

FRAGSTATS Workshop

Full-day Workshop Syllabus

Purpose and Objectives

This workshop is designed to provide an introduction to landscape structure analysis using FRAGSTATS, a computer software program designed to compute a wide variety of landscape metrics for categorical map patterns, and to explore some issues regarding the use of landscape metrics to describe landscape structure. FRAGSTATS is distributed for free over the internet and is the most widely used landscape structure analysis software available. The specific objectives of this workshop are to:

1. Introduce participants to landscape structure analysis.
2. Provide participants with hands-on experience with FRAGSTATS.
3. Provide participants with insights into the behavior of landscape metrics.
4. Provide participants with insights into future directions in landscape structure analysis.

At the end of this course, participants will be able to:

1. Select appropriate landscape metrics for particular questions of interest.
2. Conduct a landscape structure analysis using FRAGSTATS and appropriately interpret the results.
3. Apply the results of landscape structure analyses to conservation situations including monitoring land use changes over time and developing habitat suitability models.

Relevance

Landscape ecology deals fundamentally with the interplay between process and pattern; specifically, how, when and why patterns of environmental factors influence the distribution of organisms or the actions of ecological processes, and reciprocally, how the actions of organisms and ecological processes feedback to influence ecological patterns. Much emphasis has been placed on developing methods to quantify landscape patterns, which is considered a prerequisite to the study of pattern-process relationships. This has resulted in the development of literally hundreds of indices of landscape patterns. Although there are many different types of spatial patterns, landscape ecologists have focused much of their attention on categorical map patterns, in which a landscape is represented as a collection of discrete patches. FRAGSTATS has emerged as the leading software package for the analysis of categorical map patterns. In this workshop, participants will learn how to use FRAGSTATS to analyze landscape structure.

Landscape structure analysis is critical for natural resource management and endangered species conservation because many threats to native biodiversity involve habitat loss and degradation. Understanding the nature of landscape-level changes in amounts and configurations of different land cover classes and linking those changes to ecological processes can help to identify where management intervention will be most useful. Additionally, such analyses can help to identify

landscape-level patterns necessary for persistence of threatened and endangered species and thus are quite useful in recovery planning.

Who Should Attend

This workshop is designed for academic, agency, and industry professionals interested in landscape structure analysis for a broad range of applications. It is not required that participants have prior expertise in landscape ecology and landscape structure analysis, although familiarity with the principles of landscape ecology and general knowledge of GIS will be helpful. Participants are not expected to have prior experience with FRAGSTATS, and individuals with even a moderate level of experience with FRAGSTATS will still find this workshop helpful. However, this workshop is not designed for individuals having extensive experience with FRAGSTATS, although even “experts” will gain new insights.

Workshop Agenda

8:00-8:15 Introduction and Course Overview

Introduction of instructors and course participants, and overview of course organization and expectations.

8:15-9:00 Background Concepts

Overview of important conceptual issues related to landscape structure analysis, and definition of some terms essential to the proper use and understanding of FRAGSTATS, including:

Landscape Definition

- Classes of landscape pattern
- The patch mosaic model
- Scale–grain, extent, and measurement resolution
- Landscape perspectives–island vs mosaic

Landscape Metrics

- Levels of metrics
- Components of landscape structure – classes of metrics
- Structural versus functional metrics

Use and Interpretation of Metrics

- Metric redundancy
- Metric reference framework

9:00-11:00 FRAGSTATS Analysis of Landscape Structure

The analysis of landscape structure using FRAGSTATS, including instruction on the use of the FRAGSTATS software:

- Basic parameterization
- Backgrounds and borders
- Batch analysis
- Moving window analysis

11:00-11:30 Landscape Metric Behavior

Quantitative behavior of selected landscape metrics across gradients of area and aggregation based on neutral landscapes and a comparison to real landscapes.

11:30-12:00 Landscape Structure Gradients

Components of landscape structure in real landscapes, including a description of a methodology for identifying independent landscape structure gradients.

12:00-1:00 Lunch

1:00-4:30 Case Study Exercise

Cases study exercise to illustrate the application of FRAGSTATS. The full day workshop includes a single in depth application involving quantifying habitat fragmentation under alternative land management scenarios.

4:30-5:00 Summary and Future Directions

Summary of key points regarding landscape pattern analysis with FRAGSTATS and future directions.