

LESSON PLAN

Course: Principles of Ecology Laboratory

Lesson Title: Spatial Distribution & Analysis 2-week lab (180 minutes each week)

Lab TA Prep Work:

- Post materials for your sections and make any necessary edits to the PowerPoint presentation
- Prepare a short quiz for students to take at the start of the class (students should be allowed to use one-page of *HANDWRITTEN* notes – they may not print out the materials and use those)
- Review this lesson plan and student prep work and be prepared to facilitate discussion with students

Student Prep Work:

- Short Videos
 - Species distribution types: <https://youtu.be/BMsmDy-2jbA>
 - (Approximately 4 min; Source: Great Pacific Media)
 - Intro to ArcMap: <https://youtu.be/hqHCJUudPvs>
 - (Approximately 2 min; Source: UTM Library)
- Complete the Mid-Semester Feedback Quiz on Canvas

Student Learning Outcomes (SLOs)

By the end of this class, students will be able to:

1. Describe the three types of species distributions and infer the abiotic and biotic interactions that may influence why species exhibit each distribution type
2. Calculate the spatial distribution of southern live oaks (*Quercus virginiana*) using two different field-sampling technique and matching statistical analyses.
3. Compare the field-sampling and analysis techniques to using advanced spatial analysis tools like ArcMap
4. Determine how spatial scale influences dispersion patterns when using field-sampling techniques and spatial analysis tools.

CATEGORY	5	4	3	2	1
<i>Hypothesis Formation + Thought Questions</i>	Highly proficient formulation of a prediction given the background information provided; all thought questions are answered.	Proficient formulation of a prediction given the background information provided; all thought questions are answered.	Sufficient formulation of a prediction; most thought questions are answered.	Some attempt at formulation of a prediction OR answering the other thought questions.	Missing prediction and/or thought questions.
<i>Data Analysis – Field Methods</i>	Highly proficient formatting of your field map. Accurate calculation of the Index of Spatial Dispersion (C) and p-value. Figure captions are concise and include background information and the main result.	Proficient formatting of your field map. Accurate calculation of the Index of Spatial Dispersion (C) and p-value. Figure captions include background information and the main result.	Sufficient presentation of your field map. The Index of Spatial Dispersion (C) and p-value are calculated. Figure captions are included.	Missing any of the following: field map, C or p-values, or figure captions.	Missing any data analysis for the field methods.
<i>Data Analysis - ArcMAP</i>	Highly proficient formatting of summary statistics. Accurate calculation of the NNRatio & p-value. Table captions are concise and include background information and the main result.	Proficient formatting of summary statistics. Accurate calculation of the NNRatio & p-value. Table captions include background information and the main result.	Sufficient formatting of summary statistics. The NNRatio and p-value are calculated. Table captions are included.	Missing any of the following: NNratios, p-values, or table captions.	Missing any data analysis in ArcMAP.

<i>Conclusions + Summary Questions</i>	The conclusion provides an insightful summary of the investigation and directly connects to the generated hypotheses incorporating the results. P-values and figures are also correctly referenced.	The conclusion provides an accurate summary of the investigation and adequately connects to the research hypotheses and results. P-values and figures are in some way referenced.	The conclusion provides a sufficient summary of the investigation and attempts to relate to the generated hypotheses and results.	There is some attempt to summarize the investigation that may or may not relate to the research hypotheses and results.	Missing any summary of the results of the investigation.
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