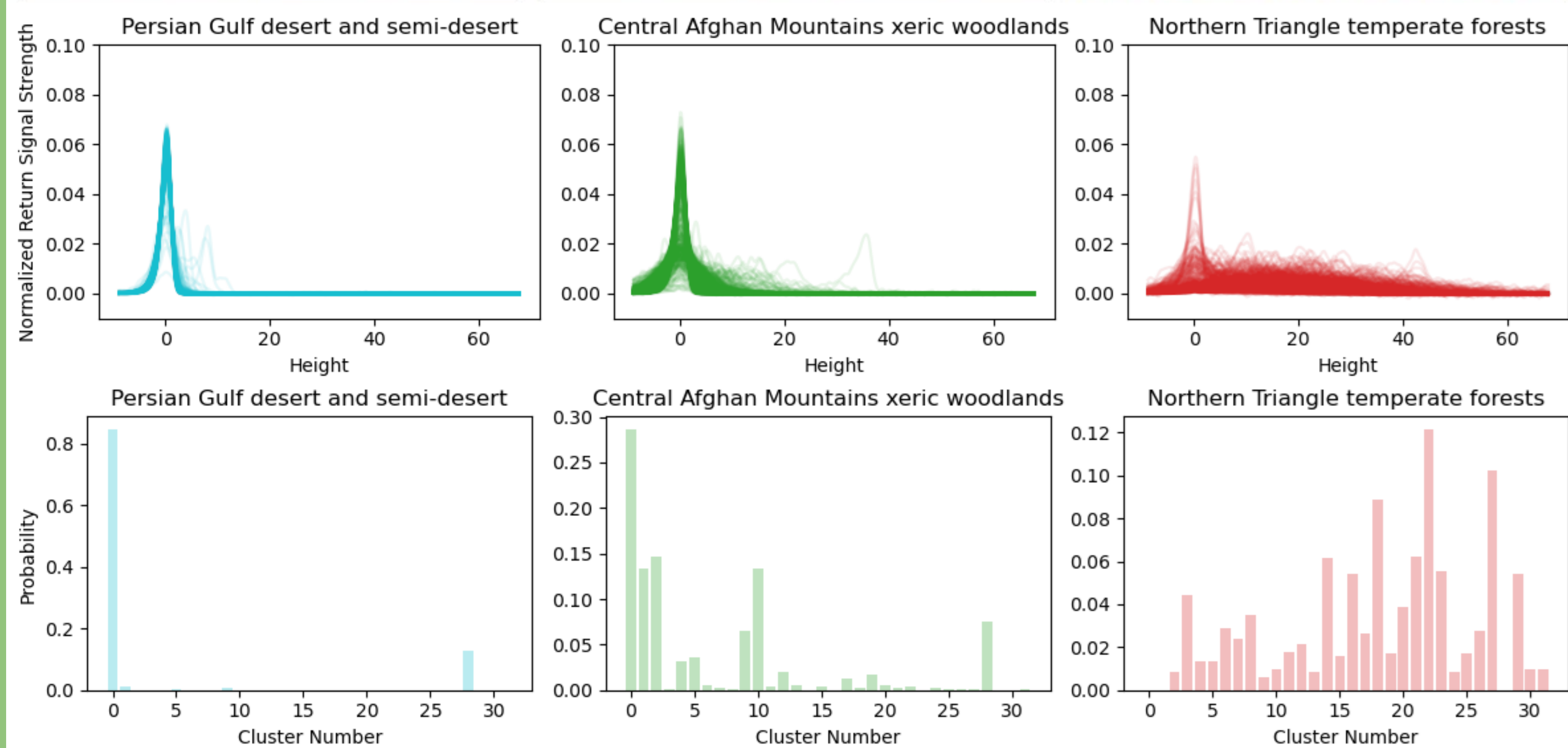
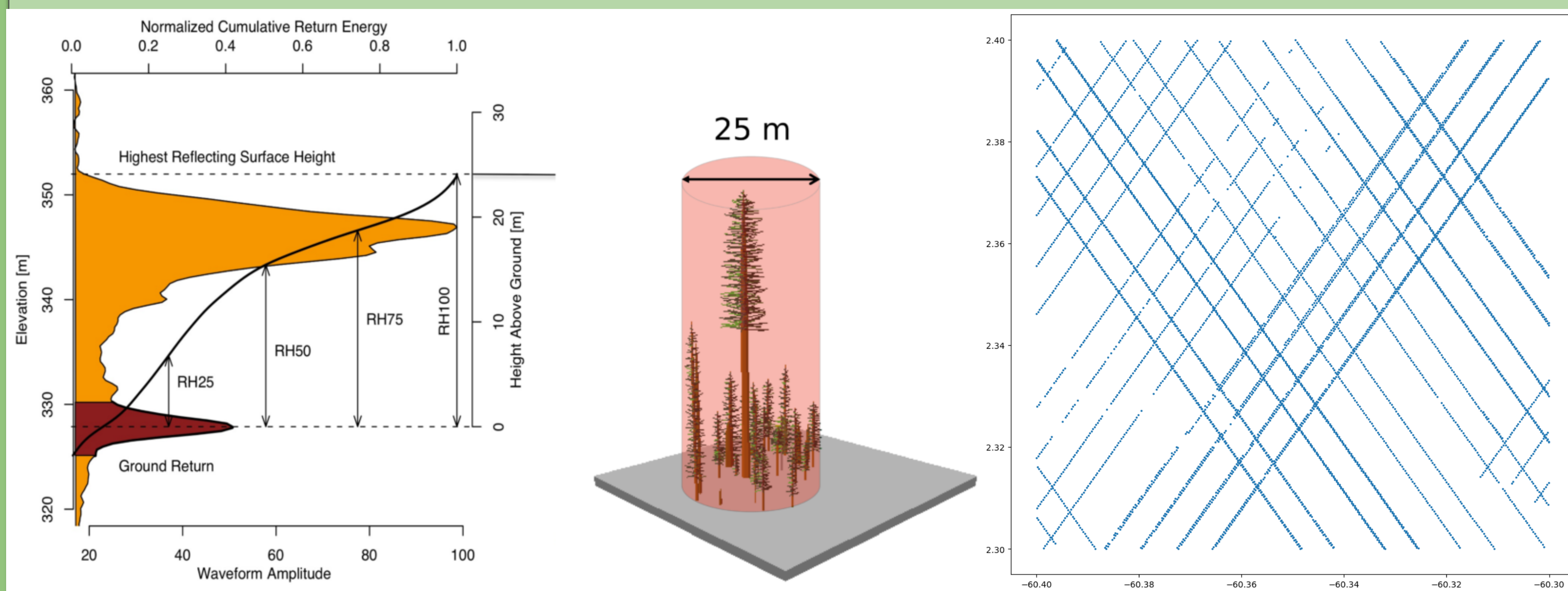


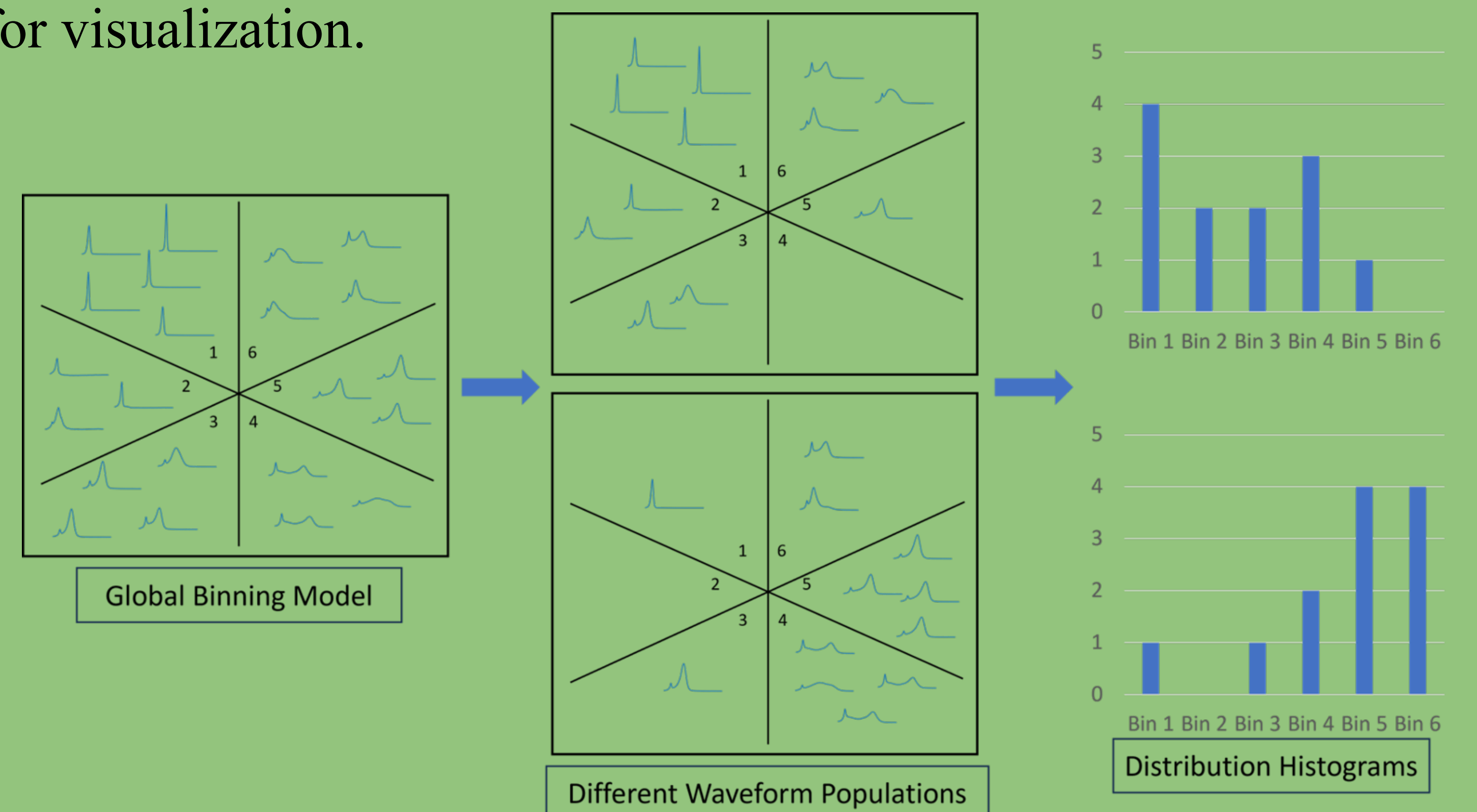
## Overview

Global Ecosystem Dynamic Investigation gives us waveforms describing the vertical distribution of vegetation structure. It samples the ground along tracks. We aim to visualize the spatial variation of populations of waveforms.



## Method

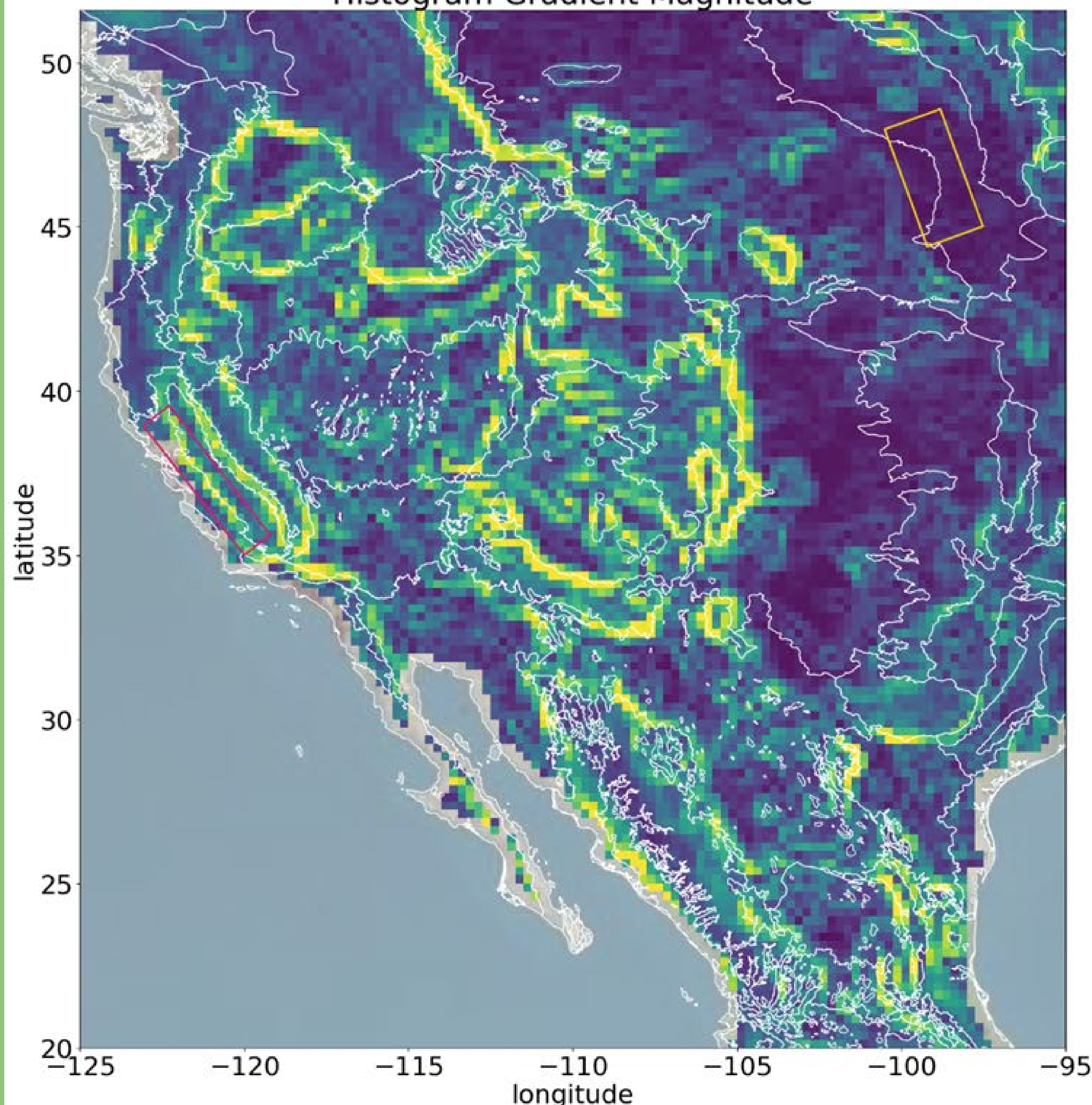
We first train a K-means model with all available GEDI waveforms across spacetime. Second, we sample waveforms from local regions and bin them with the global binning model. Then, we create histograms based on the binned waveforms. These histograms capture the structural distribution for local regions and can be used for visualization.



## Result

Differences among the bin histograms reflect the distribution difference in vegetation structure. We show three examples of different ecoregions with their waveforms and histograms. The histograms are different for these different types of ecoregions. We use Sobel gradient magnitudes to quantify the heterogeneity of histograms. We use an estimate of canopy height, RH98, for comparison. It has the ability to detect some structural transitions between ecoregions. The red boxes on the left of each map show that histograms capture different information from RH98. Additionally, neither metric identifies the structural differences across the ecoregion boundary in the orange boxes on the right side of the maps.

Histogram Gradient Magnitude



RH98 Gradient Magnitude

