North Coast and Cascades Network (NCCN) Vegetation Inventory Annual Report 2011

NCCN Parks: Ebey's Landing (EBLA), Fort Vancouver (FOVA), Lewis and Clark National Historic Park (LEWI), Mount Rainier National Park (MORA), North Cascades National Park (NOCA), Olympic National Park (OLYM), San Juan Island National Historical Park (SAJH).

Summary of major accomplishments in 2011:

- Draft vegetation classification and draft map available for SAJH, accuracy assessment underway
- Draft vegetation classification completed for LEWI, validation sampling underway
- Image processing complete for MORA, draft map near completion

Mapping work at San Juan Island National Historic Park nears completion

In collaboration with Joe Rocchio, Washington Natural Heritage Program ecologist, we continued inventory work at SAJH this season. During a field visit in late May, NCCN VIP coordinator Catharine Thompson worked with SAJH Resource Chief Jerald Weaver and NCCN ecologists to perform a preliminary validation of the new classification for the park, focusing on the descriptions and keys. Validation sampling performed in June showed a 78% total accuracy. Field work for the accuracy assessment is ongoing in July and deliverables will be prepared this fall.

Field sampling at Olympic National Park challenged by cold wet conditions

Field sampling at Olympic continues to focus on training data for map development. Field operations are challenging this year due to the considerable late season snowpack (150% of normal) and cold wet conditions.

Mapping work at Mount Rainier National Park continues

Image processing is complete after integration of high quality Landsat TM imagery from summer 2010 and generation of improved topographic metrics using the System for Automatic Geoscientific Analyses (SAGA) as well as improved stream delineation procedures. The mapping team at Portland State University (PSU) developed a new technique for image segmentation based on LiDAR metrics and have used the method to produce final mapping polygons. The method incorporates variation in canopy height and density and creates polygons that accurately reflect variability in canopy structure which have much higher correspondence to forest types than segmentation based on optical imagery. It is also effective for non-forest types. New methods for minimizing bias problems when using Random Forests to assign vegetation types to polygons are being integrated to the mapping process. Draft maps will be produced in summer 2011. Accuracy assessment field data will be collected in late summer. All methods developed in the course of the MORA mapping work will be applied to the projects in Lewis and Clark, Olympic and North Cascades National Parks, greatly increasing the efficiency of those efforts.

Mapping work at Lewis and Clark National Historic Park continues

A draft alliance-based mapping classification for Lewis and Clark National Historic Park has been developed by cooperators at Portland State University (PSU) and is currently under review.

Please contact NCCN Vegetation Inventory Project Coordinator, Catharine Copass Thompson for further information. Catharine_Thompson@nps.gov, 360 565 2979

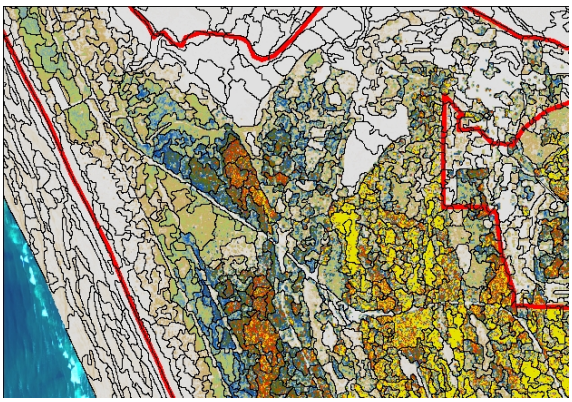

Figure 1. Segmentation based on LiDAR-generated canopy metrics, overlaid on vegetation height (Fort Stevens).

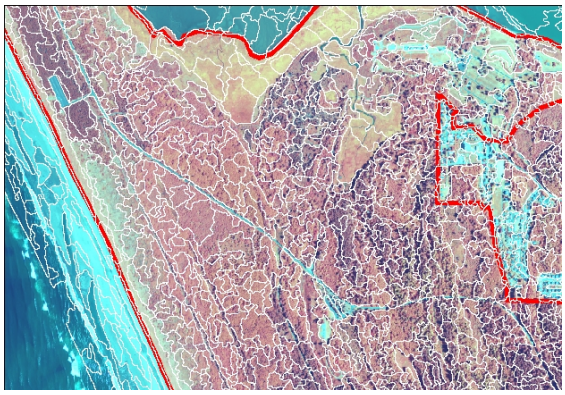

Figure 2. Segmentation overlaid on color-infrared aerial photography (Fort Stevens).

Similar to the MORA mapping, image segmentation was performed on a multi-band image consisting of different LiDAR metrics (Figure 1) and a NDVI layer created from the 2009 NAIP. Attributes for each polygon were extracted, including two dates of Landsat imagery (30m), one date of SPOT 5 imagery (10m) derived vegetation indices (NDVI, NDMI, TCW) and environmental variables. Final polygons were generated and Random Forests was used to classify landcover types for each polygon (Figure 2). In total 23 alliance-based classes were mapped (Figure 3). The initial alliance classification error from Random Forests was 38%. Next, polygons will be merged, and modifications will be made to the draft map, followed by map validation by PSU and NPS staff. An accuracy assessment will be carried out and finished in mid-August.

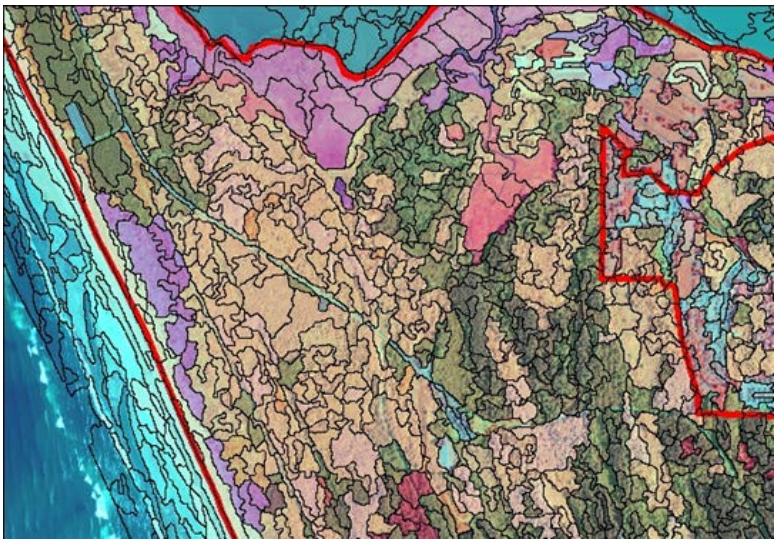

Figure 3. Alliance based classification (Fort Stevens), classes have been aggregated to simplify legend.

2012 Expected accomplishments:

- LEWI Deliverables
- Scoping for EBLA and FOVA
- SAJH Deliverables
- MORA Deliverables

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