

ENVIRONMENTAL RESPONSE TO RAPID CLIMATIC OSCILLATIONS IN NW-EUROPE DURING GREENLAND INTERSTADIAL 1

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INTRODUCTION

Rapid climatic oscillations are recorded in the Greenland oxygen isotope records during GI-1 (the Bølling-Allerød or Lateglacial Interstadial). What is the effect on the terrestrial environment?

The Netherlands Organisation for Scientific Research (NWO) funded this 4-years PhD project which will run to 2011.

RESEARCH QUESTIONS

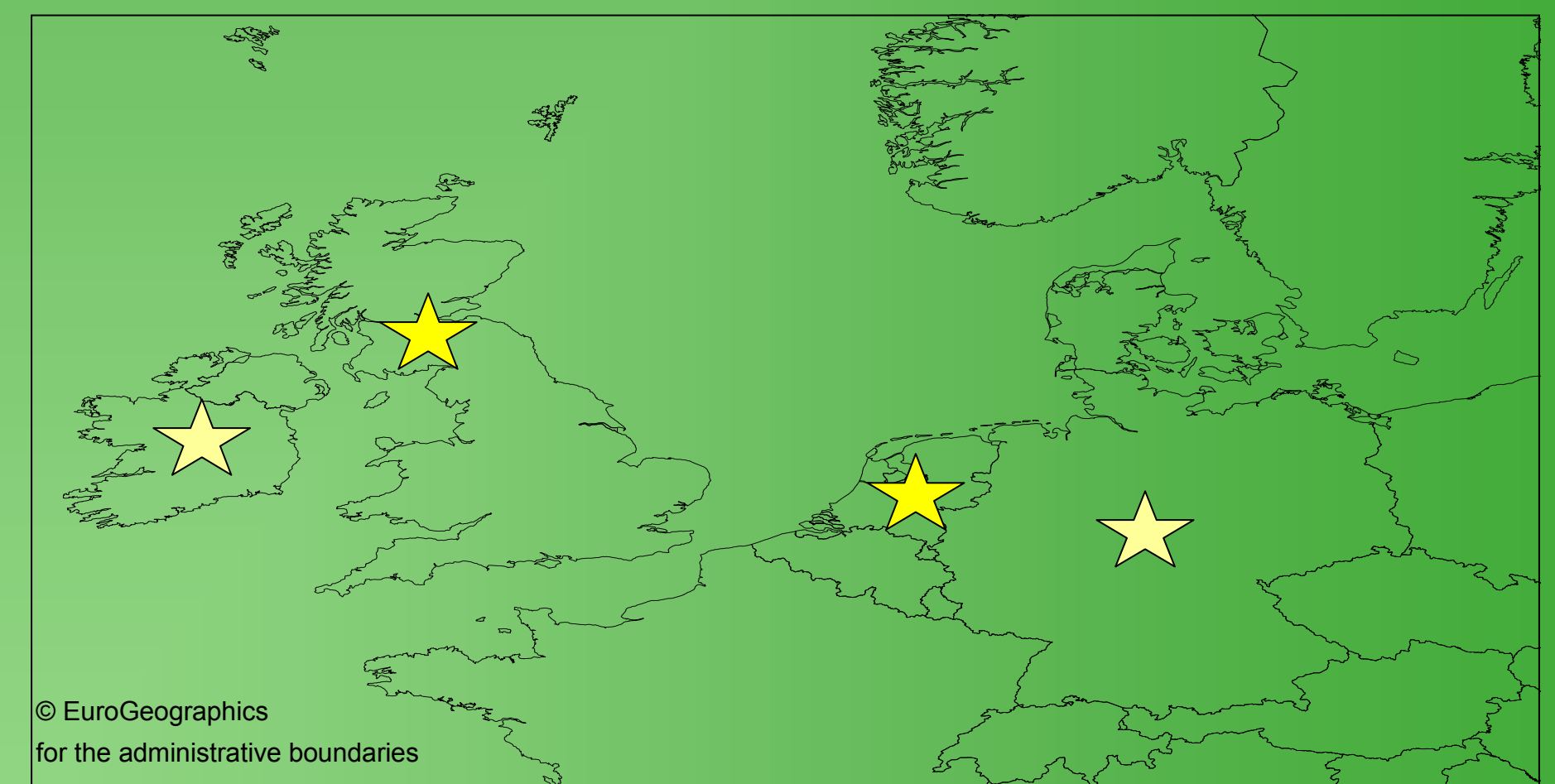
- Did temperature changes during Greenland Interstadial 1 occur synchronous in a west-east transect?
- Can we determine a west-east gradient in the amplitude of temperature changes associated with a decreasing Atlantic influence?
- Did changes in vegetation occur synchronous to temperature changes?

METHODS

Multi-proxy analyses will be carried out on calcareous lake deposits along an west-east transect in NW-Europe. Analyses will comprise oxygen isotopes, pollen, chironomids, while AMS ¹⁴C dating and tephra are used for correlation.

LOCATIONS

- ★ **Sampling sites**
- Ireland: ?
- Britain: Whitrig Bog
- The Netherlands: Empe
- Germany: ?



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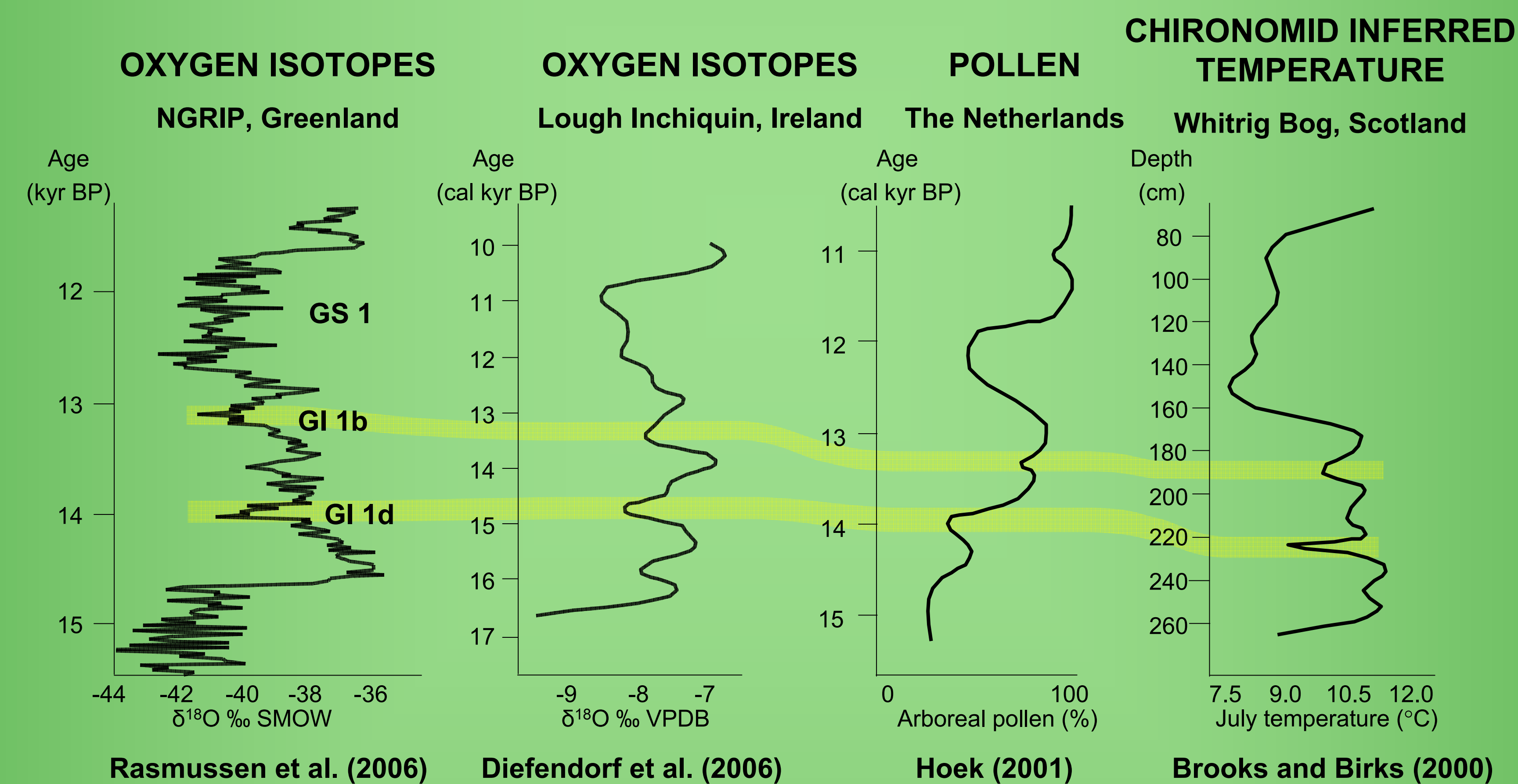
AMS ¹⁴C DATING

AIM: Chronology

METHOD: Dating of terrestrial macro remains

CORRELATION BETWEEN SITES AND PROXIES

Different proxies show changes within Greenland Interstadial 1. However, leads and lags cannot be established due to the lack of a common dating framework.



TEPHRA

AIM: Chronology, testing of synchronicity

METHOD: Analyses on selected samples, in which f.i. Laacher See Tephra (12.900 yr BP) is expected

OXYGEN ISOTOPES

AIM: Correlation of sites with NGRIP

METHOD: High-resolution (~20 yrs) oxygen isotope analyses on bulk carbonates

POLLEN

AIM: Local and regional vegetation reconstruction

METHOD: Pollen analyses on the same stratigraphic levels as oxygen isotopes

CHIRONOMIDS

AIM: Temperature reconstruction

METHOD: Chironomid analyses on the same stratigraphic levels as oxygen isotopes. Mean July air temperature can be estimated using a transfer-function.

Multi-proxy approach → (a)synchronicity of climatic and related environmental changes within sites

E-W transect → difference in timing and amplitude of climatic and environmental changes between sites

LEADS AND LAGS BETWEEN CLIMATE AND ENVIRONMENT

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