# Geog 9032 – Ecological Applications for GIS

**San Francisco State University, Spring 2024**
**Schedule:** Friday and Saturday, 8:30-5:30
**Credit:** 1.6 CEUs (Continuing Education Units)

**Instructor:** Seth Hiatt
**Email:** shiatt@sfsu.edu

## Course Description

This course builds upon skills learned in previous GIS courses, emphasizing common uses of GIS for ecological analysis. Class lectures and labs will cover a variety of ecological GIS applications such as species distribution mapping, habitat suitability modeling, corridor analysis, and invasive species mapping. Projects are designed to reinforce core GIS skills, as well as familiarize students with ecological data sources and potential data issues.

**Grading**: This course is graded Credit/Non-Credit.  To receive a passing grade, students are expected to complete assigned projects and be present and attentive for the entirety of the course.

**Prerequisite:** Geog 9003 (Into to GIS) or equivalent

**Software:** ArcGIS Pro 3.x, ArcGIS Online, and ArcGIS Field Maps

The course is designed around a series of five projects to illustrate themes discussed in lectures.  Some lectures will be PowerPoint based, but most will be centered around demos in ArcGIS intended to prepare for each project. A quiz is assigned at the end of each day to facilitate learning.

## Day 1

**Project 1:**  Creating a Geodatabase for Bee Counts
**Learning Themes**: Projections and Coordinate Systems, Converting Tabular Data to Spatial Data

**Project 2:** Creating a Trees Database
**Learning Themes:** Data considerations for field work. Working with domains, relationship classes, and attachments

**Project 3:** Analysis of Biodiversity in San Francisco
**Learning Themes:** Island biogeography, linear regression, creating charts in ArcGIS Pro

**Project 4:** Corridor Analysis for the Giant Kangaroo Rat
**Learning Themes:** Connecting fragmented habitats, corridor analysis, raster reclassification, weighted sum, cost distance, ModelBuilder

Day 1 Quiz

## Day 2

**Project 5:** Analyzing Multiband Climate Data
**Learning Themes:** Temporally stacked rasters, composite bands, cell statistics, zonal statistics, PRISM Climate Data

**Project 6:** Model for an Invasive Species
**Learning Themes:** Sampling strategies, overlay modeling, Euclidean distance, extracting raster values to points.

**Project 7:** Calero Park Vegetation Plots with Attachments
**Learning Themes:** Review of some topics covered in previous labs. Create a dataset with attachments for data collection in ArcGIS Online.

Day 2 Quiz