

# **Tentamen Marine Sciences II (2015)**

**Donderdag 5 november 2015,  
Magaron - 13.30-16.30 uur**

**NB: schrijf Uw naam en studentnummer op ieder in te leveren blad!**

**Answers can be in English or Dutch**  
**Answers must be as synthetic as possible (to the point),**  
**do not use extra space than given if not strictly**  
**necessary**

**Please, write with a readable handwriting**

**Veel succes! Good Luck!**

**FRANCESCA SANGIORGI**

***Naam:***

***Studentnummer:***

**Naam:**

**Studentnummer:**

**Questions Francesca Sangiorgi (intro, geomorphology, primary productivity and decomposition, trophic chains, estuaries & deltas, disturbance and conservation)**

- 1) The present-day location of the coasts mostly depends on two factors/processes, which operate on long-time scale. Name them

**Factor 1:**

**Factor 2:**

- 2) Sea level has been rising  $\sim 3.2 \pm 0.4$  mm/y in the last  $\sim 2$  decades.

**A) Why? List the 2 most important contributing factors**

**Factor 1:**

**Factor 2:**

**B) Is sea-level change uniform? Briefly explain your YES or NO answer**

- 3) The flatter the beach, the coarser the material from which it is made. Is this general statement (mark the correct answer):

**T = True**

**F = False**

***Naam:***

***Studentnummer:***

- 4) Briefly describe what process may have created such a morphology (a couple of words are sufficient)



- 5) Estuaries are – perhaps - the most naturally stressful of all the aquatic environments. Name 1 important stress/limiting factor for a planktonic organism and 1 important stress/limiting factor for a benthonic organism and specify what organism you are referring to and why is the consider factor limiting

**Plankton:**

**Benthos:**

**Naam:**

**Studentnummer:**

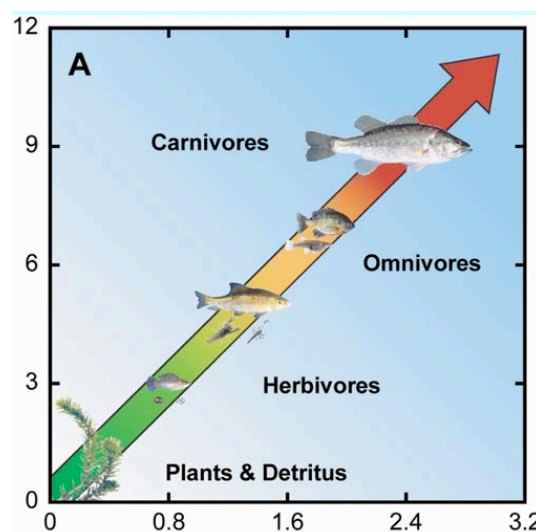
- 6) Primary productivity in estuaries and coastal zones is usually very high
- a) Which microscopic organism is the most important primary producer in Dutch coastal water areas?
  - b) Which are the non-microscopic important primary producers in the coastal areas of the world? Name them.
  - c) Primary productivity can be important in estuaries as food source, but there is another source of energy for food webs, which is generally very (if not more) important: what is it?

a)

b)

c)

- 7) a) What does this graph represent?  
b) What are the two variables in the graph? Write them next to the axis

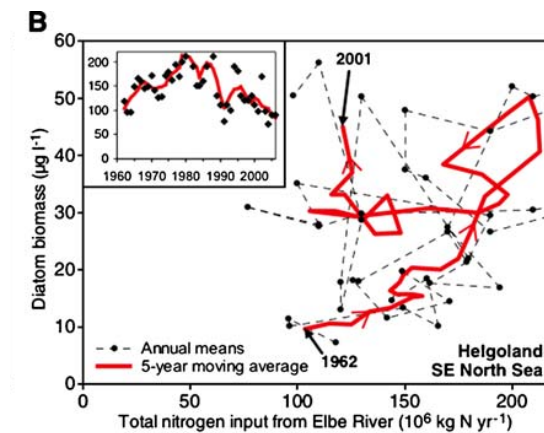


a)

**Naam:**

**Studentnummer**

8) Briefly explain this graph in view of the concept of ecosystem disturbance.



9) For the purpose of ecosystem conservation, functional biodiversity may be more important than species diversity. Why?

10) Why are deltas and wetlands highly vulnerable and “at risk”? Name 2 factors, which contribute to increase their vulnerability.

Factor 1:

Factor 2:

***Naam:***

***Studentnummer:***

**Questions Bas van de Schootbrugge (plate tectonics, waves, tides, rocky shores)**

**1. Teken een doorsnede van de Aarde en geef hierin aan (8 pt):**

- Kern
- Mantel
- Korst
- Continental collision
- Ocean spreading
- Passive margin
- Mantel convectie

**2. Wat wordt bedoeld met "Oceaan bekkens vormen bij divergent plaatgrenzen" en geef een voorbeeld? (2 pt)**

**Naam:**

**Studentnummer:**

**3. Wat is waar? (2 pt)**

- A      Getijden worden door de draaing van de Aarde veroorzaakt
- B      Getijden zijn de langste golven op Aarde
- C      Getijden zijn vrij bewegende golven
- D      Op een amphidromisch punt is de getijde werking maximaal

**4. Welke beweging van de Maan relatief tot de Aarde zorgt voor verschillen in de hoogte van getijden (bijvoorbeeld verschil tussen hoogste hoogtij en laagste hoogtij)? (2 pt)**

**5. Wat zijn "Key-stone predators"? En geef een voorbeeld. (2 pt)**



***Naam:***

***Studentnummer:***

**6. Welk criterium wordt gebruikt om te onderscheiden tussen een rotskust en land? (2 pt)**

**7. Noem tenminste 4 aanpassingen die organismen die op rotskusten leven hebben om met de extreme omstandigheden om te gaan? (2 pt)**

-

-

-

-

***Naam:***

***Studentnummer:***

**Naam:**

**Studentnummer:**

**Questions Sabine Gollner (sandy and muddy shores).**

**NOTE: more than one answer can be correct. In this case, mark all the possible correct answers.**

**1) What is the intertidal zone?**

- A: ... zone between mean high tide and mean low tide
- B: ...zone between mean low tide and  $d = L/2$  ( $L$  = wavelength)
- C: ...zone between mean high tide and dunes

**2) Which particle sizes are recognized as sand?**

- A: 0.01 mm
- B: 0.02 mm
- C: 0.06 mm
- D: 1 mm
- E: 5 mm

**3) In situ primary production is higher at**

- A: sandy shores
- B: mud flats

**4) Plants in dunes are adapted to the hot and windy environment. *Ammophila arenaria* – the common dune grass native to coastlines of Europe...**

- A: ...have succulent leaves to store water
- B: ...only grow in the shadow of bushes to protect itself from direct sunlight
- C: ...have rolled leaves to reduce water vapor
- D: ...have a waxy plant cuticle to prevent evaporation

**5) What are typical adaptations/behavior of macrofauna that live in mud flats?**

- A: “swimming” in sediments
- B: make burrows in sediments
- C: Respiratory pigments for enhanced oxygen up-take
- D: Large stomach for enhanced food up-take

***Naam:***

***Studentnummer:***

***Naam:***

***Studentnummer:***

**Questions Stefan Schouten (organic molecules, organic matter)**

**1a. Marine biomass is composed of a variety of different classes of organic compounds. Name at least three classes of organic compounds.**

**b. Which organic compound class degrades the slowest after cell death?**

**c. What is oxygen exposure time and how is it important for the preservation of organic matter?**

a)

b)

c)

***Naam:***

***Studentnummer:***

**2.a. Methane is often generated in marine sediments. From which two sources can methane be originally formed?**

**b. Methane is a gas and should bubble upwards because it is lighter than air. However, large quantities of methane still can be found on the ocean sediment floor. How is this possible?**

**c. What is characteristic about the stable carbon isotopic composition of methane?**

a)

b)

c)

***Naam:***

***Studentnummer:***

**Tjeerd Bouma (spatial ecology, ecosystem engineering)**

**2-A) Please mention 2 stress factors causing global decline of seagrass**

**2-B) Explain for one of these stressors if you expect it to increase or decrease in the coming 50 years**

***Naam:***

***Studentnummer:***



***Naam:***

***Studentnummer:***