Human land-use impacts on land-cover and biodiversity in the British Isles

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Project: *Biodiversity and land-use change in the British Isles*

- European **biodiversity** patterns have been **shaped by humans** over long time-scales, with **deforestation, agriculture, grazing, fire** and **settlement** having significant impacts.

- Biodiversity plays an important role in ecosystem functioning, habitat recovery following disturbance, and resilience to global environmental change.

- Deep-time ecological records can be used to explore biodiversity patterns and trends over multi-millennial time scales across broad regions.

- Leverhulme Trust-funded project aims to use **long-term datasets to reconstruct and explain changing patterns of biodiversity** during the Holocene.
Initial data synthesis

Pollen datasets: European Pollen Database Fyfe et al. (2013: QSR)

Insect faunal data: Smith et al. (2019: Holocene) (2020: JAS)

Archaeobotanical data: ABCD (Tomlinson & Hall, 1991), ADAPT and EUROEVOL (Colledge 2016: J. Open Arch. Data), ArboDAT

Palaeo-demographic data: Bevan et al. (2017: PNAS)
Initial data synthesis
Take-home messages

• **Initial synthesis:**
  • Declining tree cover at start of Neolithic and Bronze Age coincided with increases in population, and open ground insects and cereals since the Bronze Age
  • Vegetation diversity increased when landscapes became more open
  • Important to investigate trends at sub-regional and site specific scales

• **Future direction:**
  • Pollen and archaeobotanical datasets can be used to improve understanding of past relationships, particularly at sub-regional scales, but is dependent on synthesising additional datasets through collaboration
  • To fully understand long-term drivers of biodiversity change, future research needs to focus on amalgamating diverse data types, along with community efforts to harmonise data across broad regions and time scales
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