Welcome to Applied Populaton Analysis

WLF504, Fall 2017

Big question: how many critters are there, and why?

- To do this, we can either:
  - Observe, count, and categorize animals (usually across large spatial scale)
  - Capture, mark, and recapture animals (usually across much smaller spatial scales)
  - Combine these data types to improve inference (integrated approaches, like Bayesian IPMs).

What this course is NOT

- **Comprehensive:** we can not cover all topics or methods of population analysis during 2 hours per week for one semester.

- **Lecture-centric:** while there will be some lecture each week, most of the 2 hours will be spent doing and sharing hands-on work.

How will we use our time?

- **Topics:** The current topics on the syllabus can be changed to make sure we cover the topics that YOU are interested in learning.

- **Structure:**

  - First 45 min: sharing/debugging code & results from last week's exercise

  - Next 30-40 min: lecture and/or paper discussion

  - Final 20-30 min: begin current week's assignment

Grading:

Assignment	**Each worth**	**Total**
Participation in assigned analysis & coding exercises	10	110
Leading a discussion	20	20
Total Lecture Points		**130**

Guest lectures/labs

- Spatial capture-recapture: Clayton Lamb, U. Alberta
- Integrated population models: Jon Horne, IDFG

My expectations for coding challenges:

- We will start the exercises in class, you will complete over the next week, then share results with class
- It's ok to work collaboratively, but you need to learn to code and understand what you're doing individually. It's ok if you get stuck and need help de-bugging, etc.
- You can ask me, each other, and the internet for help.
- When we share, you will be graded based on effort to understand, process, and progress, not getting things perfectly correct.

Student-led discussions

- For the final two meetigs, we will use our time to cover topics of special interest to the group, via student-led discussions.
- We will discuss 1-2 papers per class, for a total of 2-4 papers. Each paper will be presented by a team of 2-3 students, who will also generate discussion questions to get the group started.
- Topics could include areas of deep interest to the students, or emerging/cutting-edge areas, etc.
- Teams and topics will be decided by the 3rd week of class.

Best coding practices

- Save your work often
- At the top of your code, write a few #commented lines describing the purpose of the code, who wrote it, and he last date it was modified.
- For each major section/task in the code, use #comments to describe what the code is doing
- Use indentations/tabs to organize your work within each section/task.
- If multiple versions of something are asked for, either create different sections of code, or different versions of the R doc. Don’t overwrite your work!

Week 1 challenge:

- In program R…
  - Create 2 density-dependent population models, using the exponential and logistic growth equations (table 2.2) in Skalski book (on Blackboard), that runs for 50 years. Plot the results!
  - Add stochasticity by making recruitment variable in these two models. Then, think about how you'd add a term for variable adult survival- how would the equation need to change? Implement this change for both models. Plot the results!