Tentamen Mariene Ecologie/Exam Marine Ecology (2005)

Vrijdag/Friday 11 nov 2005, 14.00-17.00hrs
Went W145 – W149

NB: schrijf Uw naam en studentnummer op ieder in te leveren blad
NB: write your name and student-code on every answer sheet

1. a) What is a *thermocline*? **b)** What is the difference between a permanent and a seasonal thermocline, and how are they caused? **c)** Why *and where* are seasonal variations of the thermocline important for marine productivity?

2. Briefly describe the principle of *Ekman transport*, and discuss how this process influences marine productivity.

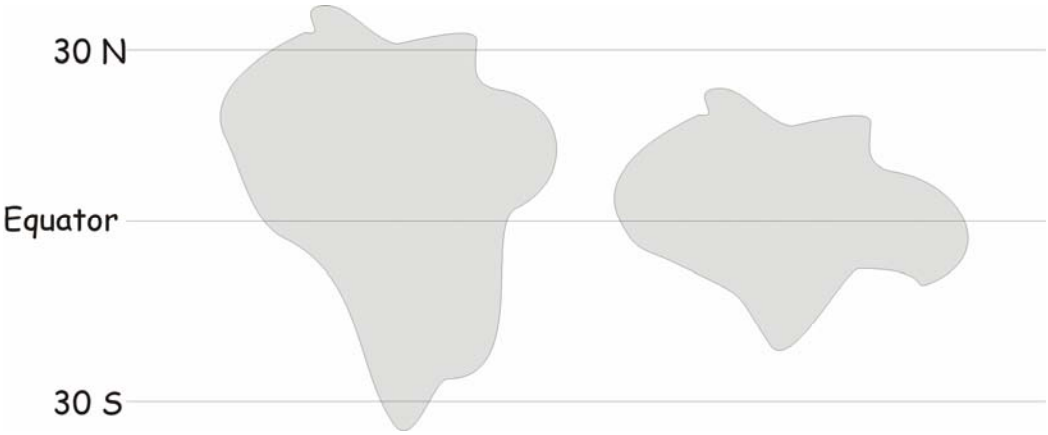
3. Give the main factors that influence primary productivity in the oceans, and incorporate the *Redfield Ratio* in your answer.

4. a) Give a typical oceanic profile of *Gross* (GP) and *Net* (NP) primary production, Respiration, and indicate *Critical Depth* and *Compensation Depth.* **b)** Discuss the typical shape of the GP. **c)** Draw the expected position of the oxygen minimum zone in the diagram, and briefly explain why you draw it in the chosen position.

5. a) Give a definition of the benthic realm. **b)** In which subclasses can you divide this environment with regard to depth?

6. a) What environmental factors change if you go from low to high elevation in an intertidal area, and how do these factors change? **b)** Explain why sessile benthos may experience (semi) diurnal salinity fluctuations in a positive estuary. What effect will this have on deep infaunal organisms?

7. Consider the map below of an Earth-like planet, the part between ~30^{o} N to ~30^{o} S, **with rotation opposite to that of Earth**, with two continents (gray) and oceans (white), with a similar distance to the Sun as Earth, but without a tilted axis. **a)** Draw the expected zones of average Low and High atmospheric pressure. **b)** Draw the prevailing wind-directions. **c)** Where do you expect areas of *coastal upwelling*, and why? (*i.e.*, where should one go for good fishing on this planet?). **d**) Assume big mountain-chains to the N of the Equator. How would the ITCZ behave during the NH summer – winter contrast (draw with dotted lines please!).



8 a) Mark (X) the correct combinations in the table below. **NB:** more than one option is/are possible.

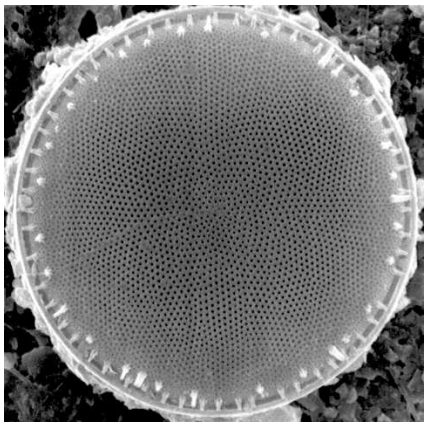
	Skeletal material			
	carbonate	organic	silica	agglutinated grains
Diatoms				
Foraminifera				
Dinoflagellates				
Dinocysts				
Ostracodes				
Pteropods				
Radiolaria				

b) What is a *biogenic ooze?* (provide definition)

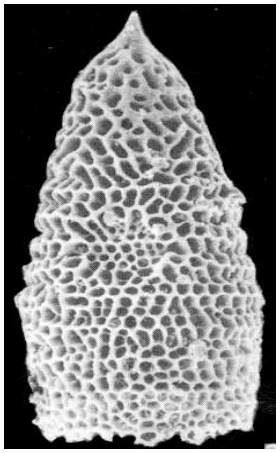
c) What are *pteropods*? (provide taxonomic position)

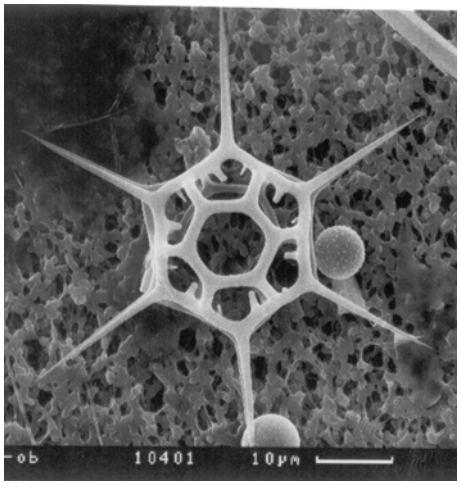
9. a) Are diatoms prokaryotic or eukaryotic algae? And dinoflagellates? **b)** where do *epipsammic*, *epilithic*, *epiphytic*, and *euplanktonic* diatoms live? **c)** Name at least two feeding strategies for dinoflagellates. **d)** Which phytoplankton group is proverbially associated with Harmful Algal Blooms?

10. a) Representatives of which groups of organisms are shown on the below pictures? Please add whether these groups belong to either zooplankton or phytoplankton.

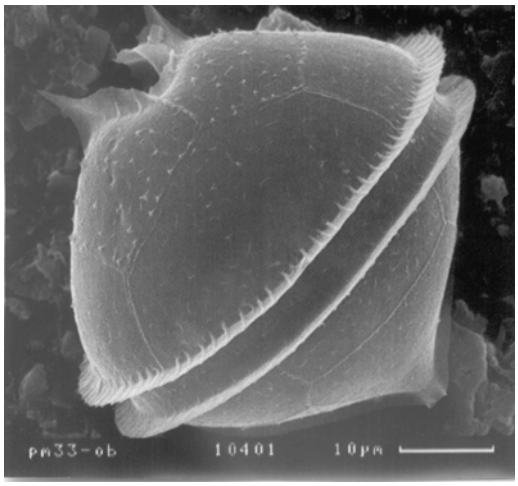


a b





c d



11. a) What is *bioluminescence?* (provide definition) **b)** In which *life strategies* of marine organisms fits the possession of bioluminescence?

12. What is the central organism in the Antarctic-Oceanic food chain and why?

13. a) Give at least two differences between a Gonyaulacoid and a Peridinioid dinoflagellate tabulation. **b)** What is an archaeopyle?