Lateglacial summer temperature changes and vegetation development along a west to east transect across NW-Europe.

Nelleke van Asch[1,*], Oliver Heiri[2] and Wim Z. Hoek[1]

INTRODUCTION

Lateglacial climatic changes, such as the Younger Dryas cold phase, are associated with changes in the North Atlantic thermohaline circulation. Presumably, Lateglacial temperature changes were most pronounced in regions close to the ocean and decreased further inland.

Here we infer longitudinal temperature gradients in northwest Europe during the Lateglacial. These are based on existing chironomid-based temperature reconstructions from the region.

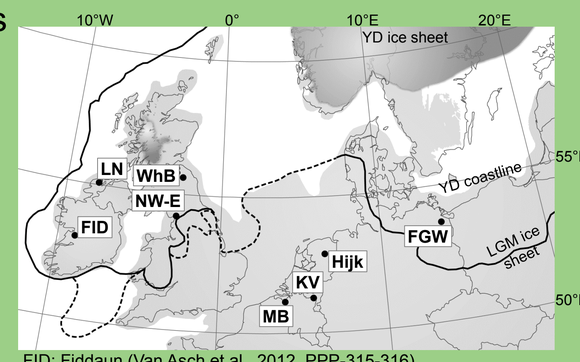
Reconstructed summer temperatures are compared with Lateglacial vegetation development to gain insight into the effect of summer temperature on vegetation in the region. Vegetation development is generalised from existing pollen records.

RESEARCH SITES

Chironomid-based temperature reconstructions and pollen records are used from the mid-latitudes (50-56°N) in northwest Europe:

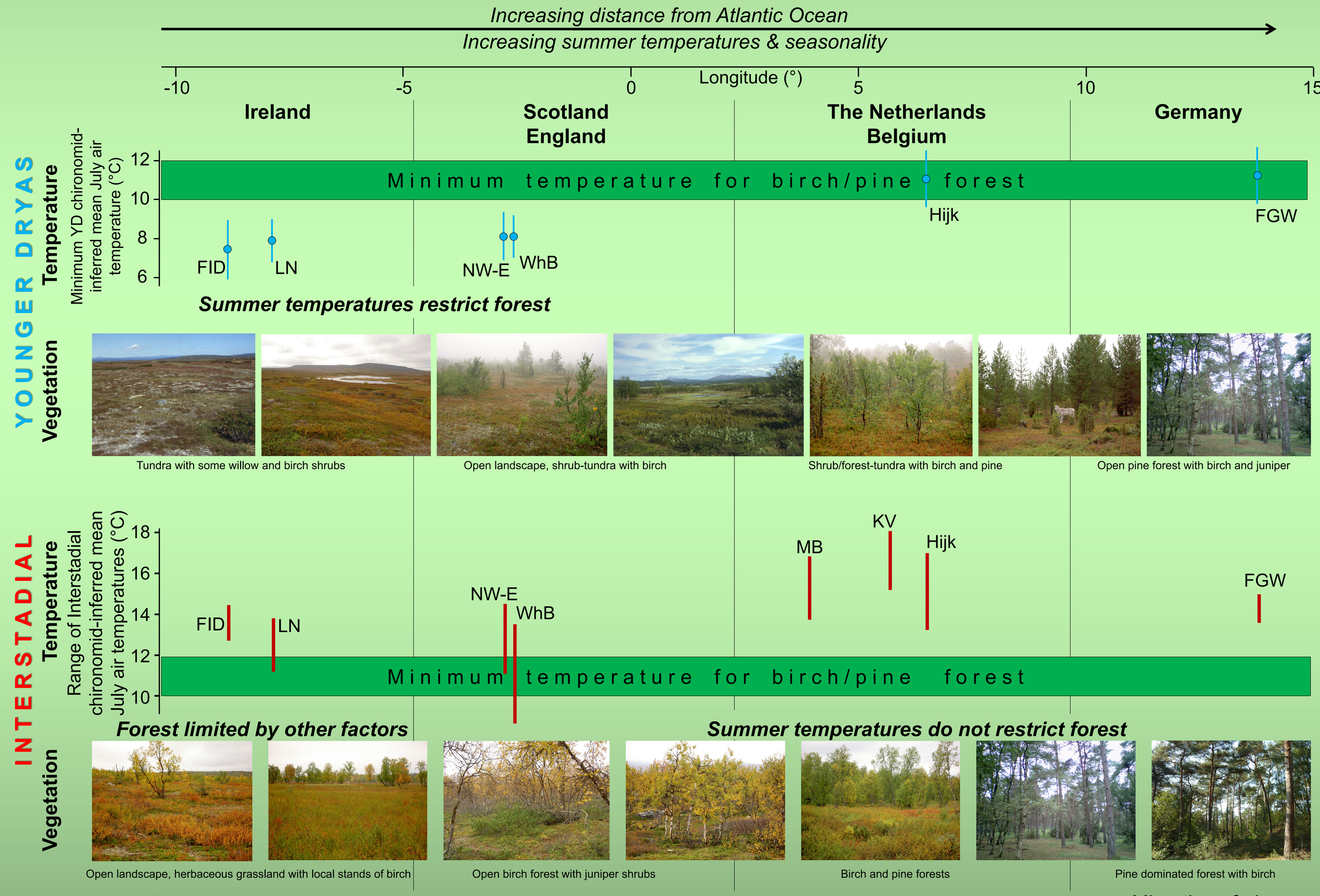
- South of the ice sheets during the Lateglacial period.
- Focus on longitudinal temperature gradient: influence of the Atlantic Ocean
- Narrow latitudinal range to minimise the N-S temperature gradient.

Lateglacial chironomid records



FID: Fiddaun (Van Asch et al., 2012, PPP-315-316)
LN: Lough Nadourcan (Watson et al., 2010, JQS-25)
WhB: Whitrig Bog (Brooks and Birks, 2000, JQS-15)
NW-E: Five northwest-England sites (Lang et al., 2010, QSR-29)
MB: Moerbeke (Gelorini et al., in prep.)
KV: Klein Ven (Van Asch et al., 2013, Bor-42)
Hijk: Hijkermeer (Heiri et al., 2011, QSR-30)
FGW: Friedlander Große Wiese (Van Asch et al., 2012, JQS-27)

RESULTS



CONCLUSIONS AND FURTHER RESEARCH

- Large range of Interstadial temperatures: centennial-scale cold oscillations
- Strong temperature decline during the YD: minimum values are 3-6 °C below average interstadial values.
- Enhanced longitudinal temperature gradient during coldest phase YD ⟹ increased influence of Atlantic Ocean
- Vegetation development reflects a combination of environmental (e.g. migration) and climatic gradients (e.g. summer temperature, seasonality)
- TO DO: include additional chironomid-based temperature reconstructions from this region for more reliable gradient inferences

*[1] Faculty of Geosciences, Utrecht University, the Netherlands. * N.vanAsch.uu.nl@gmail.com*
[2] Institute of Plant Sciences and Oeschger Centre for Climate Change Research, University of Bern, Switzerland.
Pictures by Hanneke Bos, Wim Hoek

Utrecht University
Faculty of Geosciences
NWO
Netherlands Organisation for Scientific Research