# Climate and human impacts on the vegetation in NW Turkey: palynological insights from Lake Iznik since the Last Glacial

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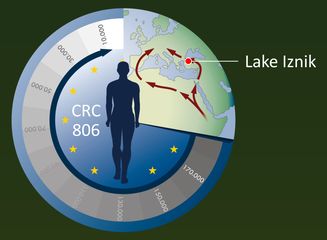


## Objectives

- Reconstruction of the vegetation development in the Marmara region for the last 31,000 years based on palynological investigations
- Detection of climate impacts on the vegetation: rapid climate changes are expected to be registered in the pollen assemblage, because Lake Iznik is located between different climate and vegetation zones
- Detection of human impacts on the vegetation: the eastern Marmara region has a long occupation history and archaeological settlements are in close proximity to Lake Iznik (e.g., Roodenberg & Roodenberg 2008)
- Pollen analysis as an independent proxy for paleoecological reconstructions: geochemical and mineralogical investigations already registered climate related changes of the lake level and the lake mixing during the last 31,000 years (Roeser 2014)

## Regional setting

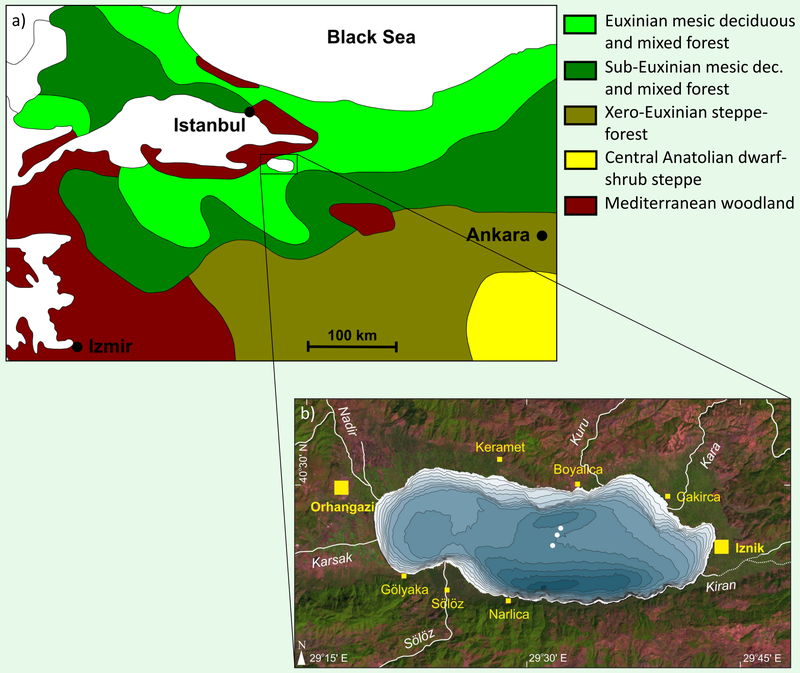


Figure 1: a) Vegetation map of northwestern Turkey after Zohary (1973). Today, the catchment of Lake Iznik is situated in a transitional area between I) (sub-) Euxinian mesic deciduous and mixed forests dominated by deciduous oak (*Quercus*) and beech (*Fagus*), and II) Mediterranean woodland characterized by a high number of drought-resistant and evergreen elements.
b) Lake Iznik with coring locations and bathymetric curves in 5 m intervals after Roeser et al. (2012). The alkaline freshwater lake has a surface area of 313 km², a maximal water depth of 80 m, and is situated 85 m above present mean sea level (Wester 1989).

## Results and discussion

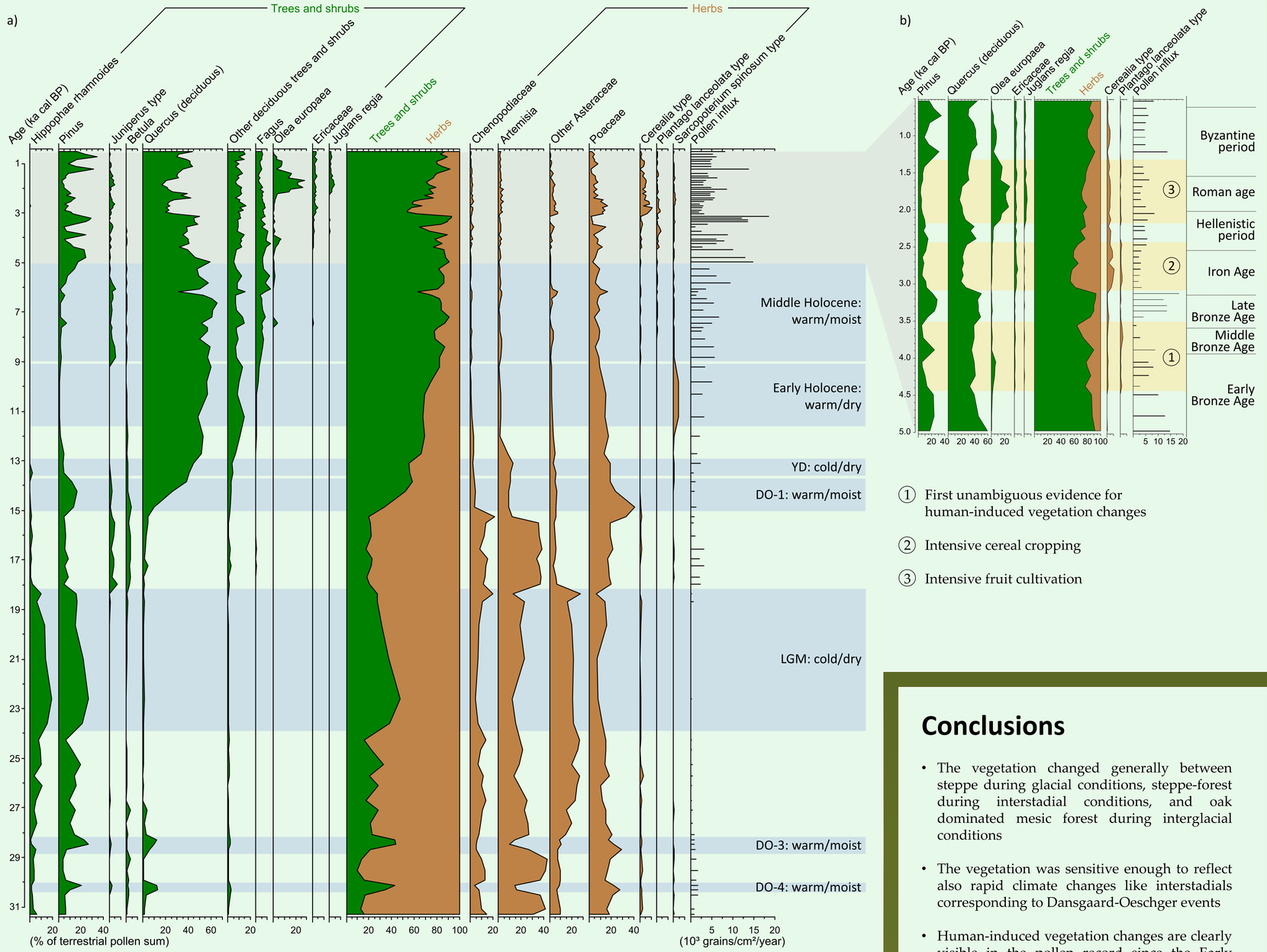


Figure 2: Pollen diagrams inferred from Lake Iznik sediments (analysis: Niestrath & Miebach) with a chronology after Roeser (2014) and Ülgen et al. (2012). a) Overview pollen diagram with climate-induced vegetation changes (DO = Dansgaard-Oeschger event; LGM = Last Glacial Maximum; YD = Younger Dryas. b) Close-up of the last 5,000 years with human-induced vegetation changes.

① First unambiguous evidence for human-induced vegetation changes

② Intensive cereal cropping

③ Intensive fruit cultivation

## Conclusions

- The vegetation changed generally between steppe during glacial conditions, steppe-forest during interstadial conditions, and oak dominated mesic forest during interglacial conditions
- The vegetation was sensitive enough to reflect also rapid climate changes like interstadials corresponding to Dansgaard-Oeschger events
- Human-induced vegetation changes are clearly visible in the pollen record since the Early Bronze Age; different stages of anthropogenic exploitations are apparent

## References

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