Younger Dryas, Younger Dryas style-event and the possible correlation with Heinrich events in deep-sea cores offshore Somalia (Indian Ocean)

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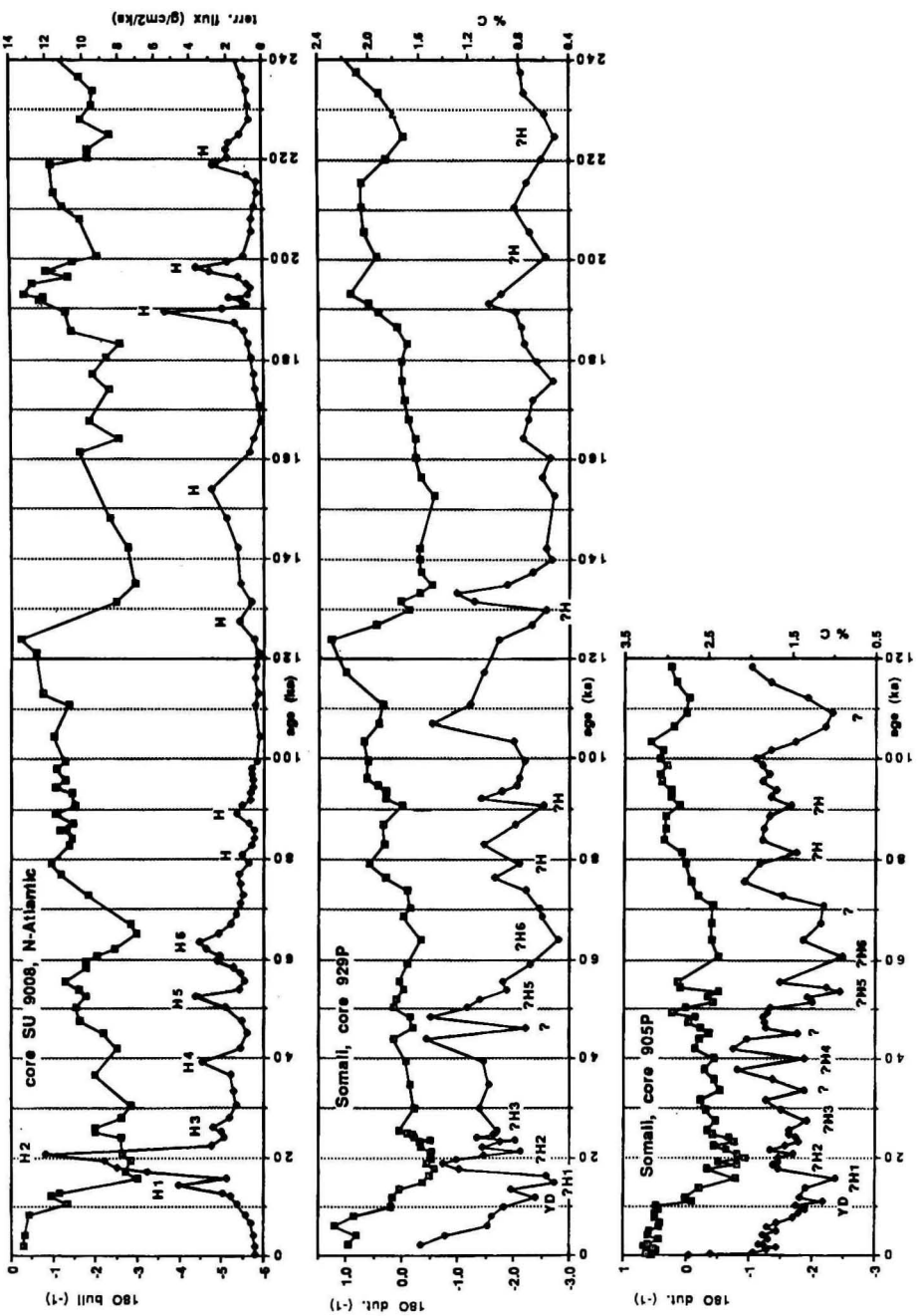
The Younger Dryas cold pulse in the marine record is not restricted to the Northern Atlantic Ocean. Recent reports include the Indonesian region, Sulu Sea, Red Sea, Mediterranean Sea and Gulf of Mexico.

Evidence that the YD is not unique is demonstrated by the presence of Younger Dryas-style events during previous deglaciations. One might also question the unique nature of the YD by realizing that it is an easily detected feature standing out as a rebound along a strong deglaciation trend. Indeed, the Heinrich layers documented in detail for the past 60 ka in deep-sea cores from the North Atlantic Ocean present evidence that climatic fluctuations are more numerous and complex than previously anticipated. These layers with a high content of ice-rafted detritus reflect meltwater discharges directly following cold pulses documented in $\delta^{18}O$ Greenland ice-core records. The YD is also associated with such a layer.

Considering the fact that the YD is a global phenomenon we can speculate whether the conditions leading up to the Heinrich events had an effect on the global climate system as well.

Two deep-sea cores recovered in the upwelling region offshore Somalia during the Netherlands Indian Ocean Program (1992–1993) both contain the Younger Dryas and Younger Dryas-style signature. Sediments deposited during these events are characterized by an enrichment of ^{18}O and a lowered organic carbon content. On closer inspection this feature is not restricted to the glacial/interglacial transitions but can be observed and correlated throughout both cores. Although not yet backed by high resolution stratigraphy and AMS ^{14}C datings, these intervals interestingly roughly coincide with Heinrich event ages.

Our research efforts concentrate on detailed sedimentological, micro-


core SU 9008, N-Atlantic
Somali, core 929P
Somali, core 905P
terr. flux (g/cm2/ka)
% C
age (ka)
H1
H2
H3
H4
H5
H6
YD
?H1
?H2
?H3
?H4
?H5
?H6

paleontological and geochemical analyses on these cores. This excercise will show whether our speculations on the global effect of the cold glacial pulses preceeding Heinrich events can be substantiated.

← Fig. 1. The upper part shows the oxygen isotope record and the Heinrich-events (H) as documented by the terrigenous flux (lower curve) from core SU9008 in the North Atlantic (from Grousset et al., 1993). The middle and lower parts show the oxygen isotope record (above) and organic carbon content through two cores from the upwelling region off Somalia: 929P (13°42.21'N, 53°14.76'E, 2490 m waterdepth, 1615 cm recovery) and 905P (10°46.01'N, 51°57.04'E, 1586 m waterdepth, 1526 cm recovery). Both cores contain the Younger Dryas signature. A YD-style event can be recognized during termination II at about 130 ka in core 929P. Sediments deposited during these events are characterized by an enrichment of ^{18}O and a decrease in organic carbon content indicating lowered temperatures and primary production, respectively. On closer inspection this feature is not restricted to the glacial/interglacial transitions but can be observed and correlated throughout both cores. Although not yet backed by high resolution stratigraphy and AMS ^{14}C datings, these intervals roughly coincide with Heinrich event ages