

GLOBE is a Human-Powered Earth System Observatory, and NASA's Eyes and Ears on the Ground



GLOBE contributes valuable *in situ* environmental observations that bridge data gaps, while preparing a skilled workforce

As of May 4, 2025:

270,340,668 Global Measurements

1,250,862 Citizen Scientists

- **53,780** Educators
- **902,362** Students
- **294,720** GLOBE Observers

42,834 Schools & Non-School Orgs

127 Countries



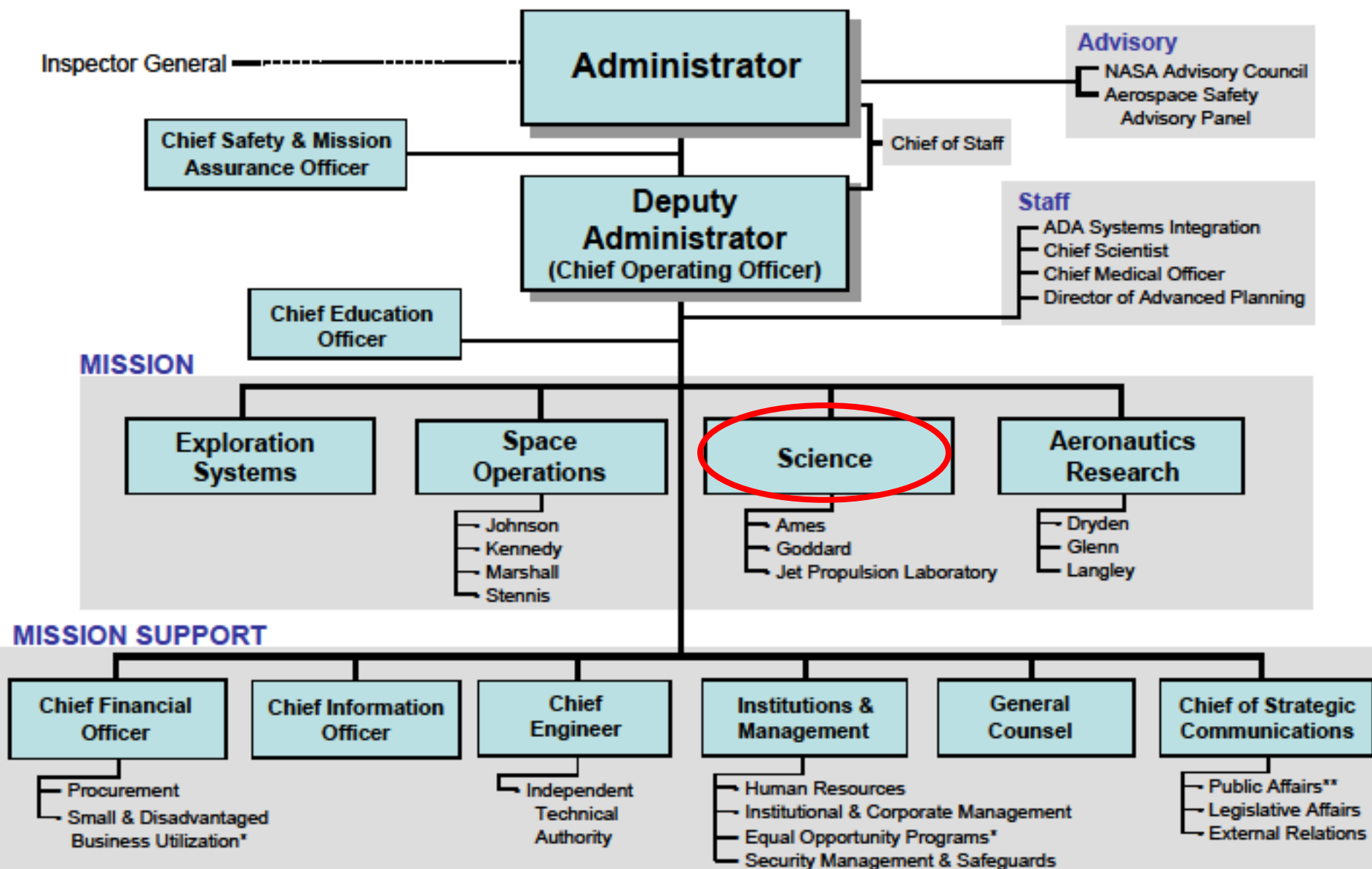
Recipient of the 2021 American Geophysical Union Earth and Space Science Education Award





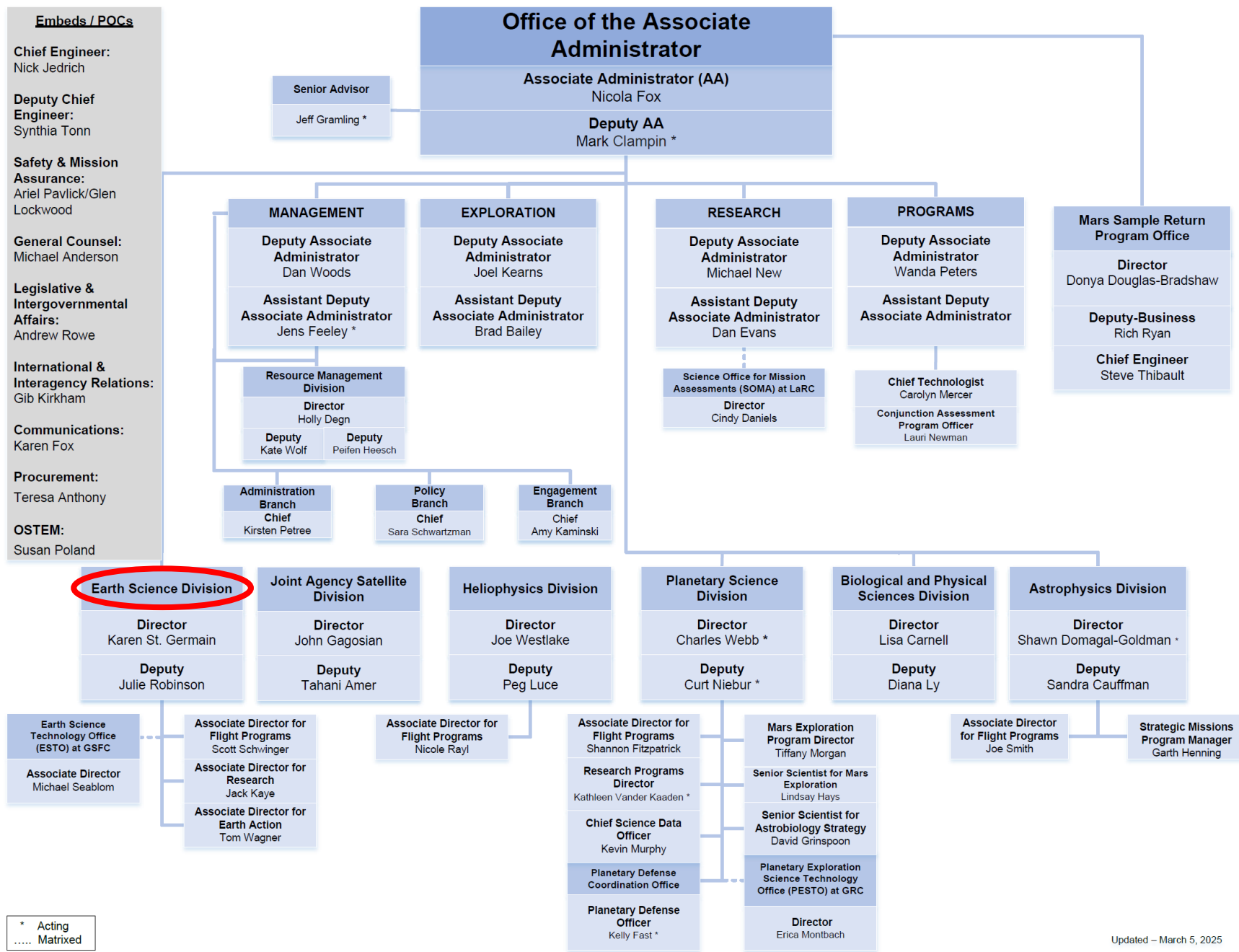
Transformed Structure

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* In accordance with law, the OEOP and SDBU maintain reporting relationships to the Deputy and the Administrator.

** Including a new emphasis on internal communications

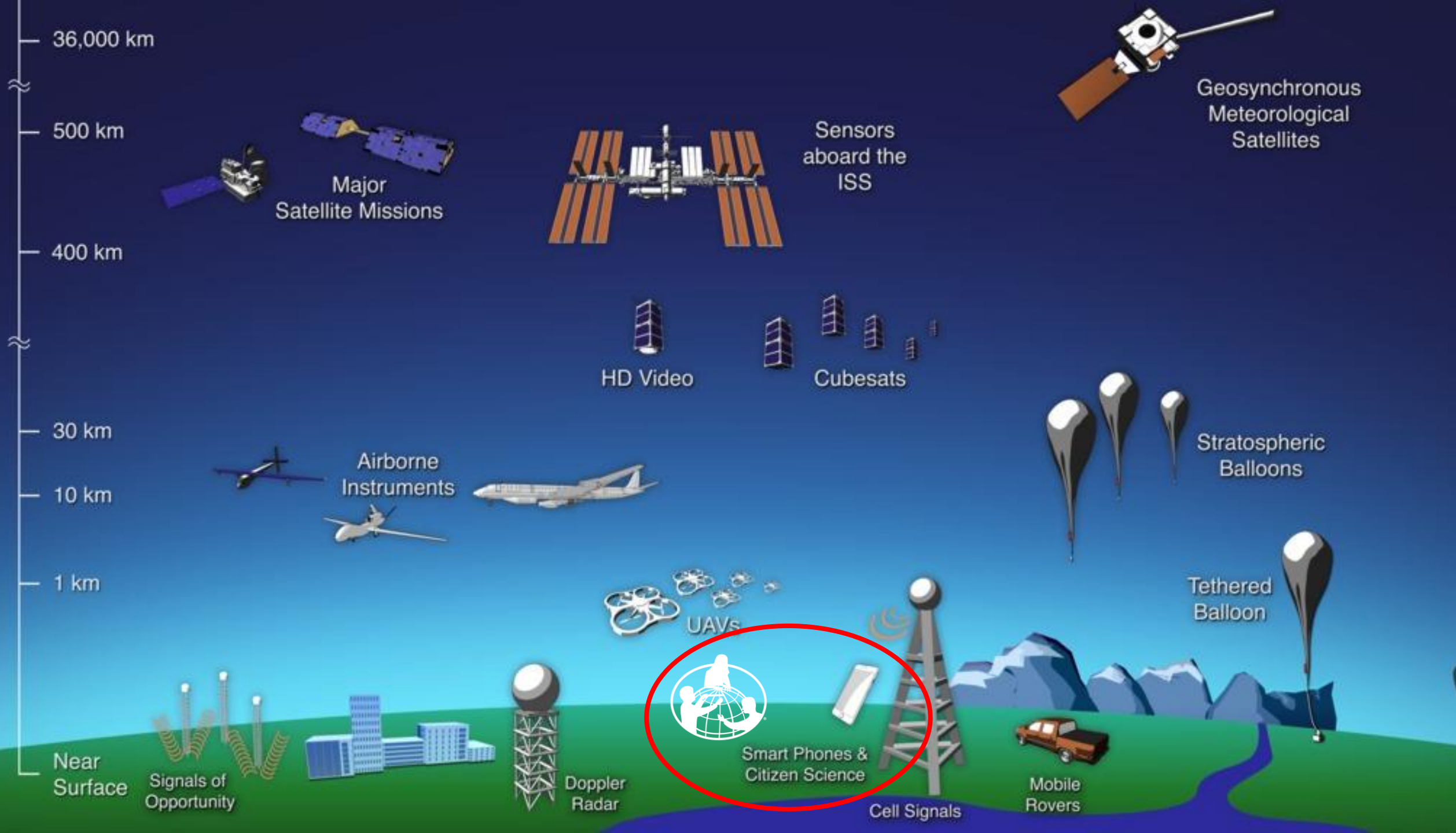


What is SMD: The Science Mission Directorate (SMD) engages the Nation's science community, sponsors scientific research, and develops and deploys satellites and probes in collaboration with NASA's partners around the world to answer fundamental questions requiring the view from and into space. SMD seeks to understand the origins, evolution, and destiny of the universe and to understand the nature of the strange phenomena that shape it.

How does GLOBE align with NASA, Science Mission Directorate, & Earth Science Division priorities?

- **NASA Strategic Plan (2022)**
 - 1.1 Understand the Earth system and its climate
 - 1.3 Ensure NASA's science data are accessible to all and produce practical benefits to society
 - 4.3 Build the next generation of explorers
- **Earth Science Division's strategic plan, Earth Science to Action**
 - Foundation of strategy build upon technology innovation, Earth observations, missions, and data collected from space, air, and **ground**.
 - Grow scientific understanding of Earth systems.
 - Provide science application and tools to inform decision
 - Amplify the value of Earth science through global-reaching **training, education, outreach, and capacity building**.
- **National Academies – Thriving on Our Changing Planet: A decadal strategy for Earth Observation from Space (by direction of Congress in 51 USC 20305)**
 - Strategy Element 2: Embrace Innovative Methodologies for Integrated Science and Applications on Advanced cost-effective observation methodologies (e.g. citizen science –based Earth observations)

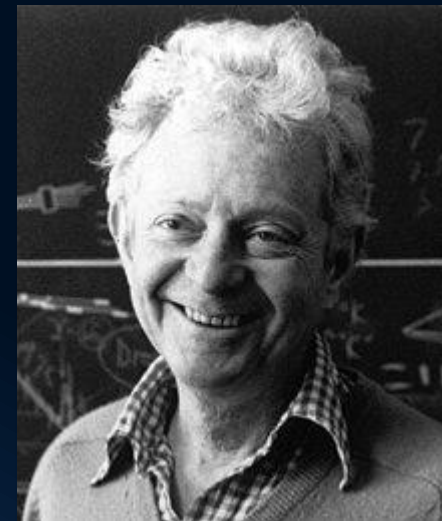




Who Does GLOBE? K to Grey!

“GLOBE is the quintessentially ideal program for involving kids in science.”

Leon Lederman, 1988 Nobel Laureate, Physics



Astronaut Megan McArthur Behrenfeld

GLOBE Observables

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Hydrosphere

Alkalinity
Conductivity
Dissolved Oxygen
Macroinvertebrates
(including Mosquitoes)
Nitrates
Salinity
pH
Water Temperature
Water Transparency



Biosphere

Biometry (including
Tree Height)
Carbon Cycle
Fire Fuel
Green Up / Green
down
Land Cover
classification
Phenological Gardens



Pedosphere

Bulk Density
Frost tube
Soil Characterization
Soil Fertility
Soil Infiltration
Soil Moisture
Soil Particle density
Soil Particle size
distribution
Soil Temperature
Soil pH



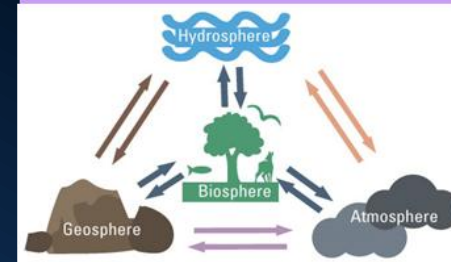
Atmosphere

Aerosols
Air Temperature
Barometric Pressure
Clouds
Precipitation
Relative Humidity
Surface Temperature
Water Vapor
Wind



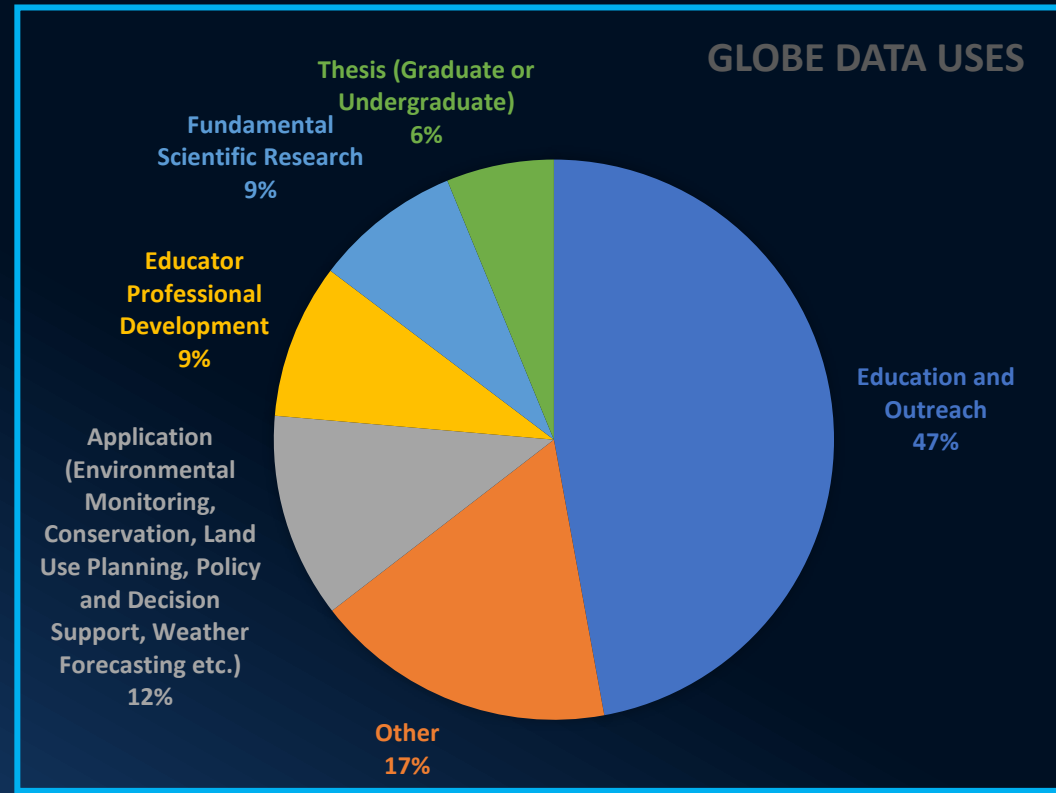
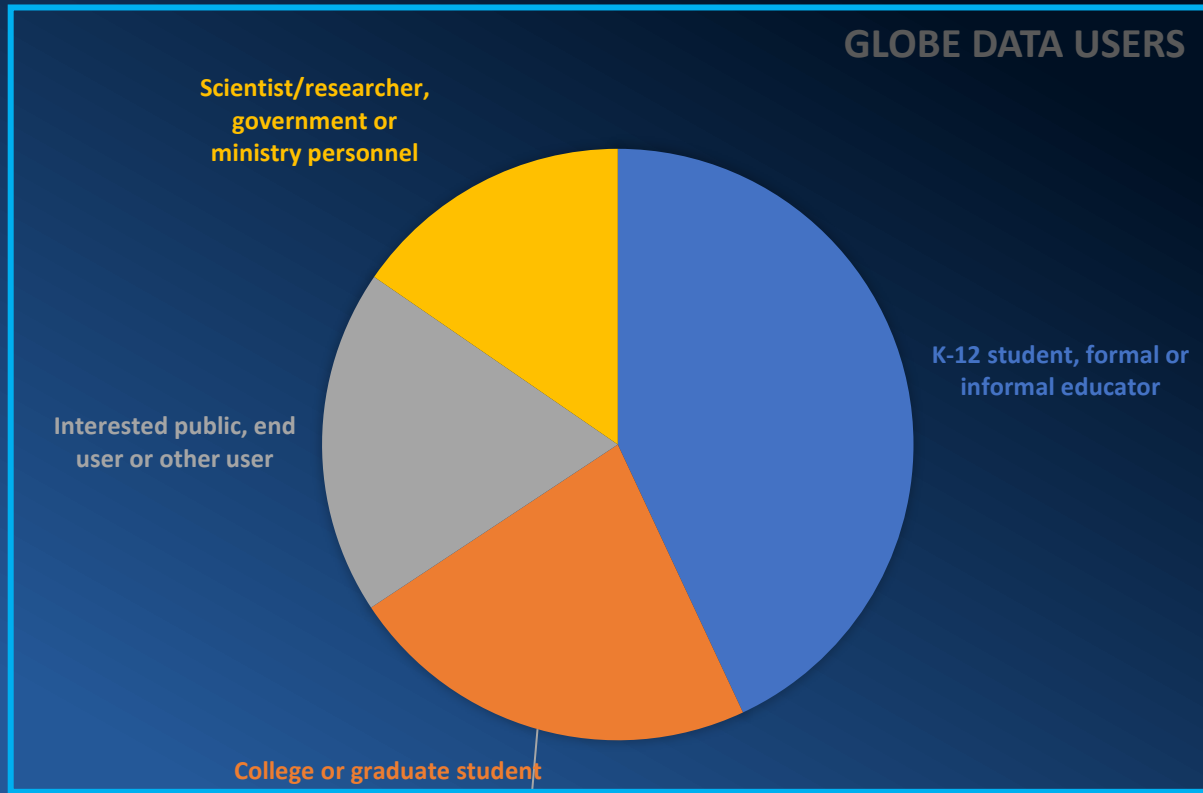
Earth as a System Bundles

Agriculture
Air Quality
ENSO
Mosquito
Ocean
River & Lakes
Soils
Urban
Water Cycle
Water Quality
Weather



How are GLOBE data used? Who use the data?

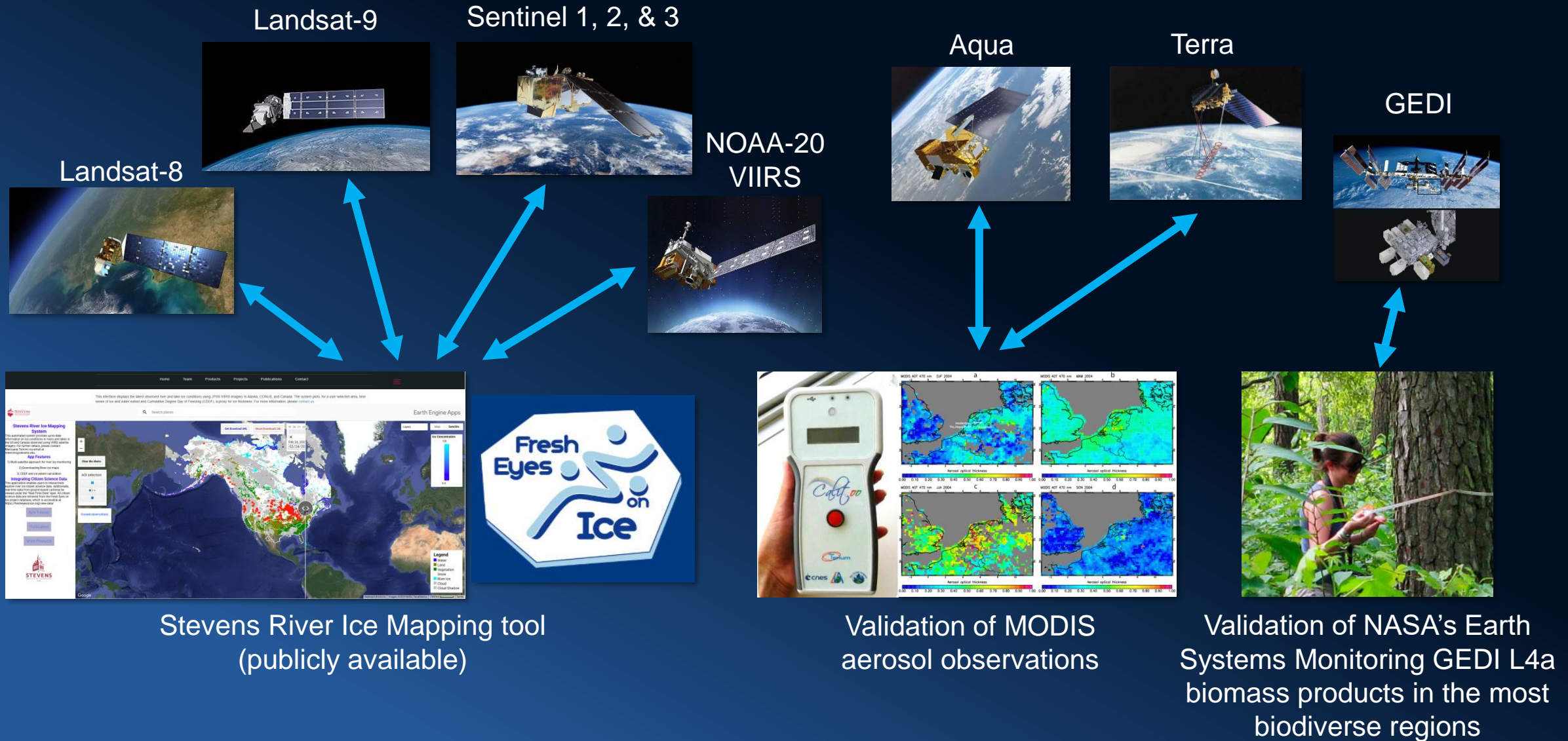
March 1, 2024 to March 1, 2025



VIS queried over 80,000 times
ADAT & API 150,000 queries performed each

****we need case studies!***

GLOBE and Satellite Mission Collaboration



GLOBE Data with NASA Earth Observations Predict Mosquito Disease Risk

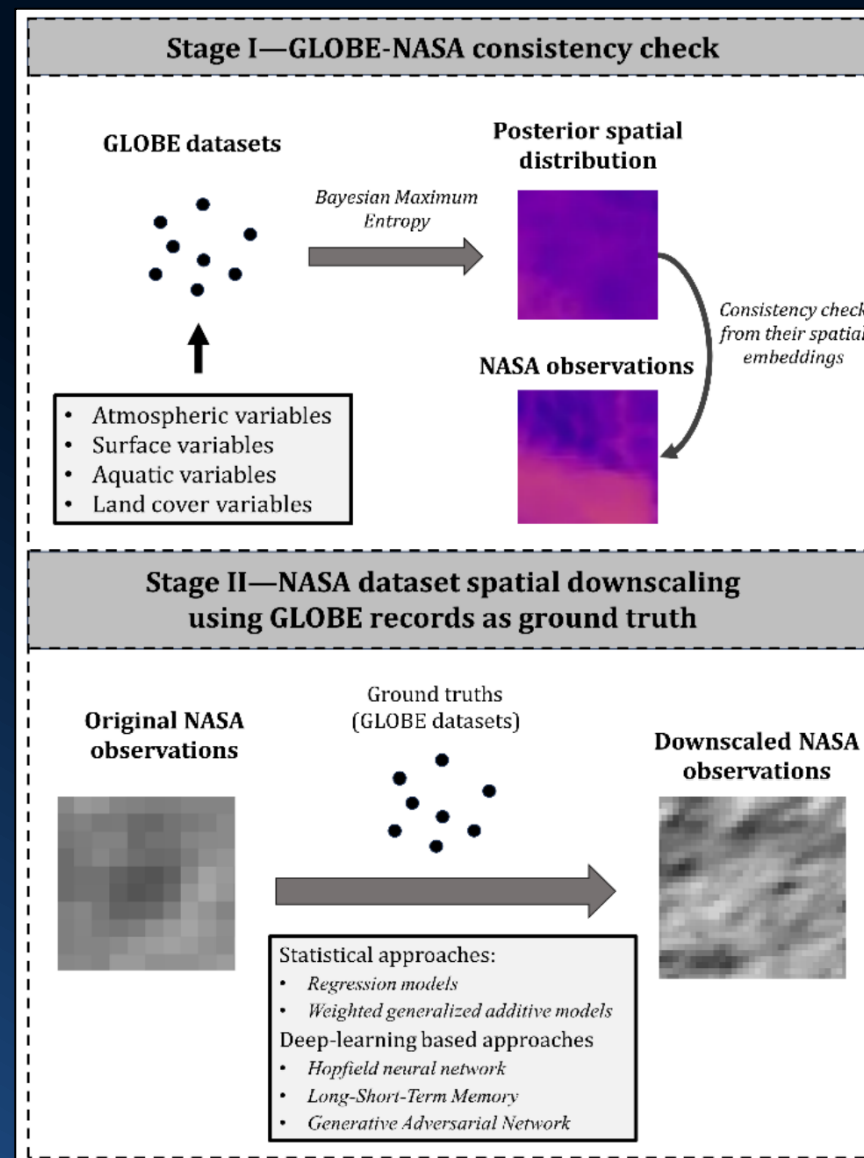
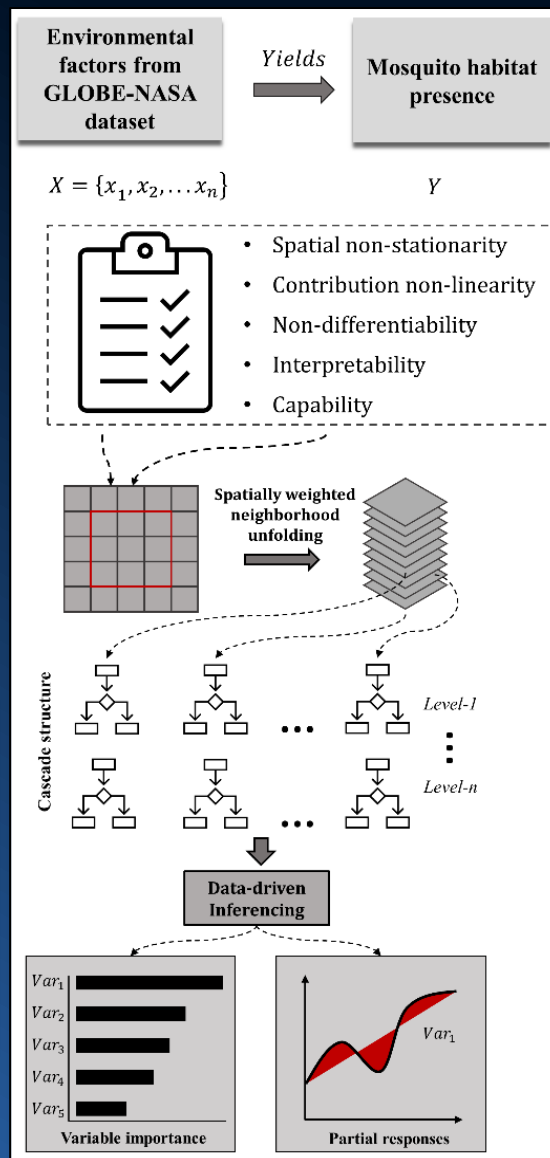
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GLOBE students Marianela Pepe, Juan Wehinger, Lucio Martínez were chosen to enter 2021 Stockholm Junior Water Prize with their GLOBE mosquito project

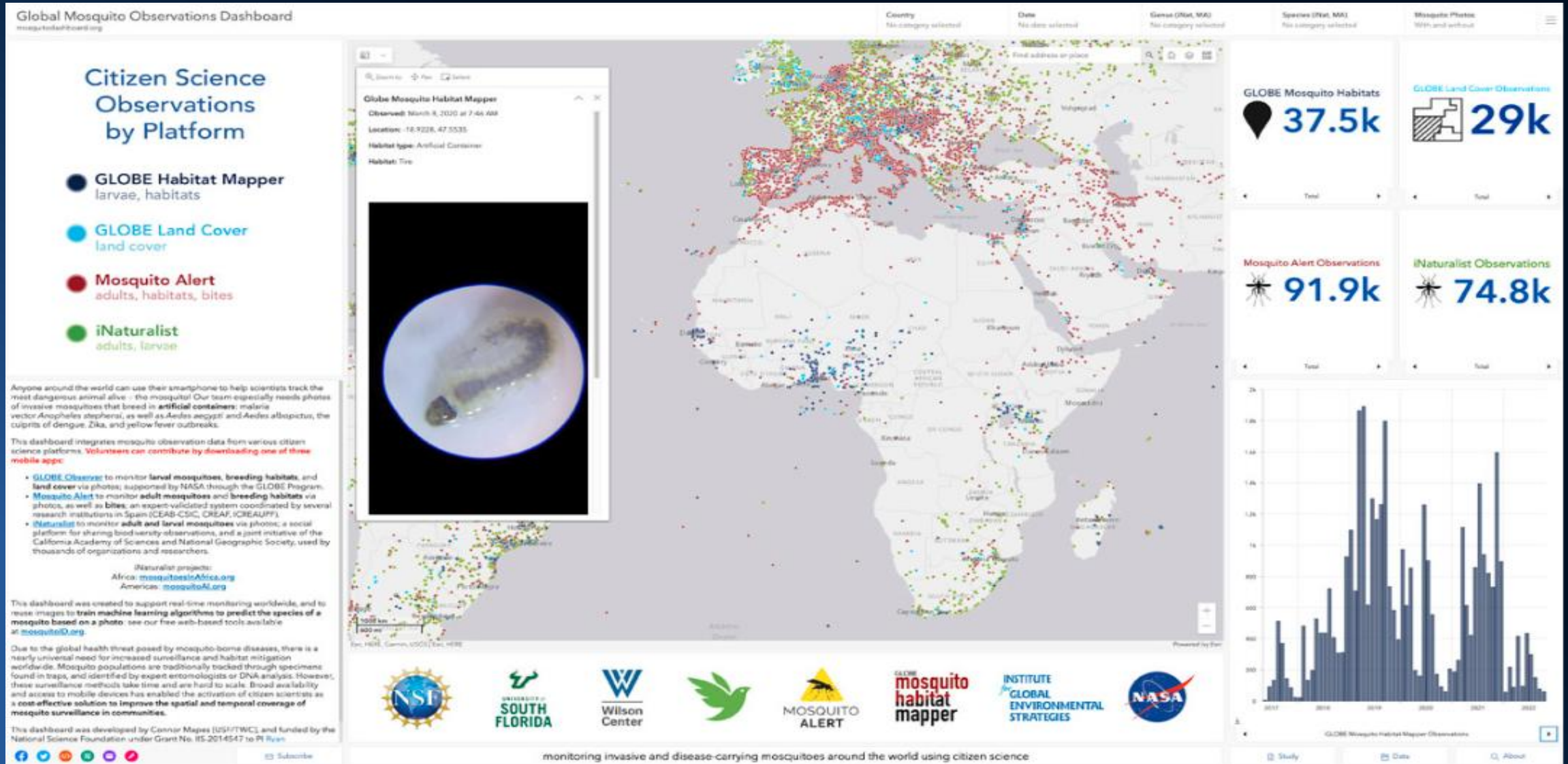


Malaria, Dengue, and more bad news!



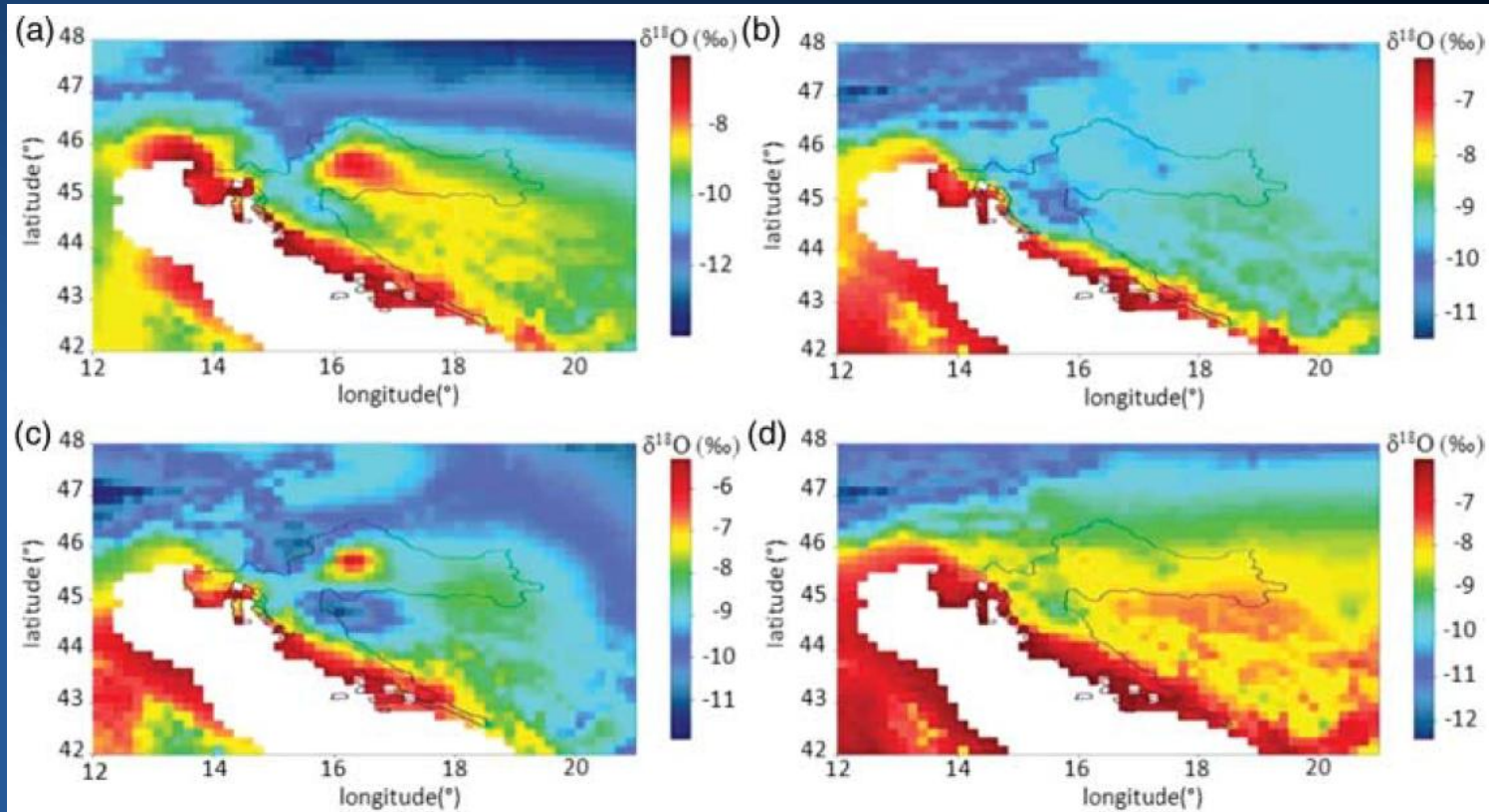
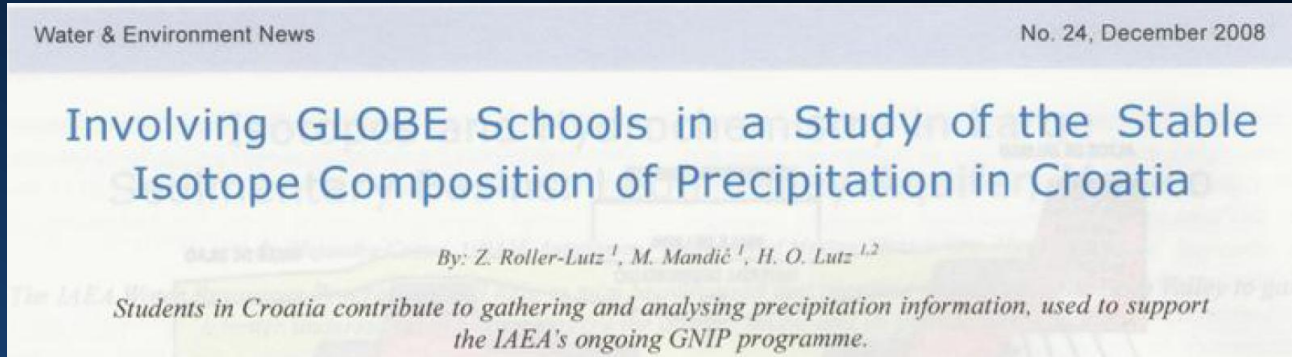
Dr. Di Yang & colleagues, Univ. FL, Early Career Researcher

Global Mosquito Observations Dashboard Carney et al. 2023



<https://experience.arcgis.com/experience/7228a5a27442468494caec2934c2b73d/page/Page/>

Advancing fundamental Earth system science knowledge



Stable isotope composition of the meteoric precipitation in Croatia

Hunjak et al. 2013

Suggestions for strategies to advance Earth system science

- **Collaborate with Earth system science networks in your region**
 - Help them understand GLOBE's observations, what they are (and are not)
 - Ask if GLOBE participants can help collect and analyze data scientists need – this also motivates GLOBE participants, connects them with STEM professionals, helps them learn about new Earth system science topics and research directions
 - *If a new protocol is needed, it fits GLOBE's criteria, and there is a clear demand by a group of scientists, contact GIO STEPE.*
 - Help scientists understand data GLOBE has & how to retrieve them.
 - Give specific examples of how GLOBE has collaborated with scientists in its history
- **Collaborate with GLOBE-related, NASA-funded projects to achieve their goals, which also motivates GLOBE participants. These are almost always connected with NASA and/or interagency partner satellite missions.**
- **Encourage participants to submit data! Data is one of very few ways to calculate GLOBE's return-on-investment.**
- **Keep GIO and Amy in the loop if you are able to collaborate with Earth system science network mentioned above! GIO can help, GIO Comms will want to amplify, and this can be very helpful to ensure continuing U.S. government support for GLOBE**
- **Good record keeping is key! Help keep your webpage up-to-date. This is the default way of how people find info these days; e.g. is Country X a GLOBE Country, is it active, is it feasible to plan a citizen sci project there?**



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