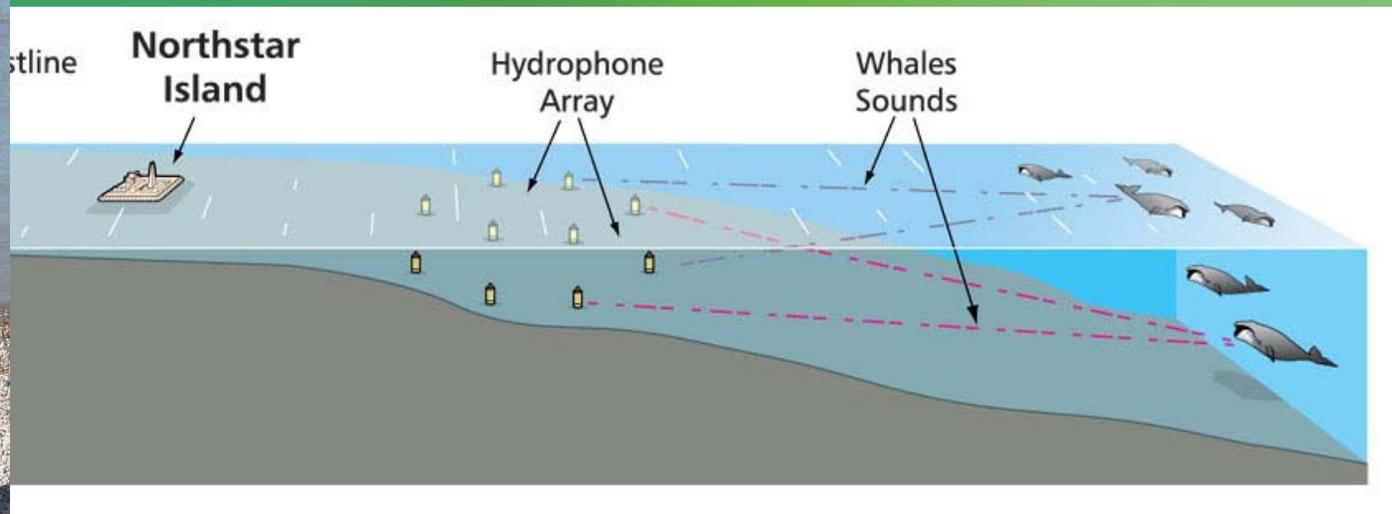


14^{th(+)} Open Water Meeting Report on Marine Mammal and Acoustic Monitoring of the Northstar Offshore Production Facility



Where We're Going . . .

- Summary
- Northstar background
- Activities
- Seal data
- 2012 Acoustics and Whale Calls
- 2012 Cross Island Hunt
- 2013 plans
- Review



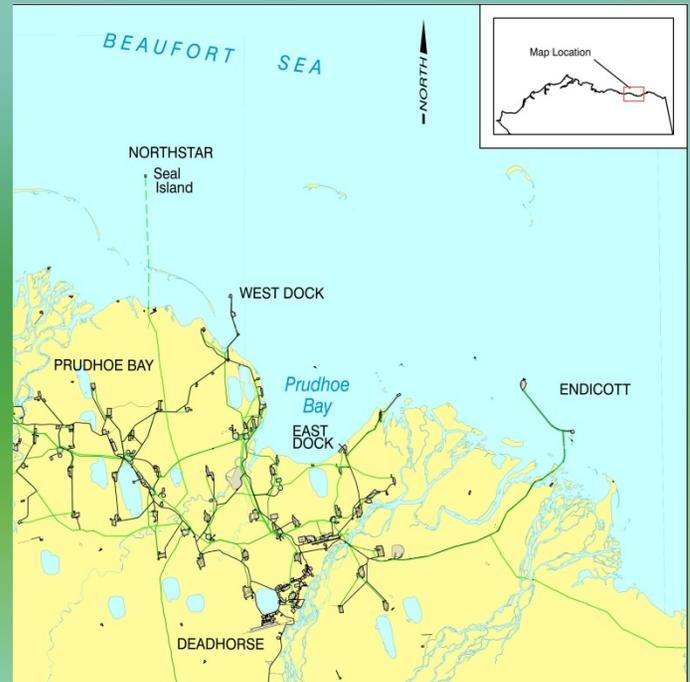
Summary 2012 (preview)

- typical activities, plus new personnel module
- typical seal counts
- typical bowhead call count
- vessel noise in array





Northstar Background



1st oil: October 2001

Peak oil: ~80,000 bpd (2003/04)

2010 production: ~18,000 bpd

2011 production: ~13,000 bpd

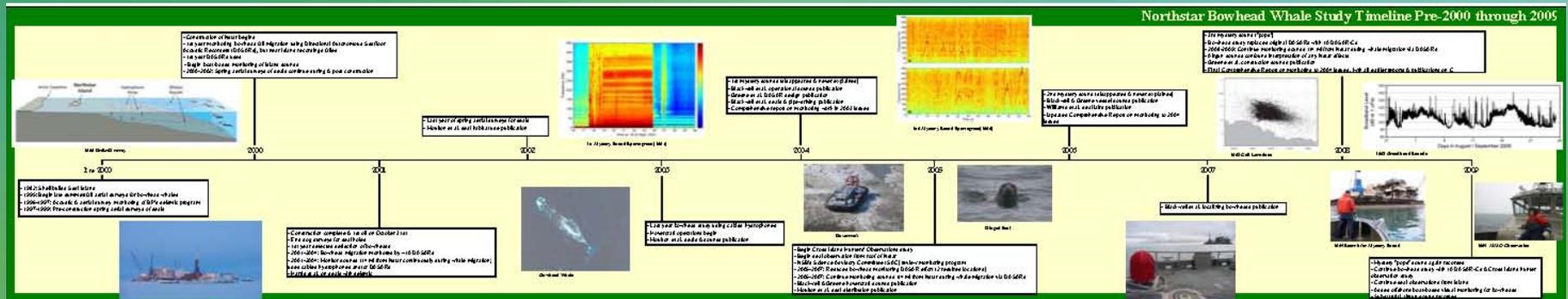
2012 production: ~11,600 bpd



Northstar Background

Date	BP Request or Regulatory Activity
Aug. 1998	BP applied for an IHA from NMFS
Nov. 1998	BP requested NMFS to promulgate regulations allowing for issuance of LoAs
15 Mar. 1999	NMFS issued interim IHA for construction phase
25 May 2000	NMFS issued Regulations, effective from 25 May 2000 to 25 May 2005
18 Sept. 2000	First LoA issued to BP for Northstar construction, effective until expired 30 Nov. 2001
14 Dec. 2001	Second LoA issued to BP, effective until 30 Nov. 2002
9 Dec. 2002	Third LoA issued to BP, effective until 30 Nov. 2003
4 Dec. 2003	Fourth LoA issued to BP, effective until 3 Dec. 2004
30 Aug. 2004	BP requested renewal of the Regulations for 2nd 5 yr term, and initial LoA
6 Dec. 2004	Fifth LoA issued to BP, effective until 25 May 2005
7 Mar. 2006	NMFS renewed the Regulations, effective from 6 Apr 2006 through 6 Apr 2011
7 July 2006	NMFS issued initial LoA under the new Regulations, effective until 6 Jul. 2007
7 July 2007	Second LoA issued to BP, effective until 6 Jul. 2008
1 July 2008	Third LoA issued to BP, effective from 7 Jul. 2008 until 6 Jul. 2009
18 June 2008	Fourth LoA issued to BP, effective from 7 Jul. 2009 until 6 Jul. 2010
27 Oct. 2009	BP requested renewal of the Regulations for 3rd 5-yr term, and initial LoA
28 Apr. 2010	Fifth LoA requested by BP, for the period until 6 Apr. 2011; neither issued nor denied
5 July 2011	NMFS published a notice in <i>Federal Register</i> seeking input re renewal of regulations

A brief history of the Northstar Marine Mammal project. . . .



2012

- Routine monitoring
- 1 peer reviewed publication published (n=14)
- 2(?) in preparation

Northstar Activities 2012



Year	Ice-covered Season		Open-water Season	
	Helicopter	Hovercraft	Helicopter	Hovercraft
2002/03	1122	na	277	202
2003/04	253	141	189	302
2004/05	118	180	103	188
2005/06	465	249	271	560
2006/07	335	574	190	347
2007/08	222	426	119	445.5
2008/09	62	539	120	373
2009/10	47	314.5	88.5	345.5
2010/11	120.5	374.5	129	106
2011/12	106	462.5	88	407.5

Northstar Activities 2012



Year	Tugs/Barges	ACS boats	Crew Boat
2003	82	--	N/A
2004	24	(22)	N/A
2005	21	(14)	N/A
2006	64	106	N/A
2007	40	137	N/A
2008	45	55	N/A
2009	44.5	65	N/A
2010	63.5	15	231.5
2011	61.5	92	488
2012	30	40	N/A

Northstar Activities 2012





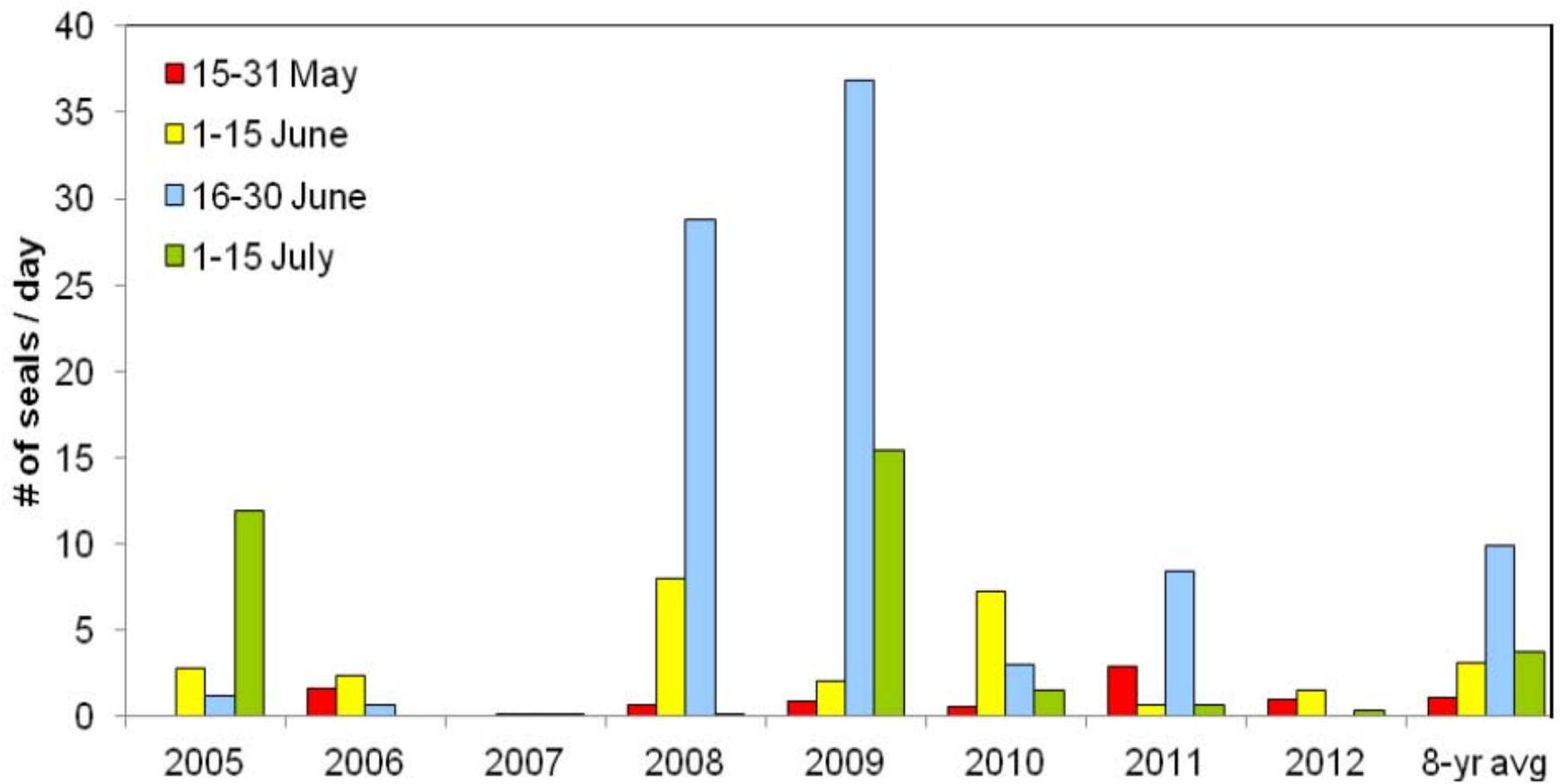
2012 Northstar Seal Monitoring

Year	Total # of seals (includes repeat sightings)	Total obs. days	Mean # seals/day	Max. # observed	Standard deviation
2005	229	42	5.5	124	19.4
2006	54	49	1.1	4	1.2
2007	3	57	0.1	1	0.2
2008	415	54	7.7	63	15.1
2009	811	61	13.3	87	25.7
2010	185	62	3.0	18	4.5
2011	185	62	3.0	70	10.9
2012	43	62	0.7	5	1.2

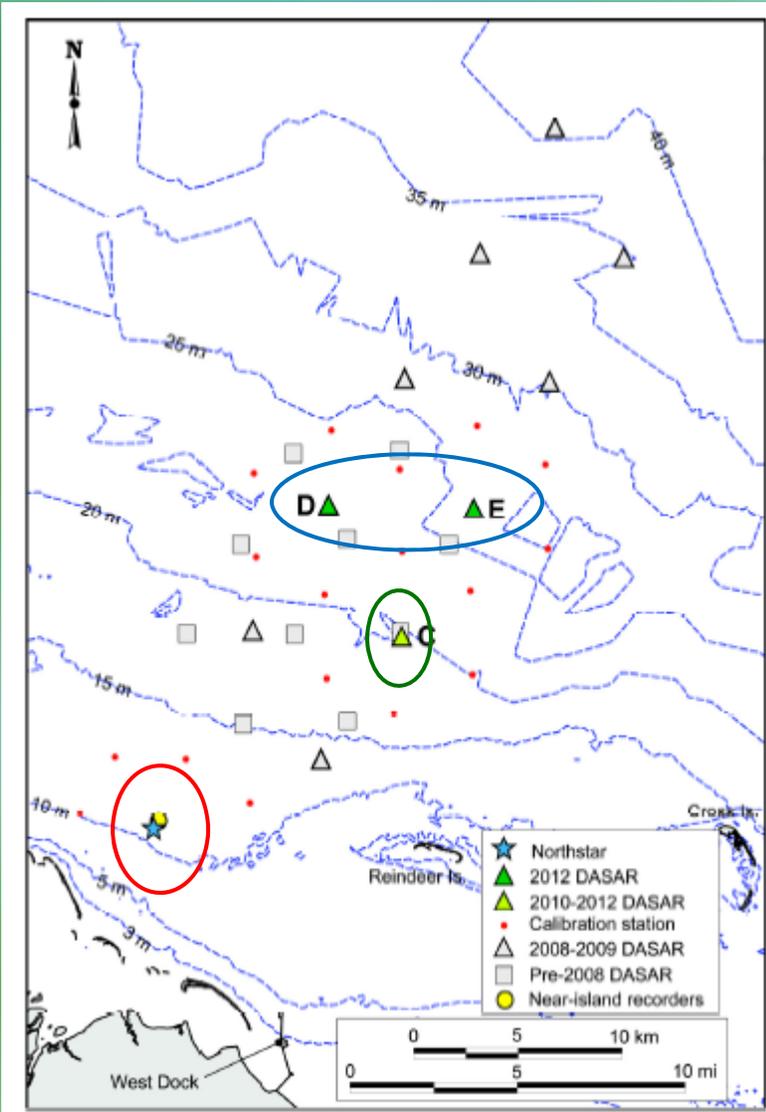
“Results of the seal counts suggest high interannual variability in number of seals sighted and mean daily sighting rates.”



2012 Northstar Seal Monitoring



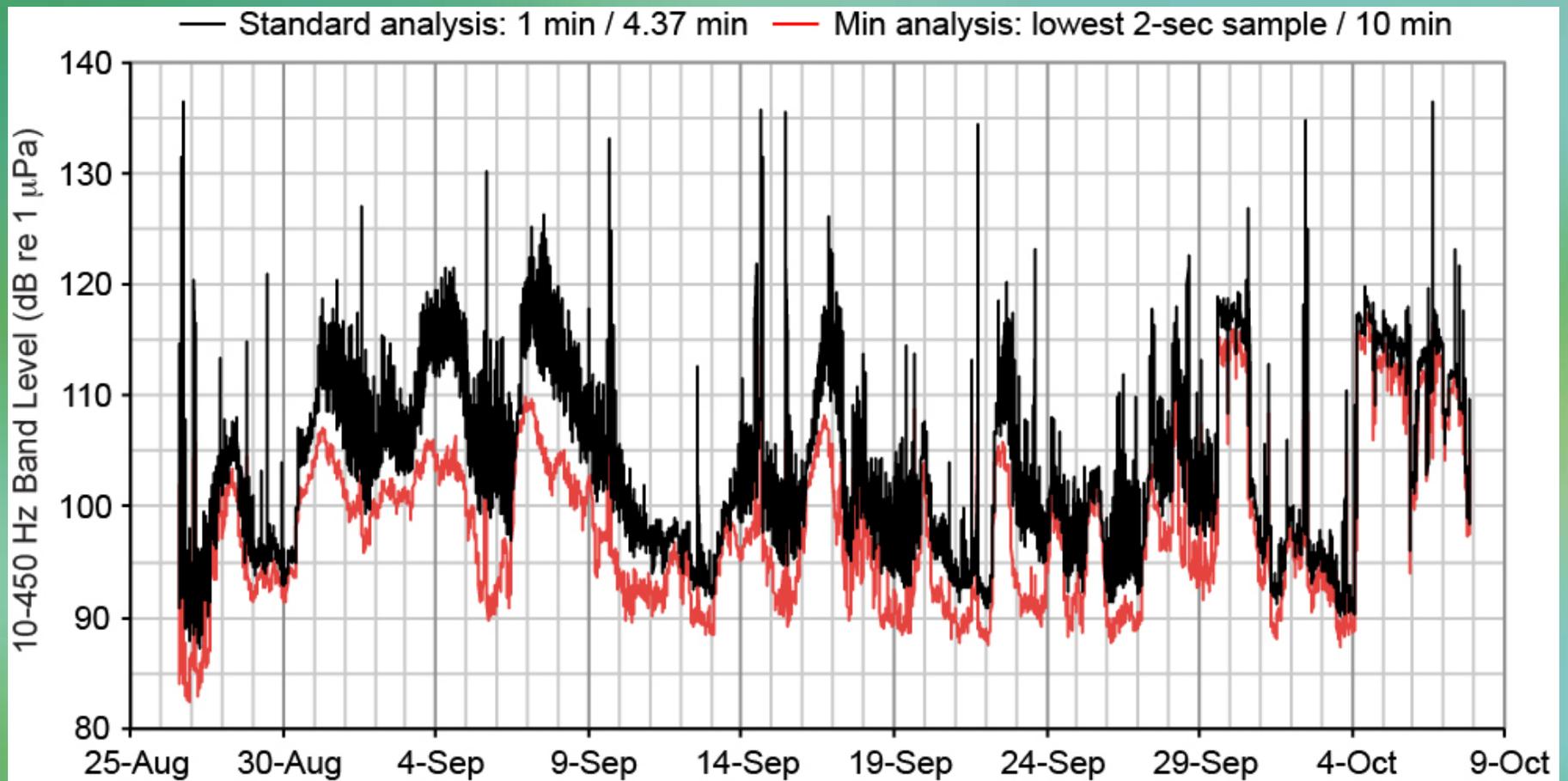
Northstar Study 2012 Design



- 1 location to record Northstar (3 recorders)
- 1 location to count calls (2 recorders)
- “Extra” locations at D and E
- Norseman retrieval
- One overwintered at C

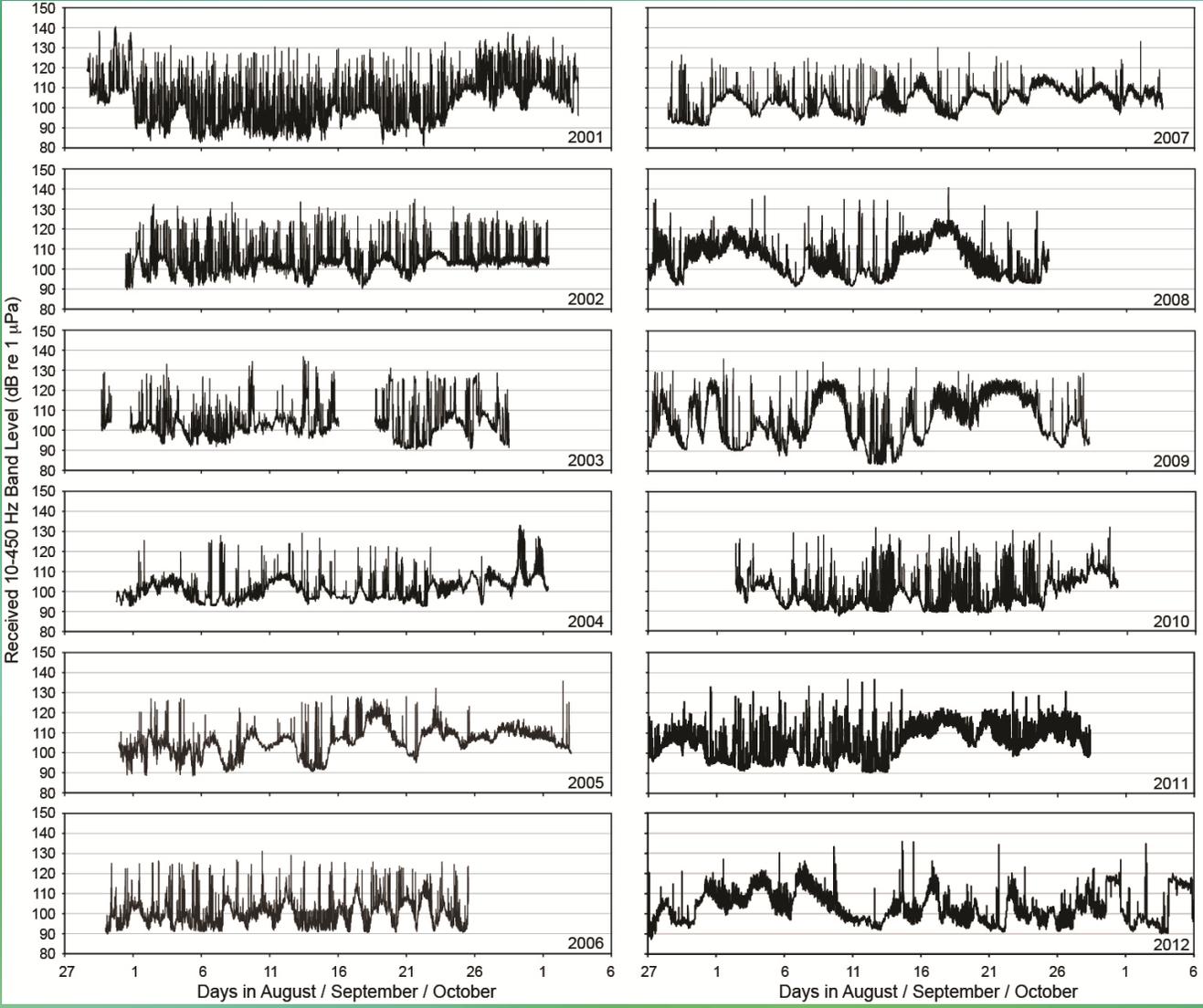


Northstar Acoustics 2012





Northstar Acoustics 2012



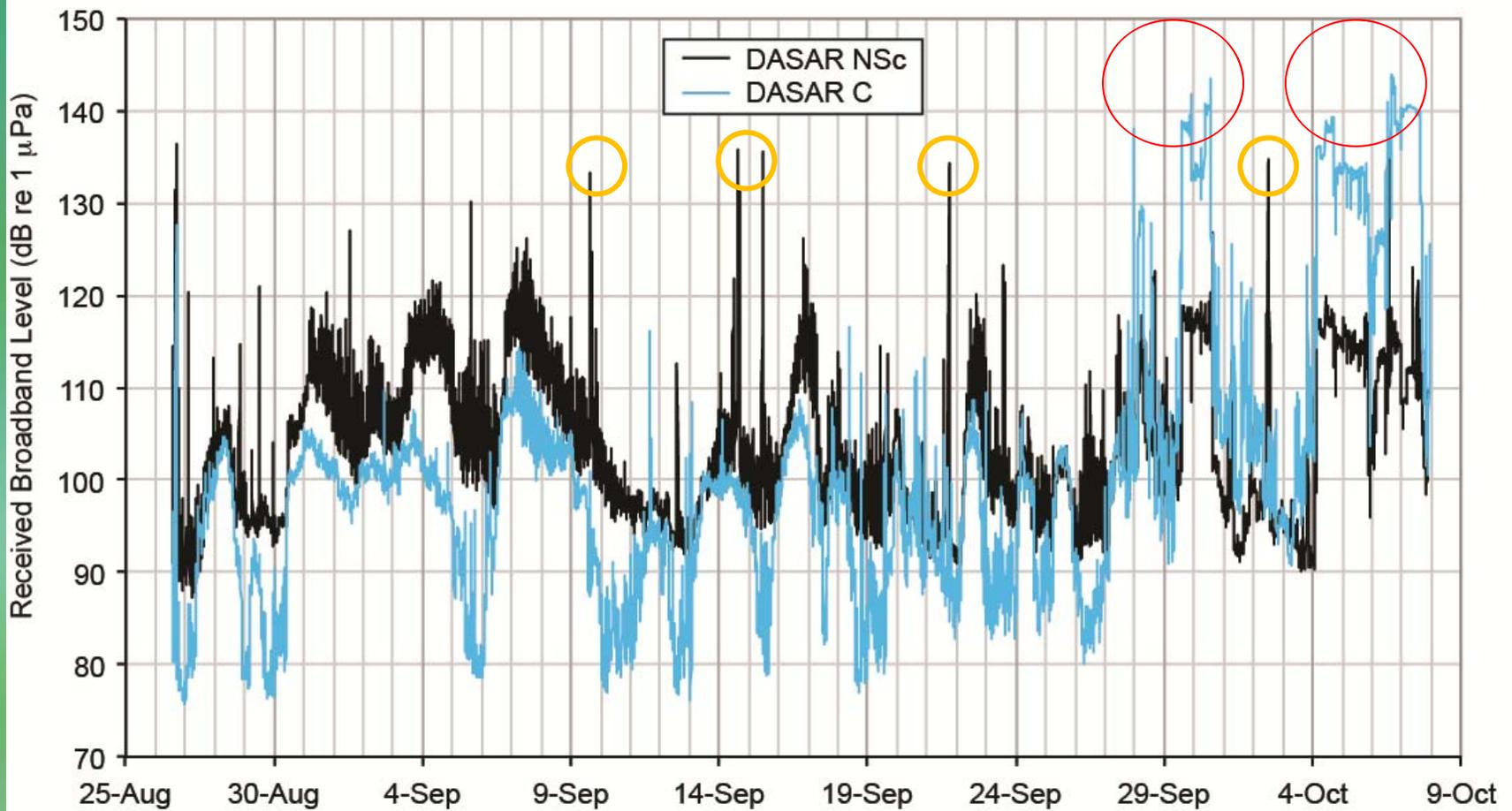
Fewer “vessel peaks” than in recent years?

Northstar Acoustics 2012



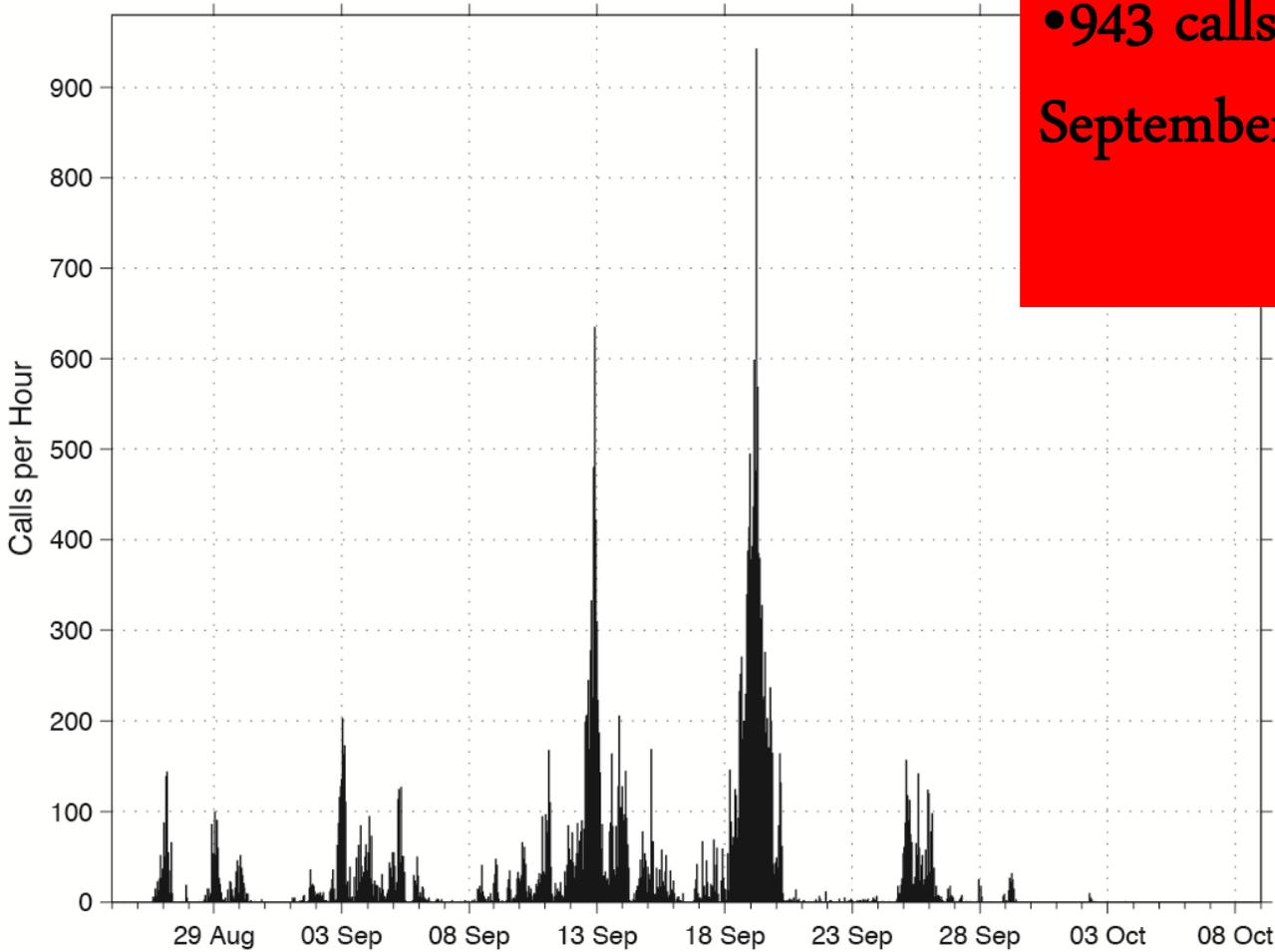
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
	EB	C	C	C	C	C						
Max	122.4	135.4	124.5	126.8	138.4	122.9	131.5	130.9	133.1	124.6	112.6	144.0
95 th %ile	108.5	107.7	104.1	103.9	110.8	108.4	108.8	108.6	107.4	111.8	105.5	135.2
50 th %ile	95.5	95.2	96.5	93.1	103.1	95.4	100.4	97.0	96.0	102.7	96.6	99.0
5 th %ile	85.2	81.1	80.2	81.1	87.2	81.8	79.2	80.2	79.6	87.3	76.1	80.4
Min	78.9	77.6	74.9	79.1	82.5	76.8	75.9	74.9	74.6	77.1	74.3	75.6
Range	43.5	57.8	49.6	47.8	55.9	46.1	55.6	56.0	58.5	47.5	38.4	68.4

Northstar Acoustics 2012





Northstar Bowhead Call data 2012



•31,200 calls
•943 calls per hour on 19
September

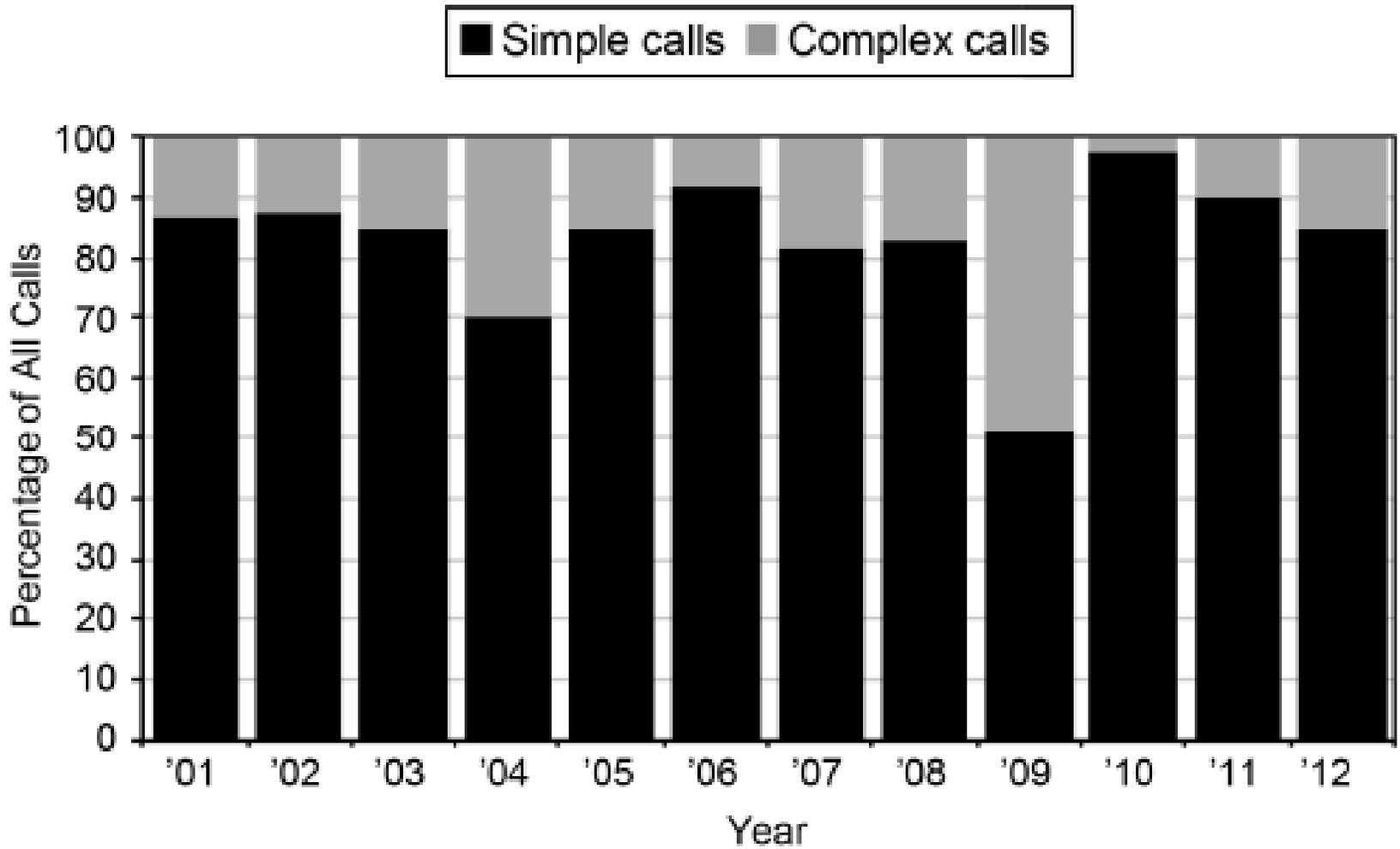


Northstar Bowhead Call data 2012

Year	Total calls detected at C/EB	Length of DASAR recording season (days)	Mean # calls detected per day
2001 (EB)	1624	25	65
2002 (EB)	4317	24	180
2003 (EB)	21,726	30	724
2004 (EB)	26,546	27	989
2005 (EB)	951	29	33
2006 (EBa)	331	18	18
2007 (EBa)	9076	36	250
2008 (C)	39,550	30	1337
2009 (C)	6859	33	205
2010 (C)	340	28	12
2011 (C)	14,440	34	424
2012 (C)	14,246	42	336

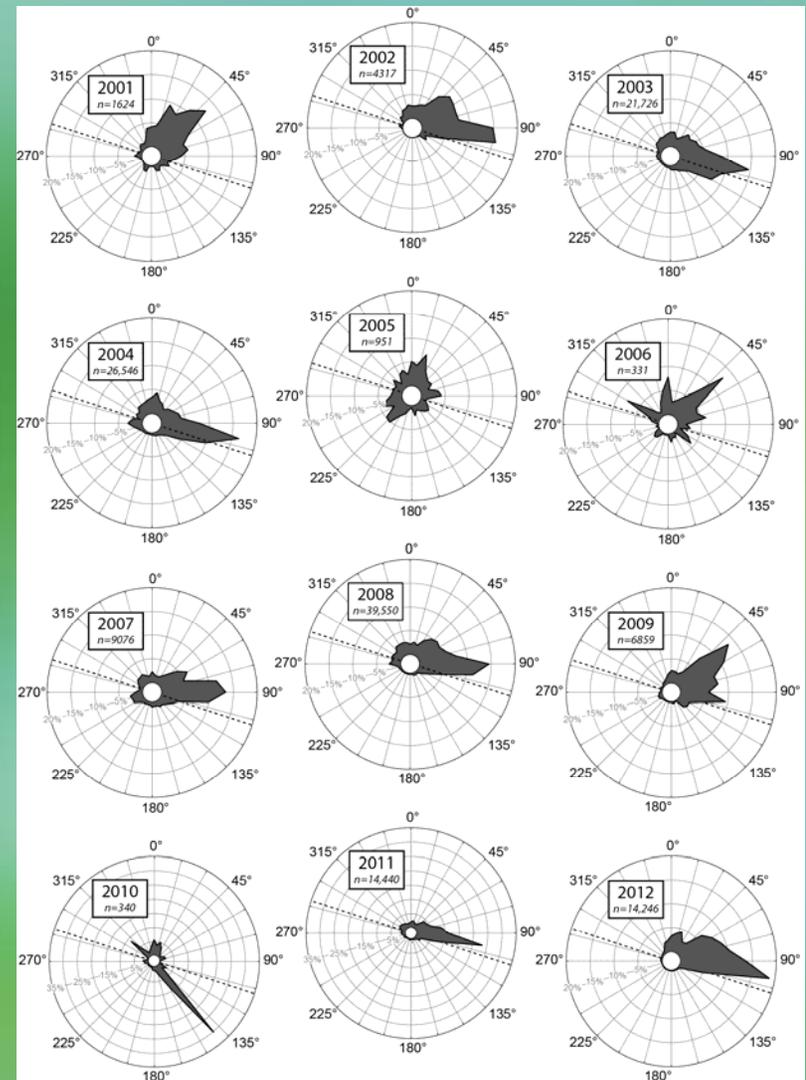
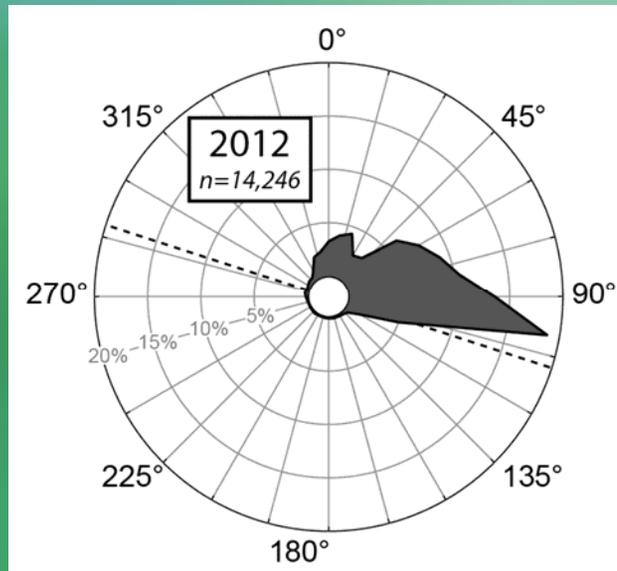


Northstar Bowhead Call data 2012





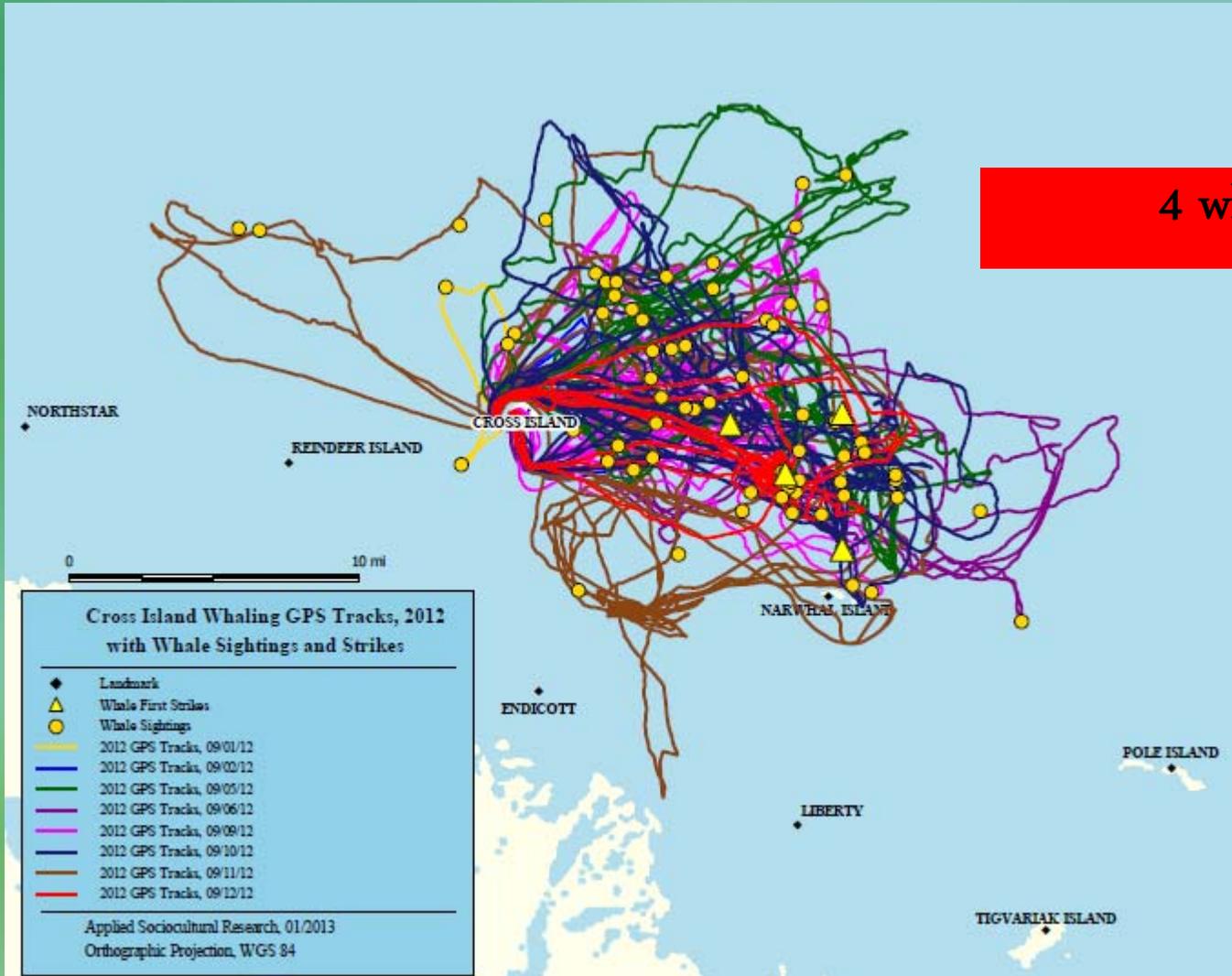
Northstar Bowhead Call data 2012



Call directionality?

Blackwell et al. 2012. Directionality of bowhead whale calls measured with multiple sensors. *Mar. Mamm. Sci.* 28(1): 200-2012.

Cross Island Hunt 2012



4 whales landed

2013 Plans



- Hope to receive LoA for Northstar
- Ongoing monitoring
- Hope to retrieve overwintered recorder
- Consider possible processing of overwintered recorder
- 2013 hunt
- Hope to submit second deflection paper
- Hope to submit summary acoustics paper
- Hope to submit cumulative effects paper
- Look at call distribution patterns?



Summary 2012 (review)

- 14^{th(+)} year of Northstar
- ongoing reservoir depletion
- typical activities
- typical sound levels (plus vessel)
- typical seal counts
- typical bowhead call count
- successful hunt

Any
questions?

