

Youth Engagement with bloomWatch

Description

In order for water quality managers around the lake to identify where harmful algal blooms (HABs) occur, they rely on multiple sources of information. One source is the participatory science app, bloomWatch. Users can identify algae and submit photos of a potential bloom to bloomWatch, a national database. Students can learn how to identify signs of a potential HAB and know how to report it regardless of the site's proximity to Clear Lake or its tributaries.

Objectives

Student Objectives	Learn how to use bloomWatch.	Core Activity: Contribute Data
	Practice using tools and protocols.	Key Youth Practice: Take ownership of data quality
	Learn how to identify a HAB.	Core Activity: Develop expertise
Educator Objectives	Connect students' observations to their water quality questions.	Key Educator Practice: Position youth as people who do science

Key Vocabulary

Harmful Algal Bloom (HAB), algae, cyanobacteria, nutrients, pollutants, pesticides, sediments, toxins, monitoring

Instructions

Time

45 minutes

Materials

- Smart phones, iPad/tablets, or cameras

- If facilitating outside without internet or phone service, print enough copies for pairs to share the [Big Valley Band of Pomo Indians: Reporting Harmful Algal Blooms using bloomWatch](#) guide.
- If facilitating outside, print enough copies for pairs to share the [San Francisco Estuary Institute Freshwater HAB Satellite Analysis Tool](#) map of Clear Lake.

Getting Ready

- Pre-download the [bloomWatch](#) app to any portable devices students will use.
- Create a single bloomWatch account and use that account to log in on all of the devices students will use.
- Familiarize yourself with how to submit observations using the [Big Valley Band of Pomo Indians: Reporting Harmful Algal Blooms using bloomWatch](#) guide.

Facilitation

Part One

Explain what a harmful algal bloom (HAB) is to your students: Algae and cyanobacteria are simple organisms that live in the water. Algae and cyanobacteria can grow fast, or “bloom,” when water is warm, slow-moving, and full of excess nutrients from pollutants like pesticides and sediments. When there is cyanobacteria present, these blooms can sometimes produce toxins called cyanotoxins. People and animals can get sick when swimming, boating, or near water with a cyanobacterial bloom.

Explain that it’s important for everyone to keep an eye on the water quality so that we can protect each other if a HAB is occurring. Use the [San Francisco Estuary Institute Freshwater HAB Satellite Analysis Tool](#) to look at satellite data of where Clear Lake’s potential cyanotoxin-producing bacteria are occurring above naturally occurring background levels. Based on the map, have students identify:

- Where is the highest cyanobacteria abundance? Answer: In the red-colored locations.
- Where is the most likely to have a HAB and why? Answer: In the red-colored locations, because cyanobacteria can produce cyanotoxins.
- In addition to satellite data, what data can help water quality managers determine locations to test for cyanotoxins? Answer: Visual observations.

Part Two

Tell students that their visual observations of the water quality can be useful data for water quality managers. Hand out copies of the [Big Valley Band of Pomo Indians: Reporting Harmful Algal Blooms using bloomWatch](#) guide to pairs of students. Have pairs of students review pages 26 and 27 of the guide, then as a group, walk through visual signs of a HAB. For additional photos,

use the [Surface Water Ambient Monitoring Program: Bloom Observation Guide](#). Ask students if they have ever seen water that looks like any of the pictures in the guide, or noticed any signs up at a beach.

Reflection

Introduce bloomWatch using [the video](#) or describe the participatory science project to students. Hand out iPads/tablets or cameras to pairs of students. Have students read through the photo tips on page 22, and review as a group. When near a body of water, have students take photographs. Once at a location with internet or service, walk through the steps on pages 24 and 25 for submitting an observation to the bloomWatch class account. As a group, review observations in the [bloom report map](#) after submission and discuss student observations.

Optional Post-Activity

If your group has access to the internet, you can walk students through filling out the [California State Water Resources Control Board's Freshwater and Estuarine Harmful Algal Bloom Report Form](#), where official reports are made. You can use the same information captured in the bloomWatch submission to fill out a report if your group observes a suspected HAB.

Additional Uses and Modifications

For younger grades, educators can be responsible for taking photos and data submission if needed. Younger grades also have the option to contribute observations to the Big Valley Band of Pomo Indians' [Clear Lake Fish Kill Monitoring](#) iNaturalist project instead of using bloomWatch. From the project description: "Clear Lake Fish Kill Monitoring is a citizen science project to record fish kills wherever they occur on Clear Lake and nearby tributaries. This project contributes to ongoing data collection and environmental monitoring efforts by the Big Valley Band of Pomo Indians EPA Office in collaboration with local, state, regional, and national agencies." If contributing data to this participatory science project, use instructions in the [Youth Engagement with iNaturalist](#) activity.