



LANDFIRE VEGETATION MODELING

Overview

- ❖ Vegetation models are a critical component of LANDFIRE and help to document and synthesize the best available knowledge to-date on vegetation dynamics across the U.S.
 - Models are created at workshops by regional vegetation and fire ecology experts and undergo a comprehensive peer review process.

Models consist of two components:

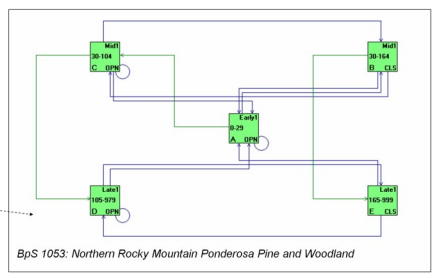
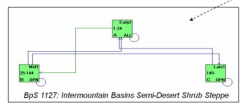
- (1) Comprehensive description of biophysical and disturbance characteristics by ecological system
- (2) Quantitative, state-and-transition (box) model, created in the public domain software VDDT (Vegetation Dynamics Development Tool)

Model Inputs

- ❖ **Biophysical settings** originate from Ecological Systems. Biophysical settings (BpS) represent the vegetation that can potentially exist at a given site based on both the biophysical environment and an approximation of the natural disturbance regime.
 - BpS can be "split" when systems are defined too coarsely to represent differences in biophysical gradients, thus disturbance regimes, and must be modeled separately
 - BpS can be "lumped" when systems are defined too finely for vegetation models and can be combined into one model
- ❖ Vegetation Characteristics in Model:
 - Structure
 - % canopy cover
 - Height (in classes by lifeform)
 - Composition (species)
- ❖ Landscape Processes or Transitions in Model:
 - Succession
 - Age range of each class
 - Typical growth pathway
 - Disturbance
 - Frequency/probability of disturbance
 - Effect of disturbance

Cover Type	Structural Stage	
	Closed	Open
Early Development	A	
Mid-Development	B	C
Late-Development	E	D

Model Name	Most Common Uses
3-Box Model	- Grasslands - Simple shrublands
4-Box Model	- Shrublands with trees - Grasslands with shrubs
5-Box Model	- Forested systems - Complex shrublands



• Each box is a vegetation class representing composition and structure
• Each arrow is a transition representing succession or disturbance

How Models are Used

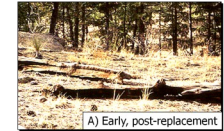
In the Rapid Assessment, models were used as reference conditions to calculate Fire Regime Condition Class (FRCC).

In LANDFIRE, models:

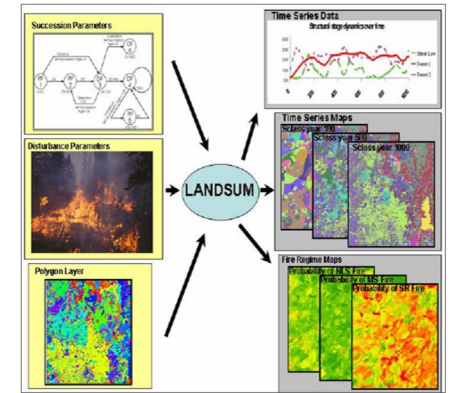
- ❖ Help map Biophysical Settings (BpS) and their succession classes.
- ❖ Models can be used in local and regional planning and management, including:
 - assessing FRCC at a project scale
 - testing alternative management and conservation scenarios

In LANDFIRE, models:

- ❖ Provide succession and disturbance pathways and rates for the LANDSUM model, which simulates fire across the landscape and calculates a range of reference conditions used to calculate and map departure and Fire Regime Condition Class (FRCC).
- ❖ Vegetation model description will supplement existing Fire Regime Condition Class Guidebook reference conditions.



LANDSUM is a spatial model that simulates vegetation and fire dynamics.



Inputs

Vegetation Characteristics and Landscape Processes or Transitions are run in model for 1,000 years, 10 simulations, or more

Outputs (used to calibrate Fire Regime Simulation):

- Percent of the landscape in each vegetation class
- Frequency and severity of fire
- Frequency of other disturbances

Inputs

➢ Models are used as inputs to the spatial fire and succession simulation model, LANDSUM, which generates reference conditions used to calculate Fire Regime Condition Class

LANDFIRE is a nation-wide multi-partner project designed to map and model vegetation, fire, and fuel characteristics using a consistent, peer-reviewed, scientifically based methodology.

