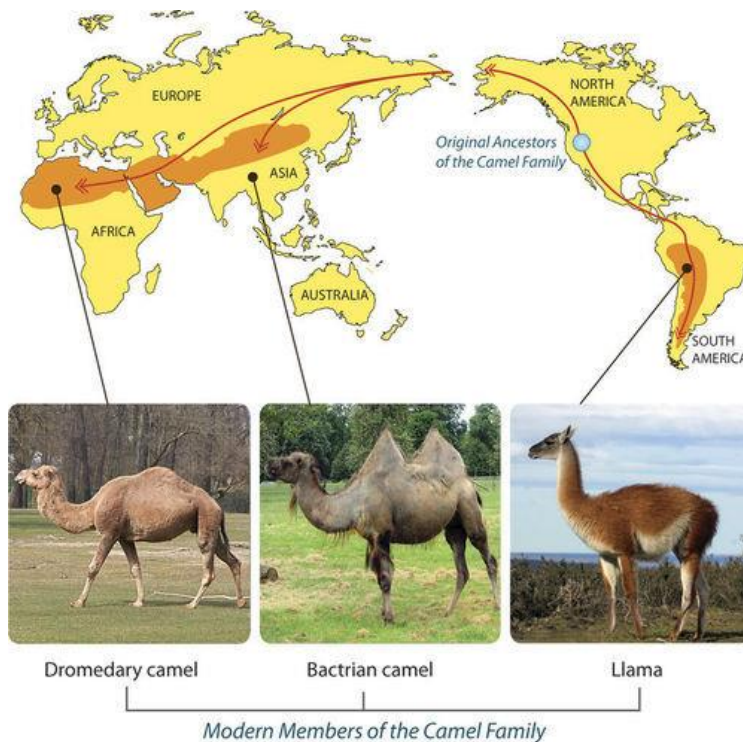


**Semester at Sea Course Syllabus**  
**Colorado State University, Academic Partner**

**Voyage:** Fall 2017  
**Discipline:** Geography  
**Course Number and Title:** GR 348 Biogeography  
**Division:** Upper  
**Faculty Name:** McKeon  
**Semester Credit Hours:** 3

**Meeting:** A Day 1230-1350, Kaisersaal Starboard

**Prerequisites:** Three (3) geography credits



**COURSE DESCRIPTION**

Biogeography is the study of spatial patterns of biological diversity and its causes. Biogeography is the synthesis of ecology, evolution, paleontology, and climatology. This course will provide a background for the field of biogeography and the ecological foundations needed to understand the distribution and abundance of species and their changes over time. We will explore the biogeography of the globe, particularly the areas visited on our voyage, and the relevance of biogeography during this time of increasing human impact and climate change.

## LEARNING OBJECTIVES

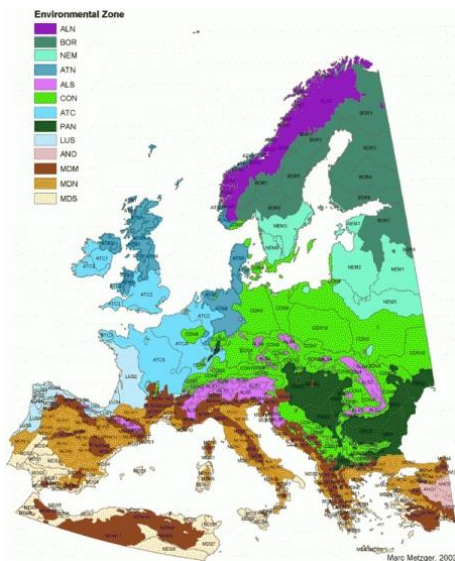
- To relate the biogeographic distribution of plants and animals to abiotic factors across spatial and temporal scales
- To identify the roles of dispersal, vicariance, and endemism in establishment of biogeographic patterns
- To apply biogeographic principles to conservation

## REQUIRED TEXTBOOKS

AUTHOR: Lomolino, MV, BR Riddle RJ Whittaker, JH Brown  
TITLE: Biogeography  
PUBLISHER: Sinauer Associates  
ISBN #: 978-1-60535-472-9  
DATE/EDITION: 2017/5<sup>th</sup> Edition (available January 2017)

AUTHOR: Quammen. D  
TITLE: The Song of the Dodo: Island Biogeography in an Age of Extinction  
PUBLISHER: Touchstone  
ISBN #: 0-684-82712-3  
DATE/EDITION: 1996

## TOPICAL OUTLINE OF COURSE



Depart Bremerhaven, Germany – September 9

**A1—September 11:**  
Introductions, Syllabus, and Overview  
Introduction to Biogeography. Chapter 1

What is biogeography? How is it relevant to the voyage and your studies? Why is biogeography important? Getting started with the text and with Quammen.

**A2—September 13: History of Biogeography. Chapter 2**

What theories have dominated Biogeography? How is this perspective changing? Ranges in Europe applied to the world.

Barcelona and Valencia, Spain — September 15-18

**A3—September 19: Distribution of Species. Chapter 4**

Species concepts and basic introduction to systematics. What are the environmental and physical parameters that define fundamental species ranges?

**A4—September 21: Distribution of Species. Chapter 4**

Continued discussion of the environmental and physical parameters that define fundamental species ranges.

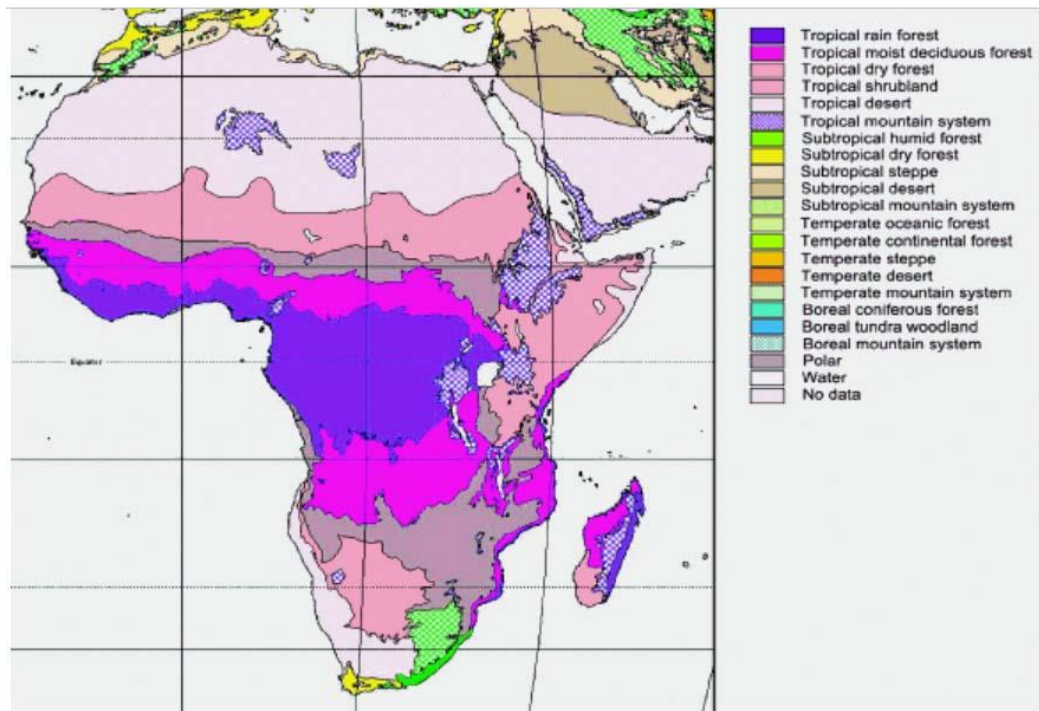
No Class — September 23

**A5—September 24: Distribution of Communities. Chapter 5**

Why the relationship between the tropics and diversity? Introduction to the flora and fauna of the equatorial forests of Africa.

**A6—September 26: Distribution of Communities. Chapter 5**

How do species and environmental interactions create and limit communities?



Tema and Takoradi, Ghana — September 27-30

**A7—October 3: Song of the Dodo 1**

Discussion of the first third of the book. How do the lessons apply to sub-Saharan Africa?

**A8—October 5: Ecological Succession and Disturbance. Chapter 5**

What is ecological Succession? How do habitats recover from disturbance? How have 'disturbance specialists' benefitted from human alteration of the environment?

Cape Town—October 7-12

**A9—October 13: Dispersal and Persistence. Chapter 6**

What does it take to get to an island? What does it take to survive there?

**A10—October 15: Speciation and Extinction. Chapter 7**

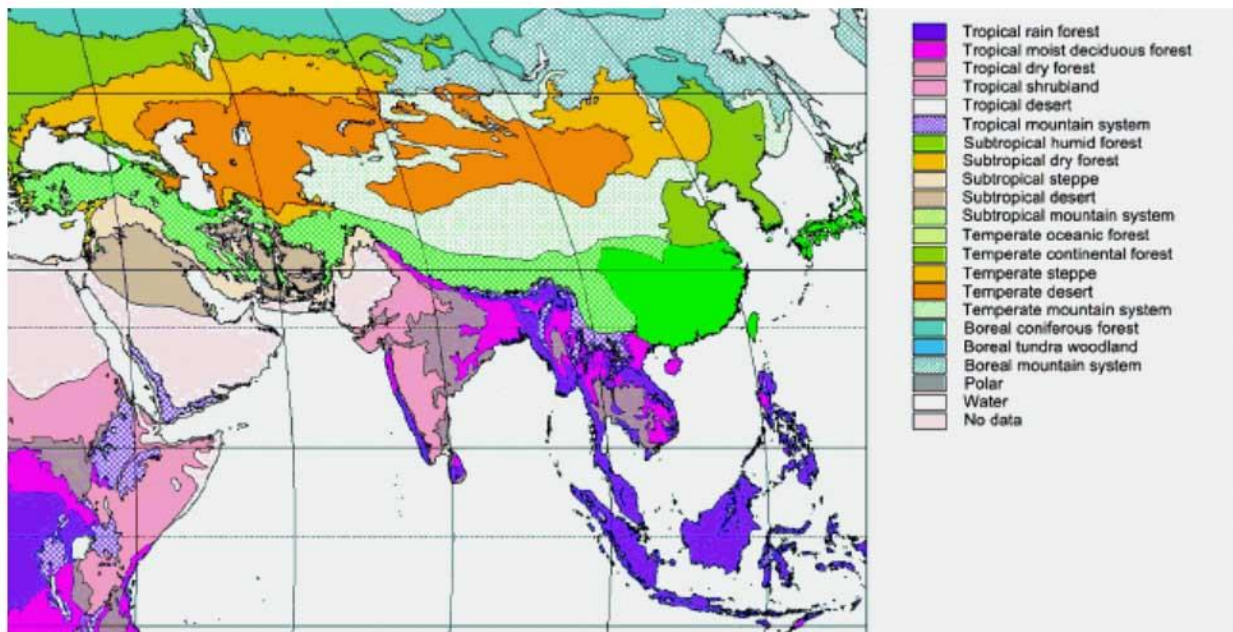
The theory of Island Biogeography, Island Endemism, the Dodo. Preparation for Mauritius.

No Classes – October 16

**A11—October 18: Song of the Dodo 2**

Part 2 of the book, island lessons, further considerations for Mauritius

Port Louis, Mauritius – October 19



**A12—October 21: Plate Tectonics and Continental Drift. Chapter 8**

Why are European and Asian faunas different? Why is India so diverse?

No Class – October 22

**A13—October 24: Species Diversification. Chapter 10**

What are the factors that have promoted diversity in India? Introduction to the fauna and flora of Asia

Cochin, India – October 25-30

No Class – October 31

**A14–November 2: Species Diversification. Chapter 10**  
Sympatry, Allopatry, Parapatry.... Getting away from your relatives

Yangon, Myanmar – November 4-8

**A15–November 9: History of Lineages, Phylogeography. Chapters 11 and 12**  
Examples from Southeast Asia and the Wallace Line. Flying lizards and snakes?

No Class – November 11

**A16–November 12: History of Lineages, Phylogeography. Chapters 11 and 12**  
If birds have wings, why are the lineages restricted? Evolutionary barriers.

Ho Chi Minh City, Vietnam – November 14-18

**A17–November 19: Song of the Dodo 3**  
Discussion of the third part of the book. Application of Biogeography to understanding the voyage so far.

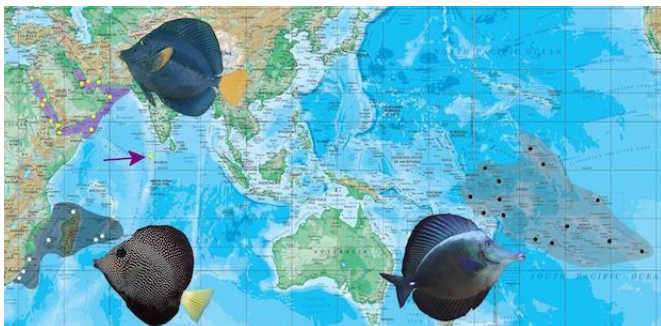
No Class – November 21

**A18–November 22: Biodiversity Gradients. Chapter 15**  
Human Hotspots vs. Biodiversity Hotspots. Same or Different?

Shanghai, China – November 24-29

**A19–November 30: Biodiversity Gradients. Chapter 15**  
Biogeographic theories of biodiversity accumulation

Kobe, Japan – December 2-6



**A20—December 7: Island Biogeography. Chapter 13, 14**  
Species gain and loss in Polynesia... Radiations lost

**A21—December 9: Island Biogeography. Chapter 13, 14**  
Species gain and loss in Polynesia... Value rediscovered

**A22—December 11: Conservation Biogeography. Chapter 16, 17**  
Anthropogenic challenges to species conservation, and the role of biogeography

**A23—December 13: Conservation Biogeography. Chapter 16, 17**  
Case studies from our collective adventures- student presentations on guides to biogeographic zones and fauna.

**A24—December 15: Song of the Dodo. Thoughts, Lessons, Hope.**

Honolulu, Hawaii – December 16

**A25—December 18; A Day Finals**

San Diego, California – December 23

#### **FIELD WORK**

Semester at Sea field experiences allow for an unparalleled opportunity to compare, contrast, and synthesize the different cultures and countries encountered over the course of the voyage. In addition to the one field class, students will complete independent field assignments that span multiple countries.

**Field Class attendance is mandatory for all students enrolled in this course. Do not book individual travel plans or a Semester at Sea sponsored trip on the day of your field class.** Field Classes constitute at least 20% of the contact hours for each course, and are developed and led by the instructor.

#### **Field Class & Assignment**

The Field Class for this course will take place on Friday, 15 September, in Barcelona, Spain.

The field class for Biogeography will be a photo safari, transecting as many habitat types as we can manage within the time period. This will be an opportunity to expose student to techniques and resources they will use later in the project, explicitly using iNaturalist, field guides, light traps etc, to bioblitz. Much of the focus will be on shifting focus away from the charismatic macrofauna, and onto insects, plants, and small creatures that will be easier to secure large numbers of observations of. As these skill sets will be used for the independent projects, locations early in the voyage (Amsterdam, Spain, Ghana) are preferred, targeting accessible but intact ecosystems (National parks, wetlands, mountain ranges)

Student participation will be evaluated as a precursor to the individual projects- the assembly of habitat 'guides', organized by habitat, and biogeographic zone. The goal will be 30 identified species, arranged with maps and descriptions.

### **Independent Field Assignments**

We will be using the online natural history platform "iNaturalist.com" to collect and share biogeographical observations throughout the semester. The platform is web-accessible, and has free apps in both Apple and Android 'ecosystems'. Each student in the class is responsible for the creation of an iNaturalist account, and logging 100 "research grade" observations with photos to the "SemesteratSea2017" Project (<http://www.inaturalist.org/projects/semester-at-sea-2017>) before the due date. These observations may not be of domesticated species. I do not expect you to know the identifications of all of your observations immediately. You will use the iNaturalist community, online and onboard resources to enable accurate identification. Your goal for each port-of-call is to document a biogeographic region through photography of the plants and animals of that region, and assemble these observations and images into a 'guide.' Evaluation will be based on accomplishment of the research grade observations, and the quality of all samples from a biogeographic region presented as a guide.

### **METHODS OF EVALUATION / GRADING SCALE GRADING SCALE**

The following Grading Scale is utilized for student evaluation. Pass/Fail is not an option for Semester at Sea coursework. Note that C-, D+ and D- grades are also not assigned on Semester at Sea in accordance with the grading system at Colorado State University (the SAS partner institution).

Pluses and minuses are awarded as follows on a 100% scale:

<u>Excellent</u>	<u>Good</u>	<u>Satisfactory/Poor</u>	<u>Failing</u>
97-100%: A+	87-89%: B+	77-79%: C+	Less than 60%:
93-96%: A	83-86%: B	70-76%: C	
90-92%: A-	80-82%: B-	60-69%: D	

### **ATTENDANCE/ENGAGEMENT IN THE ACADEMIC PROGRAM**

Attendance in all Semester at Sea classes, including the Field Class, is mandatory. Students must inform their instructors prior to any unanticipated absence and take the initiative to make up missed work in a timely fashion. Instructors must make reasonable efforts to enable students to make up work which must be accomplished under the instructor's supervision (e.g., examinations, laboratories). In the event of a conflict in regard to this policy, individuals may appeal using established CSU procedures.

## **LEARNING ACCOMMODATIONS**

Semester at Sea provides academic accommodations for students with diagnosed learning disabilities, in accordance with ADA guidelines. Students who will need accommodations in a class, should contact ISE to discuss their individual needs. Any accommodation must be discussed in a timely manner prior to implementation.

A memo from the student's home institution verifying the accommodations received on their home campus is required before any accommodation is provided on the ship. Students must submit this verification of accommodations to [academic@isevoyages.org](mailto:academic@isevoyages.org) as soon as possible, but no later than two months prior to the voyage.

## **STUDENT CONDUCT CODE**

The foundation of a university is truth and knowledge, each of which relies in a fundamental manner upon academic integrity and is diminished significantly by academic misconduct. Academic integrity is conceptualized as doing and taking credit for one's own work. A pervasive attitude promoting academic integrity enhances the sense of community and adds value to the educational process. All within the University are affected by the cooperative commitment to academic integrity. All Semester at Sea courses adhere to this Academic Integrity Policy and Student Conduct Code.

Depending on the nature of the assignment or exam, the faculty member may require a written declaration of the following honor pledge: "I have not given, received, or used any unauthorized assistance on this exam/assignment."

## **RESERVE BOOKS AND FILMS FOR THE LIBRARY**

Field guides and Floras for each of the regions visited, ideally not just for macrofauna.

BBC Natural History Documentary Series:

Planet Earth  
Life on Earth  
Life (Attenborough narration)  
Earth: The biography

## **ADDITIONAL RESOURCES**

-Students will require a reference library for the identification of organisms encountered on the voyage.

-Students will require the computer capacity to assemble images and text into biogeographic 'guides'.

-Students will require access to cameras (cell phones/tablets are fine).



-Field exercise dependent, students will need appropriate gear to explore biogeography (appropriate footwear/clothing, binoculars spotting scopes, hand lenses etc).