



HAWAIIVIEW 2020 - 2021



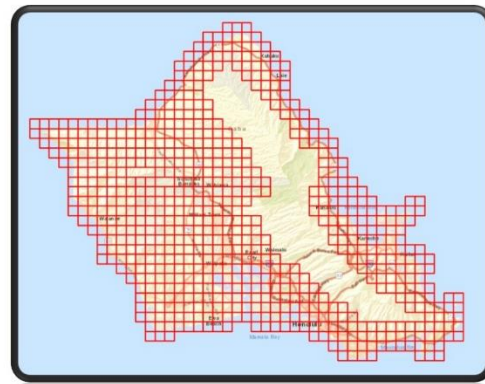
HAWAIIVIEW 2020 - 2021 ACTIVITIES

Lidar is the most accurate technology for mapping vegetation height. However, the existing airborne lidar data over Oahu (collected in 2013) miss the majority of the Ko'olau Range and a part of the Waianae Range, due to persistent cloud and complex topography. We combined island-wide Landsat-8 cloud-free mosaic (generated from the GY19 activities, <https://bit.ly/2ILmzJo>) and 2013 lidar data to map vegetation height over Oahu's mountainous areas (OMA). We first estimated vegetation height over lidar coverage areas, then used the data over the overlap areas to create a model of predicting lidar-based height from Landsat imagery, and finally predicted height over mountains using the model and the Landsat-8 mosaic.



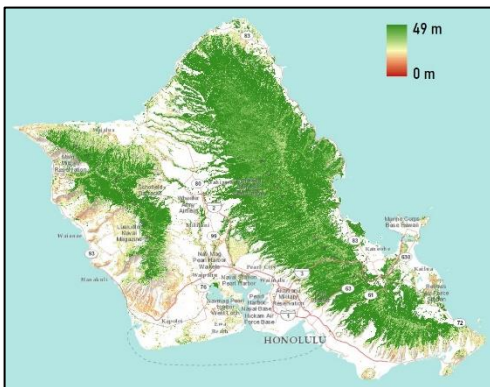
Landsat-8 Cloud-free Mosaic

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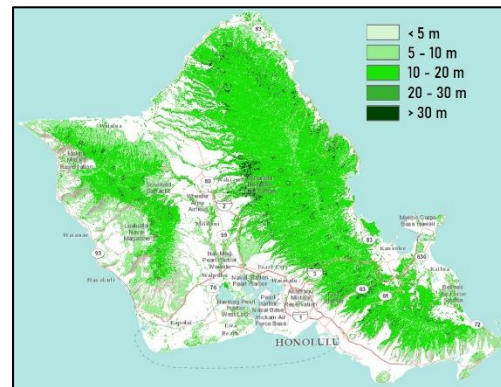


Airborne Lidar

Integration of Landstat-8 Cloud-free Mosaic, Airborne Lidar, and Machine Learning for Island-wide Tree height Mapping



Map of Oahu Continuous Tree Height



Maps of Oahu Tree Height in Categories

HawaiiView is a member of the AmericaView Consortium, a nationally coordinated network of academic, agency, non-profit, and industry partners and cooperators that share the vision of promoting and supporting the use of remote sensing data and technology within each state. AmericaView is funded by USGS grant agreement G18AP00077.



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BENEFITS TO HAWAIIVIEW

- The only existing statewide map of vegetation height in Hawaii is the LANDFIRE Existing Vegetation (EVH) products. However, this product has several limitations including that 1) it is categorical (based on the average height per vegetation type), and 2) it was derived using only 246 plots, which might be insufficient to represent the vast diversity of vegetation types and structure from the large elevation gradient. Our map is the first of its kind to generate a continuous vegetation height for the forest areas in Oahu using massive airborne lidar-derived vegetation height as the reference.
- This new map (<https://bit.ly/3dLqLo7>) of vegetation height provides a critical input for understanding the role of forests in ecosystem functioning and services (such as water supply, carbon storage, and biodiversity conservation) in the island of Oahu, which has the largest population (about two-thirds, or one million, of the state residents), attracts the most tourists (about 6.2 million visitors per year), and pristine forests with pressure from urban development, agricultural expansion, military operations, species invasion, etc.
- One master graduate student was trained and supported for airborne lidar data processing and vegetation height modeling and mapping.
- One undergraduate student was trained for exploring satellite lidar data for terrain and vegetation use.

Feedback Examples

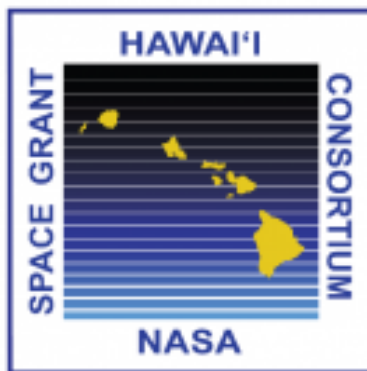
This is super interesting and very helpful.

*Thomas Giambelluca, Director, Water Resources
Research Center*

This is fabulous! Vegetation height data is one of those critical missing pieces we have had for a lot work work here in Hawaii.

*Lucas Fortini, Research Ecologist, Pacific Island
Ecosystems Research Center*

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<http://hawaiiview.org>



<https://bit.ly/3l0moex>