

Marine Environmental History

CAS NS 323 (4 credits)

Course Catalog Description:

Employ methods and sources of historians and social scientists. Examine the role of human societies in coastal and open ocean environmental change. Issues include resource conservation, overfishing, pollution, invasive species, and climate change.

Instructor(s): Sea Education Association Maritime Studies and Oceanography Faculty

Location: SEA campus in Woods Hole, MA, at field station in U.S. Virgin Islands, at sea on SEA's sailing school vessel *Corwith Cramer*, and ashore during several island port stops.

Prerequisites: Admission to SEA Semester. Sophomore standing or consent of instructor.

Course Philosophy and Approach:

Marine Environmental History (MEH) is a four-credit course team-taught by SEA's Maritime Studies and Oceanography professors. This course begins on shore in Woods Hole and the U.S. Virgin Islands and continues throughout the sea component. We will begin by exploring the links between traditional nation-oriented histories, inter-regional histories that span the Atlantic and the development of Environmental History and Environmental Science, considering methodology, approaches and current trends within each guild. This course will consider the role of ships and sailors as agents of environmental, cultural, social and economic change in the Caribbean region. Yet, we must also consider the agency of the environment and the limits placed on human beings in their interactions with the land and geography throughout the Caribbean.

Our exploration of the Caribbean will follow a quasi-chronological structure that examines the role of various human and environmental factors as active agents across several distinct and overlapping eras of change:

- Geographic Landscape – geologic and climate setting
- Native/pre-Columbian Era (pre-1500s)
- Three Worlds Collide/Dawn of Atlantic World (1500s)
- Era of Colonization (1600-1700s)
- Age of Revolutions, Emancipation, & Capitalism (1800s)
- Decolonization, Post-colonialism and Globalization (1900-1990s)
- Contemporary Era (2000s)

Through the use of primary documents we will observe and discuss the marine and terrestrial resources that motivated European expansion in the Caribbean, which of the many human endeavors were most influential during a given temporal horizon, and the resulting environmental changes. Essential to our understanding of the impacts that these human endeavors engender is an appreciation for natural patterns of change in marine and terrestrial

ecosystems. As the value and utility of various ecosystems evolve in response to ever changing political, economic and social institutions in the Caribbean, a need emerges to develop management and conservation strategies that preserve the sustainable use of island natural resources for multiple stakeholders. The human endeavors we will examine fall within the larger program themes:

- 1) *Environmental Justice* – From Early Colonization to the development of the Plantation Complex, who controls the land and resources and who gets excluded.
- 2) *Economic Equity* – In the Post-Emancipation period and decolonization process, how the valuable assets of the region are allocated.
- 3) *Sense of Place* – The cultural values of the mix of indigenous, creole and colonial peoples and the process of contestation and compromise over claims to “ownership” in the Caribbean.
- 4) *The Anthropocene* – How the Small Island Nations and territories of the Caribbean are confronting or failing to confront the effects of current and future climate disruption.

Through our study of these themes, we will develop an understanding of the need/desire for: 1) safe trade routes, including anchorages, provisioning and subsequent environmental changes; 2) colonization/settlement, including land use and introduced species; 3) commerce/profit, including bioprospecting, introduction of species, plantation system agriculture; 4) tourism/recreation/aesthetics, including cruise ships, resorts, diving, aquarium trade; and, 5) energy, sustainability, and conservation. The myriad of environmental changes brought on by human endeavors will direct the focus of the research students will conduct in this course as well as that which they complete for *The Ocean and Global Change (OGC)* course they will also take during this *Caribbean Reef Expedition* program.

During the six-week shore component in Woods Hole, this course consists of 17 lecture/discussion sessions (1.5 hours each), three laboratory/illustration sessions (3 hours each), and two field trips (10 hours). Activities for this course during the two-week field station component and four-week sea component consist of 9 lecture/discussion sessions (2 hours each) and 6 field trips (6 hours each), plus additional time for independent student exploration during port stops. Some of these sessions are joint activities integrated with other *Caribbean Reef Expedition* courses, and the weekly contact hours given in the preliminary course calendar below reflects only the portion allocated to *MEH*.

Learning Outcomes:

1. Understand the complex interplay of the environment, cultural development and history in the Caribbean region over time.
2. Apply interdisciplinary techniques and approaches to environmental studies.
3. Develop and support a thesis based on work with primary and secondary materials.
4. Work within a collaborative research and writing environment: present ideas for group feedback and offer and exchange constructive critiques of written work in a peer revision process.
5. Interrogate and evaluate arguments and conclusions developed during onshore research through observations and interviews conducted during island visits.

6. Develop and practice graphic/illustrative skills to communicate complex ideas, display technical knowledge and relay personal experiences.

Evaluation:

MEH Change Research Project (60%)

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| • Project proposal | 5% |
| • Document presentation | 20% |
| • Peer review participation | 5% |
| • Final research paper | 30% |

MEH Port Stop (Field) Research (25%)

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| • Port stop exploration & field notes | 5% |
| • Port stop presentation | 10% |
| • Addendum to MEH Change Research Paper | 10% |

Natural History Illustrations 15%

Assignments:

The *MEH Change Research Project* begins onshore and continues through the sea component. Onshore students choose a primary historical document (see Document List below) as an entry point into our exploration of the myriad course themes. Student research of additional primary and secondary literature onshore will expand their understanding of each course theme and develop a timeline of change up to contemporary times. The final research paper will progress through stages of development including an initial paper proposal due in Week 3, followed by a series of student presentations of work-in-progress in Weeks 4 and 5, and a peer review process in Week 5. Results of this shore-based work culminate in a final research paper that illuminates our current understanding of a specific element of Marine Environmental History in the Caribbean. The conclusions of the shore-based research are then corroborated with *MEH Port Stop (Field) Research* during our many port stop visits. Guided field trips, independent exploration, and interviews are recorded in student field journals. Based on these observations students will then compare their first-hand experiences to their onshore research and share their findings in a port stop presentation and addendum to their final research paper.

Additional assignments include several *Natural History Illustrations* and accompanying written descriptions. These illustrations are based on student observation during field trips on Cape Cod and the U.S. Virgin Islands, while at sea collecting marine organisms, and during port stop visits which would include marine, coastal and terrestrial habitats.

Document List (representative):

Olaus Magnus *Carta Marina* (Rome 1572)

Ralph Bohun, *Discourse concerning the origine and properties of wind* (Oxford 1671)

Athanasius Kircher, *Mundus subterraneus* (Amsterdam 1678)

- Eberhard Zimmermann, *Specimen zoological geographiae* (Leiden 1777)
- Bartolome de las Casas *History of the Indies* (1552)
- Joseph de Acosta *Natural History Indies* (1590)
- Phillip Henry Gosse and Richard Hill *A Naturalist's Sojourn in Jamaica* (London 1851)
- John White catalogue of drawings and watercolors that accompany Thomas Harriot's written account – *A Briefe and true report of the new found land of Virginia* (London 1585)
- William Dampier *A new voyage around the world* (London 1697)
- Benjamin Franklin and Timothy Folger, *Course of the Gulf Stream* (Paris 1778)
- Hans Sloane, *Natural History of Jamaica* (London 1707-1725)
- R. Smith, *British Pamphlet describing Port Royal Earthquake* (1692)
- William B. Espeut, *On the Acclimatization of the Indian Mungos in Jamaica* in Philosophical Transactions (1882)
- Paul Brooks, *Beachcombing in the Virgin Islands* in Roadless Areas (1964)
- David Rains Wallace, *Of Buccaneers and Biodiversity* in Wilderness Magazine (1989)
- Matthew Fontaine Maury, *The Physical Geography of the Sea* (1855)
- Standard Fruit and Steamship Co. *Cruise brochure* (1926)
- Dominican Republic, *Marine Mammal Samana Bay and Silver Bank sanctuary permits* (1986)
- CARICOM *Reports on climate change* (various documents, www.caricom.org)

Preliminary Reading List:

- Adams, Frederick Upham, *Conquest of the Tropics* (1914)
- Bolster, Jeffrey W., *Putting the Ocean in Atlantic History* in The American Historical Review (2008)
- Butler, Richard W. (editor), *The Tourism Area Life Cycle – Applications and Modifications* (2006)
- Crosby, Alfred W., Jr., *The Columbian Exchange* (1972)
- Crosby, Alfred W., Jr., *Ecological Imperialism: The Biological Expansion of Europe, 900-1900* (1986)
- Delbourgo, James and Nicholas Dew (editors), *Science and Empire in the Atlantic World* (2008)
- Diamond, Jared, *Collapse* (2005)
- Grove, Richard H., *Green Imperialism: Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600-1860* (1995)
- Jackson, Jeremy, Karen Alexander and Enric Sala (editors), *Shifting Baselines: The Past, and the Future of Ocean Fisheries* (2011)

- McCook, Stuart, *States of Nature: Science, Agriculture, and Environment in the Spanish Caribbean 1760-1940* (2002)
- McNeil, John, *Mosquito Empires: Ecology and War in the Greater Caribbean, 1620-1914* (2010)
- Nybakken, James and Bertness, M., *Marine Biology: An Ecological Approach* 6th ed. (2005)
- Rediker, Marcus, *Between the Devil and the Deep Blue Sea*, (1987)
- Roorda, Eric P., *The Dictator Next Door: The Good Neighbor Policy and the Trujillo Regime in the Dominican Republic, 1930-1945* (1998)
- Rozwadowski, *Small World: Forging a Scientific Maritime Culture for Oceanography in Isis* (1996)
- Sea Education Association (SEA), Science logbook of the SSV *Corwith Cramer* (various cruises/years)
- Sealey, Neil E., *Tourism in the Caribbean* (1982)
- Sealey, Neil E., *Caribbean World a Complete Geography* (1992)
- Segar, Douglas, *Introduction to Ocean Sciences*, Online text, <http://www.reefimages.com/oceans/oceans.html> (2013)
- Striffler, Steve and Moberg, Mark ed. *Banana Wars – Power, Production, and History in the Americas* (2005)
- Watts, David, *The West Indies: Patterns of Development, Culture Environmental Change since 1492* (1987)

Expectations and Requirements:

- Punctual attendance is required at every class meeting.
- Active participation in class discussion is expected.
- Late assignment submissions (without prior clearance by faculty) are not accepted.
- The policy on academic accuracy, quoted below, will be strictly followed in this class.

The written work that you submit in this course is expected to be **your original work**. You must take care to distinguish your own ideas and knowledge from wording or substantive information that you derive from one of your sources. The term “sources” includes not only published primary and secondary material, but also information and opinions gained directly from other people and text that you cut and paste from any site on the Internet.

The responsibility for learning the proper forms of citation lies with you. Quotations must be placed properly within quotation marks and must be cited fully. In addition, all paraphrased material must be acknowledged completely. Whenever ideas or facts are derived from your reading and research, the sources must be indicated. (*Harvard Handbook for Students*, 305)

- Considerations for use of internet sources:
As you browse websites, assess their usefulness very critically. Who posted the information and why? Can you trust them to be correct? Authoritative? Unbiased? (It’s okay to use a

biased source as long as you incorporate it knowingly and transparently into your own work.) Keep track of good sources that might be useful for subsequent assignments, and annotate in your bibliography any sites you cite. Your annotation should include the name of the author or organization originating any material that you reference. If you can't identify the source, don't use it!

Course Calendar:

Topic	Readings/Assignments Due
Week 1 (9 hours) – on shore at SEA campus in Woods Hole	
<p>Introduction to <i>Caribbean Reef Expedition</i> program and <i>Marine Environmental History (MEH)</i>; Overview of course goals & assignments</p> <p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • Pilot Chart Exercise & Historic Voyages (joint w/ all courses) • What is Environmental History? Methods and Approaches • Introduction to Primary Historical Documents • The Caribbean 'Landscape' – climate, current, & geologic setting explained (with <i>OGC</i>) • Natural History Illustration, Part I: Art & illustration as a means of scientific communication <p>Quissett Harbor Field Trip</p>	<p>Readings:</p> <p>Bolster (2008) Rediker (1987): Selected chapters McNeil (2010) Sealey (1992) Segar (2013): Selected portions</p> <p>Review and choose Historical Document</p>
Week 2 (3 hours) – on shore at SEA campus in Woods Hole	
<p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • Island Biogeography & Introductions – speciation, biodiversity, and extinction processes (with <i>OGC</i>) • 16th – 18th century land-use and bioprospecting in the Caribbean • Marine Biological Classification (with <i>OGC</i>) 	<p>Readings:</p> <p>Crosby (1972) Crosby (1986) McCook (2002) Nybakken & Bertness (2005): Selected portions Segar (2013): Selected portions</p>
Week 3 (4 hours) – on shore at SEA campus in Woods Hole	
<p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • Naturalists & Science at Sea in Atlantic 	<p>Readings:</p> <p>Delbourgo and Dew, Eds. (2008)</p>

<p>World & 19th century</p> <ul style="list-style-type: none"> • Production to Pollution – nutrient cycles, eutrophication, algae blooms (with <i>OGC</i>) • Development of the Marine Sciences 	<p>Nybakken & Bertness (2005): Selected portions Rozwadowski (1996) SEA, Science logbook of <i>Corwith Cramer</i>, (various cruises/years)</p> <p>Research paper proposals due</p>
<p>Week 4 (7 hours) – on shore at SEA campus in Woods Hole</p>	
<p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • Marine ecology population dynamics, food webs, trophic cascades (with <i>OGC</i>) • United Fruit Company, Contemporary Tourism & Cruise Ships • Natural Science Illustration, Part II: Techniques – perspective, depth, shading, pencil, pen, and ink <p>Document presentations by students.</p>	<p>Readings: Adams (1914) Striffler and Moberg (2005) Nybakken & Bertness (2005): Selected portions Sealey (1982)</p>
<p>Week 5 (10 hours) – on shore at SEA campus in Woods Hole</p>	
<p>Field Trip to John Carter Brown Library in Providence, Rhode Island</p> <p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • Colonial Legacies – Changing notions of sustainable tourism • Fisheries – maximum sustainable yield, shifting baselines <p>Document presentations by students. Peer-review meetings/workshop.</p>	<p>Readings: Butler, Ed. (2006) Grove (1995) Jackson et al., Eds. (2011) Watts (1987)</p>
<p>Week 6 (5 hours) – on shore at SEA campus in Woods Hole</p>	
<p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • Sugar Cultivation: The legacy of a cash crop • Cruise Research Plan/Briefing (with <i>OGC</i>) • Natural Science Illustration, Part III: Techniques – composition and watercolor 	<p>Readings: Diamond (2005) – Chapter 11 <i>One Island, Two Peoples, Two Histories: The Dominican Republic and Haiti</i> Roorda (1998) – select chapters</p> <p>Final MEH Documenting Change Research Paper due</p>
<p>Week 7 (4 hours) – at field station in the U.S. Virgin Islands</p>	
<p>Visiting Speakers with Discussion: Virgin Islands Environmental Resource</p>	<p>Readings:</p>

Station (VIERS), National Park Service (NPS), U.S. Geological Survey, University of the Virgin Islands, etc.	Local History selections and NPS literature <i>Natural Science Illustration</i> <i>Field journal entries</i>
<i>Week 8 (4 hours) – at field station in the U.S. Virgin Islands</i>	
Visiting Speakers with Discussion: U.S. Fish and Wildlife, St. Croix Environmental Association, The Nature Conservancy, dive/tour operators, etc.	<i>Field journal entries</i>
<i>Week 9 (9 hour) – at sea</i>	
Port Stop Orientation and Planning Port Stop Visit #1 <ul style="list-style-type: none"> • Guided field trips • Independent student exploration Port Stop Debrief and Discussion	Port-specific readings <i>Natural Science Illustration: marine organisms</i>
<i>Week 10 (8 hours) – at sea</i>	
Port Stop Visit #2 <ul style="list-style-type: none"> • Guided field trips • Independent student exploration Port Stop Debrief and Discussion	Port-specific readings <i>Field journal entries</i>
<i>Week 11 (8 hours) – at sea</i>	
Port Stop Visit #3 <ul style="list-style-type: none"> • Guided field trips • Independent student exploration Port Stop Debrief and Discussion	Port-specific readings <i>Field journal entries</i> <i>Natural Science Illustration: island habitat</i>
<i>Week 12 (4 hours) – at sea</i>	
Port Stop Presentations (2 afternoons)	<i>Port Stop Addendum to MEH Change Research Project due</i>