Hatch a Tag

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Summary

Much of the data available to students wanting to understand marine biology requires understanding why, where and how animals are observed. This lesson will serve to create this baseline and introduce students to real datasets. Students will discuss what data they would want to get from animals in the wild. They will work as groups to design a tag, and how to attach it to an animal (considering ethics - i.e., nothing an average person wouldn't do to their body or clothing, and external attachment that falls off at some point). Next they will test their engineering and investigate what data real world scientists gather.

Tags - seabirds, tagging, data collection

Key Concepts

- Engineering concepts of tagging animals
- Flight paths of seabirds
- Correlations with global fishing vessels or human impacts

Objectives

Include clear, measurable statements of what students will be able to do, such as:

- Explore data collection on albatross behavior
- Explain what tag data can be collected from the albatross
- Design and develop a tag to attach to albatross
- Collect data from movement of the albatross
- Compare their data collected to the data of scientists
- Demonstrate understanding through Claims, Evidence, Reasoning write up

Materials

- Expendable stuffed animal for attachment of "tag" alternately, make origami birds.
- Classroom materials (popsicle sticks, string, glue, clay, small paper cups, scissor, tape, or any other materials you have available for construction/connection of the tag)
- One small object per team- a quarter or similar item to use as their transmitter package of the tag to attach to the albatross.
- Powerpoints Spanish or English
- Optional -
    - computers or other devices for data collection or presentations of the tag development
    - Origami paper to fashion a paper bird

- Student worksheets Quick Engineering worksheet English / Spanish. Detailed write up

Procedure

1. Show students a hook video on Albatrosses. BBC Earth
2. Science talk elucidating what students want to know about Albatrosses. Write brief notes on the board as students discuss.
3. Draw attention to items from talk related to movement of the albatross.
4. Ask how to get the movement data. Demonstrate several types of data tags, including cell phones.
5. Discuss problems involved in attaching tags to albatrosses (time to attach, behavior interference, stay on for a while and fall off).
6. Have students design their tag on the worksheet first and THEN build with materials. Worksheet
7. Have students test their tags on your birds, make 2 minute student presentations (any media/method of your preference) and share with class.
8. Show students data from real albatross tagging on Google Slides presentation. Discuss.
9. We recommend you extend this lesson by comparing Albatross travel data tracks from the same time with the fishing fleets from http://globalfishingwatch.org/ to see if they are interacting (take .html data and insert as an "custom layer" and adjust the timeline at the bottom of webpage for the fishing vessel data).

Assessment

- **Formative- Students will create and improve sketches of their design and materials lists.**
- **Summative- Students write out a justification of their tag and demonstrate it works.**

Additional Resources

Tagging of Pelagic Predators (other marine animals worldwide)

Animal Telemetry Network

Extensions or adaptations

- Potential uses of dataset- Do the albatrosses from either of the 3 datasets interact substantially with the fishing boats on the global fishing network? (hint - insert the following .kml files directly into the "custom layers portion" of the global fishing network maps *these files will not open directly

  black footed albatross

  short tailed albatross

Laysan albatross

- Track an actual animal on a tracking area for a month from a website such as http://gtopp.org/ https://conserveturtles.org/sea-turtle-tracking-active-sea-turtles/ http://www.ocearch.org/ .
- What to do to help protect birds https://www.audubon.org/news/how-protect-seabirds-fishing-threats
- Sensor Kinetics App on smart phones to allow students to use their smartphones as a tracking tag http://www.rotoview.com/sensor_kinetics.htm
- "Whale rollercoaster" tagging information and activity https://www.mbari.org/a-whale-of-a-roller-coaster/

- Tracking Albatross Migrations - Winged Ambassadors lesson plan http://www.oikonos.org/ftp/outgoing/wingedambassadors/lesson_2/L2_LessonPlan_Tracking_Albatross_Migrations.pdf

Associated MBARI EARTH lessons:

https://www.mbari.org/albatross-arithmetic/

https://www.mbari.org/seabird-populations/

https://www.mbari.org/whats-that-function/

https://www.mbari.org/birds-of-a-feather/

https://www.mbari.org/battle-of-the-beaks/

https://www.mbari.org/using-your-bird-brain-to-eat-like-a-bird/

Additional scientific journal articles

Vandenabeele, S. P., Grundy, E., Friswell, M. I., Grogan, A., Votier, S. C., & Wilson, R. P. (2014). Excess Baggage for Birds: Inappropriate Placement of Tags on Gannets Changes Flight Patterns. *PLoS ONE*, *9*(3), e92657. http://doi.org/10.1371/journal.pone.0092657 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3966804/

Explore seabird bycatch reduction methods - https://www.mbari.org/wp-content/uploads/2018/05/TrendsFactSheets-RRv3_final.pdf