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Fall 2006
Mon., Wed., Fri. 0800-0930
Pettengill 127

First Year Seminar: Issues in Oceanography (FYS 282)

Course description: This course offers an opportunity to explore topics of current interest in Oceanography while also enhancing reading, writing, speaking and critical thinking skills. Topics selected cover current research in the disciplines of oceanography. Emphasis is placed on understanding how the oceans and science work and on developing investigative and reporting skills. Classes are in seminar format and supplemented with occasional field trips, films, and slides.

Reading:

Ellis, R. 2003. *The Empty Ocean*. Island Press (QL121 E5794 2003); available on Ebray

Fields, J.G., G. Hempel, and C.P. Summerhays 2002. *Ocean 2020*, Island Press

Articles available on line or on reserve in Ladd Library (listed by first author's last name in syllabus)

Books on Reserve in Ladd Library:

Pauly, D. and J. Maclean 2003. *In a Perfect Ocean*. Island Press. (SH213.2P38 2003); available on Ebray

I expect you to complete the assigned readings by the class for which they are assigned. Class discussion will focus on assigned reading and it is essential that everyone read the material prior to class. One person will be selected to introduce readings and initiate class discussion.

Papers: Short, two-page, papers are due approximately every two weeks. These papers may not exceed two pages in length, not including references and figures. I will not read more! One of these papers is a position paper. The final paper, due the last class of the semester, is limited to 5 pages. Papers **must** be submitted as hard copy **and** as an electronic copy as a word attachment to an e-mail. Papers are due in class. If you receive less than a 75 on a short paper, you must re-write the paper. If you receive more than a 75, you have the option of re-writing. In either case, you can receive no more than 5 points on re-writing. There is no option to re-write on the final paper. I will not accept late papers.

The writing workshop is an outstanding resource available to help you improve your writing. I strongly suggest you visit the workshop's web page (<http://abacus.bates.edu/ww/>) and see what they have to offer.

Oral presentations: Everyone will make a 10-minute, power point, presentation of two of their papers.

Office Hours: I have no official office hours. My office is always open and I am generally available for students anytime I am on campus from **Monday-Thursday**. It is best to make an appointment if you want to be sure to see me. Please do not try to meet with me the hour or so before class. I reserve Fridays for my thesis students. I am most easily reached by e-mail. Feel free to call me at home at a reasonable hour.

Communication: The easiest way to reach me may be by e-mail (wambrose). If you want to address your question to the entire class, use the class list serve (ffys282a@lists.bates.edu). I will use the list serve to get messages out to you between classes, so it is your responsibility to check e-mail. You may want to use it to set up study groups etc. Be aware that if you hit 'reply' to a message on the list serve, everyone will see it.

Grading: Grading is on a 10 pt. scale (e.g. A = 90-100, B = 80-89, etc.)

Short papers (4 @12 %)	48 %
Presentations (2@ 6 %)	12
Web page evaluation	5
Final Paper	20
Class participation	15

Other class and field activities will be considered in assigning the final grade.

Schedule¹

Date	Topic	Reading
Week 1		
Sept. 4	Introduction Advising: 1100-1430	
Sept. 5	Advising 1400-1700	
Sept. 6	Course Organization & Introduction Issues Paragraph Due	Carlton 1998; Field <i>et al.</i> Ch 2
Sept. 8	Introduction to Fishing (slides)	Ellis Ch 2; Field <i>et al.</i> Ch 5 Safina 1995
Week 2		
Sept. 11	Fishing: Methods, Patterns, & Problems	Dalton 2004; Pauly <i>et al.</i> 2002 Safina <i>et al.</i> 2005; Zabel <i>et al.</i> 2003; Rosenberg <i>et al.</i> 2006, Stenek 2006
Sept. 13	Library Introduction (0800-0900) Ladd Library Resources Room Web Evaluation Exercise Due	
Sept. 15	Fishing: By catch and disturbance 1st Paragraph Due	Watling and Norse 1997; Harrington <i>et al.</i> 2005;

Date	Topic	Reading
Week 3		
Sept. 18	Fishing: Ecosystem Approach	Pauly & Maclean Ch 2 Jackson <i>et al.</i> 2001; Conservation Biology 2006
Sept. 20	Aquaculture	Ellis (pp. 80-92); Naylor <i>et al.</i> 2001 Goldburg & Naylor 2005; Beveridge <i>et al.</i> 1997
Sept. 22	1st Paper Due Oral Presentations	
Week 4		
Sept. 25	Guest Speaker: Dr. Ike Levine	
Sept. 27	Whaling: Biology and History Film: <i>Cruise of James Clark Ross</i>	Ellis Ch. 11 Burns & Wandesforde-Smith 2002 Holmes & Graham-Rowe 2005
Sept. 29	Re-Write of 1st Paper Due	
Week 5		
Oct. 2	Whaling: Current Issues Debate	Burns 2001, Skåre 1994
Oct. 4	Introduced Species Film: <i>Deep Sea Invasion</i>	Ellis Ch. 14; Carlton 1996; Carlton & Geller 1993 Cohen & Carlton 1998
Week 6		
Oct. 9	Control of Biological Invasions: Shipping vs. conservation	Bax <i>et al.</i> 2001; Wonham <i>et al.</i> 2005
Oct. 11	2nd Paper Due: Position Paper Oral Presentations	
Oct. 13	Biodiversity	Williamson 1997 Witman <i>et al.</i> 2004

Date	Topic	Reading
Week 7		
Oct. 16	Coral Reefs: Biology and Bleaching	Ellis Chs. 12 & 13 Hodgson 1999, Gardner <i>et al.</i> 2003
Oct. 18.	FALL BREAK	Field <i>et al.</i> 2002 Ch. 3
Week 8		
Oct. 23	Coral Reefs: Phase Shifts Re-write 2nd Paper Due	Hughes 1994, Roberts 1995 Idjeai <i>et al.</i> 2006; Guinotte <i>et al.</i> 2006
Oct. 25	3^d Paper Due Oral Presentations	
Week 9		
Oct. 30	Salt Marshes: function & Habitat loss Field Trip: Morse Mountain (leave 1300 return ca 1700)	Bertness <i>et al.</i> 2004; Silliman <i>et al.</i> 2005
Nov. 1	Marine Reserves	Boersma & Parrish 1999 Blyth-Skyrme <i>et al.</i> 2006 Gaston <i>et al.</i> 2006
Nov. 3	Re-write of 3d paper due	
Week 10		
Nov. 6	4th Paper Due Oral Presentations	
Nov. 8	Eutrophication	Howarth <i>et al.</i> 2000; Smith 2003
Week 11		
Nov. 13	Toxic Algae: <i>Pfiesteria</i> Film: <i>Toxic Algae</i> Re-write 4th Paper Due	Griffith 1999 Burkholder & Glasgow 1999 Van Dolah 2000
Nov. 15	Coastal Development Film: <i>Beaches are Moving</i>	Riggs 1996

Date	Topic	Reading
Week 12		
THANKSGIVING BREAK		
Week 13		
Nov. 27	El Niño Film: <i>El Niño</i>	Cobb <i>et al.</i> 2003
Nov. 29	Carbon Cycling	Field <i>et al.</i> Ch 4 Falkowski <i>et al.</i> 2000; Doney 2006
Week 14		
Dec. 4	Climate Change	Rahmstorf 2002; Broecker 2003; Caldeira & Wickett 2003; Quadfasel 2005; Schiermeier 2006
Dec. 6	Global Warming: Geoengineering Wrap Up	King 1994; Field <i>et al.</i> 2002 Ch. 12
Dec. 8	Final Paper Due 0800	

¹ The schedule should be considered flexible. Changes will likely occur and when they do they will be announced in class or via the class list serve.

First Year Seminar: Issues in Oceanography (FYS 282)

Reading

(*= available on line, += on reserve Ladd Library, # Ladd Library has copy)

*Bax, N. et al. 2001. The control of Biological Invasions in the World's Oceans. *Conservation Biology*, 15:1234-1246

*Bertness, M., B.R. Silliman, and R. Jefferies 2004. Salt marshes under siege. *American Scientist*, 92:54-61.

+Beveridge, M.C.M., L.G. Ross, and J.A. Steward 1997. The development of mariculture and its implications for biodiversity. In: *Marine Biodiversity Patterns and Processes*, Ormond, R.F.G., J.D.Gage and M.V. Angel (eds.) pp. 372-393. Cambridge University Press, NY.

- *Blyth-Skyrme, R.E., M. J. Kaiser, H.G. Hiddink, G. Edwards-Jones, P.J.B. Hart 2006. Conservation benefits of temperate marine protected areas: variation among fish species. *Conservation Biology*, 20:811-?
- +#Burkholder, JoAnn M. and Howard B. Glasgow, Jr. 1999. Commentary, Science ethics and its role in early suppression of the *Pfiesteria* issue. *Human Organization*, 58(4): 443-455.
- +Burns, William C.G. 2001. From the harpoon to the heat: Climate change and the International Whaling Commission in the 21st century. *Georgetown International Environmental Law Review*, 13(335).
- *Burns, William C.G. and Geoffrey Wandesforde-Smith. 2002. The International Whaling Commission and the future of cetaceans in a changing world. *RECIEL*, 11(2): 199-210.
- *Boersma, P. Dee and Julia K. Parrish. 1999. Limiting abuse: marine protected areas, a limited solution. *Ecological Economics*, 31: 287-304.
- *Broecker, W.S. 2003. Does the trigger for abrupt climate change reside in the ocean or in the atmosphere? *Science*, 300: 1519-1522.
- * Caldeira, K. and M. E. Wickett 2003. Anthropogenic carbon and pH. *Nature* 425:365.
- *Carlton, J.T. 1996. Biological invasions and cryptogenic species. *Ecology*, 77:1653-1655
- *+Carlton, James T. 1998. Apostrophe to the ocean. *Conservation Biology*, 12(6): 1165-1167.
- *Carlton, James T. and Jonathan B. Geller. 1993. Ecological roulette: The global transport of nonindigenous marine organisms. *Science*, New Series, 261(5117): 78-82.
- *Cobb, Kim M., Charles, Christopher D., Cheng, Hai and R. Lawrence Edwards. 2003 El Niño/Southern Oscillation and tropical Pacific climate during the last millennium. *Nature*, 424: 271-276.
- *#Cohen, A.N. and J.T. Carlton 1998. Accelerating invasion rate in a highly invaded estuary. *Science* 279:555-557.
- +Conservation Biology Editorial 2006, Opposing views of the “Ecosystem Approach” to fisheries management. *Conservation Biology*, 20:617-619
- *Dalton, R. 2004. Fishing for trouble. *Nature*, 413:502-504.
- *Doney, S.C. 2006. The dangers of ocean acidification. *Scientific American*, March: 58-65
- +Ellis, Richard. 2003. *The Empty Ocean, Plundering the World's Marine Life*. Island Press, Washington DC

- *Falkowski, P., Scholes, R.J., Boyle, E., Canadell, J., Canfield, D., Elser, J., Gruber, N., Hibbard, K., Högberg, P., Linder, S., Mackenzie, F.T., Moore, B., III, Pedersen, T., Rosenthal, Y., Seitzinger, S., Smetacek, V. and W. Steffen. 2000. The global carbon cycle: A test of our knowledge of earth as a system. *Science*, 290: 291-296.
- *Gardner, Toby A., Côté, Isabelle M., Gill, Jennifer A., Grant, Alastair and Andrew R. Watkinson. 2003. Long-term region-wide declines in Caribbean corals. *Science*, 301: 958-960.
- *Gaston, K.J. et al 2006. The ecological effectiveness of protected areas: The United Kingdom. *Biological Conservation*, 132: 76-87
- +Goldburg, R. and R. Naylor 2005. Future seascapes, fishing, and fish farming. *Frontiers Ecology Environment* 3:21-28
- +#Griffith, David. 1999. Exaggerating environmental health risk: The case of the toxic dinoflagellate *Pfiesteria*. *Human Organization*, 58(2): 119-127.
- +Guinotte, J.M., J. Orr, S. Cairns, A. Freiwald, L. Morgan, and R. George 2006. Will human-induced changes in seawater chemistry alter the distribution of deep-sea scleractinian corals? *Frontiers Ecology Environment* 4:141-146
- +Harrington, J.M., R.A. Myers and A.A. Rosenberg 2005. Wasted fishery resources: discarded by-catch in the USA. *Fish and Fisheries*, 6:350-361.
- *Hodgson, G. 1999. A global assessment of human effects on coral reefs. *Marine Pollution Bulletin*, 38(5): 345-355.
- *Holmes, B, and D. Graham-Rowe 2005. Pressure is on to lift whaling ban. *New Scientist*, 186 (2504):6-8
- *Howarth, Robert; Anderson, Donald; Cloern, James; Elfring, Chris; Hopkinson, Charles; Lapointe, Brian; Malone, Tom; Marcus, Nancy; McGlathery, Karen; Sharpley, Andrew and Dan Walker. 2000. Nutrient pollution of coastal rivers, bays, and seas. *Issues in Ecology*, 7.
- *Hughes, Terence P. 1994. Catastrophes, phase shifts, and large-scale degradation of a Caribbean coral reef. *Science*, 265: 1547-1551.
- *Idjadi, J., S.C. Lee, J.F. Bruno, W.F. Precht, L. Allen-Requa and P.J. Edmunds. 2006. Rapid phase-shift reversal on a Jamaican coral reef. *Coral Reefs*, 25:209-211.
- *Jackson, Jeremy B.C., et al. 2001. Historical overfishing and the recent collapse of coastal ecosystems. *Science*, 293: 629-638.

- + #King, D. Whitney. 1994. Can adding iron to the oceans reduce global warming? *in*: J.R. Fleming and H.A. Gemery, eds. *Science, Technology, and the Environment*. Univ. Akron Press, Akron, Ohio. Ch. 5, pp. 112-135.
- *Naylor, Rosamond L.; Goldburg, Rebecca J.; Primavera, Jurgenne; Kautsky, Nils; Beveridge, Malcolm C.M.; Clay, Jason; Folke, Carl; Lubchenco, Jane; Mooney, Harold and Max Troell. 2001. Effects of aquaculture on world fish supplies. *Issues in Ecology*, 8.
- *+Pauly, Daniel and Jay Maclean. 2003. *In a Perfect Ocean: The State of Fisheries and Ecosystems in the North Atlantic Ocean*. Island Press, Washington, DC.
- *Pauly, D., V. Christensen, S. Guenette, T. Pitcher, R. Sumjaila, C. J. Walters, R. Watson, and D. Zeller. 2002. Towards sustainability in world fisheries. *Nature*, 418:689-695.
- *Quadfasel, D. 2005. The Atlantic heat conveyor slows. *Nature*, 438:565-566.
- *Rahmstorf, S. 2002 Ocean circulation and climate during the past 120,000 years. *Nature* 419:207-214.
- + #Riggs, S., R. 1996 Conflict on the not so fragile barrier islands. *Geotimes* December
- *Roberts, Callum M. 1995. Effects of fishing on the ecosystem structure of coral reefs. *Conservation Biology*, 9(5): 988-995.
- +Rosenburg et al. 2006. Rebuilding US fisheries: progress and problems. *Frontiers Ecology Environment* 4:303-308
- *+Safina, C. 1995. The world's imperiled fish. *Scientific American* .November, 46-53.
- + #Safina, C., A.A. Rosenberg, R.A. Myers, T.J. Quinn and J.S. Collie 2005. U.S. ocean fish recovery: staying the course. *Science* 309:707-708
- + #Silliman, B.R., J van de Koppel, M.D. Bertness, L.E. Stanton and I. Mendelsohn 2005. Drought, snails, and large-scale die-off of Southern U.S. Salt Marshes. *Science* 310:1803-1805.
- *Schiermeier, Q. 2006. A Sea Change. *Nature*, 439:256-260.
- *Skåre, M. 1994 Whaling, a sustainable use of natural resources or a violation of animals rights? *Environment* 36:12-36.
- + Smith, V.H. 2003. Eutrophication of freshwater and coastal marine ecosystems: a global problem. *Environmental Science and Pollution Research* 10:126-139.
- * Steneck, R.S. Is the American lobster (*Homarus americanus*, overfished? A review of overfishing with an ecologically based perspective. *Bulletin Marine Science* 78:607-632

- *Van Dolah, F.M. 2000. Marine algal toxins: origins, health effects, and their increased occurrence. *Environmental Health Perspectives Supplement*. 108:133-141
- *+Watling, L. and E.A. Norse 1997. Disturbance of the seabed by mobile fishing gear: a comparison to forest clearing. *Conservation Biology* 12:1180-1197.
- +Williamson, M. 1997. Marine biodiversity in its global context. In: *Marine Biodiversity Patterns and Processes*, Ormond, R.F.G., J.D.Gage and M.V. Angel (eds.) pp. 1-17. Cambridge University Press, NY
- *Witman, J.D., R. J. Etter and F. Smith 2004. The relationship between regional and local species diversity in marine benthic communities: a global perspective. *Proceedings National Academy Science*, 101:15664-15669.
- +Wonham, M.J., M.A. Lewis and H.J. MacIsaac 2005. Minimizing invasion risk by reducing propagule pressure: a model for ballast-water exchange. *Frontiers Ecology Environment*, 3:473-478
- *Wonham, M.J. and J.T. Carlton 2005. Trends in marine biological invasions at local and regional scales: The Northeast Pacific Ocean as a model system. *Biological Invasions*, 7:369-392.
- *Zabel, Richard W., Harvey, Chris J., Katz, Stephen L., Good, Thomas P. and Phillip S. Levin. 2003. Ecologically sustainable yield. *American Scientist*, 91: 150-157.