

**Experiment Description: SHARE 2012 (September)**

**Input required by June 15th**

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**Short Title:** *Using airborne waveform LiDAR for forest parameter estimation*

**Objectives:** *The goals of this experiment are to*

- assess the utility of airborne, small-footprint waveform LiDAR to estimate forest structure in terms of height, volume, biomass, crown width, and leaf area index (LAI);*
- test the applicability of DIRSIG to model real forest scenes, measured by the forestry parameters mentioned above;*
- further the development of algorithms for estimation of these forestry parameters, such as tree locations, heights, biomass and leaf area index; and*
- determine if ground-based LiDAR measurements can be used to calibrate and/or improve airborne assessments.*

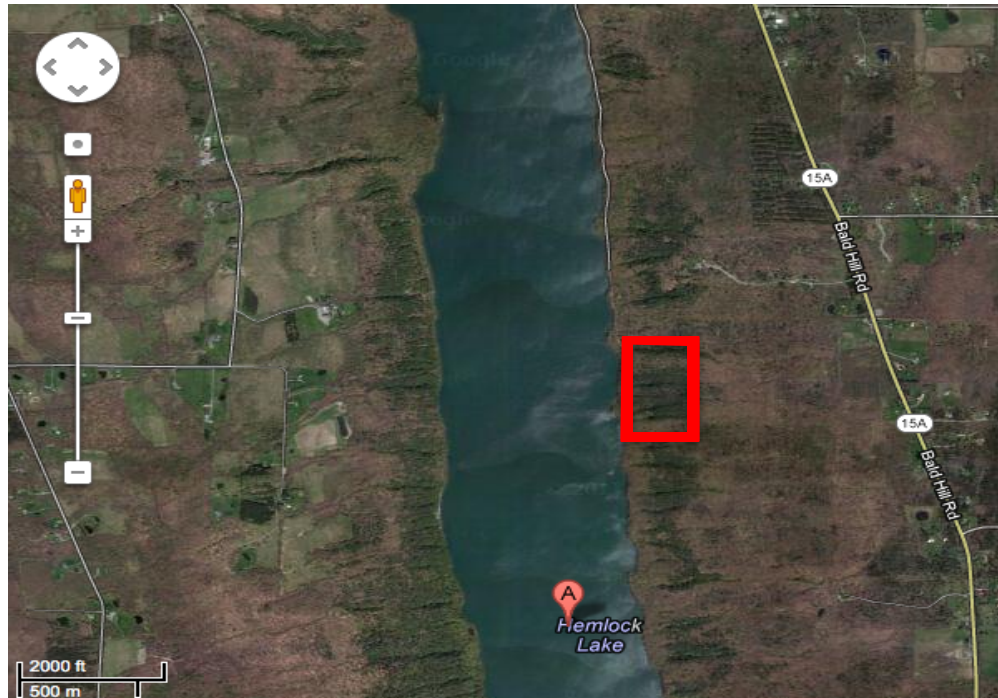
**Deployments:** *We will deploy the team described above, along with a ground-based lidar, and a spectroradiometer; the latter will be used to collect leaf spectra for DIRSIG modeling purposes.*

**Flight Lines:** *The flight lines (see Figure 1) are located to the East of Hemlock lake, with approximate NW corner co-ordinates:*

*42 44' 19.69"N 77 35' 28.17"W*

*and approximate SE corner co-ordinates:*

*42 44' 07.02"N 77 36' 14.44"W*



**Figure 1:** The area to be imaged, to the East of Hemlock lake.

**Flight Constraints:**

*An optimal collection will occur on a cloud-free day. Ground data will be collected during the two weeks before/after the airborne collect.*

**Ground Truth Required:**

*Ground truth will be collected at approximately the same time as the flight (during the same week if possible). The following measurements will be taken:*

- *Ground-based LiDAR scans*
- *Tree measurements*
  - *per-plot location maps*
  - *diameter at breast height (DBH) of trees*
  - *height of trees*
  - *crown width*
  - *LAI (Accupar sensor)*

**Equipment:**

*The following equipment will be needed:*

- *GPS*
- *Ground-based LiDAR, including tripod, backpack, etc.*
- *Marking flags*
- *Measuring tapes, clinometer, basal area prisms*
- *Accupar LAI device*