For527 / Range527
Landscape Ecology of Forests and Rangelands

Discussion: Predicting Landscape Change
Discussion Date: April 5, 2001
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Discussion Questions:
1) How big is a “landscape”? What defines this size?
2) What are the pros and cons of using empirical or process models? Is one type better than the other?
3) What are the pros and cons of scaling up or down? What is gained or lost?
4) How does scale (temporal and/or spatial) influence model complexity? Conversely, how do modeling approaches influence temporal and/or spatial scale? How does the scale of variables used in a modeling assessment affect the outcome of the model?
5) How uncertain are the findings of a model? Is the predictive ability of models related to the scale of the variables used in development?
6) How should you decide what metrics to include in modeling assessments? Can certain metrics serve as surrogates to explain ecological phenomenon you wish to investigate during model development?
7) How do you decide between simple models that give good predictive ability but limited explanatory value and more complex models with less predictive ability but more explanatory value? What are the advantages and disadvantages of simple versus complex models?
8) How should temporal considerations be included in model development? Is the temporal period of an assessment more important when attempting to model a dynamic system?
9) What are the best types of models for predicting landscape change?

Required Readings:
MAIN POINTS FOR THIS SESSION
See http://www.its.uidaho.edu/landscape_ecology

1) Importance of predicting landscape change (e.g. risk assessment, natural resources management and planning).
2) We predict landscape change using different kinds of models: simple vs. complex, stochastic vs. deterministic, process vs. empirical.
3) Uncertainty of predictions increases at broad spatial scales and long time periods. This is in part because the dynamics are more complex, and our knowledge is more limited.
4) Scale is a major challenge. The data used to build models is typically very detailed for a few sites or very coarse at a regional scale, and extrapolation across time and space is problematic.
5) Most models of landscape change are better at time or space; few effectively integrate both.
6) For a given landscape of your choice, discuss how and why to choose which processes are the most important to model for a given purpose.

ADDITIONAL REFERENCES