

## SHOALS MARINE LABORATORY – VIRTUAL SUMMER 2020

### BIOSM 2500/ MEFB 500 – Provisional Syllabus\*

#### Coastal Habitat Field Research Methods

**Instructor:** Dr. Gregg E. Moore, Biological Sciences ([gregg.moore@unh.edu](mailto:gregg.moore@unh.edu))

**Office/Lab:** Jackson Estuarine Laboratory, 85 Adams Point Road, Durham, NH

**Course Description:** This 3+ week intensive field-based course is intended for students who wish to explore and gain proficiency in various research and assessment methods of terrestrial and aquatic plant communities. We will combine virtual learning and live-stream field trips to explore habitats of the Isles of Shoals and nearby coastal habitats of the Seacoast and Great Bay Estuary, while students will apply lessons to the natural communities they have access to from their home geographies. Topics covered will include quantitative surveys methods, GIS-based and aerial (UAV) mapping of plant communities, taxonomy and systematics of major vascular taxa, island biogeography, rare species ecology and conservation, and the management of invasive species. Through both field and online exercises, we will use a variety of sampling protocols to document natural plant communities, investigate floristic and habitat gradients, and map species or populations of interest using available technologies. Student will use skills developed in lecture and live-stream field trips and exercises to design and implement brief field research project in a related topic of their choice.

**Dates:** June 22 - July 13

**Credits:** 3 (Cornell students)

4 (UNH and non-matriculated UNH students)

#### **General topics will include:**

- Quantitative field vegetation survey approaches (transect/quadrat, point intercept, ocular)
- Qualitative survey approaches (random, haphazard, meander, etc.)
- Habitat mapping (geo-referencing with GPS and basic GIS map production)
- Comparison of island vs mainland habitats and species composition
- Field identification and plant taxonomy
- Plant collection techniques, ethics and specimen preservation techniques
- Rare species (Natural Heritage) documentation protocols
- Invasive species control approaches, and associated benefits and drawbacks of each
- Vegetation management for promoting native habitat (Seavey Island Tern Colony)
- Independent, applied research project

#### **Learning Objectives:**

1. Know how to conduct terrestrial and aquatic plant surveys and apply the appropriate methodology for their intended purpose (i.e., applied research, resource management, etc.);
2. Become familiar with the flora of habitats visited, be able to distinguish native vs invasive species, rare species, and harmful (poisonous) species;
3. Document rare plant(s) using Natural Heritage's rare species occurrence forms;
4. Map plant habitats using smart-phone GPS, ARC Collector and Google Earth, which may include natural communities, limits of invasive species stands, or location of isolated rare species;
5. Produce plant habitat map(s) using GIS, Google Earth or other open source software (ARC-online)
6. Understand the factors that lead to habitat stability or floristic change over time;
7. Completed a modest virtual plant collection and prepare a selection of herbarium specimens; and
8. Develop, implement, analyze and present results of a small-scale field research project on a topic of students' choice.

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## Texts and Required Reading

Due to the unique nature of this course, reading will be selected from the literature and compiled into a module within Canvas for enrolled students. Links to reference material and primary literature will be made available through a mutually agreeable FTP or server (e.g., Canvas, Google docs, Dropbox, etc).

## Grading

Video Blog Week 1 (Introduction to your geography and/or study sites .....	10 pts
Video Blog Week 2 (Summary of data collected at your site) .....	10 pts
Virtual Plant Collection .....	30 pts
Week 1 Quiz (Habitats and Ecology) .....	50 pts
Week 1 Quiz (Methods and Approaches) .....	50 pts
Reading Summaries and/or Journal .....	25 pts
Class Participation, Discussions, etc. ....	25 pts
Independent Research Project (powerpoint presentation via Zoom) .....	100 pts
Final Exam .....	100 pts
<b>TOTAL</b>	<b>400 pts</b>

A = 94-100	C+ = 77-79	D- = 60-63
A- = 90-93	C = 73-77	F = 0-59
B+ = 87-89	C- = 70-73	
B = 83-87	D+ = 67-69	
B- = 80-83	D = 63-67	

## Course Policies and Academic Integrity

Any work submitted must be your own. Uncredited use of another person's words, data or images is considered plagiarism, a serious violation of basic academic codes of conduct, whether the material comes from another student, a web site, or a published paper. Students must adhere to Cornell's and UNH's Policy for Academic Honesty/Plagiarism and Discrimination

- i. Cornell: <http://cuinfo.cornell.edu/aic.cfm>
- ii. UNH: <http://www.unh.edu/vpsas/handbook/welcome-university-new-hampshire>

## Academic Honesty

Honesty is a core value at the University of New Hampshire. The members of its academic community both require and expect one another to conduct themselves with integrity. This means that each member will adhere to the principles and rules of the University and pursue academic work in a straightforward and truthful manner, free from deception or fraud. Any attempts to deviate from these principles will be construed as acts of academic dishonesty and will be dealt with according to the rules of due process detailed in the academic conduct guidelines.

## Plagiarism

The unattributed use of the ideas, evidence, or words of another person, or the conveying of the false impression that the arguments and writing in a paper are the student's own. The penalty for cheating, plagiarism or misrepresentation in this class will be an automatic F for the course and could result in dismissal from the University.

## SHOALS MARINE LABORATORY – VIRTUAL SUMMER 2020

### Weekly Meeting Times

Our Weekly Schedules will vary depending upon the week. Weeks 1-2 will meeting at the same times each day as shown below, while Week 3 and Monday of Week 4 are rather different in format in order to allow ample time for independent study and workshopping research ideas and progress with faculty, teaching assistants and your peers. A more detailed Syllabus will be provided prior to the start of class. Registered students will receive this document via email.

### Week 1-2: Daily Schedule

10:00-11:00 Lecture (Live from office)

11:00-11:30 Video/Photo montage (pre-recorded)

1:00-3:00 (Live-streaming from location)

### Week 3: Daily Schedule (Jul 6-Jul 9)

10:00-12:00 Daily on-line forum for project Q&A

4:00 Student “Read-Outs” providing 5 min summary of research project

### Week 3: July 10 Only

All Day Student Presentations

### Week 4: July 13 Only

Final Exam 10:00-12:00

### Field Trip Topics and Locations

Week	Date	Day	Theme	Activities	Key Assignments
1	22-Jun	Mon	Exploring Habitats	Rocky Shore, Apledore or Gerish Island, ME	Readings and Journal
1	23-Jun	Tue		Salt Marshes, Essex, MA	Readings and Journal
1	24-Jun	Wed		Beach and Dune, Hampton, NH	Readings and Journal
1	25-Jun	Thu		Living Shorelines, Durham, NH	Readings and Journal
1	26-Jun	Fri		Freshwater Systems, Portsmouth, NH	Identify Study Site + Quiz 1
2	29-Jun	Mon	Applying Research Methods	Elevation and Salinity Gradients (Rocky Shore)	Readings and Journal
2	30-Jun	Tue		WLR's, UAV and Aerial Imagery (Salt Marshes)	Readings and Journal
2	1-Jul	Wed		Erosion and Dune Die-off Metrics (Beach and Dune)	Readings and Journal
2	2-Jul	Thu		Vegetation and Porewater Metrics (Living Shorelines)	Readings and Journal
2	3-Jul	Fri		Vegetation Survey Methods (Freshwater Systems)	Identify Study Concept + Quiz 2
3	6-Jul	Mon	Independent Studies	Students select sites in their geography, implement study*	Research Progress Report
3	7-Jul	Tue		* employ one or more approaches above	Research Progress Report
3	8-Jul	Wed		Students check in at set time weekly to ask questions	Research Progress Report
3	9-Jul	Thu			Research Progress Report
3	10-Jul	Fri		<<Presentation Day>>	Student Presentations
4	13-Jul	Monday	Wrap up	FINAL EXAM	Final Exam via Canvas + Plant Collection Due

\* *ADDITIONAL DETAIL TO BE ADDED*