Toward a Sustainable Ocean: Conservation & Management

CAS NS 328 (3 credits)

Course Catalog Description (max. 40 words):
Comparative and issue-driven introduction to managing human uses and conserving coastal and ocean places and resources. Explore concepts of technology, governance, sector and ecosystem management, and marine protected areas through expert content lectures, topical seminars, and field trips.

Instructor(s): Sea Education Association Maritime Studies, Ocean Policy, and Oceanography Faculty, Visiting lecturers

Location: SEA campus in Woods Hole, MA, and on board SEA vessels at sea

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

Course Philosophy and Approach:

How do we "manage" the ocean? In plain truth, we don't. We can, however, manage human *uses* and *influences* on the ocean. This course addresses contemporary human uses and influences on coasts and oceans and their living and non-living resources.

In this class we address large-scale questions:

> How do we establish the value and measure the "health" of the coasts and oceans?
>
> What are the principle threats or roadblocks for achieving a sustainable relationship with the coasts and oceans?
>
> Who directly and indirectly benefits from coastal and ocean uses?
>
> How do we accommodate "necessary" human uses of the ocean while reversing the current trends of degradation?
>
> What tools and approaches offer the best chance of improving ocean health?
>
> What opportunities exist that combine ocean and community sustainability?

Students will look at place-based issues of coastal protection, clean water, fisheries, and climate change adaptation and their relationships with overall ocean health. Format includes lectures by SEA faculty, policymakers, practitioners, and scientists, place-based policy research and data collections projects, and field trips in New England and during cruise port stops.

This course consists of six 3-hour and six 2-hour lecture/discussion sessions, a mid-term exam and 12 hrs of directed place-based investigation.

Learning Outcomes:

1. Understand the major anthropogenic threats to ocean and coastal health.
2. Capacity to identify significant relationships between economic (market) forces, technology, and ecological sustainability.
3. Understanding of direct and indirect ocean uses at local, national, and global scales.
4. Ability to compare and contrast major concepts/or approaches to coastal ocean management .
5. Ability to critically evaluate the successes or failures of individual Marine Protected Areas (MPAS).
6. Ability to observe, categorize, and record offshore human uses of the marine environment.
7. Capacity to critically evaluate coastal and marine policy documents and to community their work orally, visually, and in writing.
8. Communicate and comport effectively in professional management or conservation settings.

Evaluation:

Policy Exam	20%
Annotated Critical Policy Bibliography	30%
Policy Project Presentation and Outline	10%
Group Conservation Management Project	40%

Assignments:

Exam: An exam, covering material from lectures, readings and discussions, will be given during the semester. Emphasis will be on application of concepts, not rote memorization of facts.

Policy Project Presentation and Outline: In consultation with the professor, students will identify an area of coastal and ocean policy that they can research at the place-based level during field components of the semester that will serve as a nucleus for their portion of the Conservation Management Projects. The student will identify and choose among key place-based sources that inform their research projects while making connections with broader concepts and their anticipated field observations.

Annotated Critical Bibliography: The annotations require students to identify placed-based sources that connect their interests with each week's topic areas. For example, in week 2, a student interested in MPA management might identify and develop and annotation for an article about ecosystem-based management in large-scale MPAs. A student interested in sustainable tourism might look at integrated coastal management literature relevant to tropical islands. The annotated bibliography project helps student identify and capture essential issues and information that they will include in their Conservation Management Project. A rubric will be used to evaluate source quality, annotation content, clarity of composition, and effectiveness of the annotation as a resource.

Group Conservation Management Project: The offshore environment remains outside of most people's direct experience, a fact that poses a major challenge in our efforts to manage and conserve critical areas of the high seas. In a positive and hopeful sign, the last decade has seen the establishment of very large MPAs across remote open ocean regions across the globe. While these developments speak of a willingness and desire to protect the open ocean, the scientific, legal, economic and policy underpinnings of these new very large MPAs are mostly untested and still evolving. The voyage to the Phoenix Islands Protected Area provides us with a rare opportunity to engage in a process that encompasses both policy and science research in evaluating how the existing Management Plan appears to be working, and whether the formulated goals are based on firm understanding of the ecosystem the MPA seeks to protect. Working in teams of three or four, the students will identify sections of the existing Management Plan identified as benefiting from revision, and produce alternative language based on both the scientific research conducted on board the ship and on the policy research begun in Woods Hole. These recommendations will be prepared in a format of recommendations for the Management Plan and as a part of a symposium presentation at the end of the sea component.

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!

Readings:

Al-Abdulrazzak, Dalal and Stephen C Trombulak, 2012. Classifying levels of protection in Marine Protected Areas. *Marine Policy*, 36, 576-582.

Ballance, L.T., 2008. Understanding Seabirds At Sea: Why And How? *Marine Ornithology*, 35, pp.127–135. Available at: http://www.marineornithology.org/PDF/35_2/35_2_127-135.pdf.

Charles, A., 2012. People, oceans and scale: governance, livelihoods and climate change adaptation in marine social–ecological systems. *Current Opinion in Environmental Sustainability*, 4(3),351–357.

Chuenpagdee, R. et al., 2013. Marine protected areas: Re-thinking their inception. *Mar. Pol*, 39(C), 234–240.

Cummings, V., et al. Review of Integrated Coastal Management & Principles of Best Practices. Coastal and Marine Resources Center, University of Cork, Ireland.

Curry, Janel. 2007. The Nature-Culture Boundary and Ocean Policy: Great Barrier Island, New Zealand. *Geographical Review*: 97.

DeSanto, Elizabeth, 2013. Missing marine protected area (MPA) targets: How the push for quantity over quality undermines sustainability and social justice. J*our. of Env. Manag.* , 124 (137-146.)

Fishery and Aquaculture Country Profiles. Kiribati (2010). Country Profile Fact Sheets. In: FAO Fisheries and Aquaculture Department [online]. Rome. Updated 1 May 2010. [Cited 30 March 2014]. http://www.fao.org/fishery/facp/KIR/en

Grotius, Hugo. *Mare Liberum*. 1608.

Havice, E., 2013. Rights-based management in the Western and Central Pacific Ocean tuna fishery: Economic and environmental change under the Vessel Day Scheme. *Mar. Pol*, 42(c), 259–267.

ICES Special Issue. 2007. Fishing Technology in the 21st Century: Integrating Fishing with Ecosystem Conservation. *ICES Journal of Marine Sciences*: 64 (8).

McLeod, Karen and Heather Leslie. *Ecosystem-Based Management for the Oceans*. Island Press, 2009.

McLeod, KL, J Lubchenco, SR Palumbi, and AA Rosenberg. *Scientific Consensus Statement on Marine Ecosystem-based Management*, 2005.

Morrison, R.J., J Zhang, E R Urban Jr, J Hall, V Ittekkot, B Avril, L Hu, G H Hong, S Kidwai, C B Lange, V Lobanov, J Machiwa, M L San Diego-McGlone, T Oguz, F G Plumley, T Yeemin, W Zhu, and F Zuo. Developing human capital for successful implementation of international marine scientific research projects. *Marine Pollution Bulletin*, 77 (2013) 11-22.

National Research Council, *Increasing Capacity for Stewardship of Oceans and Coasts,* 2006.

PHOENIX ISLANDS PROTECTED AREA KIRIBATI Draft Management Plan 2010 – 2014. Phoenix Islands Protected Area Management Committee, Government of Kiribati. 2009

Pierce, Ray, Richard Anderson, Eric VanderWerf and Lindsay Young, 2007. Surveys And Capacity Building In Kiritimati To Assist In Restoration Of Populations Of Bokikokiko And Seabirds. Eco Oceania, Onerahi, NZ. URL: http://www.pacificrimconservation.com/wp-content/uploads/2013/10/51%20Pierce%20etal%202007%20Kiritimati%20report.pdf.

Safina, Carl. Fisheries Management and Maximum Sustainable Yield Parts 1 – 3. *Okeanus Tutorials* www.carlsafina.org.

Toonen, R.J. et al., 2013. One size does not fit all: The emerging frontier in large-scale marine conservation. *Marine Pollution Bulletin*, 77(1-2), pp.7–10.

Wainger and Boyd. Valuing Ecosystem Services. In *EBMFO*, 2009.

Wright, Andrew, Natasha Stacey, and Paula Holland, 2006. The cooperative framework for ocean and coastal management in the Pacific Islands: Effectiveness, constraints and future direction. *Ocean & Coastal Management*, 49(9-10), pp.739–763

Course Calendar:

Topic	Readings/Assignments Due
Week1 (9 hours)	
Foundations in Conservation and Management • Introduction to "Sustainable" Oceans • Historical and Contemporary Ocean Uses • Components of the Ocean Health Index • Place-Based Management • Legal Definitions of Ocean and Coastal Spaces • Governance	Hugo Grotius: "Mare Liberum" Kiribati Fisheries Country Profile. Wright et al. 2006 NRC, 2006, Chapts. 4-6. Cummings, Review of ICM. **Model Policy Annotation Due**
Foundations in Conservation and Management • Sector Management • Ecosystem-Based Management • Integrated Coastal Management • Coastal and Marine Spatial Planning	Wainger and Boyd, EBMFTO, Chpt. 6 McLeod and Leslie, 2009. McLeod et al., 2005 Al-Abdulrazzak and Trombulak, 2012 **Critical Policy Annotation Due**
Conservation and Science in the Marine Environment	**R**eadings TBA **Critical Policy Annotation Due**
Week 2 (9 hours)	
Fisheries, Technological Change and Global Markets: • "Managing" Fish • Tuna fisheries of the Pacific	Selections from ICES special issue on Fishing Technology in the 21st Century Safina, Okeanus Tutorials Curry, 2007 Havice, 2013 **Critical Policy Annotation Due**
Marine Protected Areas • MPAS as management and conservation tool • Scientific rationale for MPAs • MPA establishment and governance • MPA case studies	NOAA MPA Center "How is my MPA doing? Chuenpagdee 2013 Toonen et al. 2013 DeSanto 2013 **Critical Policy Annotations Due**
Phoenix Islands Protected Area • History and current status • Goals and governance • Management plan	PIPA Management Plan **Critical Policy Annotation Due**
Exam	

Topic	Readings/Assignments Due
Week 3 (2 hours)	
Managing highly migratory species. Field trip to Honolulu Fish Market Census of Offshore Human Ocean Uses Project	Reading TBA
Week 4 (2 hours)	
MPAs and Global Climate Change Census of Offshore Human Ocean Uses Project	Charles 2012
Week 5 (8 hours)	
Invasive species management in small Pacific Islands Census of Offshore Human Ocean Uses Project	**Research Presentation Outline Due**
Week 6 (2 hours)	
Ecotourism and MPAs Census of Offshore Human Ocean Uses Project	Reading TBA
Week 7 (8 hours)	
Seabird conservation Census of Offshore Human Ocean Uses Project	Ballance 2008, Pierce et al 2007
Week 8 (2 hours)	
Research Presentations	**Group Conservation Management Project Presentations and Plan Due**