

# **Fish, Seabird & Marine Mammal Observations during the 2010-2011 Pilot DBO**

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# FISH, SEABIRD & MARINE MAMMALS = Higher Trophic (HT) Species SURVEYS, OBSERVATIONS AND LINKAGES TO RELATED PROJECTS

Higher-Trophic (HT) species reflect ecosystem 'hotspots' & organization

People CARE about HT species – they provide a link for education & outreach

## Surveys during DBO Pilot Study

**FISH:** no effort on DBO cruises

\*Related Projects = BASIS surveys in DBO Regions 1 & 2 + shore-cast sampling Region 5

**Data archived** @ NOAA/Alaska Fisheries Science Ctr

+ Industry sampling in Region 4?

**SEABIRDS:** standard 300m survey protocol

2010 = 5 of 9 DBO cruises

2011 = 3 of 9 DBO cruises

**Data archived** = North Pacific Pelagic Seabird Database

**MARINE MAMMALS:** watches & standard 'Big Eye' survey protocol

2010 = 5 of 9 DBO cruises

2011 = 4 of 9 DBO cruises

\*Related **acoustic sampling** = Regions **1** (M8), Bering Strait (RUSALCA), **4** (CHAOZ) & **5** (BOWFEST)

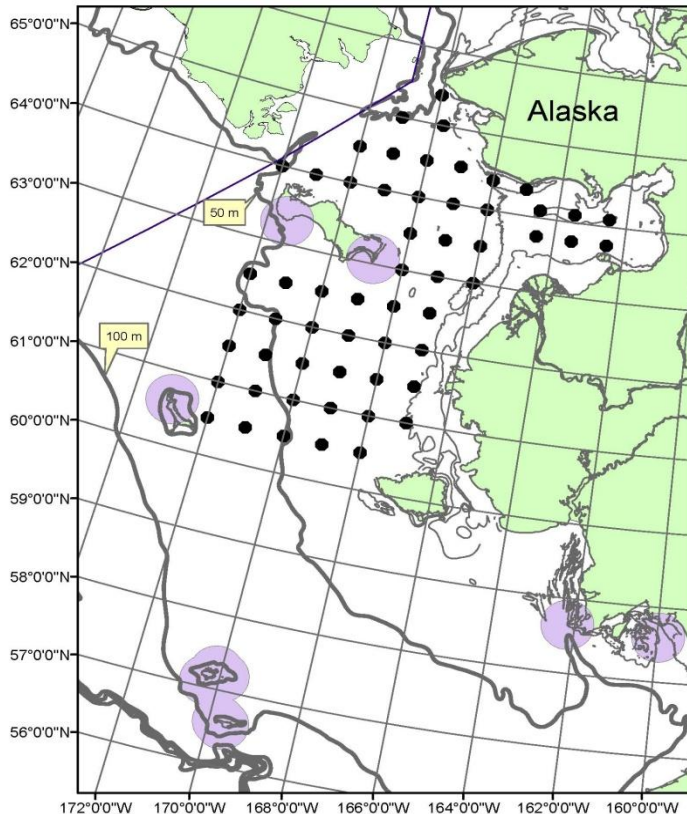
**Data archived** by projects; standard visual survey data (CHAOZ) & acoustic data @ NOAA/NMML & UW



# BASIS - Surface & mid-water trawl surveys in DBO Regions 1 & 2: salmon, forage fish & amphipods (*Themisto*)

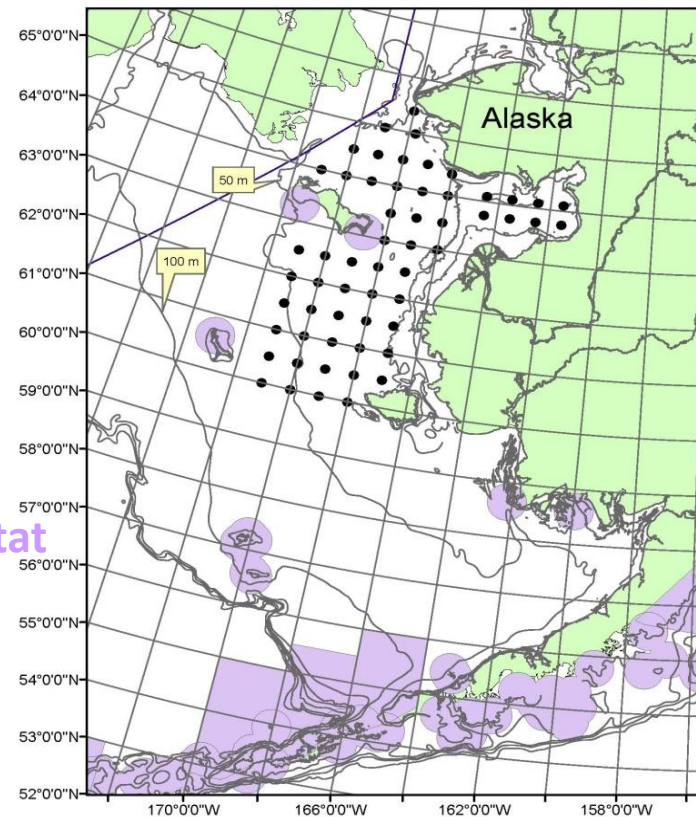
**3 September – 7 October 2010**

60 surface & 7 mid-water trawls, north of 60N



**18 August-21 September 2011**

58 surface & 4 mid-water trawls, north of 60N



Purple = SSL  
Critical Habitat

**BASIS = Bering Arctic Subarctic Integrated Surveys; echosign guides mid-water trawls**

# Seabird Surveys - Standard Survey Protocol:

USFWS (2009) Pelagic Seabird Observer's Manual & Data Entry Software

Single observer surveys a 300m quadrant from a port **or** starboard 'station' on bridge

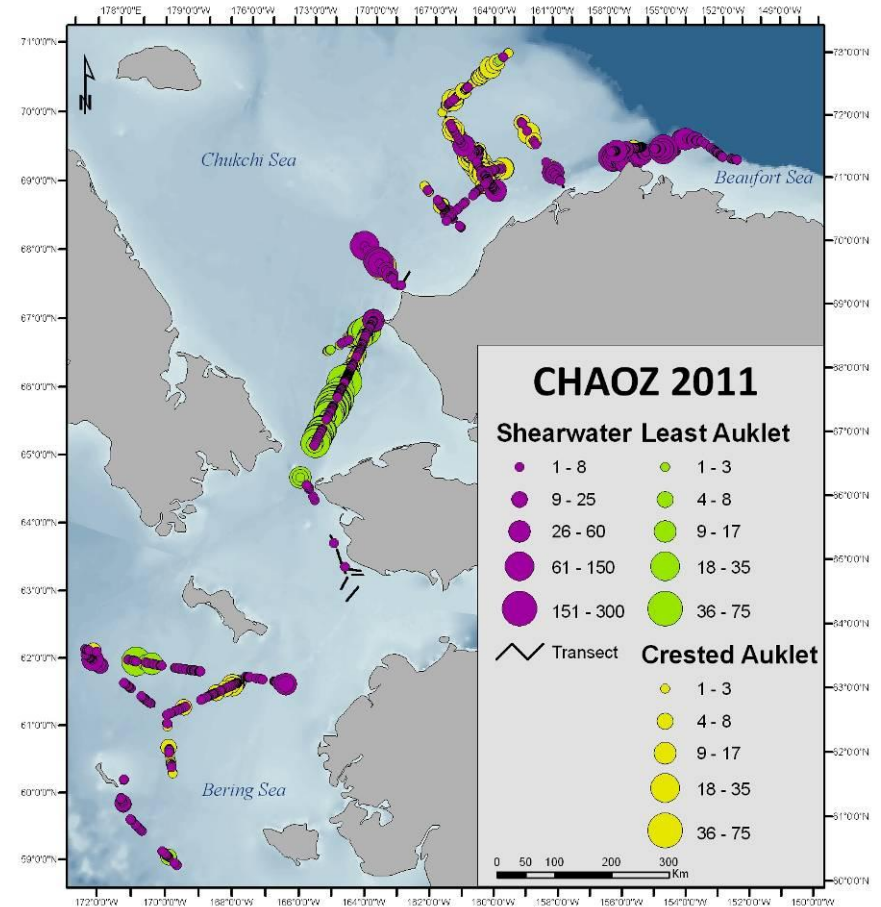
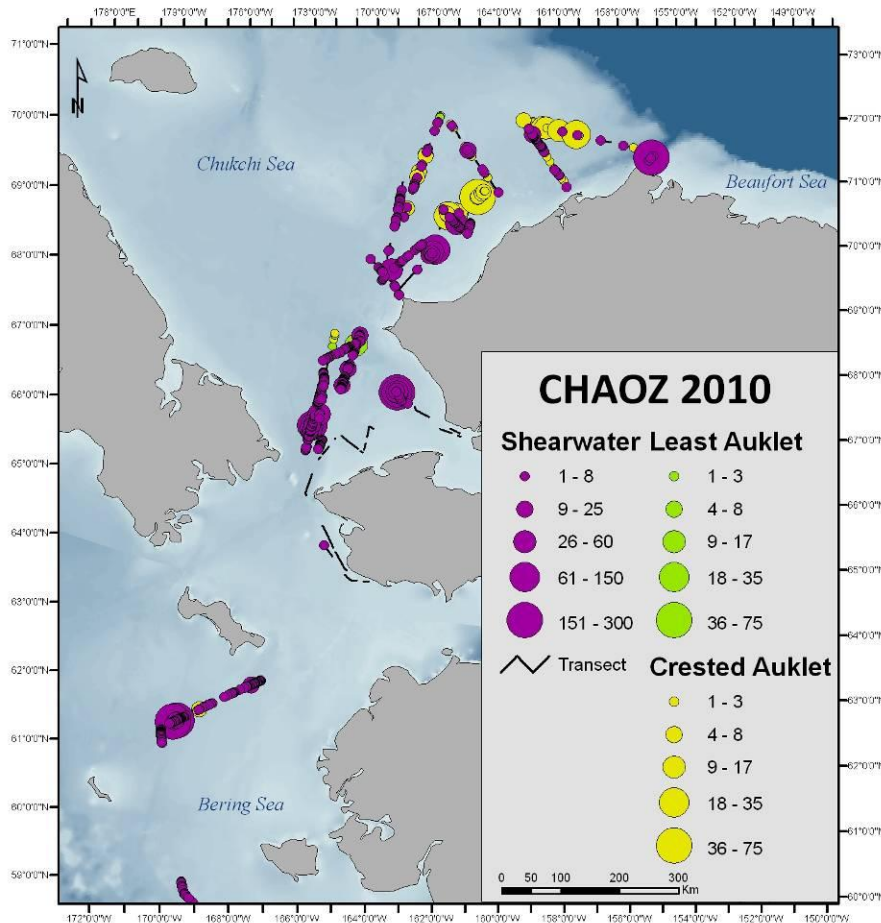
Data entry on GPS-linked laptop computer



# Seabird Sightings from CHAOZ Cruises (USFWS Survey Protocol)

2010 – DBO Region 3 – ‘hotspot’

2011: DBO Region 1&3 – ‘hotspot’



CHAOZ = CHukchi Acoustic Oceanographic and Zooplankton study

# Marine Mammals: Watches vs. Standard Surveys

**Watch Effort:** 1-2 person, handheld binoculars, excel spread sheet



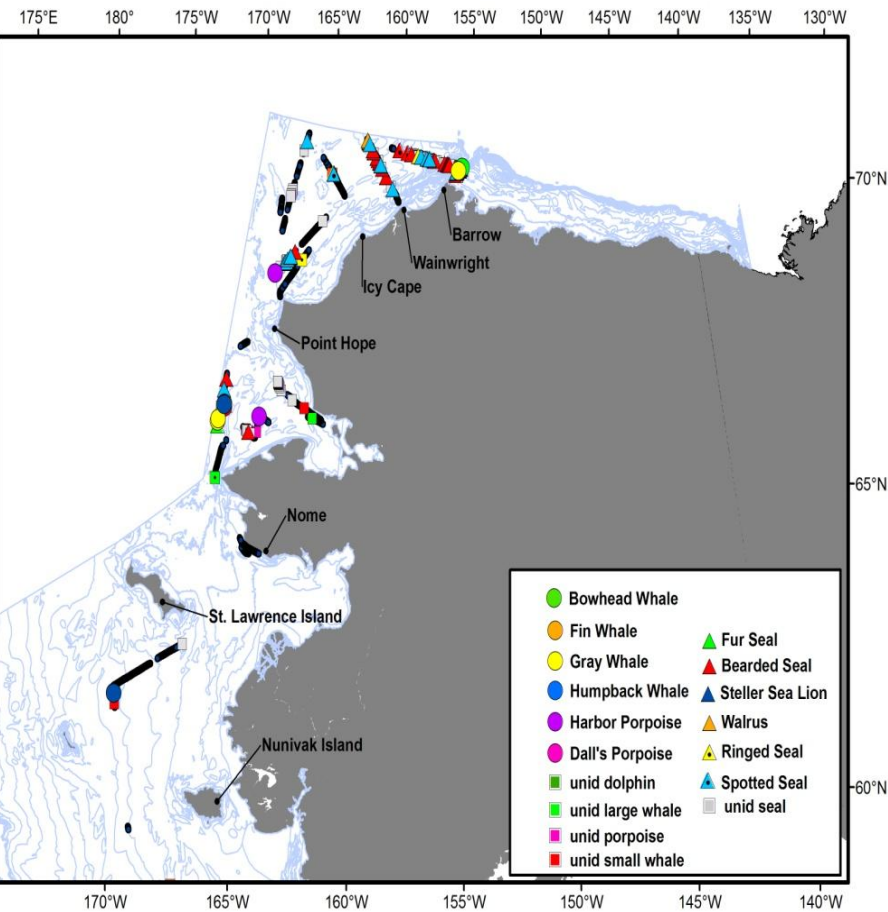
**Standard Survey :** 3-person team, Big Eye binoculars, Wincruz program



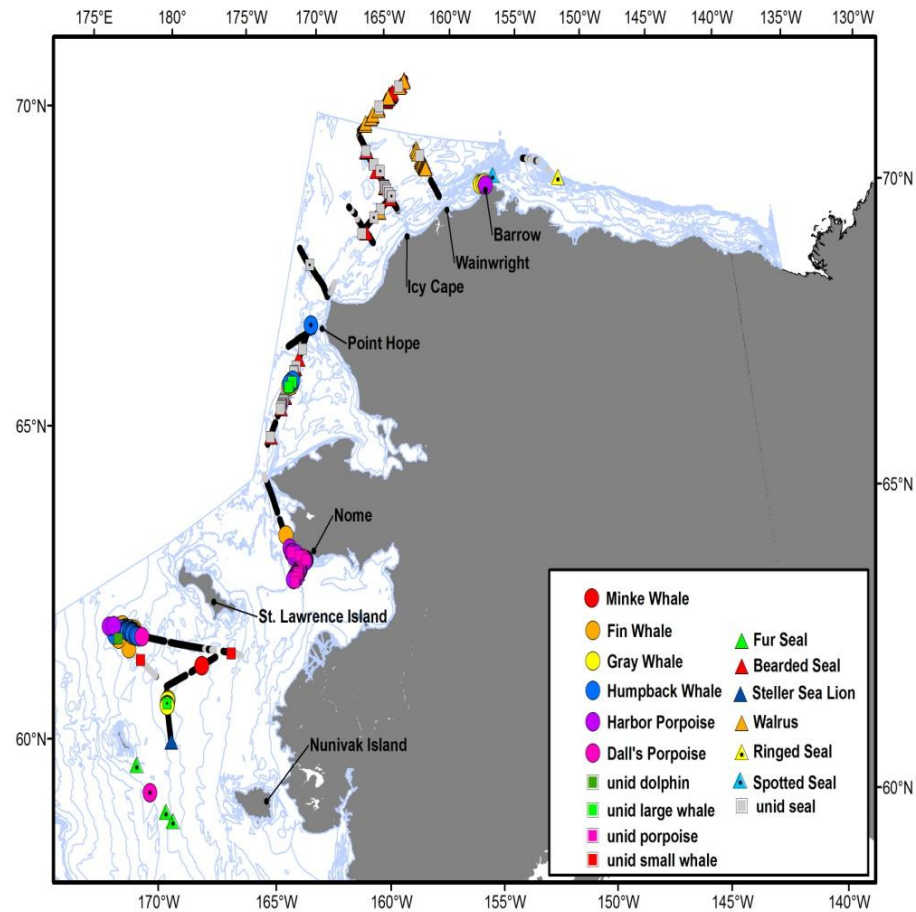
# Marine Mammal Sightings (CHAOZ)

## Standard Survey Protocol

2010 – DBO Region 3 – ‘hotspot’

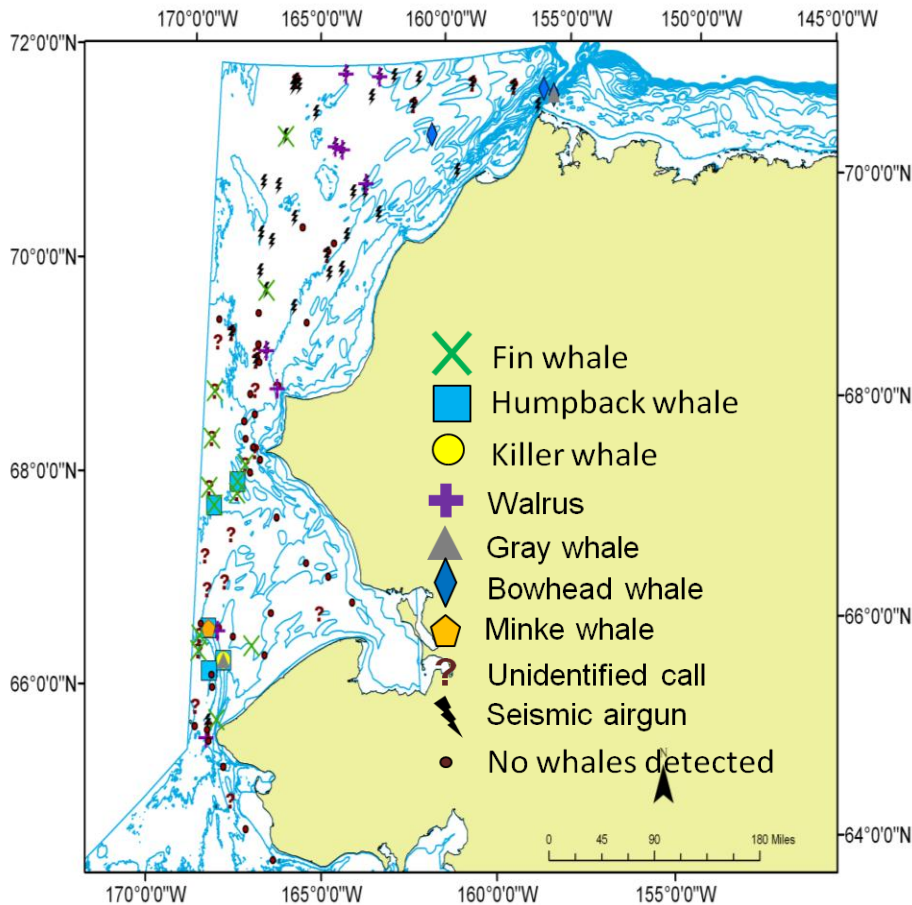


2011: DBO Region 1 – ‘hotspot’

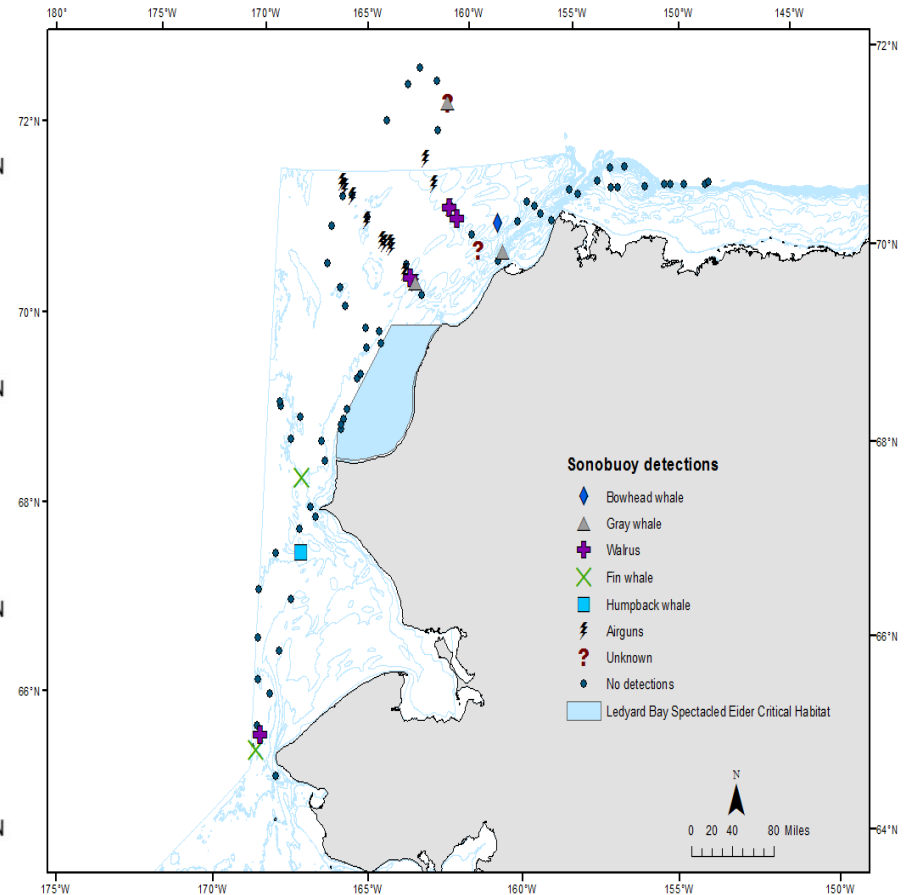


# Marine Mammal Acoustic Detections from deployment of expendable sonobuoys (CHAOZ)

## 2010 sonobuoy detections



## 2011 sonobuoy detections



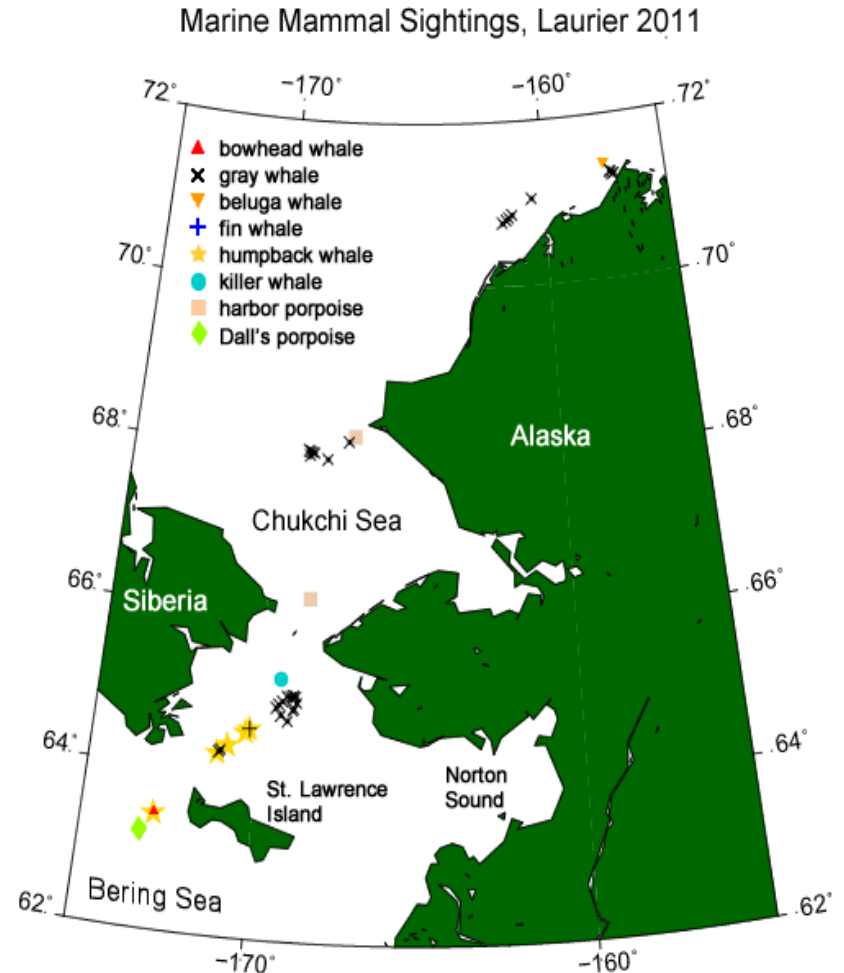
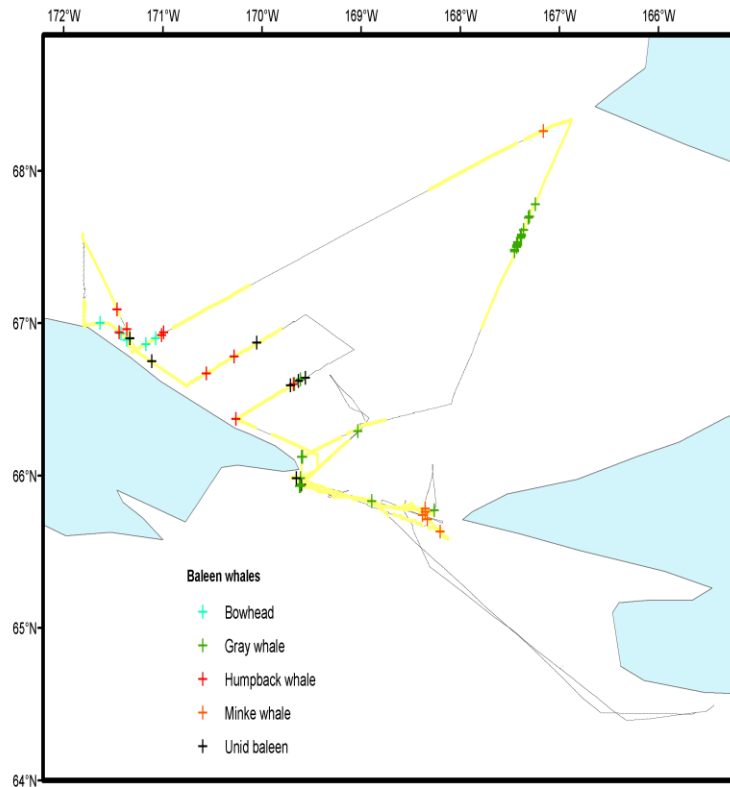


# Marine Mammal Watches

\* need to develop 'standard watch' protocol

2010 - RUSALCA: 31 July – 11 August (RT Nome)

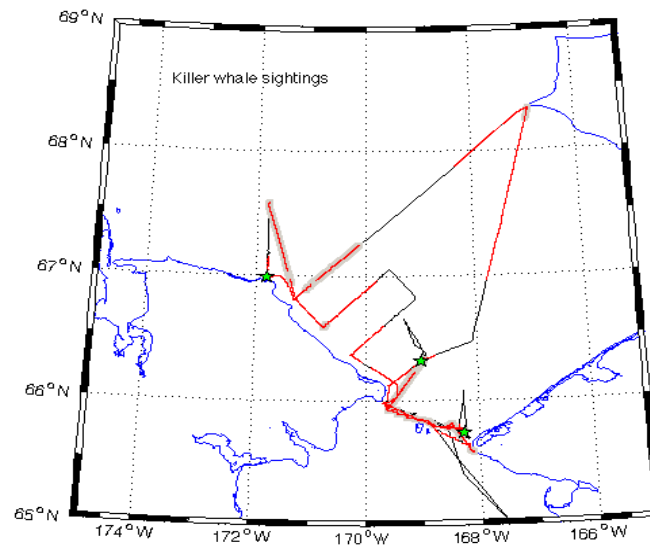
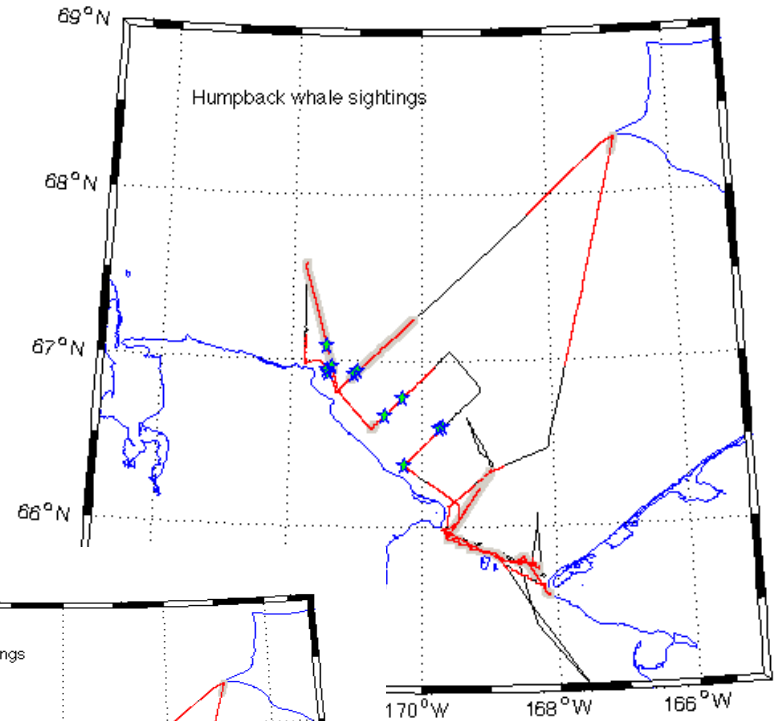
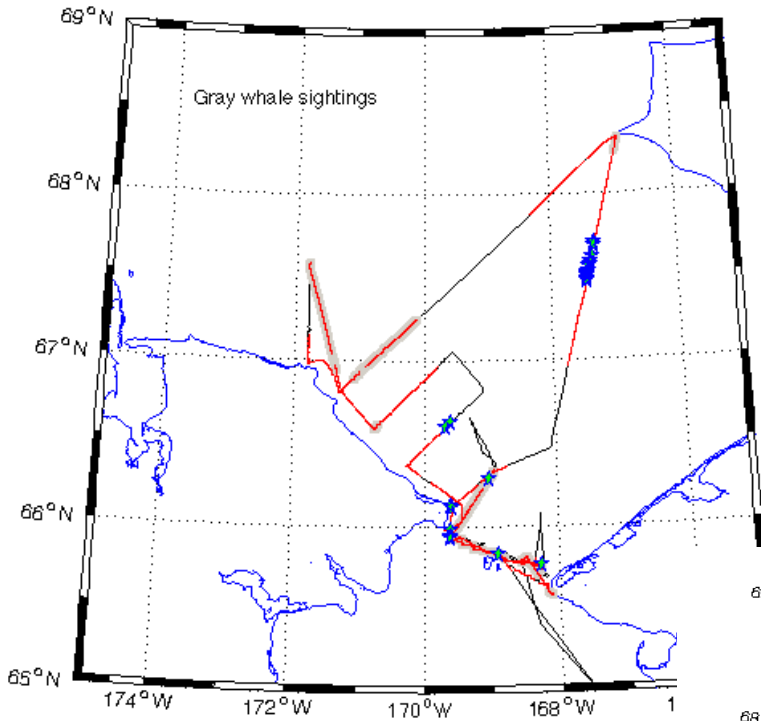
2011 - C30: 15-20 July (N. Bering-Barrow)



Kate Stafford (APL-UW) – primary observer

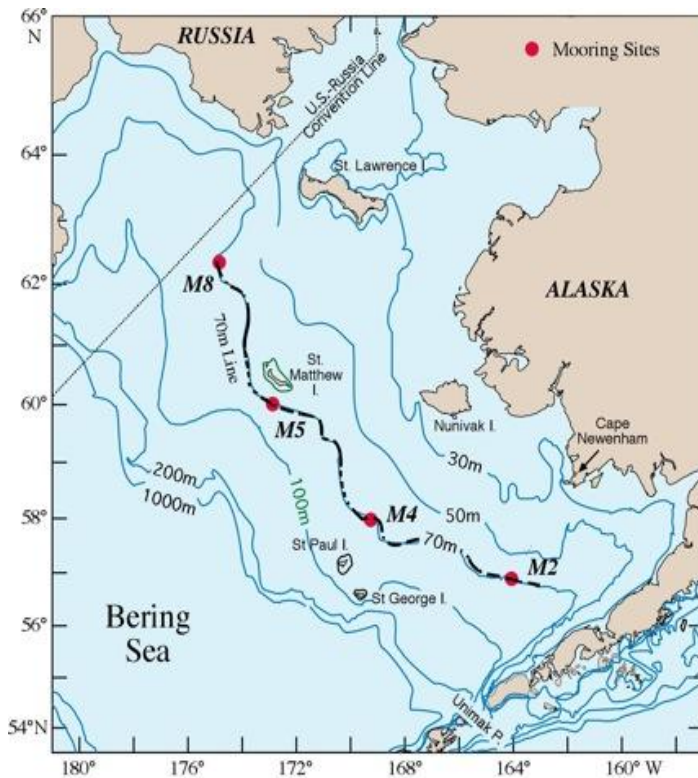
# RUSALCA 2010 – example ‘**temperate whale species**’ distributions

(data courtesy Kate Stafford; Woodgate et al. 2010 RUSALCA cruise report)

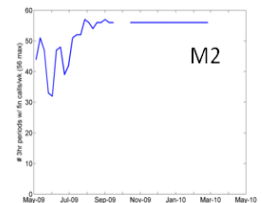
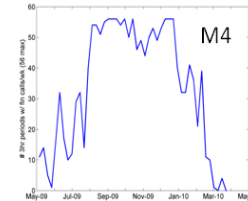
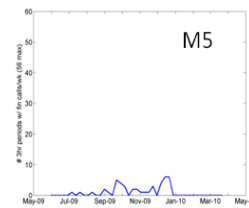
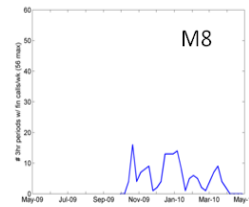


# **Related Study:** Example Year-round Acoustic Sampling at mooring M8, near Region 1

## Bering Sea Recorders



## 2009 Fin whale calling record



2009 fin whale calling

Y-axis is the # of 3 hr periods containing fin calls per week. Max possible is 56.

**Note:** Year-round acoustic sampling is ongoing in or near all DBO regions & across the Beaufort Sea shelf.