



Marine Environmental History

CAS NS 323 (4 credits)

Course Catalog Description (max. 40 words):

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 Faculty

Location: SEA campus in Woods Hole, MA, at sea aboard SEA's sailing school vessel (SSV) *Robert C. Seamans*, ashore during several island port stops, and ashore in New Zealand.

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

Course Philosophy and Approach:

Sustainability in Polynesian Island Cultures (SPICE) is an interdisciplinary program that examines the interaction of culture and ecological sustainability. We develop the program around this theme by first establishing a working definition of "sustainability," using the islands on our cruise track as case studies. We address the relationship between people and their environment, and look for ways to measure and assess the impact of agriculture and aquaculture, fishing, the introduction of new species of plants and animals, changing demographics due to migration and European colonization, and the impact of global trading networks. The SPICE program consists of five courses, each with specific academic requirements, although the lines between the disciplines in lectures, discussions and projects are, by design, blurred into an interdisciplinary whole. Discussion of course materials from environmental, historical, cultural, scientific and nautical perspectives will integrate our program themes.

Marine Environmental History (MEH) is a four-credit course team-taught by the Maritime Studies and Oceanography professors. This course begins on shore in Woods Hole, continues throughout the sea component, and is completed during the second shore component in New Zealand. To understand the impact of human actions on island ecosystems it is essential that we first become familiar with patterns of change that occur naturally in marine and terrestrial ecosystems. Accordingly, we will study the process of island formation and the physical, biological and oceanographic phenomena that fundamentally shape these environments; much of this material will be presented in the *Oceanography* course that all SPICE students take. In many ways, the study of these islands is a wonderful integrator of planet-wide physical processes that tend to challenge our thinking of sustainability in the human context. During the shore component students will start acquiring the basic understanding of these processes, an understanding that they will apply and expand during the cruise and as we observe the ocean environment using the scientific tools on board the *Robert C. Seamans*.

The primary research assignment for this course will draw on information from all of our disciplines. With their classmates, each student will undertake a research project that will

culminate in a polished entry for our on-line *Atlas of Polynesia* that includes both text and visuals. The myriad of environmental changes brought on by human endeavors will direct the focus of the research that students conduct in this course as well as that which they complete for the *Oceanography (OC)* course they will also take during the SPICE program. Some details of this *MEH* research assignment are provided in the 'Assignment' section below; further details will be discussed during the introductory class meetings.

This course consists of 26 hours of lecture/discussion sessions, research workshops, and field trips during the initial 4-week shore component in Woods Hole, 26 hours of field trips and independent research in the island communities visited during the 6-week sea component, and 15 hours for field trips, mentored work sessions and writing workshops, and student presentations during the final 2-week shore component in New Zealand. Many of the activities listed on this syllabus are joint activities integrated with other SPICE courses, most particularly with *Oceanography (OC)*; weekly contact hours summarized here and given in the course calendar below reflect only the portion allocated to this *Marine Environmental History* course.

Learning Outcomes:

1. Understand the complex interplay of the environment, cultural development and history in the Polynesian 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:

Draft paper/ <i>Atlas</i> entry	10%
Final paper/ <i>Atlas</i> entry	40%
Group presentations (3)	30%
Active participation in discussions and the research process	20%

Assignments:

Understanding the use of resources on land is pretty easy; the landscape usually tells the story clearly enough. The problems stemming from unsustainable practices are also usually quite visible as well, although placing one's observations of agriculture, loss of forests or biodiversity in appropriate historical context can be tricky. Understanding the marine resource space on the other hand is much more difficult. In the research projects of the *Marine Environmental History* course, our goal is to tackle this complex topic. The final work product of the projects will be a paper, accompanied by appropriate maps, of what resources are being extracted from the ocean by the various islands and where. The papers will also evaluate the use of the ocean for other purposes, such as transportation and recreation. This will be a big task, and it will rely on many lines of evidence. We will begin the process in Woods Hole, where students will research all official statistics available for each island we will visit, together with any mapping resources that might be available. Groups of four or five students will each tackle one of the islands we will visit, with individuals within each group exploring a particular research topic on that island. A draft paper, field work plan, and annotated source list will be due at the end of the Woods Hole shore component. On the ship, we will use our research capabilities to assess and map things such as chlorophyll-a concentration and plankton abundance as indicators of overall ocean productivity and try to understand the patterns of resource availability this way. During our island visits, we will conduct interviews of people who use the ocean, from fishermen to recreational boaters, and try to gain an understanding of where they go and for what purposes, and what they gain by their activity. The New Zealand shore component will allow students to analyze and assemble the information they have gathered. The final project deliverable will consist of a research paper that will serve as a polished entry for our on-line *Atlas of Polynesia* that includes both text and visuals. In addition, each student will give presentations detailing their progress and research results three times during the SPICE program – once during the shore component in Woods Hole, then once on the ship, and a final presentation summarizing their research results during the second shore component in New Zealand. This major course assignment and the associated research process are specifically designed to complement the similar type of work students undertake in *Maritime History and Culture (MHC)* using different documents and with a different focus.

Required Readings and Background Research References (partial list):

- Bedford, Stuart, et al. (Eds.). 2007. *Terra Australis 26, Oceanic Explorations: Lapita and Western Pacific Settlement*. Australian National University E Press. 310 pages.
- Dalzell, P., et al. 1996. *Coastal Fisheries in the Pacific Islands*. Oceanography and Marine Biology Annual Review. Volume 34: 395-531.
- Denyer, Susan. (Ed.). *Cultural Landscapes*. UNESCO. 130 pages.
- Frimigacci, Daniel. 2000-2. *La préhistoire d'Uvea (Wallis)*. *Chronologie et périodization*. Journal de la Société des Océanistes, 111: 135-163.

- Hage, Per and Jeff Marck. 2003. *Matrilineality and the Melanesian origin of Polynesian Y chromosomes*. *Current Anthropology*, 44(S5). 12 pages.
- Kawaharada, Dennis (Ed.). 1995. *Voyaging Chiefs of Hawai'i – Tiara Henry and Others*. NOIO. 28 pages.
- Kerch, Patrick Vinton. 1995. *The Wet and the Dry: Irrigation and Agricultural Intensification in Polynesia*. University of Chicago Press. 408 pages.
- McPhaden et al., 2006. *ENSO as an integrating concept in earth science*. *Science*, 314: 1740-1745.
- Mafioso-Smith, E. and J.H. Robins. 2004. *Origins and dispersals of Pacific peoples: evidence from medina phylogenies of the Pacific rat*. *PNAS*, 101(24): 9167-9172.
- Ministry of Natural Resources and Environment (MNRE). Integration of Climate Change Risk and Resilience into Forest Management in Samoa (ICCRIFS).
<http://www.mnre.gov.ws/index.php>
- Ministry of Natural Resources and Environment (MNRE) Publications.
<http://www1.mnre.gov.ws/publications.htm>
- Ministry of Natural Resources and Environment (MNRE). 2013. Samoa's 2013 State of the Environment Report. Government of Samoa. 147 pages.
- Oliver, Douglas. 2002. *Polynesia: In Early Historic Times*. Bess Press, Honolulu, Hawaii.
- Sea Education Association. SPICE Atlas. Online at: http://www.sea.edu/spice_atlas
- Segar, D.A. 2007. *Introduction to Ocean Sciences*. 2nd Edition. W.W. Norton & Company, NY.
- Speech, Jim. 1991. Review of Kerch, Patrick V. and Terry L. Hunt (Eds.), 1988. *Archaeology of the Lapita Cultural Complex: A Critical Review*. In *Pacific Studies*, 14(2): 173-178.
- Taro, Maraud and Henry Adams. 1901. *Memoirs of Aria Tamari E, Maraca of Eimear, Trireme of Tiara*. Termini of Tahiti. Tauraatau I Amo. Paris. 144 pages.
- Wright, Andrew and Lance Hill (Eds.). 1993. Nearshore marine resources of the South Pacific – Information for Fisheries Development and Management. Institute of Pacific Studies (IPS) and Foreign Fisheries Agency (FFA). 710 pages.

Expectations and Requirements:

- Punctual attendance is required at every class meeting.
- Active participation in class discussion is expected.
- Late assignment submissions are not accepted.
- The policy on academic accuracy, quoted below, will be strictly followed in this class.

The papers that you submit in this course are 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
<i>Week 1 (7 hours) – on shore at SEA campus in Woods Hole</i>	
<p>Introduction to SPICE and Marine Environmental History (MEH): Projects & Course Expectations</p> <p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • Introduction to the <i>Atlas</i> • Sustainability – Deconstructing & Debriefing a Complex Topic • Demographics of Sustainability • Culture and Sustainability • The Life & Death of the Oceanic Pacific Islands • Winds & Currents in the Tropical Pacific • Cruise Track Introduction <p>Workshop: Reading lists; introduction to research; writing & editing standards</p>	<p><i>Readings:</i> Oliver, <i>Polynesia</i>, p. 1-21. Selections from Segar (2007)</p>
<i>Week 2 (5 hours) – on shore at SEA campus in Woods Hole</i>	
<p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • The Stratified Tropical Ocean • Biological Productivity in Tropical Waters <p>First MEH research group meetings</p> <p>Field trip: Port of New Bedford and Whaling Museum</p>	<p><i>Readings:</i> Selections from Segar (2007) Background reading for MEH project topics (partial list given above)</p> <p><i>Sign up & begin work on MEH project</i></p>

Week 3 (9 hours) – on shore at SEA campus in Woods Hole	
<p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • El Nino • Climate Change and Tropical Islands <p>Student presentations</p> <p>Workshop: Papers; research methods</p> <p>Field Trip: Wellfleet Oyster Farm</p>	<p>Readings: McPhaden et al. (2006) Selections from Segar (2007)</p> <p>Prepare & deliver 1st student presentation on MEH research project</p> <p>Work on collecting source material, drafting paper, and planning field work</p>
Week 4 (5 hours) – on shore at SEA campus in Woods Hole	
<p>Lecture/Discussion Topics:</p> <ul style="list-style-type: none"> • Tropical Island Fishing and Fisheries • Review of the Tropical Oceans • Oceanographic Preview/Cruise Research Plan <p>MEH group research meetings</p> <p>Mentored review of paper drafts & preparation of research materials for ship</p>	<p>Draft paper, field work plan, and annotated source list due at end of week</p>
Weeks 5 and 6 (8 hours) – during island port stops & at sea	
<p>Port Stop Orientation and Planning</p> <p>Visits 1 & 2 to island communities (3 to 4 days each)</p> <ul style="list-style-type: none"> • Guided field trips • Independent student exploration <p>Port Stop Debrief and Discussion</p>	<p>Port-specific readings</p>
Weeks 7 and 8 (10 hours) – during island port stops & at sea	
<p>Port Stop Orientation and Planning</p> <p>Visits 3 and 4 to island communities (3 to 4 days each)</p> <ul style="list-style-type: none"> • Guided field trips • Independent student exploration <p>Port Stop Debrief and Discussion</p> <p>Student presentations</p>	<p>Port-specific readings</p> <p>Prepare & deliver 2nd student presentation on MEH research project</p>

Weeks 9 and 10 (8 hours) – during island port stops & at sea	
Port Stop Orientation and Planning Visits 5 & 6 to island communities (3 to 4 days each) <ul style="list-style-type: none"> • Guided field trips • Independent student exploration Port Stop Debrief and Discussion	Port-specific readings
Weeks 11 and 12 (15 hours) – 2nd shore component in New Zealand	
Field trips to local sites of <i>MEH</i> interest. Mentored <i>MEH</i> research project work sessions and writing workshops. Final presentations of <i>MEH</i> projects.	<p><i>Prepare & deliver 3rd student presentation on MEH research project</i></p> <p><i>Final MEH Atlas entry/paper is due at end of 2nd shore component</i></p>