

Stevens Middle School 7th grade @ Hurricane Ridge; Written by Dana Christenson

Location: Hurricane Ridge

Time: 20-30 minutes

Group size: around 15 students @ each station, 6 rotations in a day

Materials needed:

- ropes for boundaries (1)
- poker chips (several dozen? Or pieces of paper if its not windy)
- whiteboards (1 for everyone), markers
- pictures of glacier retreat, visuals of animals used in the game?

Big goals of what students will learn:

-What is the greenhouse effect, how does this lead into climate change, how does the changing climate affect plants and animals in our area?

1. About 5-8 minutes: Intro to our station, brief overview of the greenhouse effect

- a. Quick meet and greet, overview of our station and goals
 - i. Share names and favorite thing to do in the snow
- b. Greenhouse effect: What is it/ how does it change/ how has it changed over time
 - i. Difference between Weather and Climate
 - ii. Use whiteboard to collaboratively draw model, have students copy along in their journals/ on whiteboards

---Transition to game: put away journals/whiteboards, explain new rules and select helpers/(chaperones?) to help

2. About 5-17 minutes: Swallow migration game

Goal: Students will connect how global changes in temperatures affect plants and animals, make predictions for the future.

- a. Make a prediction: this game's title has the word *migration* in it. Share with a neighbor how you think our greenhouse model review may influence this game... then have 1-2 students share.
- b. Play migration relay, first round spring of year 1200, then 2019, then 2100

Game: Explain that violet green swallows are aerial insectivores, meaning they eat bugs out of the air. How might this help humans? (They eat lots of bugs like mosquitos!) In this game, students are going to model birds trying to get enough food to survive their season. They're also a migrating species, so they'll be travelling up from Mexico on their way to Alaska. Our food source represents insects flying around in the air- not so much up here at HR, but around Port Angeles in general. Have students line up on a line away from where we will have our 'food sources' (volunteers/chaperones). Explain that in this game they're trying to get enough food to survive. When you say 'go', have the food sources start dropping poker chips in the air, and each student's goal is to run up and grab two chips (has to be from the air, not off the ground) and then they can run back. If they get two chips then they won the round. Play for several minutes, then announce how many chips you needed to survive, graph the amount of surviving birds. As the climate starts to warm, have the food sources start dropping chips earlier, but explain that the birds still migrate with the sun, and haven't arrived yet.

- c. Graph amount of birds that survived each season

****Adapt this game for marmots and food and snow melt? (not a migrating animal...)**

-- If students have journals and there is time, have them grab those to integrate into the debrief...

About 5-10 minutes: Debrief

Have these debrief components written on pieces of paper and in a bag, pass around and have students pull one-three out for us to do.

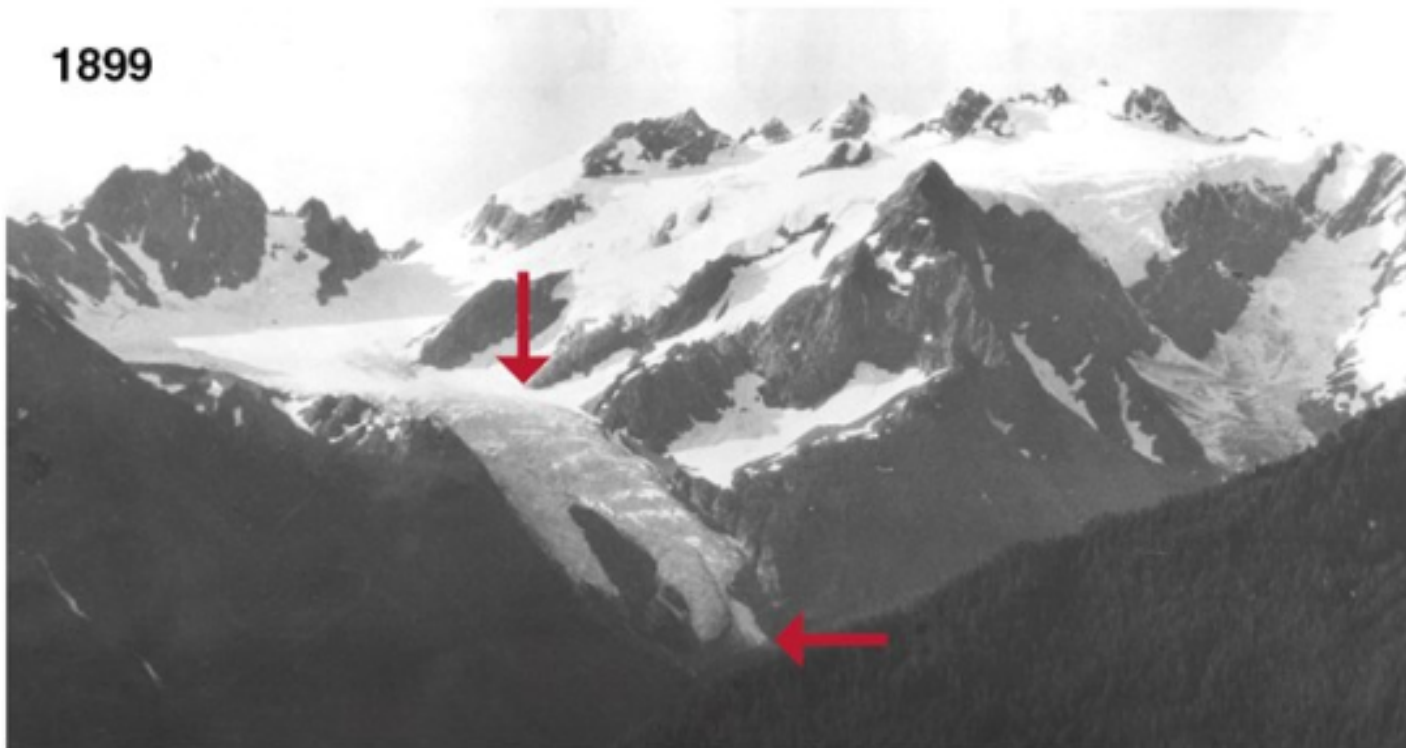
- d. Discuss: What do we notice from our graph? What predictions could we make for the fate of violet green swallows, based on this game's model?
- e. Quiz: What is the greenhouse effect, and how does it magnify?
 - i. Students could draw quick model in their journals, or write down the 5 key action words that explain the process and then share.
- f. Draw: How does the greenhouse effect impact life on Earth?
 - i. Students draw a quick comic to showcase that more heat ---> food is out at different times ---> migrating species may not get what they need
- g. Brainstorm: What can we do to help slow this process, or reverse it?
 - i. Have students write down 2 ideas

Notes:

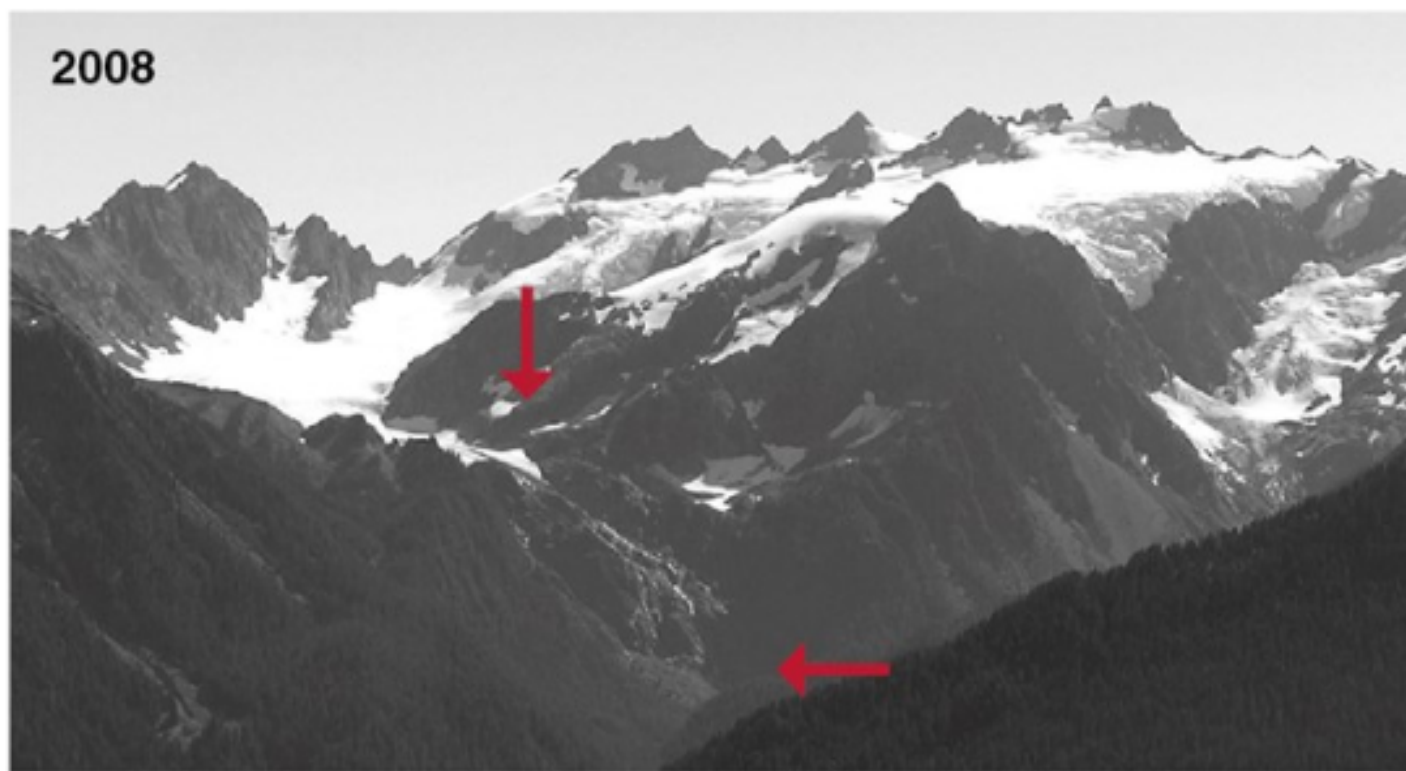
- Animals migrate based on day length/ amount of sun. Their migration won't change just because the temperature regionally is warming.
- Plants grow based on temperature and amount of sun
- Hibernating animals are internally regulated, meaning they have evolved to hibernate for roughly the amount of time they need to skip their winter. So if their winters change, their bodies won't adapt quickly enough.
 - From the ONP website: Olympic Marmots used stored fat for a 7-8 month hibernation (Roughly October-March asleep).
 - If the regional climate was to warm, plants would like sprout earlier, seed earlier, and die earlier. What would happen to the marmots diet in August and September?

Olympic National Park - Blue Glacier

1899

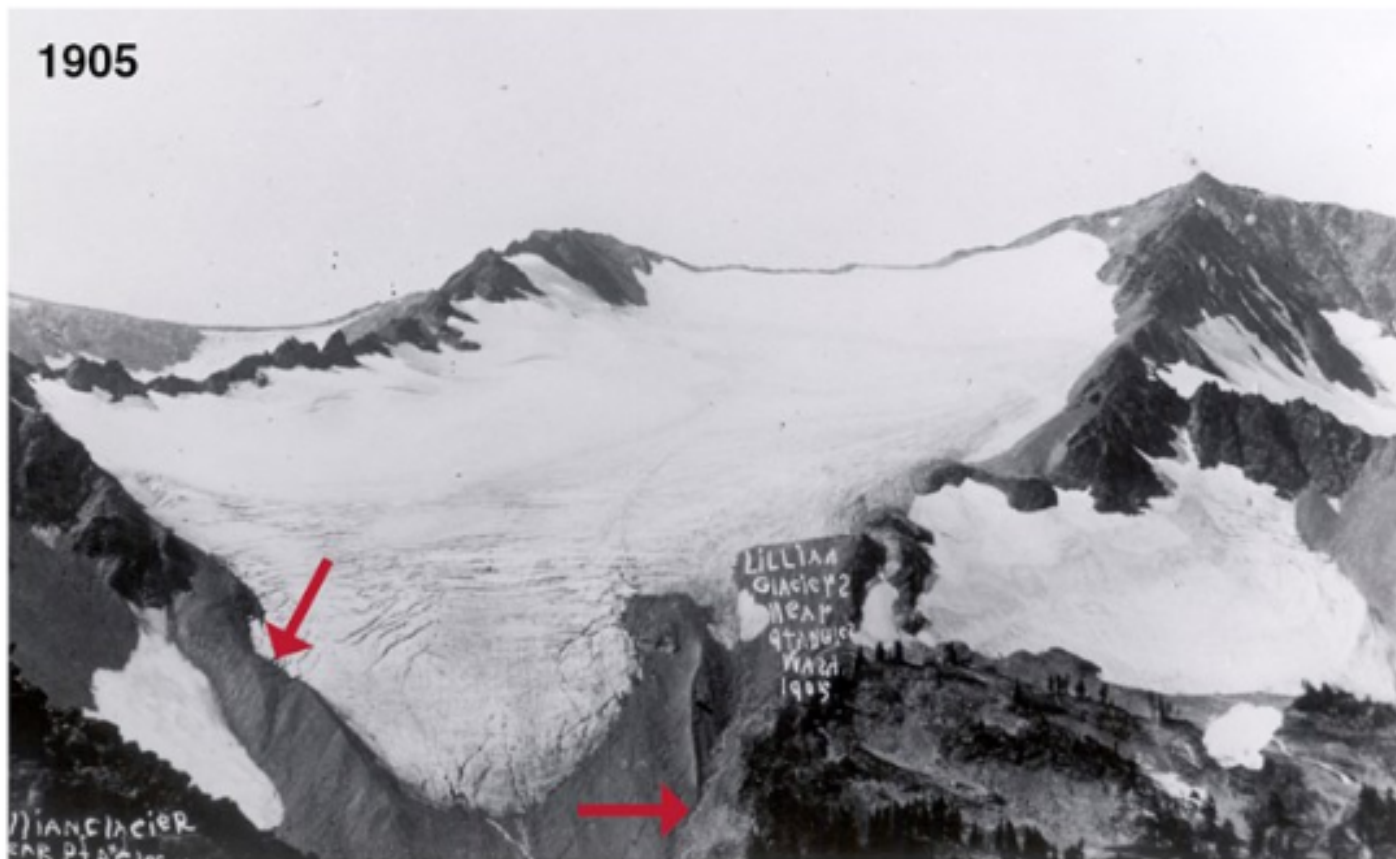


2008

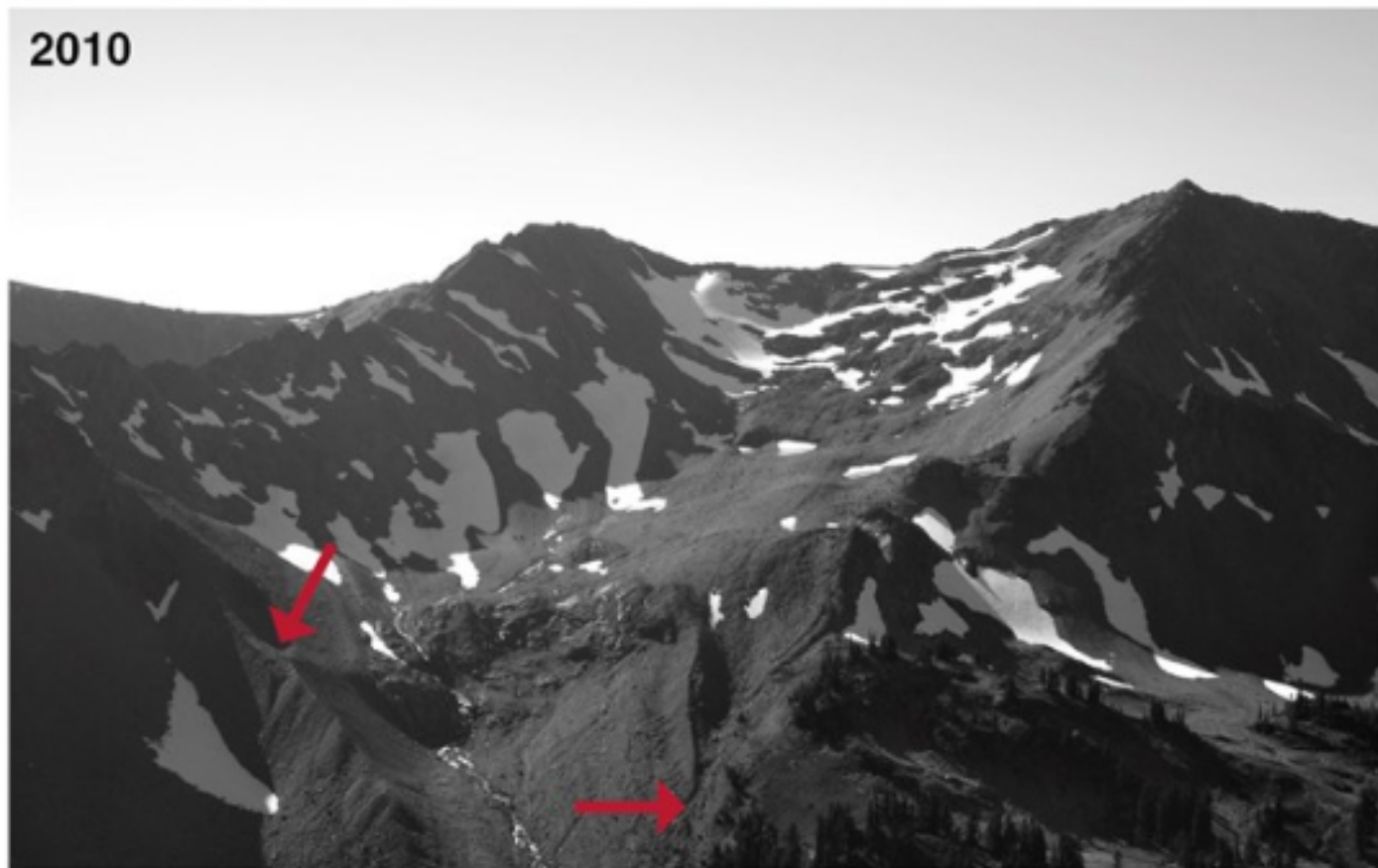


Olympic National Park - Lillian Glacier

1905



2010



Olympic National Park Glacier Repeat Photographs Anderson Glacier

