

## QUIZ I — STUDY GUIDE

The quiz will cover everything through the lecture on **Secondary Productivity** (Thursday Sept 26).

The questions will be short answer questions. Most can be answered with a sentence or two, or a sketch with a few words. Sometimes I give you a graph or data and ask you to interpret it. There could be one discussion question. Use the problem set and last years quiz (which is on the course web site) as a guide to the types of questions that might be asked.

- Use the study questions, problem set, lecture notes, recitation, and the lecture handouts as a top priority for studying.
- Also make sure you have read and are familiar with the main message of the articles that have been assigned
- If you understand everything we have talked about in lecture and recitation, and understand the articles that have been handed out, you should be able to do at least average on the quiz.
- Go to the text for elaboration on the lectures, and focus your reading on the pages that I have emphasized below.

**TEXTBOOK** Read the sections assigned below. Any of the information therein is fair game for the quiz, even if we did not cover it in class

Chapter 1: pp 10-15.

Chapter 23: 463-469 p. 477; 480-483;

Chapter 25 whole chapter

Chapter 26 p. 544-551

### OTHER ASSIGNED READINGS

You should be sure you have read these articles, and understood the take-home argument. On some I have indicated where your focus should be below.

Vernadskii: *The Biosphere*

Rowe: *Biological Fallacy: Life Equals Organisms*

Remmert: *Ecology, the Basic Concept*

Redox Primer: For your background only

Luria: *Photosynthesis*—Use only as backup for lecture. (Note that there may be minor differences between the lecture version of the light reaction and Luria's. When in doubt, believe the lecture material)

Falkowski: 2002. The Ocean's Invisible Forest. *Scientific American* August 2002. p.38-45 (This article covers many things. Much of it is relevant to material coming up. The only part you are responsible for this quiz is the parts that cover phytoplankton and primary productivity --- to supplement lecture materials. You do not need to study the section on ocean fertilization.)

Rojstaczer, S. Sterling, S.M. and N.J. Moore. 2001 Human Appropriation of Photosynthesis Products. *Science* 294: 2549-2553 (relevant to the homework...study take-home message)

Field, C.B., M.J. Behrenfeld, J. T. Randerson, and P. Falkowski. 1998. Primary Production of the Biosphere: Integrating Terrestrial and Oceanic Components. *Science*. 281:237-240 (Read to get a good feeling for the distribution of NPP in marine and terrestrial ecosystems, and its variability)

Chisholm: *What Limits Phytoplankton Growth?* (You should understand all of this that is relevant to lecture material – e.g. limiting factors and Redfield Ratios --. Some parts – e.g. iron limitation - are relevant to sections that will come later in the course.)

Redfield, 1934: "On The Proportions Of Organic Derivations In Sea Water. James Johnstone Memorial Volume, Liverpool University Press, Liverpool. 176-192. (Use as backup for lecture)

Libes: "Reading the Sedimentary Record: The Use of Stable Isotopes in the Study of Paleooceanography (from: Libes 1992, "An Introduction to Marine Biogeochemistry". Wiley) (W)

Beddington, J. 1995 "The Primary Requirements" Nature 374: 213-214 (W)

Pauly, D. and V. Christensen. 1995. Primary Production Required to Sustain Global Fisheries. Nature: 374: 255-257 (W)

### **Other Readings that were assigned to help with the Homework**

(you will not be responsible for all of the contents of these, but will be responsible for understanding the sections that were covered in the homework)

Kasting, J.F. and J. L. Siefert. 2002. Life and the Evolution of Earth's Atmosphere. Science 296:1066-1068 (L)

Nisbet, E.G. and N.H. Steep. 2001. The Habitat and Nature of Early Life. Nature. 409:1083-1090 (L)

Pace, N. 2002. A Molecular View of Microbial Diversity and the Biosphere. Science 276:734-740 (L)

Van Dover, C.L. C.R. German, K.G. Speer, L. M. Parson, and R. C. Vrijenhoek. 2002. Science 295:1253-1257. (L)

Jannasch, H. Life at the sea floor. Nature. 1995 374:676-677. (L) **and**

Fossing, H., et al. 1995 Concentration and transport of nitrate by the mat-forming sulphur bacterium *Thioploca*. Nature. 374:713-715 (L)

Nisbet, E. 2000. The realms of Archaean life Nature. 405:625-626 (L) **and**

Rasmussen, B. Filamentous microfossils in a 3,235 million year old volcanogenic massive sulphide deposit. Nature 405:676-678 (L)

Kaiser, J. 1995 Can deep bacteria live on nothing but rocks and water? Science 270: 377 (L) **and**

Stevens, T.O. 1995. Lithoautotrophic microbial ecosystems in deep basalt aquifers. Science 270:450-454 (L)