HAWAIIVIEW 2022 - 2023 ACTIVITIES

Lidar is the most accurate technology for mapping vegetation height. However, the existing airborne lidar data over Maui miss a large portion of the Haleakalā in the east and almost the entire Mauna Kahālāwai in the west, 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 airborne lidar data to map vegetation height over Maui's mountainous areas (MMA). 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.
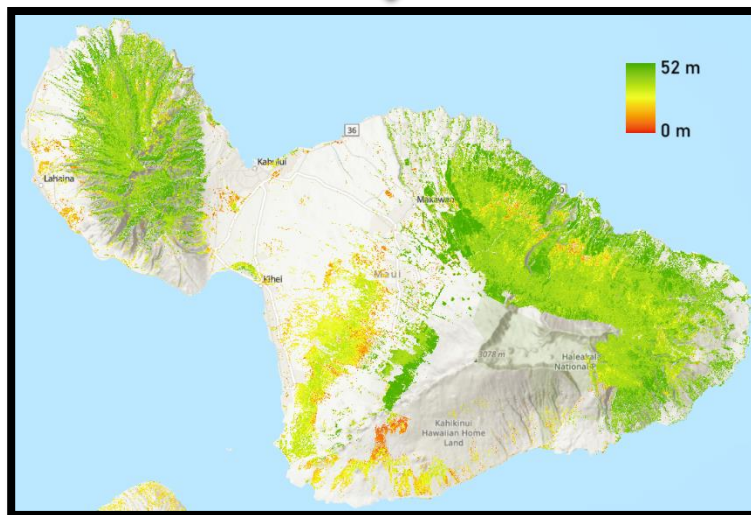

Landsat-8 Cloud-free Mosaic

+
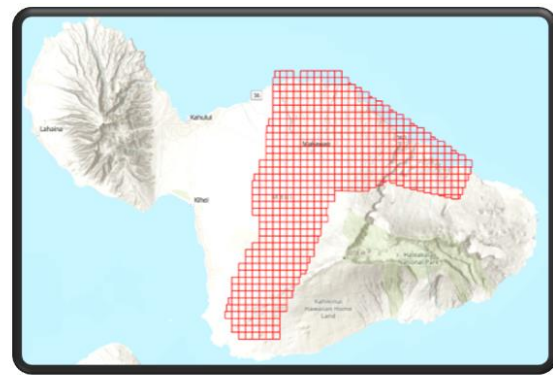
Airborne Lidar

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

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- We produced a new map of vegetation height over the forest areas in Maui using massive airborne lidar-derived vegetation height as the reference, which led to a much better accuracy than the existing vegetation height maps in Hawaii (such as the LANDFIRE Existing Vegetation Height, EVH) (see Figures below as an example).

- This new map (https://tinyurl.com/sezw7425) 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 Maui.

- One master graduate student was trained and supported for airborne lidar data processing and vegetation height modeling and mapping.
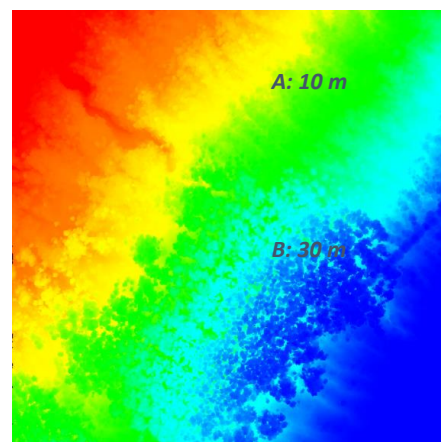

ArcGIS Base Imagery (Locations A and B)
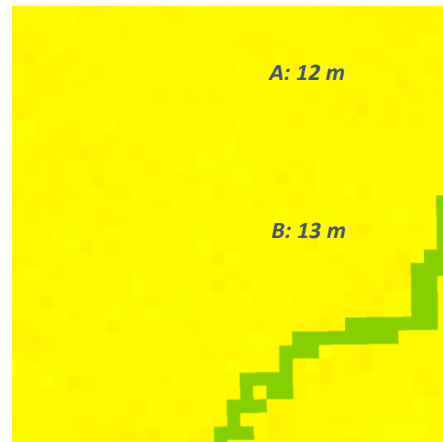
Landfire Existing Vegetation Height Maps
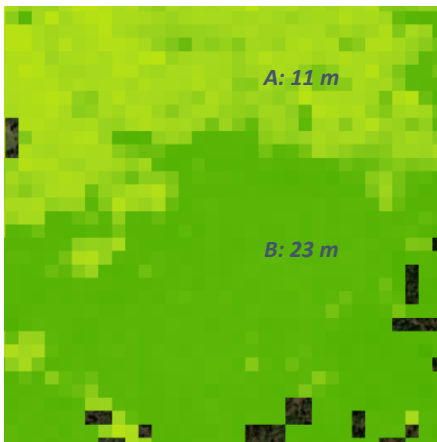
Our product: L2FHM

Airborne lidar point cloud

Note: Numbers at locations A and B indicate the vegetation heights from different products

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