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## Report of working group 4: Younger Dryas-style events

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Climatic rebounds are a general feature of earlier terminations. Cooling events during earlier glacial-interglacial transitions (I – VI) are now clearly evidenced from deep-sea records (ODP 658, northwest Africa; Anholt-II, Denmark) and terrestrial pollen records (Funza-I, Colombia) However, the evidence is still scarce which makes comparison of the cold pulses difficult. For example, there is benthic foraminiferal evidence for a YD-style event at the Saalian/Eemian transition in Denmark (Anholt-II record). But up till now no clear signal has been reported from ice-cores during this transition.

From the Funza-I pollen record there is evidence that some, but not all, cold pulses show a two-fold character, cold/wet in the earlier phase and cold/dry in the later part.

Some tentative estimations of the duration and timing of YD-style events exist. The duration of these events is in the order of 1000–2500 years. Sarnthein and Tiedemann (1990) observed that minima in benthic  $\delta^{13}\text{C}$  were mostly directly succeeded by YD-style events, except the cooling events at Terminations IV, V and the Younger Dryas itself.

Most Younger Dryas-style coolings resulted from a short-term antecedent estuarine circulation regime in the North Atlantic (Sarnthein and Tiedemann, 1990), except for the cooling events mentioned above.

### SUGGESTIONS

Berger stated that the Younger Dryas occurred during a period of maximum insolation. It should be interesting to know if analog conditions persisted during earlier events. To answer this question, Terminations with maximum insolation (12/11 and 6/5 transitions) should be studied in sections with sufficient

resolution. However, it should be noted that the dating of the cooling events in older Terminations is difficult. This is an important problem to determine existing associations with orbital forcing.

#### WHERE TO LOOK FOR YD-STYLE EVENTS?

- The greatest effects are expected in the North Atlantic and marginal seas, which are relatively sensitive and/or react very quickly to climatic changes (e.g. changes in monsoon activity). Pollen records from marginal seas (e.g. Africa) can provide important information about changes in atmospheric circulation.
- We recommend to study the nearest analogue of the Holocene, 413 ka at the 12/11 transition (Termination V).

#### REFERENCE

Sarnthein, M. and R. Tiedemann – Younger Dryas-style cooling events at glacial terminations I-VI at ODP Site 658: associated benthic  $d^{13}O$  anomalies constrain meltwater hypothesis. *Paleoceanography* 5, 1041–1055 (1990).