

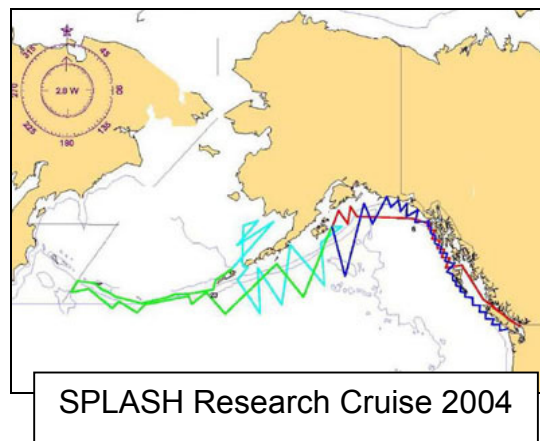
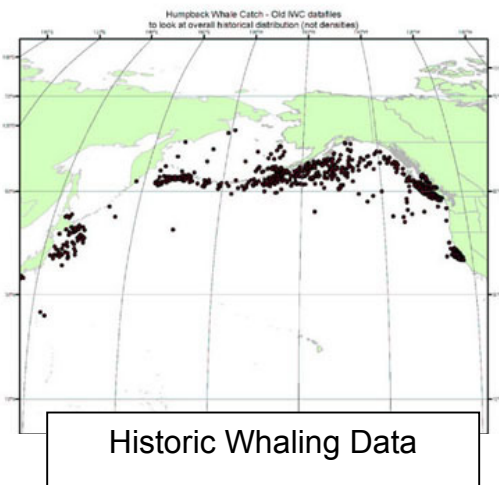
Humpbacks in the Gulf of Alaska: Line Transect Survey

How will SPLASH Biologists estimate the abundance of humpbacks in the Gulf of Alaska?

While four months at sea may seem like ample time for this job, we have a lot of ocean to cover! It is simply impossible for the *McArthur II* to cover every inch of the Gulf of Alaska; therefore, SPLASH biologists will use a method known as a “line-transect survey” to make the most of their time in this area. In the line-transect survey, SPLASH will sample portions of the region by zig-zagging back and forth along pre-determined lines, also known as “track-lines.” As the *McArthur II* continues along its path, the scientists will be divided into teams also known as “watches,” and will take turns scanning the horizon for humpbacks.

While conducting their line transect survey, SPLASH scientists will use a tool known as “Big-Eye” binoculars to survey the area to the port (left) and starboard (right) sides of the ship. The Big-Eye binoculars are large (as long as your outstretched arm) and powerful, magnifying an image 25 times its normal size. On a clear day, SPLASH observers using Big Eye binoculars can see up to 5 miles on either side of the ship.

So how will the SPLASH team determine their path? In planning their research track-lines, the SPLASH team first consulted historical whaling data. The diagram on the left reflects records from whaling ship logs and plots the number of humpbacks captured by whalers in various areas. The diagram on the right outlines the proposed “legs” of the cruise, represented by the zig-zagging lines on the chart.



Discussion Questions:

Based on historic whaling data, would you describe the humpbacks distribution as even or clustered?

How do the SPLASH track-lines reflect the historic whaling data?

In addition to humpback sightings, what meteorological and oceanographic data should be recorded?

Figure 1: SPLASH Line Transect Data (Leg 1)

(See reverse for annotated map of the Gulf of Alaska and chart explaining Beaufort Scale)

Date	General Location	Starting Position	Average Beaufort	(#) Humpbacks Photographed
6/29/04	BC Offshore	N 48°28.74 W 124°36.03	3.2	10
6/30/04	BC Offshore	N 49°01.46 W 126°13.76	4.9	2
7/1/04	BC Offshore	N 49°55.09 W 128°04.84	3.9	5
7/2/04	BC Offshore	N 50°44.02 W 128°55.83	2.7	4
7/3/04	BC Offshore	N 51°36.19 W 130°45.38	1.5	12
7/4/04	BC Offshore	N 52°07.34 W 131°55.17	2.0	19
7/5/04	BC Offshore	N 53°10.87 W 133°04.18	2.0	4
7/6/04	SE Alaska	N 54°37.54 W 132°53.50	4.6	4
7/7/04	SE Alaska	N 56°19.43 W 134°28.14	1.9	51
7/8/04	SE Alaska	N 57°56.10 W 136°48.25	1.9	10
7/9/04	Yakutat	N 58°01.76 W 126°50.11	1.7	39
7/10/04	Yakutat	N 58°03.12 W 138°49.44	2.1	32
7/11/04	Yakutat	N 58°34.54 W 138°35.10	3.2	1
7/12/04	Yakutat	N 59°32.53 W 140°02.05	3.3	0
7/13/04	Yakutat	N 59°06.00 W 140°45.35	1.0	0
7/14/04	Yakutat	N 59°06.00 W 142°28.60	2.8	1
7/15/04	Prince William Sound	N 59°17.17 W 143°52.94	1.3	4
7/16/04	Prince William Sound	N 58°08.86 W 145°06.20	2.8	7
7/17/04	Prince William Sound	N 59°52.73 W 146°49.01	3.6	0
7/18/04	Prince William Sound	N 56°51.67 W 147°59.26	3.6	1
7/19/04	Kodiak	N 54°15.87 W 149°02.04	3.4	5
7/20/04	Kodiak	N 54°31.17 W 150.16.30	2.0	5
7/21/04	Kodiak	N 55.31.81 W 152°10.39	4.6	4
7/22/04	Kodiak	N 56°07.27 W 154°48.06	2.5	16
7/23/04	Kodiak	N 56°24.24 W 153°11.51	2.0	73
7/24/04	Kodiak	N 56°42.73 W 151°46.34	3.4	54
7/25/05	Kodiak	N 58°32.10 W 151°30.34	5.7	1

Discussion Questions:

What was the total number of humpbacks seen by SPLASH biologists during the first “leg”?

What was the average number of humpbacks seen per day?

Which regions had the highest densities of humpbacks? Which had the lowest?

What factors might impact the number of humpbacks seen by the SPLASH team on a given day?

Figure 2: Annotated Map of The Gulf of Alaska

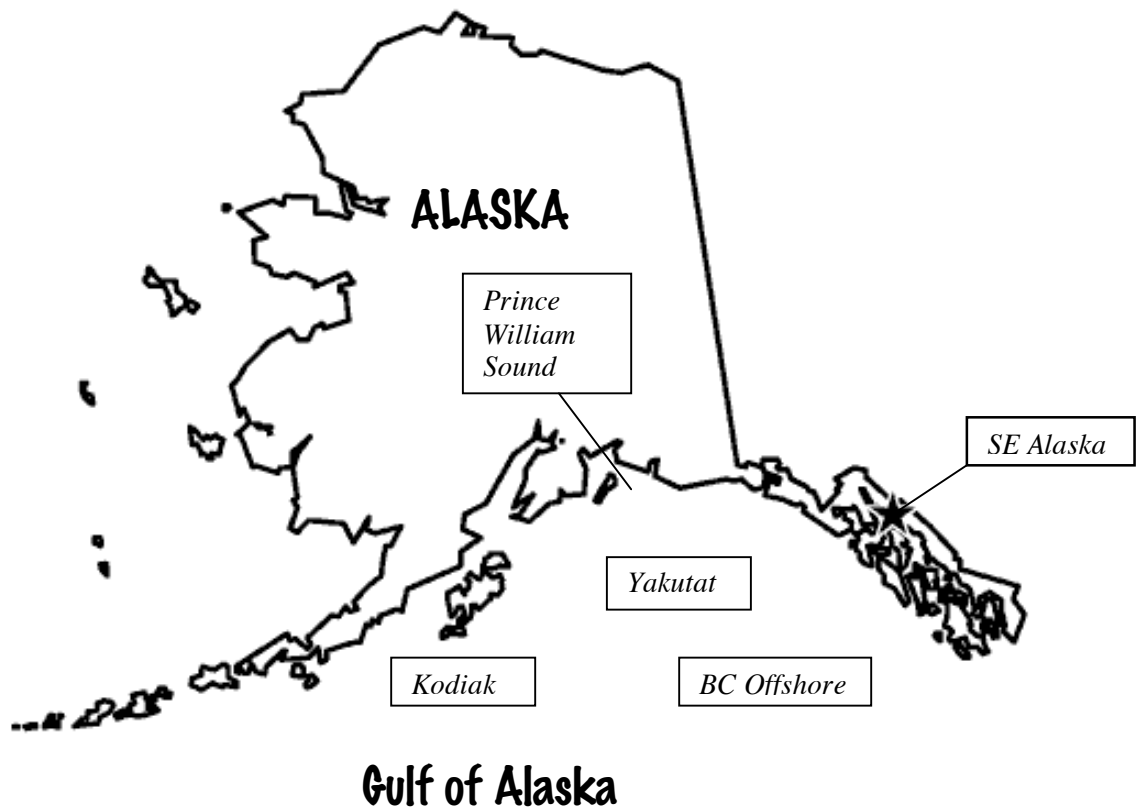


Figure 3: Explanation of Beaufort Scale

(Adapted from NOAA “Beaufort Wind Scale--<http://spc.noaa.gov/faq/tornado/beaufort.html>)

Beaufort Force	Wind Conditions	Sea Conditions
1	calm	smooth & mirror-like
2	light breeze	small wavelets
3	gentle breeze	large wavelets
4	moderate breeze	small waves (1-4 ft.)
5	fresh breeze	moderate waves (4-8 ft.)
6	strong breeze	larger waves (8-13 ft.)
7	near gale	seas “heap up” (13-16 ft.)
8	gale	foaming waves (17-20 ft.)
9	strong gale	high rolling waves (20 ft.)
10	storm	very high waves 20-30 ft.
11	violent storm	very high waves 30-45 ft.
12	hurricane	very high waves >45 ft.