

VEG3D: BIODIVERSITY & HABITAT – Definitions & Questions

Overarching Question: How are biodiversity and species habitats distributed over the Earth's surface, how are they changing, and what Veg3d information is critical for biodiversity and habitat science and management?

1. What are structure, biodiversity, and habitat?

- Structure: Landscape Structure is the spatial heterogeneity of an area composed of interacting habitat patches. Vertical Structure is the bottom to top configuration or complexity of above-ground vegetation. Landscape heterogeneity and vertical complexity and changes in them have been shown to influence distribution patterns among animals and other plants.
- Biodiversity:
 - combination of species richness and abundance
 - richness is number of different plant or animal species in an area
 - focus typically on multiple species
 - more work done with vegetation diversity than animal
- Habitat:
 - conditions required by a species for survival and reproduction
 - habitat heterogeneity known to be linked to species diversity
 - habitat heterogeneity metrics can be derived from RS data sets

2. What is the importance of Veg3d and biodiversity/habitat? i.e., to science and for application to management & specific programs

- Scientific questions that need to be answered, e.g.
 - Vegetation diversity: how is it distributed and changing across landscapes & regions?
 - Animal habitat: what animal taxa (i.e. arthropods, birds, and mammals are particularly important) respond to vegetation structure in choice of habitat and in what way?
 - Animal biodiversity: does vegetation structure in part control faunal biodiversity across landscapes?
 - How is animal habitat and biodiversity distributed and changing across landscapes & regions
- What management organizations use or would use vegetation structure in assessing biodiversity and/or habitat
- What are the requirements of these management agencies & specific programs

3. What Veg3d variables are needed?

- Traditional measurements: what variables have typically been measured and how could these be measured by Radar/Lidar/InSAR
 - Direct or surrogate measurements/models
- New measurements: are there new capabilities and metrics

4. What spatial resolutions and spatial extents?

5. What temporal, i.e. repeat, capabilities are needed?

6. What levels of accuracy and precision are required?

- How does this vary by scale
- How does this vary by application?

7. Sensors and sensor fusion

- What sensors and parameters are required?
- Active sensor fusion (i.e. Radar-Lidar) utility and needs for habitat/biodiversity mapping and modeling
- Active and passive optical sensor fusion (i.e. Radar or Lidar with Landsat-MODIS) utility and needs for habitat/biodiversity mapping and modeling
- Recent advances

8. Models

- Types of models/modeling in habitat and biodiversity science
- Incorporating structure in models for biodiversity and habitat – how could structure data be used in and improve habitat and biodiversity models
- Recent advances