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ICESAT-2 AND THE TREES AROUND THE GLOBE STUDENT RESEARCH CAMPAIGN: LOOKING AT EARTH'S HEIGHT, ONE TREE AT A TIME

Abstract

The NASA Ice, Cloud and land Elevation Satellite-2 or ICESat-2 launched on September 15, 2018 from the Vandenberg Air Force Base aboard the last Delta II rocket. ICESat-2 is designed to map the height of our planet by counting the laser photons leaving and returning to the satellite. Although its primary science objective is to measure the height of Earth's ice, it is able to measure other 3-dimensional objects on Earth, like mountains, buildings, oceans, lakes, trees, etc. The GLOBE Program is an international program of students, educators, scientists, and citizen scientists that allows participants to take measurements in their local environments, in order to see the big picture of how our planet is changing over time. One of the GLOBE measurements is tree height.

Students, as part of the Trees Around the GLOBE Student Research Campaign, have been collecting tree height data and will be comparing it to ICESat-2 tree height data. The Trees Around the GLOBE Campaign commenced on September 15, 2018 in conjunction with NASA's ICESat-2 satellite launch. This campaign is a student research campaign focusing on tree height. Tree height is not just a measurement - it is a gateway to understanding many things about the environment. The structure of tree canopies, the 3D arrangement of individual trees, has a huge effect on how ecosystems function and cycle through carbon, water, and nutrients.

As part of the NASA GLOBE Observer Citizen Science Program, a new Trees protocol will allow citizen scientists to measure tree height using their mobile device. From this, there will be an increasingly robust dataset that will allow scientists to use it as satellite data evaluation and in potential professional research. Scientists from the ICESat-2 Mission will periodically review the tree height data collected by the GLOBE community throughout this campaign and beyond.