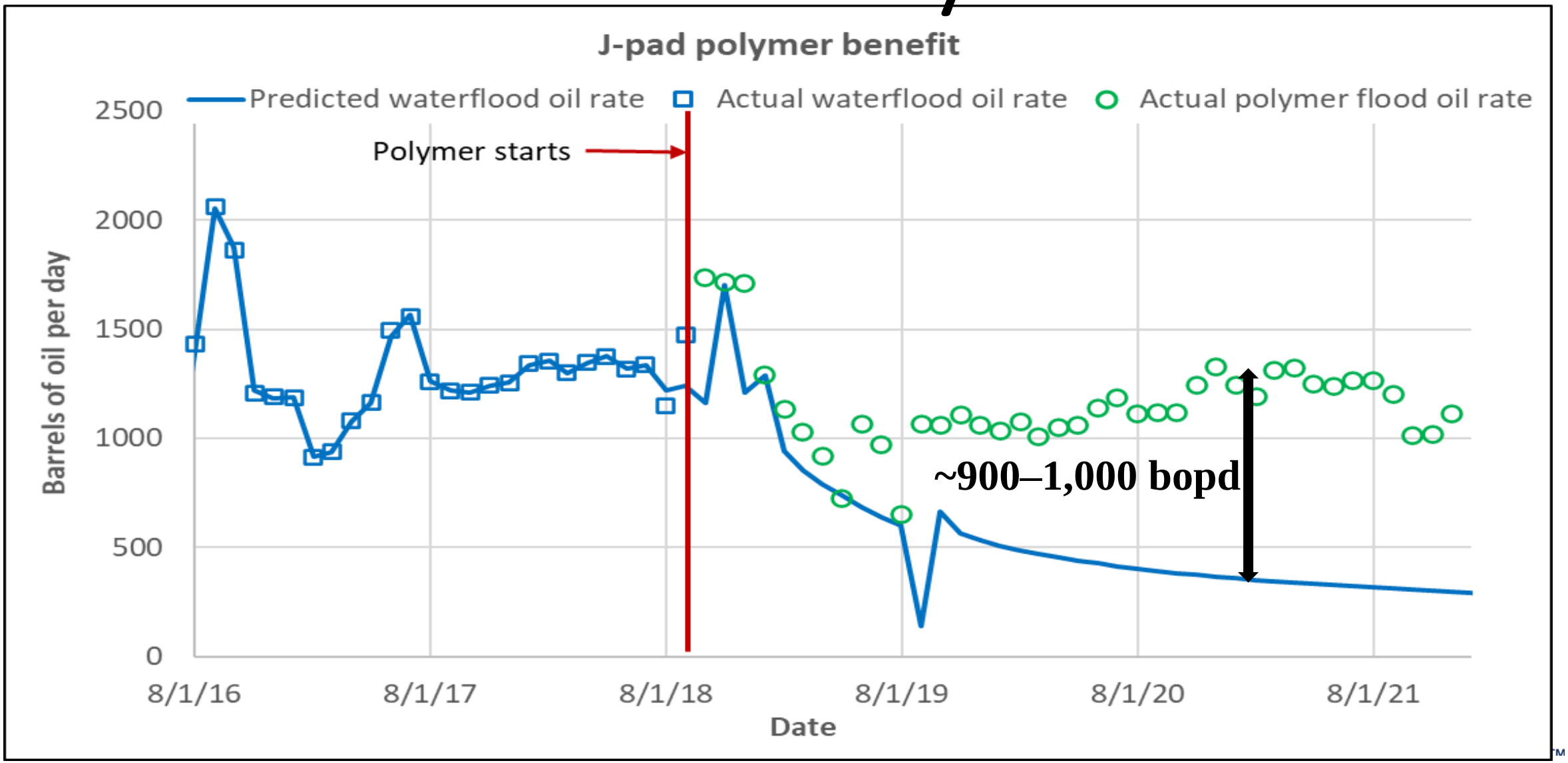
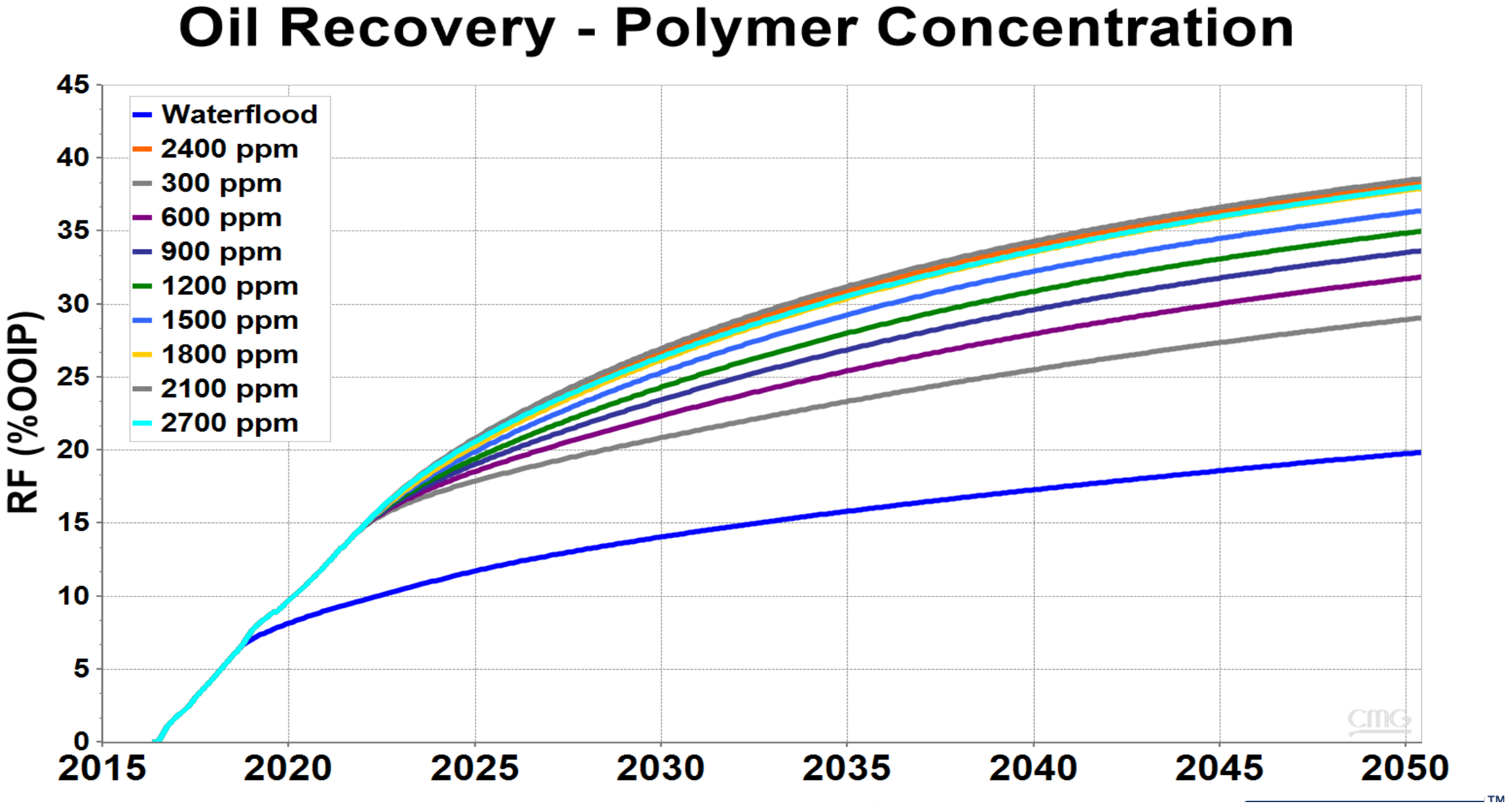
Our Success To Date – The ANS Field Laboratory

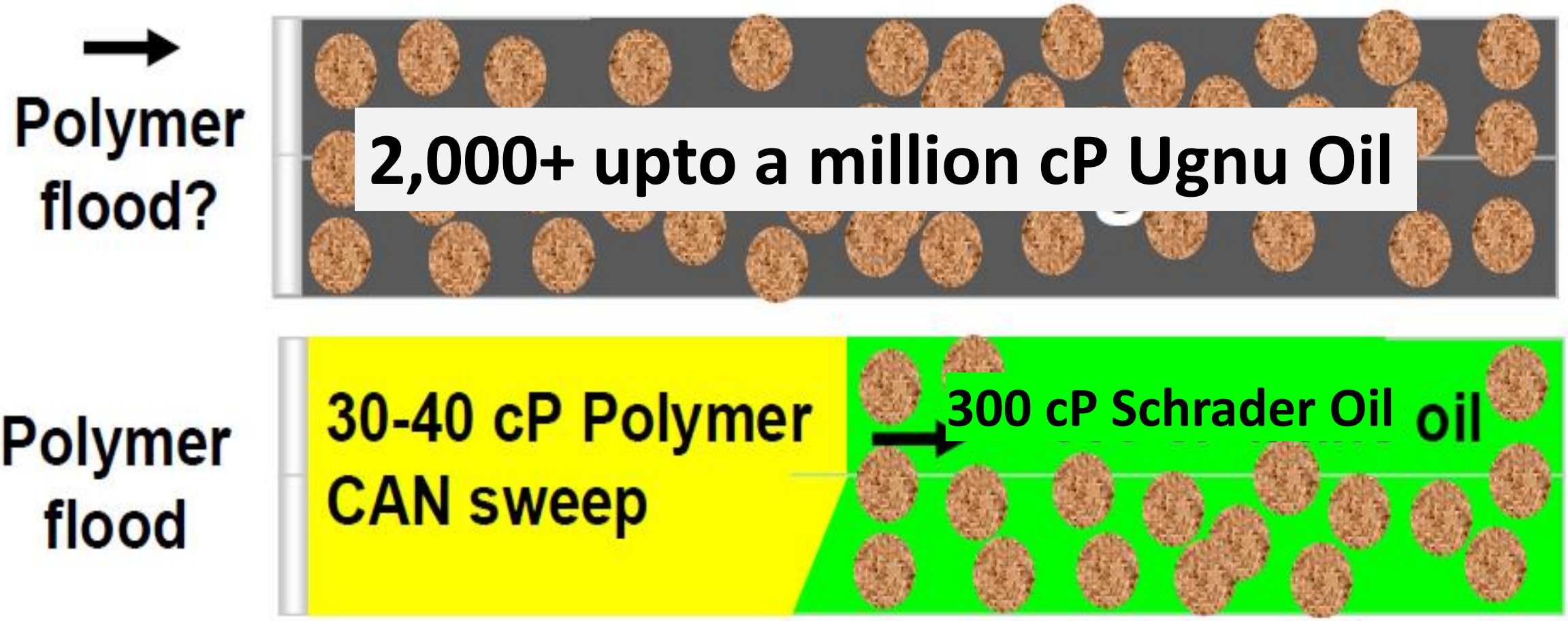


Oil Recovery Forecasts



Polymer alone for the Heavy Oil in Ugnu?

Several orders of magnitude viscosity contrast and injectivity constraints!



Building on Current Success

- Polymer alone not feasible – a combination of polymer and “solvent” is needed
- Limitation of deploying thermal methods due to nearly continuous “permafrost”
- No other production techniques currently exist
- Another **“Field Laboratory”** in collaboration with Hilcorp to specifically target Ugnu and test novel enhanced oil recovery methods
- This is the right time to embark on this research – don’t want to lose the momentum
- Herein lies our “quest” for developing innovative solutions, leveraging our success to date, to unlock the potential for the 12-18 billion barrels of heavy oil

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Heavy Oil Recovery Research Roadmap

Team Members:

(1) Dr. Yin Zhang, UAF
(2) Mr. Brent Sheets, UAF
(3) Dr. Samson Ning, Hilcorp
(4) Dr. Abhijit Dandekar, UAF

Workforce Development:

(1) Postdocs
(2) PhD, MS, UG students
(3) Increase in enrollments
(4) Key element of UA mission and vision

Project Duration:

(1) 4 years – similar to the current project
(2) 3 months' overlap with current project
(3) Our proposed solution for Ugnu needs to be proved quickly while the TAPS can handle it from a transport standpoint

Research Tasks:

(1) Project Management Plan
(2) Screening of polymer and a solvent
(3) Laboratory studies to assess polymer/solvent compatibility and the recovery efficiencies
(4) Field pilot test
(5) Numerical simulation
(6) Economic evaluation

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