

SOS EDUCATION FORUM

Agenda

- August Workshop Update - Beth
- Pandemic & Air Quality StoryMap - Hilary
- Data in the Classroom - Amy Dean
- Climate Resilience Activity Book - Kate Semmens

July 2022

SOS USERS COLLABORATIVE NETWORK WORKSHOP IS NOW VIRTUAL!

Aug 30 - Sept 1
1:30 - 4:30 EDT



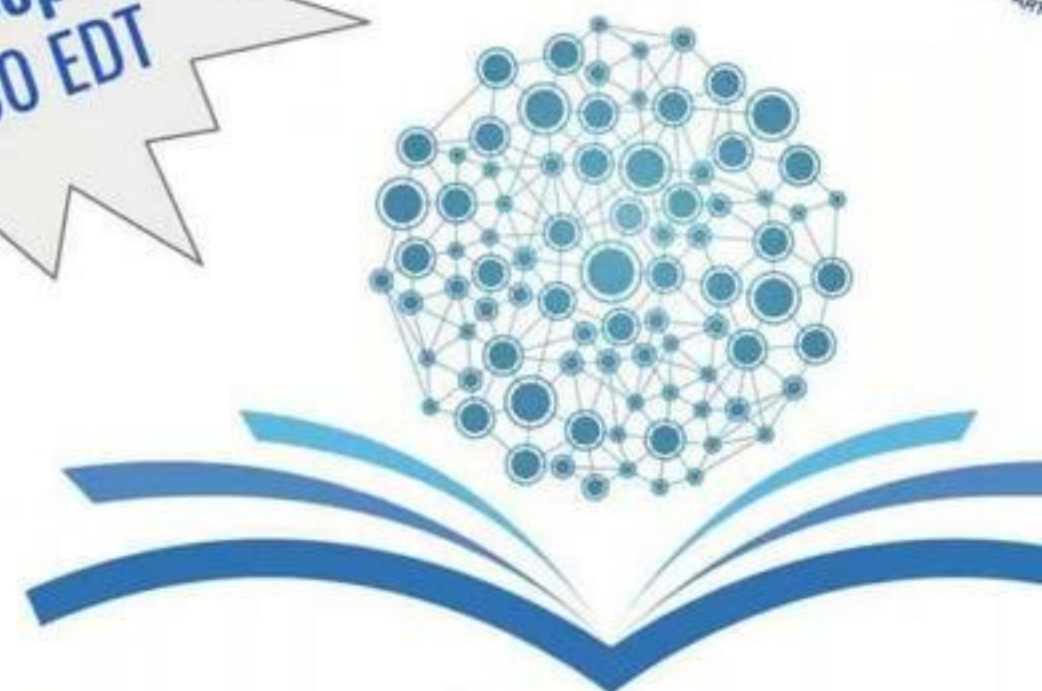
Projecting Leadership in Science Engagement

Register by Friday, July 29

Presentation Proposal due by Friday, July 22

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Audio Selection



Hilary's Meeting
This is a recurring meeting

Computer audio options Switch to phone call
Don't use audio

The meeting will begin when
Hilary Peddicord arrives



Computer audio

You'll sound best with a headset

Are you Hilary Peddicord or a co-organizer? [Sign in now](#)

[Back to sign-in](#)

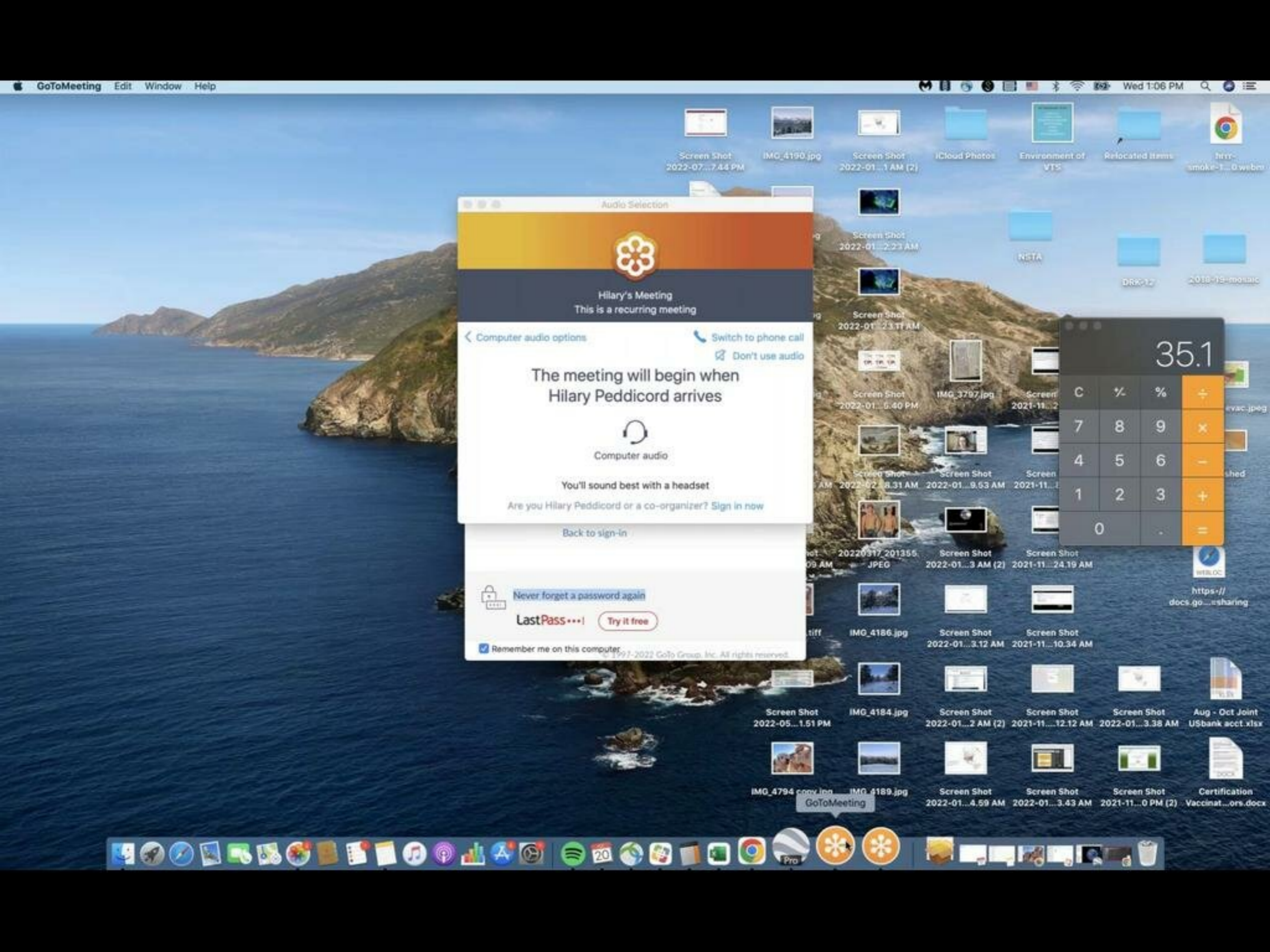
Never forget a password again
LastPass [Try it free](#)

Remember me on this computer

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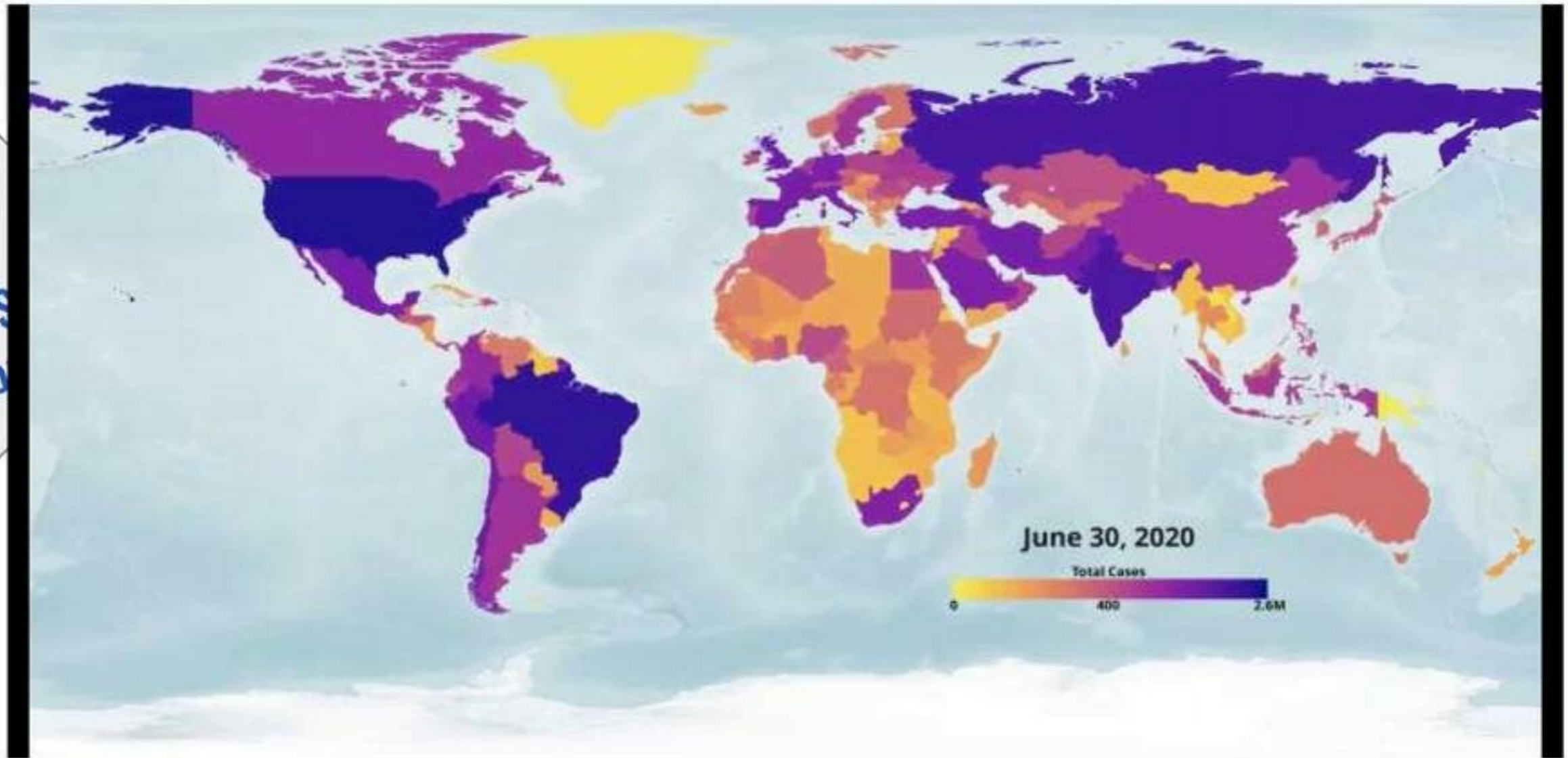


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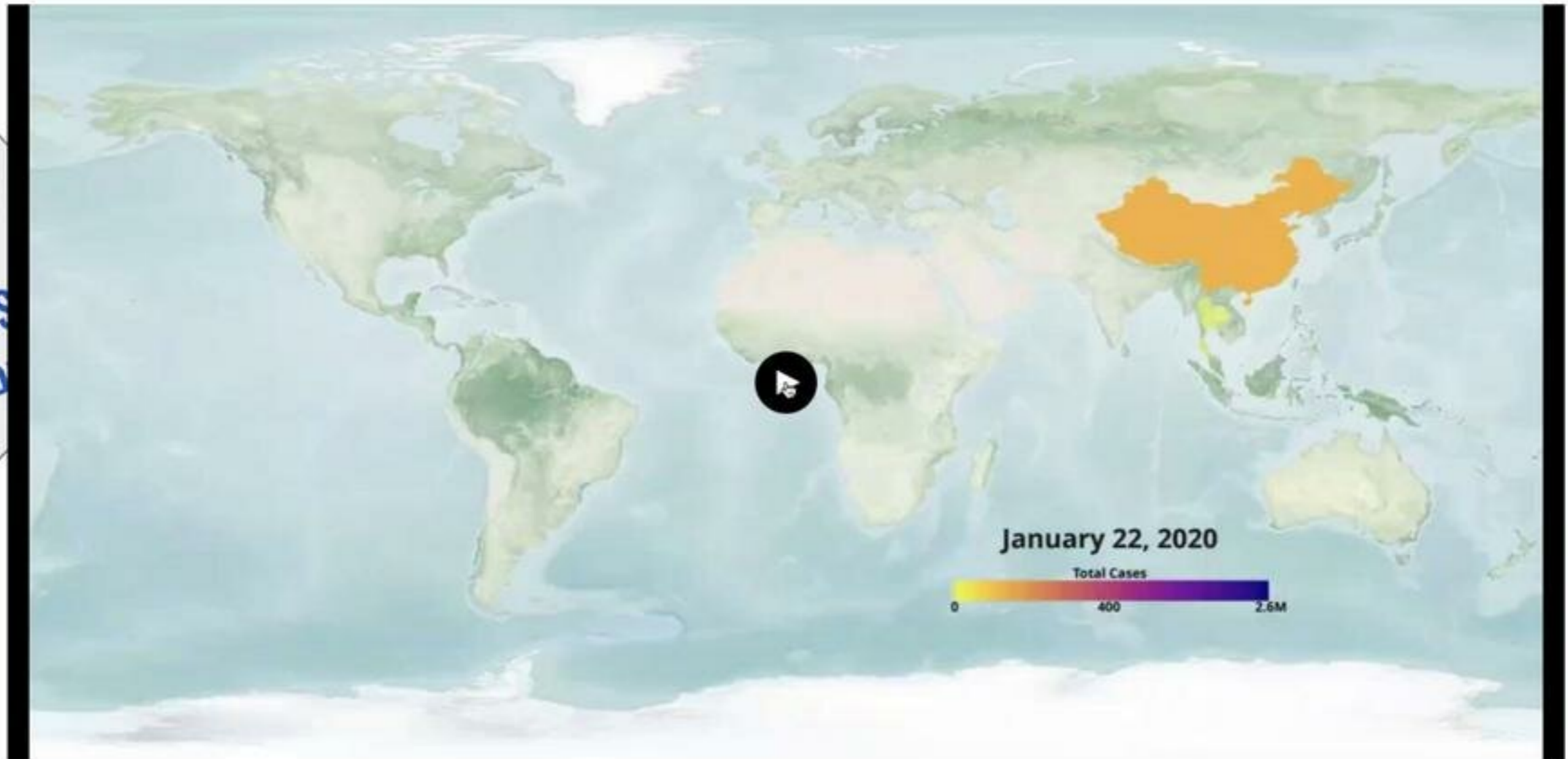
THE PANDEMIC & AIR QUALITY STORYMAP IS PUBLIC!



<https://storymaps.arcgis.com/stories/4e26d95f16b84b5e82b91a04cead7749>

OR <https://tinyurl.com/jmrmh2wk>

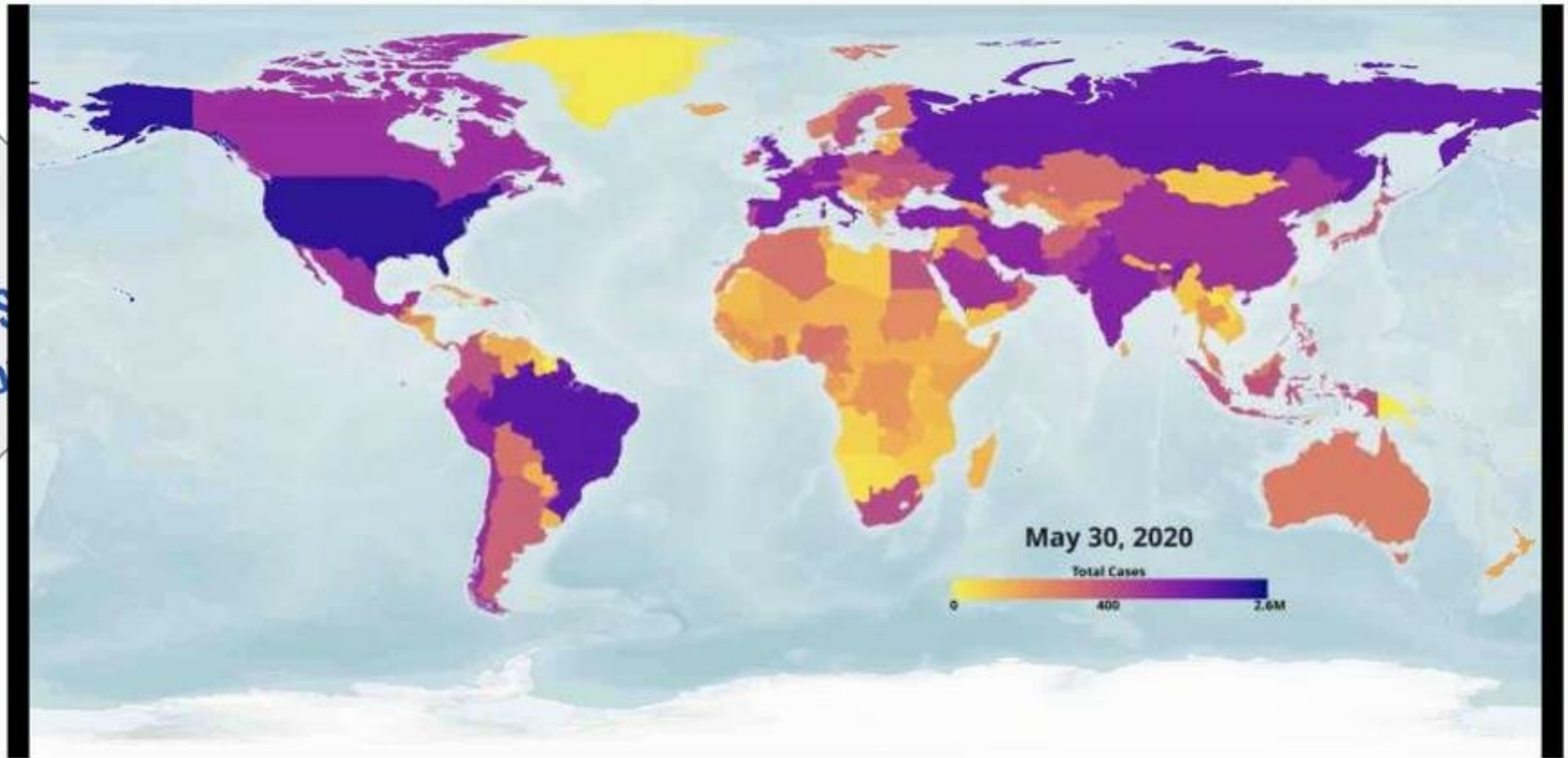
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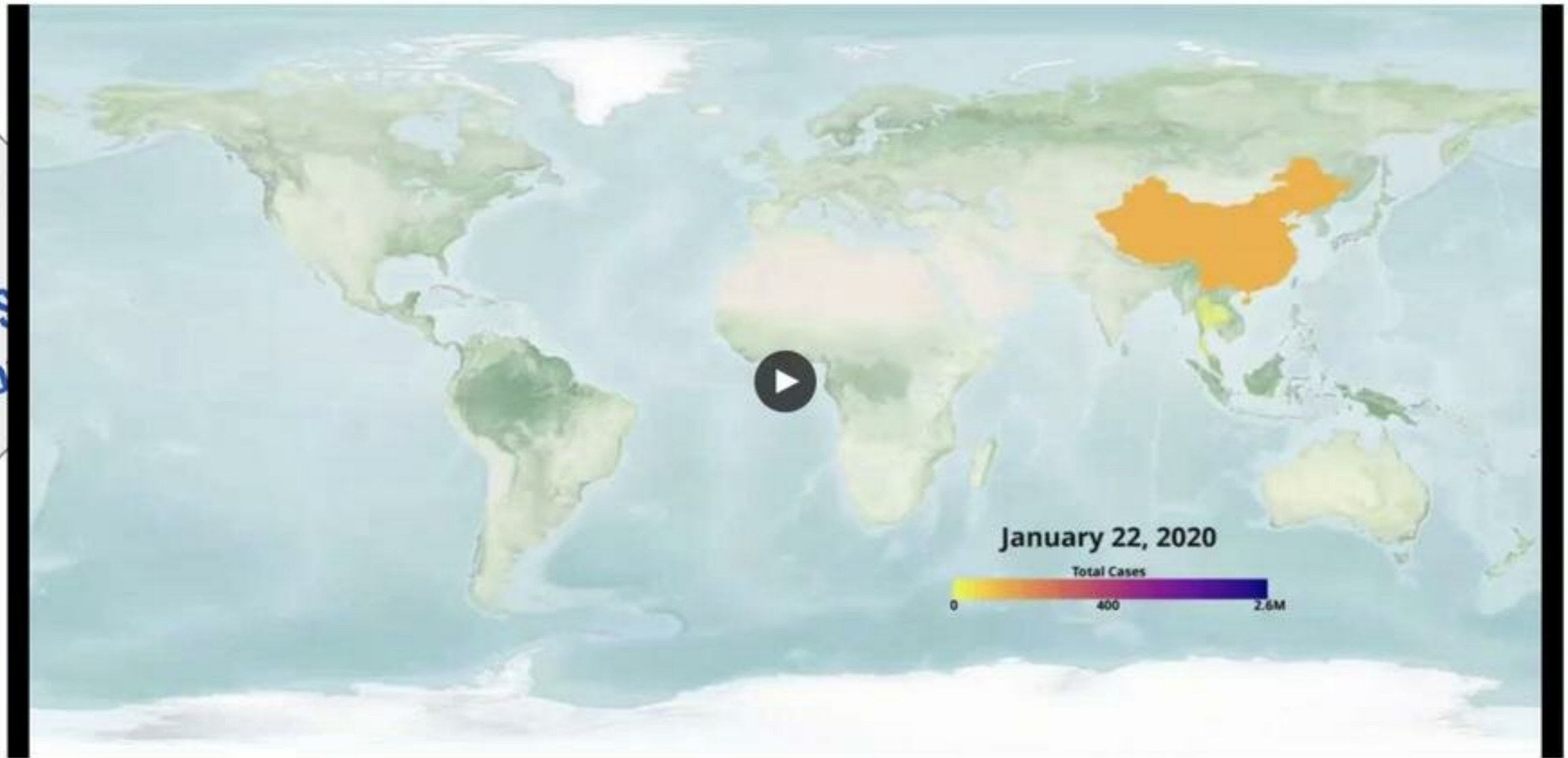
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July 2022

NOAA's Data in the Classroom



Amy Dean
dataintheclassroom@noaa.gov

July 20, 2022


Agenda | Objectives

- What is Data in the Classroom?
- How is DITC using NOAA data to engage audiences about environmental issues (coral bleaching & ocean acidification)?
- How might these resources be useful for informal educators & audiences?

Spend 1 minute exploring the website

Web search "NOAA Data in the Classroom"

Data in the Classroom

A collage of four images related to marine and coastal science. The top-left image shows an underwater view of a coral reef with various colorful corals. The top-right image shows a person sitting on a wooden pier, looking out at the water. The bottom-left image shows a wooden dock extending into a body of water with a person standing on it. The bottom-right image is a close-up of a coral polyp.

Questions or comments?

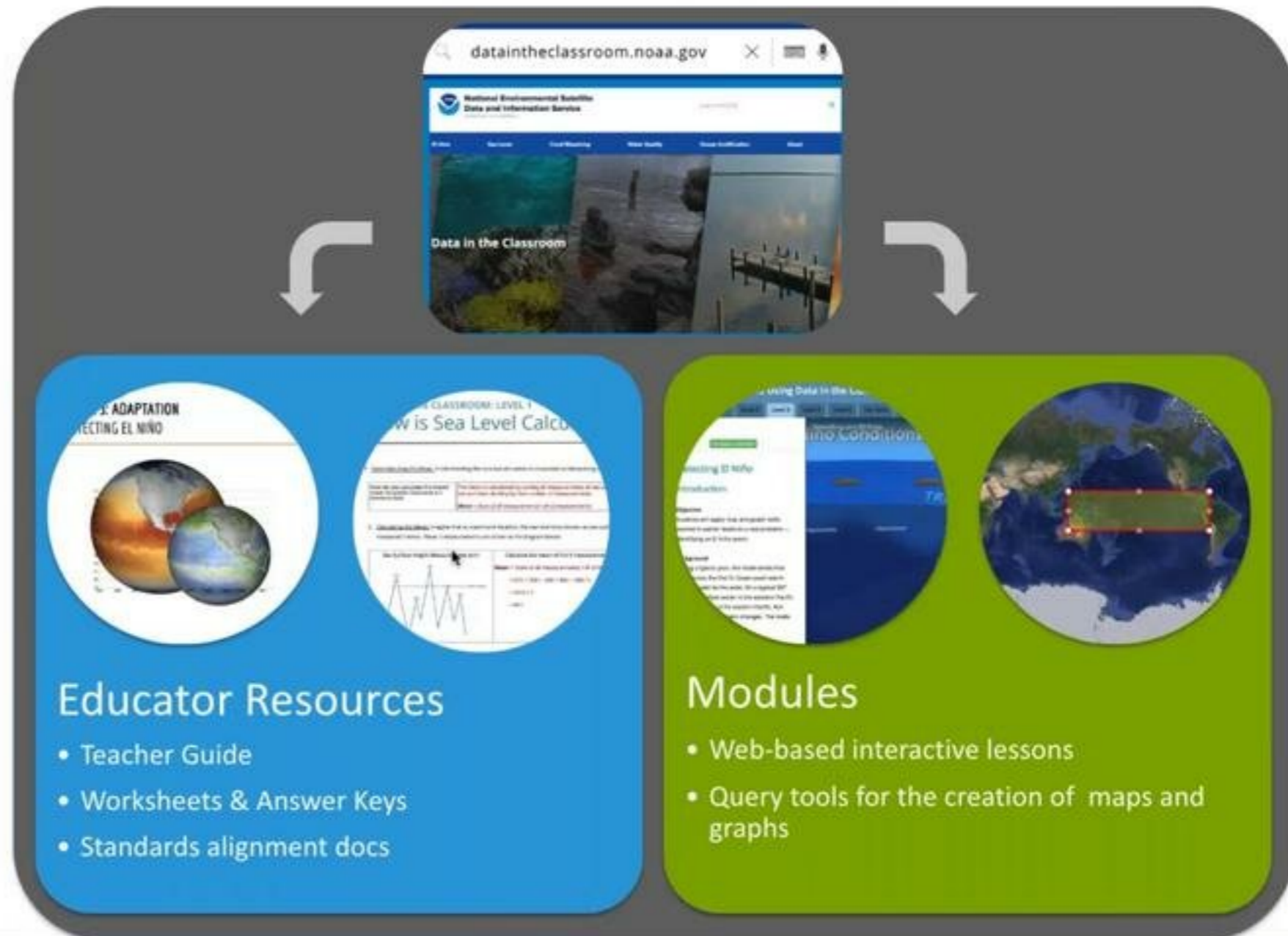
Use the chat feature

WHAT IS DATA IN THE CLASSROOM?

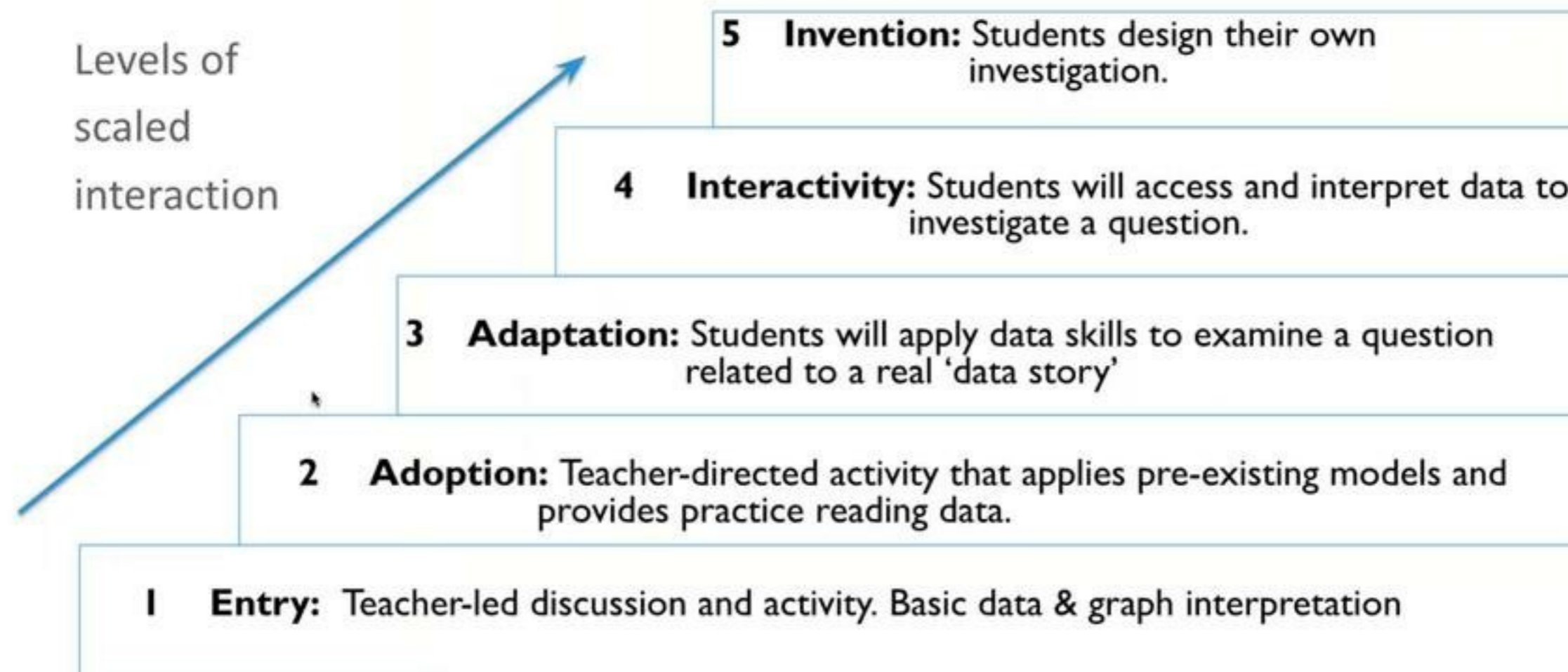
dataintheclassroom.noaa.gov

Currently 5 MODULES

1. Coastal & Ocean Acidification
2. Sea Level
3. Coral Bleaching
4. Water Quality
5. El Niño



EACH MODULE HAS 5 LEVELS



Tour & tutorial on how to engage with data presented in modules

Through the lessons in this module, designed for grades 6-12, students are guided through the use of NOAA data (sea surface temperature and SST anomalies, coral bleaching hotspots, and degree heating weeks) to understand how scientists monitor coral bleaching events in order to determine what is happening to the health of coral reefs in the world's oceans. The module offers lessons at five different levels, beginning with basic graph interpretation (Levels 1 & 2) and building towards activities that challenge students to ask questions and develop their own data investigations (Levels 4 & 5).



[Launch Online Module →](#)

Module Resources

Teachers Guide
This guide provides educators with lesson plans, background information and tips and strategies for using the

Student Worksheets (PDF)
These worksheets support the online lessons. Fillable PDFs are digital documents that students can type in and submit to a learning

Student Worksheets (PPT)
Worksheets in this format give educators flexibility to add (or edit) content for a specific grade level or course

Worksheet Answer Keys
Answer keys are available for checking and reviewing answers with students.
[Download PDF →](#)



Investigating Coral Bleaching Using Data in the Classroom

- Introduction
- Level 1
- Level 2
- Level 3
- Level 4
- Level 5
- Get Data
- Teacher's Guide

Coral Reef Locations and Temperature

Coral Reef Habitat and Range

Building upon the earlier maps, analyze this map that combines coral reef locations, average SST, and ocean depth, along with a grid of latitudes and longitudes.

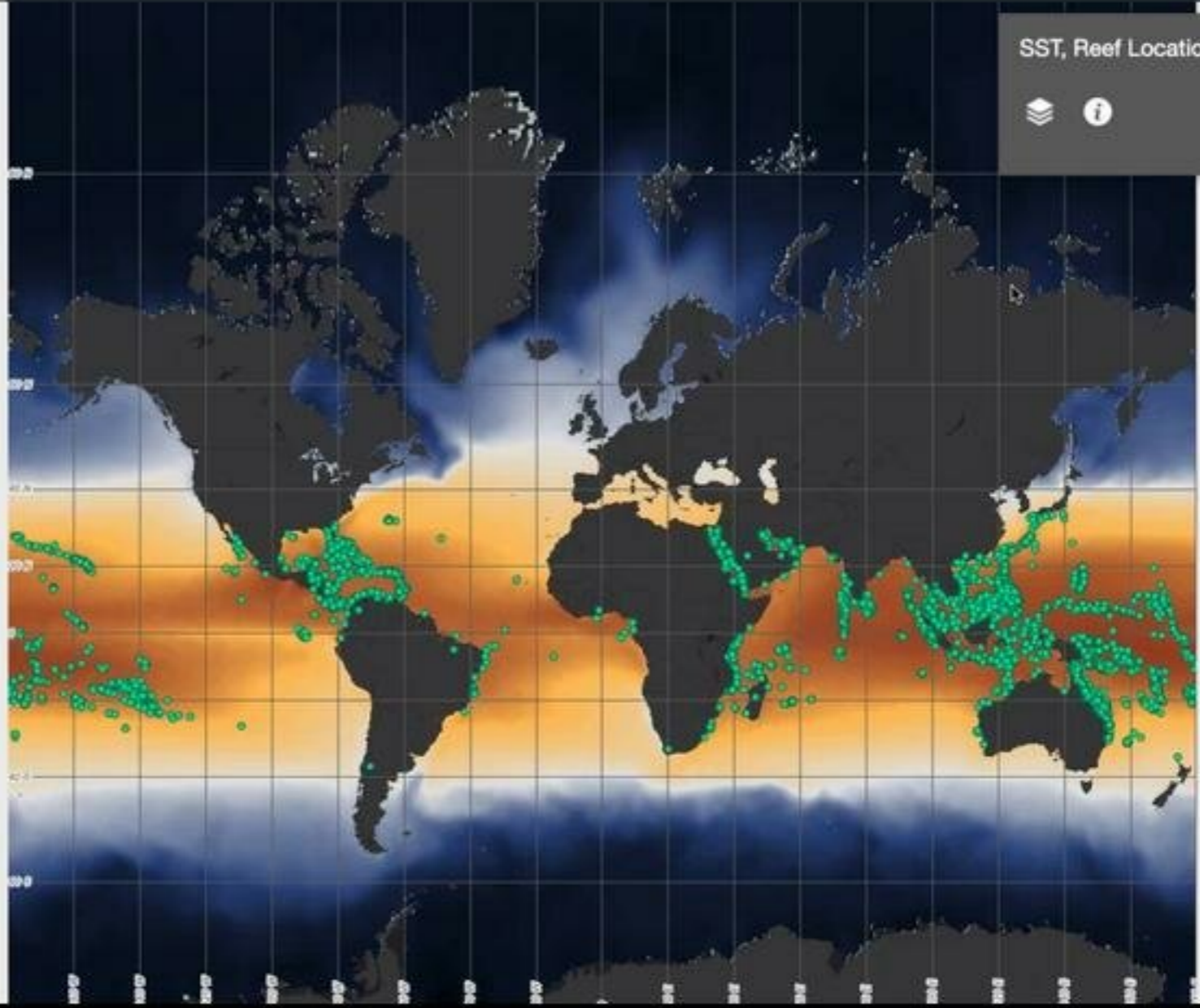
In the Layers box at the upper right, you can turn on/off each layer, or click the ... to the right of the layer name, and in the drop down menu click Transparency. A slider will appear that allows you to change the transparency of a layer.

- Texas
- Hawaii
- Florida
- All of the above



Question 6: Corals have a limited temperature range within which they can live. Most corals survive in temperatures ranging from _____

- 14-18° Celsius
- 18-29° Celsius
- 26-28° Celsius
- 30-32° Celsius

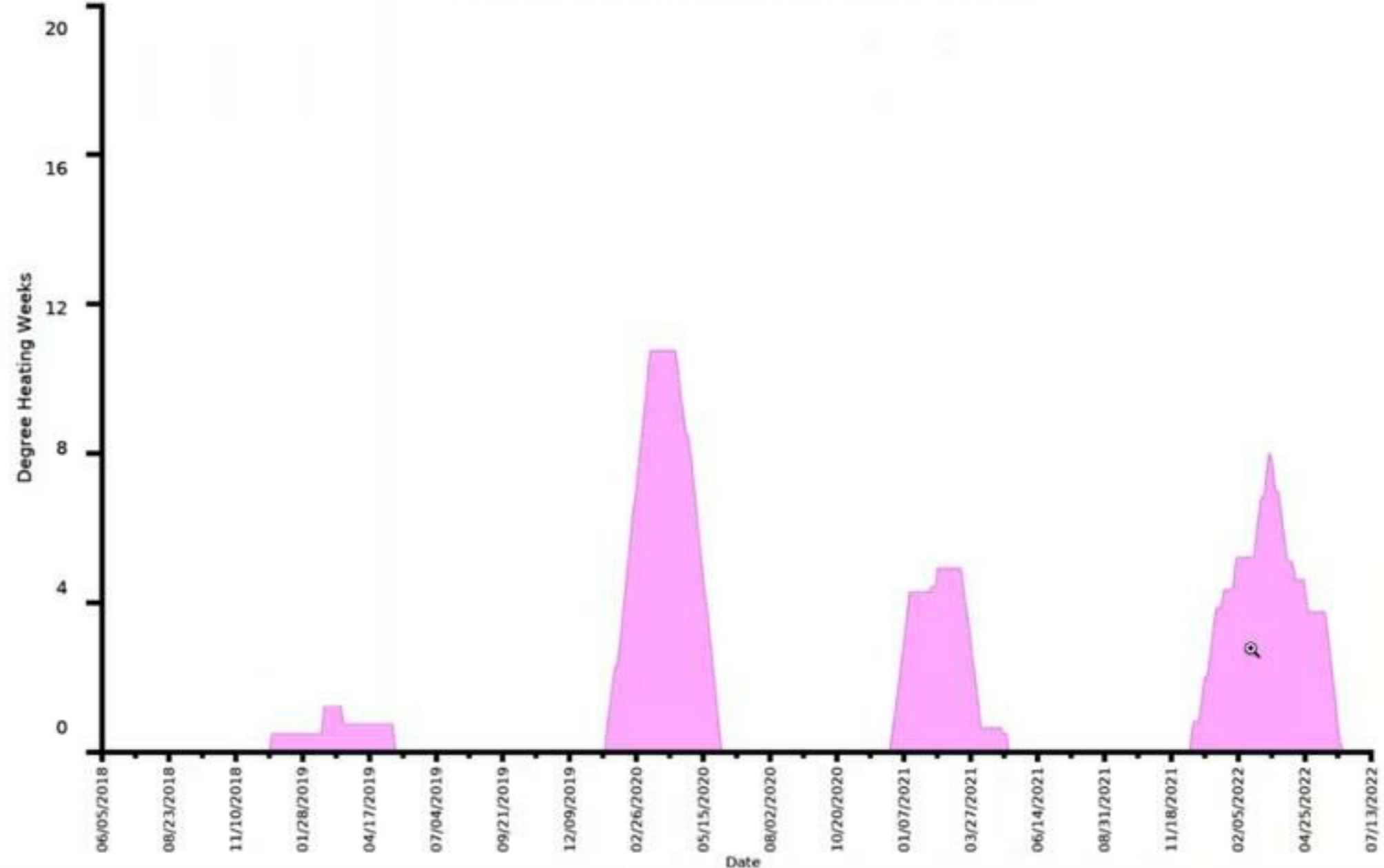
Check my answers



SST, Reef Locations, and Depth



Degree Heating Weeks in Northern Great Barrier Reef



Through the lessons in this module, designed for grades 6-12, students are guided through the use of NOAA data (sea surface temperature and SST anomalies, coral bleaching hotspots, and degree heating weeks) to understand how scientists monitor coral bleaching events in order to determine what is happening to the health of coral reefs in the world's oceans. The module offers lessons at five different levels, beginning with basic graph interpretation (Levels 1 & 2) and building towards activities that challenge students to ask questions and develop their own data investigations (Levels 4 & 5).



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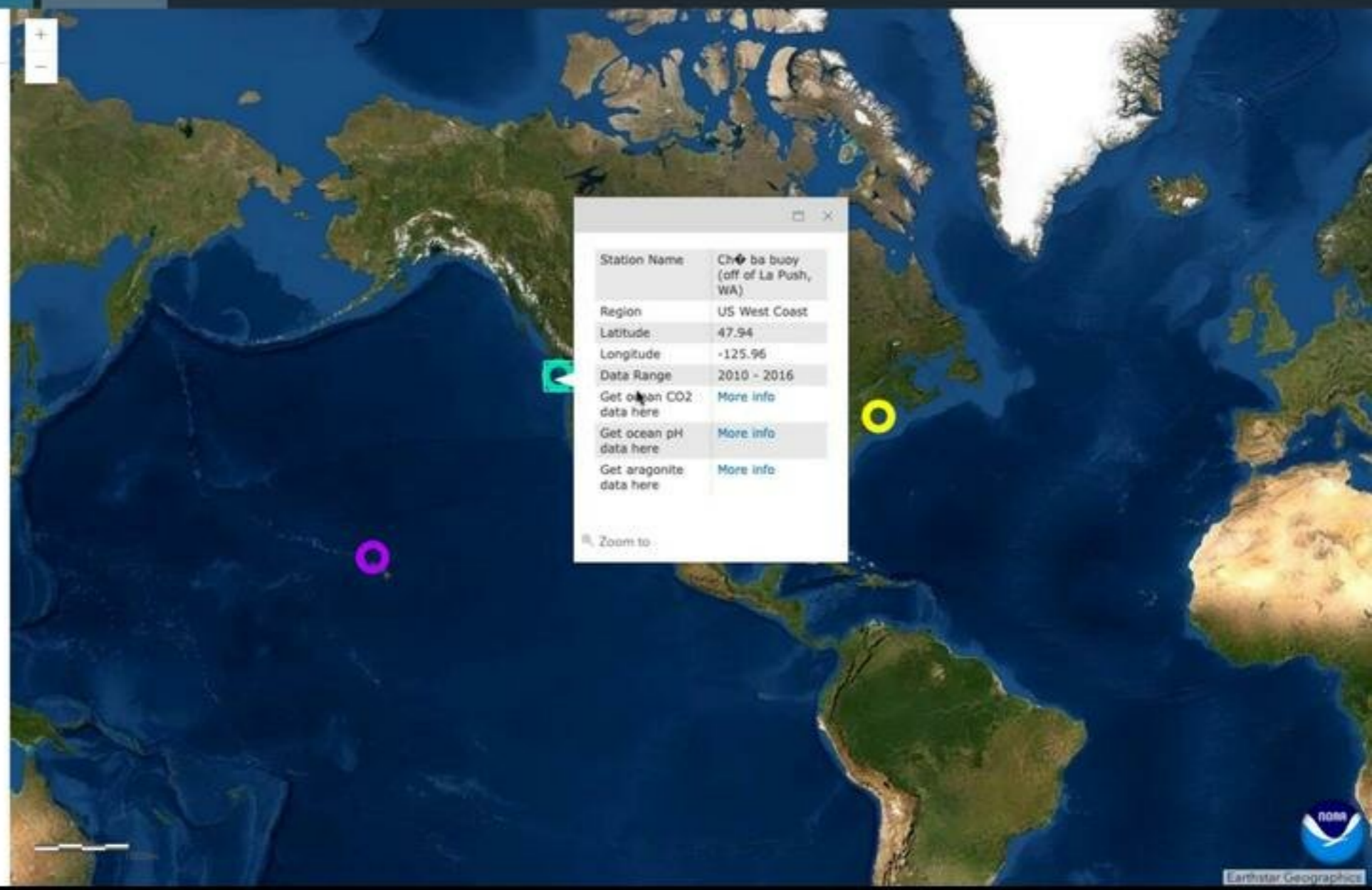
Understanding Ocean and Coastal Acidification

- Introduction
- Level 1
- Level 2
- Level 3
- Level 4
- Level 5
- Get Data**
- Teachers Guide

Get Data

The map tool and links on this page will allow you to access historic, real-time and modeled data from NOAA and their partners. The pH and CO₂ measurements are collected by instruments on autonomous moorings. These instruments can sample chemical, biological, and physical parameters on a continuous basis.

1. **Map tool:** Use the map tool at right to access historic CO₂, pH and aragonite data at three locations.
2. **PMEL coastal mooring data:** Use this link to access real-time data collected by a network of ocean acidification moorings around the United States. Click on any mooring of interest to access real-time CO₂, pH and aragonite graphs.
3. **Model simulation - pH:** Use this link to run a model simulation of surface ocean pH (from 1861 to 2100), based on historical data and future projections of carbon dioxide emissions.
4. **Model simulation - aragonite:** Use this link to run a model simulation of surface ocean aragonite saturation state (from 1861 to 2100), based on historical data and future projections of carbon dioxide emissions.





Press esc to exit full screen



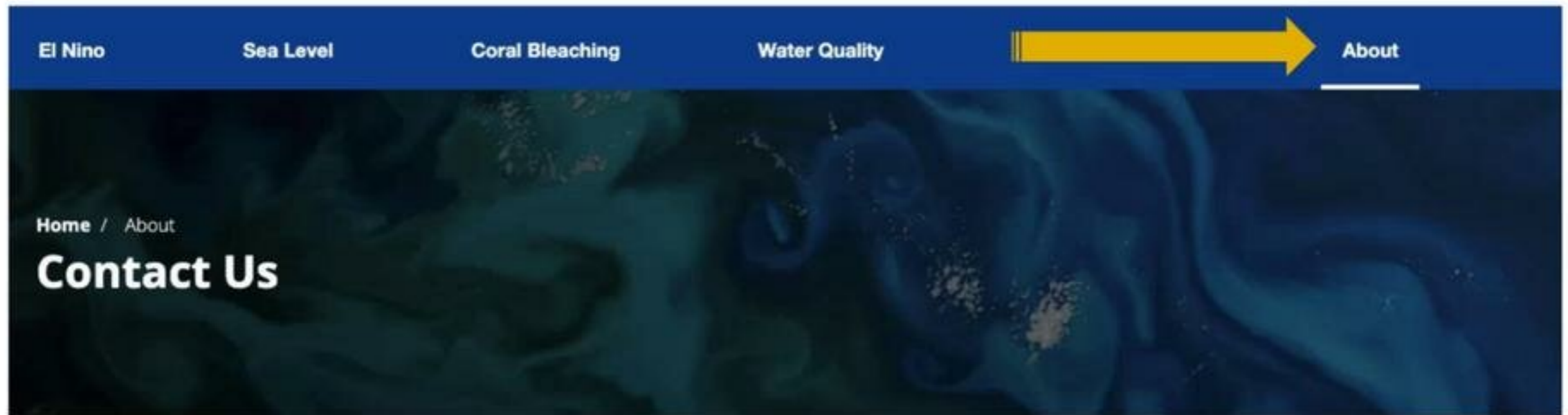
Loading...



Summary: How is DITC using NOAA data to engage audiences about environmental issues?

- HISTORIC data (interactive graphs and maps) used to build skill & understanding.
- REAL TIME data (query tools and models) used to allow users to ask questions about current trends.

Join the Online Community



Contact Data in the Classroom

We're here to help and answer any questions you might have.
We'll do our best to respond to technical questions or needs within 12 hours.

[Sign in to Google](#) to save your progress. [Learn more](#)

* Required

QUESTIONS?

IDEAS? How might these resources be useful for informal educators & audiences?

Amy Dean: dataintheclassroom@noaa.gov

NOAA's Environmental Literacy Program

- One of NOAA's major education grant offerings and has been providing grants since 2005.
- Since 2015, ELP's grant competitions have focused on helping communities build the environmental literacy necessary for resilience to extreme weather, climate change, and environmental hazards
- Active community of practice with 22+ grantees across the country
- We anticipate issuing a new competition in the fall of 2023. Announcing a new cohort of grantees in September!



NOAA's Community Resilience Education Theory of Change

- Provides the **philosophy/rationale** that guides the program.
- **Articulates the value of education** in community, city, state, and national efforts to **build community resilience** to extreme weather, climate change, and other environmental hazards.
- Serves as **a model for how environmental literacy contributes** to resilience that grantees and others working in the field of community resilience might use.
- Variety of uses, such as a guide for evaluation, a resource for grantees and other educators, and a tool to create logic models



Expanding the audience of the Theory of Change

- In its current form, the Theory of Change is a long, technical report.
- The messages within the Theory of Change are relevant for audiences beyond NOAA, ELP grant applicants, and community resilience educators.
- Sought to expand the audience of the Theory of Change to include younger audiences and their families.



Co-produced Activity Book



- ELP co-produced an activity book with Nurture Nature Center and with consultation from other ELP grantees.
- The book explains community climate resilience in an interactive way using the framework of the Theory of Change.
- Primary goal: Empower young people and give them some tools to take action in their own communities

Activity Book

- Activity book with six sections and additional activities plus an accompanying educators' guide
- Each section focuses on a different target area of the Theory of Change
- Target age range is grades 3-8
- All of the materials are 508 compliant
- Worked with an excellent designer from Nurture Nature Center, Keri Maxfield
- Used art by Jessica Bartram, who created images to go along with the Theory of Change, and Tom Maxfield from Nurture Nature Center



Activity Book Purpose

Have fun while learning
about community
resilience

Discover ways to make
a difference

Opportunities, tools
and resources for
educators to engage
their youth

Earn Resiliency Badges!

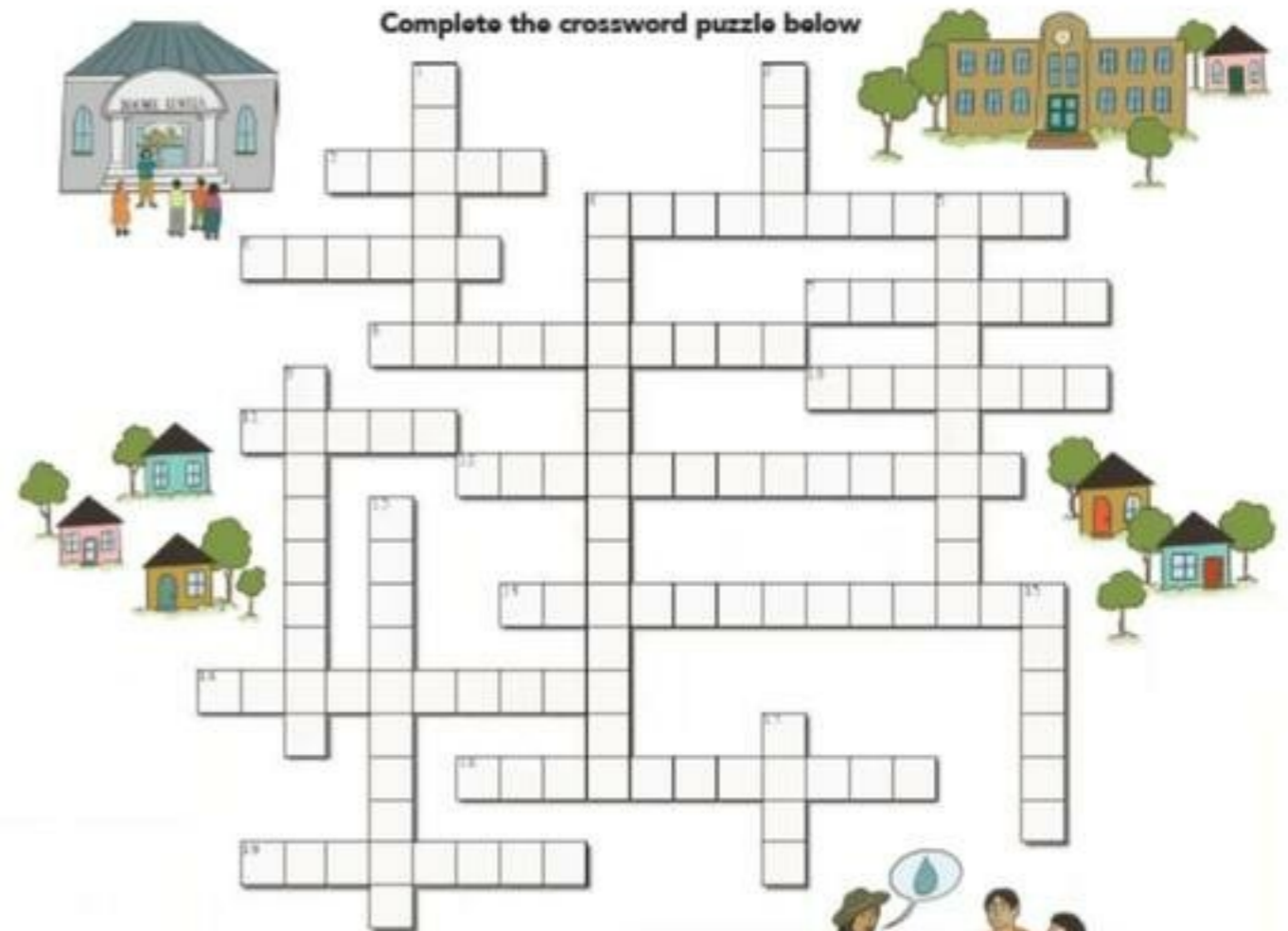


Think about where you live. Have you ever been in a strong storm? Have you ever experienced flooding, a wildfire, or really hot days? These types of environmental hazards are happening more often because of climate change. Even though these events can be scary, there is so much you can do in your own community to make it better able to handle these challenges. When we work together to protect our communities from environmental hazards, we are building community resilience.

Education

Learn about key vocabulary related to community and climate resilience.

Discover innovative projects NOAA supports that work to reduce vulnerabilities and risk to climate change.



Across

3. relating to government
4. working together to a shared goal
6. an event or condition that may cause injury, illness, or death to people or damage to property
7. effects on life and places that result from hazards
8. being able to plan for, recover from, and adapt to negative impacts

Down

1. many different perspectives
2. National Oceanic and Atmospheric Administration

Activity:
Exploring Your Community



Research important questions about your community.

Discover community assets and strengths.

Community Resources

8 Does your community have a resilience or climate action plan? See if you can find the plan and the year it was created. If your community does not have a plan, try to find one from a similar community.

10 Are there organizations working in your community to help make it better? What is the name of one of these organizations, and what are they doing to improve the community?



Traditional Ecological Knowledge

Activity:
Exploring the Seasons

Learn about TEK and explore several examples related to seasons and activities.

Make your own table of activities.



Discover the Indigenous Peoples that live/lived in your community.

Traditional subsistence seasons

Subsistence is the act of harvesting plants and animals from the local environment for survival during specific times of the year or seasons. On the Arctic coast of Alaska, the Inupiat peoples define the seasons by the availability of resources. The table below describes traditional subsistence seasons for the Inupiat communities and changes in their environment affecting subsistence that they have observed.



Season	Month/s	Description	Observed Change
Tom-cod	January	Chop holes in ice near shore and jig for tom-cod.	Delayed sea ice development.
Winter Caribou, Crab	February, March	Caribou hunting inland. Use baited wire to catch crab through ice.	Variable weather conditions.
Whaling	April, May	In late March or early April, flocks of snowbirds are migrating and in the ice leads, bowhead and beluga.	Thin ice conditions interrupt sea ice-based hunting.
Bearded Seal, Seal Ducks, Geese	June, July	Sea ice breaks up and hunters switch to open boats to hunt bearded seal and seal species. Bird hunting.	Poor ice conditions.
Summer Caribou, Egg Gathering, Salmon, Arctic Char	August	Caribou often come down to the coast in summer and can be hunted by boat. Catch fish and trout with beach seine nets.	Temperature is too hot for drying fish and meat.
Fall Caribou, River Fish	September, October	Hunting for caribou until river freeze up, also time in fish camps, berry picking, and hunting ptarmigan and other birds.	Delayed caribou arrival.
Seal, Polar Bear	November, December	Venturing out onto the sea ice hunting seal and occasionally polar bear.	Delayed sea ice development.

Footnote: B. (1992): *The Tiagara Eskimos and Their Environment*. North Slope Borough Commission on Inupiat History, Language and Culture, Point Hope, Alaska.

Community Preparedness

Activity:
iSpy and Community Tour

Being More Sustainable

- People planting trees
- Building with green roof (roof that is covered with plants/vegetation)
- Building with green wall (walls that are covered with plants/vegetation)
- Teachers and students creating a rain garden



Discover indicators of a resilient community in a fun iSpy activity.

Think about your own community and draw places where it is resilient.



Places for Learning and Action

- Aquarium
- Planetarium
- Library
- Science Center
- City Hall (a place where youth and adults can present their ideas to officials)
- A group of students gathered outside to show support for resilience action

Activity:
Writing a Headline and Short
Article About Environmental Justice

Environmental Justice



Gridlock is just one of the negative impacts of the main highway in Highwaytown, USA

Uranium mine brings both economic opportunities and health impacts to the community

Learn about EJ.

Read news articles about EJ issues.

Research EJ issues in your community and talk to others.

Write an article.

Action

Create a story about one of the characters in the activity book.



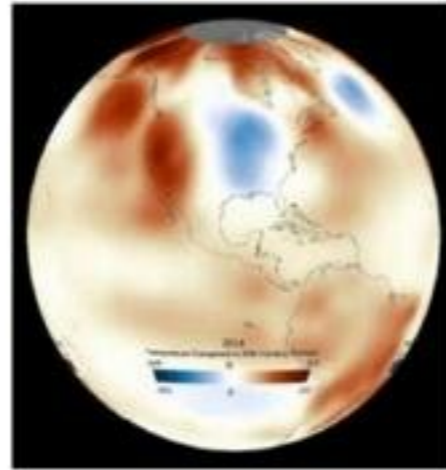
Activity:
Telling a Story and Taking Action



Think about actions you can take in your community and devise a plan.

Commit to taking action!

Activities to Continue to Learn and Explore



Citizen Science



Science on a Sphere activity exploring temperature change

Citizen science opportunities



Steps to Resiliency Badges

Youth add up their points for each section.
Total number shows which badge they earn.
Badges correspond to the U.S. Climate Resilience Toolkit steps:

1. Explore Hazards
2. Assess Vulnerability and Risks
3. Investigate Options
4. Prioritize and Plan
5. Take Action

Badges highlight the importance of the process and journey.

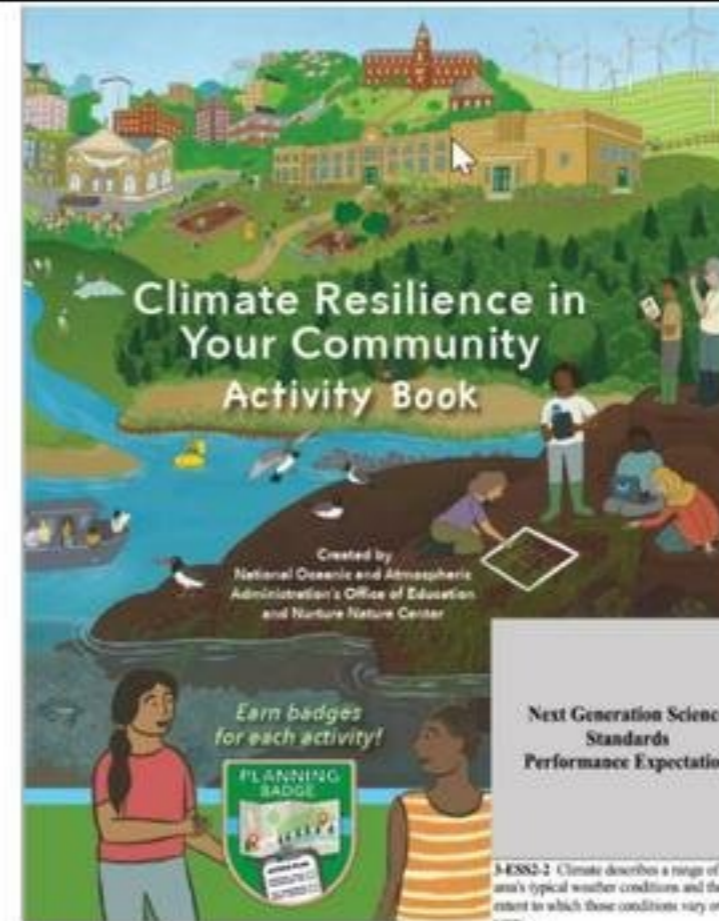


Educators' Guide

Instructions for how the activities can be used in the classroom or other learning environments.

A table showing the alignment of the activities with the Next Generation Science Standards.

Links to additional education resources that relate to these topics that have been developed by NOAA's education grantees.



Next Generation Science Standards Performance Expectation	Activity					
	Education Activity	Community Resources Activity	Community Preparedness Activity	Environmental Justice Activity	Traditional Knowledge	Action Activity
4-ESS2-2 Climate describes a range of an area's typical weather conditions and the extent to which these conditions vary over years. [ESS.2B]	☛	☛	☛		☛	☛
3-ESS3-1/4-ESS3-2 MS-ESS3-5 A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. [ESS3.B]	☛	☛	☛	☛	☛	☛
5-ESS3-1 Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, oceans, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. [ESS3.C]	☛	☛	☛		☛	☛
MS-ESS3-5 Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. [ESS3.D]	☛	☛	☛	☛	☛	☛

What's Next for the Activity Book

- You can access the activity book here:
www.noaa.gov/resilience-activity-book
- Will be distributed as part of the Earth Science Week 2022 Toolkit that accompanies their annual calendar
- Print versions available by request from the NOAA Outreach Center:
education@noaa.gov
- We are starting to think about future collaborations to translate the activity book and further increase its accessibility

