GLOBE
Global Learning & Observations to Benefit the Environment
globe.gov and observer.globe.gov
@NASAGO

Citizen Science Data Quality: The GLOBE Program

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Helen Amos, helen.m.amos@nasa.gov
Travis Andersen, andersen@ucar.edu

THE GLOBE PROGRAM

GLOBE Program

Global **L**earning & **O**bservations to **B**enefit the **E**nvironment (GLOBE)

Sponsored by: Supported by: Implemented by:

GLOBE by numbers

Since 1995

50+ environmental parameters

122 countries

41,000 schools

200,000 citizen scientists

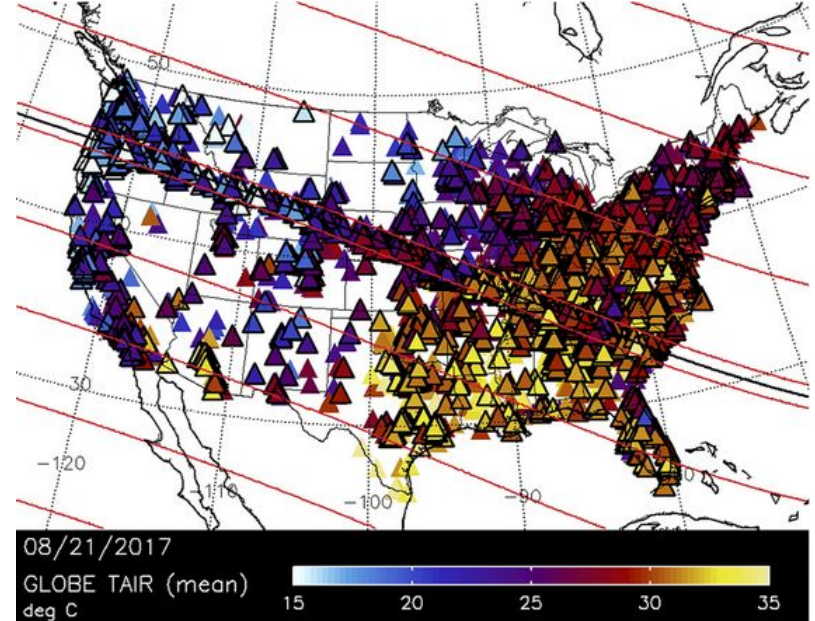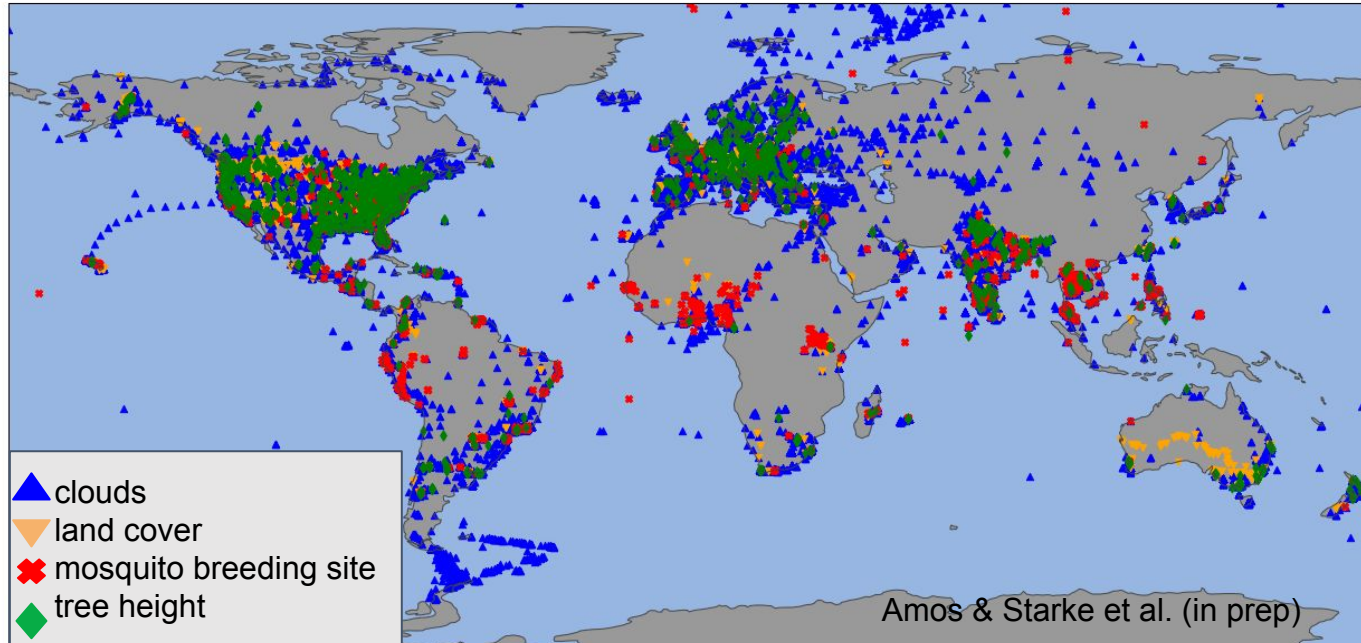23rd GLOBE Annual Meeting, Detroit, Michigan, USA, July 2019

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Research applications of GLOBE data
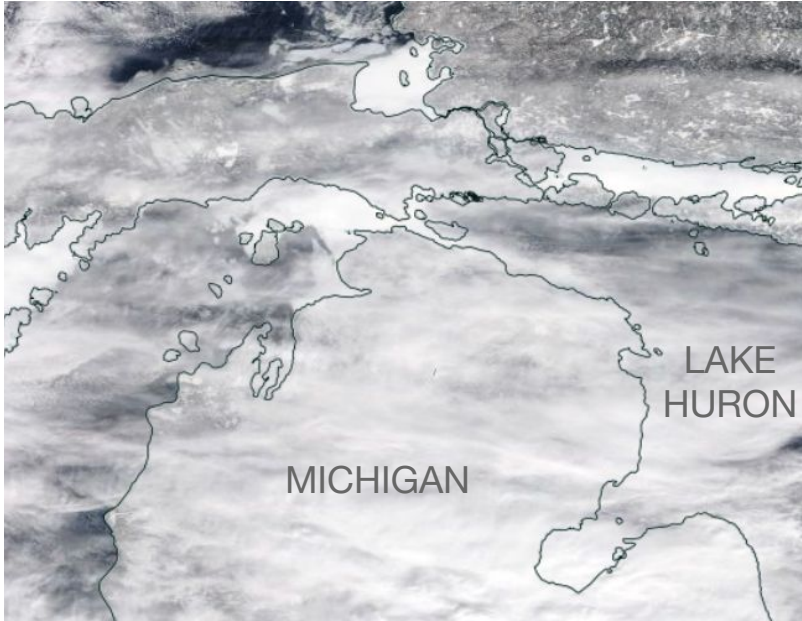
Ault et al., 2006, *Remote Sens. Environ.*

Dodson et al., 2019, *J. Appl. Meteo. Clim.*

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International data collection

clouds
land cover
mosquito breeding site
tree height

Amos & Starke et al. (in prep)

GLOBE data are available to everyone: globe.gov/globe-data

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Who is collecting data?

Teachers & Students

Citizen Scientists

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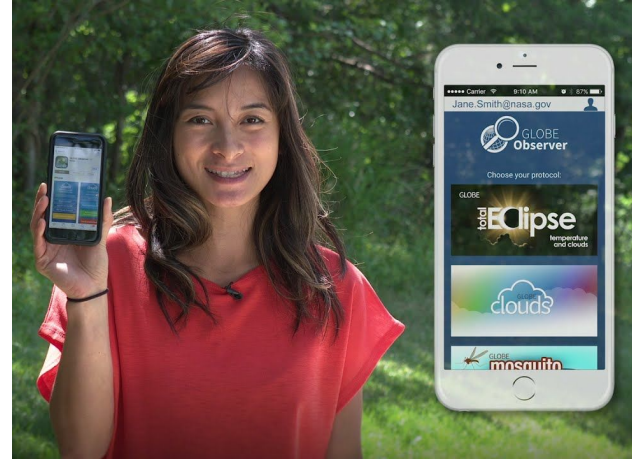
How are data collected and entered?

Automated
Stations & Loggers

Manual

Mobile app

Data are collected using standardized protocols

Hydrosphere

Alkalinity
Conductivity
Dissolved Oxygen
Macroinvertebrates
📱 Mosquitoes
Nitrate
pH
Salinity
Water Temperature
Water Transparency

Biosphere

Biometry
📱 Tree Height
Carbon Cycle
Green Up
Green Down
📱 Land Cover
Lilac Phenology
Pheno. Gardens

Pedosphere

Bulk Density
Particle Size Dist.
Particle Density
pH
Soil Characterization
Soil Fertility
Soil Moisture
Soil Infiltration
Soil Temperature
Frost Tube

Atmosphere

Aerosols
📱 Clouds
📱 Air Pressure
Precipitation
📱 Relative Humidity
Surf. Temperature
📱 Air Temperature
Water Vapor

View GLOBE protocols: globe.gov/do-globe/globe-spheres

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Participants must complete training before contributing data

In-Person

Online

In the app
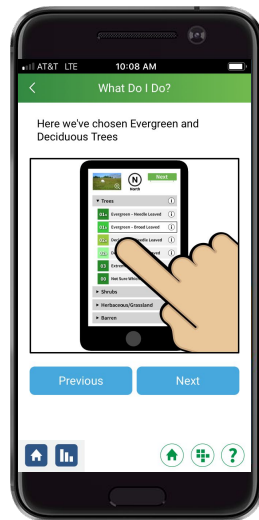
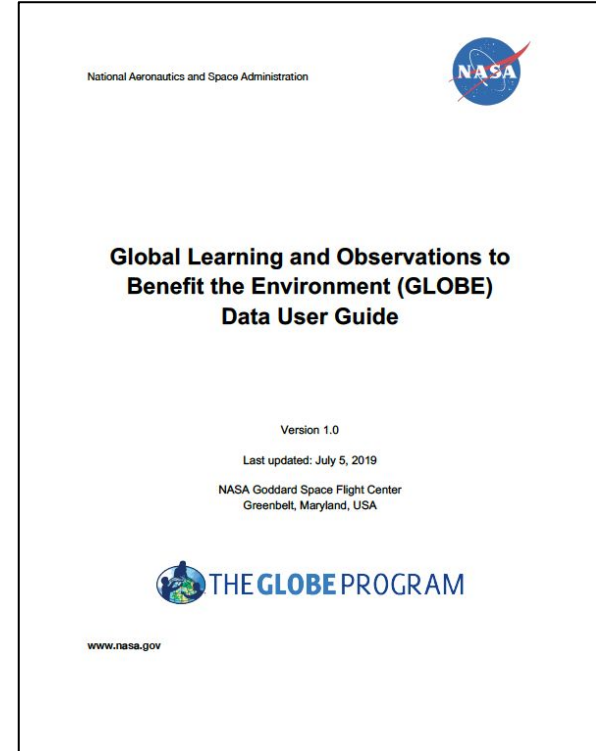globe.gov/get-trained

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Technical documentation

User guide released July 2019

To help scientists and researchers understand, access, and use available GLOBE data.

PDF available

globe.gov/globe-data/globe-data-user-guide

National Aeronautics and Space Administration

Global Learning and Observations to Benefit the Environment (GLOBE) Data User Guide

Version 1.0

Last updated: July 5, 2019

NASA Goddard Space Flight Center
Greenbelt, Maryland, USA

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www.nasa.gov

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Data Quality Assurance

| Standardized Protocols | Participant Training | Range & Logic Checks | Photo Approval |

When protocols for collecting data are well written, instruments are of good quality, and range checks are put into place then the data collected is that of "research grade data" (Lawless and Rock 1998)

Lawless, J. G., and B. N. Rock, 1998: Student Scientist Partnerships and Data Quality. *Journal of Science Education and Technology*, **7**, 5–13, doi:10.1023/A:1022575914118.

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What kinds of data have to be quality controlled?

Discrete data
Example: air temperature

Manual: Dundaga Secondary School, Latvia

Photos

North	East
South	West
Up	Down

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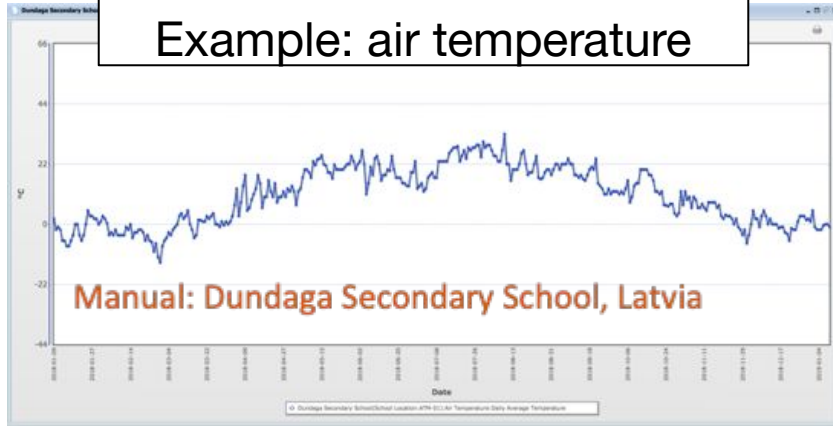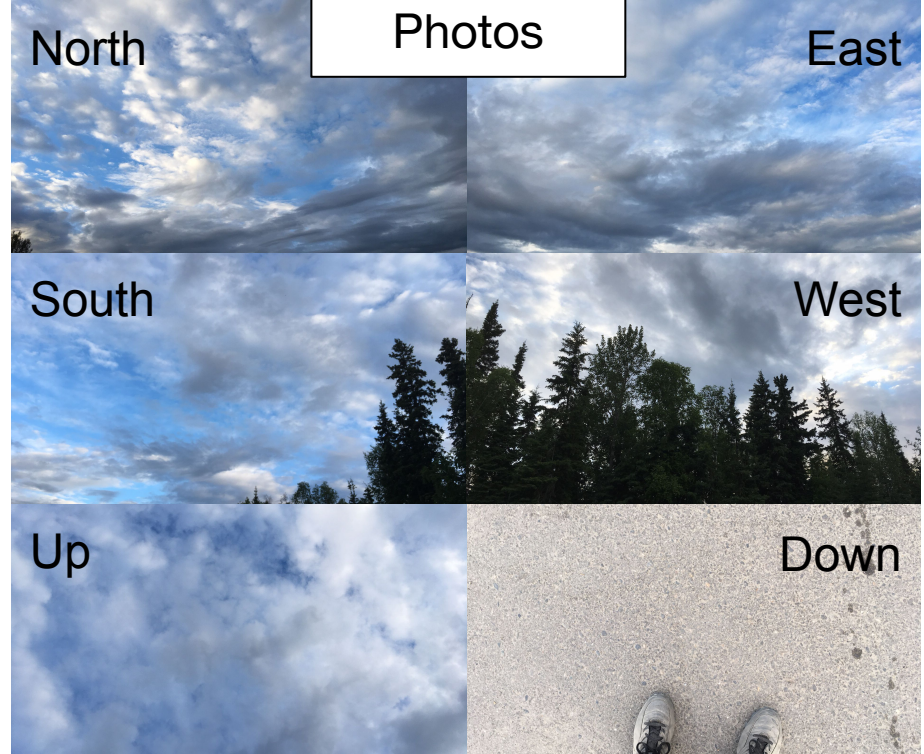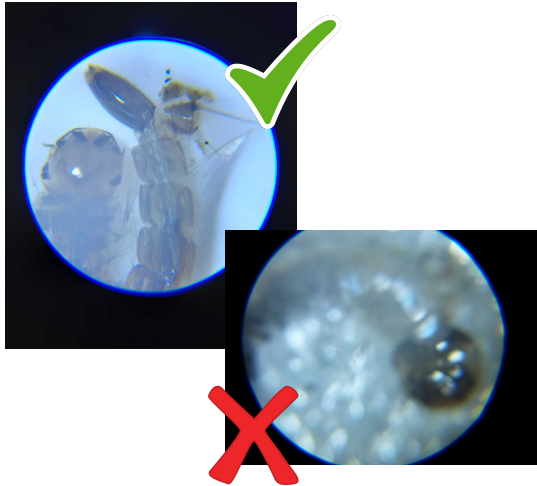
QA/QC: recent exploratory work

Blurry photo detection

Repeat photo detection

Email intervention

Original

Repeat

Dust Storm

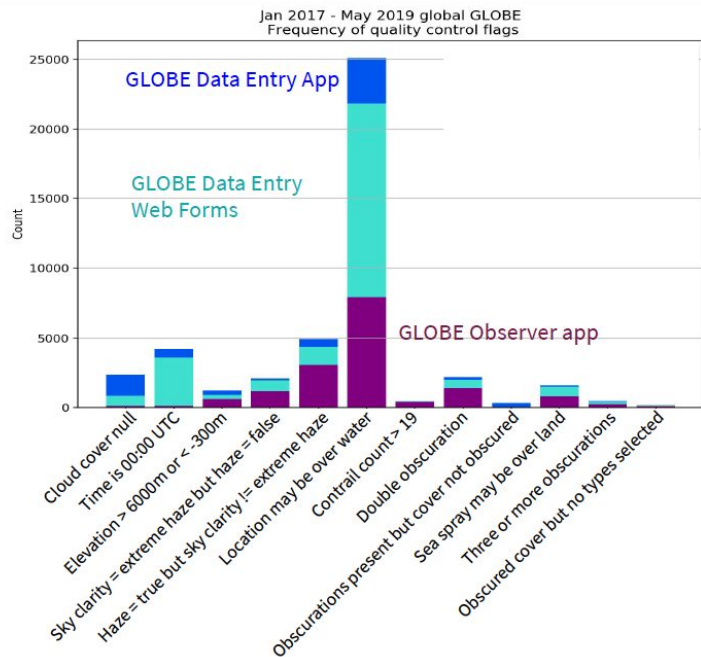Not a Dust Storm
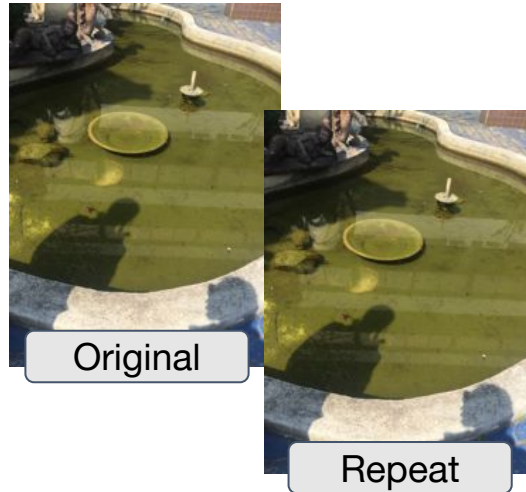
Credit: K. Arica, H. Amos, E. Podest, M. Colón Robles, T. Rogerson

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QA/QC: recent exploratory work
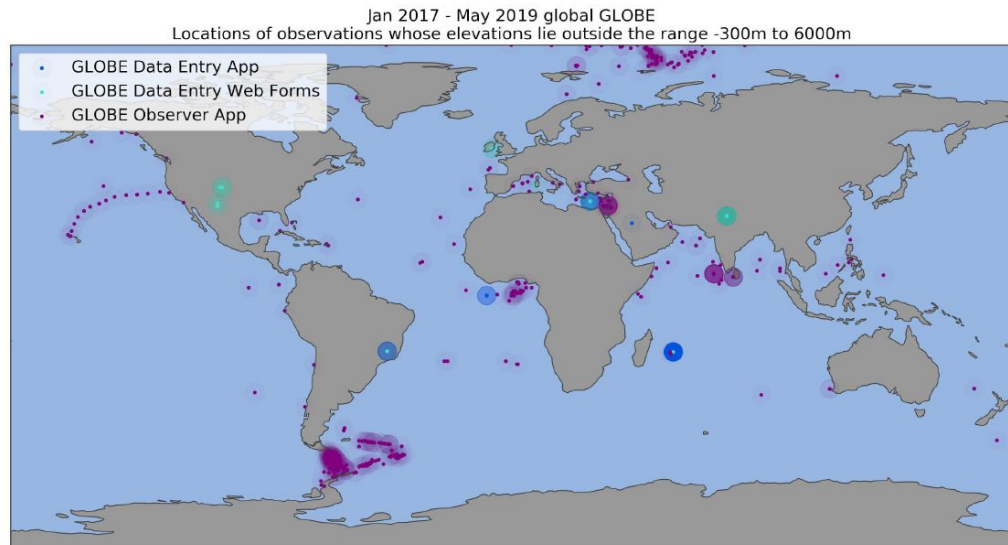
Credit: M. Starke, H. Amos, M. Colón Robles, T. Rogerson

Summary

GLOBE is a worldwide community of students, teachers, scientists, and citizen scientists

GLOBE's quality assurance is multi-faceted: standardized protocols, training, range & logic checks on data

GLOBE data are freely available to everyone at globe.gov/globe-data

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Upcoming virtual training on Jan 23

Register here: http://bit.ly/GLOBE-Data

Stay connected with GLOBE

Join our listserv for scientists and researchers using GLOBE data
https://lists.nasa.gov/mailman/listinfo/go-sci

@GLOBEProgram and @NASAGO

@TheGLOBEProgram and @nasa.globeobserver

Download the app!

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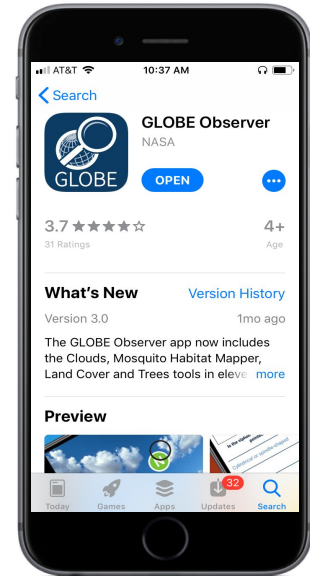
Thank you!

helen.m.amos@nasa.gov