ANALYZING OCEAN TRACKS

Investigating Marine Migrations in a Changing Ocean

TEACHER GUIDE

The student investigations from the first pilot have been rewritten to be more engaging, shorter, less text dense, and informal. They are designed to get students working with the data very quickly and keep the context and purpose for what they are doing clear. Each module focuses around a challenge for students to investigate and answer. The role of conservation and human impacts on the marine environment is also highlighted throughout to give students the broader context for this type of scientific work.

Goals for the Learning Modules

- Learn science by being scientists
- Utilize scientific practices such as:
  - Asking questions
  - Analyzing and interpreting data
  - Supporting claims with evidence
- Provide a Challenge with appropriate scaffolding

Module Sequence

1. Introduction to Ocean Tracks
2. Prey Maps
3. Biological Hotspots
4. Human Impacts
5. Conservation Strategy

Components of the Teacher Guide

Each module begins with an overview of what students will be doing, how many class sessions should be spent, and the key goals for the module. In addition, the Next Generation Science Standards core concepts and scientific practices that are addressed in each module are provided.

In the Implementation Suggestions section, there are recommendations for incorporating the Ocean Tracks modules into your classroom, including support for developing student scientific practices. All students should work in pairs/groups and talk through their thinking so it can be recorded for research purposes. Prompts for class discussions are provided, as well as relevant assessment opportunities and additional activities you might carry out with your class.

Connections to Ocean Literacy Standards

#5 The ocean supports a great diversity of life and ecosystems.

- Ocean biology provides many unique examples of life cycles, adaptations, and important relationships among organisms (symbiosis, predator-prey dynamics, and energy transfer) that do not occur on land.
- The ocean is three-dimensional, offering vast living space and diverse habitats from the surface through the water column to the seafloor. Most of the living space on Earth is in the ocean
- Ocean habitats are defined by environmental factors. Due to interactions of abiotic factors such as salinity, temperature, oxygen, pH, light, nutrients, pressure, substrate and circulation, ocean life is not evenly distributed temporally or specially, i.e. it is "patchy". Some regions of the ocean support more abundant life than anywhere on Earth, while much of the ocean is considered a desert.

#7 The ocean is largely unexplored.

- The ocean is the last and largest unexplored place on Earth-less than 5% of it has been explored. It is the great frontier for the next generation's explorers and researchers, where they will find great opportunities for inquiry and investigation.
- New technologies, sensors and tools are expanding our ability to explore the ocean. Ocean scientists are relying more and more on satellites, drifters, buoys, subsea observatories and unmanned submersibles.

Questioning

There are opportunities for students to develop their own questions throughout and students should be encouraged to record their questions as they happen. Feel free to add a couple of class sessions for students to investigate and research their own questions.

Use of Scientific Explanation/Argumentation in Ocean Tracks

During the Ocean Tracks modules we want students to engage in practices that have students thinking and acting like scientists. We want students to understand that developing scientific knowledge is a process that involves the collaboration of people engaged in discussion and debate. In order to communicate effectively in these situations, we want students to be able to develop and justify their own claims using the data from the Ocean Tracks interface. In the revised modules, we have incorporated more time for students to collaborate and share ideas, and provide rationale for their conclusions to simulate what occurs within the science community when different explanations are compared.

In order to communicate these ideas clearly, we ask that students follow the outline of providing a claim, their evidence and then their reasoning.

The **claim** is the conclusion the student came to that addresses the research question.

The **evidenc**e is scientific data that the student used to arrive at their claim. The scientific data that supports the claim. For our ocean tracks work, potential data sources might include the dates of tracks, the chlorophyll concentration, the curviness of a track, the depth at which an animal travels, and results of literary research. To be considered evidence, the data needs to be relevant to the problem so that it helps supports the claim. In addition, to adequately support the claim, there needs to be enough data to convince others. This usually means providing multiple pieces of data. For Ocean Tracks, this might be using curviness data, depth data, and chlorophyll concentrations as evidence to show where an elephant seal might be feeding.

The **reasoning** is a logical justification that explains why the data works as evidence to support the claim. Here students would elaborate on why they chose the data points they chose and how that data supports their claim. In addition, in the reasoning there should be a connection to the significance of the claim by including appropriate scientific principles. It is here that a student could explore the greater implications of the data and the real world relevancy of the claim. For example, in Ocean Tracks this might mean in addition to finding the location of a biological hotspot, a student might also discuss relevant scientific concepts such as primary production and upwelling that contribute to the formation of that hot spot.

Throughout the modules, students are asked to develop their scientific explanations but initially this is done so in a very guided way. In the first module, students are prompted with very specific questions to state a claim and provide evidence. In the second module, again students are asked some specific questions to help them formulate their claim and are given prompts so that they use appropriate data sources to support their claim. But in the second module, the question being asked is a more challenging question to answer, making the formation of the claim more challenging than it was in the first module. Also in the second module, students are asked to provide reasoning for the first time, but this is also done with the support of prompting questions. In the third and fourth modules, the prompting for developing a scientific explanation is less specific and more generalized. This means that students need to think back to the types of evidence they utilized in the first and second modules and apply those skills to these later tasks. In the final module, the challenge question is the broadest question yet for students to address and their claim will have multiple components. Again, students will need to apply the skills that they have gained throughout their work on the Ocean Tracks modules to select the best pieces of evidence and adequately support the claim.

Module 1: Introduction to Ocean Tracks

Overview

In this introductory module, groups of students become familiar with the Ocean Tracks interface by exploring tracks of their assigned species to find the individual that has traveled the furthest and the fastest. Student groups then come together to compare their results and identify the "champion" species and individual. As a group, the class holds a discussion about the adaptations that enable species to travel long distances in the ocean.

Timeframe

2–3 class sessions

Module Goals

This module gets students deeply into the data right away by viewing all the tracks from a single species. They gain practice displaying the tracks and using the track tools to find discrete pieces of information. Students will also learn key concepts in animal physiology and behavior during their library research. Through comparisons between groups, students will gain experience comparing measurements and making a case for their claims (my animal is the fastest!) with the measurements they have collected.

Next Generation Science Standards

- LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations

NGSS Disciplinary Core Idea

- LS4.C Adaptation

Scientific Practices

- Making observations of the animal tracks
- Taking measurements and recording data in a table
- Repeating measurements and observations to build support for a claim
- Comparing measurements
- Developing a claim that is based on your measurements/evidence
- Engaging in arguments from your evidence
- Collaborating with your peers

Implementation Suggestions

- Watch the TOPP introduction video and Ocean Tracks tutorials before beginning this module.
- Students should work in groups, each assigned to one of the four Ocean Tracks species: great white shark, bluefin tuna, laysan albatross, and elephant seal.

- Use the directions slide (slide #6) to emphasize to students that the document provides them with prompts to help them gather the information they need and also serves as a template for them to record and document their work. They should add to the document by including screen shots of maps, their observations, measurements, charts/graphs, and the results of their research.
- Encourage students to include as many additional slides as necessary to complete each task. The slides they create will be used to generate their final product at the end of the module.
- It is important that students are aware that these tracks are only a snapshot in the life of these animals. The distance travelled by the animal over the course of a track is a reflection of how long the tag was on the animal, not a reflection of how far the animal travels over the course of its entire life. Animals that were tagged over longer time periods will have longer duration tracks than animals that were tagged for shorter time periods, which will influence the student's conclusions about the champion distance traveler. This idea should be the focus of the class discussion surrounding the second question above.
- During track animation, the date appears in the top right hand corner of the screen. If the student selects multiple tracks to animate, they will animate in chronological order. This means that tracks occurring at the same time will animate simultaneously, but tracks occurring in different years will animate separately and in sequence. If a student selects to animate a track in 2005 and a track in 2007, nothing will appear to happen during the time period between the two tracks.
- A few notes about depth:
    a. The depth measurement represents the maximum daily dive depth. Students may misinterpret this data as though the animal never goes to the surface, when that is not actually the case.
    b. Depth data are not available for all of the tracks on the Ocean Tracks interface. Albatross remain at the surface, so their depth will always be zero. For some of the other tracks, such as those of white sharks and Bluefin tuna, depth data have not yet been added to the interface and depth appears as 0. It is important for students to distinguish between instances when there is no depth data (as for white sharks) and where depth is actually zero (as for albatross). The library provides information about the average depths of each animal's dive.
    c. Depth appears as a negative number to represent the distance below the surface of the water. Students may be confused when selecting the maximum depth, which will be the most negative number.

PROMPTS & DISCUSSIONS

1. In this module, students will be making claims and using evidence for the first time, but with the support of very specific prompting. At this point, it would be helpful to point out the terms claim and evidence and identify examples of each
2. As a class it might be helpful to create a table with the results of each groups' research so that the champion traveler (for both distance and speed) can be determined
3. At the end of this module, you might pose questions such as the following to guide a class discussion:

- Did the same individual travel the farthest distance and have the highest distance travelled per day?
- Why is it important to consider the length of time when comparing total distances between tracks?

ADDITIONAL ACTIVITIES

- Watch Shark Week episode *Jaws Comes Home* (see notes at the end of Teacher Guide)
- Learning about tuna physiology experiments at the Tuna Research and Conservation Centre (TRCC - https://www.youtube.com/watch?v=Uw13qOnDVLE)
- Seal bradycardia experiment

Module 2: Prey Maps

OVERVIEW

In this module, students generate a map showing the locations of elephant seal prey in the Pacific Ocean. They begin the activity by researching basic ecological concepts, and constructing a basic food web for elephant seals. They then inspect and collect measurements of elephant seal tracks to gather evidence for where elephant seals might be feeding. Then, students inspect the chlorophyll data, and combine this information with the measurements they took of the tracks to generate a map of where elephant seal prey are likely located. Because the location of elephant seal prey varies over time with changing ocean conditions, students focus on drawing this map using data from August 2004. They will also take measurements of track characteristics in July 2004 for comparison of the elephant seal's behavior during these two months. Students finish by discussing the importance of generating such maps, and thinking about additional ways in which they would conduct research to determine the locations of prey species.

TIMEFRAME

2–3 class sessions

MODULE GOALS

This module can be used to teach students basic ecological concepts relating to trophic interactions, food webs, populations, communities, ecosystems, etc. Learning these basic concepts is necessary for students to draw linkages between the chlorophyll layer (indicating primary production in the surface of the ocean) and elephant seals. Students gain more practice taking measurements of tracks, and begin using and thinking deeply about the data overlays. A focus of this lesson is also for students to think about how the curviness measurement is calculated, and what it can tell us about the animal's behavior.

NEXT GENERATION SCIENCE STANDARDS

- LS2-4 Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem

NGSS Core Idea

- LS2.B Cycles of matter and energy transfer in ecosystems

SCIENTIFIC PRACTICES

- Making observations, taking measurements, and recording data
- Finding relationships between variables
- Analyze and visualize data through multiple means
- Comparing measurements
- Developing a claim that is based on your measurements/evidence
- Engaging in arguments from your evidence

- Collaborating with your peers

Implementation Suggestions

- Students can create the food web either in the presentation or on paper depending on which format they are more comfortable with
- This module has more vocabulary terms associated with it than other modules. It would be helpful to do formative assessment (a quick word game, a check-in quiz, etc.) to assess the students' understanding of these terms
- During this module, students are asked to provide reasoning for their claim. Be sure to clarify at this point, the different components of a scientific explanation (claim, evidence and reasoning) and see if students can create definitions of each to display in the classroom as a reference
- One possibility for the sharing out at the end of this module is for students to hang their prey maps around the room and for there to be a grazing period when students study the maps of different groups. During that time students are asked to look for similarities and differences in the prey maps. This would then lead to a class discussion exploring the variation in the claims of each group and why that variation may or may not exist. During this time students would have to explain more about their map and how they reached their conclusion. The class as a whole would then decide which map has the most convincing evidence to support it

Prompts and Discussions

At the end of this module, you might pose questions such as the following to guide a class discussion:

- If you were a scientist conducting this kind of research on prey species, what additional information or steps would you take to gather more evidence to support your claim of where the prey are located?
- Why might this kind of information (having a prey map) be important? What is the purpose of compiling this kind of information?
- Did you notice any differences in the locations of hotspots for individual species? What might account for these differences?

Possible Points of Confusion and Clarification

- The idea is for students to identify that prey are likely to be found where chlorophyll concentrations are high, and where elephant seal tracks reflect feeding behavior (high curviness).
- It is important that students overlay the chlorophyll layer from the appropriate month (July or August 2004). This can be achieved by selecting the year and month in the track tools menu, or by clicking a track point in July or August 2004.

Additional Activities

- Learning about the Sea Lion Mass Mortality Event 2013
- See **For Further Investigation: Is the Elephant Seal Male or Female?** at the end of this Teacher Guide.

Module 3: Biological Hotspots

Overview

In this module, students are challenged with determining where diversity hotspots are located in the Pacific Ocean and also what species use them. They use the hotspot tool in the Ocean Tracks interface to identify areas with high data density. Students are asked why they think that particular area is a hotspot and what the animals are doing there. Students work in groups and present their findings to the rest of the class to choose a final common diversity hotspot to then investigate *why* that location is a hotspot.

Timeframe

2–3 class sessions

Module Goals

This is where students begin looking for interactions and relationships between different individuals and species in the Pacific Ocean. Students will need to think about how the term "hotspot" is defined, and decide on the amount of evidence that is needed for them to designate a particular area of the ocean as a hotspot. A key component of this module will be facilitating student's inspection of data overlays, and thinking about the characteristics of productive ocean habitat.

Next Generation Science Standards

- LS2-2 Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales

NGSS Disciplinary Core Idea

- LS2-B Ecosystem Dynamics, Functioning and Resilience

Scientific Practices

- Take measurements, record data and find relationships between variables
- Analyze and visualize data through multiple means
- Construct explanations from the data
- Select data that best supports the claim
- Consider multiple variables when looking for patterns and explanations

Implementation Suggestions

- During this module the scientific explanations that students are writing are more challenging and students are given less prompting. It might be helpful at this point to use a few examples of student work to model a complete, logical and evidence based scientific explanation. Since students have been collaborating in groups, now might be a good time to give an informal assessment to determine individual understanding of claim, evidence and reasoning. For students that are still struggling with the communication of their ideas, pull them together in a small group and provide them with more direct instruction on developing their explanations.

- If you notice that some groups need additional guidance during data collection, you can have them complete the following steps:
  1. Select one animal that spends time in the hotspot
  2. Use the time selector to choose the portion of the track where the animal is lingering in the hotspot
  3. Examine the SST, chlorophyll or bathymetry overlay/map for any month within the selected time period
  4. Select a location on the map that is outside of your habitat hotspot. Examine the SST, Chlorophyll or bathymetry outside of the hotspot that your group identified

- It is important to clarify the difference between diversity hotspots and species hotspots. A species hotspot will not necessarily also be a diversity hotspot. Differences in the location of species and diversity hotspots can reflect interesting differences between species and the habitats that they use.
- The coloring of hotspots by the hotspot tool is automatically scaled to the number of tracks that are selected. That is, the track density resulting in a bright red color when one set of tracks is displayed will not necessarily be the track density that will result in a bright red color when a different set of tracks displayed. The track densities resulting in red and green colors are set by the maximum and minimum track densities of only the tracks that are selected when the hotspot tool is activated.

PROMPTS AND DISCUSSIONS

At the end of Challenge #1, you might pose questions such as the following to guide a class discussion:

- When identifying the location of your hotspot, you used a unique, quantitative tool to measure the track density. If you didn't have that tool available to you, how would you have determined where the diversity hotspot was located?
- Do you think you would have reached a similar conclusion if you didn't have the hotspot tool?
- What might be some advantages for using the hotspot tool in place of a more qualitative approach?

At the end of Challenge #2, you might pose questions such as the following to guide a class discussion:

- Would you expect the diversity hotspot that you agreed on as a class to be in the same location all of the time?
- Do you think this hotspot existed in the same location 10 or 50 years ago? Do you think it will be the same in 10 or 50 years?
- What might influence changes in the location of the hotspot?

ADDITIONAL ACTIVITIES

This module has students considering some complex factors that create the diversity hotspots in the Pacific Basin. Ocean properties such as temperature, salinity and density, bathymetry, wind, and currents all contribute to the creation of these diverse areas. Given that there is so much for students to consider, it might be helpful to do some quick demonstrations of some of these ocean properties. A short lab illustrating the process of cold and dense water masses sinking and the upwelling that follows might be helpful to aid the students' understanding of these oceanographic processes.

Module 4: Human Impacts

Overview

Using the hotspot tool, students will identify an area of the ocean that is heavily used by marine species (or they will use their findings from Module 3: Biological Hotspots). They will then inspect the human impacts data overlay to identify how heavily impacted their hotspot area is by humans. Students will go deeper into the information to identify the key activities that may harm marine species in the hotspot. This will require them to learn more about the human impacts index and how it was created, as well as conduct research in the library and in outside sources.

Timeframe

1 class session

Module Goals

The focus of this module is for students to develop an understanding of the impacts humans have on the marine environment. A critical element for them is also to learn more about the human impacts data layer, how it is generated, and how to interpret it. Students will have the opportunity to do outside research to learn more about particular topics they are interested in.

Next Generation Science Standards

- ESS3-6 Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity

NGSS Disciplinary Core Idea

- ESS2.D: Weather and Climate
- ESS3.D: Global Climate Change

Scientific Practices

- Take measurements, record data and find relationships between variables
- Analyze and visualize data through multiple means
- Construct explanations from the data

Implementation Suggestions

If you think your students will struggle to understand how and why human impact maps are created, you might review the NCEAS site together as a class.

Prompts and Discussions

At the end of this module, you might pose questions such as the following to guide a class discussion:

- What other types of information would be helpful to determine the types of human activities that impact animals in your biodiversity hotspot?
- What is the importance of learning about the potential impacts that human activity can have on these species?

ADDITIONAL ACTIVITIES

Online albatross bolus dissection to inspect for the present of plastics
http://education.nationalgeographic.com/education/activity/laysan-albatross-virtual-bolus-dissection/

Explore the issues of plastic pollution and the Pacific Garbage Patches, through the use of articles, videos and the NOAA marine debris website.

- http://marinedebris.noaa.gov/info/patch.html#5
- http://response.restoration.noaa.gov/about/media/how-big-great-pacific-garbage-patch-science-vs-myth.html

Consider possible solutions to the Garbage Patches by viewing these TED talks:

- http://www.ted.com/talks/dianna_cohen_tough_truths_about_plastic_pollution.html
- http://www.youtube.com/watch?v=ROW9F-c0kIQ

Module 5: Conservation Strategy

Overview

In this culminating module, students will gather all of the pieces of information they have collected during their time using the Ocean Tracks interface, and design a mobile sanctuary to protect marine species. This will require them to think critically about how animals use the ocean habitat, and what characterizes productive areas of ocean at different times of the year. They will present their findings to their classmates.

Timeframe

2–3 class sessions

Module Goals

This module will require students to synthesize their knowledge of the data, and various concepts in marine conservation. They will develop a conservation plan, which they will present to their classmates with supporting data as rationale for their decisions. By this point, students should be comfortable supporting claims with evidence, and synthesizing multiple types of data and information.

Next Generation Science Standards

- LS2-7 Design, evaluate and refine a solution for reducing the impacts of human activities on the environment and biodiversity
- ESS3-3 Create a computational simulation to illustrate the relationships among management of natural resources the sustainability of human populations and biodiversity

NGSS Disciplinary Core Idea

- ESS3.C Human Impacts on Earth Systems

Scientific Practices

- Considering multiple variables when looking for patterns and explanations
- Collaborating with peers
- Considering scale when answering questions
- Recognizing the limitations of data
- Relating data to previous experiences and other outside contexts
- Developing claims based on evidence
- Engaging in arguments from evidence

Implementation Suggestions

When students are posed with the question, "What are some important things to consider when designing a marine protected area?" students might make suggestions such as the following:

- Are there people that rely on these marine resources to live?

- Stakeholder input and support: commercial users, subsistence users, recreational users, government, scientists, non-profit environmental groups, concerned citizens
- Cost and practicality of implementation and management should weigh in when deciding reserve area, how it is protected, whether the area is protected all the time or only part of the time.
- How valuable is this site ecologically - is it a priority for protection with limited resources available?
- How does MPA establishment affect the cultural and tourism value of an area?

PROMPTS AND DISCUSSIONS

When students are supporting their claim with evidence, you might pose questions such as the following:

- Which species use this area of the ocean?
- Is there evidence that this area is a hotspot? If so, use your maps and data to support this.
- When do marine species use this particular area?
- What are they doing in this area of the ocean?
- Use your measurements of the track (e.g. date, curviness, speed) to support your statement
- Are there certain oceanographic characteristics that you think make this area important for marine life (e.g. higher chlorophyll, area of upwelling)?
- If so, use specific measurements to support your statement.
- What are the human impacts that are the greatest threat to marine life in the area you wish to protect?
- Do these activities impact marine species throughout the year, or only during certain times?
- Is there anything else that you think makes this area important?

At the end of this module, you might pose questions such as the following to guide a class discussion:

- Do you think existing conservation strategies will be effective in the future as ocean climate changes?
- What improvements do you think should be made to the current design of MPAs to improve their effectiveness as the ocean environment changes in the future?

ADDITIONAL ACTIVITIES

Prior to working on the module, students could view Sylvia Earle's Ted Talk, My Wish for the Ocean (http://www.youtube.com/watch?V=43dulcbfxoy 18 minutes) In the video, Sylvia Earle describes the need for increasing the number of marine protected areas in the ocean.

For Further Investigation:
Is the Elephant Seal Male or Female?

Overview

Students are first asked to do some research in the library to identify the characteristics that distinguish male and female elephant seals. Students are then asked to link these characteristics to pieces of data they could collect from the track. They are then asked to collect pieces of data to make a case for the sex of the elephant seal. The teacher facilitates a debate between students about their findings.

Timeframe

2 class sessions

Module Goals

Here, students begin by doing some library research on elephant seals. Based on this information, students begin making some independent decisions about what pieces of information would be required to make their claim about the sex of the elephant seal. They then carry out this research plan, and engage in a debate with their colleagues about their results. This module will also aim to get students thinking about how the shape of the track reflects the animal's behavior, and that this behavior is linked to characteristics of the ocean environment.

Next Generation Science Standards

- LS2-8 Evaluate the evidence for the role of group behavior on individual and species chances to survive and reproduce

Scientific Practices

- Make both qualitative and quantitative observations
- Take measurements, record data and find relationships between variables
- Construct explanations from the data
- Select data that best supports the claim
- Determine what measurements need to be taken to answer research questions

Implementation Suggestions

This activity will require some careful facilitation by teachers so that students are encouraged to go beyond answers they find on Google to carefully inspecting the track and data overlays.

Prompts and Discussions

Prior to investigating:

- What observations will you need to record?
- What measurements will you take?
- What additional questions do you have and how will you answer those questions?

If students need prompting for ideas:

- What are the dates associated with this track?
- When is the animal onshore and when is it offshore?
- When is the seal traveling?
- What are the characteristics (speed, depth, curviness) associated with these portions of the track?
- What is the seal doing when it is out to sea and lingering in certain areas?
- What is special about these areas?
- What are the characteristics associated with these portions of the track?
- What is the seal doing during the two onshore portions of the track? What are the characteristics associated with these portions of the track?

FURTHER PLANNING IDEAS FOR SUPPLEMENTAL ACTIVITIES

Class Discussion for *Jaws Comes Home*

Goals:

- For students to have an engaging introduction to how animals in the ocean are studied
- To gain an understanding that there is a lot we don't know about animals that live in the ocean

1. Watch the episode from Shark Week Season 6, Episode 2, *Jaws Comes Home*, 44 minutes *http://www.amazon.com/Jaws-Comes-Home/dp/B005FFUSV6*

2. As students watch the movie, ask them to take notes regarding the following questions:
   - How do marine biologists study migratory ocean animals?
   - What questions do scientists have about Great White Sharks in the Atlantic?
   - What has caused the population fluctuations of white sharks?
   - What questions do YOU have about white sharks?

3. Review the students' responses as a class.

Learning about the Sea Lion Mass Mortality Event 2013

1. Explore the issue with students:
- Watch video footage:
  - http://www.youtube.com/watch?v=Xma_BoAG1P4
- Look at the data: http://www.nmfs.noaa.gov/pr/health/mmume/californiasealions2013.htm

2. Have students answer the following questions:
- Describe what is happening to the sea lions.
- What are some of the different hypotheses to explain the mortality event?

3. Whole class discussion:
- Sea lions are different species from the elephant seals that you have been studying through Ocean Tracks. What are some similarities and differences between these animals?
- How could animal tracking data help scientists study these unexplained deaths?
- How could having a prey map for the sea lion, like the one you just created for the elephant seal, help scientists who are investigating the sea lion deaths?