WILDLIFE 742
ECOLOGICAL DATA ANALYSIS
SPRING SEMESTER 2019, 3 CREDITS

Contact Info

Instructors: Dr. Shawn M. Crimmins
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Office Hours: By appointment
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Classroom: TNR 322, 4:00-5:50 Wednesday

Communication

My primary form of communicating with you is through announcements in class, but I will also post most announcements subsequently posted to D2L.

Learning Outcomes

Goal: This course will introduce students to the most common analytical frameworks and software that are widely used in ecology.

Students satisfactorily completing this course should be able to:

1) Conduct and interpret basic parametric statistical models in program R.
2) Build and interpret common ecological models and modeling frameworks such as
    a. Mark-recapture models
    b. Occupancy models
    c. Resource selection functions
3) Understand the reasoning behind and application of mixed-effects and hierarchical models in ecology
4) Understand the fundamentals of building and interpreting ecological models under a Bayesian paradigm.
5) Fluently describe the analytical framework and approaches relevant to their thesis research and competently analyze their data

A secondary objective of this course is to help graduate students with specific analytical issues or concerns that they have related to their research. To facilitate this, a substantial portion of this course will be dedicated to working collaboratively as a group on specific coding and analytical issues that the students bring to class.

Course Materials: Essentially all course materials will be posted to D2L. This includes copies of course lectures, assigned and recommended readings, and other related materials. Information related to the study area for the development of management plans will also be posted to D2L.

Course Structure: This course will meet once per week for a two-hour block on Wednesday morning, with a second one-hour block in the afternoon. The morning period is to present information in a "typical" classroom setting (although we'll be in the computer lab so you can work through examples) while the afternoon period is an optional meeting time for troubleshooting code and analyses. The course delivery will be varied and will include lectures, worked out examples, discussions of peer-reviewed literature, and collective analyses of ecological data.

Course Grading: The grading in this course will be based primarily on two things, 1) course discussions and participation, and 2) a class project. The course discussions and participation will be worth 20% of the grade, with the final 80% based on the class project. The class project will have three graded components: a draft project report (20%), a final project report (30%), and a project presentation (30%). Final grades for the course will be awarded as follows: A = 93%; A- = 90%; B+ = 87%; B = 83%; B- = 80%; C+ = 77%; C = 73%; C- = 70%; D+ = 65%; D = 60%; F = <60%.

Attendance: University policy dictates that I take attendance during the first eight days of the semester (place your initials next to your name on the sign-in sheet at the front), after that I do not take attendance. You're obviously going to miss everything that this course is all about if you don't show up, and as a grad student you should hold yourself to a high standard.

Getting Help: Please do not be shy about coming in to office hours for help! My office hours are on the first page but you are welcome to email me to schedule a time outside of my regular office hours for help. If you are having any trouble understanding something in class, then do not hesitate to come by, as those problems will likely only get worse as the material becomes more complex and builds on itself.

Tentative Course Schedule

DATE	TOPIC	READINGS
Week 1 (1/23) – Course Introduction		
Week 2 (1/30) – NO CLASS, MIDWEST F&W		
Week 3 (2/6) – Basics of R Programming		
Week 4 (2/13) – NO CLASS, TWS MEETING		
Week 5 (2/20) – Linear Models and Model Selection		Arnold 2010 Sells et al. 2018
Week 6 (2/27) – Mixed-Effects Models		Gillies et al. 2006 Crimmins et al. 2016a
Week 7 (3/6) – Occupancy Models		Bailey and Adams 2005 Crimmins et al. 2009
Week 8 (3/13) – Abundance Models		Crimmins et al. (unpublished)
Week 9 (3/20) – Survival Models		Heisey & Patterson 2006 Crimmins et al. 2013a
Week 10 (3/27) – SPRING BREAK !!!		
Week 11 (4/3) – Home-Range Estimation		Kie et al. 2010 Crimmins et al. 2015
Week 12 (4/10) – Environmental-Niche Models		Elith et al. 2006 Crimmins et al. 2013b
Week 13 (4/17) – Matrix Models		Mills 2012 (Chapter 7) Crimmins (unpublished)
Week 14 (4/24) – Bayesian Modeling		Ellison 2004 Crimmins et al. 2016b
Week 15 (5/1) – Ethics of Complex Models		Chapron and Treves 2016 Olson et al. 2017
Week 16 (5/8) – Final Project Presentations		N/A

University Policies (my interpretations)

Academic Dishonesty: Don't cheat, seriously. Aside from the fact that cheating is cause for dismissal from the university, you are just short-changing yourself when you stoop to that. You're better than that, and UWSP is better than that.

Harassment: Be cool. Nobody likes a bully or a jerk.