

# Wainwright DBO Line in the northeastern Chukchi Sea, 2008–2012



Robert H. Day  
and the members of the CSESP team

# ACKNOWLEDGMENTS

- CSESP Program funded by
  - ConocoPhillips Alaska
  - Shell Exploration and Production, Inc.
  - Statoil USA E + P
- Program managed by Olgoonik Fairweather LLC
  - Sheyna Wisdom, Program Manager

# BACKGROUND ON CSESP

- Chukchi Sea Environmental Studies Program (2008–2012)—interdisciplinary ecological study begun prior to offshore exploratory drilling
  - Most surveys in offshore area (2008–2012)
  - Added stations at ends of sampling grid to expand DBO line—5 stations inshore, 2 stations offshore into Central Channel (2012)
- Plans for continued monitoring into foreseeable future

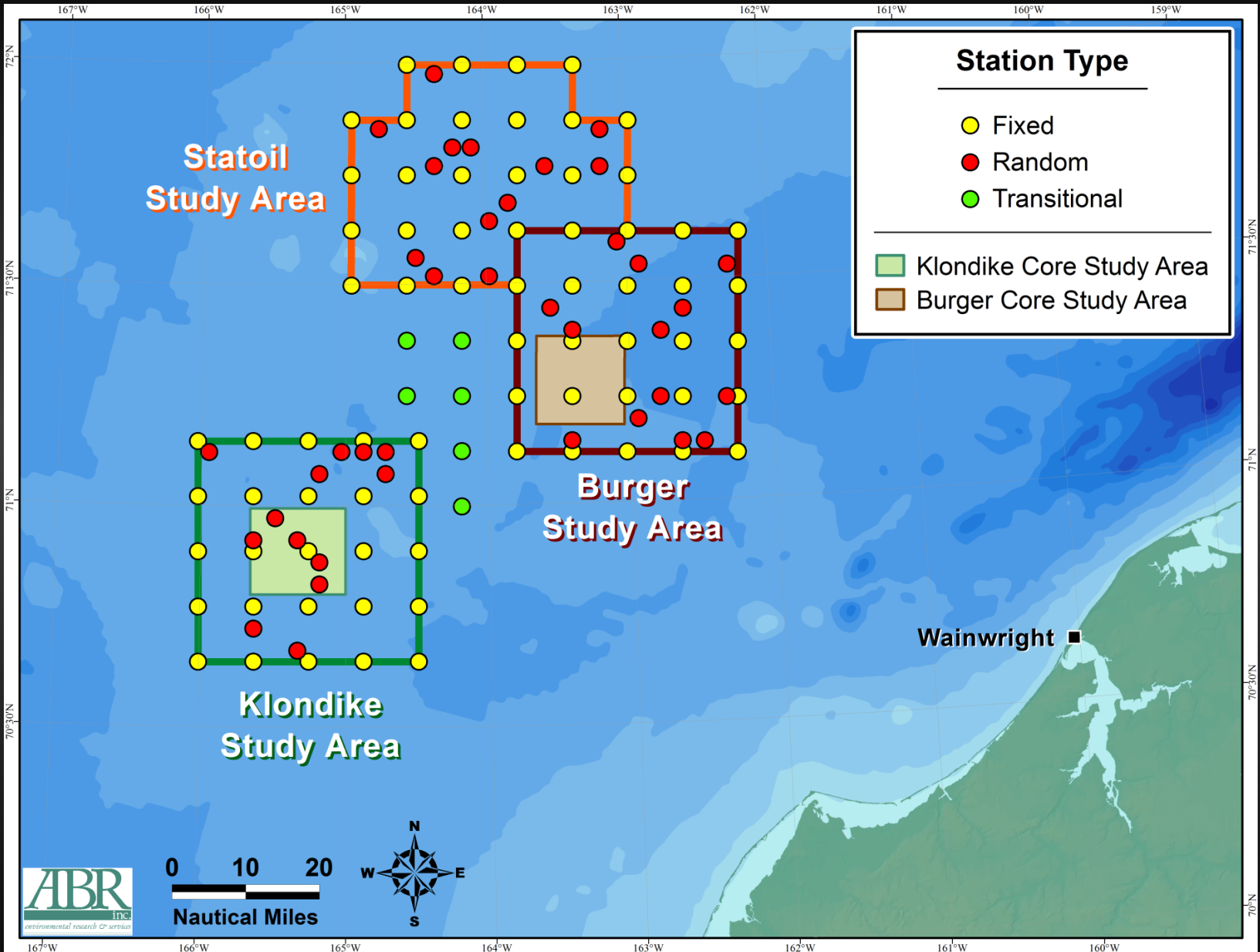
# OVERALL APPROACH

- Original study design focused on study-area boxes—30 X 30 NM (~55 X 55 km)
- Station sampling grid 7.5 NM (~13.8 km) apart
- Multiple samples (seasons)/year in original sampling design
- Emphasis on offshore area, with nearshore area to be added when we began surveying area for pipeline routes
- Expanded grid to most of Hanna Shoal (2011–2012)

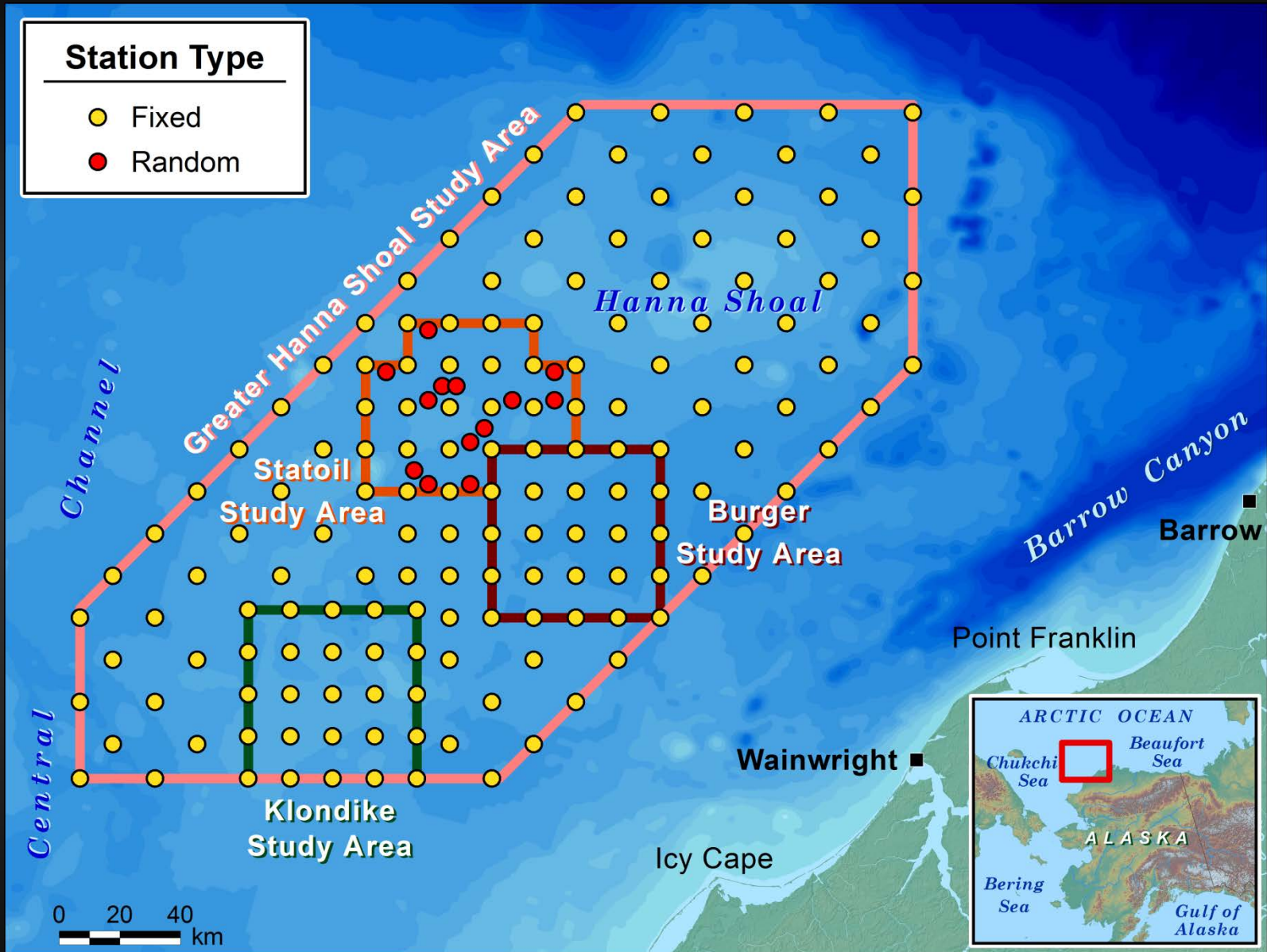
# DISCIPLINES

- Physical oceanography (CTD, ADCP, moorings)
- Nutrients
- Acidification (2011–12)
- Zooplankton (microplankton added 2012)
- Benthic macrofauna
- Benthic megafauna (trawling 2009–10, camera [spotty] 2011–12)
- Fishes (trawling 2009–10, acoustics 2011–12)
- Seabirds
- Marine mammals
- MM acoustics (moorings nearby)
- NOT ALL DISCIPLINES AT EVERY STATION!

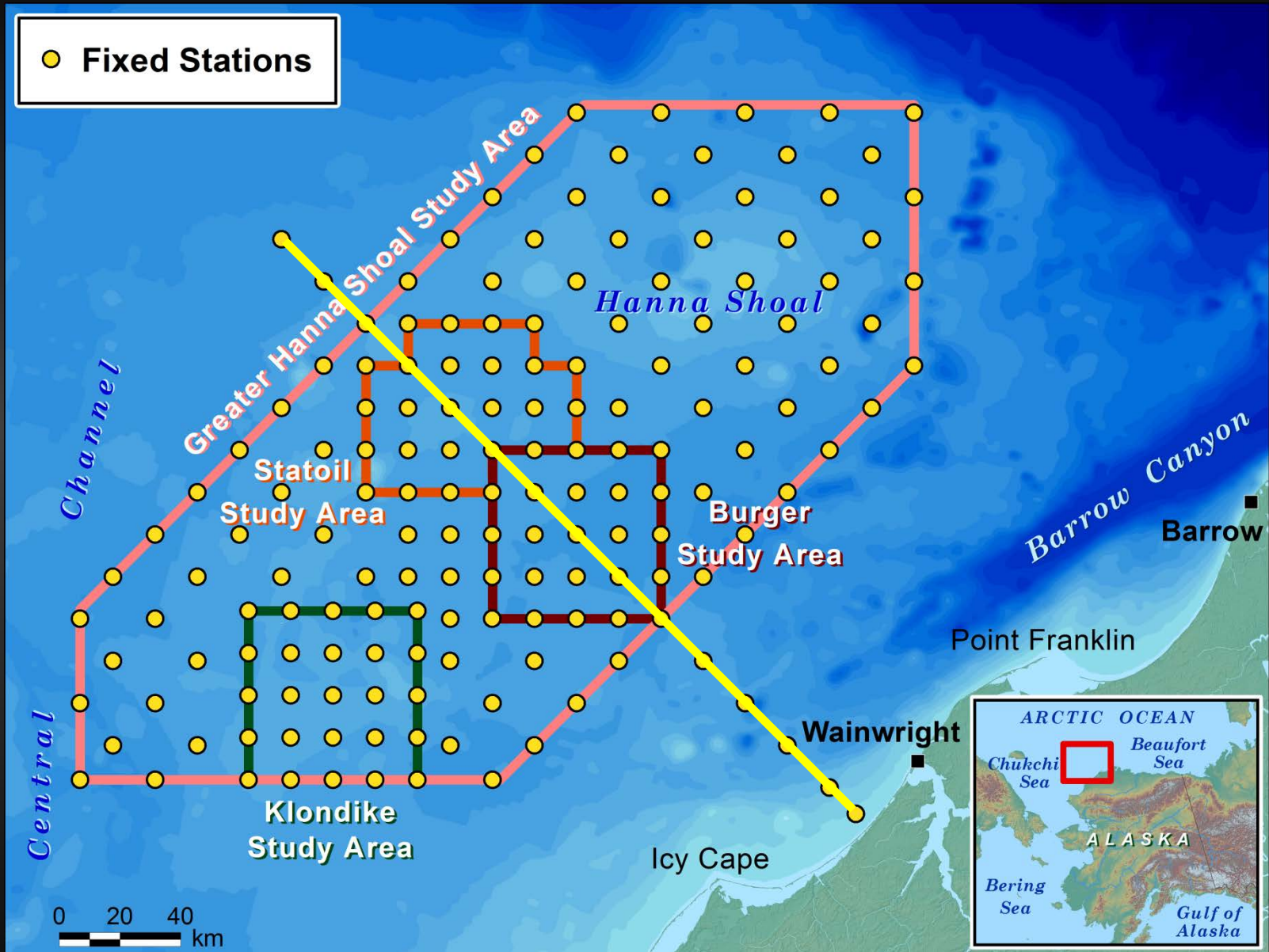
# ORIGINAL SAMPLING DESIGN (2008–2010)



# SAMPLING DESIGN (2011)

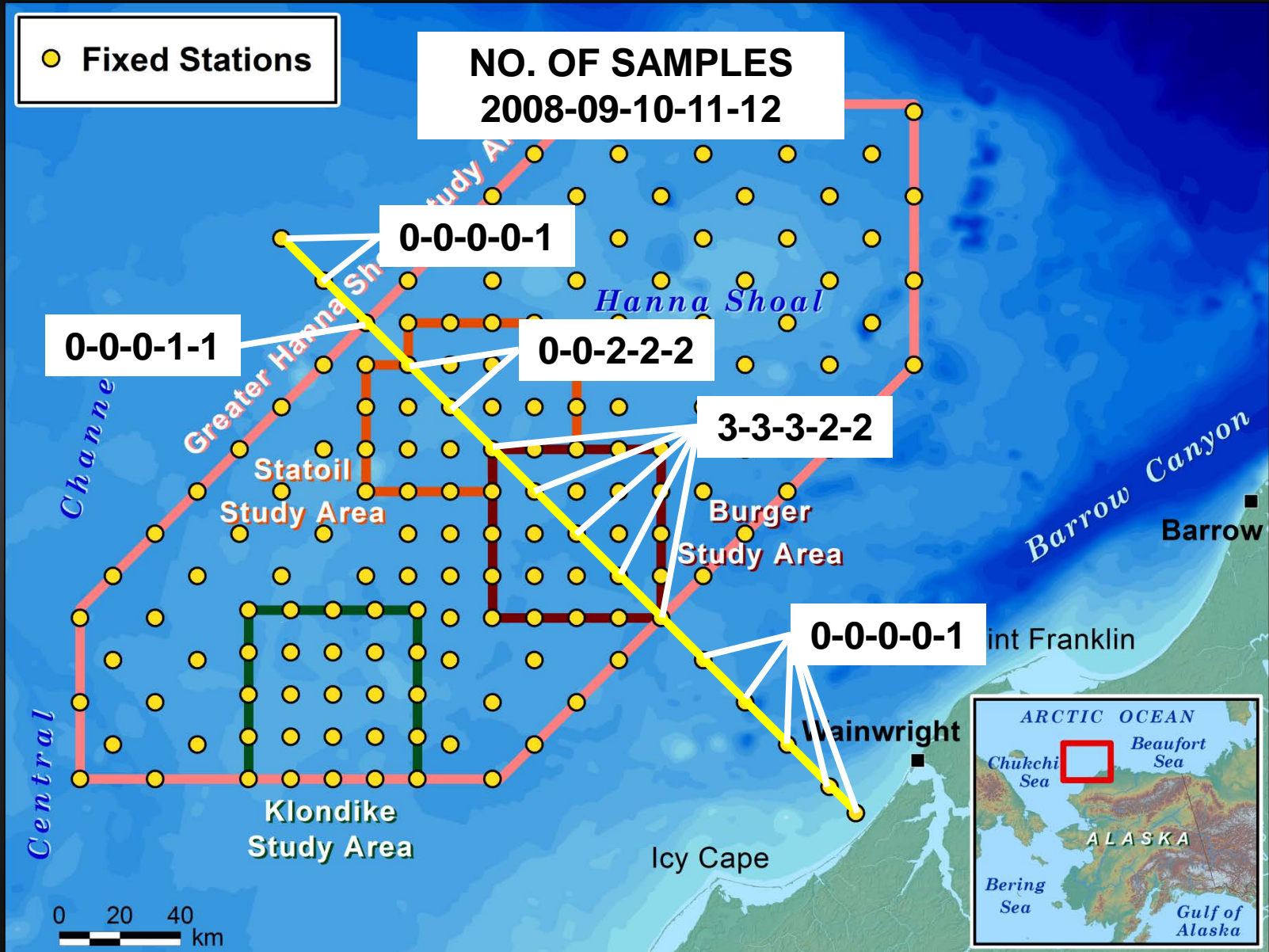


# SAMPLING DESIGN (2012)

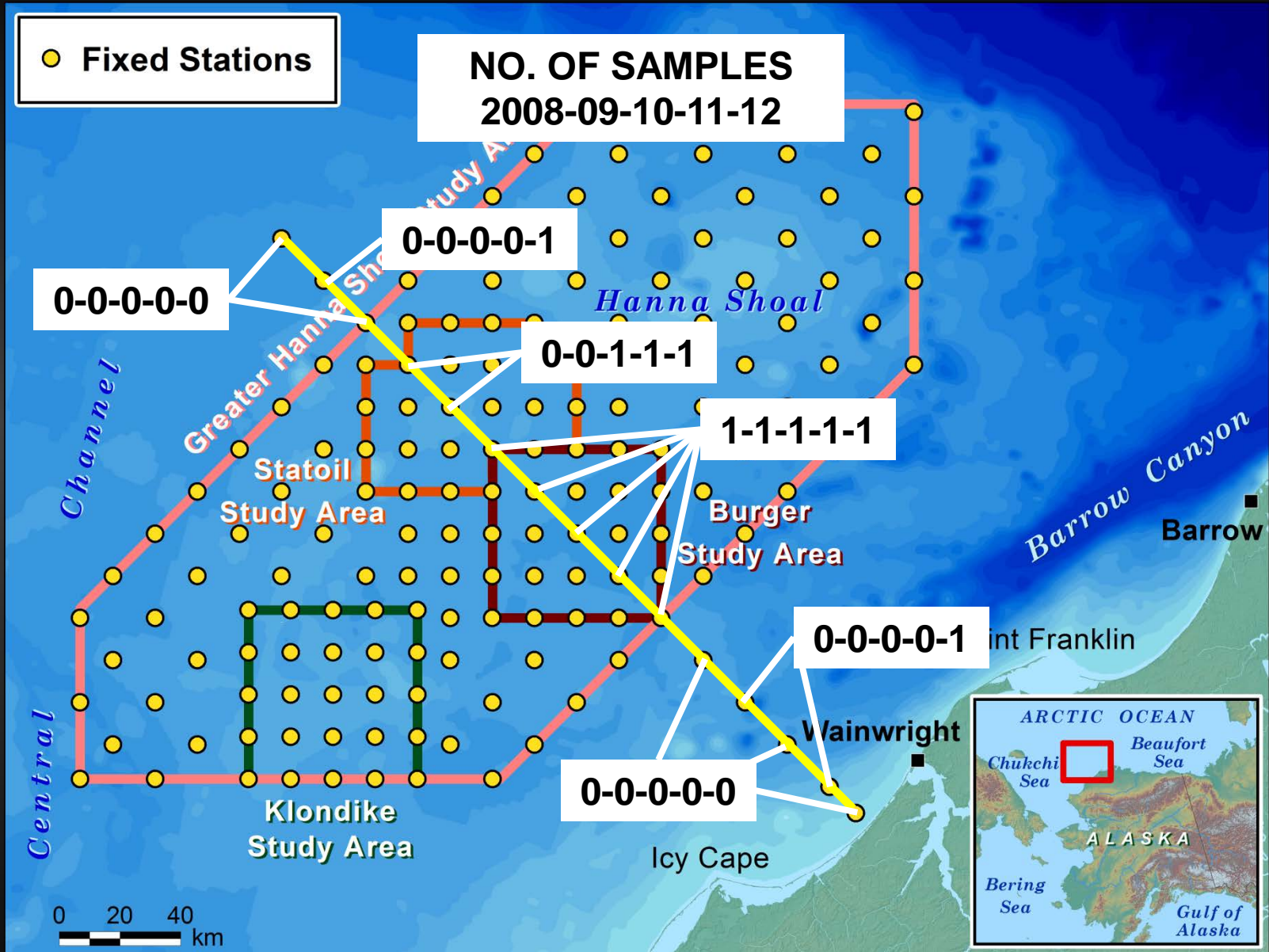




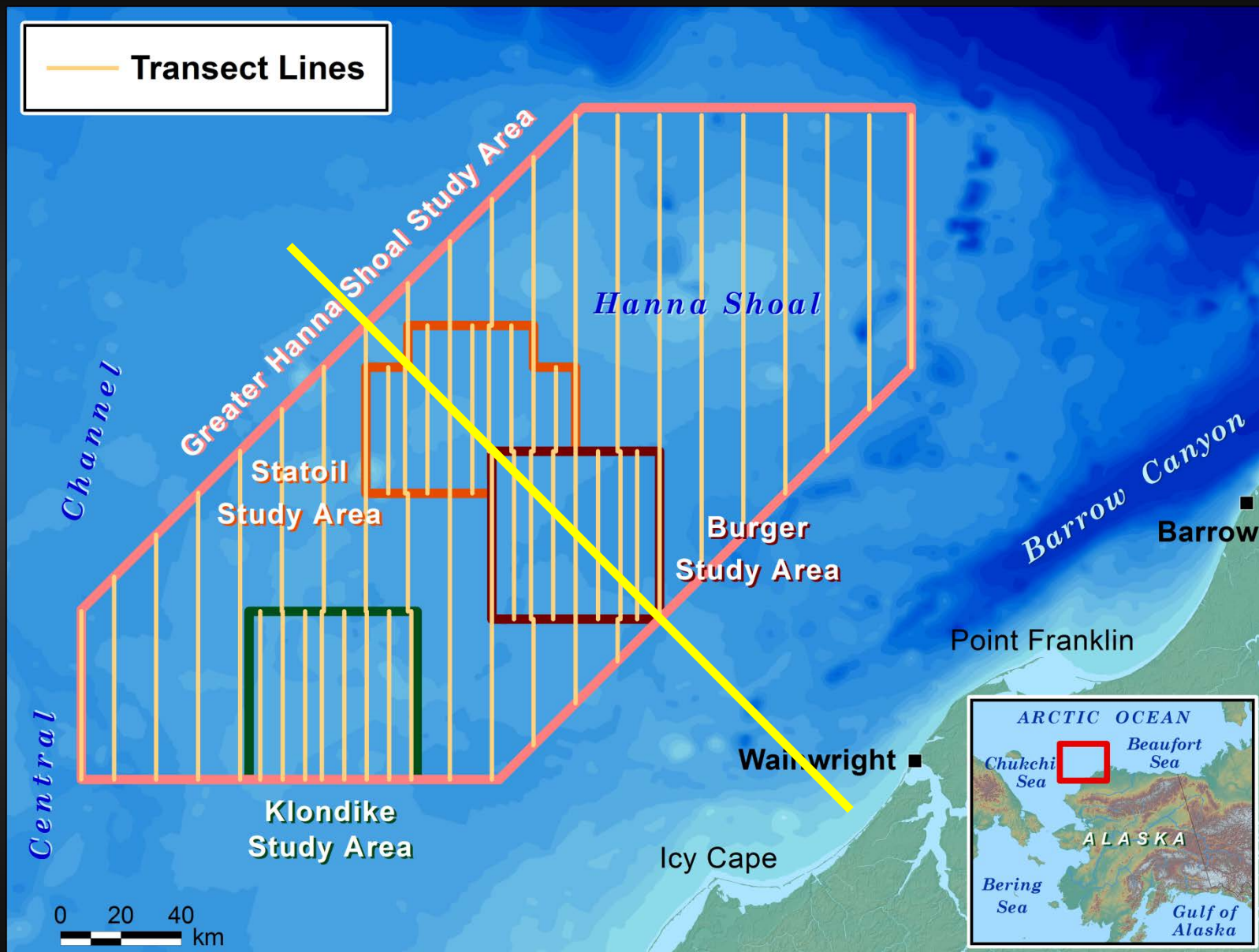
# CTD, NUTRIENTS (MULTIPLE SEASONS/YR)



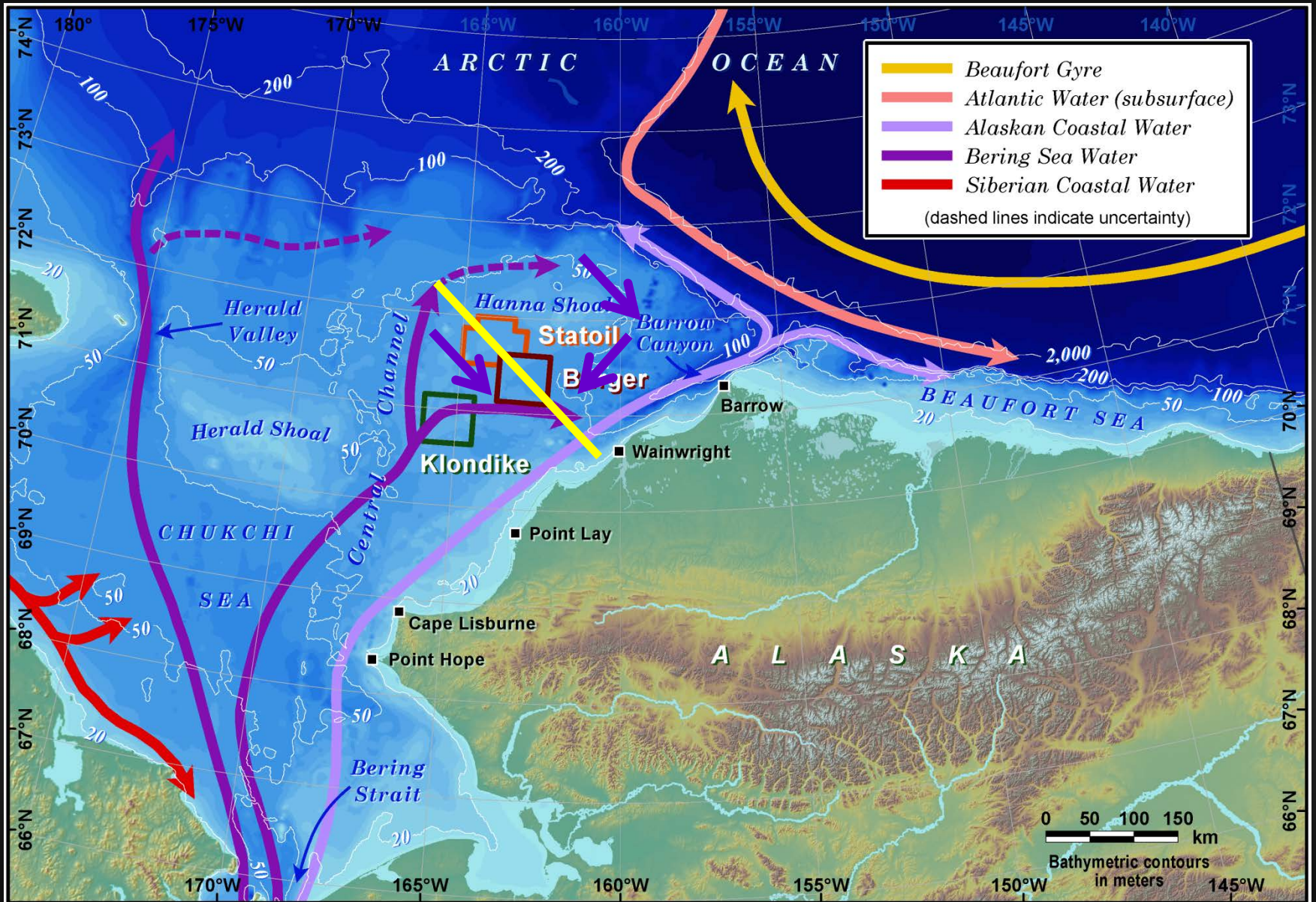
# INFAUNA (1 SAMPLE/YR)



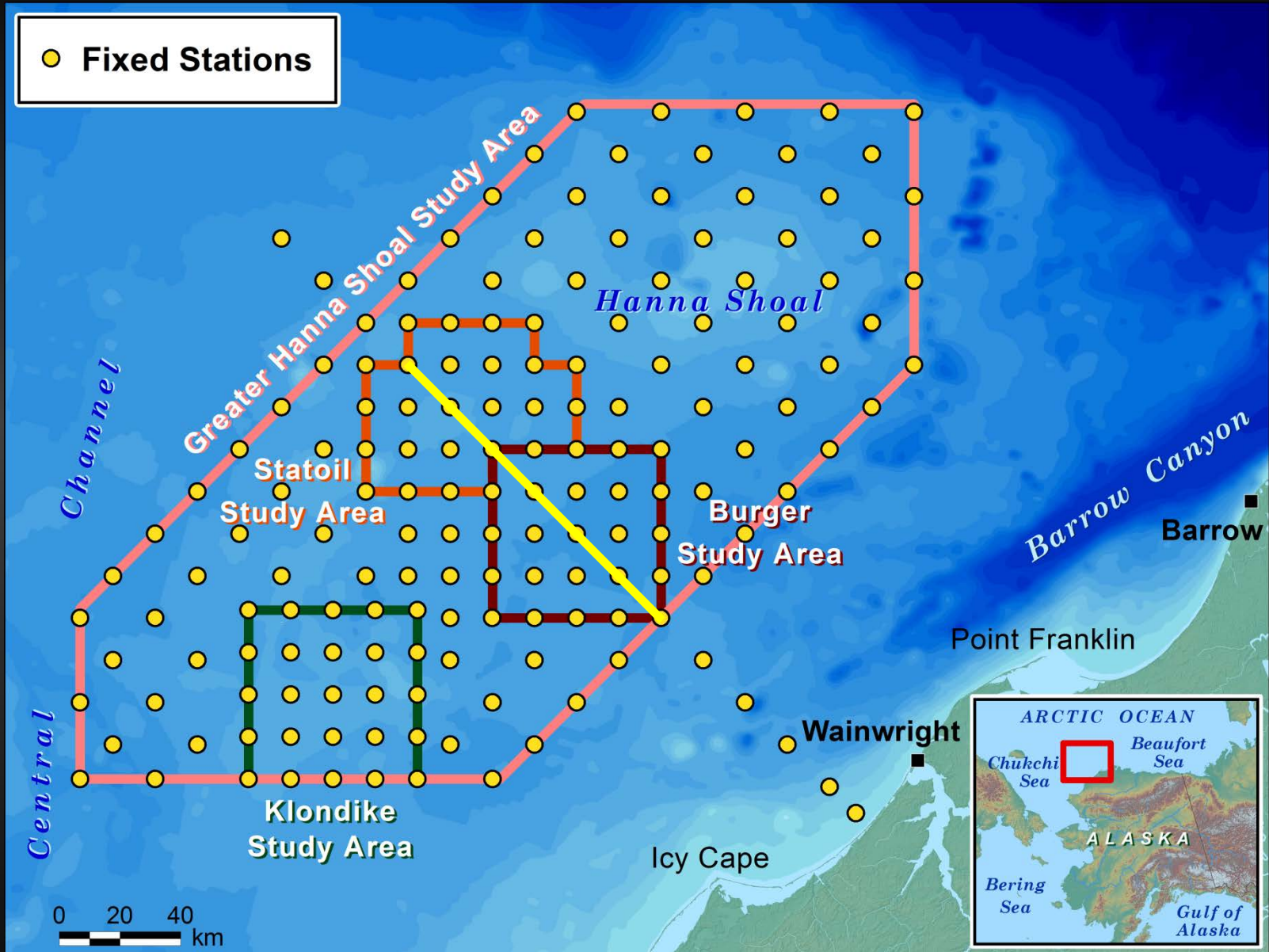
# BIRD & MAMMAL SURVEY LINES (2011–2012)



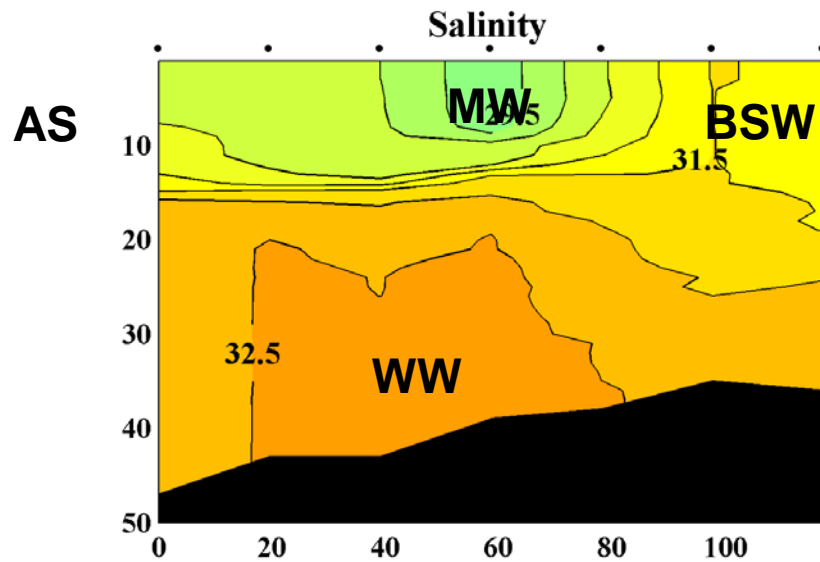
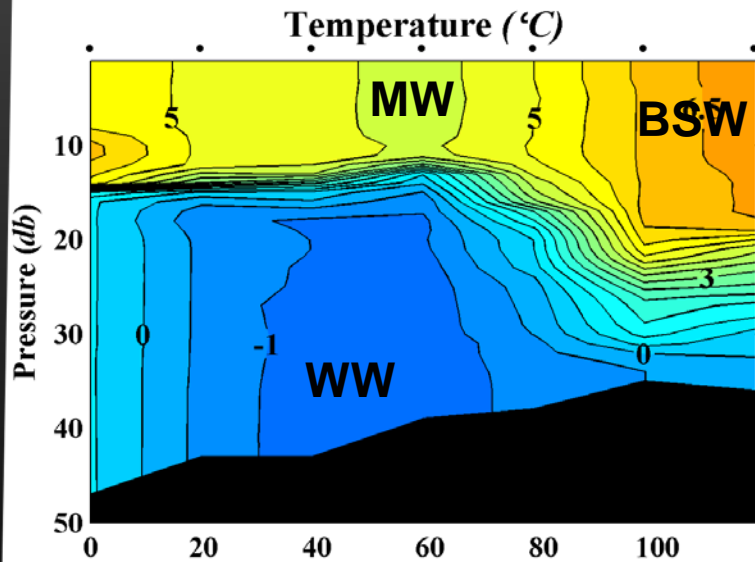
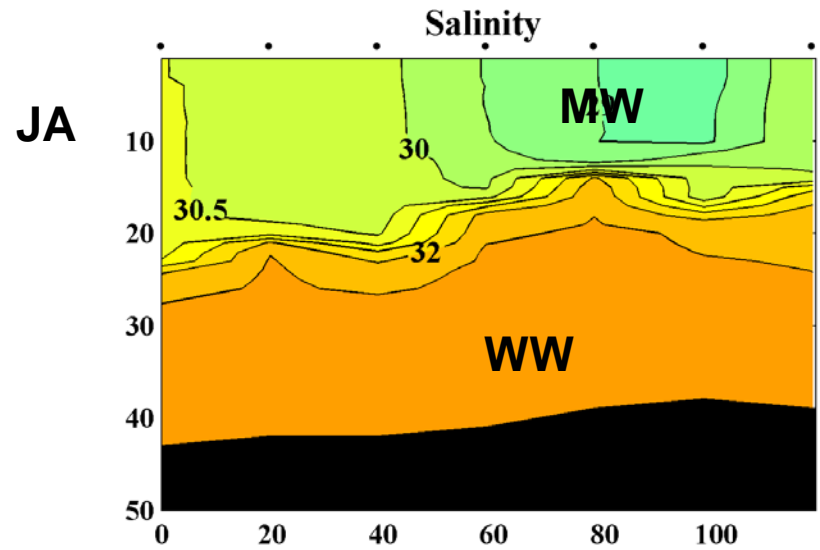
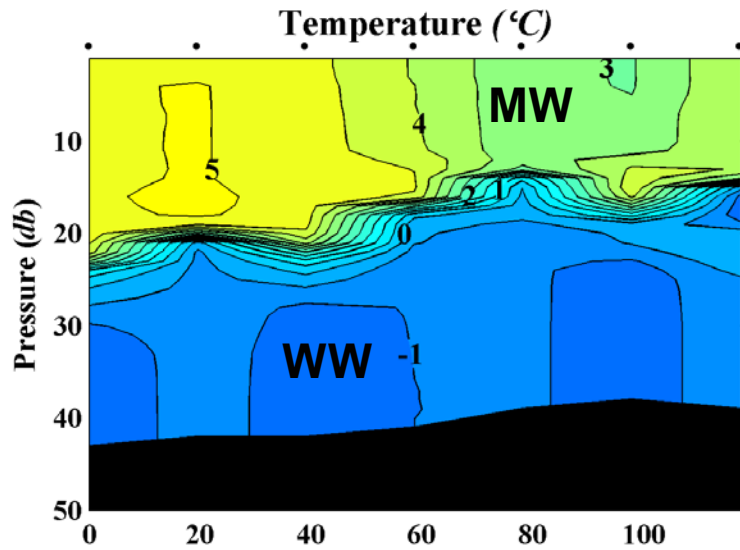
# OCEANOGRAPHY



# SAMPLING (2010–2011)

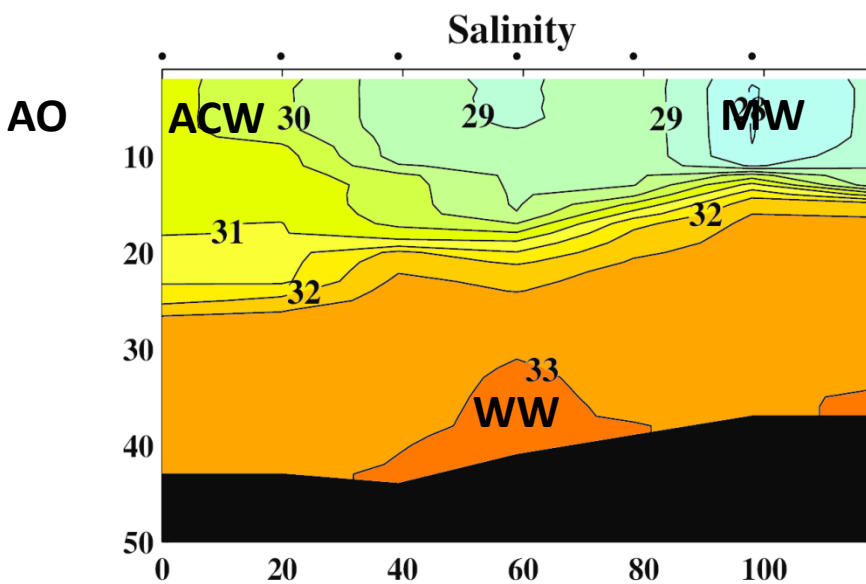
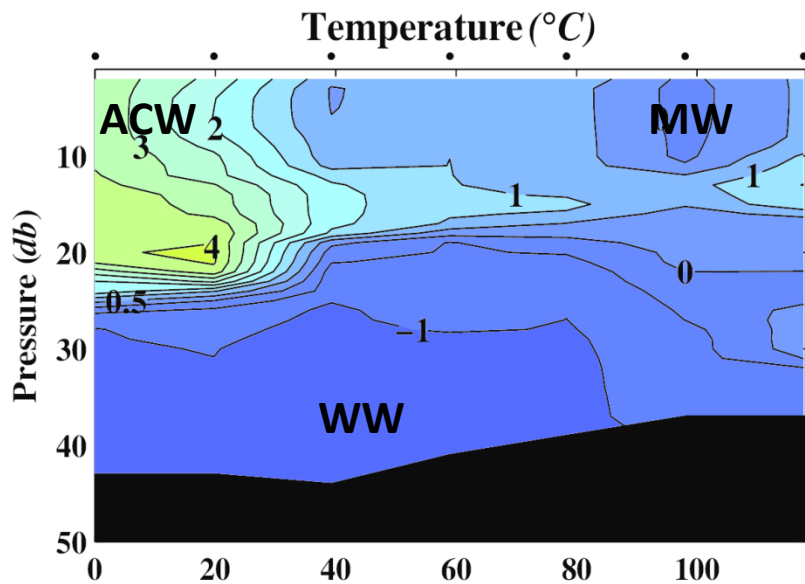
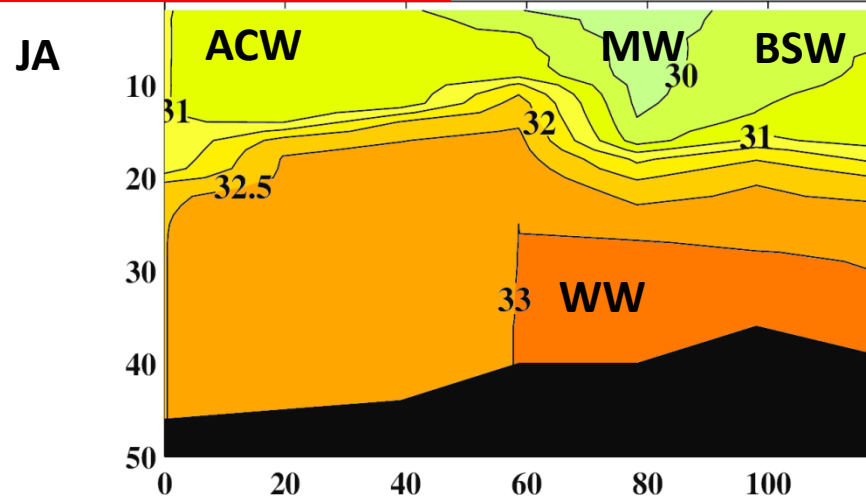
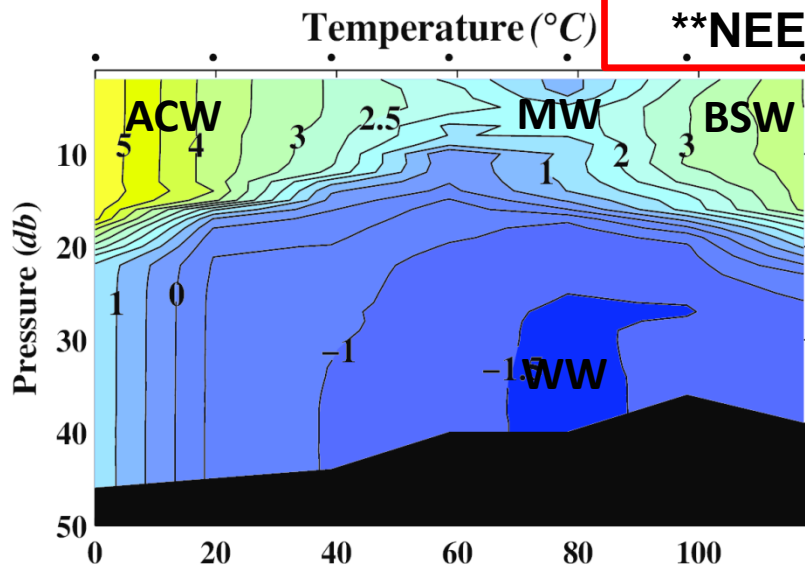


# BURGER-STATOIL (2010)

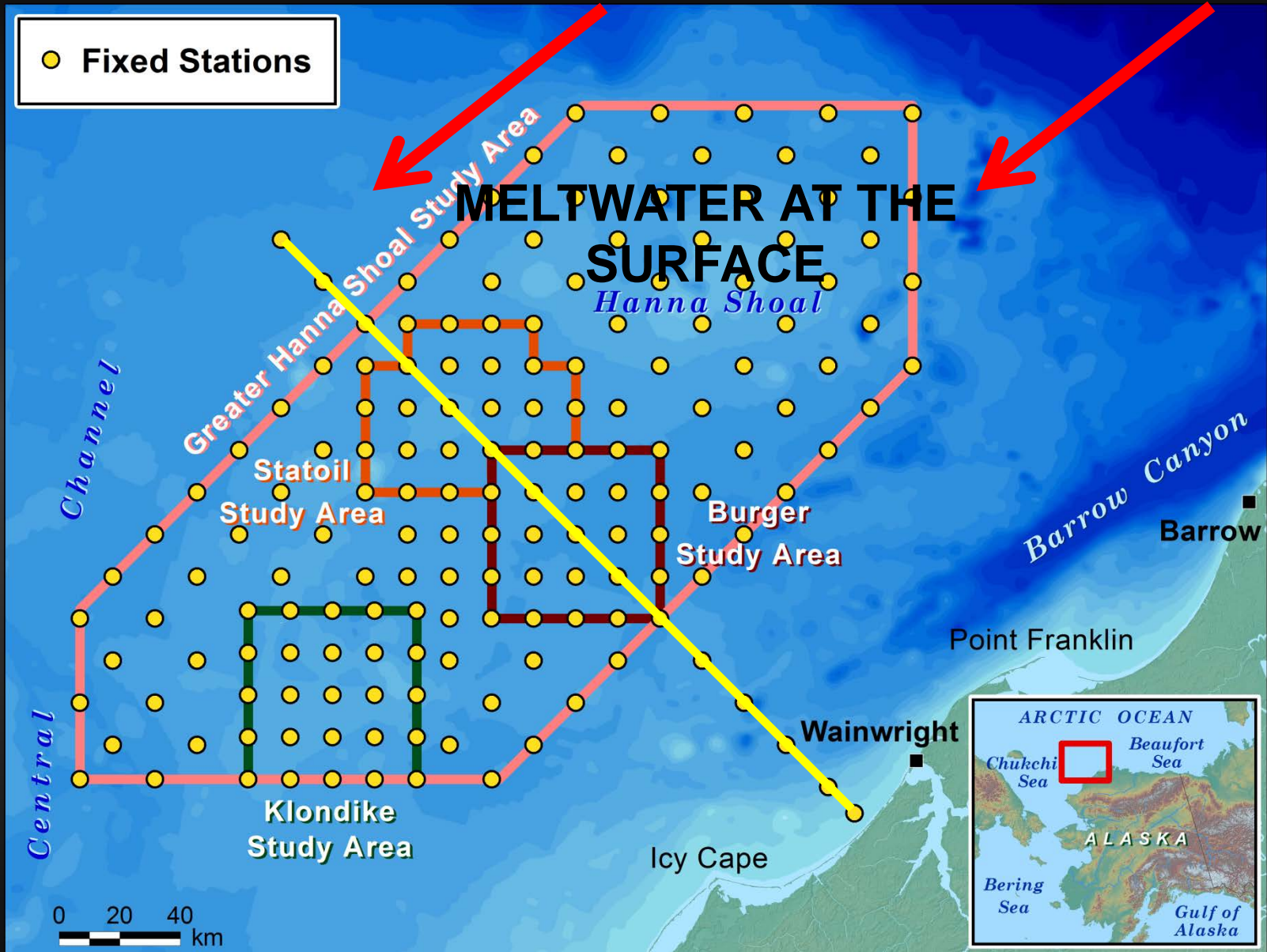


# BURGER-STATOIL (2012)

**\*\*NEED CALIBRATIONS\*\***



# SAMPLING DESIGN (2012)

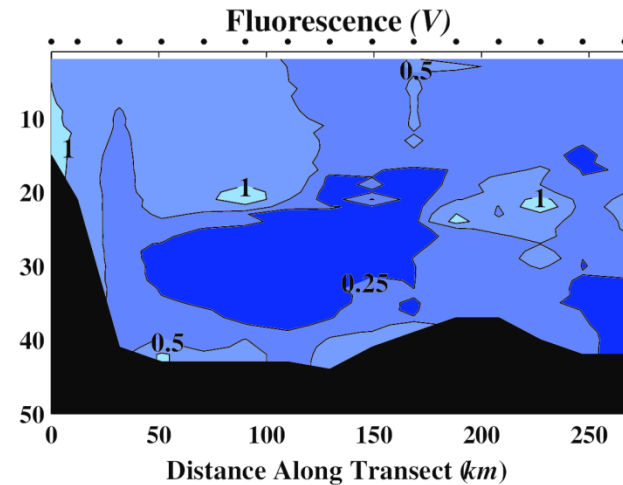
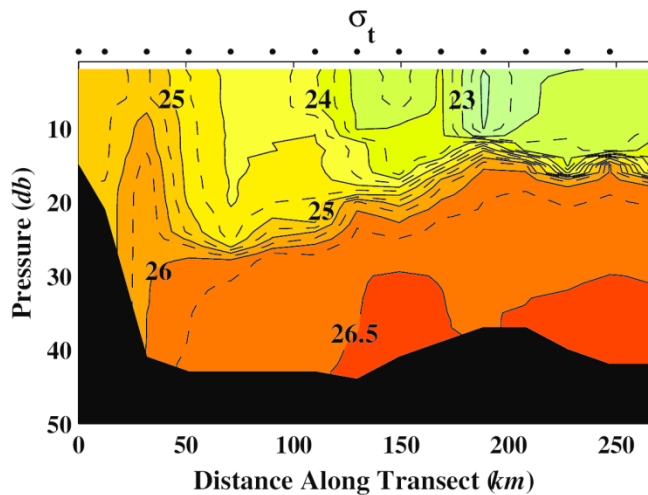
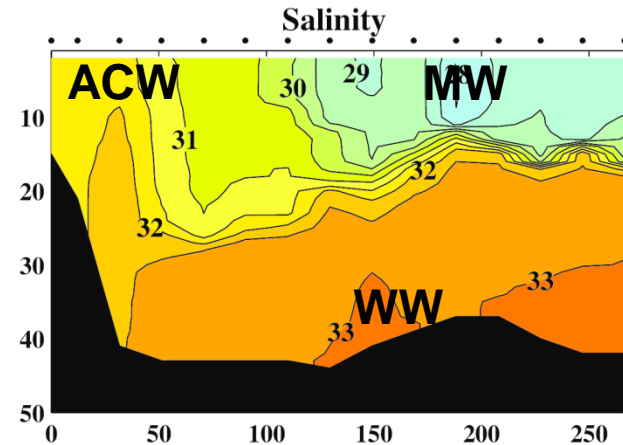
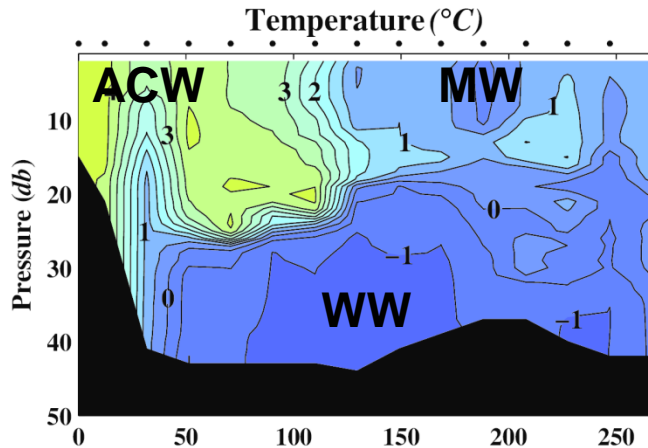




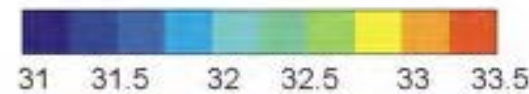
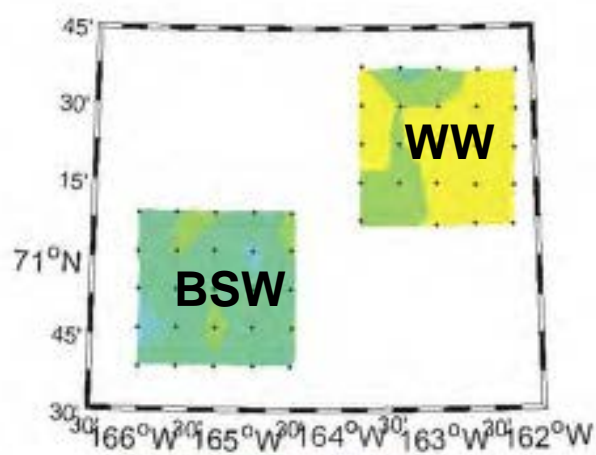
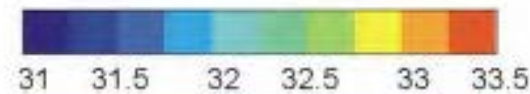
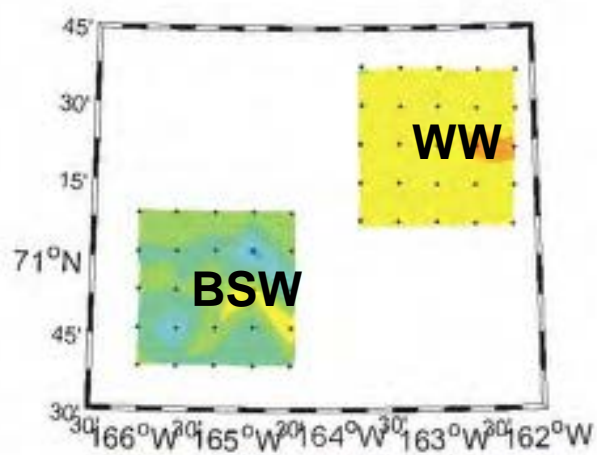
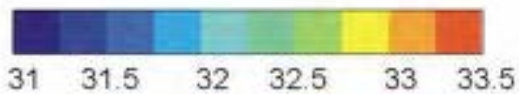
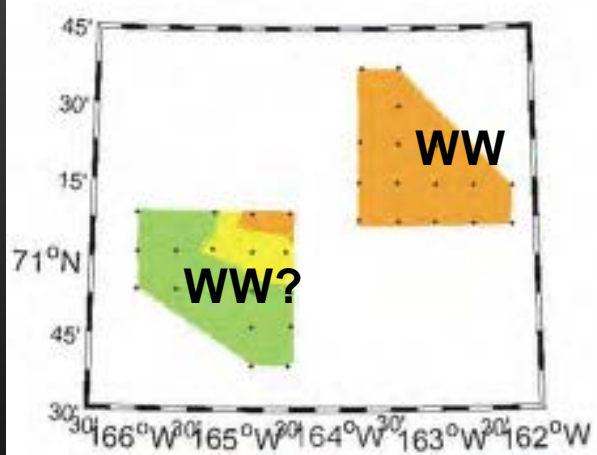
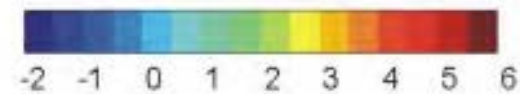
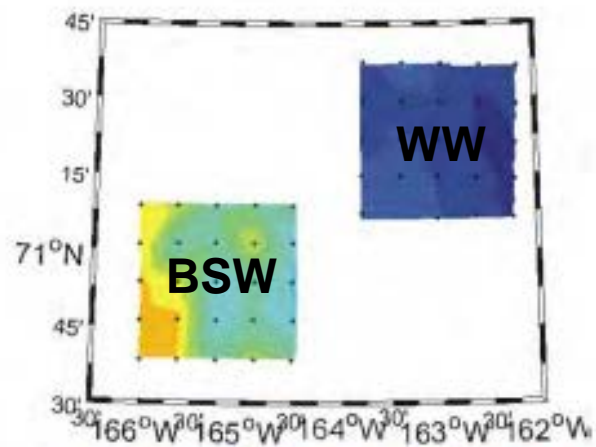
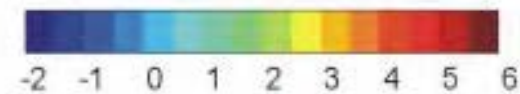
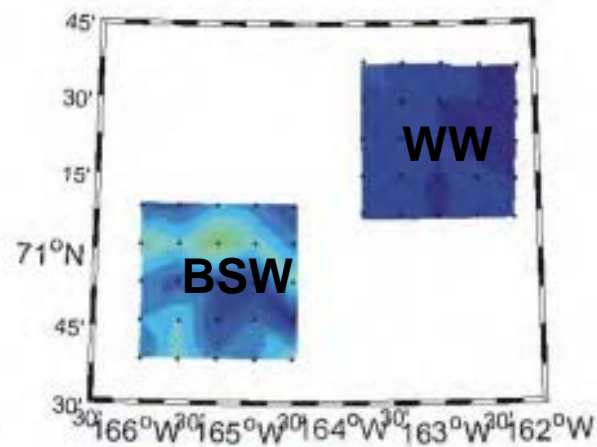
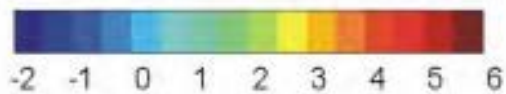
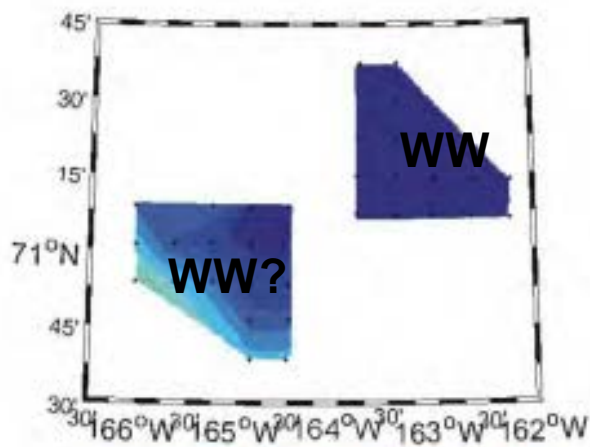
# VERTICAL SECTION (SEP 2012)

T34BSext\_afterEvent, Diagonal, Burger and Statoil extended, 9 – 24 September 2012

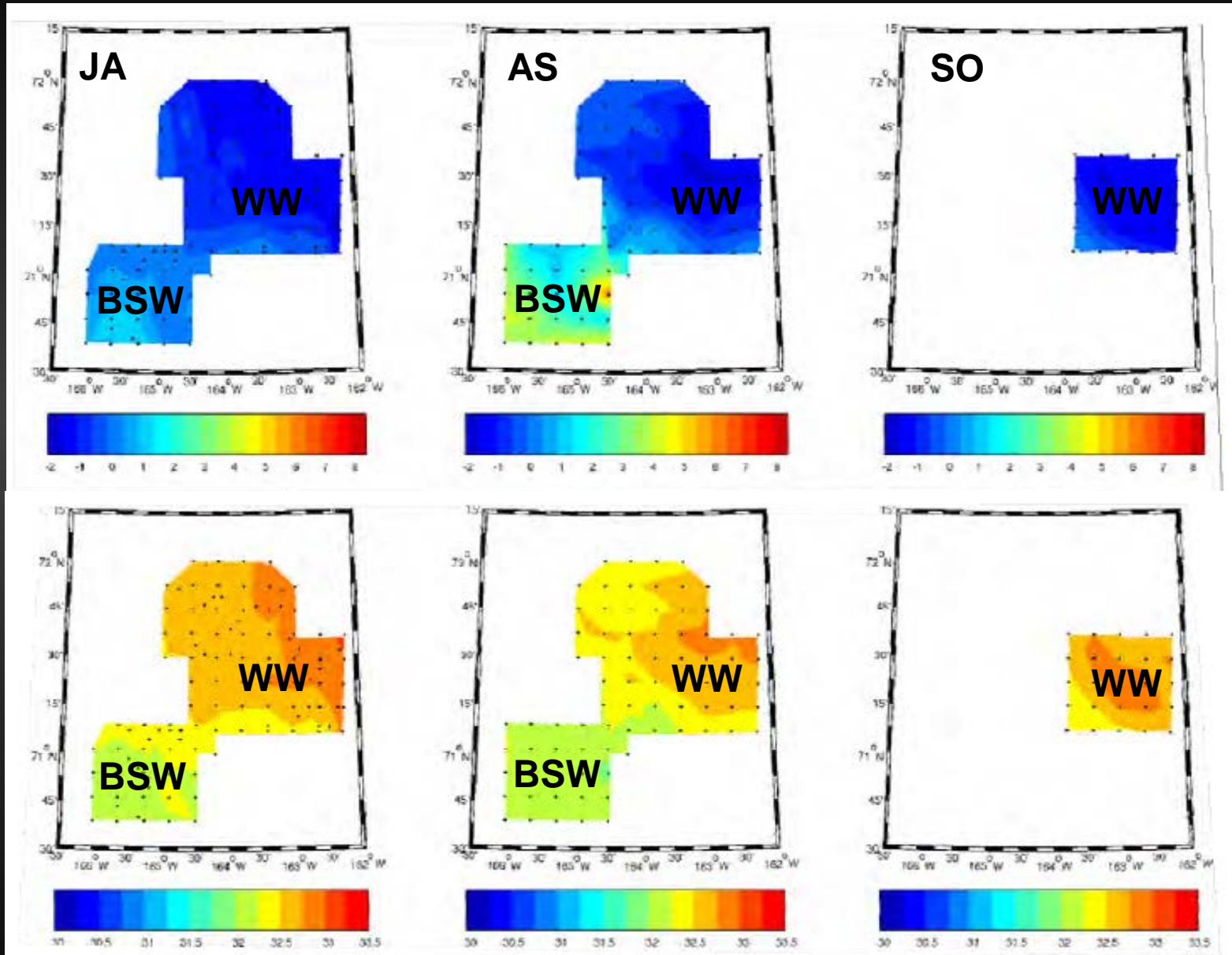
**\*\*NEED CALIBRATIONS\*\***



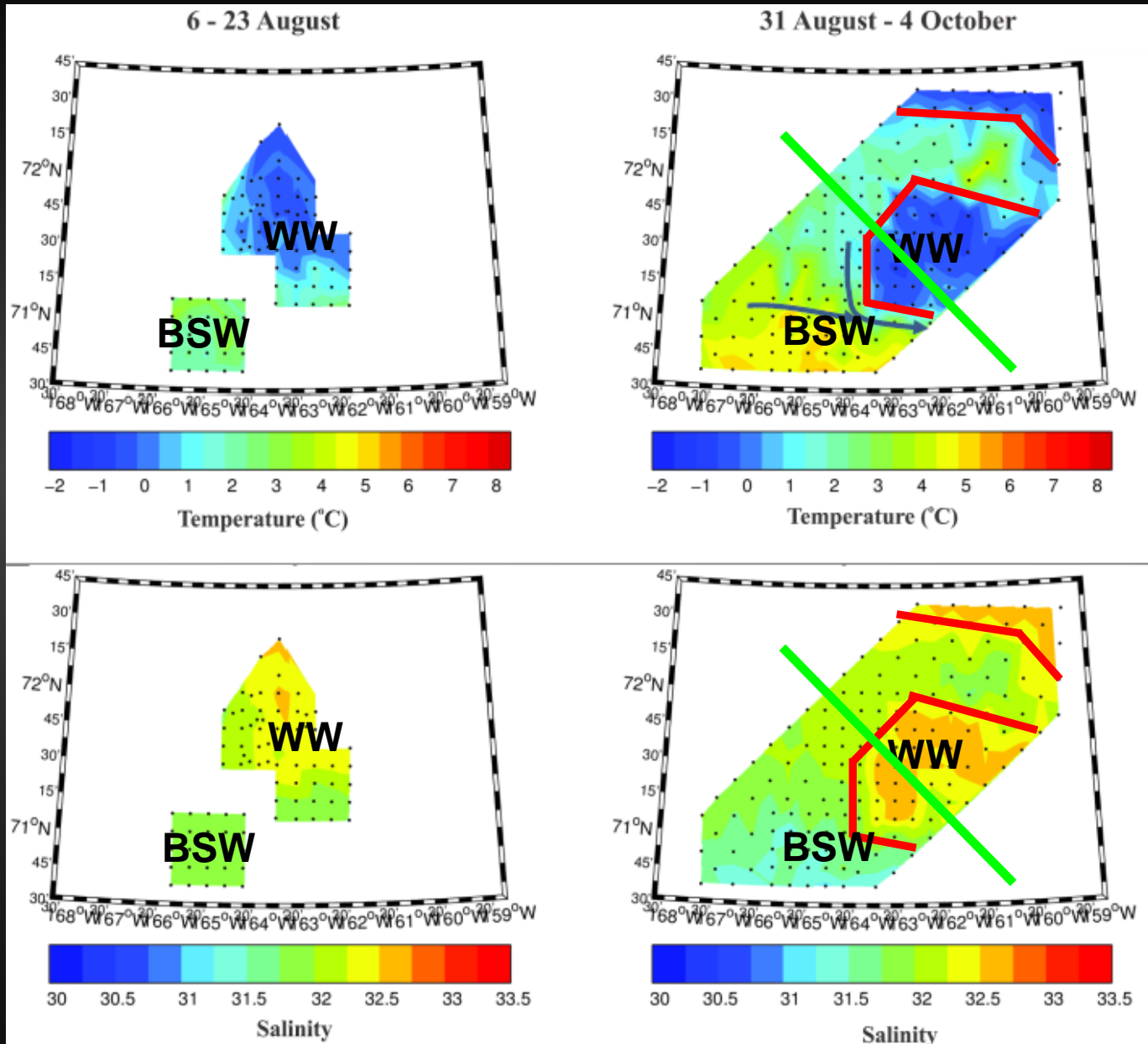
# MEASUREMENTS BELOW MIXED LAYER (2008)



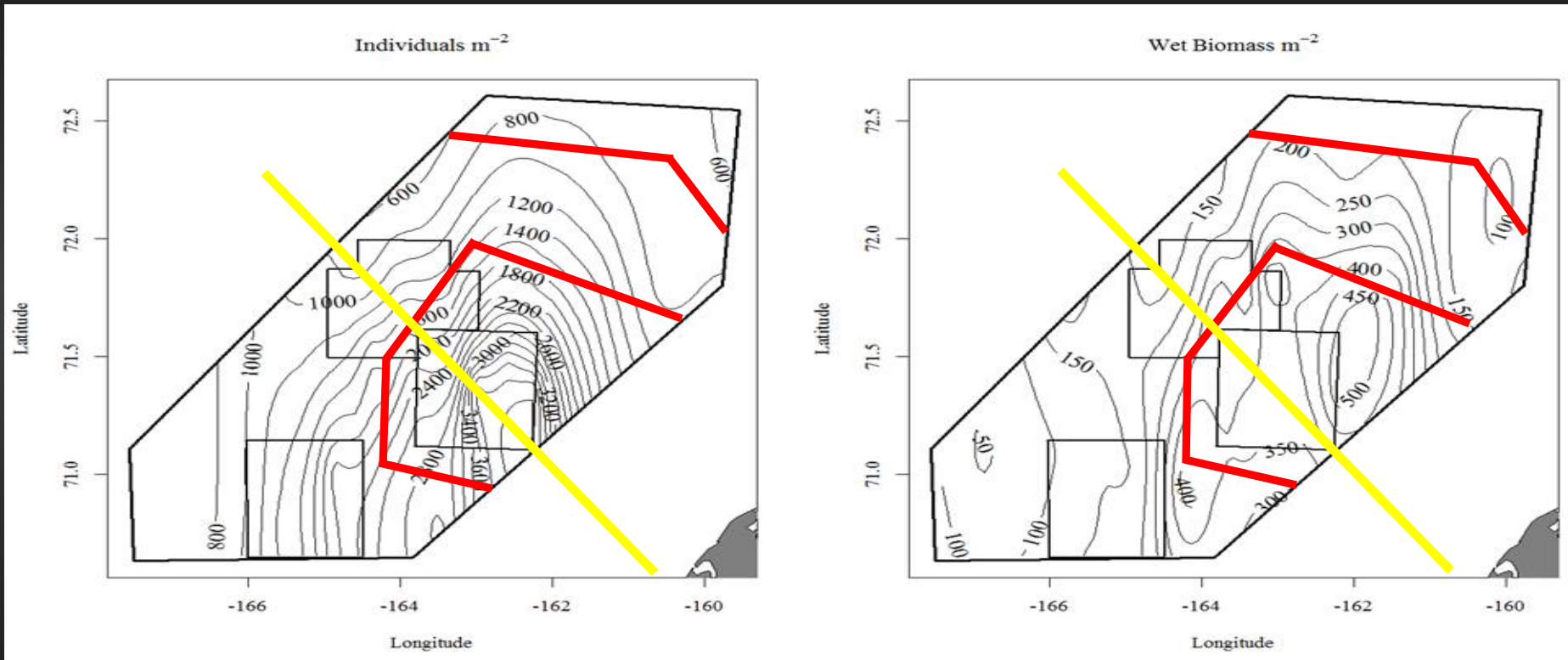
# MEASUREMENTS BELOW MIXED LAYER (2010)



# MEASUREMENTS BELOW MIXED LAYER (2011)

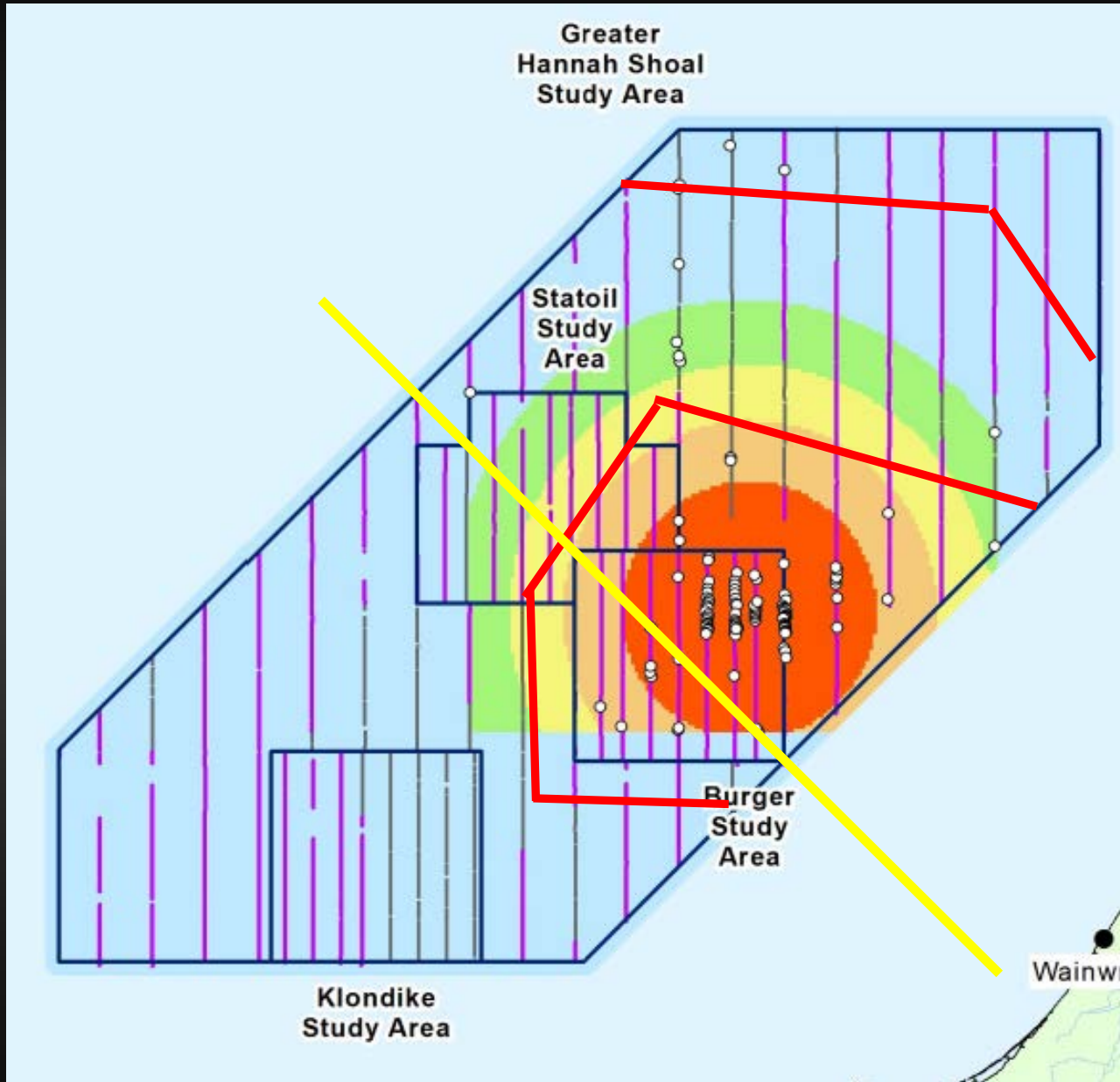


# MACROFAUNA (2011)

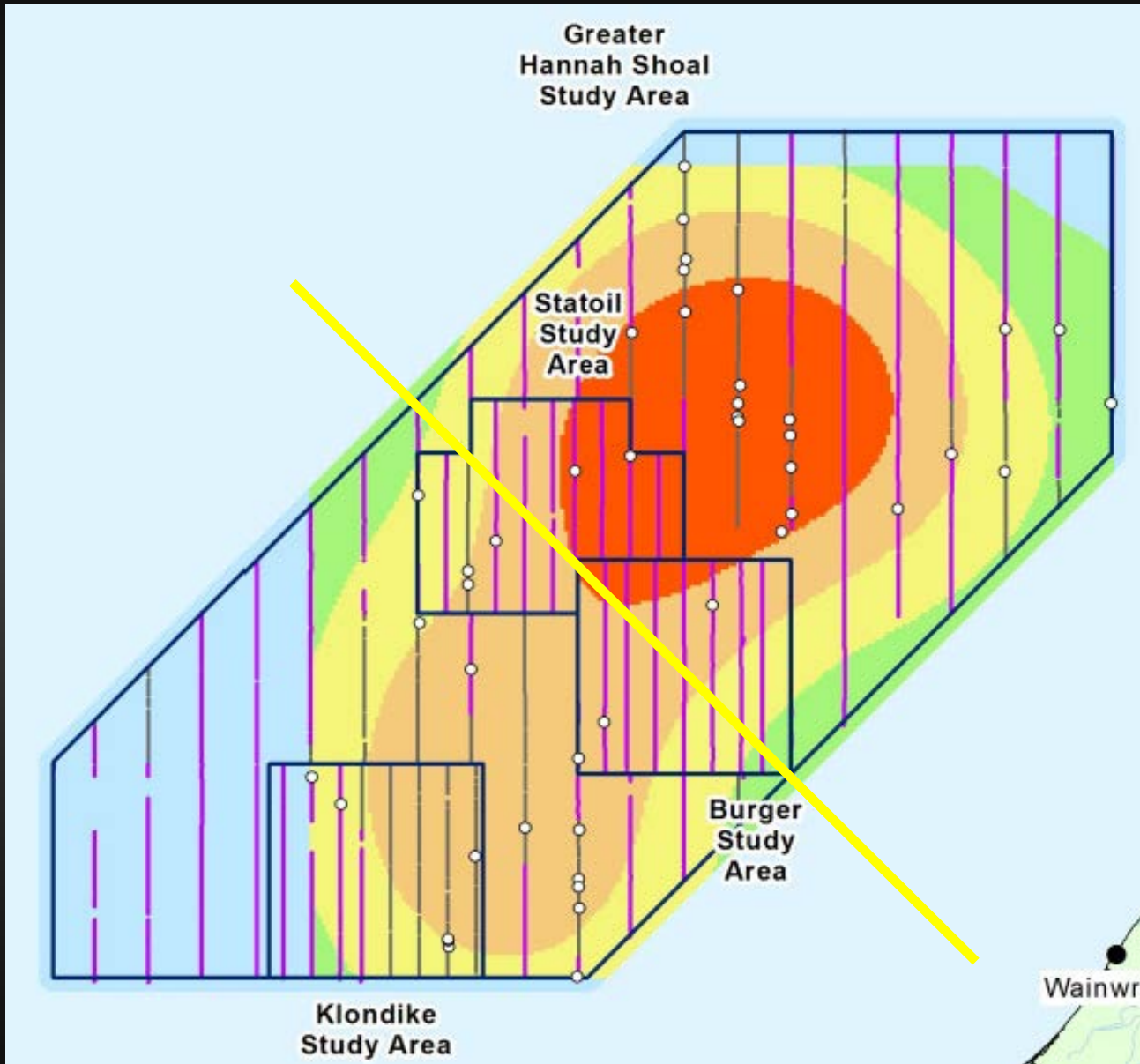


Primarily polychaetes and bivalves

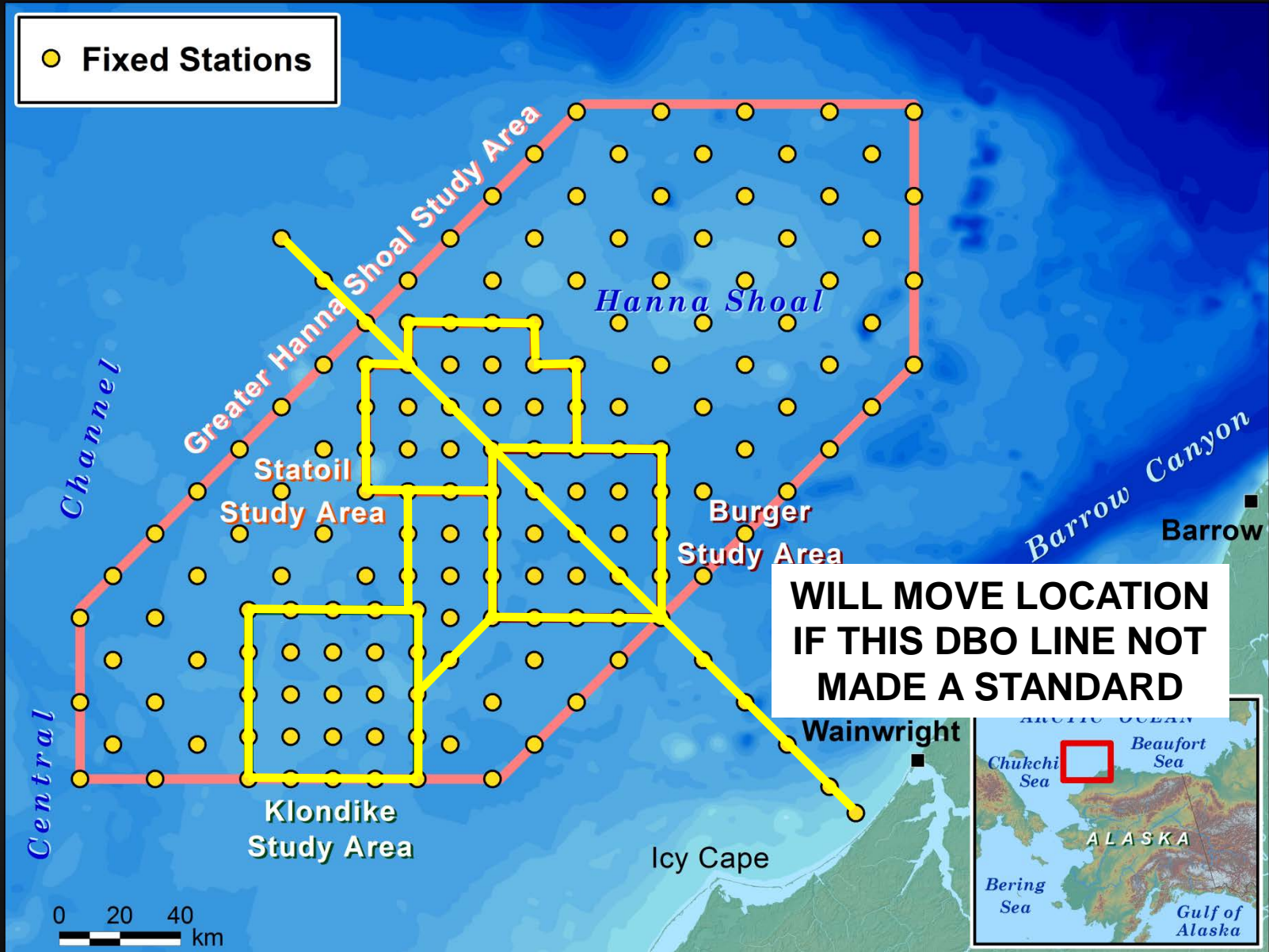
# WALRUSES AT SEA (2011)



# BEARDED SEALS AT SEA (2011)



# SAMPLING DESIGN (2X IN 2013)





# SUMMARY

- Wainwright DBO Line builds on existing data set started in 2008
- Multiple years
- Multiple seasons
- Multiple disciplines
- Planned to be sampled into foreseeable future
- Designed to monitor ACW, BSW, MW, and WW
- Most importantly, includes monitoring of WW