Framework for assessing landscape treatment effects on modeled fire
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Outline:
1. Base vegetation map/ identify treated areas
2. Fire spread and behavior modeling
3. Translate fire behavior to predicted effects
4. Project forest change over time
1. Base vegetation map – LiDAR-NAIP Fusion
unsupervised classification and segmentation

1. Identify treated areas – Reconcile LiDAR-based
change detection and FS-reported treatment boundaries
2. Fire spread and behavior modeling

Fire behavior simulations will primarily be conducted using Farsite

Pro:
- Spatially explicit & able to capture “off-site” treatment effects
- Avoids the problems associated with relating conditional burn probabilities to specific fire effects (i.e., how fire will modify stand structure/habitat)

Con:
- Single ignition scenario (i.e., no random ignitions as with FlamMap) based on ‘problem fire’ originating outside the study area and burning into it

Evaluation of treatment effects
- Changes in flame length, fire type

Problem fire FARSITE fire simulation
(fire coming up from Middle Fork Feather River Canyon)

Untreated 2010

Treated 2010

Conditional burn probability

High : 0.16

Low : 0

Fuel treatment network

Core study area

Collins et al., 2013 For. Ecol. Manage.

3. Translate fire behavior to fire effects—
Linking FARSITE with FVS-FFE

- Calculate average polygon (or “stand”) flame length ($F_L$)
- Use $F_L$ to predict stand structure (habitat) changes at beginning of 30 year projection
4. Model forest change over time – With and without both fire and treatment

Example*: Area within watershed with > 50% canopy cover

*Not real data, made up to demonstrate potential outcomes