

OCN 628 - BENTHIC BIOLOGICAL OCEANOGRAPHY

Spring 2007, MWF 1030-1120 am, MSB 315; Lab Tue 230-500 pm, MSB 315
Instructors: Craig Smith

OUTLINE OF LECTURES

Date	Topic

Jan 8, 10, 12	No Class**
	I. INTRODUCTION
Jan 16 _{lab}	A. Course Goals and Characteristics of Benthos
	II. THE PHYSICAL ENVIRONMENT
16 _{lab} 17	A. Physics of Bottom-Boundary Layers
17, 19	B. Sediments--Structure, Flux and Transport
	III. CORAL REEFS
22	A. General biology, community structure, disturbance and succession
24,26	B. Impacts of pollution and management implications
29	C. A coral invasion in Hawaii
	IV. MICROBIAL PROCESSES AND GEOCHEMISTRY
31 (SQ 1 ass.)* Feb 2 5	A. Microbial Processes B. Basic Sediment Geochemistry C. Diagenetic Modeling
	V. BASIC BIOLOGICAL CONSIDERATIONS
7 (SQ 1 due)* 9	A. The Organisms (handout only) B. Sources of Data: Observation, Sampling, Experiments C. Development Types and Dispersal D. Consumption and Production
12	a) Deposit feeding
14, 16	i) basic considerations
23 (SQ 2 ass.)	ii) models of deposit feeding
26	b) Scavengers, predators, epistrate feeders c) Suspension feeding
Date	Topic

28

d) Benthic-pelagic coupling

VI. OBSERVED PATTERNS AND SOME EXPLANATIONS

1. Soft Bottoms

Mar 2 (SQ 2 due)

A. Within-Community Patterns

a) Size patterns

b) Spatial patterns

c) Temporal patterns

5

B. Across Community Correlations

5

C. Pollution Gradients

9

D. Zonation and Biogeography

2. Vents, Seeps, Whale Falls and Other Reducing Habitats

12

A. Vent-Seep Habitat Characteristics

12 (SQ 3 ass.)

B. Microbiology

14, 16

C. Macrobiology

19

D. Ecology of Whale Falls

21 (SQ 3 due)

E. Wood falls and other reducing habitats

23

***** MIDTERM EXAM *****

26-30

***** SPRING BREAK *****

VII. COMMUNITY-LEVEL PROCESSES

1. Inputs and outputs

Apr 2

A. Food Webs and Energy Flow

4

B. Recruitment and Adult-Larval Interactions

C. Disturbance, Colonization, Succession

9

a) Sources and scales of disturbance

10_{lab}

b) Modes and rates of colonization

10_{lab}

c) Models and mechanisms of succession

4. Population Interactions

11

A. Competition and Amensalism

13

B. Predation

***** PROPOSAL TOPICS DUE APRIL 13*****

16

Ecology of Seamounts

C. Species Invasions

18

a) Ecology of Invasive Species

20

b) Mangroves: A Hawaiian Invasion

23, 25

VIII. ANTHROPOGENIC CHANGES IN BENTHIC HABITAT

IX. GLOBAL OCEAN FLUXES

Date

Topic

27, 30

A. Benthos, Regeneration and Burial

******* PROPOSALS DUE IN LAB TUES MAY 1*******

May 1_{lab}, 2

******* PROPOSAL PRESENTATIONS *******

******* FINAL EXAM MONDAY, MAY 7, 0945-1145, MSB 315 *******

* SQ = Study Question

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SCHEDULE OF LABORATORIES

Spring 2007, Tuesday 230-500 pm

Instructor: Craig Smith

Guest Lecturers: Grieg Steward, Sam Kahng, and Richard Grigg

Date	Topic

1/9	Sediment Microbiology/Virology (Steward)
1/16	Make-up lecture: Course Goals and Characteristics of Benthos, and Physics of Bottom-Boundary Layers (part 1)
1/23	Lab identification of Hawaiian corals (Grigg/Kahng)
1/30	Corals Field trip to Hanauma Bay at time arranged by Kahng/Grigg
2/6	Discussion # 1 (Topic TBA); BBC <i>Blue Planet</i> tidal flat ecology
2/13	Macrobenthos methods and field trip to Paiko Lagoon
2/20	Discussion # 2 (Topic TBA)
2/27	Analysis of macrobenthic samples from sand and mud habitats
3/6	Deposit feeding and bioturbation – live experiments
3/13	Movie: BBC <i>The Deep</i> , Review for midterm
3/20	Midterm Exam
4/3	Discussion # 3 (Deep-sea biodiversity, biodiversity and ecosystem function)
4/10	Mangrove Field Trip
4/17	Sediment traps: theory, design, pitfalls, applications
4/24	Discussion # 4 (Anthropogenic impacts and marine conservation)
5/1	Proposal presentations
