ESRM 203
ENVIRONMENTAL STATISTICS

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Office Hours: BTW 1245
Tue 1-3pm & Wed 11am-1pm & by appointment

CLASS SUMMARY

Why environmental stats?

We can already see interesting patterns and trends in the natural world around us. For example, it may be obvious that California has more wildfires than Connecticut. But how can you prove that? How do you put a number to your intuition? In this class we learn the fundamentals of statistics and how to apply them to real environmental problems (like natural disasters) to quantify our observations and test hypotheses.

LEARN TO CODE

Make the computer do the work.

Have you ever seen the mathematical formulas for most statistics equations? What do those symbols even mean? Do I seriously have to repeat the math 1000 times to get a "good sample?" The field of statistics used to be a huge pain because it's a ton of repetitive math you had to do by hand. Thanks to modern computers, what used to take hours of work with pen and paper can now be accomplished in a single line of code. The future is now. We have the technology. In this class, we will start with the very basics of programming and by the end of the semester we will have the computers doing all the hard math for us.

LEARNING GOALS

What skills and knowledge can you expect to gain in this class?
Below are some key concepts covered in this class.

Exploratory Data Analysis
Take a brand new dataset and explore it through simple visualizations and summary stats.

Hypothesis Testing
Use real data to test hypotheses and answer relevant environmental questions.

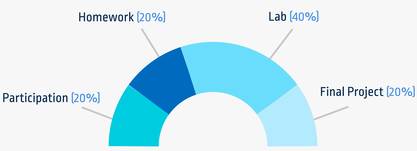
Data Visualization
Create clear, compelling data visualizations to tell a story about your data.

Scientific Programming
Use programming languages (R, Python) to easily do math and data analysis that is a pain to do by hand.

Science Communication
Data is meaningless without us to provide appropriate context and unbiased interpretation.

GRADING

No exams in this class!



Participation [20%]
Attendance, asking questions, participating in class and lab.

Homework [20%]
Weekly assignments on Canvas to check terms and basic concepts.

Lab [40%]
Weekly lab assignments and micro-reports.

Final Project [20%]
Take ownership of your data and tell a story with an infographic and stats.

ARE THERE PRE-REQs?

"What if I've never written computer codes or done statistics before?"

There are no pre-reqs for this class. I teach assuming you know nothing about programming or about statistics.

We will start at the absolute square one and over the course of the semester we'll develop practical, applied skills in both programming and statistics. We'll go from scared of computers to laughing at programming memes in no time.

WHERE'S THE REST OF THE SYLLABUS?

This visual syllabus is only an overview of what we will be covering and doing in class. For more detailed information and assignment descriptions, please review the full syllabus PDF posted on our class Canvas and on our Github and Jupyter Project page. It will be everywhere.