Landfire Application Grant: Final Report
Deschutes Application Grant

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Executive Summary

The Deschutes Upper Basin LANDFIRE Application Project was awarded to facilitate the collection and analysis of local data layers to develop Fire Regime Condition Class on the Deschutes landscape, to compare the Condition Class analysis to LANDFIRE Rapid Assessment data and to LANDFIRE National Data. In addition, this application award funded the initiation of local data development at three Oregon sites associated with the Fire Learning Network on the Malheur NF, the Fremont-Winema NF and in the Applegate Valley, owned by Rogue Siskyou and Medford District BLM.

Included in this executive summary are:

1. Required Deliverable list and associated deliverable for the Upper Deschutes Basin.
2. Summary of work accomplished at associated sites.
3. Key Points listing some major differences between Landfire products and locally derived products.
4. Supporting information for those key points (pulled from associated reports).
5. Potential Improvements to Landfire Data
6. Current Uses of Landfire Data
7. Maps comparing LF Rapid Assessment, LF National and Local Data.

1. Required Deliverables:

Required Deliverables	Deliverable
Document describing partners, partners interest and our desired outcomes for each partner relative to how LANDFIRE data will facilitate accomplishment of these outcomes. **Year 1**	**UDBFLN_Letter_of_Agreement.doc** *Partner's vision includes setting forests on a trajectory that takes the Historic Range of Variability into Account; in this respect, LANDFIRE data can fill data gaps to measure the current status of the forest and set plans for future management.
Document describing the landscape and fire situation (the proposal info may be sufficient, but you should check for additions or modifications. **Year 1**	**FRCC_UDBMethods.doc** *see intro
Spatial data set that contains data required to compute FRCC vegetation departure, and any fire history or treatment information that is available.	2004 Satellite Imagery, classified into structural data, further cross-walked to local 5-box models using ViableEcosystem (Ochoco National Forests). See **FRCC_UDBMethods.doc**
Map of FRCC derived from local data set for at minimum one "scale" (HUCs, administrative boundaries, etc.). It would be preferable that the FRCC map be created at a second scale since FRCC is scale-dependent. **Year 2**	**FRCC_UDBMethods.doc**

Document containing a comparison between the FRCC map derived from local data with the FRCC map derived in the Rapid Assessment. **Year 2/3**	**Application_RA_Final.doc** (John Foster)
Document containing a comparison between the FRCC map derived from local data with the FRCC map derived in LANDFIRE National Implementation. **Year 3**	**Application_LF_Final.doc** (John Foster) **LandfireNational_Local.xls** – a crosswalk of the LF National BpS to local BpS set.
Present your project results or vegetation modeling results at an FLN meeting, or present your results at an appropriate national meeting, or publish your results in a journal or at a professional symposium. **Year 2/3**	Data presented to FLN technical team.

2. Work accomplished in associated sites:
Fremont-Winema NF: The Landfire Application grant was utilized to initiate process of developing local data to address landscape condition class. Local Biophysical Setting Maps, Biophysical models and current conditions were unavailable in 2005. Since then, TNC staff has partnered with the IMAPs project (Region 6 Interagency Mapping Application Project). We have successfully mapped out the steps needed to develop local-based forest condition class. We currently have Biophysical Setting Models (VDDT) developed by Miles Hemstrom through the Interagency Mapping Assessment Project (IMAP). These multi-box models have a crosswalk to the 5-box Landfire Models – this cross walk will be used to summarize current conditions for a FRCC Maptool run. In addition, we have current vegetation from Gradient Nearest Neighbor (GNN); this data is currently being cross-walked to the BpS Models. Finally, an a new BpS map was developed (Aug. 2009) using the Potential Natural Vegetation model (Jan Henderson, Robin Lesher) by USFS area ecologist Mike Simpson.

TNC staff developed a stand level map for the forest using GNN data and eCognition tools. This map provides the necessary information to create a succession class map required for FRCC mapping. Next steps are to create the succession class map and map FRCC. See attached flowchart Lakeview Tasks Flowchart V3.pdf.

Other sites were behind with available layers, and so no LF application grant money was put towards Malheur NF or Applegate Watershed.

3. Key Points
LANDFIRE data is very useful in areas where data is missing or limited to certain ownerships. This grant provided the opportunity to determine how well LANDFIRE data compared when relatively robust local data was available.

John Foster provided the analyses for the both the LF National and Rapid Assessment data. Although Landfire RA and National weren't directly compared, John did the same analysis on both and some comparisons can be derived.

Attached as two different reports are the following comparisons:

1. Locally derived data (BpS and FRCC) to Landfire Rapid Assessment (Application_RA_Final.doc).
2. Locally derivded data (BpS and FRCC) to Landfire National data (Application_LF_Nat_Final.doc).

Key Point 1: Landfire Rapid Assessment and National data overestimated the acres of Condition Class 3 in the Upper Deschutes Basin when compared to locally developed data.

Key Point 2: Landfire Rapid Assessment and National data had differences in Biophysical Settings from the local data; however they were different from each other, as well.

4. Supporting Information:

Table 1. % Stand FRCC = 3 and Bps User and Producer Accuracies.

	Landfire Rapid Assessment	Landfire National	Local Data
% Stand FRCC 3	**61%**	**49%**	**23%**
Bps – User Accuracy	36%	38%	n/a*
Bps – Producer Accuracy	29%	47%	n/a*

*These accuracy rates are calculated by comparing to the Local Data.

LF Rapid Assessment Differences:

- RA differences in the BpS layer
  - much of the landscape was classified as wet mixed conifer, with a CC of 3;
  - lodgepole forest, with CC of 2 or 1, was classified on less than 1 % of the landscape; our local data shows lodgepole on 21% of the landscape. This BpS has relatively low departure compared to Ponderosa pine or Dry Mixed Conifer BpS', which were overestimated in the RA landscape.

- RA differences in the CC calculation
  - Mtn Hemlock forests were calculated as CC 3 on much of the landscape; assessment with LF National data and Local data classifies these stands as CC 1 or 2.
  - Wet mixed conifer has a condition class of 3 in both the Rapid Assessment and the LF national data; our local data classifies this as CC2.

LF National Data Differences:

- Landfire National Differences in the BpS layer
  - LF National data does have higher accuracy rates than the Rapid Assessment; however, in this analysis John Foster had to lump multiple

BpS' into categories – the National dataset had 69 different BpS' in the Deschutes watershed; our local data only had 13 (see NationalLandfire.xls). Without the combining, this accuracy drops to 23%.
    - Multiple BpS's were mapped in the Upper Deschutes Basin that do not occur in this basin: e.g., North Pacific Oak Woodland; Mediterranean California Mesic Mixed Conifer Forest and Woodland; North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest.

- Landfire national Differences in CC calculation
    - Overall the landscape, about 1/3 was scored the same on both datasets (as CC 1, 2 or 3) for both strataFRCC and standFRCC.
    - Across all BpS's, LF National calculated more the twice as much StandCC 3 than the local StandCC.
    - LF National calculated 8X as much strataCC =3 than the local data did.
    - Cross-walking the multiple LF BpS's into the local BpS's confounded the successional stage distributions, which are necessary to properly calculate Condition Class and also to interpret the differences in total % CC 3 across the landscape.

5. Potential Improvements to LANDFIRE:

Biophysical Setting:

- Coarser assessment of biophysical settings: It was challenging to use Landfire National's BpS layer because of the large number of BpS's mapped across our landscape. Approximately 70 BpS's were found in LF National data, compared to14 in our locally-derived data. Several of these were incorrect plant assemblages, others seem to be pretty fine-scale splitting of similar forested types. Given that LF National is promoted as a coarse-scale assessment tool, this fine-scale mapping is unnecessary.
- Quick Fix: J. Foster did cross-walk the LF National models to our local data, however, some were dropped off the list (occurring on very low % of landscape).
- Uncharacteristic classifications: LF National currently classifies both native and non-native vegetation as uncharacteristic, depending on the model. There is a need to accurately map invasive non-native species. May need the potential for uncharacteristic 1 and uncharacteristic 2.

Condition Class:

- Related to above, condition class assessments may improve with coarser BpS's assigned. Seral stage classifications are coarse (3 or 5-box models) and so serve well to provide a general picture across a broad landscape. However, when split among multiple BpS's, that usefulness is lost. Although J. Foster was able to create a crosswalk of the LF National BpS's to local BpS's, lumping seral stage classification across multiple BpS's is not possible due to the different seral stage criteria for each BpS model. As a result, Condition Class assessment of LF National data was not easily compared to local Condition Class, with no "quick fix" available.

6. Where Landfire is Successful.

- Landfire National data provides contiguous data across areas with limited or no data. Unrelated to this project scope, we have used Landfire data to fill data gaps:

- Fuel models: Landfire National data provides a large-scale map of fuel models, often not available at forested levels. This layer is easily modified by local experts for known areas, but is needed to fill in unknown gaps and private lands to run fire behavior models at larger scales (Deshcutes NF, Ochoco NF, Prineville District – BLM).

- Sagebrush steppe landscapes: A large gap on our public land management are vegetation layers for "rangeland". In central Oregon, this is primarily our sagebrush steppe habitat. LF National provides a course-scale start for vegetation, which can be improved with local data and knowledge. (Prineville District – BLM).

7. Maps below show locally derived data compared to Landfire National, and locally derived data compared to Landfire RA).

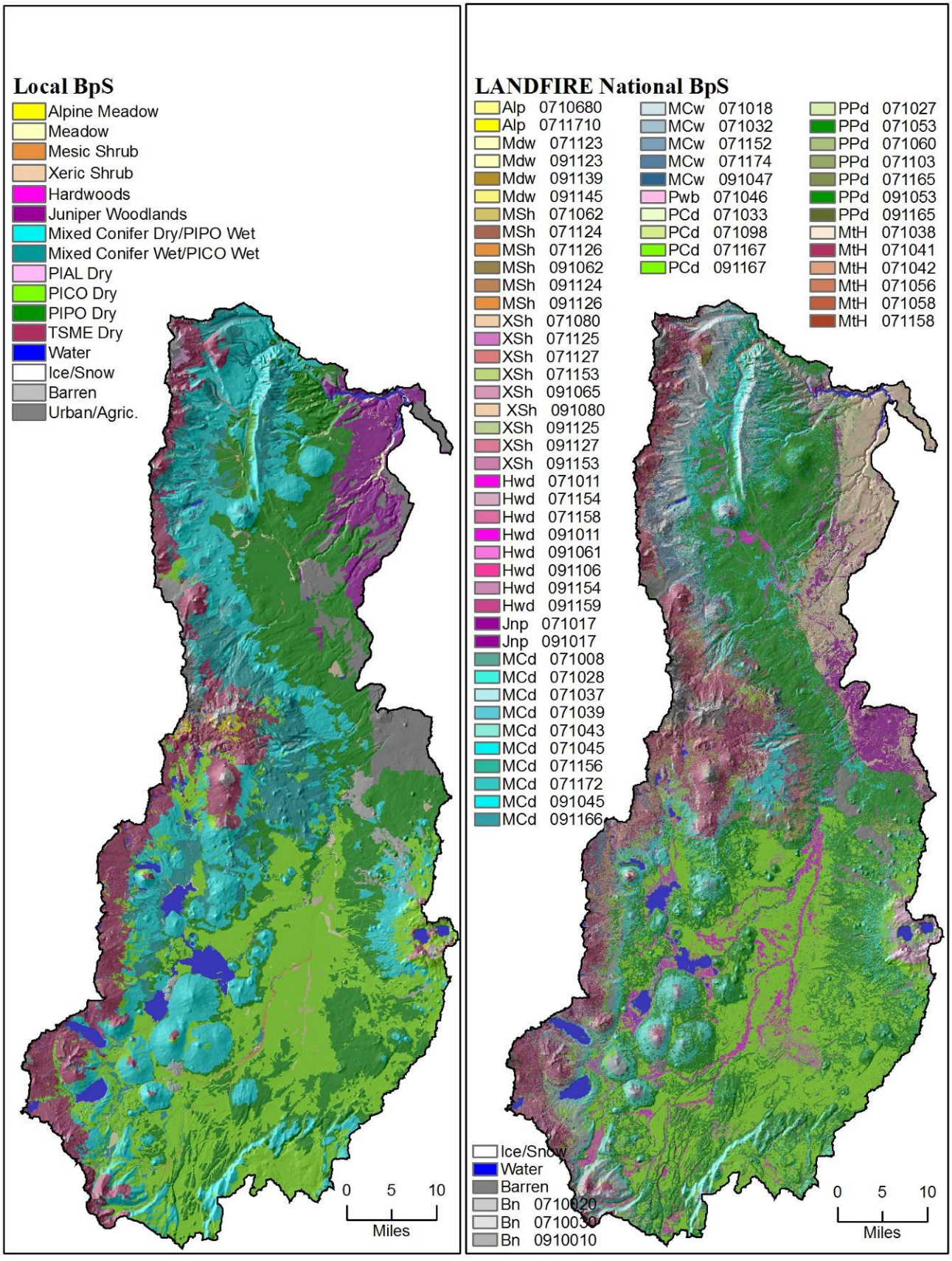
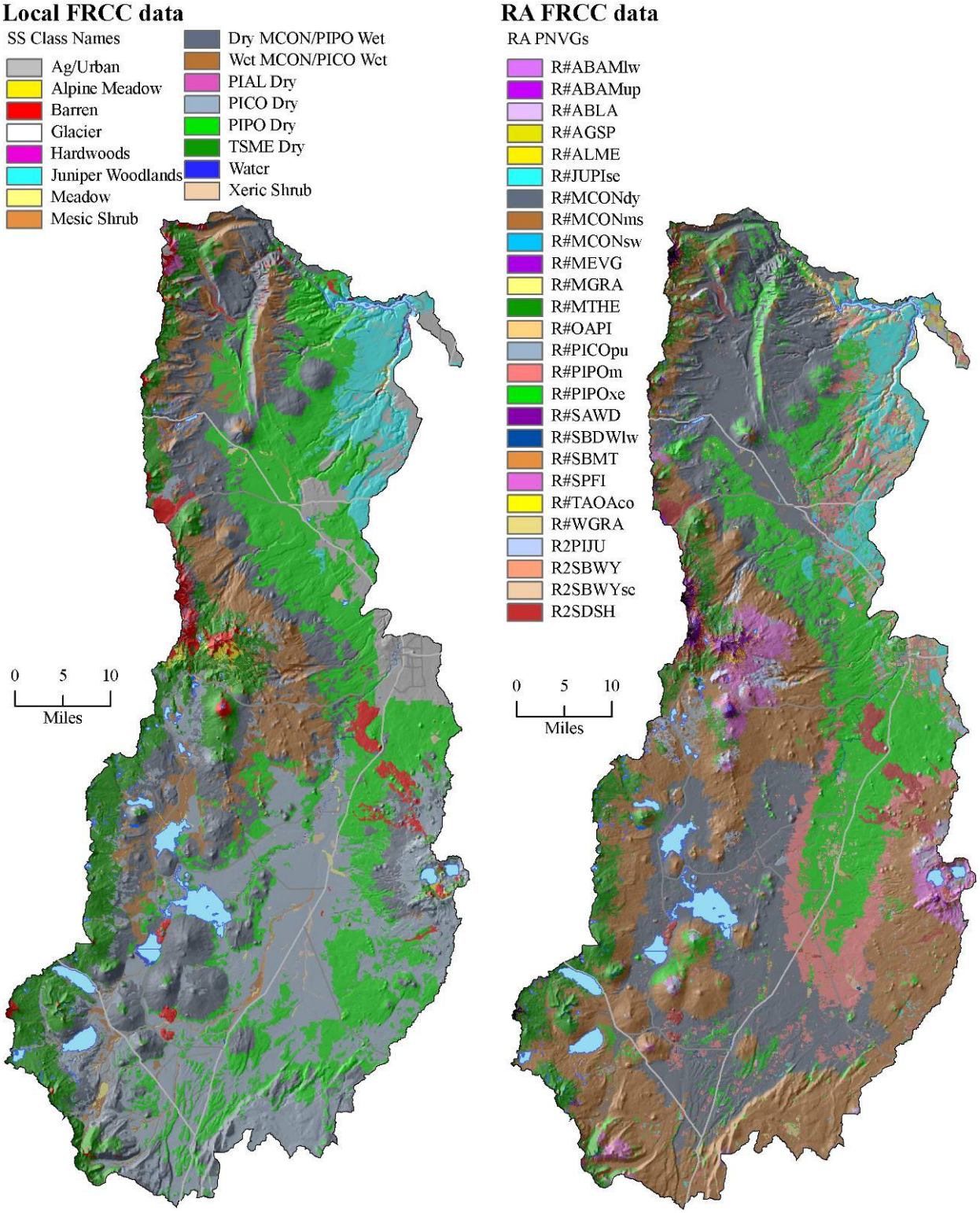


Figure 1
Vegetation Classes, Upper Deschutes Fire Learning Network.



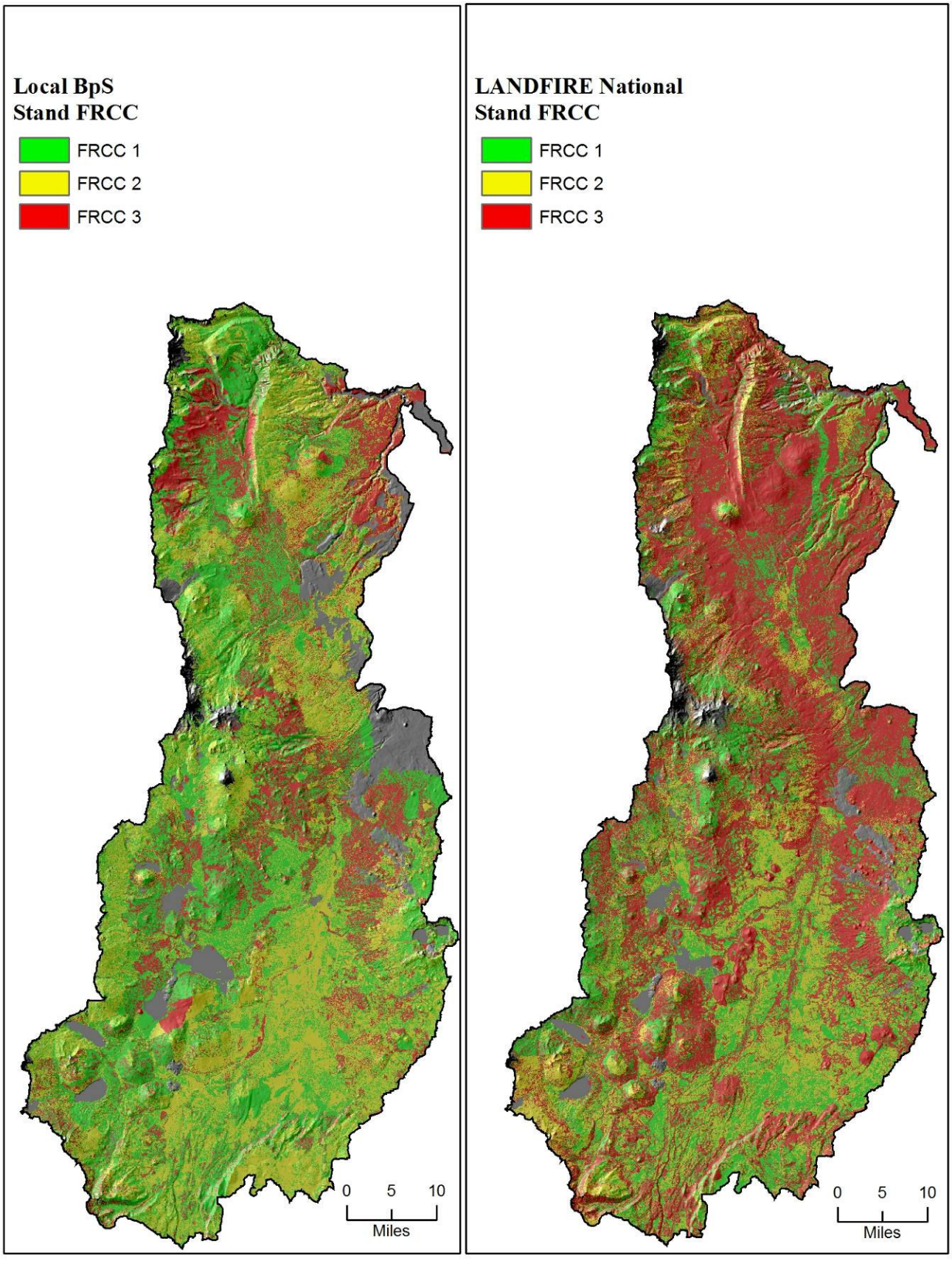
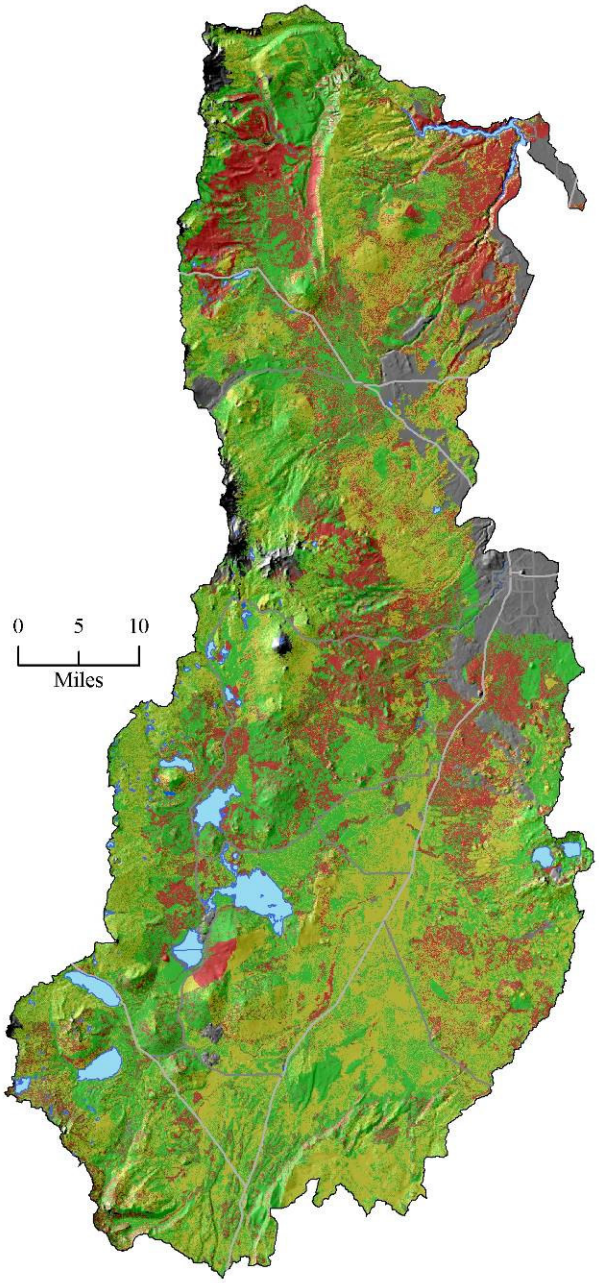

Local BpS
Stand FRCC
FRCC 1
FRCC 2
FRCC 3
0 5 10
Miles
LANDFIRE National
Stand FRCC
FRCC 1
FRCC 2
FRCC 3
0 5 10
Miles

Figure 2
Stand-scale FRCC

FRCC 3
FRCC 2
FRCC 1

Local FRCC data



RA FRCC data