

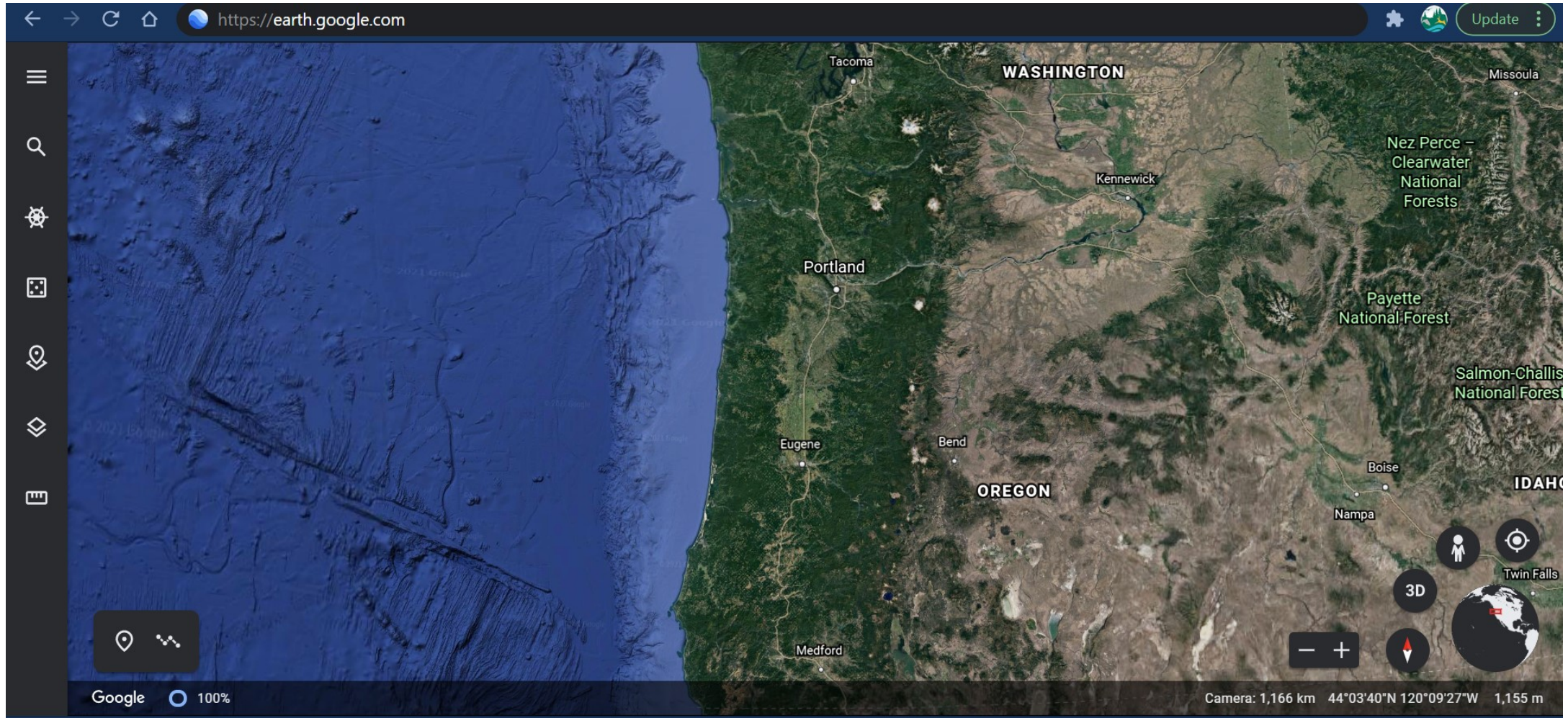
# Waterfowl Tracking

In this assignment you will see how different individuals of the same species may follow similar or different migratory paths in their annual life cycle.



# Waterfowl Tracking

Step one: Go to Earth.Google.com



# Waterfowl Tracking

Step two: Use [this Google Link](#) and choose one waterfowl species you would like to study. Download the file. Write down the name of the species you're choosing.

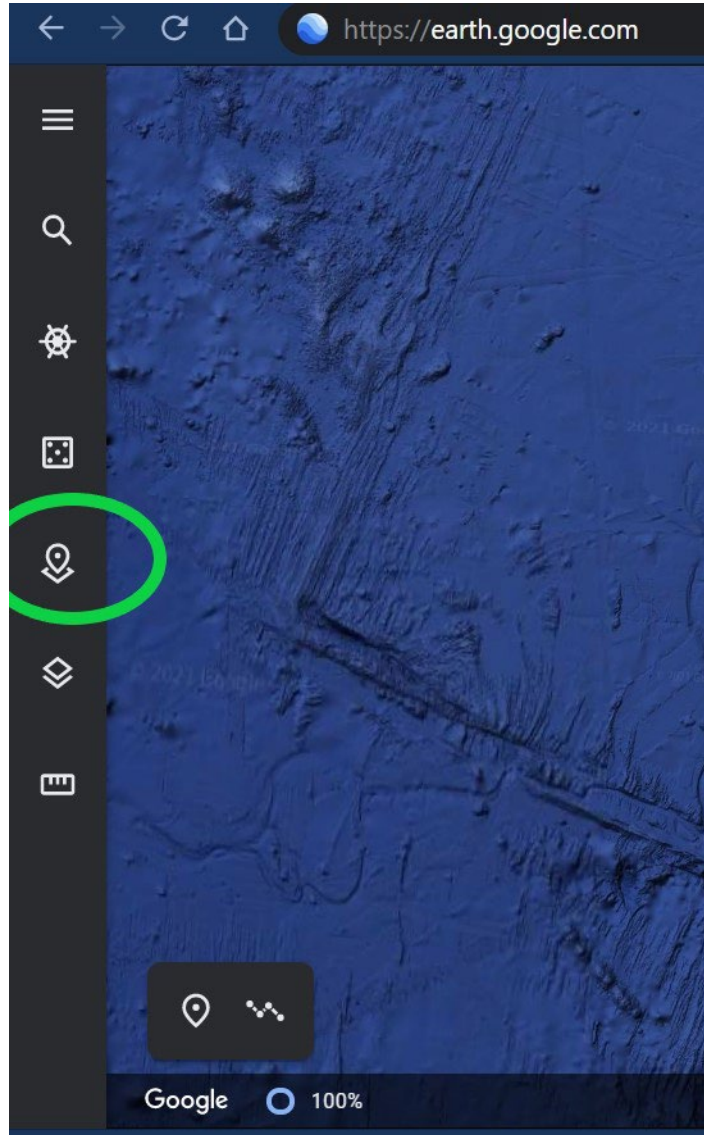
The screenshot shows the Google Drive interface. The breadcrumb path is 'My Drive > Wild Washington > GoogleEarthFiles\_Waterfowl'. A table lists several .kmz files, with the first one selected. A context menu is open over the selected file, showing options like 'Open with', 'Show file location', 'Add shortcut to Drive', 'Move to', 'Add to Starred', 'Rename', 'View details', 'Manage versions', 'Make a copy', 'Report abuse', and 'Download'.

Name	Owner
Washington State White-winged Scoter.kmz	me
Washington State Surf Scoter.kmz	me
Washington Harlequin Duck.kmz	me
Skagit Valley _ Wrangel Island Snow Goose.kmz	me
Skagit County Brant.kmz	me
Eastern Washington Lesser Canada Goose.kmz	me
Eastern WA, USA Northern Pintail.kmz	me

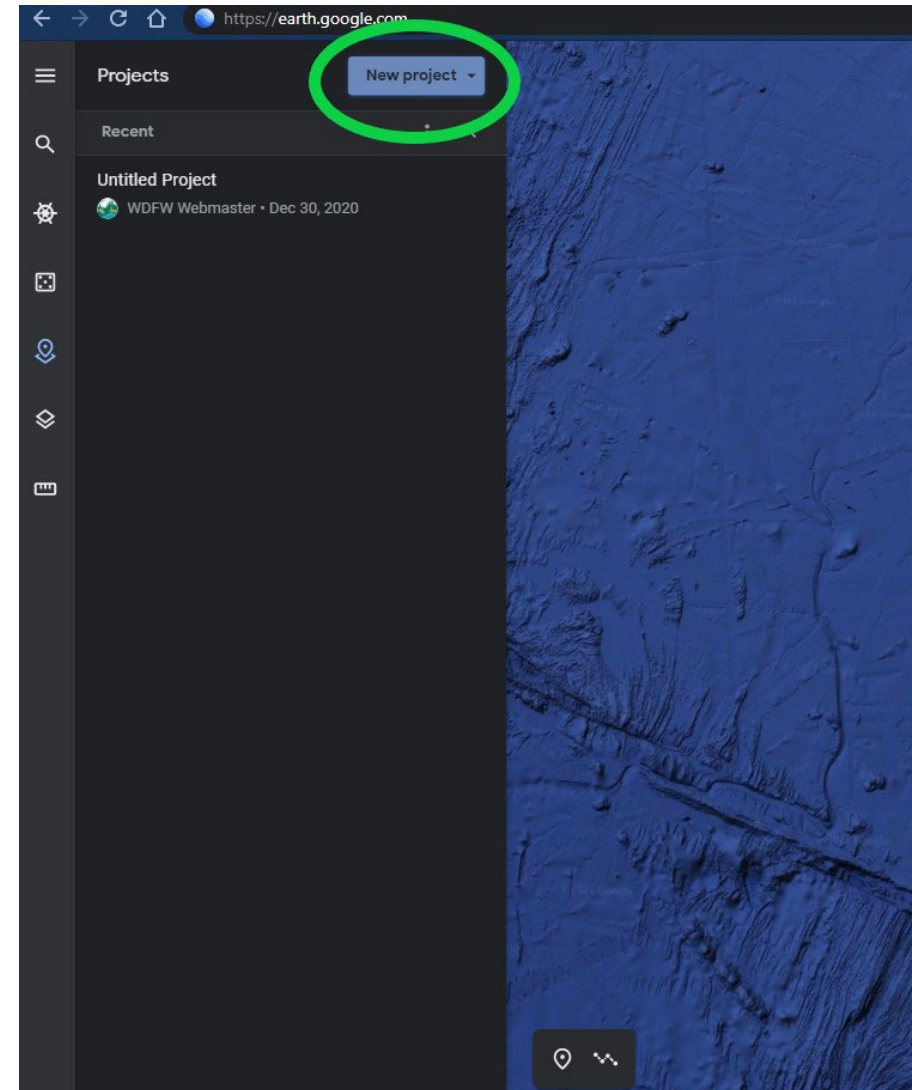
<https://drive.google.com/drive/folders/1d4noe3dMpVZ1ovilmcGXSJReZRYVn8HH?usp=sharing>

# Waterfowl Tracking

Step three: Go back to Google Earth and click on the button highlighted in green.

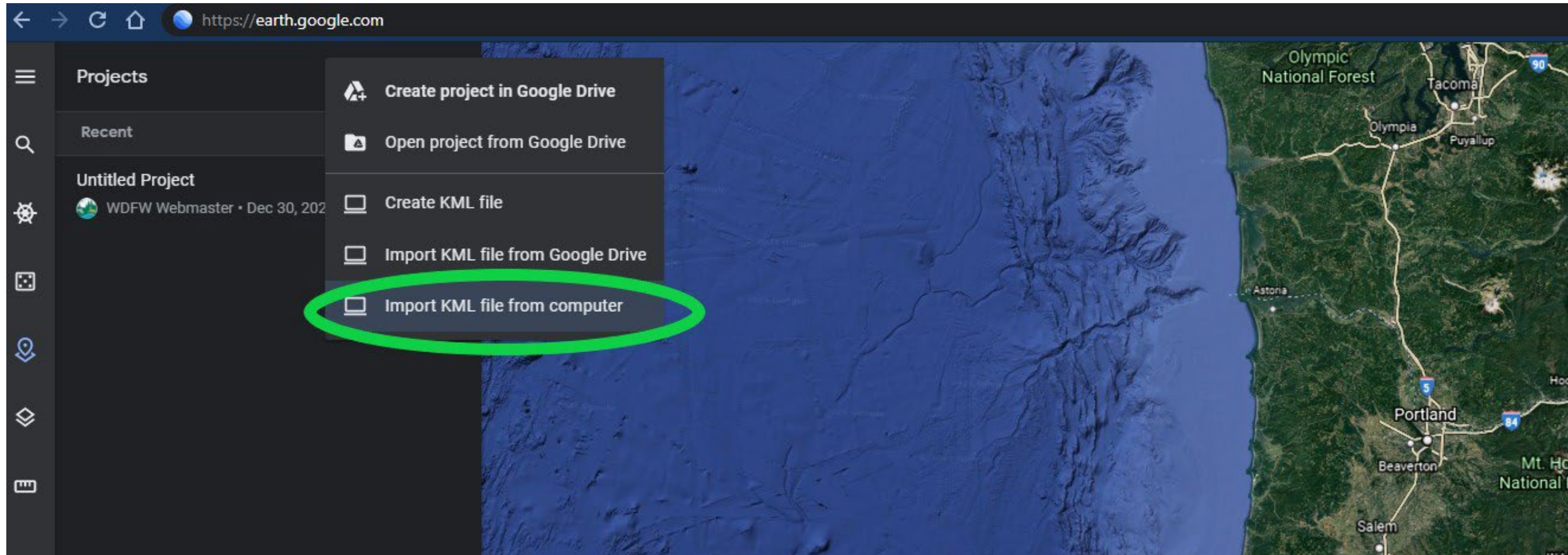


Step four: Click the new project button



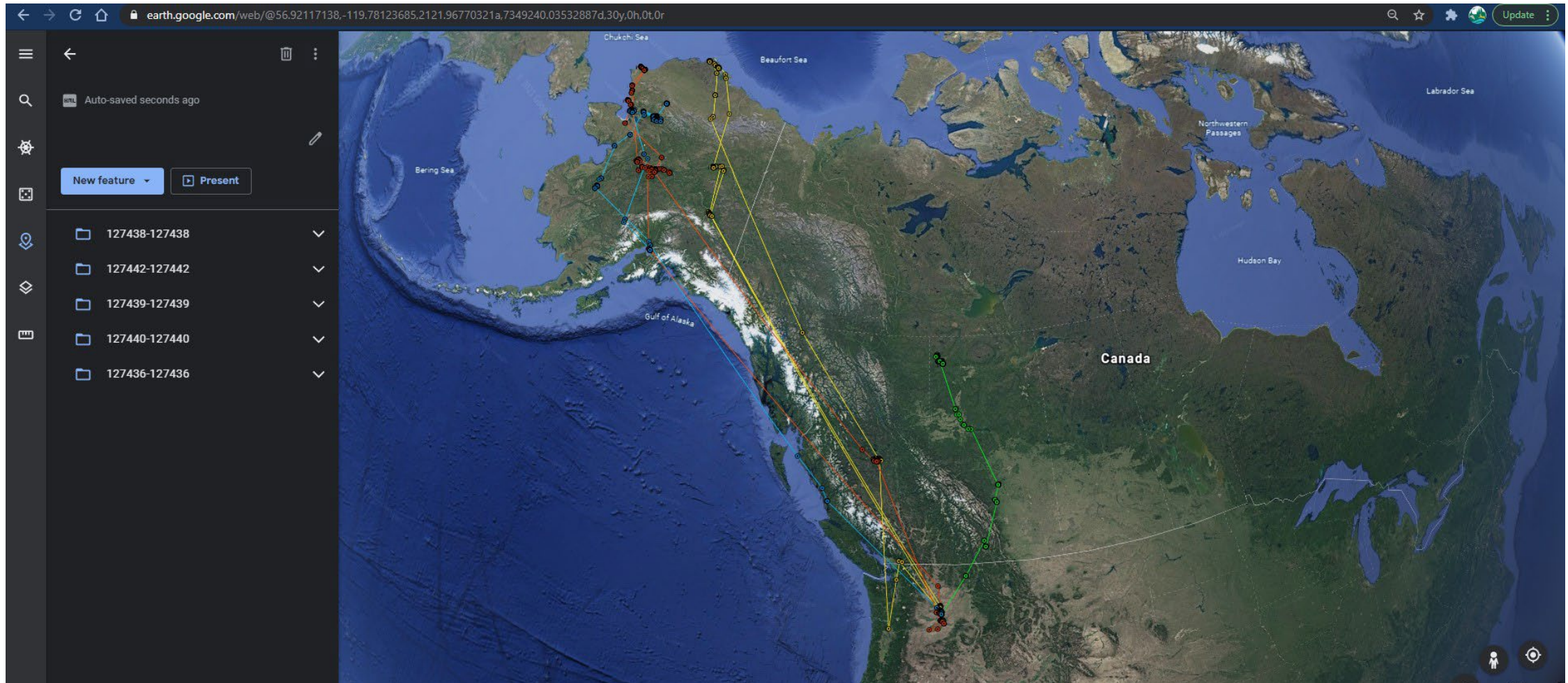
# Waterfowl Tracking

Step five: Upload the file you just downloaded



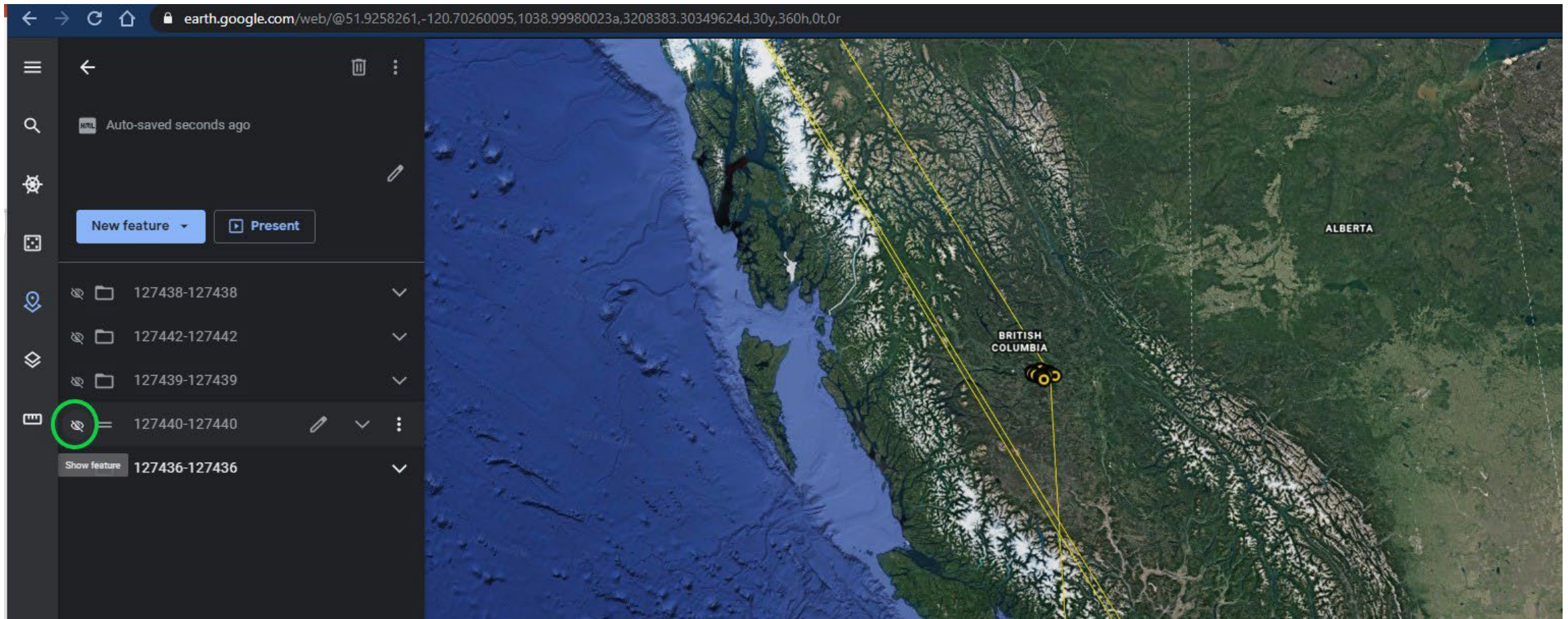
# Waterfowl Tracking

Step six: You should see a colored lines and dots appear. Each color is a different individual of the species.



# Waterfowl Tracking

Step seven: play with the data! You can navigate Google Earth and see how different species move throughout the year. You can also toggle the eye switch to isolate individual birds.



Clicking on a dot will bring up the satellite information. You can also see a time stamp of when the bird was at this location. Look at nearby locations to see how often the bird moved. Did it stay in that spot all day? For a couple of minutes or hours?

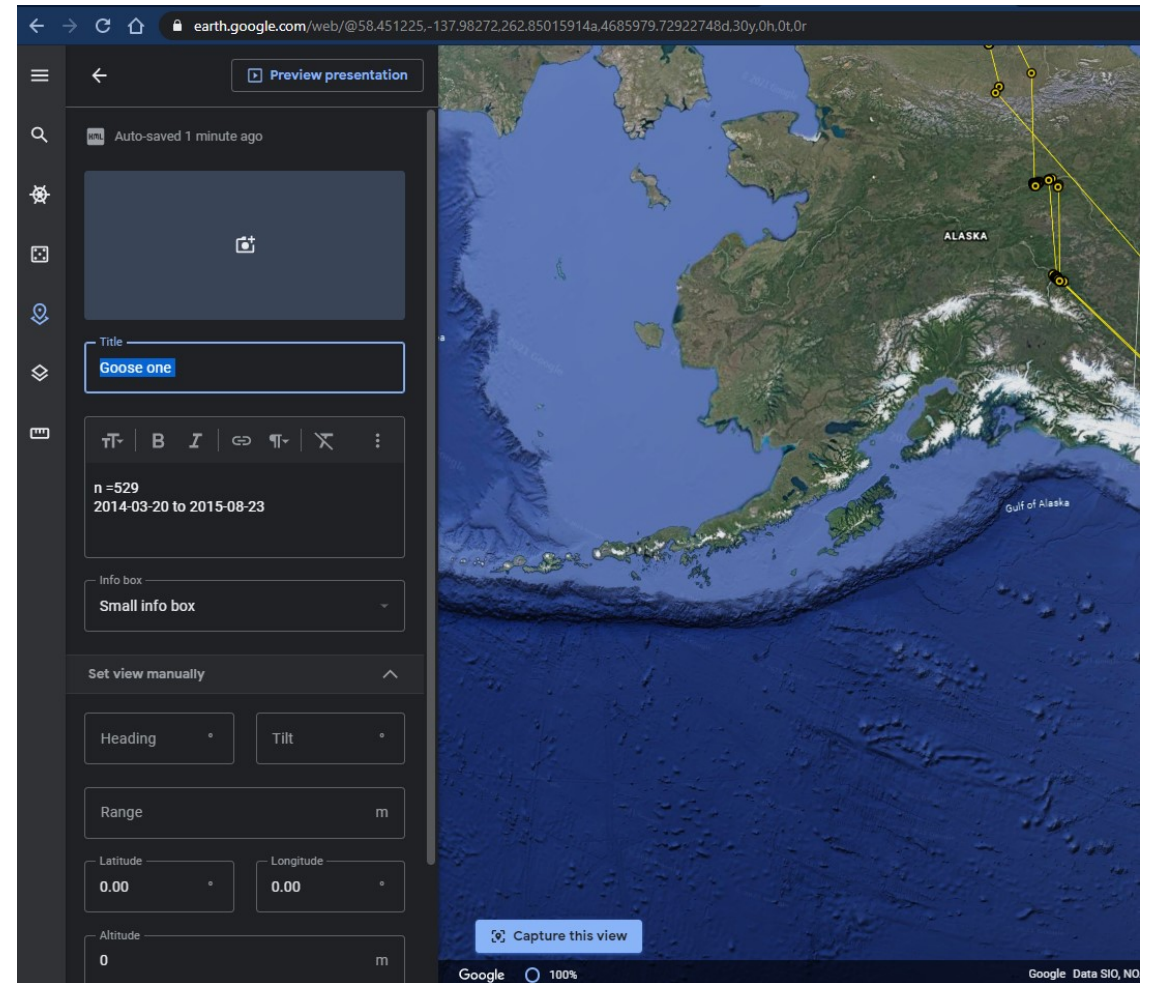
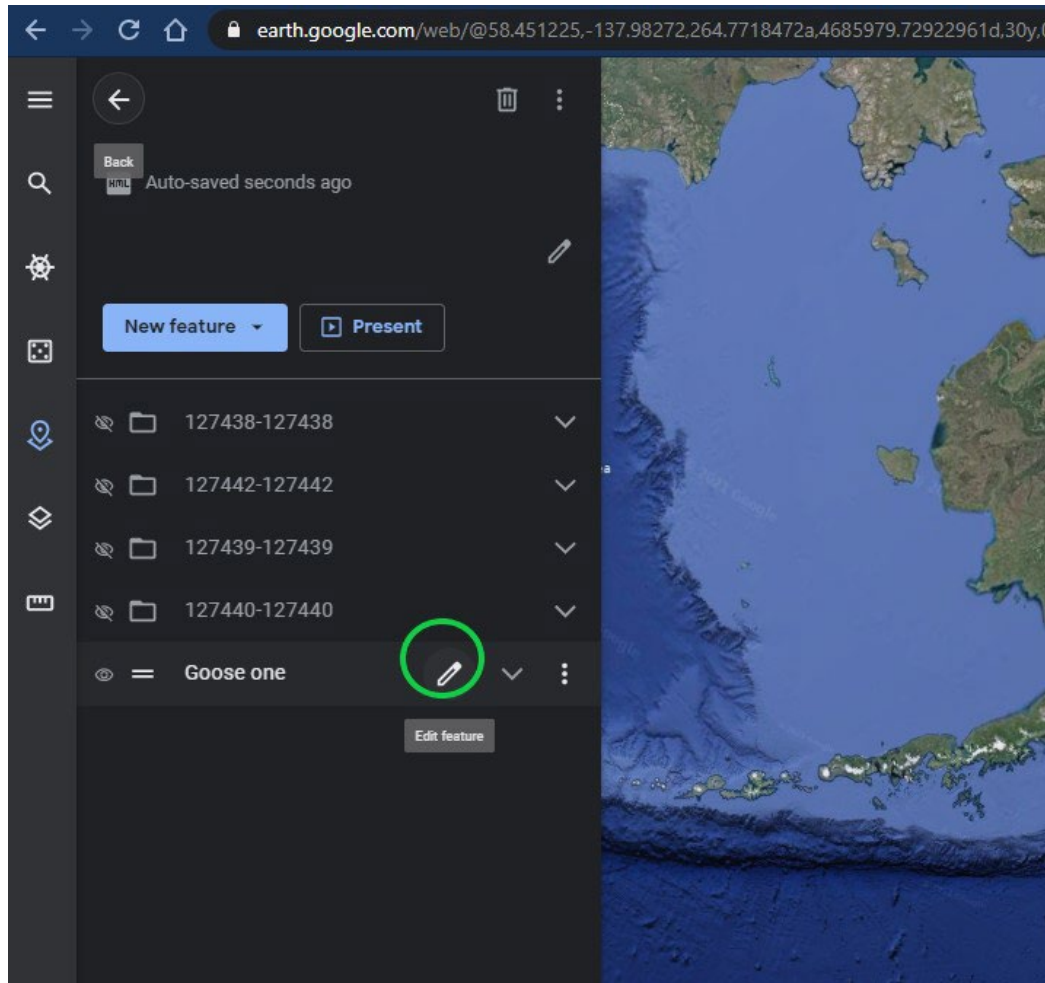
The screenshot shows a Google Earth interface with a satellite view of the Columbia National Wildlife Refuge. A yellow line with circular markers indicates the path of a bird. A popup window on the right displays detailed tracking data for a specific location. The popup title is "Timestamp: 2015-04-15 00:20:34.000" (circled in green). The data includes:

- Location: Long: -119.16986, Lat: 46.74571
- Algorithm Marked Outlier: null
- Argos Altitude: 241.0
- Argos Best Level: -129.0
- Argos Calcul Freq: 4.0163573503E8
- Argos Error Radius: 228.0
- Argos GDOP: 473
- Argos IQ: 50
- Argos Lat1: 46.74571
- Argos Lat2: 46.74571
- Argos LC: 3
- Argos Lon1: -119.16986
- Argos Lon2: -119.16986
- Argos Nb Mes: 6
- Argos Nb Mes 120: 0
- Argos NOPC: 3
- Argos Orientation: 78.0
- Argos Pass Duration: 384.0
- Argos Satellite id: null
- Argos Semi Major: 1609.0
- Argos Semi Minor: 32.0
- Argos Sensor 1: 0
- Argos Sensor 2: 81
- Argos Sensor 3: 14
- Argos Sensor 4: null
- Argos Transmission Timestamp: null
- Argos Valid Location Algorithm: 1
- Argos Valid Location Manual: null
- Sensor Type: argos-doppler-shift
- Individual Taxon Canonical Name: Branta canadensis
- Tag ID: 127436
- Animal ID: 127436
- Study Name: Eastern Washington Lesser Canada Goose - Delineating the breeding grounds of small Canada geese wintering in the Columbia Basin
- Utm Easting: 334256.4686066443
- Utm Northing: 5179192.745235196
- Utm Zone: 11N
- Study Timezone: Pacific Daylight Time
- Study Local Timestamp: 2015-04-14 17:20:34.000



# You will track the movement of two different individuals.

- Write down the individual name (you may want to change the name to make it easier to remember)



## Questions bird one: *Attach a screen shot of the bird's path to this document.*

- What species is this bird?
- Where did the bird start? You can name country/part of state, i.e., Near Wenatchee, Washington, or near Braeside, British Columbia). Please include the month, day, year and time.
- Where did the last recording take place? Please include the month, day, year and time.
- Why do you think the bird started/stopped in these areas?

## Questions bird one:

- What was the furthest north location the bird traveled (include day, month, year, and time)
- What was the furthest south location the bird traveled? (include day, month, year, and time)
- What spots did this bird spend most of its time in? (include day, month year and time)

## Questions bird one:

- Name locations of potential stopover locations. Why do you think these places were stopover areas and not a staging area?
- Were there any points that seemed extremely out of the way or abnormal? Hypothesize why you think this could occur.
- What did you find most interesting about this bird's journey.

## Questions bird two: *Attach a screen shot of the bird's path to this document.*

- What species is this bird?
- Where did the bird start? You can name country/part of state, i.e., Near Wenatchee, Washington, or near Braeside, British Columbia). Please include the month, day, year and time.
- Where did the last recording take place? Please include the month, day, year and time.
- Why do you think the bird started/stopped in these areas?

## Questions bird two:

- What was the furthest north location the bird traveled (include day, month, year, and time)
- What was the furthest south location the bird traveled? (include day, month, year, and time)
- What spots did this bird spend most of its time in? (include day, month year and time)

## Questions bird two:

- Name locations of potential stopover locations. Why do you think these places were stopover areas and not a staging area?
- Were there any points that seemed extremely out of the way or abnormal? Hypothesize why you think this could occur.
- What did you find most interesting about this bird's journey?

## Final questions:

- How/were the two birds' paths similar? Describe using details of location, time, season, etc.
- How were/did the two birds' paths vary? Describe using details of location, time, season, etc.
- Hypothesize how resource availability (food, water, shelter, space) may impact these bird's movements.



Final project:

Use internet, encyclopedia, journal, or other resources to compare your Google Earth data to information already existing on the species.

Does this information confirm or challenge what is already known about this species' annual life cycle? Explain.

Make a three-slide PowerPoint that summarizes your data and compares it to the data you found. Cite your sources and include graphics when appropriate.