Lesson 2: Tracking Albatross Migrations

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 ho‘okele in Hawai‘i, 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 one's 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 Hōkūle‘a during a 2004 voyage to the Northwestern Hawaiian Islands. Photo: Na‘alehu Anthony
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.

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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.
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.
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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)?
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.

**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.
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.