



North Coast and Cascades Network (NCCN) Vegetation Inventory Annual Report 2010

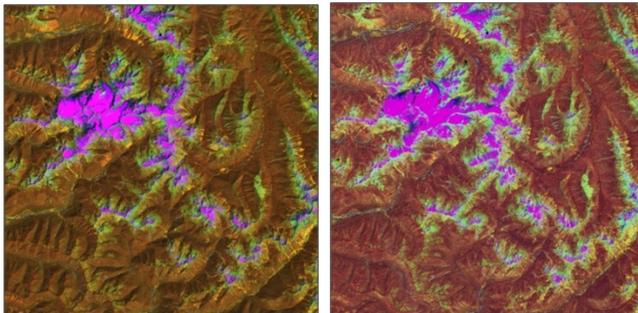
NCCN Parks: Ebey's Landing National Historical Reserve (EBLA), Fort Vancouver National Historic Site (FOVA), Lewis and Clark National Historical Park (LEWI), Mount Rainier National Park (MORA), North Cascades National Park Service Complex (NOCA), Olympic National Park (OLYM), San Juan Island National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

Summary of major accomplishments in 2010:

- Initiated OLYM inventory and first full OLYM field season
- Initiated SAJH inventory
- Incorporated novel image processing and map classification techniques into mapping work at MORA
- LEWI draft vegetation classification created

Mapping work at Olympic National Park has begun

Eric Nielsen, mapping technical lead at Institute of Natural Resources quickly incorporated the 2009 color-infrared National Agricultural Imagery Program (NAIP) data in order to be ready for the field season. He has refined image processing techniques to create satellite imagery, NAIP photography, and vegetation indices that are less influenced by topography and other variability, and therefore better represent vegetation composition.



Left image shows an uncorrected Landsat TM image from Olympic National Park. Right image has been topographically corrected so that the impact of variable solar radiation on various slope facets is normalized. This produces an image where reflectances correspond more closely to land cover.

For the 2010 field season, Eric automated field sample site selection which has resulted in better sample stratification, more homogeneous samples, and more efficient fieldwork. The field sample sites correspond to unique spectral/topographic clusters in the imagery. The NPS field crew evaluates site homogeneity on the ground, assigns a National Vegetation Classification (NVC) Alliance or Group code, and collects a small amount of additional information. Field sampling has been completed along the outer coastal strip, as well as in the Bogachiel, North Fork Quinault and Elwha drainages.

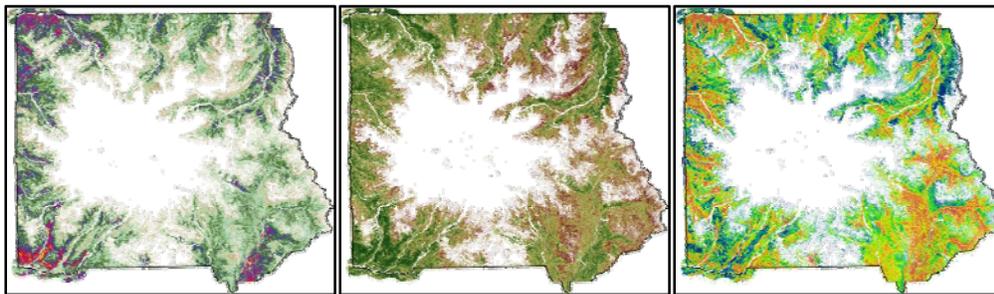
Mapping work at San Juan Island National Historical Park has begun

In collaboration with Joe Rocchio, Washington Natural Heritage Program ecologist, we initiated mapping at SAJH. Prior to the field season, Joe crosswalked the existing classification with the updated National Vegetation Classification (NVC) hierarchy and assembled imagery and GIS resources. Between May and July, Joe completed field mapping of non-forested vegetation at American Camp, collected plot data for data gaps associated with non-forested vegetation at American Camp, and completed mapping 80% of English Camp.



Mapping work at Mount Rainier National Park continues

While waiting for the 2009 NAIP aerial imagery to become available, the technical team concentrated on refining approaches that will be used in the final mapping. First, Eric derived products from the Light Detection and Ranging (LiDAR) data, including; a variety of vegetation metrics (see graphic below), improved terrain and tree shadow modeling to identify where optical imagery cannot be used accurately for mapping, and riparian modeling. Next he prepared for image segmentation by devising a segmentation approach based on pixel classification probabilities rather than on raw aerial photography. This approach allows eCognition to make use of other data sources (e.g., multispectral satellite imagery, LiDAR, etc.), and locates polygon boundaries in areas where Random Forests determines transition probabilities are highest. Last, he improved post-eCognition processing in order to create more naturally-shaped polygons.



Examples of LiDAR metrics derived for Mount Rainier NP. Left- canopy height, Center- canopy cover and Right=canopy rugosity.

Mapping work at Lewis and Clark National Historical Park continues

Image processing accomplishments include; 1) deriving products from the LiDAR similar to those developed for MORA but with the addition of new processing methods for wetland mapping in low-relief terrain; and 2) incorporating recently-available free SPOT satellite imagery for improved mapping of small-patch vegetation. Vegetation classification accomplishments include the development of a comprehensive list of plant associations at LEWI, based on fieldwork and past vegetation mapping efforts, that has been cross-walked to the NVC. A draft alliance-based mapping classification has also been developed. Recent work with NatureServe has focused on implementing a new classification for ruderal types, including lawns, planted open woodlands, and maintained “gardens” with a mix of native and planted shrubs, forbs and trees. Field data collection is ongoing at LEWI this summer.

2011 Expected accomplishments:

- LEWI Deliverables (February 2011)
- MORA Deliverables (March 2011)
- SAJH Deliverables (December 2011)
- Scoping for EBLA and FOVA

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