SURVEY OF OCEANOGRAPHY
WINTER 1974
One unit of credit

General Description

A descriptive survey of oceanography covering physical, chemical, geological and biological aspects: ocean floor topography and history, seawater physics and chemistry, ocean circulation, waves, tides, coasts, estuaries, marine organisms, ecosystems, intertidal and coral reef biology and biological productivity. Seventeen sessions, usually two per week, approximately two hours each - lectures and films.

Texts

(1) Gross, M. G. 1972. Oceanography. A View of the Earth. Prentice Hall.
(2) Scientific American Book, 1972. Oceanography. Freeman.

Films

The Restless Sea, The Restless Earth (Videotape), History Layer by Layer, Continents Adrift, The Sea, Waves Across the Pacific, The Tides, The Beach-A River of Sand, Ecology of a Tidal Slough.

Study Questions

Ten study questions covering major aspects of the module were offered for self study and as a basis for evaluation.

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TESC Module - Winter Quarter 1974 - Peter Taylor

Text: Gross, M.G. 1972. Oceanography. A View of the Earth. Prentice-Hall

DATE	TOPIC	FILM	READ*
Jan. 8	Introduction	The Restless Sea	1/1,2
Jan. 10	Physical geography		2/
Jan. 15	Ocean floor topography		3/15,16,17,18
Jan. 17	Ocean floor history	History Layer by Layer	4/20,21
Jan. 22	Ocean floor sediments		5/
Jan. 24	Seawater chemistry		6/13
Jan. 29	Marine organisms and ecology	The Sea	16/22,33
Jan. 31	Marine Organisms and ecology		19/23-32,34
Feb. 5	NO MEETING		
Feb. 7	NO MEETING		
Feb. 12	Biological cycle	Continents Adrift	16/
Feb. 14	Density and mixing of seawater		7/12
Feb. 19	Ocean Currents		8/3,6-11
Feb. 21	Biological productivity		17/37
Feb. 26	Waves	Waves Across the Pacific	9/4,5
Feb. 28	Tides	Tides of the Ocean	10/
Mar. 5	Estuaries	Ecology of a Tidal Slough	11/
Mar. 7	Shorelines	The Beach - A River of Sand	13/14
Mar. ~~17~~ 12	Intertidal ecology	The Salt Marsh	12/36
Mar. ~~19~~ 14	Coral Reefs		

*Gross chapters/Scientific American Readings chapters

STUDY QUESTIONS

Survey of Oceanography
TESC Module
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Limit answers to one typewritten page per question.

1. The oceans and seas of the earth's surface are interconnected into one "world ocean." What are the implications of this view in understanding the dynamics of the oceans? Consider in your answer the results of this interconnectedness expressed in the physical, chemical, geological and biological features observed.

2. Which of the following features are explained (and how) by the current theory of sea floor spreading and continental drift?

a. coastal mountain ranges
b. continental margins
c mid-oceanic rises
d. deep ocean trenches
e. submarine canyons
f. oceanic island chains
g. the age of ocean floor sediments
h. belts of volcanic activity
i. San Andreas Fault

3. Describe the major topographic features of the continental margins and current theory on how they were formed.

4. How do atmospheric conditions -- temperature, humidity and air movement -- and sunlight affect the movement of water in the ocean surface layer?

5. Describe as many of the physical and chemical properties of water (H_2O) as you can and the significance of each for the occurrence of life in the sea.

6. Exceptionally high tides are predicted for January 8, February 6, July 19 and August 17 for the north Atlantic U.S. coast this year. Extreme high tides are predicted on similar dates here, also. What events (of nature) determine these tides? What possible additional unpredictable events may accentuate these tides to create disastrously higher tides?

7. Why is the coastal ocean generally more productive biologically than ordinarily observed in the open ocean beyond the continental margin? Be specific and consider that there is more than one reason.

8. Estuaries may support even higher levels of biological productivity than ocean coastal areas.

a. What features (mechanisms, conditions, etc.) of estuaries, generally, contribute to high productivity?
b. Specifically for Puget Sound, what are the contributing causes of high biological productivity in this estuary?

9. What arguments can you offer, pro or con, about the often cited statement that the sea is an inexhaustible source of food (for human populations of the world)?

10. One proposal for siting nuclear power plants is to locate them in coastal areas offshore within breakwater enclosures. This provides easy access to water for cooling and by floating the reactor, protection from earthquake shocks. If you were charged with preparing an environmental impact statement, what possible relationships of the <u>total structure</u> to the marine environment would you consider? Think in terms both of effects on the marine environment and of problems created for the nuclear facility by the marine location.