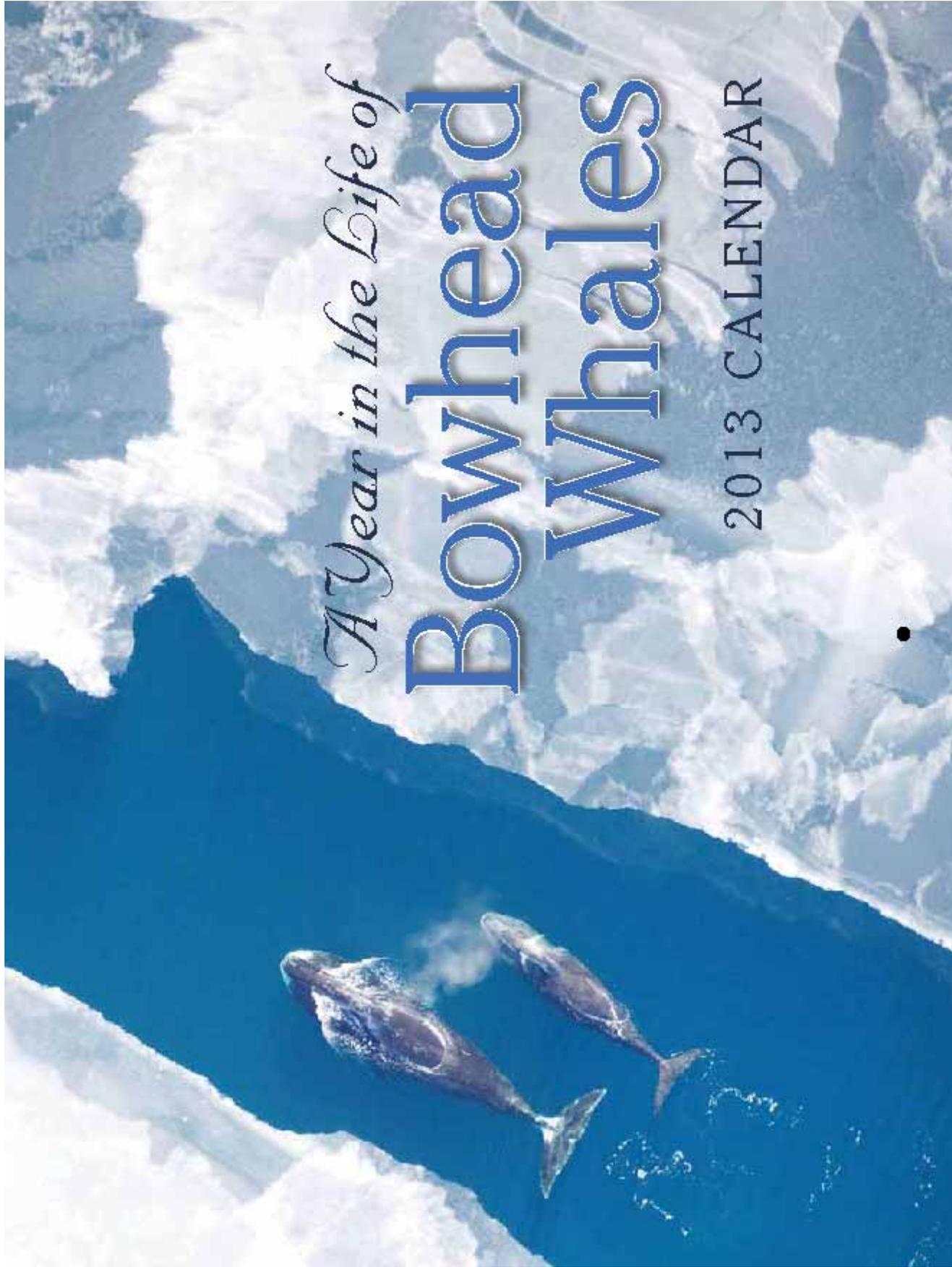


*A Year in the Life of*

# Bowhead Whales

2013 CALENDAR

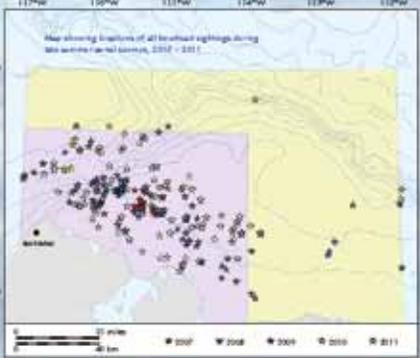




### Tracking bowhead whales from airplanes



The Nova Scotia aircraft, with 83 jet engines mounted under the NOAA Twin Otter's belly pan.



Map showing locations of all bowhead sightings during the entire aerial survey, 2007 - 2011.

Aerial surveys can be used to describe changes in the timing and locations of bowhead whales. In addition, aerial photography provides information on how long individual whales stay in an area and on the sizes of whales.

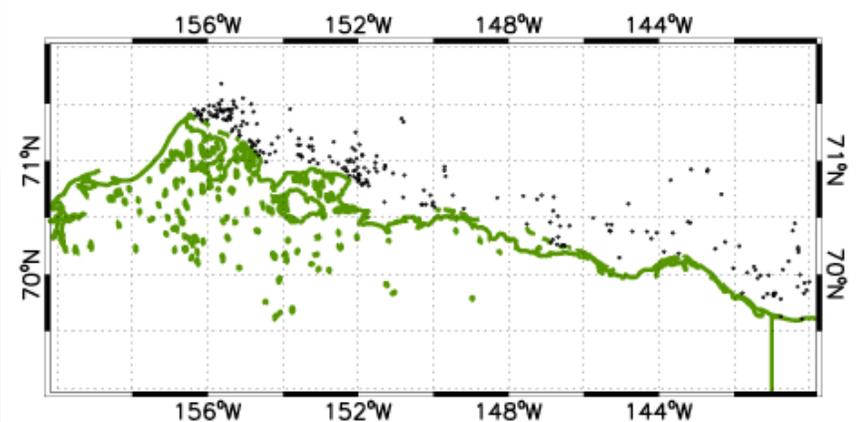
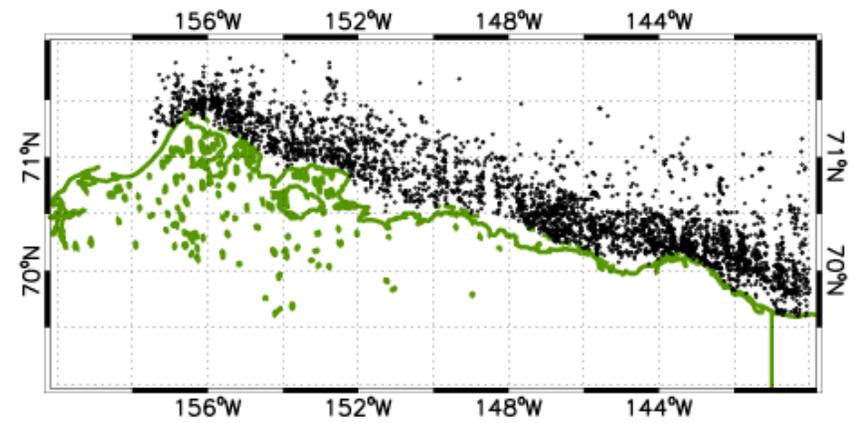
Bowhead whale behavior is also observed by the aerial survey team. Often, bowheads are seen feeding, based on mud on the body, open mouths, and the presence of feces. However, the most commonly observed whale behavior near Barrow is hauling.



### February | Siqĩññaasugruk 2013

SUN	MON	TUE	WED	THU	FRI	SAT
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

*A Year in the Life of* **Bowhead Whales**



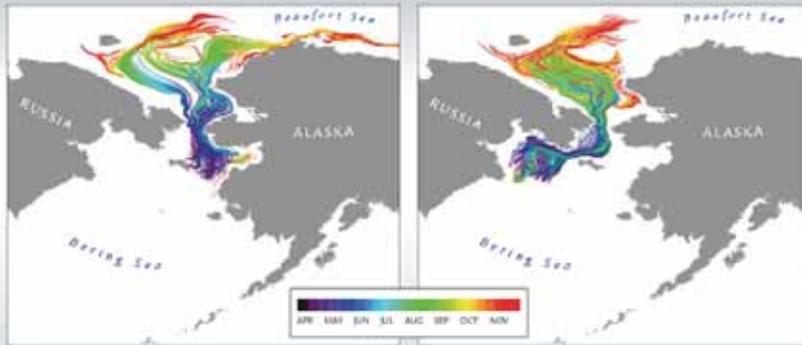
[www.afsc.noaa.gov/nmml/personnel/nmmlprofile.php?name=Julie.Mocklin](http://www.afsc.noaa.gov/nmml/personnel/nmmlprofile.php?name=Julie.Mocklin)

[www.afsc.noaa.gov/nmml/](http://www.afsc.noaa.gov/nmml/)

[www.alaska.boemre.gov/ess/bwasp/xbwasp.htm](http://www.alaska.boemre.gov/ess/bwasp/xbwasp.htm)



### Bowhead food in the Beaufort Sea: Alaska grown



Computer studies of ocean currents show how food might be carried from their spawning grounds in the Bering Sea to the Beaufort Sea. The map on the left shows that some of the kelp spawning in April near Alaska could arrive at Barrow in time for bowhead whales to feed on them during September and October. The map on the right shows that kelp spawning in April near Russia are not likely to arrive at Barrow by September and October.

Компьютерные исследования океанских течений показывают, как пища может быть доставлена из районов нереста в Беринговом море к Барроу. Карта слева показывает, что часть водорослей, произрастающих в апреле у берегов Аляски, может прибыть в Барроу вовремя, чтобы киты могли ими питаться в сентябре и октябре. Карта справа показывает, что водоросли, произрастающие в апреле у берегов России, вряд ли успеют прибыть в Барроу к сентябрю и октябрю.

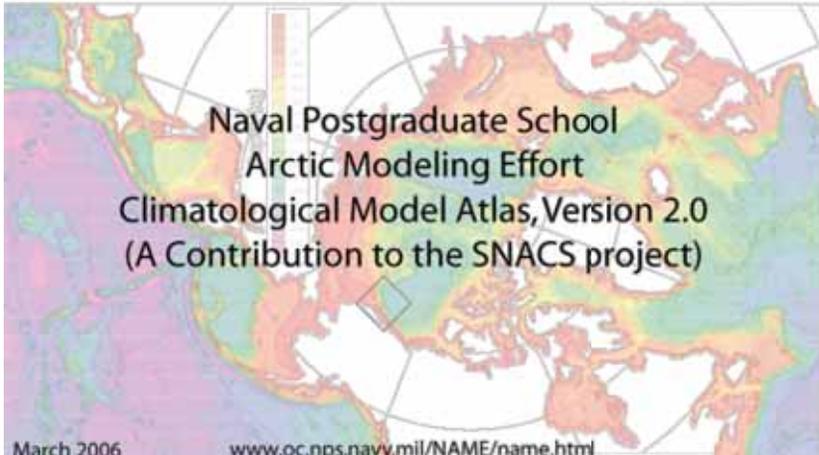
### April | Qargilliigvik 2018

SUN	MON	TUE	WED	THU	FRI	SAT
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

*A Year in the Life of* **Bowhead Whales**



Naval Postgraduate School  
Arctic Modeling Effort  
Climatological Model Atlas, Version 2.0  
(A Contribution to the SNACS project)



March 2006 [www.oc.nps.navy.mil/NAME/name.html](http://www.oc.nps.navy.mil/NAME/name.html)



[www.oc.nps.edu/NAME/name.html](http://www.oc.nps.edu/NAME/name.html)

[psc.apl.washington.edu/wordpress/research/projects/arctic-sea-ice-volume-anomaly/](http://psc.apl.washington.edu/wordpress/research/projects/arctic-sea-ice-volume-anomaly/)

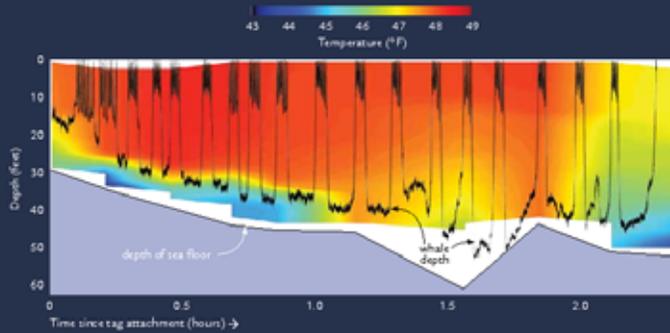
[data.aos.org/maps/arctic\\_assets/](http://data.aos.org/maps/arctic_assets/)







## "Tags" help us observe whale feeding behavior



Short term tagging is a common way to study whale feeding behavior. A tag is attached to a whale for periods of a few hours while scientists follow the whale's movements and sample the ocean many times along the whale's path to measure temperature, salinity, and the amount of food available to the whale. Once detached from the whale, the tag can be recovered and dive information recorded by the tag can be analyzed. The plot above shows an example of a bowhead whale tagged north of Barrow that is searching for food in the cool water near the sea floor (the black line indicates the whale's depth and the color background indicates the temperature of the water).



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## August | Amigiksivik 2013

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

*A Year in the Life of* **Bowhead Whales**



Photo: Mark Baumgartner

[www.whoi.edu/sbl/liteSite.do?litesiteid=5252](http://www.whoi.edu/sbl/liteSite.do?litesiteid=5252)



### Copepods and krill – tiny prey for massive whales



A krill, and krill filling the stomach of a whale harvested near Barrow.



A copepod, and copepods filling the stomach of a whale harvested near the Alaska/Canada border.

Euphausiid or krill are close relatives of shrimp and look similar. They are born in the Bering Sea in spring and are brought to Alaska's northern coast by ocean currents, arriving at Barrow in the fall as juveniles and adults, in time for migrating bowhead to eat them. Juvenile and adult krill are a little less than an inch long. Many whales harvested near Barrow are found with krill in their stomachs. Few krill survive the trip in the currents from Barrow to Kaktovik, so whales in eastern Alaska and in Canada are rarely found with krill in their stomachs.

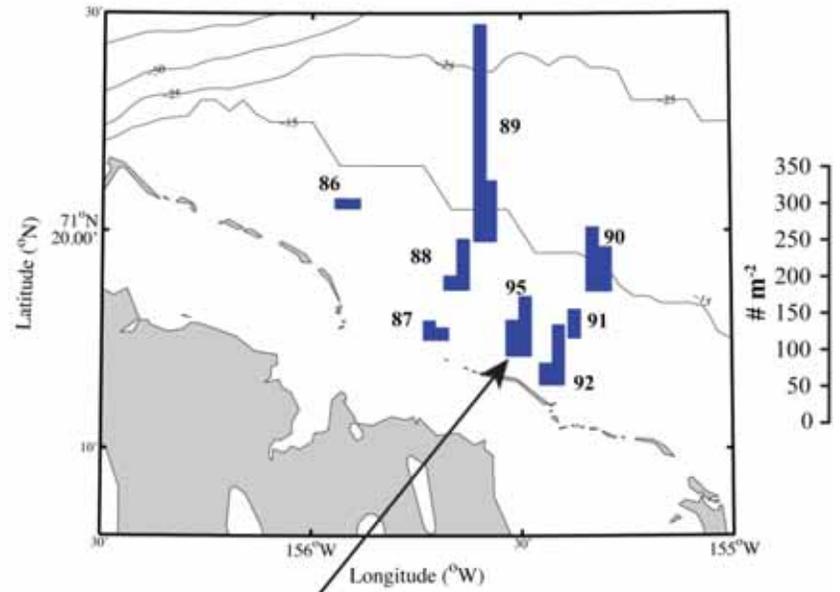
Copepods are the most abundant animals in the sea. Bowhead whales feed on large copepods the size of a grain of rice. Copepods spend the summer feeding and building up fat, and are a high-energy, high-calorie food. Bowhead whales eat copepods along Alaska's north coast and in the whales' summering grounds in the Canadian Arctic. Whales harvested at both Barrow and Kaktovik may have copepods in their stomachs.

October | Sikkuvik 2013

SUN	MON	TUE	WED	THU	FRI	SAT
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

A Year in the Life of **Bowhead Whales**

September 11, 2010- Total Water Column Abundance of Krill



Surface Feeding Bowhead Whales

[www.whoi.edu/science/B/people/cashjian/](http://www.whoi.edu/science/B/people/cashjian/)

[www.whoi.edu/more.go?username=palatalo](http://www.whoi.edu/more.go?username=palatalo)

[www.gso.uri.edu/users/campbell](http://www.gso.uri.edu/users/campbell)





# *A Year in the Life of* Bowhead Whales

This calendar illustrates aspects of the life history of bowhead whales. It incorporates traditional knowledge and contemporary research from many individuals representing a variety of institutions, agencies, and organizations.

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**Dixon Jones**  
UNIVERSITY OF ALASKA FAIRBANKS

**Phil Alatalo**  
WOODS HOLE OCEANOGRAPHIC INSTITUTION

**Carin Ashjian**  
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**Mark Baumgartner**  
WOODS HOLE OCEANOGRAPHIC INSTITUTION

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**Jaelyn Clement-Kinney**  
NAVAL POSTGRADUATE SCHOOL

**Robert G. Campbell**  
UNIVERSITY OF RHODE ISLAND

**John Citta**  
ALASKA DEPARTMENT OF FISH AND GAME

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NORTH SLOPE BOULDER DEPT. WILDLIFE

**Kim Goetz**  
NATIONAL MARINE MAMMAL LABORATORY

**Lara Horstmann-Dehn**  
UNIVERSITY OF ALASKA FAIRBANKS

**Wieslaw Maslowski**  
NAVAL POSTGRADUATE SCHOOL

**Julie Mocklin**  
NATIONAL MARINE MAMMAL LABORATORY

**Dave Rugh**  
NATIONAL MARINE MAMMAL LABORATORY

**Lori Quakenbush**  
ALASKA DEPARTMENT OF FISH AND GAME

**Kate Stafford**  
UNIVERSITY OF WASHINGTON

**Linda Kate Brattstrom**  
NATIONAL MARINE MAMMAL LABORATORY

Special thanks to Billy Adams, Nok Acker, Lewis Brower, Michael Donovan III, Bill Kopplin, Charles Monnett, Sue Moore, Scott Oyagak, Glenn Sheehan, Michael Stotts, Edith Suvlu and Bryan Thomas.

**FRONT COVER** Whale photo by Julie Madden, NOAA/AFSC/NMML, Permit No. 782-1719. **JANUARY** Whale photo by Julie Madden, NOAA/AFSC/NMML, Permit No. 782-1719. **FEBRUARY** Ring photo by Kate Stafford, Applied Physics Laboratory, University of Washington. Triple crown photo by Dave Rugh, NOAA/AFSC/NMML. Whale bycatch photo by Matt Scaer, NOAA/AFSC/NMML, Permit No. 14243. **MARCH** Whale eye and spine photo by Craig George. Whale photo by Julie Madden, NOAA/AFSC/NMML, Permit No. 782-1719. **APRIL** M/C whale photo by Matt Scaer, NOAA/AFSC/NMML, Permit No. 14243. **MAY** Whale from internet photo by photo by Kate Stafford, Applied Physics Laboratory, University of Washington. Bowhead in cage photo by Matt Scaer, NOAA/AFSC/NMML, Permit No. 14243. **JUNE** Ice on whale photo by Matt Scaer, NOAA/AFSC/NMML, Permit No. 782-1719. Ice on whale photo by BOAIES Treadwell survey team, NOAA/AFSC/NMML, Permit No. 14243. Big bowhead photo by Julie Madden, NOAA/AFSC/NMML, Permit No. 782-1719. **JULY** Calveid photo by Cole Giffman (LRI). Bowhead photo by Amelia Brower, NOAA/AFSC/NMML, Permit No. 14243. **AUGUST** Whale cage photo by Mark Baumgartner. Whale photo by Amelia Brower, NOAA/AFSC/NMML, Permit No. 782-1719. **SEPTEMBER** Whale photo by Julie Madden, NOAA/AFSC/NMML, Permit No. 782-1719. **OCTOBER** Kill and a pup photo by Cole Giffman (LRI). Whale combed photo by Craig George. Whale photo by Julie Madden, NOAA/AFSC/NMML, Permit No. 782-1719. **NOVEMBER** Whale combed photo by Craig George. Whale photo by BOAIES Treadwell survey team, NOAA/AFSC/NMML, Permit No. 782-1719. **DECEMBER** Hydrophobic photo by Kate Stafford, Applied Physics Laboratory, University of Washington. Whale photo by Amelia Brower, NOAA/AFSC/NMML, Permit No. 14243. **BACK COVER** Ring photo by Julie Madden, NOAA/AFSC/NMML, Permit No. 782-1719.

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Thanks to Rachel Reier (UAF) for producing this MCD15 illustration.

