

Examination Reconstructing Quaternary Environments (GEO4-4409)
January 30, 2012

Answers may be given in English or Dutch, in any case: please answer concise and readable! For every sub-question you can earn 5 points.

1. Give a short and to-the-point description of the following subjects:
 - a. OSL
 - b. Speleothems
 - c. Cryoturbation.
 - d. AMS dating
 - e. Quaternary.

2. Dating
 - a. Describe the principle and application of tephrochronology.
 - b. In a coring from the western part of the Netherlands marine shells are present at about 15 meters below the present sea level in a fluvial deposit underlying a layer of coversand. How old are these shells and how can they be dated?
 - c. What is the basis for the construction of the ^{14}C calibration curve?
 - d. How would you date the formation and decay of pingos in N-Germany?
 - e. In a lake in Northern Sweden a tree trunk has been found with 250 countable rings, in the deeper part of the lake, varves have been formed over a period of 8000 years. How would you date and correlate these two records?

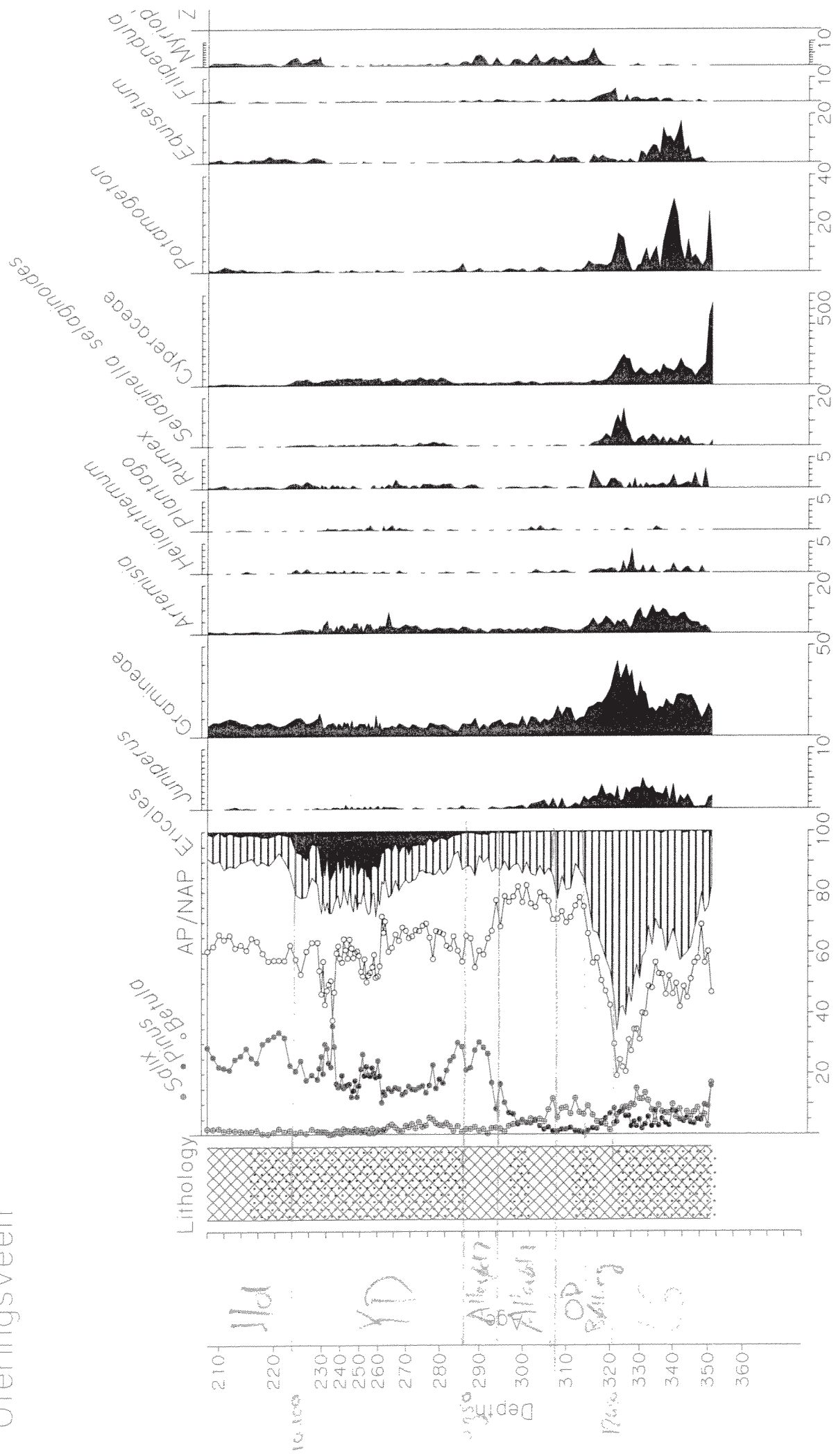
3. Proxies
 - a. Give at least 3 proxies that can be used for reconstructing changes in precipitation.
 - b. Which environmental changes can be deduced from the fluvial record?
 - c. How can you use the Loss on Ignition method for the reconstruction of environmental changes?
 - d. What is the indicator value of chironomids?
 - e. Describe the principles and applications of palynology.

4. Events
 - a. What was causing mega-faunal extinctions in the Late Quaternary, give 3 examples of extinct species.
 - b. Draw a temperature curve for the time period since the end of the Saalian in northwest Europe.
 - c. Give at least 3 interstadials that occurred before the Last Glacial Maximum and describe how they can be recognised in terrestrial environments in comparison with stadials that occurred during the same time interval.
 - d. How fast were the changes from Glacial to Interglacial conditions and *vice versa*?
 - e. Make a chronostratigraphical interpretation of the pollen diagram obtained from a core in the N Netherlands (gyttja, sandy gyttja) that is given on the reverse side. Subsequently, give a best estimate of the start of organic infilling in ^{14}C yrs BP.

The final results will be available within 2 weeks and published on Blackboard.

Good-luck !

Uteringsveen



Cleveringa et al.,