Ocean Science and Public Policy
CAS NS 320 (3 credits)

Course Catalog Description:
Culture, history, political systems and science can shape ocean policy. Practice current strategies to build, analyze, and communicate about diverse policy issues. Examine the power, use and limitations of science and the scientist's voice in determining ocean policy.

Instructor(s): Sea Education Association Maritime Studies and Ocean Policy Faculty and visiting scholars and guests.

Location: SEA campus in Woods Hole, MA.

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

Course Philosophy and Approach:
Ocean Science and Public Policy (OSPP) is a 6-week course taken by all Oceans & Climate SEA Semester students while studying onshore in Woods Hole. It focuses on U.S. and international policy controlling marine energy resources and practices. Topics include: the science-policy dialectic; recent U.S. marine environmental policy history and process; international law of the sea; U.S. climate-related and “clean” energy technology policy; whaling; petroleum-related policy; renewable energy sources and political controversies; writing in varied styles about climate- and energy-related issues; and energy policy and practices in the region through which the ship will sail during the sea component.

World ocean space provides energy resources, energy-generation locations, transportation and commerce routes, and a place to dispose of waste (including carbon). Currently, many energy-industry externalities occur. For example, the burning of fossil fuels like gasoline, heating oil, and coal produces greenhouse gases thought to trap heat in Earth’s atmosphere and contribute to climate warming. We will explore effects of, communication of, adaptation to, and mitigation of climate change followed by sustainable energy resources, and related policy. We will consult experts working in marine conservation, port management and development, marine chemistry, science in policymaking, coastal management, economics, physical oceanography, and marine energy transport.

Federal and international laws set guidelines for how marine energy resources may be sought and exploited. Local concerns significantly impact how policies are implemented. We will investigate aspects of the energy resource and technology development process and attempt to discover wise ways forward for marine energy policy. We will apply our studies as we examine energy perceptions, needs, and resources in the island nations we will visit.

This three-credit course consists of 45 contact hours of official instruction, through lectures, discussion sessions, student presentations, and field trips. The course calendar that follows provides preliminary details.
If we each do a little, we’ll achieve only a little.
–David MacKay, Sustainable Energy without the Hot Air

Learning Outcomes:

1. Critically evaluate scientific information; does this argument or statement have a scientific basis? Assess and evaluate an array of climate-related material and pose questions about it.
2. Assimilate vetted data from multiple disciplines and apply it to decision making that helps people and ecosystems.

Evaluation:

Climate Policy Timeline Presentation, Outline, and Reflective Essay 15%
Climate Atlas Entries and Presentation 30%
Energy Survey Report and Presentation 15%
Public Meeting Testimony and Outline 15%
Participation/Engagement: posts and discussion 25%

Assignments:

Climate Policy Timeline Presentation, Outline, and Reflective Essay: Working in small groups, you will prepare a creative product or presentation related to a topic in marine policy and an outline of content conveyed. Finally, working individually, you will write a reflective essay. Each group will pick an area of interest related to marine policy—e.g., sea-level rise adaptation strategy policies, changes in frequency/duration/location of droughts and related impacts/strategies, changes in temperatures, storminess, precipitation and related impacts/strategies, etc. Each group will work together in conducting research to develop a comprehensive foundation about the topic and an understanding of the laws, policies, science and timeline of historical events important to the topic. Each group will write a short paper outlining and explaining their findings, and develop a creative presentation that both educates and engages the audience (your classmates) in the significant aspects of your topic. This is an opportunity to be creative and have fun; just about any type of presentation format you can imagine is acceptable (e.g., song, game, mural timeline painting, skit, sculpture, and more!), but you must discuss your concept with your instructor beforehand. Each student will prepare a reflective essay after their presentation, analyzing their successes and challenges.

Climate Atlas Entries (2): Exploration of regional climate challenges, concerns and activities in a human context will overlay scientific, sustainable-development, resource-use, and economic implications to help us appreciate the complex relationship between people and their environment. The Atlas Entry assignment offers an opportunity to contribute 1) a science-focused essay and 2) a policy-focused essay to an ever-expanding effort throughout SEA to document the natural processes acting upon the places we visit as well as human impacts on and relationships with local coastal and marine environments. You are asked to draw upon information from many disciplines, merge it with first-hand experiences, and create a final product for possible web publication. In a small group of two or three students, you will
During the simulation, each student expert will present accurately represent your assumed persona’s perspective, expertise, and political agenda. Appropriate sources (industry, Alaska coastal resources management, etc.). You will research your role using indigenous assigned a this congressional hearing we need experts; government should allow offshore oil exploration and exploitation in the Arctic’s offshore areas under U.S. control; and, 3) determine whether the U.S. federal government should allow offshore oil exploration and exploitation in the Arctic. In order to hold this congressional hearing we need experts; you will be those experts. Each student will be assigned a specific stakeholder role (e.g., White House, United Nations, Alaskan or Canadian indigenous people, U.S. Coast Guard, oceanographic institution, fishing industry, U.S. oil industry, Alaska coastal resources management, etc.). You will research your role using appropriate sources (government, university/college, peer-reviewed academic articles, mainstream media reports, and publications by the entity being represented) in order to accurately represent your assumed persona’s perspective, expertise, and political agenda. During the simulation, each student expert will present their information in a 5-minute
testimony (PowerPoint and other visuals encouraged), and answer a few questions from the audience. Each student expert will also prepare and submit a written outline of information presented and a list of references consulted.

Students will be provided full instructions for all assignments during class meetings at the beginning of the course.

Expectations and Requirements:
- Punctual attendance is required at every class meeting.
- Participate actively in class discussion.
- 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!

Readings:
Avery & Madin, Protect the Scientific Deliberative Process, 2012

Columbia University Law School Center for Climate Change Law, Climate Regulation Tracker and Climate Change Litigation Chart, 2014


Graetz, The End of Energy, 2011

Hoagland and Jin, *Developing Annual Estimates of the Economic Consequences of Shoreline Change in the United States*, 2004 (www.whoi.edu)


MacKay, *Sustainable Energy Without the Hot Air*, 2009

Mann, *The Hockey Stick and The Climate Wars*, 2012

Oliver, *Polynesia in Early Historic Times*, 2002

Oreskes & Conway, *Merchants of Doubt*, 2010


Romney et al., *Massachusetts Climate Protection Plan*, 2004

The Kohala Center, *County of Hawai‘i Energy Sustainability Program Five Year Roadmap*, 2012

United Nations Intergovernmental Panel on Climate Change (IPCC), *Assessment Report 5 Summary for Policymakers*, 2013

U.S. Energy Information Administration (www.eia.gov)

Film:

*Cape Spin: An American Power Struggle* (2011)

*The Daily Show*, on Cape Wind (2007)

Optional readings:

Banerjee, The most hated climate scientist in the US fights back: Michael Mann is taking a stand for science, *Yale Alumni Magazine*, 2013

Englander, *High Tide on Main Street*, 2013

Melville, *Typee: A Peep at Polynesian Life*, 1846


Revkin, Fresh Views on Climate Scientists as Advocates, *The New York Times*, 2014


Troost, *The Sex Lives of Cannibals*, 2004

Vaite, *Breadfruit*, 2000
Course Calendar:

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<tr>
<th>Topic</th>
<th>Required Readings/Assignment(s) Due</th>
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<td><strong>Week 1 (5 hours) – What is climate? Is there a problem? How do science &amp; policy interact?</strong></td>
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| Introduction to O&C Program and OSPP Lecture/Discussion Topics: | **Readings:**
| • Kiribati Case Study | United Nations IPCC (2013): Exec. Summary
| • Science and policy dialectic | **Optional reading:**
| • End users of science | Sachs (2011): Chpt. 13
| • U.S. Marine Environmental Law intro | **Optional pre-reading:**
| • Human migration around the Pacific | Melville, H. (1846); Troost, J. (2004); Vaite (2000)
| • International Law of the Sea | **Posts:** Your climate-related questions about cruise track ports of call; your questions about the assigned readings.
| **Choose climate policy timeline topic.** | |

| Lecture/Discussion Topics: | **Readings:**
| • Who works to understand climate change and policy? | Hansen (2009)
| • Role of scientists in policy making | Hoagland and Jin (2004)
| • U.S. Marine Environmental Law, continued | Lomborg (2001), and responses
| • Sea level rise/shoreline change/MA StormSmart Coasts program | Mann (2012)
| • Energy policy survey design and implementation | Orekes & Conway (2010): Epilogue
| Climate Policy Timeline Presentations | Pielke (2007)
| | Romney et al. (2004): Exec. Summ. (pp. 5-12)
| **Optional readings:** | **Posts:** Your questions about scientists in policymaking and about shoreline change, based on readings.
| **Climate policy timeline outlines and presentations due.** |
### Week 3 (7 hours) – Adapt to climate change?

**Lecture/Discussion Topics:**
- IOL USCG map activity
- Pacific legal and political land/seascape
- Maritime law
- Climate change impacts on small island developing states

**Energy Survey Presentations**

**Readings:**
- Columbia University Law School Center for Climate Change Law (2014)
- Craik et al. (2013)
- Osofsky & McAllister (2012)

**Posts:** Your questions about Pacific organizations readings – SeaWeb, SPREP, AOSIS, World Bank.  
**Climate policy timeline reflective essays due.**  
**Energy survey presentations and reports due.**  
**Annotated bibliography & outline due for climate atlas entries.**

### Week 4 (10 hours) – Mitigate climate change?

**Lecture/Discussion Topics:**
- Marine energy law
- Waste-to-energy power generation
- BP oil spill – chemical and legal residue

**Atlas Entry Presentations**

**Field Trip to Rochester SEMASS waste-to-energy power plant (joint w/ OGCC)**

**Readings:**
- Avery & Madin (2012)
- Graetz (2011): Chpt. 13
- Reddy and Camilli (2012)
- U.S. Energy Information Administration: read page on dependence on foreign oil

**Posts:** Your questions about assigned readings.  
**Climate atlas entries and presentations due.**

### Week 5 (10 hours) – Alternative energy sources

**Lecture/Discussion Topics:**
- Offshore wind energy

**Field Trip to New Bedford – Energy pursuits from whaling to wind**

**Public Meeting/Congressional Hearing Simulation with Student ‘Experts’**

**Readings/Films:**
- Cape Spin: An American Power Struggle (film)
- The Daily Show (film)
- Kohala Center (2012): Executive Summary

**Posts:** Your questions about assigned readings.  
**Public meeting testimony & briefing outline due.**
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<th>Week 6 (6 hours) – History and policy of cruise track locations</th>
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<tr>
<td><strong>Lecture/Discussion Topics</strong> (case studies will vary with specific cruise tracks):</td>
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<tr>
<td>• French Polynesian kinship, mythology, and gifts</td>
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<td>• Regulatory adaptation or mitigation strategies</td>
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<tr>
<td>• Case Study: Biodiversity; UNESCO Biosphere Reserve Management</td>
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<tr>
<td>• Case Study: Tropical Cyclone Inundation in French Polynesia 1982-1983</td>
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<tr>
<td><strong>Readings:</strong></td>
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<tr>
<td>Oliver (2002)</td>
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<td>Case study assigned readings will vary with specific cruise tracks.</td>
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<td><strong>Posts:</strong> Your questions about case study readings.</td>
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<td><strong>Climate atlas field research plans due.</strong></td>
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<th>Weeks 7-12 – at sea</th>
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<tr>
<td><strong>Optional readings:</strong></td>
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<tr>
<td>Selections on cruise track locations: politics, culture, history, economics</td>
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<td><strong>At Sea:</strong></td>
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<tr>
<td>• Final Energy Perceptions survey report.</td>
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<td>• Atlas entry field research &amp; completion of final atlas entries.</td>
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