Lesson 2: Tracking Albatross Migrations

Name: _____ **Date:** _____

Engage

Throughout history, humans have explored and observed their world. An important skill for ocean exploration is to know where you are located on a map, often with no visible landmarks. For instance, skilled wayfinders, called hoʻokele in Hawaiʻi, use their studies of the stars, sun, ocean swells, and other observations of nature to travel tremendous distances in double-hulled canoes. Technological methods used on sailboats, cruise ships and research vessels include sending and receiving signals from satellites orbiting the Earth and using this electronic information to calculate ones position on the globe.

Scientists also rely on satellite technology to learn about animals that travel too fast and too far to be followed by boat or plane.

Polynesian voyaging canoe Hōkūleʻa during a 2004 voyage to the Northwestern Hawaiian Islands.
Photo: Naʻalehu Anthony

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1. Describe 2–3 examples of technological tools and how they have allowed humans to learn something new. These tools might be new, or ones from the past.

Just like the tools you have described, biologists have used new technological tools to learn about seabirds such as albatross. Technology is very important to science. Technological tools allow scientists to collect and process data. People who design solutions to problems are called **engineers**. Engineers design everything from computers to transmitters, chairs to rocket ships.

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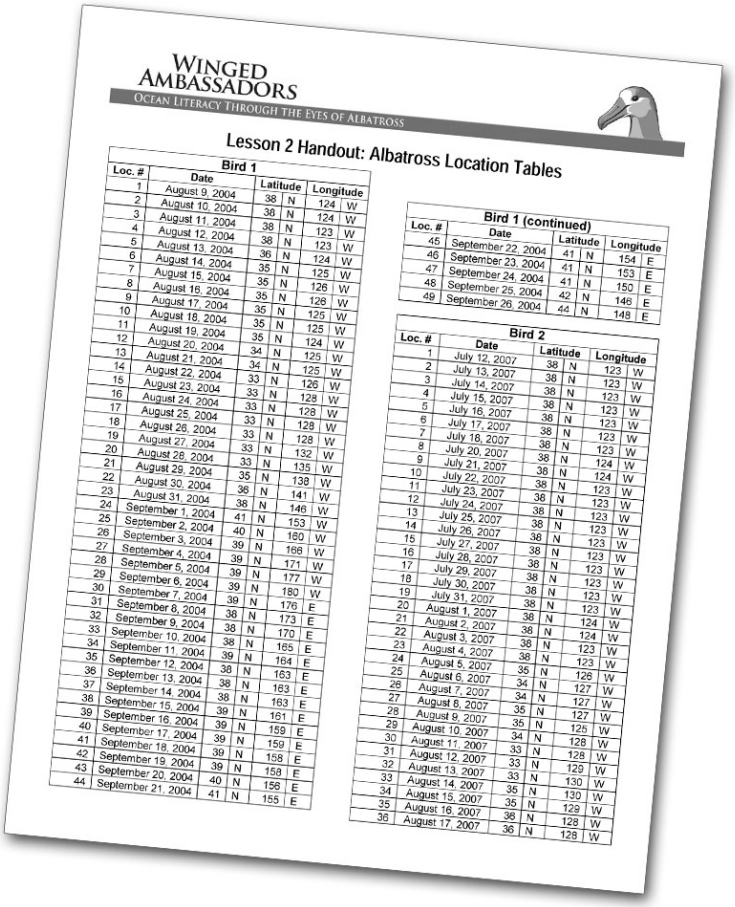
Explore

It is very interesting to analyze albatross movements. These birds spend time looking for food, **foraging,** for themselves and their chicks. You will be given a data sheet with the latitude and longitude of a series of points, which represent the *actual* locations of where an albatross was observed by a satellite. The place where the bird was tagged, the *release point,* and the gender are indicated at the top of your data sheet. Keep in mind that the bird did not necessarily land on the water and stop at the location. The latitude and longitude coordinates were communicated from the bird's transmitter to the satellite.

Use the handout ***Albatross Locations*** provided by your teacher.

- Plot the points on the map on the next page.
- Double check you work.
- Now, connect your points to create a track.
- Once you have completed your track, answer the questions that follow.



WINGED AMBASSADORS

OCEAN LITERACY THROUGH THE EYES OF ALBATROSS

Lesson 2 Handout: Albatross Location Tables

Bird 1

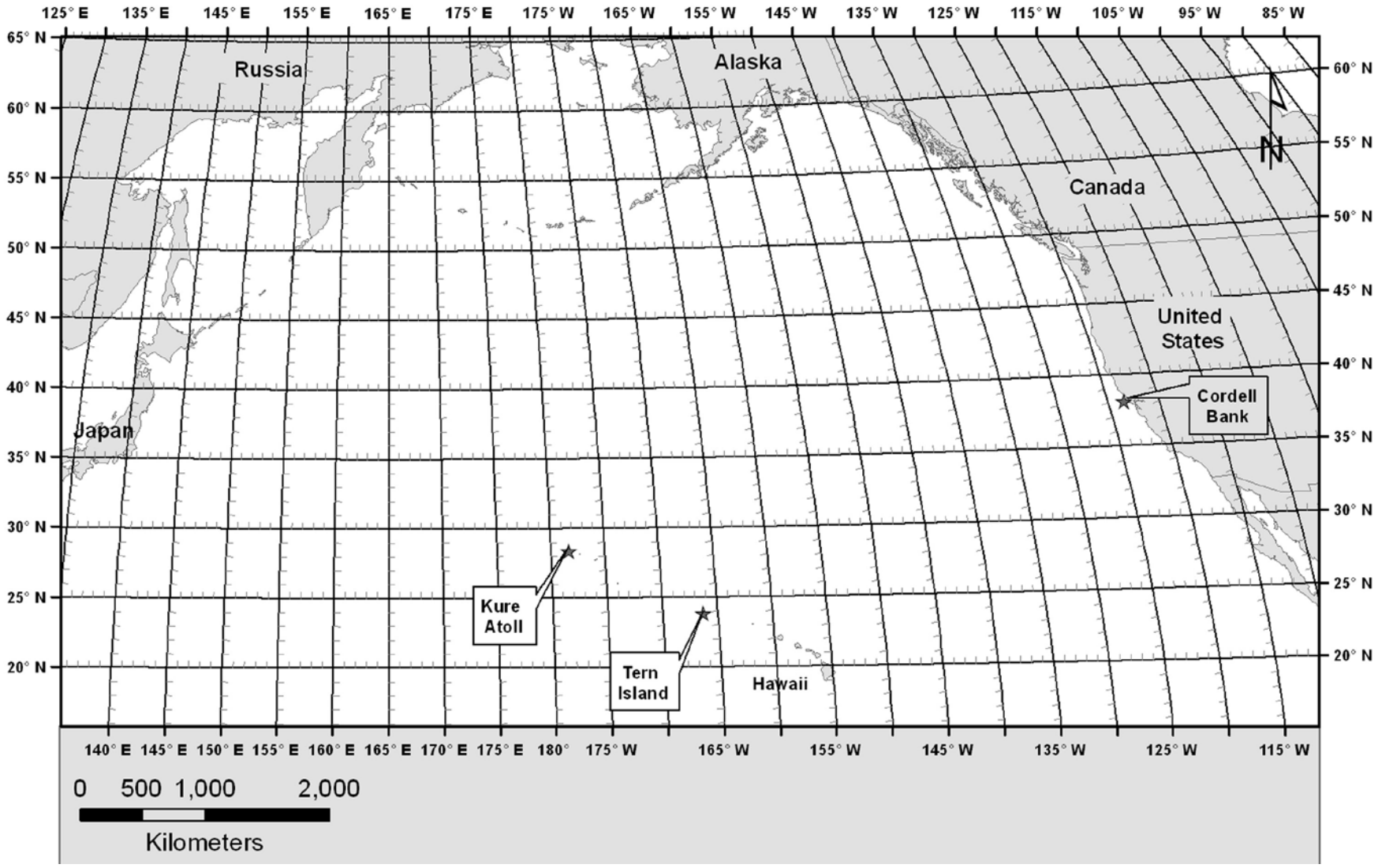
Loc. #	Date	Latitude		Longitude	
1	August 9, 2004	38	N	124	W
2	August 10, 2004	38	N	124	W
3	August 11, 2004	38	N	124	W
4	August 12, 2004	38	N	123	W
5	August 13, 2004	38	N	123	W
6	August 14, 2004	36	N	124	W
7	August 15, 2004	35	N	125	W
8	August 16, 2004	35	N	126	W
9	August 17, 2004	35	N	126	W
10	August 18, 2004	35	N	125	W
11	August 19, 2004	35	N	125	W
12	August 20, 2004	35	N	124	W
13	August 21, 2004	34	N	125	W
14	August 22, 2004	34	N	125	W
15	August 23, 2004	33	N	126	W
16	August 24, 2004	33	N	128	W
17	August 25, 2004	33	N	128	W
18	August 26, 2004	33	N	128	W
19	August 27, 2004	33	N	128	W
20	August 28, 2004	33	N	132	W
21	August 29, 2004	33	N	135	W
22	August 30, 2004	35	N	138	W
23	August 31, 2004	36	N	141	W
24	September 1, 2004	38	N	146	W
25	September 2, 2004	41	N	153	W
26	September 3, 2004	40	N	160	W
27	September 4, 2004	39	N	168	W
28	September 5, 2004	39	N	171	W
29	September 6, 2004	39	N	177	W
30	September 7, 2004	39	N	180	W
31	September 8, 2004	39	N	176	E
32	September 9, 2004	38	N	173	E
33	September 10, 2004	38	N	170	E
34	September 11, 2004	38	N	165	E
35	September 12, 2004	39	N	164	E
36	September 13, 2004	38	N	163	E
37	September 14, 2004	38	N	163	E
38	September 15, 2004	38	N	163	E
39	September 16, 2004	39	N	161	E
40	September 17, 2004	39	N	159	E
41	September 18, 2004	39	N	159	E
42	September 19, 2004	39	N	158	E
43	September 20, 2004	39	N	158	E
44	September 21, 2004	40	N	156	E
45	September 22, 2004	41	N	155	E

Bird 1 (continued)

Loc. #	Date	Latitude		Longitude	
46	September 23, 2004	41	N	154	E
47	September 24, 2004	41	N	153	E
48	September 25, 2004	41	N	150	E
49	September 26, 2004	42	N	146	E
		44	N	148	E

Bird 2

Loc. #	Date	Latitude		Longitude	
1	July 12, 2007	38	N	123	W
2	July 13, 2007	38	N	123	W
3	July 14, 2007	38	N	123	W
4	July 15, 2007	38	N	123	W
5	July 16, 2007	38	N	123	W
6	July 17, 2007	36	N	123	W
7	July 18, 2007	38	N	123	W
8	July 20, 2007	38	N	123	W
9	July 21, 2007	38	N	124	W
10	July 22, 2007	38	N	124	W
11	July 23, 2007	38	N	123	W
12	July 24, 2007	38	N	123	W
13	July 25, 2007	38	N	123	W
14	July 26, 2007	38	N	123	W
15	July 27, 2007	38	N	123	W
16	July 28, 2007	38	N	123	W
17	July 29, 2007	38	N	123	W
18	July 30, 2007	38	N	123	W
19	July 31, 2007	38	N	123	W
20	August 1, 2007	38	N	123	W
21	August 2, 2007	38	N	124	W
22	August 3, 2007	38	N	124	W
23	August 4, 2007	38	N	123	W
24	August 5, 2007	38	N	123	W
25	August 6, 2007	35	N	126	W
26	August 7, 2007	34	N	127	W
27	August 8, 2007	34	N	127	W
28	August 9, 2007	35	N	127	W
29	August 10, 2007	35	N	125	W
30	August 11, 2007	34	N	128	W
31	August 12, 2007	33	N	128	W
32	August 13, 2007	33	N	129	W
33	August 14, 2007	33	N	130	W
34	August 15, 2007	35	N	130	W
35	August 16, 2007	35	N	129	W
36	August 17, 2007	36	N	128	W


125° E
135° E
145° E
155° E
165° E
175° E
175° W
165° W
155° W
145° W
135° W
125° W
115° W
105° W
95° W
85° W
65° N
60° N
55° N
50° N
45° N
40° N
35° N
30° N
25° N
20° N
Russia
Alaska
Canada
United States
Japan
Cordell Bank
Kure Atoll
Tern Island
Hawaii
N
140° E
145° E
150° E
155° E
160° E
165° E
170° E
175° E
180°
175° W
165° W
155° W
145° W
135° W
125° W
115° W
0 500 1,000 2,000
Kilometers

Name: _____ **Date:** _____

2. Using the scale on your map, estimate how far your bird traveled.

3. Based on how many days the bird traveled, how many kilometers did the bird fly per day?

Explain

Now, compare your plot with those of the other students in your group.

4. Other than the release point, are there certain areas that several birds seem to travel to? Describe those areas below and/or circle them on your map.

4a. Why do you think that several birds might be traveling to the same area(s)?

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5. What are some differences between your track and your classmates' tracks?

_____

_____

_____

6. Which birds do you think were looking for food for their chicks? Why?

_____

_____

_____

7. What else would you want to know about these birds and their movements? Write at least two scientific questions that you have based on the tracks you have observed.

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_____

_____

_____

Elaborate

Read the following passage.

Satellite tagging has been a great technological tool for scientists to study the movements of animals such as the albatross. Like with any technology, there are benefits as well as costs to using satellite tags. Costs do not refer just to money. They include negative impacts and problems associated with them.

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For instance, a benefit of driving a car is that it allows us to quickly and conveniently travel from place to place. A cost is that cars release pollutants into the air.

In the case of the albatross tagging, the **transmitters**, or tags, are very small. They are attached to feathers on the bird's back with sticky tape. The tags are not believed to change the birds' behaviors. The tags send signals to satellites orbiting round the Earth. The satellites send the location to scientists. In a way, the birds all email (text!) the scientists their locations.

After 2-3 months, the tags fall off the albatross. This can happen when the birds molt, or lose and replace their feathers, or just when the tape wears out. Unfortunately, tags can also fail for unknown reasons or because the batteries die. These tags are expensive, so it is disappointing when scientists do not get the data they need.

8. Describe at least two *benefits* and two *costs* of using satellite technology to track albatross.

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_____

_____

_____

_____

_____

Evaluate

Using the data provided on the handout ***Pink-footed Shearwater Locations,*** plot locations of the tracked Pink-footed Shearwater.

a. Make two observations about your plot.
b. Write two scientific questions related to your plot.
c. Make one prediction about why you think the bird made the movements that it did.
d. Give one reason why scientists use satellite tags to follow the movements of seabirds.

This shearwater nests in Chile where it is called *Fardela*.