



# GLOBE Virtual Training

## Hydrosphere & Pedosphere

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Linda Hayden

July 18, 2020

2 pm – 4 pm



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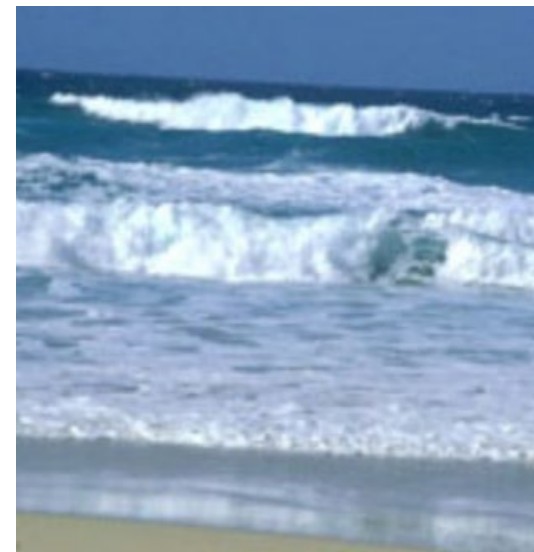




# Our Agenda - Hydrosphere

- Introductions/Ice breaker
- Review GLOBE Protocols – Hydrosphere
  - Alkalinity - Conductivity
  - Dissolved Oxygen
  - Nitrates
  - Salinity
  - Water Temp & Transparency
- pH

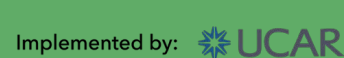
- Data Entry Log
- GLOBE Observer
- Freshwater Macroinvertebrates
- Mosquito Habitat





# Our Agenda - Pedosphere

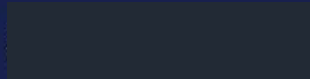
- Soil Protocols
- "Why do we study soil?"
- "Digging around " - A Field View of Soil.
- "From Mud Pies to Bricks"
- "Just Passing Through"
- "Just Passing through" (Beginners Version)





# About Me



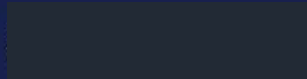


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## GLOBE stands for:

- a. Global and Latitude Observations to Benefit Everyone
- b. Glad to Live On Beautiful Earth
- c. Good Living Observations to Benefit Education
- d. Global Learning and Observations to Benefit the Environment



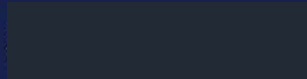


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# What is GLOBE?



**G** Global  
**L** Learning and  
**O** Observations  
**B** to Benefit the  
**E** Environment



[globe.gov](http://globe.gov)





# GLOBE Investigation Areas

## Biosphere

The biosphere includes plant life and land cover.



## Geosphere

The geosphere (**pedosphere**) includes rocks and soil.



## Atmosphere

The atmosphere includes the air around the earth and weather.



## Hydrosphere

The hydrosphere includes water on Earth, in rivers, lakes, and the ocean.







# THE GLOBE PROGRAM



## THE GLOBE PROGRAM

A Worldwide Science and Education Program



SIGN IN

ENGLISH 

About

Get Started

Get Trained

Do GLOBE

GLOBE Data

Community

News & Events

Support

**2020 GLOBE Virtual All-Hands**  
REFLECTING ON THE PAST, LOOKING FORWARD  
July 13-16 • #VirtualGLOBE



Meeting Takes Place This Week  
will be hosting our annual meeting



- By Earth Sphere >
- GLOBE Teacher's Guide (Protocols) >
- Student Research Reports
- Elementary GLOBE
- Classroom Activities >
- Research & Resources >
- GLOBE Observer Website
- Measurement Campaigns >
- Zika Education and Prevention Project
- Translated Material >



Help K-12 Students  
Home  
Learn More About Our  
Program

See GLOBE in your Country or Region:

<https://www.globe.gov/do-globe>



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# Navigating GLOBE - Hydrosphere

- **Hydrosphere**

- Establish a sample site
- Know your students and train young scientist
- Cross train students - delegate jobs
- Equipment
- Data log procedure and entry

- **Learning Activities**

[Learning Activities ! ?](#)

- [Selecting and Documenting Your Hydrosphere Study Site](#)





# Lesson Planning in the classroom - “Where do we start?”

Selecting and Documenting your water site

Practice your Protocols

Water Walk

Water Detectives

Model a Catchment Basin

Freshwater Macroinvertebrates Protocol



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# Digging deeper into data - Hydrosphere

Modeling your water balance

Water Collection

Dissolved Oxygen

Freshwater Macroinvertebrates : Instrument Construction

Freshwater Macroinvertebrate technique



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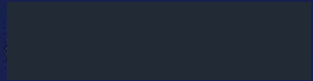


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# Hydrosphere Continued

**Water Transparency instrument construction**

**Water Collection Protocol**

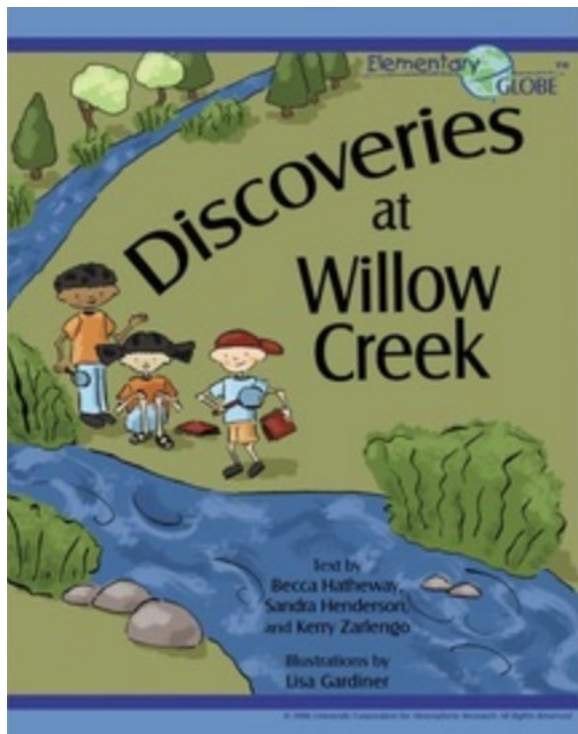
**pH Protocol**



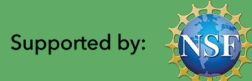


# Hydrosphere Picture Books

- Elementary GLOBE - "Discoveries at Willow Creek"



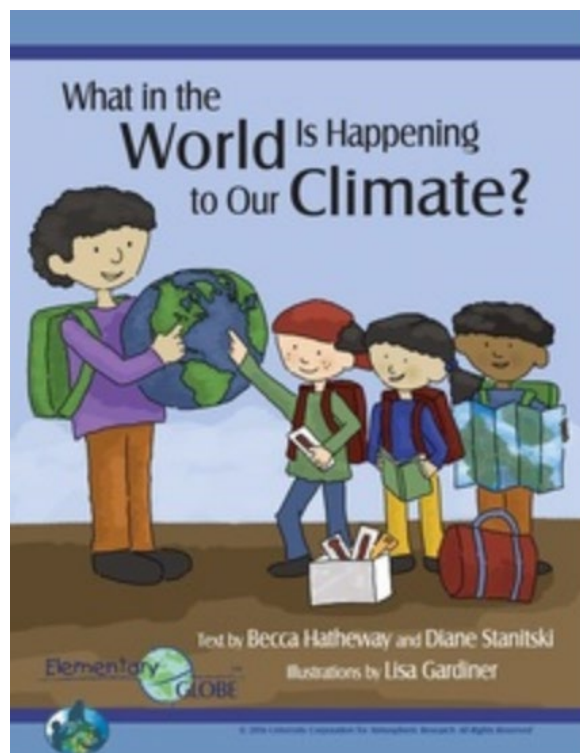
**Students learn how to describe a creek by making observations, taking measurements, and looking for macroinvertebrates. They get to know tools for making science observations.**



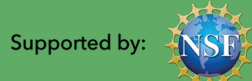


# Hydrosphere Picture Books

- [Elementary GLOBE - "What in the world is happening to our climate?"](#)



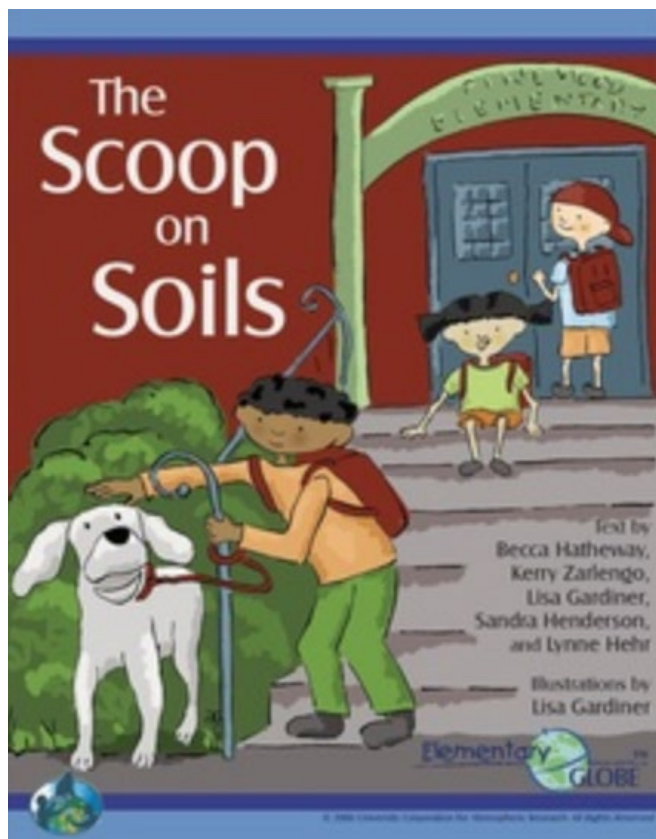
**Through the storybook and activities, students learn about regional climate variations and how climate change is affecting our world. Then students consider what we can do to solve climate change.**





# Pedosphere Picture Books

## The Scoop on Soils



**Students investigate how soils are different in different locations, learn to describe what they find in soil, and explain the importance of soil to plants and animals.**

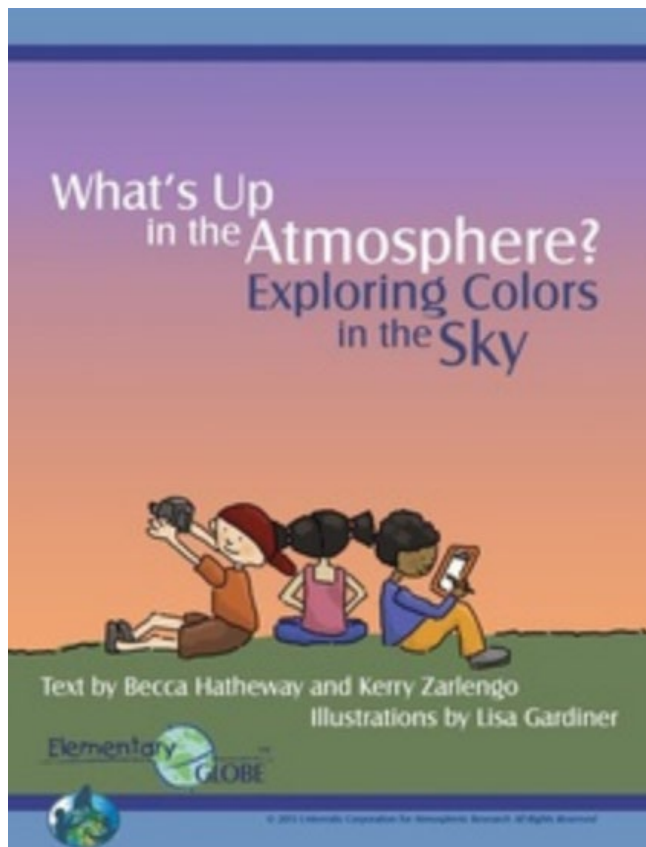






## Atmosphere Picture Books

### What's up in the atmosphere



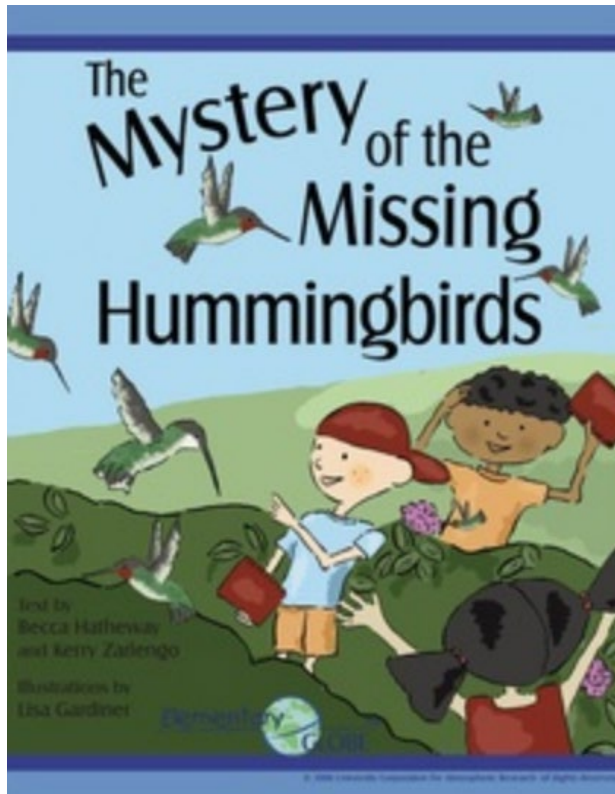
**Students consider how and why aerosols and other types of air pollution affect the color of the sky and learn how to describe sky color and conditions in the atmosphere.**





## Biosphere Picture Books

### [The Mystery of the missing Hummingbirds](#)



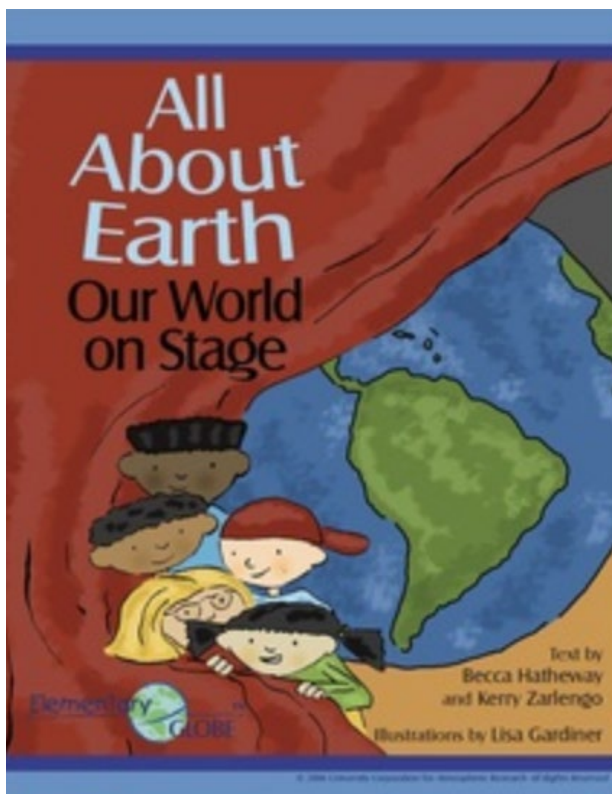
**Students learn how hummingbirds deal with seasonal changes and use science journals to describe the seasonal changes in their local environment.**





## Earth System Picture Books “Bring it all together”

All about Earth - "Our World on Stage"



**Students explore how water, air, soil, and living things interact in the Earth system and how they are all important parts of our planet.**





# Let's Talk

- 1. Describe the four spheres in GLOBE.**
- 1. What would be the best approach to teach students about the spheres in GLOBE?**
- 1. What is the difference between a Transparency Tube and Secchi Disk and how are they similar.**





## **Let's Talk Answers:**

**1. Atmosphere, Biosphere, Hydrosphere,  
Geosphere (Pedosphere)**

**1. Teach as a cycle not in isolation.**

**1. Transparency Tube is better for shallow water  
clarity, Secchi Disk used for deeper water clarity.  
They both measure water clarity.**



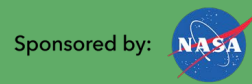


# GLOBE Observer



- Free Download
- Sign up with an email address
- Start being a citizen scientist

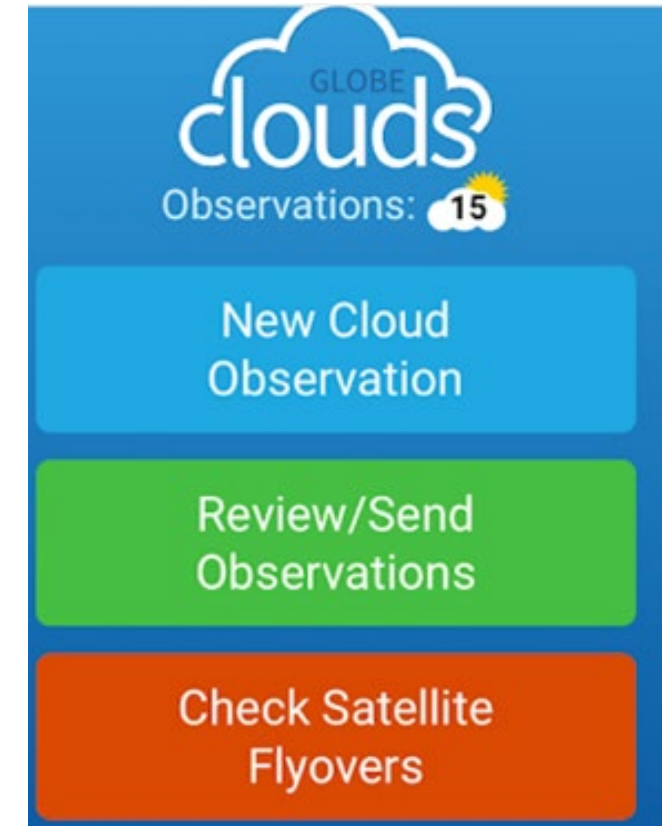
Choose Your Data Collection Tool

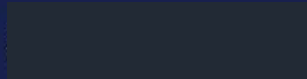




# Make Cloud Observations Frequently

- Take a peek out of your nearest window
  - Look up into the sky
  - What do you see?
    - Clouds?
    - Contrails?
    - Cloud height (high, medium, low)
    - Sky color (light blue, blue, dark blue)
    - Sky clarity (unusually clear, clear, hazy)





**BREAK – 5 minutes and 35 seconds**







# Pedosphere - Our Soil

- Soil Protocols
  - "Why do we study soil?"
  - "Digging around " - A Field View of Soil.
  - "From Mud Pies to Bricks"
  - "Just Passing Through"
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# Pedosphere

## Pedosphere Protocols

- **SMAP - Soil Moisture Active Passive**
- **Soil Characterization Protocol**
- **Soil Fertility Protocol**



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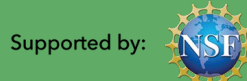
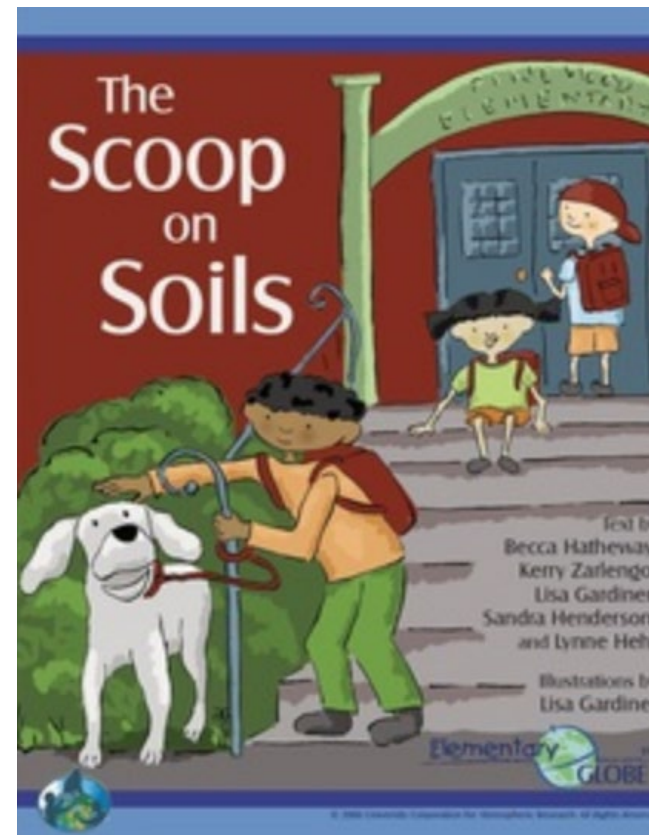
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## Pedosphere Protocols Continued

- **Soil Infiltration Protocol**
- **Soil infiltration Data Sheet**
  
- **Soil pH Protocol**

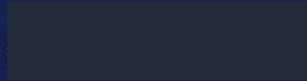




# Making Connections: Hydrosphere and Pedosphere

Let's Chat: What connections do you see with these two spheres?





## Tips for Classroom implementation with GLOBE

1. Start small (Data sheets in One Notebook)
2. Cloud Observation twice a week
3. Train small group of students
4. Cross train ( Month later)
5. Invite fellow Science Teachers (Science Club)
6. Invite Community, Environmental Supporters
7. Collaborate with local High Schools and Universities





# Many Thanks



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