
# Trees Around the GLOBE Student Research Campaign Webinar

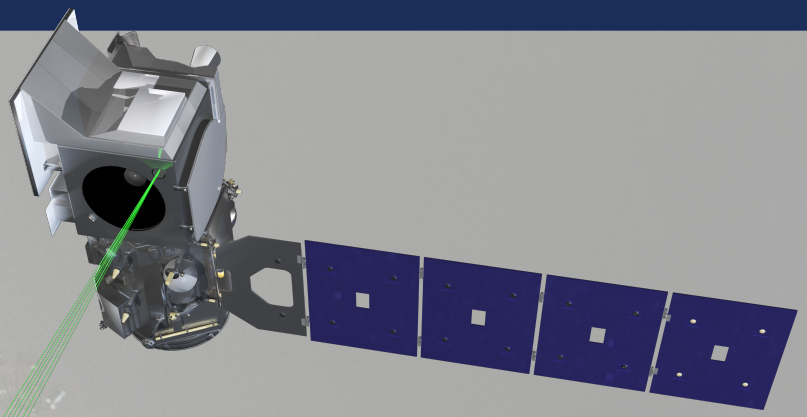
## Kicking Off Year 3 With Tree Height Research Using Satellites and Ground-Based Instruments: The importance of tree and vegetation research

**Featuring Dr. Nancy Glenn**
**Professor, Department of Geosciences**
**Director, Boise Center Aerospace Laboratory,**
**Boise State University,**
**NASA ICESat-2 Mission Early Adopter**

**Tuesday, September 15, 2020 @ 2:00pm EDT (6:00pm UTC)**

# HAPPY 2nd ANNIVERSARY IN ORBIT, ICESat-2!

## Launched 15 September 2018



# ICESat-2

Ice, Cloud, and land Elevation Satellite-2

Sponsored by: NASA Supported by: NSF NOAA Implemented by: UCAR

# Core Campaign Team

**Brian Campbell**
*Campaign Lead*
NASA Wallops/GST
Virginia USA

**Peder Nelson**
*Co-Lead and Online Tool and Data Expert*
Oregon State University
Oregon USA

**Peter Falcon**
Cross-Country Coordination Lead
NASA JPL
California USA

**Dorian Janney**
*Cross-Campaigns Lead*
NASA Goddard/ADNET
Maryland USA

**Christopher Shuman**
*Campaign Subject Matter Expert and Trees in the News Lead*
NASA Goddard/UMBC
Maryland USA

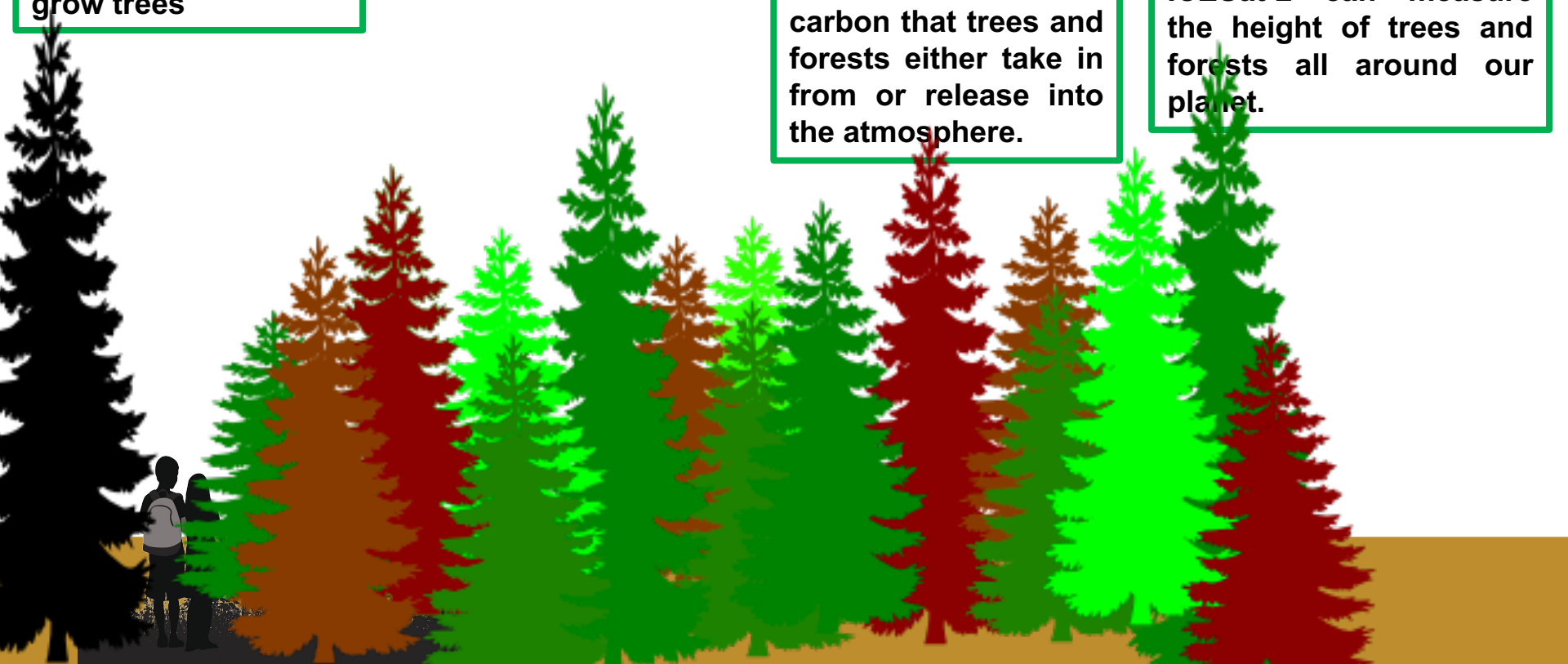
# WHY IS TREE HEIGHT SO IMPORTANT AND WHY DOES NASA AND THE GLOBE PROGRAM CARE?

Tree height is the most widely used indicator of an ecosystem's ability to grow trees

Tree height allows you to track the growth of trees over time

The GLOBE Tree height observations can help researchers understand the gain or loss of biomass which can inform calculations of the carbon that trees and forests either take in from or release into the atmosphere.

NASA missions utilize an onboard laser altimeter systems to measure the height of our planet, one photon at a time. The advanced technology of ICESat-2 can measure the height of trees and forests all around our planet.



# Trees Around the GLOBE Student Research Campaign Metrics

https://www.globe.gov/web/trees-around-the-globe

**Year 1: September 15, 2018 – September 14, 2019**

7,123 Tree Height Measurements (Students and Citizen Scientists) at 4,492 global sites
7,265 Land Cover Measurements (Students and Citizen Scientists) at 5,364 global sites
6,323 Green Up/Green Down Measurements (Students) from 406 global sites

**20,711 measurements from 10,262 global sites!**

**Year 2: September 15, 2019 – August 31, 2020**

13,690 Tree Height Measurements (Students and Citizen Scientists) at 6,078 global sites
8,504 Land Cover Measurements (Students and Citizen Scientists) from 6,059 global sites
5,832 Green Up/Green Down Measurements (Students) from 287 global sites

**28,026 measurements from 12,424 global sites!**

**Year 3: September 1, 2020 – September 15, 2020**

659 Tree Height Measurements (Students and Citizen Scientists) at 328 global sites
292 Land Cover Measurements (Students and Citizen Scientists) from 176 global sites
132 Green Up/Green Down Measurements (Students) from 18 global sites

**1,083 measurements from 522 global sites!**

**Full Campaign: September 15, 2018 – September 1, 2020**

21,471 Tree Height Measurements (Students and Citizen Scientists) at 10,351 global sites
16,062 Land Cover Measurements (Students and Citizen Scientists) at 11,035 global sites
12,287 Green Up/Green Down Measurements (Students) from 492 global sites

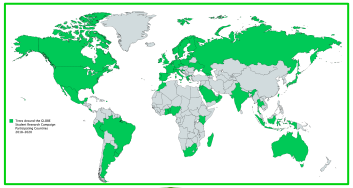
**49,820 measurements from 21,878 global sites!**

**Bottom Line: All the above represents just a small amount of GLOBE data students can use for their IVSS projects**

# GLOBE Trees, Land Cover, Greenings– Full Campaign

25 webinars

Participants from 51 countries



35 blogs with 91,350 views

**<u>September 15, 2018– September 15, 2020:</u>**
**49,820 measurements during the campaign so far!**

**September 2020 - November 2020**
**The Science**
Highlight the science that correlates to the Trees Around the GLOBE Student Research Campaign. Each month, we will highlight associated science, how to access the GLOBE and mission data aligning to the relevant science, multi-campaigns webinars, and focus on online tools that showcase the science, including GLOBE Vis and ADAT.

**December 2020 - February 2021**
**The Science and Planning Student Research**
**Phase 1**: Highlight how to use the science, data, and online tools from the first 3 months of Year 3 in the development of student research project ideas. We will utilize the "Thematic Overarching Research Question (TORQ), Major sub-questions, and additional questions for research.
**Phase 2**: Highlight and bring together the collaborative science, data, and student research from the European Phenology Campaign. Mission Mosquito, and the Urban Heat Island Effect - Surface Temperature Field Campaign.

**March 2021 - May 2021**
**Submitting and Presenting Student Research**
Highlight the student research that was submitted, as part of the Trees Around the GLOBE Student Research Campaign, to the US SRS and IVSS. Students present their research during the webinars as a teaser for the end of the campaign workshop.

**June 2021- August 2021**
**The Workshop and End of Year 3**
In June, there will be a one-two day thematic workshop where students present their GLOBE research projects while interacting with SMEs from NASA and beyond. The themes will be aligned to GLOBE protocols (i.e. Biometry.
July and August will be wrap-up webinars with students, researchers, SME, and citizen scientists.

# The Year 3 Scaffold Structure

In order to maximize the information we provide to campaign participants and to provide students the needed content for answering research questions, we will have a Year 3 Scaffold for campaign science, student research and data.

# Guiding Questions for Student Research (IVSS)

## A Thematic Overarching Research Question (TORQ)

**Why are or why aren't there trees in my local environment?**

Example Exploratory Research Questions to Help Answer the TORQ

Where are all the trees in your location?

What is the tallest tree in your location?

What type of trees are around me?

What are the environmental conditions around me?

What can historical and current time series of imagery tell you about the trees in your location?

Are trees in your region being impacted by climate change?

The campaign would like student participants to focus on the TORQ, in the sense that this question can be answered by researching some of the following Exploratory Research Questions through looking at existing GLOBE data and utilizing online tools that assist in data visualization, data analysis, and data mapping. In other words, we would like students to answer the TORQ by investigating the example Exploratory Research Questions.

These exploratory questions can serve as a guide to helping students in their research projects. Answering one or more questions can lead to the answering of others.

# THE PROTOCOLS

## TREE HEIGHT

## LAND COVER

## GREENINGS (GREEN-UP/GREEN DOWN)

## CARBON CYCLE

# Collaboration with other GLOBE Campaigns

**Trees Around the GLOBE Student Research Campaign**

**Tree Height, Land Cover, Greenings**
https://www.globe.gov/web/trees-around-the-globe

**European Phenology Campaign**

**Greenings (Green-up, Green-down, Carbon Cycle)**
https://www.globe.gov/web/european-phenology-campaign

**GLOBE Mission Mosquito**

**Mosquitoes, Tree Holes**
https://www.globe.gov/web/mission-mosquito/overview

**Urban Heat Island Effect – Surface Temperature Field Campaign**

**Land Surface Temperature – Shaded and Non-shaded tree areas**
https://www.globe.gov/web/surface-temperature-field-campaign


**Learn More at the Campaign URL:**
**https://www.globe.gov/web/trees-around-the-globe/**

**Major Website Sections**

**Join the Campaign**

**Start Taking Measurements**

**Getting Started with Your Student Research and Accessing GLOBE Protocols**

**Activities, Resources, Online Tools, Blogs and Discussion**

**Webinars**

**All About ICESat-2**

**Campaign Community**

# *An Upcoming Opportunity in Just 2 Days*

## GLOBE Student Investigations with NASA

**Webinar: GLOBE Student Investigations with NASA**
**Thursday, September 17, 2020**
**2:00pm-3:30pm EDT (6:00pm-7:30pm UTC)**

**Register for the webinar at: https://bit.ly/JoinUsGLOBE**

nesec
NASA Earth Science Education Collaborative

Learn about resources and events that can support GLOBE student research during the 2020-2021 school year and prepare students to enter the GLOBE International Virtual Science Symposium (IVSS). Join this interactive webinar and hear from nine presenters about planned campaigns and events, as well as data sources and online analysis tools for use in research by you and your students. Julie Malmberg, GLOBE Implementation Office (GIO), will share the new 2021 IVSS rubric. Presented by team members from the NASA Earth Science Education Collaborative, GLOBE Mission Earth, Arctic and Earth SIGNS, GLOBE Implementation Office, and My NASA Data.

# Today's Featured Science Talk

THE GLOBE PROGRAM

## Trees Around the GLOBE Student Research Campaign Webinar

### Kicking Off Year 3 With Tree Height Research Using Satellites and Ground-Based Instruments: The importance of tree and vegetation research to help us understand our changing planet.

Dr. Nancy Glenn, Boise State University and the University of New South Wales, Australia

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**Dr. Nancy Glenn**
Professor, Department of Geosciences and Director, Boise Center Aerospace Laboratory, Boise State University, ICESat-2 Early Adopter

# Questions for you!

What might you consider when designing a field campaign for remote sensing

What other types of data might you use in addition to what I discussed today?

What tools could you use to answer research questions, similar to mine, in your local area?

Why is it important to investigate several sources of data when researching trees?


# THANK YOU!

# Featured Webinar Question

**What are some tree and land cover issues in your local area that students can help answer with student research projects related to the Trees Around the GLOBE Student Research Campaign?**

**Please answer in the chat!**