

From Science Labs to Your Homes: Be Citizen Scientists during the Solar Eclipse



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GLOBE Mission EARTH (The University of Toledo)

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What is GLOBE Mission EARTH?



- Funded by NASA
- Get teachers and students to collect / submit GLOBE data and use NASA resources
- Provide K-12 teacher professional development (PD)
- Engage the public on GLOBE and NASA resources



GLOBE (<http://www.globe.gov>)

- International Program
- People all over the world collect data and submit the data to the GLOBE website
- Study what is happening all around the world



Citizen Science

An individual

- who voluntarily contributes his or her time, effort, and resources toward scientific research in collaboration with professional scientists or alone
- May not necessarily have a formal science background
- May coincide with hobby, interest, or curiosity
- Uses your mobile phone or the internet to collect and submit observations and to see results



Examples of Citizen Science

Project	Description
Bee Spotter	Contribute data to a nationwide effort to collect baseline information on population status of bees in IL, IN MO, OH.
National Wildlife Association	Fun with Frogs! , Beauty of Birds , Fabulous Firefly Festivities , Monarch Mayhem! , Monarch Butterfly Journey North , Birds in Your Backyard , Be a Star Gazer
Project BudBurst	Collect important climate change data based on the timing of leafing and flowering of trees and flowers (there is also a GLOBE protocol)
Globe at Night	Raise public awareness of the impact of light pollution by inviting citizen-scientists to measure & submit their night sky brightness observations. (App)
SETI	Uses Internet-connected computers in the Search for Extraterrestrial Intelligence (SETI). You participate by running a free program that downloads and analyzes radio telescope data.



GLOBE Citizen Science – Become part of a team



The screenshot shows the GLOBE Observer website in a Safari browser window. The address bar displays "observer.globe.gov". The page features a blue header with the GLOBE Observer logo and a "Sign In" link. Below the header is a green navigation bar with links for "About", "News & Events", "Training", "Data", "Science Connections", "Observer Community", "Tips & Help", and a "Get the App" button. Underneath the navigation bar are three buttons: "Get the App", "See the Data", and "Get Training". The main content area displays a featured article titled "Cloud Effects On Earth's Radiation" with a diagram and a text box that reads: "Did You Know... GLOBE Observer: Clouds is Getting an Update! Watch for GLOBE Observer News updates, where we'll share the new look of cloud observations and unveil updated".

- Use the GLOBE Cloud Observer App

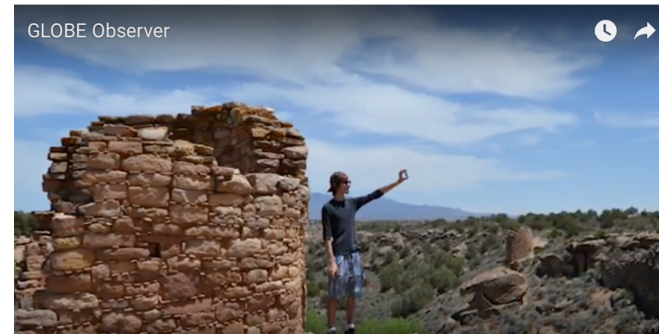
- Submit your Observations on a regular basis

- <http://observer.globe.gov/about/team>



WHY – GLOBE Citizen Scientist

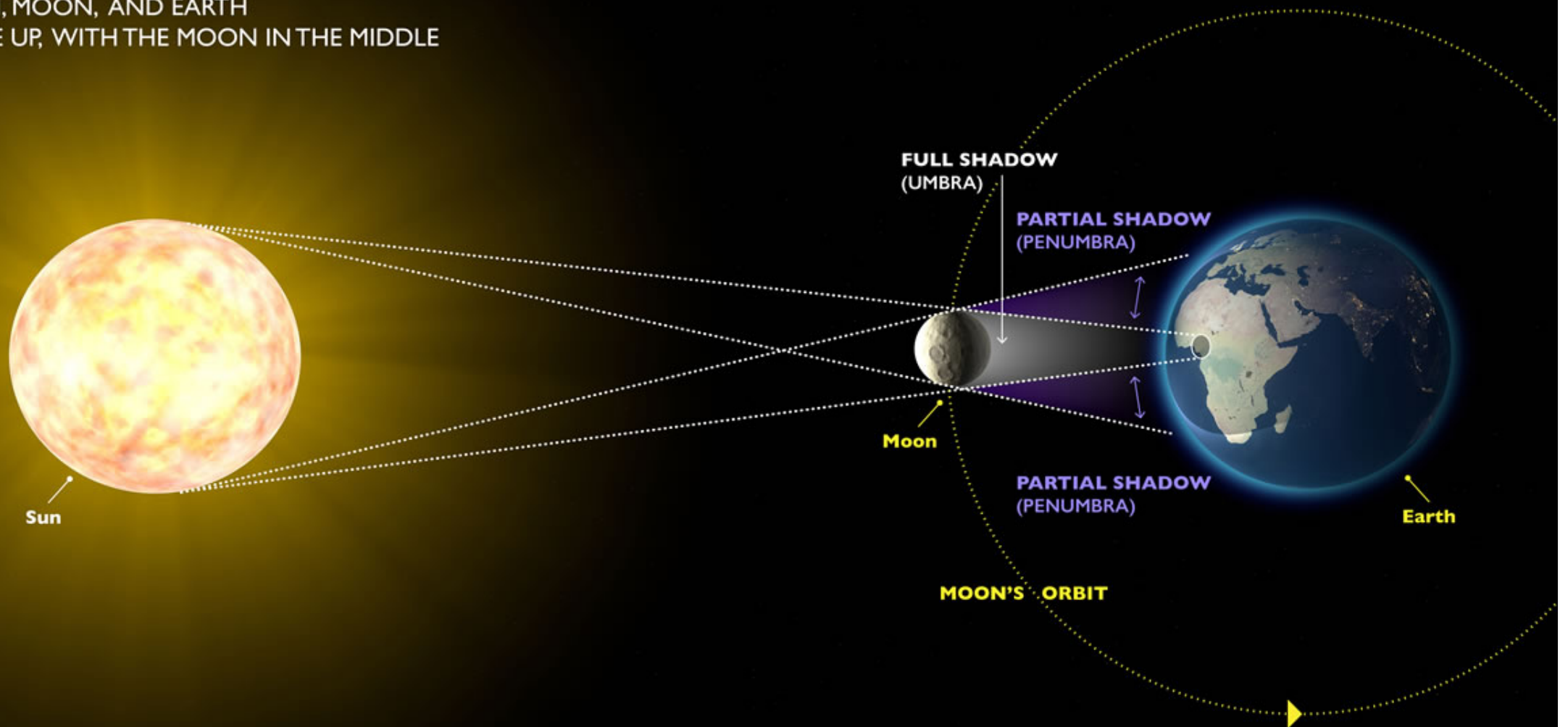
The cloud observations help NASA scientists understand clouds from below (the ground) and above (from space)



What is a Solar Eclipse? <https://nightsky.jpl.nasa.gov/>

SOLAR ECLIPSE

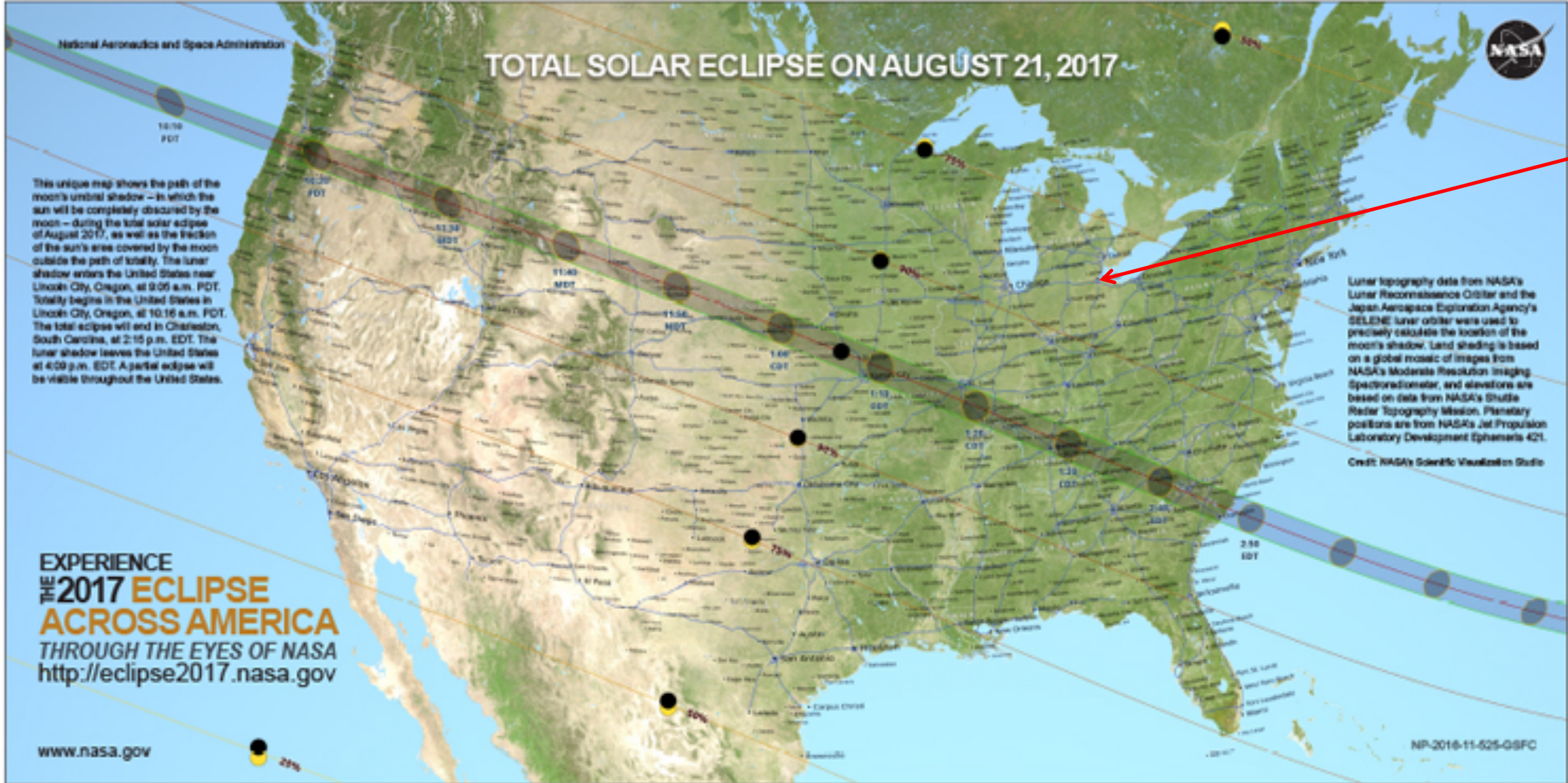
SUN, MOON, AND EARTH
LINE UP, WITH THE MOON IN THE MIDDLE



Not to scale

<https://youtu.be/XX7AxZhPrqU>





- <https://eclipse2017.nasa.gov>



What will it look like in Toledo

<p>Max View in Toledo</p>  <p>Monday, August 21, 2017 at 2:27 pm</p>	<p>Global Type: Total Solar Eclipse</p> <p>Toledo: Partial Solar Eclipse</p> <p>Begins: Mon, Aug 21, 2017 at 1:02 pm</p> <p>Maximum: Mon, Aug 21, 2017 at 2:27 pm</p> <p>Ends: Mon, Aug 21, 2017 at 3:48 pm</p> <p>Duration: 2 hours, 46 minutes</p>	
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<https://www.timeanddate.com/eclipse/in/usa/toledo?iso=20170821>



To Observe: Use Solar Glasses



Stand still and cover your eyes with your eclipse glasses or solar viewer before looking up at the bright Sun. After glancing at the Sun, turn away and remove your filter — do not remove it while looking at the Sun.



Use glasses with special-purpose solar filters, such as “eclipse glasses” (example shown at left) or hand-held solar viewers. (To date four manufacturers have certified that their eclipse glasses and hand-held solar viewers meet the ISO 12312-2 international standard for such products: Rainbow Symphony, American Paper Optics, Thousand Oaks Optical, and TSE 17.)



SAFETY!!! (Handout)

- Do NOT look directly at the Sun
- Always inspect your solar filter before use; if scratched or damaged, discard it.
- Read and follow any instructions printed on or packaged with the filter.
- Always supervise children using solar filters.
- Stand still and cover your eyes with your eclipse glasses or solar viewer before looking up at the bright Sun. After glancing at the Sun, turn away and remove your filter — do not remove it while looking at the Sun.
- Do not look at the unclipsed or partially eclipsed Sun through an unfiltered camera, telescope, binoculars, or other optical device.
- Do not look at the Sun through a camera, a telescope, binoculars, or any other optical device while using your eclipse glasses or hand-held solar viewer.
- Seek expert advice from an astronomer before using a solar filter with a camera, a telescope, binoculars, or any other optical device.
- An alternative method for safe viewing of the partially eclipsed Sun is pinhole projection.



Let the Training Begin!





THE GLOBE PROGRAM

Cloud Identification Chart



2016

Sponsored by:



Supported by:



Implemented by UCAR

Kevin will be doing clouds



When Should You Take Observations?

In the GLOBE Observer App



Upcoming Flyovers

Saturday, February 25, 2017

Suomi National Polar Orbiting Partnership
Feb 25, 2017 2:29:05 AM

Aqua
Feb 25, 2017 2:39:42 AM

Terra
Feb 25, 2017 12:04:26 PM

Aqua
Feb 25, 2017 1:45:32 PM

Suomi National Polar Orbiting Partnership
Feb 25, 2017 1:52:18 PM


Terra
Feb 25, 2017 11:10:25 PM

Sunday, February 26, 2017

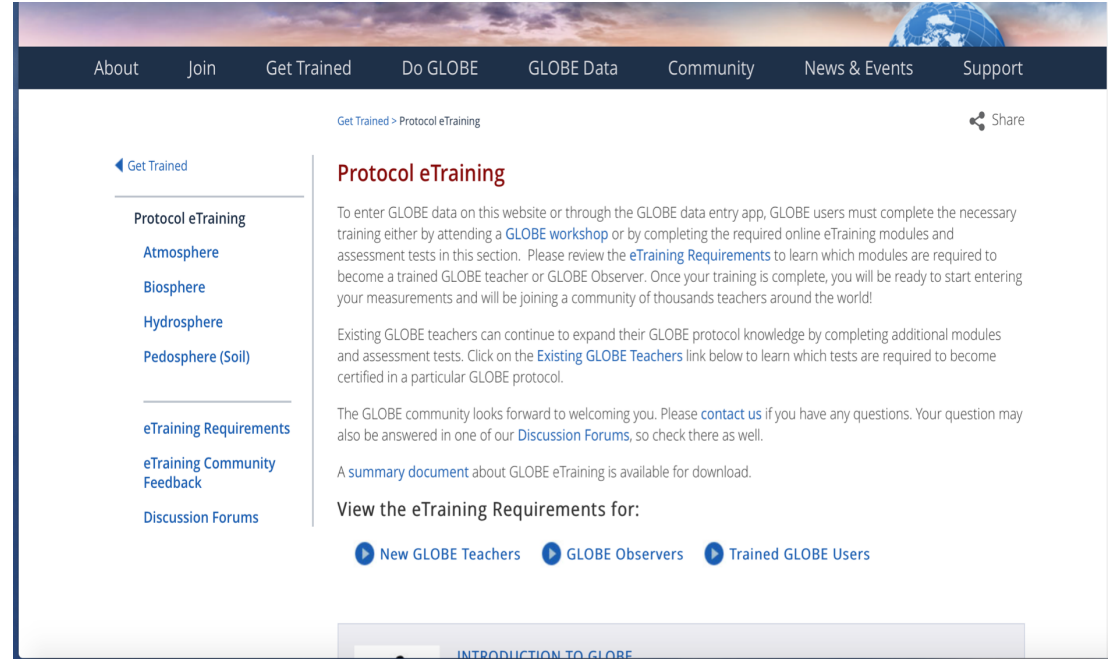
7 1:44:30 AM

Home, Bar Chart, Home, Satellite, Key, Help icons

GLOBE E TRAINING



The screenshot shows the main navigation menu with links for About, Join, Get Trained, Do GLOBE, GLOBE Data, Community, News & Events, and Support. The 'Get Trained' section is highlighted, featuring a photo of a woman in safety gear and gloves demonstrating a procedure to a group of students outdoors. Below the photo is a 'Get Trained' link and a brief description: 'GLOBE offers trainings around the world. In order to provide high-quality data to the scientific community, teachers are...'



This screenshot shows the 'Protocol eTraining' page. It includes a navigation menu with links for About, Join, Get Trained, Do GLOBE, GLOBE Data, Community, News & Events, and Support. The 'Protocol eTraining' section is highlighted, featuring a photo of a woman in safety gear and gloves demonstrating a procedure to a group of students outdoors. Below the photo is a 'Get Trained' link and a brief description: 'GLOBE offers trainings around the world. In order to provide high-quality data to the scientific community, teachers are...'

<http://www.globe.gov/get-trained>

<http://www.globe.gov/get-trained/protocol-etaining>



GLOBE Observer App

Get the App

- Get the App
- Need to register with your email address
- Check email to accept the app



GLOBE Observer invites you to make environmental observations that complement NASA satellite observations to help scientists studying Earth and the global environment. The latest version includes GLOBE Clouds, which allows you to photograph clouds and record sky observations and compare them with NASA satellite images. GLOBE is now the major source of human observations of clouds, which provide more information than automated systems.

Future versions of GLOBE Observer will add additional tools for you to use as a citizen environmental scientist.

By using the GLOBE Observer app, you are joining the GLOBE community and contributing important scientific data to NASA and GLOBE, your local community, and students and scientists worldwide.

New and interested users are encouraged to go to <http://www.globe.gov> to learn more about the GLOBE program, or learn more about the [GLOBE Clouds protocol](#). A [one page summary of GLOBE Observer](#) is available too.

Download the app:

[For iOS via the App Store](#)

[For Android via Google Play](#)



Janet.struble2@utoledo...



Choose your protocol:



Visit the GLOBE Website



Janet.struble2@utoledo...



Observations: 4

New Cloud Observation

Review / Send My Cloud Observations

Check Satellite Flyovers

See My Data

Select Organization

Which organization are you making this measurement for?

The University Of Toledo >

TrainTheTrainerSchool - Tennessee >



Time and Location

Enter the **local** date and time of the observation:

Feb 21, 2017

2:17 PM

Enter location coordinates:

Latitude: 41.6601

Longitude: -83.6130

Next

Cloud Coverage

Is the sky Clear, Cloudy, or Obscured?

Clear (no clouds visible) >

Clouds Visible (1-100% covered by clouds or contrails) >

Obscured (more than 25% of the sky is not visible) >



Types of Clouds

What percentage of the sky is covered by clouds?

Enter your cloud percentage ▾

Click all cloud types seen:

High in the Sky

^ v Done

- Clear 1 to 10%
- Isolated 10 to 25%
- Scattered 25 to 50%
- Broken 50 to 90%**
- Overcast 90 to 100%

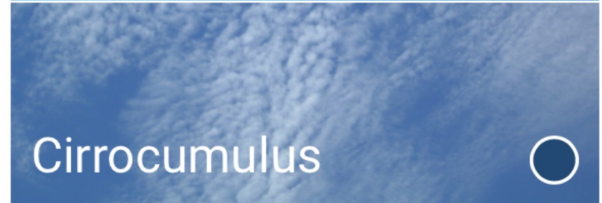
Broken 50 to 90%

Click all cloud types seen:

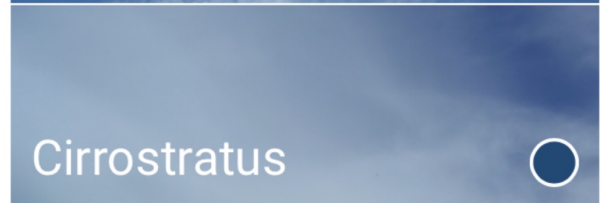
High in the Sky



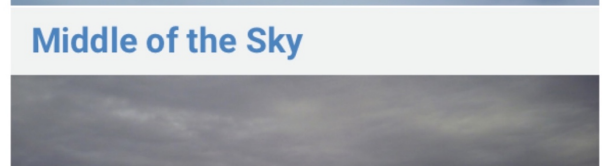
Cirrus



Cirrocumulus



Cirrostratus

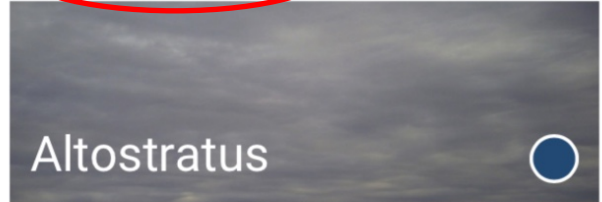


Middle of the Sky



Cirrostratus

Middle of the Sky

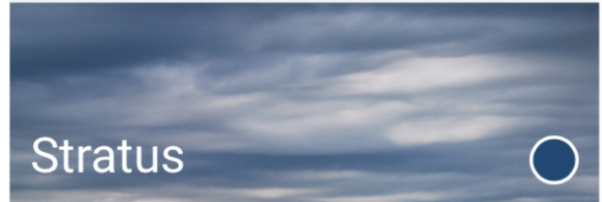


Altostratus



Altostratus

Low in the Sky



Stratus



Altostratus

Low in the Sky



Stratus



Stratocumulus



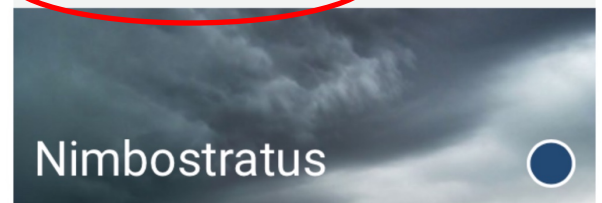
Cumulus

Rain or Snow Clouds

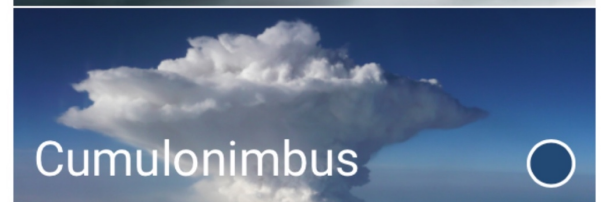


Cumulus

Rain or Snow Clouds



Nimbostratus



Cumulonimbus

Next





Are there contrails in the sky?

No contrails >

Contrails are visible >



What percentage of the sky is covered by contrails?

0 to 10% ▼

Choose the number of contrail types seen:



^ v Done

0 to 10%

10 to 25%

25 to 50%

Greater Than 50%

Choose the number of contrail types seen:

Short Lived

- 0 +

Persistent Non Spreading

- 0 +

Persistent Spreading

- 0 +



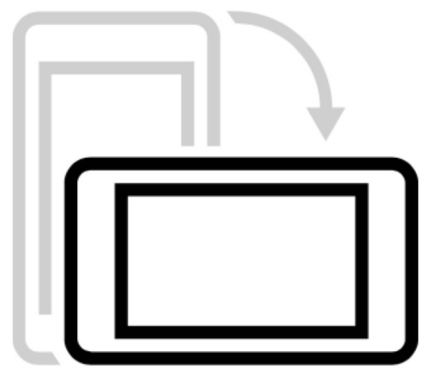
Next

Take pictures of the sky?

Take Pictures

Add Pictures Manually

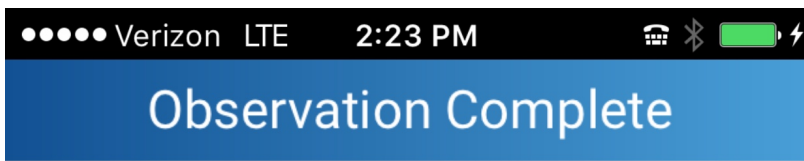
Skip Pictures



Rotate your device to landscape to take pictures.
Finished Taking Pictures

Take Pictures

North Caption	South Caption
East Caption	West Caption



Thank you, your data has been stored successfully on your device and is ready to send to GLOBE.

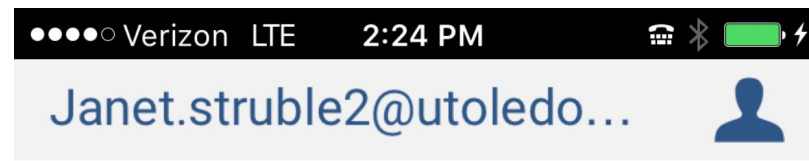
Cloud App Home

Review / Send My Cloud Observations

Share



DON'T FORGET TO SEND YOUR DATA TO GLOBE!!!









3 observations collected

Select All

Clouds Observations

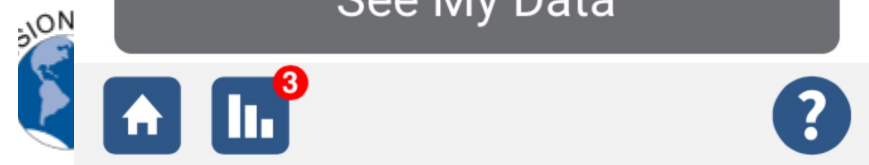
New Observation

Clouds Home

- 12/1/16 12:06 pm  
- 12/1/16 1:13 pm  
- 2/21/17 2:17 pm  

Select Some Observations Above

See My Data



DATA CAN BE TRASHED AND YOU CAN START OVER!!

Let's go outside

Look at the clouds

Enter the data using the GLOBE Observer App

Come back in and Share out our results!

