Digging into Data

Description

How can we use local iNaturalist data to answer biodiversity questions? Youth will have a chance to validate, expand upon, or push back against publicly-available data with observations from their own lived experiences. Using questions generated during this activity, or from the Three "I"s activity, students will dive deeper into some key native and invasive species in the region while exploring local projects on iNaturalist. Students will be introduced to local organizations that are using iNaturalist to monitor biodiversity within the region and find out how these organizations are using the data.

Objectives

Student Objectives	Explore biodiversity data local to students.	Core Activity: Make meaning
	Connect students' observations to ongoing biodiversity monitoring efforts in the region and discover local organizations that are connected to iNaturalist projects.	Key Youth Practice: Youth engage with complex socio ecological systems
	Learn what native and invasive species are.	Core Activity: Develop expertise
Educator Objectives	Connect iNaturalist observations from projects in the region to students' biodiversity questions.	Key Educator Practice: Position youth as people who do science

Key Vocabulary

Biodiversity, taxon, threatened species, introduced species, invasive species, conservation

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This activity was adapted from the National Geographic Analyzing Bioblitz Data activity. See Module 1 References.

Instructions

Time

1 hour

Materials

- Computers and/or internet access
- Biodiversity of Lake County, CA iNaturalist project
- Printed copies of the Analyze iNaturalist Data (For Computers) or the Analyze iNaturalist Data (For Tablets/Smart Phones) worksheet, enough for each group

Getting Ready

- Familiarize yourself with iNaturalist by making practice observations and looking through the data on your own.
- Divide students into groups, assign groups one or more of the 11 taxa
- Make sure each group has access to a computer or a tablet/smart device
- Each group should navigate to go to www.inaturalist.org and log in with the class account as described in the Youth Engagement with iNaturalist Activity.

Facilitation

Part One

Demonstrate for students how to navigate around the Biodiversity of Lake County, CA iNaturalist project page, highlighting the website features. Have students click on the "Observations" button in the green Totals box on the left side of the screen. Show students how to toggle between the different views of observations: map, list, and icon. Introduce students to the search filter. Review taxon group icons and checkboxes for threatened and introduced species. Show students an example of filtering for a particular group, for example birds, then click "Update Search" to show all birds in the results.

Part Two

Distribute a copy of the Analyze iNaturalist Data (For Computers) worksheets to each group. Student groups will analyze observation data for their taxon and read about how the organizations within the project are using the iNaturalist data collected. Students should be prepared to share their taxon's defining characteristics, total number of species and observations, the five most common species, any introduced species, and any introduced species. They should

also be prepared to share about one organization they found leading a project within the Biodiversity of Lake County, CA project and why the organization is collecting iNaturalist data.

Reflection

Have groups take turns sharing their findings in a one-minute presentation. Depending on the grade level, you may have students graph their taxon's number of observations and species and compare the graph after the presentations.

If your group has completed the Three "I"s activity, you may engage with the data from the Biodiversity of Lake County, CA project to answer students' individual questions or a group question. Possible discussion topics to be investigated:

1. Compare findings from the species list with the top observations from each taxon shared by each taxon group. Is it the same or different? Discuss possible reasons why. If you completed the Youth Engagement with iNaturalist activity, you may also compare that activity's findings with the top observations from each taxon shared by each taxon group.
2. Discuss with the students some of the common and different reasons that each organization presented on are monitoring biodiversity.
3. What are the invasive species near me? Why are they impacting native biodiversity?
4. Explore the number of observations for one of the culturally significant species indicated in the species list. Are there observations near me? Why are they culturally significant? What do I need to know to help conserve these species?

Optional Post-Activity

Have students select one of the invasive species listed in the species list, and use the information provided in iNaturalist to create a fact sheet. Use the Lake County Department of Water Resources' Hydrilla Fact Sheet as an example. Students should make sure their fact sheet includes:

1. Why their invasive species is threatening to the ecosystem.
2. How their invasive species spreads.
3. Some ways people can stop the spread of their invasive species.

Additional Uses and Modifications

If you do not have access to computers, use the Analyze iNaturalist Data (For Tablets/Smart Phones) worksheet. Review the answers to questions 5 and 6 as a group:

1. Compare the plants and animals you observed today with the list of top 5 most observed plants and animals species in the project. Is what you observed similar or different from this list? What could be some reasons what you observed is similar or different from the

list? Note: You may also compare the project observations top 5 species list with findings from the species list.
    a. Possible answers: Different/similar habitats, were drawn to observe different/similar types of wildlife, may not have the tools available to observe certain wildlife (like binoculars or nets)
2. How could we find out what plant and animal species are native to where we live using this project's Research Grade observations?
    a. Possible answers: If you select an observation from the "Observations" tab, they can see which observations are "Research Grade" in the "Data Quality" section at the bottom of the screen. For those observations, they can tap the name of the species, and they can read more about the species in the description. Looking at its map of observations will tell you if they can observe that species nearby.

Depending on your site's internet availability, swap out the data with suggestions in the References for this activity. Compare these data sources with what is found on the Biodiversity of Lake County, CA iNaturalist project page. Sort the iNaturalist data and print a list in advance for students to compare data sources.

Youth-Driven Pathway Facilitation

For educators facilitating the youth-driven pathway, this is one of the activities you can do after your team has completed the Real vs. Ideal activity and identified the environmental issue it would like to focus on. Following the Real vs. Ideal activity, the goal is for your youth team to explore publicly-available data to see what's already known about their topic and how well it aligns with their own experiences. This process is often referred to as "ground-truthing".

While access to official data is important for community change work, they often don't tell the whole story. Ground-truthing is one important practice to help youth critically engage with publicly-available data. It allows youth to use their own observations "on the ground" and knowledge from their own lived experiences to validate, expand upon or push back against official data and the stories that are told using those data.

If your team has chosen biodiversity or a related topic for their environmental issue, you can facilitate this activity with them more or less as written (remembering to adapt it as needed for your youth and their age range). However, if your team has chosen a different issue to focus on, you may want to facilitate one of the other data activities in this toolkit instead (e.g., Water Quality Data Investigation, Data Talks, or Using Fire Data).

If none of these data activities align with your group's focus, you can search for other local data sources in the community resource list. If using another data source, use the instructions and the ground-truthing worksheet in "Activity 3.5: Data Ground-Truthing" on p. 112 of Stepping Stone 3 in

the Community Futures, Community Lore Stepping Stones Toolkit for youth participatory action research (YPAR) from the UC Davis Center for Regional Change and School of Education.