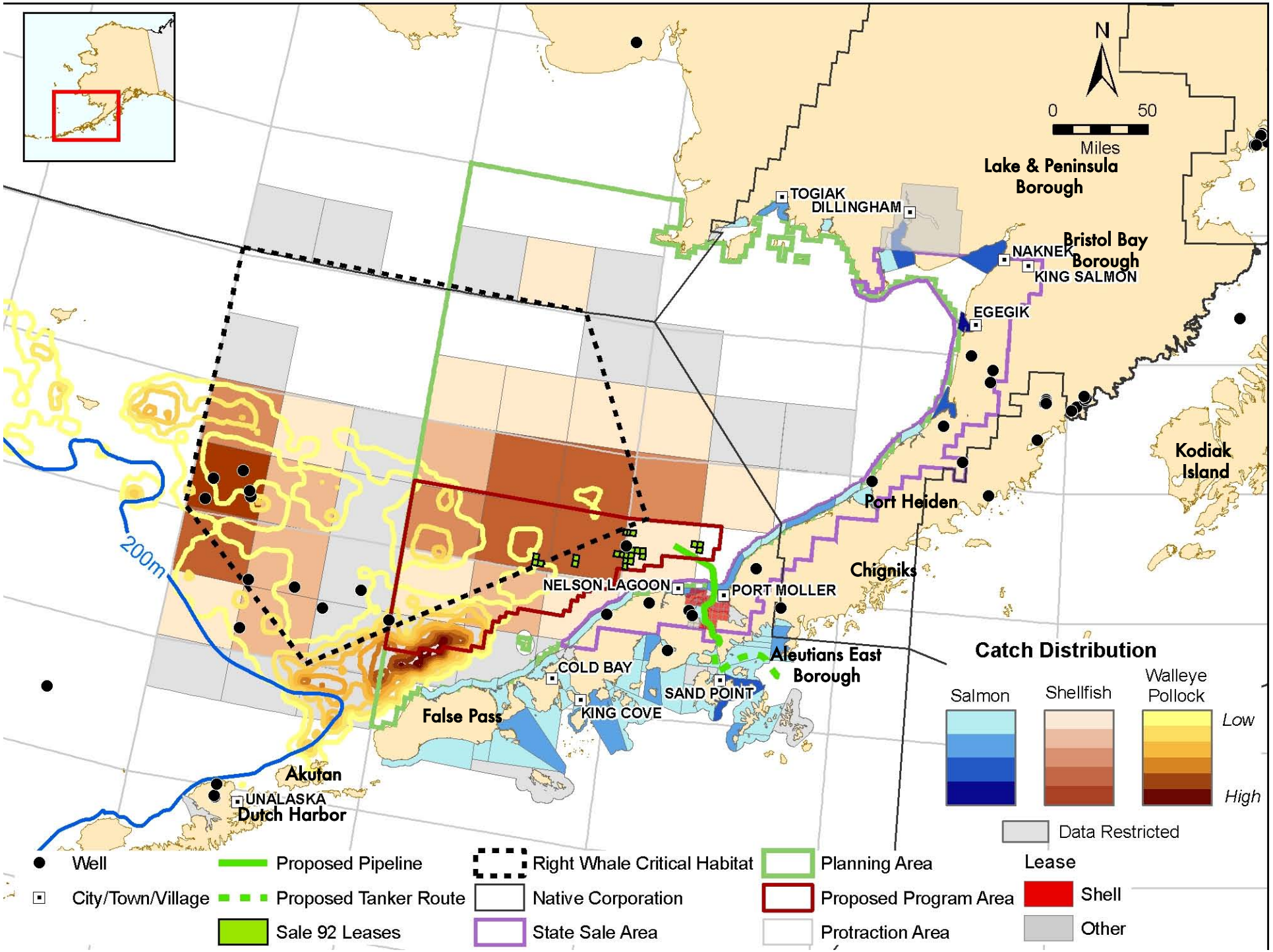
North Aleutian Basin, Alaska

Resource Development Council Breakfast

Exploring Common Ground Between Oil & Fishing

March 7, 2008

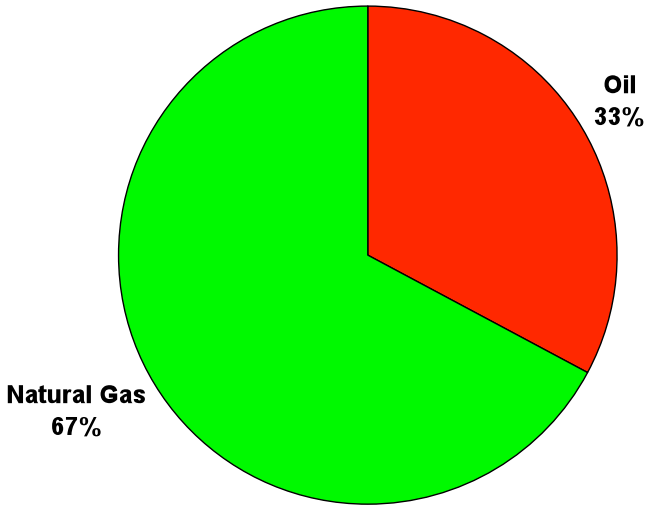

N
0
50
Miles
Lake & Peninsula Borough
Bristol Bay Borough
TOGIAK
DILLINGHAM
NAKNEK
KING SALMON
EGEGIK
Kodiak Island
Port Heiden
Chigniks
NELSON LAGOON
PORT MOLLER
Aleutians East Borough
COLD BAY
SAND POINT
KING COVE
False Pass
Akutan
UNALASKA
Dutch Harbor
200m
Catch Distribution
Salmon
Shellfish
Walleye Pollock
Low
High
Data Restricted
Well
City/Town/Village
Proposed Pipeline
Proposed Tanker Route
Sale 92 Leases
Right Whale Critical Habitat
Native Corporation
State Sale Area
Planning Area
Proposed Program Area
Protraction Area
Lease
Shell
Other

2006 Minerals Mgmt. Service Resource Assessment for Offshore North Aleutian

Natural Gas: 8.6 trillion cubic feet
Oil/Condensate: 753 million barrels
Natural gas equivalent: 12.8 trillion cubic feet equivalent

Mean, Risked, Conventionally Recoverable Reserves (all in Cenozoic).

North Aleutian Basin
~950 OCS blocks
~5.5 million acres



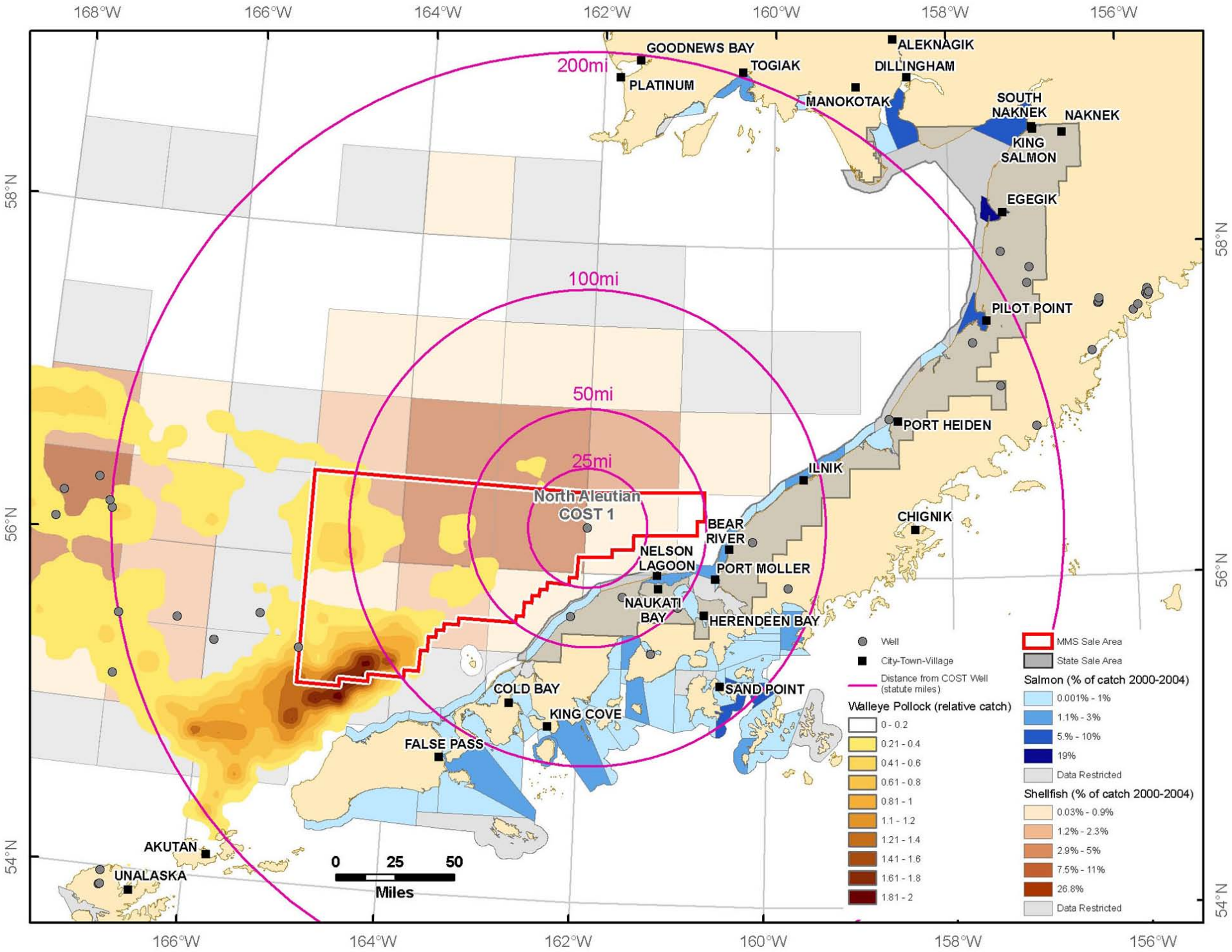
Eastern Gulf, Florida. Senate Passed Leasing Bill August, 2006
8.3 million acres, 12.9 tcfe estimated, (1.26 bbo & 5.8 tcf gas)

History of North Aleutian Basin

- DOI began studying in 1974 & after canceling 2 sales included NAB in 1982 5 year plan
- **Sale 92 was scheduled for April, 1985**
  - March, 1984 deleted 83% of sale area per Governor's request (5.6 million acres left)
  - Governor also asked for 8 year delay & 25 mile coastal exclusion
    - DOI implemented an 11 mile coastal exclusion zone
  - Final sale notice in Dec., 1985 – 3 lawsuits immediately filed, claims included:
    - DOI didn't adhere to all of Governor's requests
    - NEPA assessment was flawed, primarily oil spill risk assessment (DOI argues for phased approach)
    - DOI violated ESA by not adopting all of NMFS biological opinion recommendations.
  - Injunction issued to delay sale & upheld on appeal
  - **Oct. 5, 1988 9th Circuit Court found in favor of DOI & lifted injunction**
  - **Bids opened in Oct., 1988. $95 million high bids.**
  - **Final litigation appeals dismissed on Mar. 9, 1989**
- **Exxon Valdez oil spill on Mar. 24, 1989**
- **1990 – Presidential withdrawal & Congressional moratorium**
- **July 31, 1995, leases bought back by DOI after litigation from oil companies**
- **FY 2004 - Congressional moratorium lifted at the request of Bristol Bay Native Corporation**
- **March, 2005 – Shell re-entry into Alaska – Dialogue begins**

History of North Aleutian Basin

- Presidential withdrawal still in place as of March, 2005
- July 2003 – State of Alaska begins planning of onshore/coastal lease sale
  - Commits to no offshore drilling
  - October 2005 state lease sale
- Early discussions with BBNC, Aleutians East Borough, Aleut Corp. & Lake, Peninsula Borough & Governor/DNR
  - We know oil & they know fish
- Shell believed dialogue & an informational campaign was needed
  - Mapped out key stakeholders, starting with closest to the potential lease sale
  - 10 village tour + Seattle (offshore oil & gas 101)
- August, 2005 - MMS begins 2007-2012 5-year plan scoping meetings
  - If not now, a lease would be in the next 5 year plan (2012-2017)
- Local comments led to Governor's support & President lifting the withdrawal in January, 2007 & inclusion in July, 2007 5-year leasing plan
- MMS is starting lease sale 214 EIS scoping


168°W
166°W
164°W
162°W
160°W
158°W
156°W
58°N
56°N
54°N
GOODNEWS BAY
PLATINUM
TOGIAK
ALEKNAGIK
DILLINGHAM
MANOKOTAK
SOUTH NAKNEK
NAKNEK
KING SALMON
EGEGIK
PILOT POINT
PORT HEIDEN
ILNIK
CHIGNIK
BEAR RIVER
NELSON LAGOON
PORT MOLLER
NAUKATI BAY
HERENDEEN BAY
SAND POINT
COLD BAY
KING COVE
FALSE PASS
AKUTAN
UNALASKA
200mi
100mi
50mi
25mi
North Aleutian COST 1
0 25 50
Miles
Well
City-Town-Village
Distance from COST Well (statute miles)
MMS Sale Area
State Sale Area
Walleye Pollock (relative catch)
0 - 0.2
0.21 - 0.4
0.41 - 0.6
0.61 - 0.8
0.81 - 1
1.1 - 1.2
1.21 - 1.4
1.41 - 1.6
1.61 - 1.8
1.81 - 2
Salmon (% of catch 2000-2004)
0.001% - 1%
1.1% - 3%
5.% - 10%
19%
Data Restricted
Shellfish (% of catch 2000-2004)
0.03% - 0.9%
1.2% - 2.3%
2.9% - 5%
7.5% - 11%
26.8%
Data Restricted

North Aleutian Basin – What's Changed Since 1988?

- No significant (>1000 barrels) OCS platform spills in over 25 years
- No significant (>1000 barrels) OCS well blowouts in over 30 years
  - 13,463 expl. wells drilled in US OCS between 1954-2005; 4 oil spills; none significant (largest 200 barrels)
  - 33,979 total wells drilled in US OCS between 1971-2005, no significant oil well blowouts
  - 26.7 barrels spilled in prior Chukchi & Beaufort drilling, but 24 barrels were recovered.
- Oil & fishing have co-existed in many places around the world:
  - 34 years in Norway, 40 years in the Cook Inlet of Alaska, 58 years in the Gulf of Mexico, 10 years in Eastern Canada (Newfoundland & Nova Scotia)
  - This is not about gas/oil or fish, this is about more economic activity, gas/oil and fish
- NAB projected to be natural gas prone which has lower spill impacts than oil (67% gas, 33% oil)
  - Zero cargo spills ever (35+ years) for LNG shipping (more than 35,000 voyages)
- <1% of hydrocarbons released to oceans come from oil & gas extraction (National Academy of Science Study)
  - 62% from natural seeps & 33% from cars, boats & planes
- Significant improvements in spill prevention & regulation in the past 30 years
- Additional natural gas supply source for North America & jobs & tax base for local economies

Industry Advances Relating to Exemplary Well Blowout Track Record

1. **Shallow hazard surveys:** These are mini-seismic surveys and sonar surveys required by the MMS before a drilling permit is issued. These detect shallow, high pressure, gas pockets which can cause a well to blow-out. They also detect any other obstructions on the sea floor (such as topography or ship wrecks) prior to putting a drilling rig in place.
2. **Bottom hole pressure prediction (aka pore pressure prediction):** Using nearby well information and seismic data, we can predict zones of high pressure prior to drilling by using seismic velocity data. Higher pressure zones will have slower seismic velocities. Also, while we are drilling, lower resistivity zones indicate higher pressure zones. If we encounter such a zone while drilling, we can prepare to balance the weight of the drilling fluid to prevent a well blow out.
3. **Previous well data provides bottom hole pressure information** (Sivulliq & Burger)
4. **Drilling Wells on Paper (DWOP):** Process to review all well plans with multi-disciplined group prior to starting any work at the well site. Mud weights are designed for various stages of the well based on the foregoing input.
5. **Real time bottom-hole pressure sensors while drilling (aka measurement while drilling or MWD):** We now monitor drilling (as you saw at our Real Time Operations Center) real time with bottom hole sensors which continuously measure bottom hole pressures. Again, if abnormal conditions are detected, we can react before a well control problem arises.
6. **24 hour manned remote duplicate drilling control centers (RTOC):** We no longer rely solely on the staff on the rig floor to manage the drilling operation. We have staff in Houston and Anchorage who also monitor the well bore conditions and are in constant communication with the rig floor to take any needed corrective action. Data from rig is transmitted in milliseconds to the RTOC. This process includes having well engineering expertise located at the RTOC so all issues can be dealt with immediately.
7. **MMS in Alaska has regulators on the drilling rigs to monitor activity 24 hours a day, 7 days a week**.
8. **Drilling Mud:** Developed benign drilling muds – formerly oil based mud, then synthetic mud, now using water based mud for exploration wells. If well pressures increase beyond expectation, then mud weight is increased to control formation pressure.
9. **Blowout preventer (BOP) advances:** Standard BOP's have 4 shut down systems in place: 1) rig floor annular seal (closes around drill pipe), 2) 3 sealing devices below the rig floor (operated from rig floor or 2 back-up locations at other platform locations) – 2 mid-rated typically 5000 psi and a 10,000 psi shear ram which will cut the drill pipe and completely seal the wellbore. In the Beaufort Sea, Shell is using BOP's with 6 sealing devices. All BOP's must be tested every 2 weeks.

- These technologies have been developed over the past 30 years and are a key reason for the excellent performance in recent years.
- **13,500 exploration & appraisal wells drilled in the U.S. OCS since 1956 & only 4 have released oil to the ocean. Largest was 200 barrels, others were 100, 11 & 0.8 barrel spills. Never a significant exploration well blowout in the U.S.**

- If there is a blowout, spill response plan in place in the theatre of operations and relief well technology can intersect an 8" wellbore from 3 miles away.

Industry Advances Relating to Exemplary Platform Oil Spill Track Record

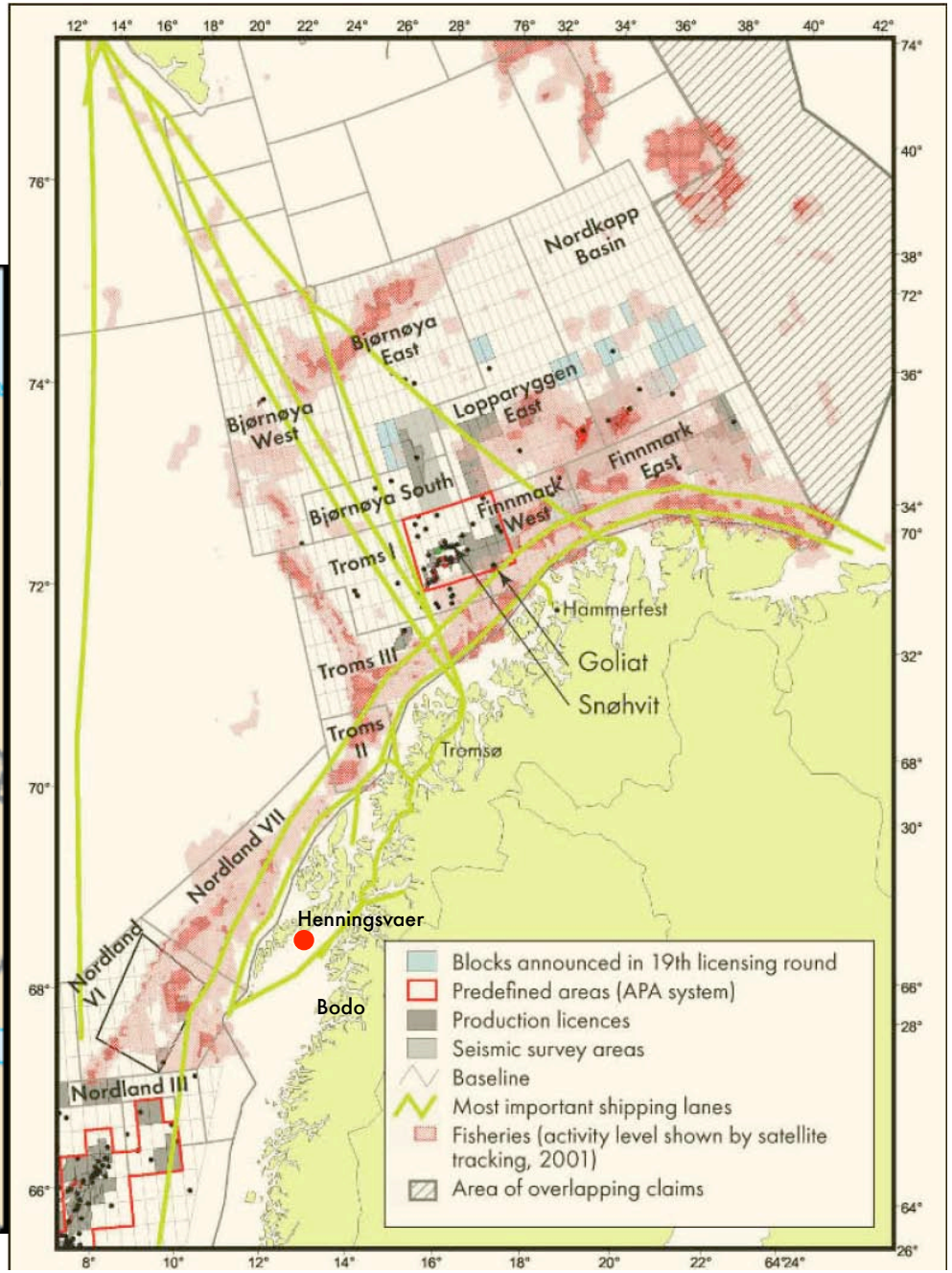
1. Individual wellhead shut-in valve on platform deck
2. SCSSV (surface controlled subsea safety valve): required on all OCS wellbores 3-4000' below the sea floor.
3. Emergency Shutdown Devices (ESD's): 30-50 devices at various locations around a platform, so any employee can shut-in production immediately. Shuts in production within 60 seconds. ESD also located next to emergency escape vehicles.
4. Catch basins under all oil and gas processing modules
5. Constant monitoring for oil sheen on the water
6. Infared gas leak detection sensors around processing modules.
7. Platform control room monitoring of all production systems to determine if there are any pressure imbalances or other operational upsets
8. Every person on the platform has the right to shut-in production if there is an unsafe condition
9. MMS scheduled inspections of all safety features with Incidents of Non-Compliance (INC's) issued for corrective actions
10. MMS unscheduled inspections
11. MMS scheduled oil spill response drills
12. MMS unscheduled oil spill response drills (over 250 since July 25, 2989)
13. MMS has 56 inspectors in the GOM with dedicated fleet of 14 helicopters

- If there is a spill or leak, spill response plan in place in the theatre of operations.

Shell Exploration & Production

Northern Norway Co-existence

See map at right for detail

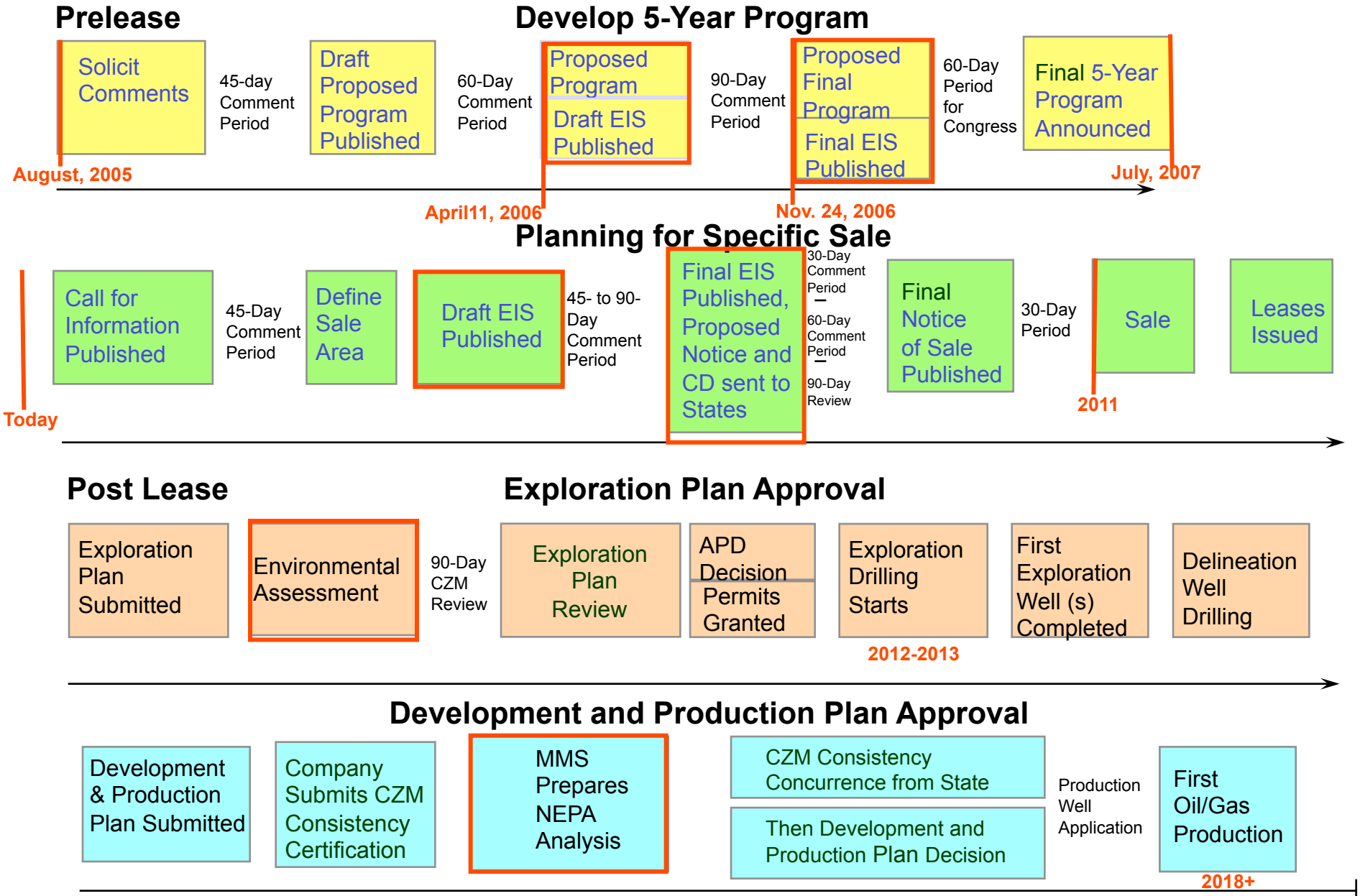


Northern Norway
Co-Existence Workshop in Henningsvaer, Norway – April, 2007

- "The goal of peaceful coexistence," according to Per Eidsvik, Advisor at Nordland County Council "is to ensure that energy extraction does not interfere or give the appearance of interfering with offshore fishing activities. We in Nordland are keenly aware of migration patterns and the need to maintain our fishing habitats. We are also aware of the benefits natural gas and oil provide to our economy. The ongoing challenge is to properly harmonize the two industries through technology, improved mapping and common understanding. Bodø's Seminar was extremely important – and needed. The point is we can and should properly coexist with the necessary safeguards."
- Stanley Mack, Mayor of Aleutians East Borough in Alaska said that "this was an exciting and worthwhile event. I am so pleased that the good people of Bodø University hosted this event to bring together two diverse, but close-tied, industries. Our discussions were productive and made me very enthusiastic about the prospects for having the oil & gas industry join with the fishing industry in the North Aleutian region to provide more economic opportunities for our citizens."

Back-up Slides

The OCS Leasing, Exploration, and Development Process



Abbreviations: ADP, Application for Permit to Drill; CD, Consistency Determination; CZM, Coastal Zone Management; EIS, Environmental Impact Statement
NEPA, National Environmental Policy Act