

Is disturbance causing geese to take longer incubation breaks than normal?

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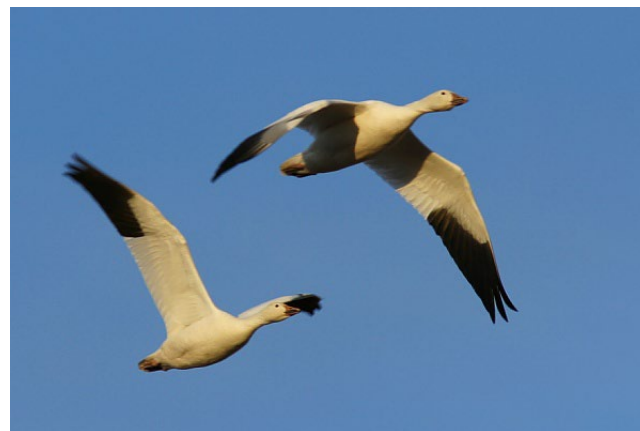
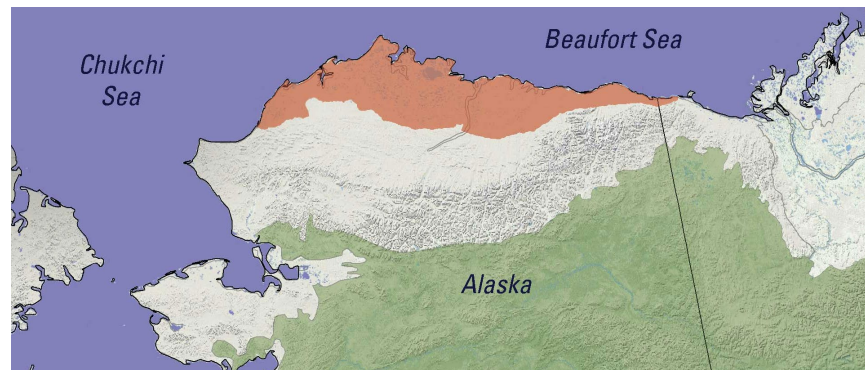
What is the U.S. Geological Survey?

- The USGS is a science and research agency that focuses on energy and minerals, water resources, ecosystems, and natural hazards
- The USGS is non-regulatory and provides science information to other federal agencies and the public



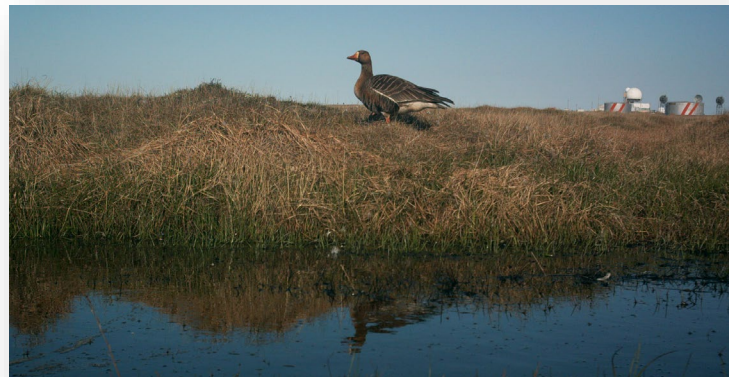
Overview of USGS Science on Geese

- USGS is currently working in northern Alaska on questions related to Arctic geese
- Geese are increasing in number
- Oil and gas exploration also takes place in this region
- A main question is, will nesting geese be disturbed by industrial activities?



What we've observed in northern Alaska

- Geese spend about 30 days sitting on the nest, incubating the eggs
- Sometimes they take a short break from sitting on the nest to eat or drink
- Sometimes they are forced to leave the nest due to a disturbance, such as people approaching or vehicles and aircraft passing by



What else we've observed in northern Alaska

- When geese are at their nest, they can usually protect the eggs from predators
- The photo on the right shows a goose defending its nest from an arctic fox by holding its wings out to look bigger
- However, when geese are away from their nest, sometimes predators find the nest and take some or all of the eggs



Study specifics

Our main question:

- Is disturbance causing geese to take longer incubation breaks than normal?

How did we address this question?

- Conducted a study at a site where there was industrial activity ongoing
- Used cameras at nests to record goose behavior



Let's collect some data!

- There are six groups of photos, and within each group are photos from five different nests
- Students can work independently or in groups
- Go through one group of photos and measure length of an incubation break in minutes using the time stamp at the bottom right of each photo
- But first, the next few slides show what an incubation break looks like by looking through the next few slides

The goose stands up at 7:16 pm to take a break



WINGSCAPES

1 MINUTE

CAM32

JUN.29,13

07:16 PM

The goose covers the eggs with feathers at 7:17 pm



WINGSCAPES

1 MINUTE

CAM32

JUN.29,13

07:17 PM

The goose is absent from the image at 7:18 pm



The goose is still absent from the image at 7:19 pm



The goose is back on the nest at 7:24, an 8 minute break



Now, let's collect some data

- There are different sets of photos to look through:
 - Single camera photos, labeled “Camera 11” and so on, are lower file size and show photos from a single camera.
 - Group photos, labeled “Group 1 photos” and so on, are larger file size and each contain images from 5 cameras.
 - Students can work individually on these photos or can work together and then compare their notes to other students or groups of students.

Use the data sheet provided

- Look through the photos and collect time stamp data on incubation breaks; both how long are natural breaks and breaks caused by disturbance.
- Use the data sheet to record camera number, if the goose was disturbed, what might have caused the disturbance, and how long the goose was off the nest in minutes.



Is disturbance causing geese to take longer incubation breaks than normal?

Camera number	Was the goose disturbed off the nest or did it take a break?	If a disturbance, what kind? Person, predator, Aircraft?	Did the female leave the nest?	Break start time	Break end time	Total break length (minutes)



What did we learn from this activity?

After you've summarized data from the photos, answer or discuss the questions below:

What was the length of natural breaks?

How long were birds gone from the nest due to a disturbance?

If you found a difference in break length between natural breaks and breaks caused by disturbance, why do you think that happens?

Were you surprised by any of the photos and if so, why?

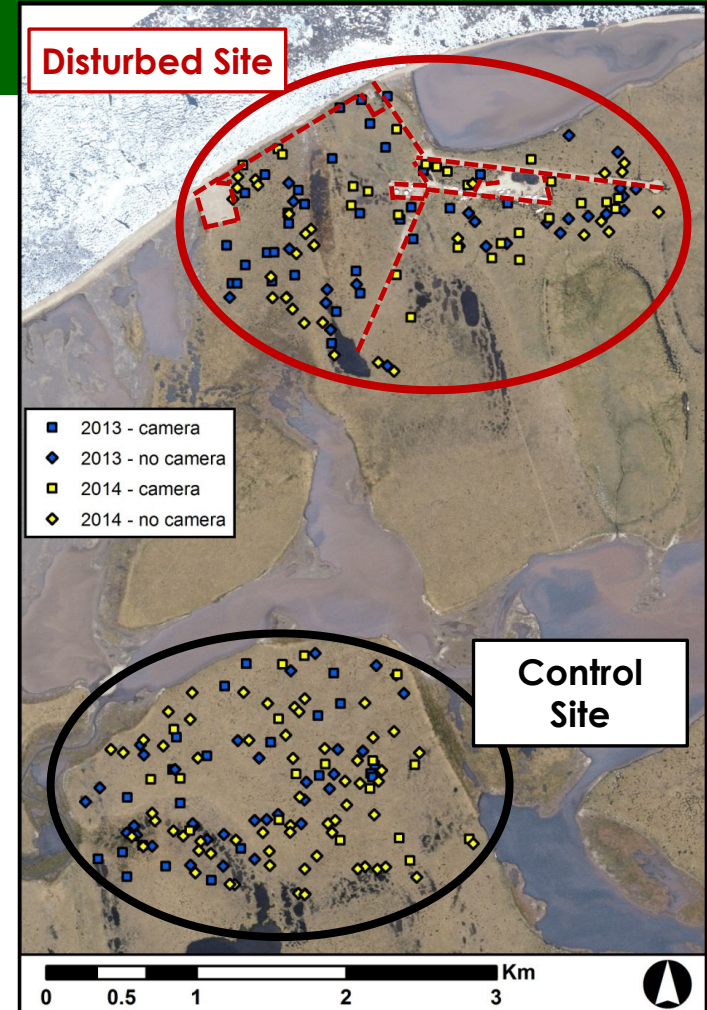
Here are some details on the actual study

- USGS conducted the study on the North Slope of Alaska in 2013 and 2014
- The main goal of the work was to estimate effects of industrial disturbance and human observers on goose nesting success
- The study was conducted during a time when old buildings were being torn down



What data was collected?

- The study monitored 247 nests and about 100 of those nests had cameras near them
- There were two study sites: a disturbed site where buildings were being torn down and a control site that was about 1.5 miles away
- The cameras produced over 1.5 million photos that were analyzed!



What did we learn from all those photos?

- Geese take about one natural break from the nest each day
- These natural breaks are short, about 8 minutes long
- However, breaks taken due to disturbance by people are much longer, about 38 minutes on average



What else did we learn?

- Construction noise caused little change in the number and length of natural breaks
- The longer geese are off their nests, the greater chance there is for a predator to take the eggs
- Common predators were gulls and foxes
- Remote cameras placed near nests did not cause any disturbance to geese



Thanks for participating in this activity!

- You can read more about this study at the links below:
- <https://www.usgs.gov/news/technical-announcement/wildlife-cameras-offer-insight-geese-industry-and-researchers-arctic>
- <https://doi.org/10.1002/jwmg.21312>



Thanks for participating!

Let us know if you have any questions about this lesson.

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