

**Dynamics of Marine Ecosystems:
Biological-Physical Interactions in the Oceans (OCN 480/680)
Spring 2010**

Instructor:

Dr. Margaret Anne McManus
Marine Sciences Building (MSB)
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(Office hours by appointment)

Class Time:

Tuesday and Thursday from 12:00 -1:15 pm

Class Location:

MSB 307

Readings:

Dynamics of Marine Ecosystems: Biological-Physical Interactions in the Oceans. 2005. Mann KH and Lazier JRN. Blackwell Scientific Publications.

Journal Articles

Midterm Exam: February 23

In Class Presentations/Papers Due: April 27, April 29

Final Exam: May 4

Homework:

Please pay attention to the syllabus.

- (1) If we are going to have a lecture on a chapter, read the chapter before class.
- (2) If we are going to have a lecture on a journal article, read the journal article before class.
- (3) If you are going to present a journal article, please come to class prepared.

Class Schedule:

Date	Activity	Ch	Topic
Jan 12	Lecture	1	Introductions Overview of syllabus, readings & project Chapter 1
Jan 14	Lecture	2	Chapter 2: Biology and Boundary Layers I Phytoplankton
Jan 19	Journal Article		Berdalet, E. and Estrada, M.: Effects of small-scale turbulence on the physiological functioning of marine algae, in: Algal Cultures, Analogues of Blooms and Applications, edited by: Subba Rao, D. V., Enfield, NH, USA, Science Publishers, Inc., 2005
Jan 21	Lecture & Journal Article	2	Chapter 2: Biology and Boundary Layers II Zooplankton

			Woodson CB, DR Webster, MJ Weissburg and J. Yen. 2005. Response of copepods to physical gradients associated with structure in the ocean. <i>Limnol. Oceanogr.</i> 50(5) 1552-1564.
Jan 26	Journal Articles		Kunze, E et al. Observations of biologically generated turbulence in a coastal inlet. Huntley and Zhou. 2004. Influence of animals on turbulence in the sea. Vol. 273: 65–79, 2004
Jan 28	Lecture	3	Chapter 3: Vertical Structure of the Open Ocean: Biology of the Mixed Layer
Feb 2	Journal Article & Exercise		Sverdrup HU. 1953. On Conditions for the Vernal Blooming of Phytoplankton. <i>J. Cons. Perm. Int. Exp. Mer.</i> 18: 287-295.
Feb 4	Lecture	4	Chapter 4: Vertical Structure in Coastal Waters: Freshwater Run-off and Tidal Mixing
Feb 9	Journal Article		Dekshenieks MM, PL Donaghay, JM Sullivan, JEB Rines, TR Osborn and MS Twardowski. 2001. Temporal and spatial occurrence of thin phytoplankton layers in relation to physical processes. <i>Marine Ecology Progress Series.</i> 223: 61-71
Feb 11	Lecture	5	Chapter 5: Vertical Structure in Coastal Waters: Coastal Upwelling Regions
Feb 16	Journal Article		Graham WM and JL Largier. 2007. Upwelling shadows as nearshore retention sites: the example of northern Monterey Bay. <i>Continental Shelf Research.</i> Vol 17(5) 509-532.
Feb 18	Lecture & Midterm Exam Review		Understanding the effects of a variable climate on planktonic populations Midterm Exam review
Feb 23	Midterm Exam		Midterm Exam
Feb 25	No class		Ocean Sciences
March 2	Lecture	6	Chapter 6: Fronts in Coastal Waters
March 4	Journal Article		Pingree RD, PR Pugh, PM Holligan and GR Forster. 1975. Summer phytoplankton blooms and red tides along tidal fronts in the approaches to the English Channel. <i>Nature</i> Vol 258: 672-677.
Mar 9	Lecture	7	Chapter 7: Tides, Tidal Mixing and Internal Waves
Mar 11	Journal Article		McManus MA, OM Cheriton, PT Drake, DV Holliday, CD Storlazzi, PL Donaghay and CE Greenlaw. 2005. The effects of physical processes on the structure and transport of thin zooplankton layers in the coastal ocean. <i>Marine Ecology Progress Ser.</i> 301: 199-215.
Mar 16	Journal Article		Pineda J. 1999. Circulation and larval distribution in internal tidal bore warm fronts. <i>Limnology and Oceanogr.</i> 44(6): 1400-1414.
Mar 18	Lecture		Circulation and zooplankton distribution in coastal Hawaiian waters.
Mar 23	No class		Spring Break

Mar 25	No class		Spring Break
Mar 30	Lecture	8	Chapter 8: Ocean Basin Circulation: The Biology of Major Currents, Gyres, Rings and Eddies
Apr 1	Lecture		Eddy studies & Optics in Oceanography
Apr 6	Journal Article		Bidigare, Benitez-Nelson, Leonard, Quay, Parsons, Foley, Seki. 2003. Influence of a cyclonic eddy on microheterotroph biomass and carbon export in the lee of Hawaii. <i>GRL</i> , Vol 30(6) 1318.
Apr 8	Lecture	9	Chapter 9: Variability in Ocean circulation: Its Biological Consequences bring paper
April 13	Lecture		The Transition Zone chlorophyll front, a dynamic global feature defining migration and forage habitat for marine resources
Apr 15	Journal Articles		Woodson CB and MA McManus. 2007. Foraging Behavior can Influence Dispersal of Marine Organisms. <i>Limnology and Oceanography</i> . 56(2): 2701-2709. Woodson CB, MA McManus, J Tyburczy, JA Barth, L Washburn, PT Raimondi, BA Menge, and SR Palumbi. submitted. Persistent fronts determine biological hotspots along the Eastern Pacific. <i>PNAS</i> .
Apr 20	Lecture & Acid Test Movie	10	The Oceans and Global Climate Change: Physical and Biological Aspect "Acid Test" movie
Apr 22	Lecture & Exercise	11	Fisheries exercise. The social component. Questions for the future
Apr 27	Presentations		
Apr 29	Presentations		
May 4	Final Exam		Final Exam