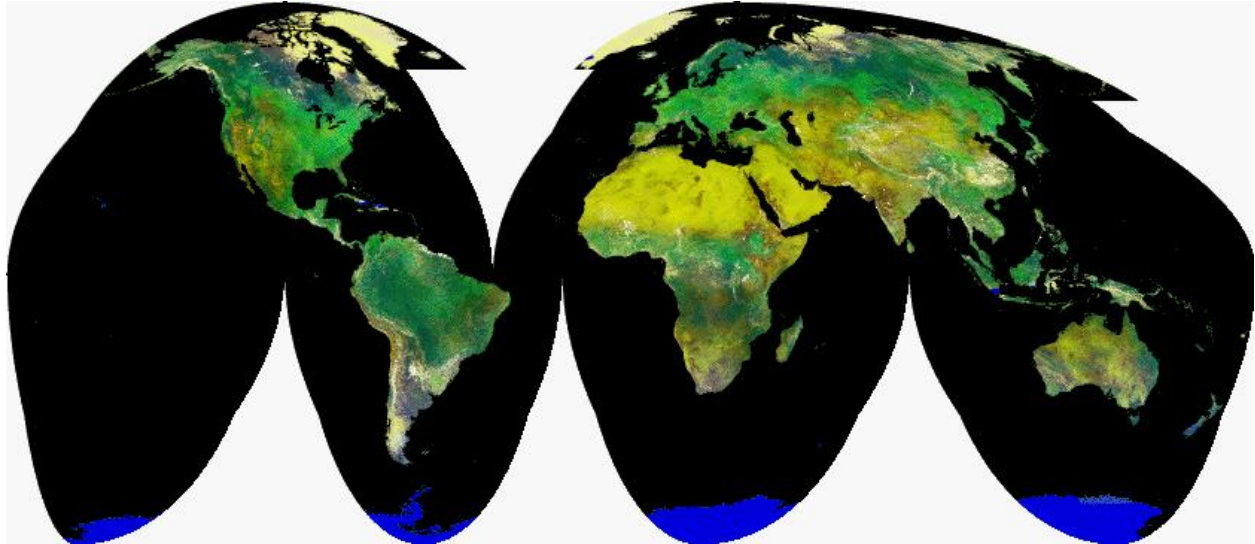


ENVIRONMENTAL BIOGEOGRAPHY: Spring 2023

GEO 4300 / 5305; Sections EB43,EBUF / EB53

SYLLABUS As Of 4 January 2023

NOTE THAT THIS IS NOT NECESSARILY THE FINAL SCHEDULE - IT WILL EVOLVE OVER THE SEMESTER.



Instructor: Michael W. Binford

Office Hours: Tuesdays 1:00 - 1:55 PM and Wednesdays 11:00 – 12:00 AM in my office or online. Alternatively by Appointment (e-mail me)

Office: 3131 Turlington Hall

Phone: 392-0494 (although I do not use the telephone very much)

E-mail: mbinford@ufl.edu and Canvas E-Learning

Required Textbook: Lomolino, M.V, B.R. Riddle, R.J. Whittaker. 2017. Biogeography. 5th Ed. Sinauer

Recommended Textbook: Lomolino, M.V., D.F. Sax, J.H. Brown. 2004. Foundations of Biogeography: Classic Papers with Commentaries. University of Chicago Press.

Class Meetings:

Tuesday Periods 7 - 8 (1:55 PM - 3:50 PM) in Turlington Hall Rm. 3012, Thursday Periods 7 (1:55 - 2:45 PM) in Turlington Hall, Rm. 3012.

This class will be in-person. There will be a UF Online section but only UFO students will have access to it.

Description: Biogeography is the science that describes and explains spatial patterns of biodiversity and is core science in the understanding of human-environment interactions. Biogeographers study distributions of organisms, both past and present, and how related patterns of environmental variation influence the organisms. Recent new sciences of Landscape Ecology, Macroecology, Global Ecology are extensions of or borrow significantly from Biogeography. Biogeography is also an applied science in that biogeography theory is useful for designing nature reserves, forecasting how climate change may affect organisms, and explaining human adaptations to environmental variability. Very recent developments in Macrosystems Biology and the completion of the National Ecological Observatory Network (NEON) have brought Biogeography into the era of Big Data. This class will take a mostly ecological approach to understanding biogeography.

Prerequisites:

Any P or B General Education Class. Physical Geography, basic Ecology, and Evolution would be useful but are not required.

Course Objectives - Undergraduate Section

1. Students learn the patterns and mechanisms of global to local species distributions.
2. Students learn how to apply knowledge of biogeographic patterns and mechanisms to solving important problems, e.g. biodiversity conservation, forecasting responses of biota to environmental change at scales from local to global.
3. Students will be able to describe the relationships among traditional Biogeography, Macroecology, Landscape Ecology, Macrosystems Biology, and Global Ecology
4. Students will be able to apply the hypothetico-deductive scientific method: observations, theoretical explanation, testable hypothesis generation, hypothesis testing, and theory modification. Educated skepticism will be enhanced.
5. Students learn the meaning of peer-reviewed, primary scientific literature, and become familiar with reading and interpreting scientific publications.

Basis of Grade - Undergraduate Section:

1. Two equally weighted essay examinations (midterm and end of semester), each worth 30% of the course grade.
2. Six, one-page summary of a peer-reviewed paper in the current scientific literature every other week weighted as one additional exam.
3. Class discussion participation weighted as 10% of the course grade.

Course Objectives - Graduate Section

1. Students learn the patterns and mechanisms of global to local species distributions.
2. Students learn how to apply knowledge of biogeographic patterns and mechanisms to solving important problems, e.g. biodiversity conservation, forecasting responses of biota to environmental change, at scales from local to global.

3. Students will be able to formulate research questions and hypotheses in traditional Biogeography, Macroecology, Landscape Ecology, Macrosystems Biology, and Global Ecology.
4. Students conduct biogeographic literature research and analysis necessary to develop excellent foundations for thesis and dissertation research questions.
5. Students learn the classic literature in biogeography, and gain experience leading discussions of this literature.

Basis of Grade - Graduate Section:

1. Two equally weighted essay examinations (midterm and end of semester), each worth 25% of the course grade
2. Each graduate students will determine two "classic" papers for one of the general topics, and one time during the semester each graduate student will lead the class in a short discussion of the "classic" papers of the week; weighted as 25% of the course grade
3. Term paper (maximum 20 pages, 12-point font, double spaced, excluding figures, tables, and references) on a biogeographic topic of the student's choosing, weighted as 25% of the course grade.

Grades assigned as: A > 92%; A- 90 - 91.9%; B+ 88 - 89.9%; B 82 - 87.9%; B- 80 - 81.9%; C+ 78 - 79.9%; C 70 - 77.9%; C- 68 - 69.9%; D+ 66 - 67.9%; D 60 - 65.9%; D- 58 - 59.9%; E < 58%

Please note the university policies for calculating grade point averages. See <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx> for details.

No make-up exams will be given under any circumstances, and no late assignments will be accepted without very important reasons.

Schedule and Topics

(Always tentative except for dates of exams and assignments)

Schedule and Topics (Always tentative except for dates of exams and assignments)

10 January

Lecture 1. Introduction, Course Logistics, Introduction to the Subject: The Science of Biogeography.

Lecture 1 Notes

Lecture 2. Questions, Principles, Themes, and History of Biogeography.

Lecture 2 Notes.

Lecture 1-2 Zoom Recording

12 January

Lecture 3. Organization of Life and Codes of Zoological and Botanical Nomenclature AND Environmental Setting Introduction (Start Reading The Geographic Template Ch. 3 in Lomolino et al.)

Lecture 3 Notes

Lecture 3 Zoom Recording

[\(ICZN - International Commission for Zoological Nomenclature website,](#)

[IAPT - International Association for Plant Taxonomy web site\)](#)

17 January

Lecture 4: Environmental Setting 1 (The Geographic Template: Ch. 3): Energy, Global Atmospheric and Oceanic Circulations.

4 Lecture Notes

Lecture 5: Reading a Peer-Reviewed, Scientific Paper; Environmental Setting 2, The Geographic Template 1: Global Distribution of Climates, Soils, Soil Characteristics and Processes (Ch 3).

5 Lecture Notes

Lecture 4 Recording

19 January

Lecture 6. Environmental Setting 3; Climate, Soils, Aquatic and Marine systems.

6 Lecture Notes

Lecture 6 Recording

24 January

Lecture 7. Environmental Setting 3: Aquatic and Marine Systems Projections.

7 Lecture Notes

Lecture 8. Range Maps (Ch. 4)

8 Lecture Notes.

[NatureServe: A GREAT source of digital range maps for animals and plants \(Links to an external site.\)](#)

[Map Of Life: Another source of species distribution data](#)

[GBIF - Global Biodiversity Information Facility: The Greatest source of species distribution data of all.](#)

Lecture 7-8 Recording

26 January

Lecture 9. Distributions of Species: Ecological Foundations - Intra and Interspecies Interactions (Ch. 4)

9 Lecture Notes.

Lecture 9 Zoom Recording

First literature summary due at 11:59 PM on 26 January. Upload your summary into the assignment in the Canvas course.

[Example Paper 1 for Literature Summary; Example Summary by MWB](#)

[Example Paper 2 for Literature Summary; Example Summary by TopStudent with MWB Comments](#)

First literature summary due at 11:59 PM on 27 January. Upload your summary into the assignment in the Canvas course.

Literature Summaries 1 Posted

Student 1 Summary; Student 1 Paper...

31 January

Lecture 10. The Niche, Limiting Factors, Interspecies Interactions; Habitat Modeling, Predictive Vegetation Modeling;

10 Lecture Notes.

Lecture 11: Habitat Modeling, Predictive Vegetation Modeling, Applied Habitat Modeling;

11 Lecture Notes

Lecture 10-11 Recording

Interesting web site for exploring various population and other ecological models

Readings for this and next few lectures (definitely read those marked with *):

- *1. [Early Review Franklin, J. 1995. Predictive Vegetation Modeling. Prog. Phys. Geog.](#)
- *2. [Recent Review Elith, J. and J.R. Leathwick 2009. Species Distribution Models: Ecological Explanation and Prediction Across Space and Time. Annual Reviews of Ecology, Evolution, and Systematics. 40:677-697. Supplemental Material for Elith and Leathwick 2009.](#)
3. [Review Austin 2002 Spatial prediction of Species Distributions - ecological and statistical approaches. Ecol. Modeling](#)
4. [Example: Ohman and Gregory 2002. Modeling Forest Composition in Oregon. Can. J. For. Res.](#)
5. [Climate-change example Iverson and Prasad 1998 Predicting abundance of 80 tree species following climate change in E. U.S. Ecol. Monogr.](#)
6. [USFWS Habitat Suitability Index Model Newsom, J.D., T. Joanen, and R.J. Howard. 1987. Habitat suitability index models: American alligator. U.S. Fish Wildl. Serv. Biol. Rep. 8X10.136\). 14 PP.](#)
7. [Web site for US Forest Service Climate Change Atlas: Predictive Vegetation Mapping, species by species \(Links to an external site.\)](#)
8. [An excellent and more complete conceptual review of Predictive Habitat Modeling by Guisan, A., and N.E. Zimmermann. 2000. Predictive habitat distribution models in ecology. Ecological Modelling 135:147-186](#)

2 February

Lecture 12: More Habitat Modeling, Predictive Vegetation Modeling, Applied Habitat Modeling;

12 Lecture Notes

Lecture 12 Zoom Recording

Comprehensive Species Distribution Modeling Software: [OpenModeller Desktop](#)

Marine and Aquatic Species Data Bases: [SeaLifeBase](#), [FishBase](#), [AlgaeBase](#)

Extra for Experts: [Species Distribution Modeling with R \(earlier\)](#) [And a Tutorial \(recent\)](#)

A recent review of Species Distribution Modeling with excellent list of algorithms:

Pecchi, M., Marchi, M., Burton, V., Giannetti, F., Moriondo, M., Bernetti, I., Bindi, M., & Chirici, G. (2019). Species distribution modelling to support forest management. A literature review. *Ecological Modelling*, 411, 108817. <https://doi.org/10.1016/j.ecolmodel.2019.108817>

7 February

Lecture 13: Wrap up Species Distribution Modeling.

13 Lecture Notes.

[Elith et al. 2011. A statistical explanation of MaxEnt for Ecologists. Biodiversity Research.](#)

[GAP Analysis Process and Importance](#)

[GAP Analysis Web Site](#)

Lecture 14: The Changing Earth 1 - Plate tectonics mechanisms and consequences (Ch. 8)

14 Lecture Notes

Lecture 13-14 Zoom Recording

9 February

Lecture 15: Changing Earth 2: Biogeographic Implications of Plate Tectonics; Glaciation and Insolation Lecture Notes (Ch. 9);

15 Lecture Notes (Ch. 9)

Lecture 115 Zoom Recording

Reading: [Botta et al. 2019. Abrupt Change in Climate and Biotic Systems. Current Biology.](#)

Second literature summary due at 11:59 PM on 10 February. Upload your summary into the assignment in the Canvas course

Literature Summaries 2 Posted

Student 1 Summary; Student 1 Paper...

14 February

Lecture 16: Biogeographic Dynamics of the Pleistocene, Biogeographic Responses to Glaciation/Deglaciation;

16 Lecture Notes

Interesting reading:

[Davis, M.B. and R.G. Shaw. 2001. Range shifts and adaptive responses to Quaternary climate change. Science 292:673-679.](#)

Lecture 17: Milankovitch and Biogeographic Responses to Pleistocene Glaciation

17 Lecture Notes

[Botta et al. 2019. Abrupt Change in Climate and Biotic Systems. Current Biology 29:R1045-R1054; https://doi.org/10.1016/j.cub.2019.08.066](https://doi.org/10.1016/j.cub.2019.08.066)

Lecture 16-17 Zoom Recording

16 February

[Biogeography in the News: North American Megadrought Worst in 1200 years.](#) NY Times 2/15/2022

[Biogeography in the News 2: Modern human incursion into Neanderthal territories 54,000 years ago at Mandrin, France.](#) NY Times 2/15/2022

Lecture 18: Lakes; Changes in the Tropics LGM-Present

18 Lecture Notes

Lecture 17 & 18 Zoom Recording

21 February

Lecture 19: Changes in the Tropics; Pleistocene Tropical Refugia, a beautiful idea

19 Lecture Notes

Lecture 20: 50K - 10K Extinctions of Large Mammal: Anthropogenic Extinctions and Overkill Hypothesis

20 Lecture Notes

Lecture 19-20 Zoom Recording

Readings for 17 and 22 February: Tropical Biodiversity and Pleistocene Refuges

1. [Hill, J.L. and R.A. Hill. 2001. Why are tropical rain forests so species rich? Classifying, reviewing and evaluating theories. Progress in Physical Geography 25:326-354.](#)

2. [Haffer, J. 1969. Speciation in Amazonian birds. Science 165:131-136](#)

3. [Knapp, S and J. Mallett. 2003. Refuting Refugia? Science \(Perspectives\): 300:71-72.](#)

4. [Mayle et al. 2009. Vegetation and Fire at the Last Glacial Maximum in Tropical South America. Ch. 12 in Vimeux, et al. \(eds.\) Past Climate Variability in South America and Surrounding Regions from the Last Glacial Maximum to the Holocene. Springer.](#)

5. [Häggi, Christoph, Cristiano M. Chiessi, Ute Merkel, Stefan Mulitza, Matthias Prange, Michael Schulz, and Enno Schefuß. 2017. "Response of the Amazon Rainforest to Late Pleistocene Climate Variability." Earth and Planetary Science Letters 479 \(December\): 50–59. https://doi.org/10.1016/j.epsl.2017.09.013.](#)

6. [Rocha, Daniel Gomes da, and Igor L. Kaefer. 2019. "What Has Become of the Refugia Hypothesis to Explain Biological Diversity in Amazonia?" *Ecology and Evolution* 9 \(7\): 4302–9. <https://doi.org/10.1002/ece3.5051>.](#)

More Controversy!

1. [Hoorn et al. 2010. Amazonia through time: Andean uplift, climate change, landscape evolution, and biodiversity. *Science* 330:927-931](#)
2. [Critical comment on Hoorn et al. 2010: Rull 2011. Origins of Biodiversity. *Letters. Science* 331:398-399. AND](#)
3. [Response to critical comment by Rull: Horn et al. 2011. Response. *Letters. Science* 331:399-400.](#)

Overkill Hypothesis Literature

1. [Martin, P.S. 1973. Discovery of America. *Science* 179:969-974.](#)
 2. [Grayson, D. and D.J. Meltzer. 2003. A Requiem for North American Overkill. *Journal of Archaeological Science*30:585-593.](#)
 3. [Fiedel, S. and G. Haynes. 2004. A premature burial: comments on Grayson and Meltzer's "Requiem for overkill" *Journal of Archaeological Science* 31:121-131.](#)
2. [Broughton, Jack M., and Elic M. Weitzel. 2018. "Population Reconstructions for Humans and Megafauna Suggest Mixed Causes for North American Pleistocene Extinctions." *Nature Communications* 9 \(1\): 5441. <https://doi.org/10.1038/s41467-018-07897-1>.](#)
3. [Surovell, Todd A., Spencer R. Pelton, Richard Anderson-Sprecher, and Adam D. Myers. 2016. "Test of Martin's Overkill Hypothesis Using Radiocarbon Dates on Extinct Megafauna." *Proceedings of the National Academy of Sciences* 113 \(4\): 886–91. <https://doi.org/10.1073/pnas.1504020112>.](#)

[Williams et al. 2004. Late-Quaternary vegetation dynamics in North America: Scaling from taxa to biomes. *Ecological Monographs* 74:309-334.](#)

[Webb, T. 1986. Is vegetation in equilibrium with climate? How to interpret late-Quaternary pollen data. *Vegetatio* 67:75-91.](#)

23 February

Lecture 21: The Geography of Ecological Communities 1: Introduction, Definitions, Theory, Diversity and Evenness, Composition, Metrics, Biomass, Production. {Reading Chapter 5}

21 Lecture Notes

Lecture 20 & 21 Zoom recordings

Third literature summary due at 11:59 PM on 23 February. Upload your summary into the assignment in the Canvas course.

Literature Summaries 3 Posted

Student 1 Summary; Student 1 Paper

28 February

Lecture 22: A little more Succession {Reading: Chapter 5 }

22 Lecture Notes.

Lecture 23: The Geography of Ecological Communities 3: Functional Succession, then Biogeographic Patterns: Vegetation vs. Flora, Climate Zones, Life Zones, Biomes {Reading Chapter 5}

23 Lecture Notes

Lecture 22 - 23 Zoom Recording

[Odum, E.P. 1969. The strategy of ecosystem Development. Science 164:262-270. \(A Classic Paper\)](#)

2 March

Lecture 24: Biogeographic Patterns: Vegetation vs. Flora, Climate Zones, Life Zones, Biomes

24 Lecture Notes

Lecture 24 Zoom Recording

MID-TERM EXAM POSTED FRIDAY MORNING (Posted 8:00 AM, 3 March DUE 11:59 PM 8 March - 5 Days). NOTE: If you have any problems reading the exam files, or the two files with links in the exam, please notify me AS SOON AS POSSIBLE at mbinford@ufl.edu so I can repair any broken links.

Mid-term exam as .docx file; Mid-term exam as .pdf file.

REMEMBER: Mid-Term Exam is DUE 11:59 PM Friday 8 March!

7 March

Lecture 25: Oceanic and Aquatic Regions

25 Lecture Notes

Lecture 26: Dispersal 1;Basics, Barriers, and Corridors (Ch. 6)

26 Lecture Notes.

Lecture 25 & 26 Zoom Recording

8, 10 March is Spring Break

9 March

Lecture 27: Dispersal 2; Barriers and Corridors

27 Lecture Notes

Lecture 27 Zoom Recording

Fourth literature summary due at 11:59 PM on 9 March. Upload your summary into the assignment in the Canvas course.

Literature Summaries 4 Posted

Student 1 Summary; Student 1 Paper

MARCH 11 - 19 IS SPRING BREAK; HAVE FUN!

21 March

Lecture 28: A Little More Dispersal, then Speciation

28 Lecture Notes

Biogeography in the News: Moura, M.R. & Jetz, W. 2021. Shortfalls and opportunities in terrestrial vertebrate species discovery. Nat Ecol Evol. <https://doi.org/10.1038/s41559-021-01411-5>

Lecture 29: Speciation Continued

29 Lecture Notes

Lecture 28-29 Zoom Recording

23 March

Dr. Binford will be gone to the AAG Meeting - No lecture.

28 March

Lecture 30 Extinctions and Island Biogeography 1 (Ch. 13)

30 Lecture Notes

Lecture 31: Island Biogeography: Equilibrium Theory. E.O. Wilson Obituary - December 2021

31 Lecture Notes

Lecture 30 - 31 Zoom Recording

SPECIFIC READINGS

1. [Simberloff and Wilson. 1969. Experimental Zoogeography of Islands: The Colonization of Empty Islands. Ecology 50:278-296.](#)
2. Wilson, E.O. and D.S. Simberloff. 1969. Experimental Zoogeography of Islands: Defaunation and Monitoring Techniques. Ecology, Vol. 50:267-278
3. [Simberloff, D. 1976. Species Turnover and Equilibrium Island Biogeography. Science 194:572-578](#)
4. [Simberloff, D. 1974. Equilibrium theory of Island Biogeography. Annual Review of Ecology and Systematics. V. 5:161-182.](#)
5. [Simberloff, D. and L. Abele. 1976. Island biogeography theory and conservation practice. Science 191:285-286.](#)
6. [Walter, H. 2004. Mismeasure of Islands: implications for biogeographical theory and the conservation of nature. J. Biogeography 31:177-197.](#)
7. [Gilbert, F.S. \(1980\) The equilibrium theory of island biogeography: fact or fiction? J. of Biogeography, 7, 209–235.](#)
8. AND THE MOST RECENT REVIEW:

[Whittaker, R. J., Fernández-Palacios, J. M., Matthews, T. J., Borregaard, M.](#)

[K., & Triantis, K. A. \(2017\). Island biogeography: Taking the long view of nature's laboratories. Science, 357\(6354\), eaam8326.](#)

<https://doi.org/10.1126/science.aam8326>

30 March

Lecture 32: Island Biogeography: Equilibrium Model, Tests, Revisions

32 Lecture Notes

Lecture 32 Zoom Recording

Fifth literature summary due at 11:59 PM on 30 March. Upload your summary into the assignment in the Canvas course.

Literature Summaries Posted

Student 1 Summary; Student 1 Paper

4 April

Lecture 33: Island Biogeography 4: Evolution on Islands(Ch 13)

33 Lecture Notes

Lecture 34: AereoGeography and Ecogeographic Rule

34 Lecture Notes

Lecture 33 -34 Zoom Recording

Interesting Reading: I

[Kodric-Brown and Brown. 1993. Highly structured fish communities in Australia. Ecology74:1847-1855.](#)

[Sayol et al. 2020. Anthropogenic extinctions conceal widespread evolution of flightness in birds. Science Advances. Vol. 6, no. 49, eabb6095 DOI: 10.1126/sciadv.abb6095](#)

6 April

Lecture 36: Diversity Gradients

36 Lecture Notes

Lecture 36 Zoom Recording

11 April

Lecture 37: Extinctions and Conservation

37 Lecture Notes.

Lecture 37 Zoom Recording

Lecture 38: A Little More about Extinctions; Human Biogeography 1: Evolution and Dispersal;

38 Lecture Notes

Lecture 38-39 Zoom Recording

Reading:

[Stewart and Stringer 2012 Human Evolution Out of Africa: The Role of Refugia and Climate Change. Science 335:1317-1321;](#)

[Perspectives on Stewart and Stringer](#)

[Pope and Terrell 2008 Environmental setting of human migrations in the circum-Pacific region. J. Biogeogr 35:1-21.](#)

[Krause et al. 2010. The complete mitochondrial DNA genome of an unknown hominin from southern Siberia. Nature 464:894-897.](#)

[Hoffecker. 2010. The spread of modern humans in Europe. PNAS 106:16040–16045.](#)

Extra reading:

[Zeder, M. 2008. Domestication and early agriculture in the Mediterranean Basin: Origins, diffusion, and impact. Proc. US Nat. Acad. Sci. 105:11597–11604.](#)

Reading: Dawson_et_al_incl_Jackson_2011_conservation_changing_climate+Science.pdf
Petitpierre_et_al_2012_Niche_shifts_are_rare_among_terrestrial_plant_invaders. Science 335:1344-134

[Ellis and Ramankutty. 2008. Anthropogenic Biomes](#)

[Vitousek et al. 1997. Human Domination of Earth Ecosystems](#)

13 April

Dr. Binford will be gone to NSF Panel Meeting

Sixth (and last!) literature summary due at 11:59 PM on 14 April. Upload your summary into the assignment in the Canvas course.

Literature Summaries Posted

Student Summary, Student Paper

Readings: (Rose et al.; NEON documents) Frontiers in Ecology and Environment Special Issue on Macrosystems Biology:

<https://esajournals.onlinelibrary.wiley.com/toc/15409309/2014/12/1>

Landscape Ecology Special Issue on Macrosystems Biology, Including K.A. Rose et al. Theory: <https://link.springer.com/journal/10980/31/1> 2021 Frontiers in Ecology and Environment Special Issue: Macrosystems Biology - Challenges and Successes <https://esajournals.onlinelibrary.wiley.com/toc/15409309/2021/19/1>

18 April

Lecture 39: Human Biogeography 2: Agriculture, Dominance, Anthropogenic Biomes, Anthropocene,

39 Lecture Notes

Lecture 40: Human Domination and Macrosystems Biology - Regional to Continental Scale

40 Lecture Notes

[Lecture 39 - 40 Zoom Recording](#)

Grad students' references

20 April

Lecture 41: The National Ecological Observatory Network (NEON)

NEON Readings: <https://www.neonscience.org/>

Critiques of NEON: Collins, Scott L., and Alan K. Knapp. "NEON Should Be Run by Ecologists for Ecologists." *BioScience* 69, no. 5 (May 1, 2019): 319–319.

<https://doi.org/10.1093/biosci/biz043>

[Sagoff M. 2019. Will NEON kill ecology? *Issues in Science and Technology* 35: 54–62.](#)

Knapp, Alan K, and Scott L Collins. "Reimagining NEON Operations: We Can Do Better." *BioScience*, October 18, 2019, biz119. <https://doi.org/10.1093/biosci/biz119>.

In Praise of NEON:

Balch, Jennifer K., R. Chelsea Nagy, and Benjamin S. Halpern. "NEON Is Seeding the next Revolution in Ecology." *Frontiers in Ecology and the Environment* 18, no. 1 (2020): 3–3.

<https://doi.org/10.1002/fee.2152>

Review of Museum Collections Use: Soltis, Douglas E., and Pamela S. Soltis. "Mobilizing and Integrating Big Data in Studies of Spatial and Phylogenetic Patterns of Biodiversity." *Plant Diversity, Dedicated to 100 years of Wu Zhengyi*, 38, no. 6 (December 1, 2016): 264–70. <https://doi.org/10.1016/j.pld.2016.12.001>.

25 April

Lecture 42: Undergraduate Research Presentations

Lecture 43: Course Summary

Lecture 43 Notes

Lecture 42 - 43 Recording

Student 1 - Title 1...

26 APRIL GRADUATE STUDENTS' TERM PAPERS DUE

27 - 28 April: Reading Days

Final Exam Posted 28 at X:XX PM; due May 5, 2023 at 9:30 AM

Final exam WITH MWB EXAMPLES in .pdf format

Final exam WITH MWB EXAMPLES in .docx format

EXAMS Mid-term and end-of-semester essay exams will evaluate the ability of the student to understand and synthesize the material presented in class and in the reading. Students are responsible for all material in lectures and readings.

BI-WEEKLY SUMMARIES OF PEER-REVIEWED PAPERS IN THE CURRENT SCIENTIFIC LITERATURE Every other week undergraduate students will read a peer-reviewed paper in the current scientific literature and hand in a summary of the paper and a pdf file of the paper. "Current" means published in the past 4 years (2017-2021 for Spring 2021). The summary will state 1) The full citation reference for the study including the affiliations of the authors, 2) the research problem or question (1 or 2 sentences), 3) the general background knowledge leading up to this study (2 sentences), 4) the methods used by the investigators (1 or 2 sentences), 5) the results of the study (2 sentences and one figure or table), 6) what we learned new from the study (2 sentences), and 7) what are the important questions not answered by the study or new questions raised by the study. This is a total of 12 sentences at most and one illustration of the evidence and is not a copy of the abstract of the paper. Here is an example of a paper that would be appropriate, and here is an example of the summary of the paper (NOTE: I ADDED A SHORT SECTION AT THE END "MWB Comments" THAT DESCRIBE SOME OF MY THINKING THAT WAS NOT ADDRESSED IN THE PAPER ITSELF. YOU DON'T HAVE TO WRITE THIS UNLESS YOU WANT TO.). And, here is a paper that I have summarized, and here is my summary. Each summary will be evaluated on the basis of how well it describes the paper. The overall grade on the summaries will be equivalent to one exam.

CLASSIC WORKS IN BIOGEOGRAPHY Every topic in any discipline has seminal papers or books that started research programs or changed the way that scientists, and ultimately the public, understand their subject. These publications are often called "classic" works. Examples in Biogeography include Darwin's "On the Origin of Species," Wallace's "The Geographical Distribution of Animals," Dov Por's "One Hundred Years of Suez Canal -- A Century of Lessepsian Migration: Retrospect and Viewpoints," Elton's "Ecology of Invasions by Animals and Plants," Haffer's "Speciation in Amazon Forest Birds," MacArthur and Wilson's "Island Biogeography," and many others. Lomolino et al. (2004) "Foundations of Biogeography: Classic Papers with Commentaries" (on reserve in the Marston Science Library for the semester) is a great source of these papers, and although it is very long it does not have all of the papers that you might consider "classic." Lomolino et al. (2004) recognize eight general topics within which classic papers are identified: I. Early Classics; II. Geological history and the distribution of species; III. Biological and environmental factors affecting species' ranges, issues of scale, human influences; IV. Revolutions in Historical Biogeography, geography of dispersal, phylogenetic systematics, V. Geography and diversification, VI. Island biogeography, human effects on extinctions; VII. Community assembly rules; VIII. Environmental gradients and species diversity. To this I would add IX. Conservation biogeography. Each graduate student will select one of the topics, and 2-3 papers within the topic, to summarize for the rest of the class in a short written paper that the class will read and a short in-class presentation and discussion. The summary, presentation, and discussion will account for 25% of the graduate student's grade for the course.

TERM PAPER Graduate students will write a review of the literature in Biogeography about some specific topic. The paper will be a maximum of 20 pages long, 12-point type, double-spaced, excluding figures, tables, and references. Each student should decide on the topic to be reviewed and consult with the instructor early in the semester so the work can commence. The papers summarized in the task above can be used for the term paper research. The term paper will be evaluated on the basis of how well the topic is chosen, how well the topic is summarized, and how well the paper is written. The grade on the term paper will be equivalent to one exam.

EXTRA CREDIT Many students, both graduate and undergraduate, are involved with independent study projects, thesis or dissertation research, or have other experiences with biogeographic research. Short (10-minute) presentations to the class that describe these projects or experiences will be welcome, and will earn extra credit. Past presentations have included a description of a colonization study of small aquatic ecosystems and the Ordway-Swisher Biological Station and a description of a study of the genomes of all terrestrial and marine species that live within 1 km of the land-water interface in Moorea.

LINKS TO VARIOUS JOURNALS WITH BIOGEOGRAPHIC CONTENTS

Journal of Biogeography Science Library QH84 .J68 - Internet Access for UF

Global Ecology and Biogeography Science Library QH84 .G56 - Internet Access for UF

Diversity and Distributions Science Library QH75.A1 B56 - Internet Access for UF

Ecography

American Journal of Botany

American Naturalist

Annals of the Missouri Botanical Garden

Annual Reviews in Ecology and Systematics

Biodiversity and Conservation

Biological Journal of the Linnean Society

Cladistics

Conservation Biology

Deep-Sea Research

Ecological Applications

Ecology

Evolution

Evolutionary biology

Journal of Molecular Evolution

Molecular Ecology

Molecular Phylogenetics and Evolution

Oecologia

Proceedings of the National Academy of Sciences

Proceedings of the Royal Society B: Biological Sciences

Science

Systematic biology

Systematic Zoology

Trends in Ecology & Evolution

Academic Honesty, Student Responsibilities, Student Conduct Code, etc. Students are required to do their own work on the exams, for term papers, and for the literature summaries. It is fine to consult with each other on how to make measurements, where to find interesting literature, etc., but each of you must submit your own work separately. The penalty for cheating is to receive zero points for that exam or paper, and the incident will be reported to the Student Honor Court. You are required to review the UF Student Responsibilities Guidelines (links below).

Academic Honesty Student Conduct Code Alcohol and Drugs Relations Between People and Groups Service to Others Standard of Ethical Conduct

Students with Disabilities Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

Course policy on Zoom Presence where sessions are recorded: no Zoom presence required

Our class sessions may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or use a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who unmute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.