LANDFIRE Remap Vegetation Type Agreement Assessment Summary

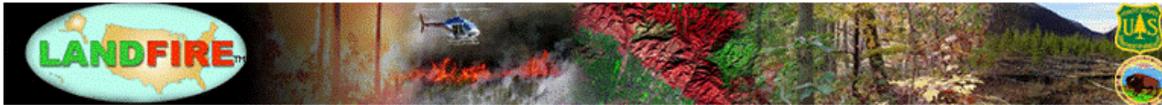Goals of the LANDFIRE Remap Agreement Assessment Summary are to:

- provide timely information on the quality and usability of the LANDFIRE Existing Vegetation Type (EVT) spatial data,
- ensure a consistent approach across each of the EVT product classifications, including Ecological Systems classification (ES), National Vegetation Classification (NVC), and the SAF/SRM system, and
- provide this information in a consistent way across each GeoArea product as the spatial data products are released for distribution.

NW GeoArea Assessment Highlights

- This summary and associated geographic area agreement assessments are being provided to help LANDFIRE EVT spatial product users understand the characteristics of the data to support appropriate applications.
- The EVT Ecological Systems (ES) and EVT National Vegetation Classification Group (NVC) are independent products and are not the result of a cross-walk as they were in previous versions of LANDFIRE.
- The assessment for the SAF/SRM cover type classification was developed by cross-walking from Ecological Systems, while the NVC Macrogroup was assessed by collapsing the NVC Group assessment based on the NVC hierarchy.
- The NW GeoArea assessment sample contained 9724 plots in 169 unique Ecological Systems and 130 unique NVC Group categories.
- Agreement can vary considerably across categories and the quantity of categories is extensive which reduces the aggregated rate of agreement across all categories. It is best not to rely on the overall, aggregated agreement alone to indicate the usefulness of a data set for your specific application.
- The NW GeoArea LANDFIRE EVT Ecological Systems overall agreement was 47%. 49 ES categories had a sufficient sample to estimate row agreement, with significant agreement variation across those categories.
- While not directly comparable due to changes in processes and geographic extent, this represents an improvement in overall agreement for Ecological Systems from the original LANDFIRE data (called LF National) which ranged from 32% in the Northern Rockies to 38% in the Pacific Northwest geographic areas.
- The NW GeoArea LANDFIRE EVT NVC Group averaged agreement was 48%. 38 of the NVC Group categories had a sufficient sample to estimate row agreement, with significant agreement variation across categories.

Methods used in this assessment are similar to previous LANDFIRE and other mapping efforts. A subset of training plot locations was held out from the EVT modeling process so that products could be assessed for agreement using independent samples. Variations in plot count and distribution will create significant variability in agreement rates for individual EVT categories within and across different GeoAreas.

We remind users that local review of the data will add valuable information for localized applications and a different perspective than these GeoArea wide summaries. We suggest that the applicability and relevance of LANDFIRE data sets be evaluated for individual, specific project purposes by thoroughly investigating individual category results in the classification of interest and identifying important matches and mismatches that are present in the assessment data, not simply from aggregated agreement across a large region such as the NW GeoArea.

As with all quality assessments, it is important that the user understand the strengths and limitations of the assessment process. Limited time and resources are often an issue in accuracy assessments, particularly here, where LANDFIRE is working quickly with limited budgets to release an assessment at the same time the spatial product is made available to the public. In the case of LANDFIRE EVT classifications there are no national reference or "truth" data sets available for use in the assessment. All mapping and assessment plots are assigned an NVC and ES category using an automated dichotomous key (called an Auto-Key) especially created for each region by LANDFIRE. A subset of these plots are "held-out" and the remainder are used in the EVT modeling process. As these assignments are made using heuristic rules rather than on the ground "truth" observations, LANDFIRE adopts the term "agreement" in lieu of "accuracy". A strength of this approach is that it allows LANDFIRE to create a much larger assessment sample with improved geographic and thematic distribution.

Results are given as contingency tables for each of the individual classification systems. NVC Group (NVC) and Ecological Systems (ES) EVT products were created independently, but the same subset (and location) of holdout plots was used for each assessment. The holdout sample was designed to provide the most representative distribution of plots for assessing the ES product. The holdout sample may not be as representative for NVC.

Below is an example of examining the assessment information:

- Are you using the Ecological Systems classification, National Vegetation Classification, or the SAF/SRM system?
- Identify which categories are actually important to you in your application and focus your data quality review on those.
- Both NVC and ES are mid-scale classifications - Should you collapse Ecological System categories into categories more relevant to your application? If so, collapse those rows/columns appropriately to modify the agreement assessment results.
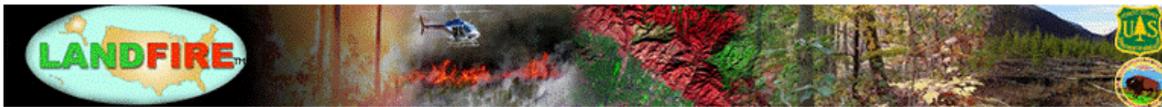
Table 1. Examples of Category Variability (from NW Remap Ecological System Row Agreement table)

EVT_Name	Number of mapped pixels in the Holdout Sample	Row Agreement	Primary Within Row Mismatch/Mapping Error
Northwestern Great Plains-Black Hills Ponderosa Pine Woodland and Savanna	359	90%	Interior Western North American Temperate Ruderal Grassland; 7 Incorrect Pixels
Inter-Mountain Basins Big Sagebrush Shrubland	567	33%	Inter-Mountain Basins Big Sagebrush Steppe; 83 Incorrect Pixels

- Examine the types of errors identified in the assessment. For example, in Table 1, the primary map error for pixels mapped as Inter-Mountain Basins Big Sagebrush Shrubland was mis-identification as Inter-Mountain Basins Big Sagebrush Steppe. For some applications the distinction between shrubland or steppe class may be critical, for others not an error at all. If not, the 83 pixels labeled as Inter-Mountain Basins Big Sagebrush Steppe, can be collapsed increasing the agreement for this category to 48%.
- Agreements may also vary depending on perspective, e.g. Column Agreement vs Row Agreement (often called User's vs Producer's Accuracy, respectively).