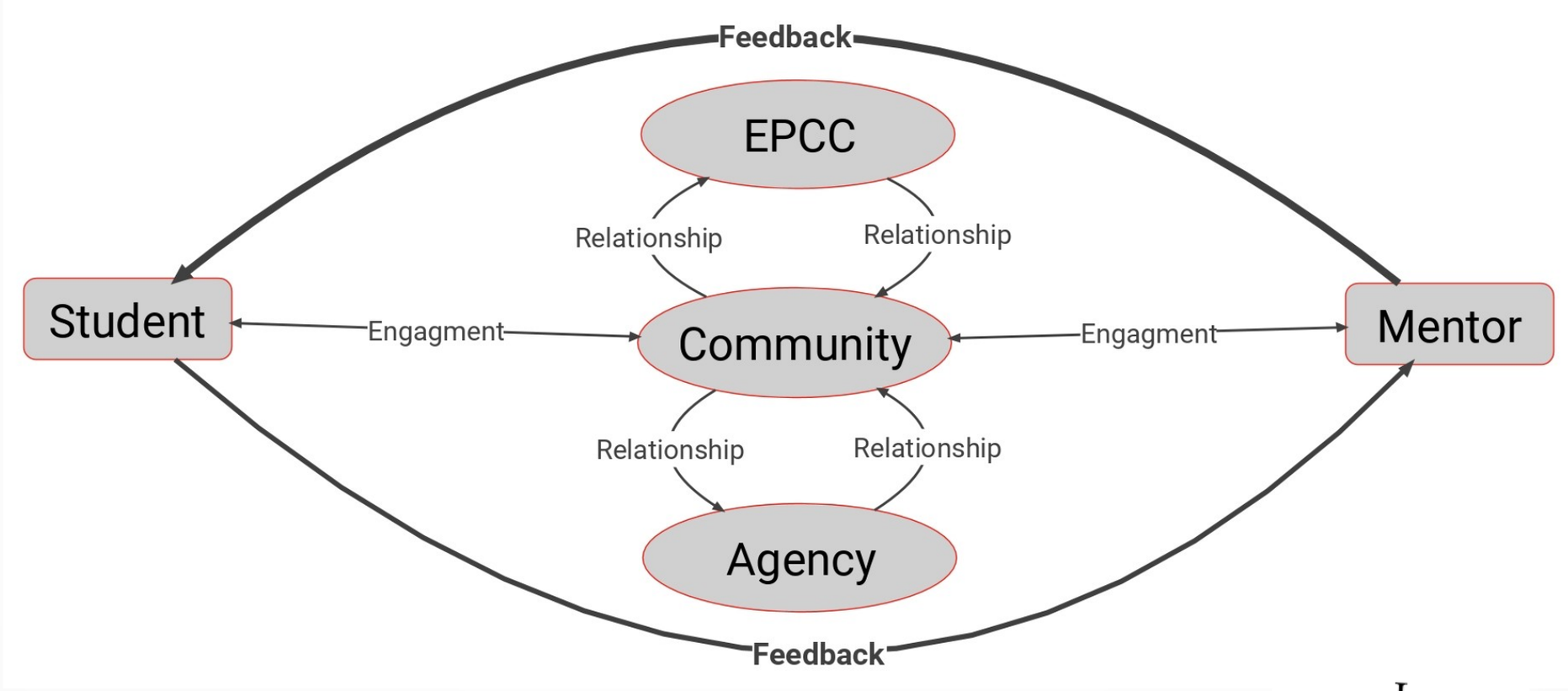
# Service learning and dust storm data collection through the GLOBE Observer app

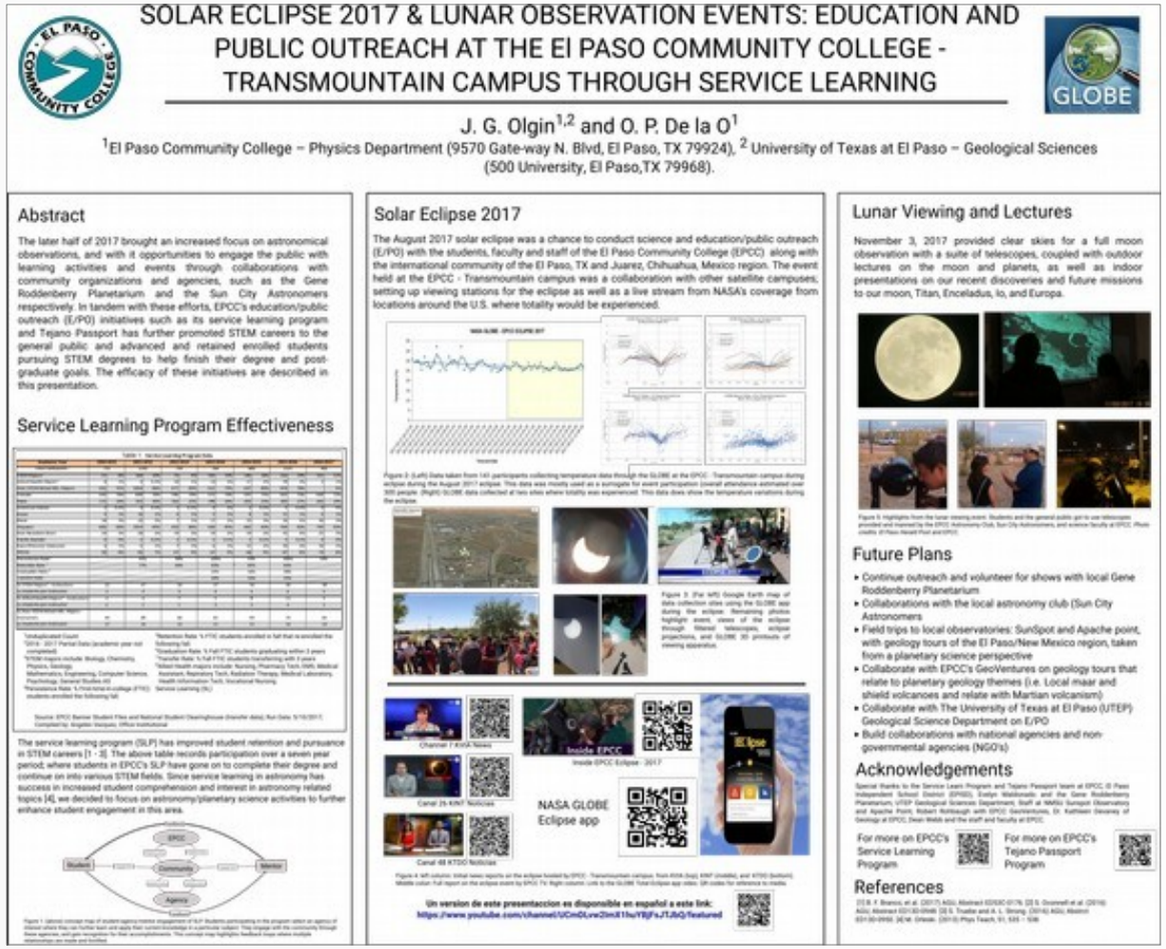
In collaboration with

# (EPCC) Service Learning Program




*The Service Learning Program at El Paso Community College encourages civic responsibility among students through community service.*

# Works and Collaborations



SOLAR ECLIPSE 2017 & LUNAR OBSERVATION EVENTS: EDUCATION AND PUBLIC OUTREACH AT THE El PASO COMMUNITY COLLEGE - TRANSMOUNTAIN CAMPUS THROUGH SERVICE LEARNING

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Abstract

The later half of 2017 brought an increased focus on astronomical observations, and with it opportunities to engage the public with learning activities and events through collaborations with community organizations and agencies, such as the Gene Roddenberry Planetarium and the Sun City Astronomers respectively. In tandem with these efforts, EPCC's education/public outreach (E/PO) initiatives such as its service learning program and Tejano Passport has further promoted STEM careers to the general public and advanced and retained enrolled students pursuing STEM degrees to help finish their degree and post-graduate goals. The efficacy of these initiatives are described in this presentation.

Service Learning Program Effectiveness

The service learning program (SLP) has improved student retention and pursuance in STEM careers [1 - 3]. The above table records participation over a seven year period; where students in EPCC's SLP have gone on to complete their degree and continue on into various STEM fields. Since service learning in astronomy has success in increased student comprehension and interest in astronomy related topics [4], we decided to focus on astronomy/planetary science activities to further enhance student engagement in this area.

Solar Eclipse 2017

The August 2017 solar eclipse was a chance to conduct science and education/public outreach (E/PO) with the students, faculty and staff of the El Paso Community College (EPCC) along with the international community of the El Paso, TX and Juarez, Chihuahua, Mexico region. The event held at the EPCC - Transmountain campus was a collaboration with other satellite campuses; setting up viewing stations for the eclipse as well as a live stream from NASA's coverage from locations around the U.S. where totality would be experienced.

NASA GLOBE Eclipse app

Un version de este presentaccion es disponible en español a este link:
https://www.youtube.com/channel/UCmDLvw2lmK1huYBjFsJTJbQ/featured

Lunar Viewing and Lectures

November 3, 2017 provided clear skies for a full moon observation with a suite of telescopes, coupled with outdoor lectures on the moon and planets, as well as indoor presentations on our recent discoveries and future missions to our moon, Titan, Enceladus, Io, and Europa.

Future Plans

- Continue outreach and volunteer for shows with local Gene Roddenberry Planetarium
- Collaborations with the local astronomy club (Sun City Astronomers
- Field trips to local observatories: SunSpot and Apache point, with geology tours of the El Paso/New Mexico region, taken from a planetary science perspective
- Collaborate with EPCC's GeoVentures on geology tours that relate to planetary geology themes (i.e. Local maar and shield volcanoes and relate with Martian volcanism)
- Collaborate with The University of Texas at El Paso (UTEP) Geological Science Department on E/PO
- Build collaborations with national agencies and non-governmental agencies (NGO's)

Acknowledgements

Special thanks to the Service Learn Program and Tejano Passport team at EPCC, El Paso Independent School District (EPISD), Evelyn Waldorado and the Gene Roddenberry Planetarium, UTEP Geological Sciences Department, Staff at NMSU Sunspot Observatory and Apache Point, Robert Rutledaugh with EPCC GeoVentures, Dr. Kathleen Devaney of Geology at EPCC, Dean Webb and the staff and faculty at EPCC.

For more on EPCC's Service Learning Program

For more on EPCC's Tejano Passport Program

References

[1] B. F. Branco, et al. (2017) AGU, Abstract ED53C-0176. [2] S. Drummelf et al. (2016) AGU, Abstract ED13D-0948. [3] S. Trudel and A. L. Strong. (2014) AGU, Abstract ED13D-0950. [4] M. Orlado. (2013) Phys Teach, 51, 535 – 538.

Service Learning Program

GLOBE total Eclipse temperature and clouds

GEO-VENTURES
EXPLORING GEOLOGY THRU ADVENTURE

THE RODDENBERRY PLANETARIUM

**Lunar and Planetary Science Conference (LPSC) 2018 Poster link:**

# Works and Collaborations

AGU 100
ADVANCING EARTH AND SPACE SCIENCE

**ED32A-06 - EXPLORING STEAM THROUGH SERVICE LEARNING AND CITIZEN SCIENCE ACTIVITIES: ENHANCING EDUCATION/PUBLIC OUTREACH IN THE INTERNATIONAL COMMUNITY AT EL PASO COMMUNITY COLLEGE AND THE UNIVERSITY OF TEXAS AT EL PASO**

Wednesday, 11 December 2019
11:10 - 11:20
*Moscone South - 215, L2*

**Swirl Topics**

Ethics, Diversity and Inclusion Field Guide - Track
Science & Society - SWIRL


Link to abstract →

# GLOBE At EPCC

Global Learning & Observations to Benefit the Environment (GLOBE) Program

El Paso Community College (EPCC) – Official GLOBE Partner since April 2019

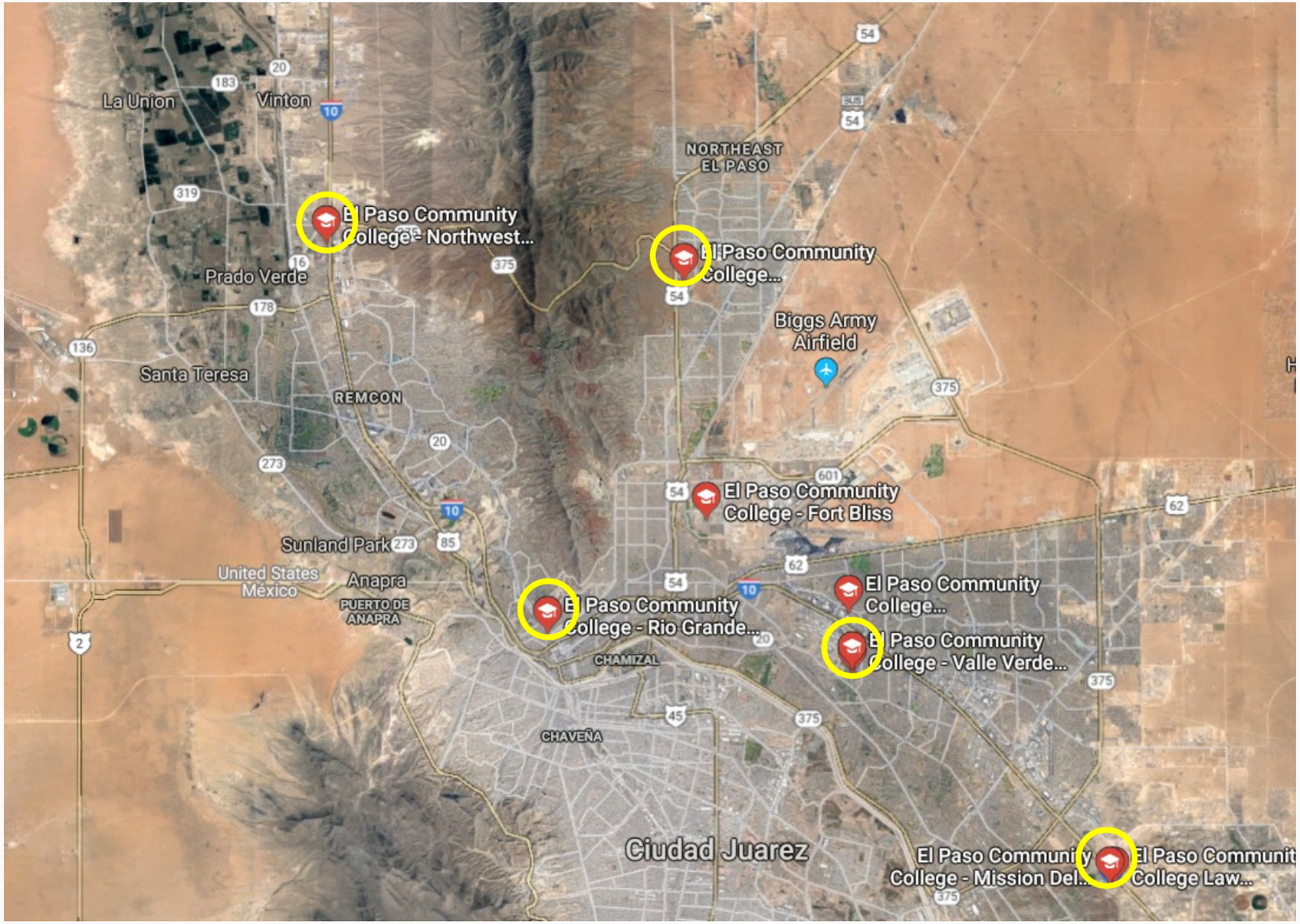
GLOBE Observer

Cloud observations November 2019

GLOBE Program – Weather Station Network (Spring 2020)

**Sponsored by** **Supported by:** **Implemented by**

# Weather Station Locations



# Dust Storm Ground Observations

# Dust observations made easy

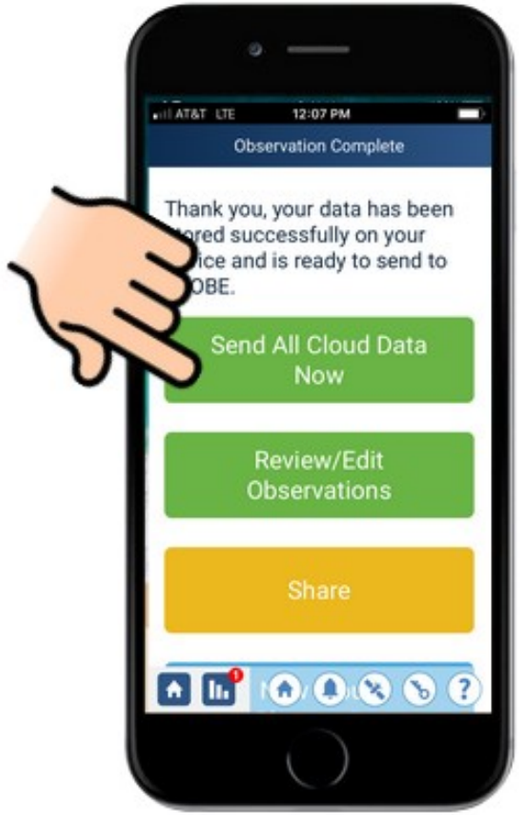

bit.ly/2S2PNnw

*Excerpt from Amos et al (2020)*

# Data Processing

## What happens to the data?

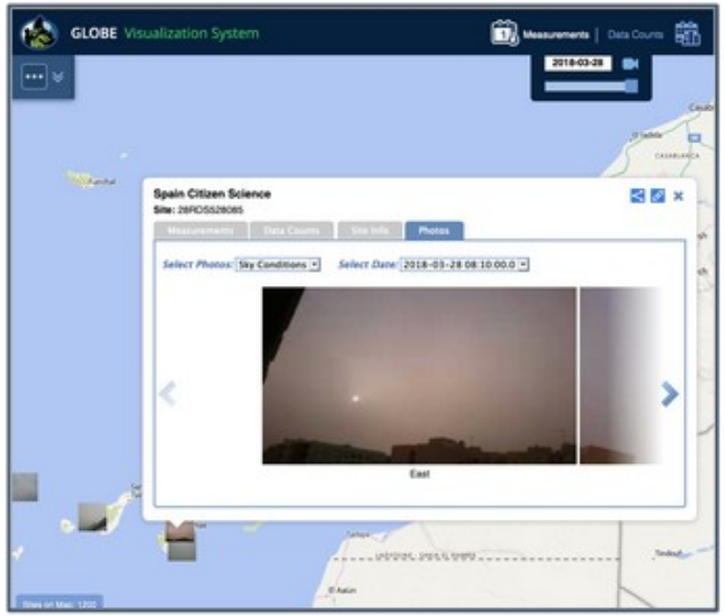
1. Send




2. Photo Approval

Kristen Weaver, NASA

3. Data goes live




*Excerpt from Amos et al (2020)*

# App users reporting dust worldwide


*Excerpt from Amos et al (2020)*

# Collaborations and Community Engagement

- Dust Observations
  - GLOBE Observer
  - Additional collaborations:
- Sponsor weather workshops

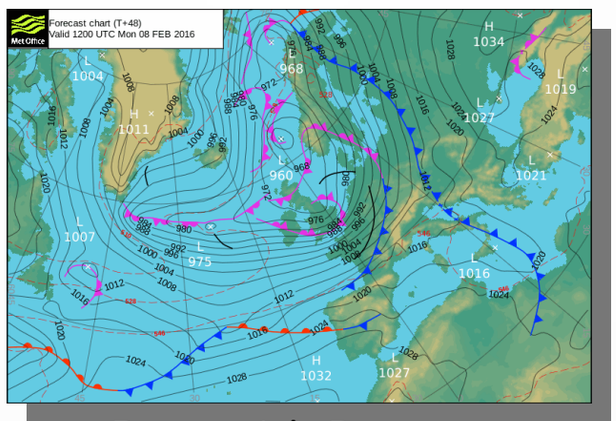




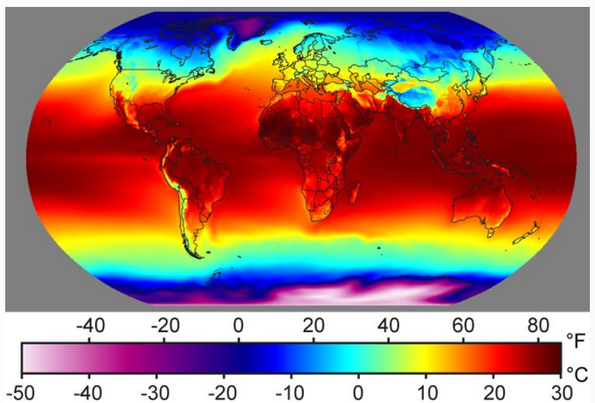

- Engage student participation in STEM/STEAM
- Promote citizen science within the international community
- Advance service learning opportunities
- Curriculum advancement (i.e. physics, geology, chemistry)

# GLOBE Protocols

Clouds

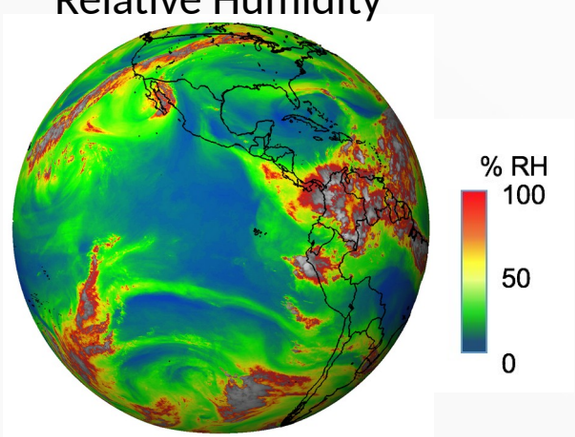



Barometric Pressure



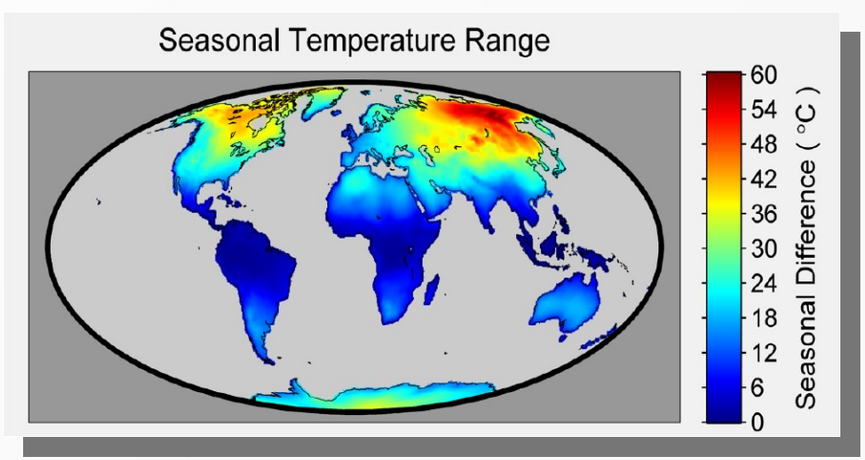

Surface Temperature

Relative Humidity




Relative humidity found in our atmosphere,
as observed by satellites of the *GOES project*.
The gray and white regions are clouds. *Image: NOAA*

Air Temperature




# Thank You
# Questions/Comments


Special Thanks to:
Tom Gill (UTEP), Helen Amos (NASA GLOBE), Marilé Colón Robles (NASA GLOBE), Daniel Tong (George Mason U/NOAA), and Kerstin Schepanski (TROPOS)