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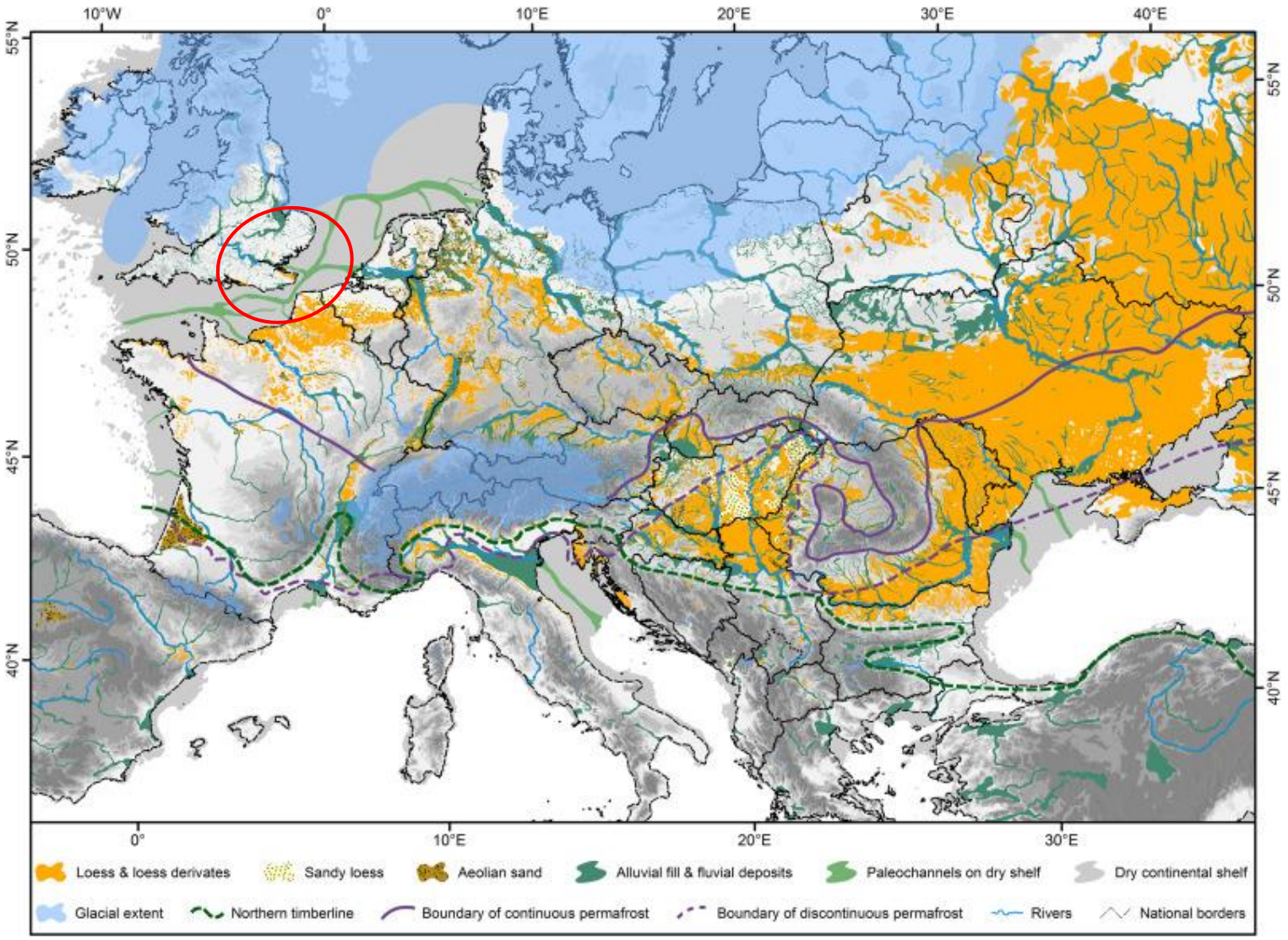
Vetenskapsrådet

Abrupt last glacial loess-dust deposition over southeast England coupled with dynamics of the British-Irish Ice Sheet

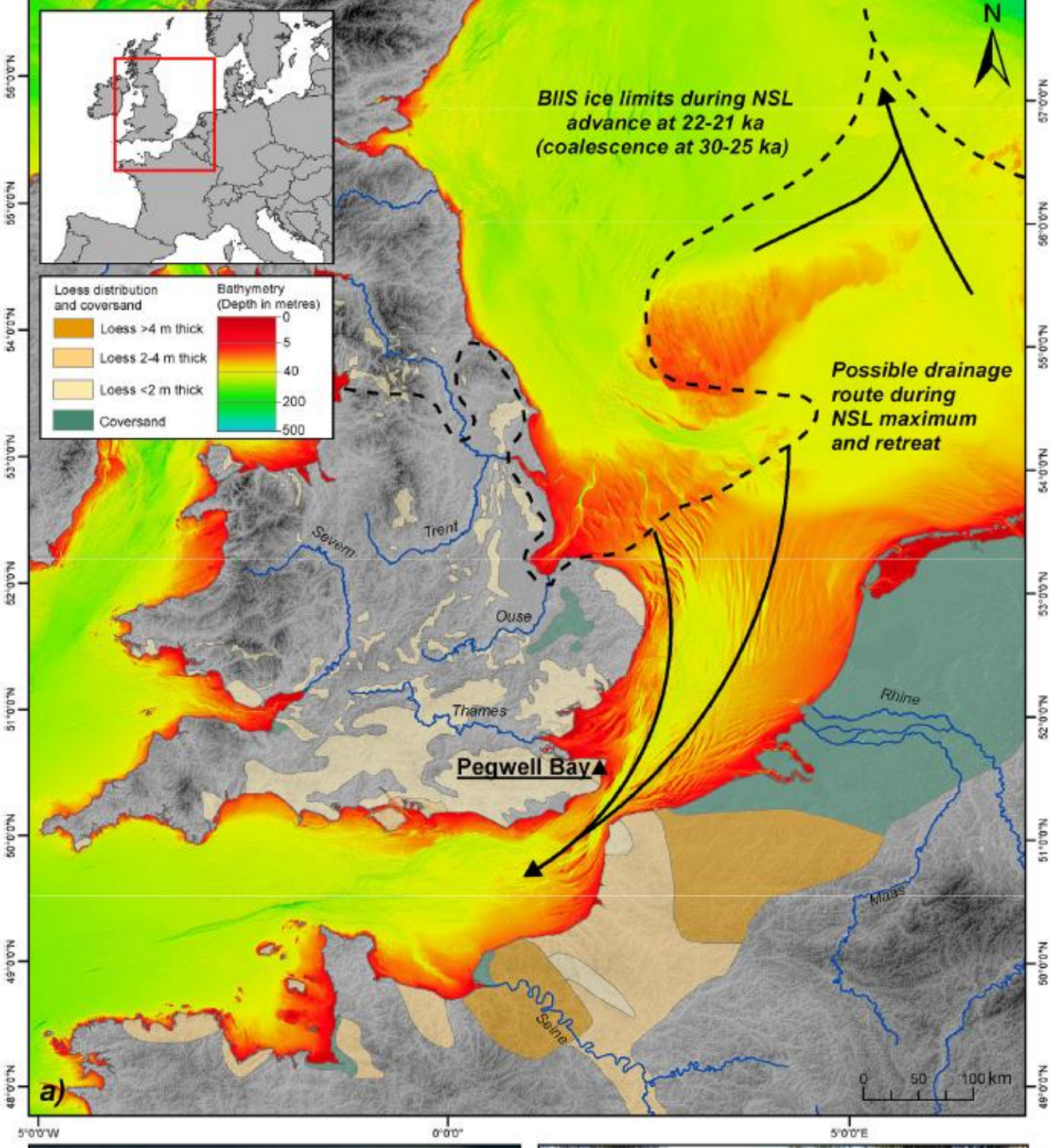
T. Stevens, D. Sechi, B. Bradák, R. Orbe, Y. Baykal, G. Cossu, C. Tsiavaras, S. Andreucci, V. Pascucci

(thomas.stevens@geo.uu.se)

Loess of NW Europe – patchy loess in southeast England

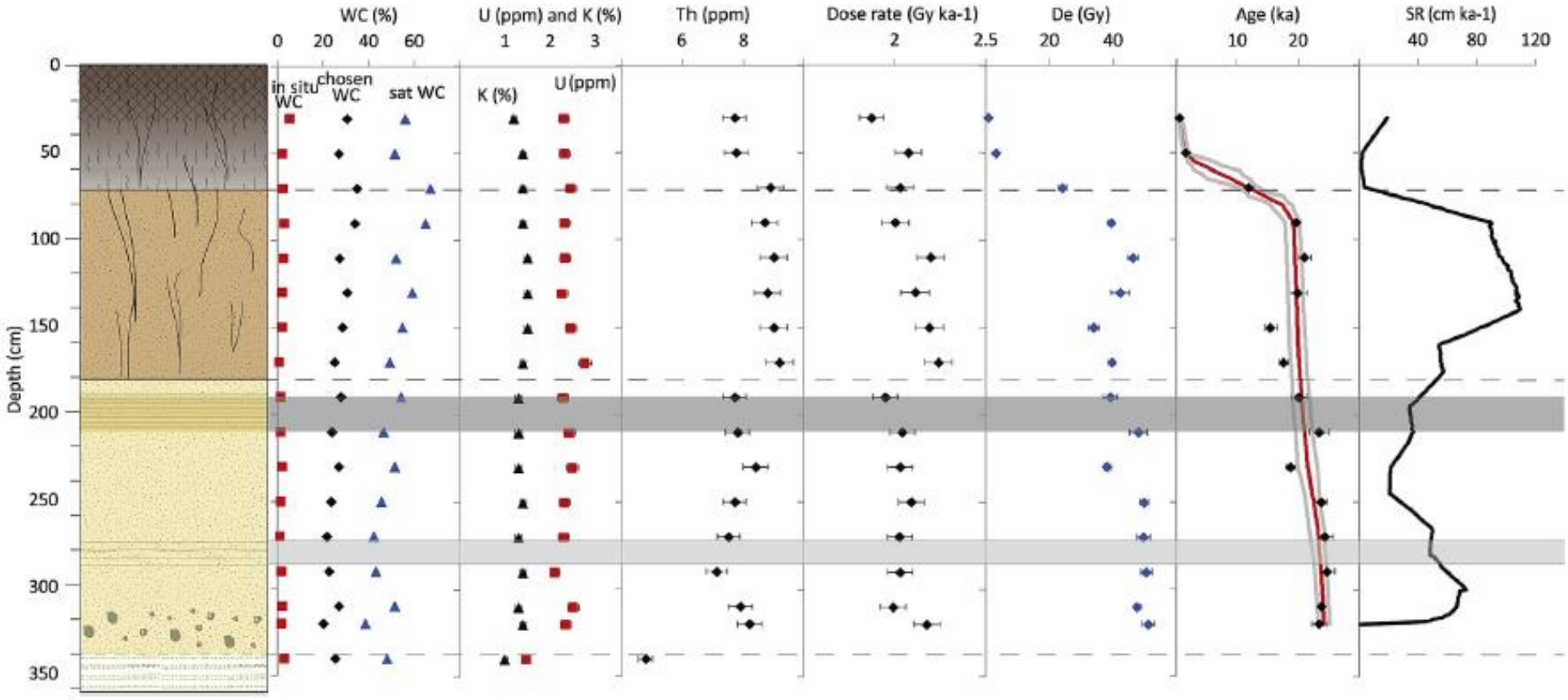


Lehmkuhl et al., 2021, Earth-Science Reviews 215

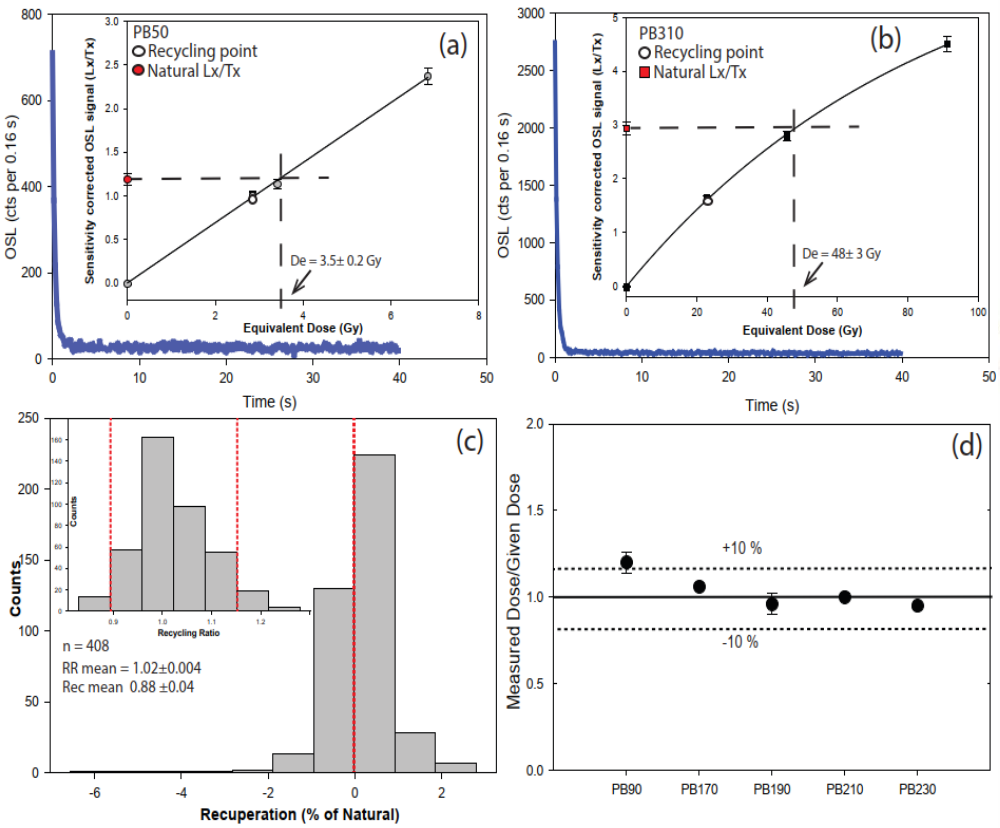


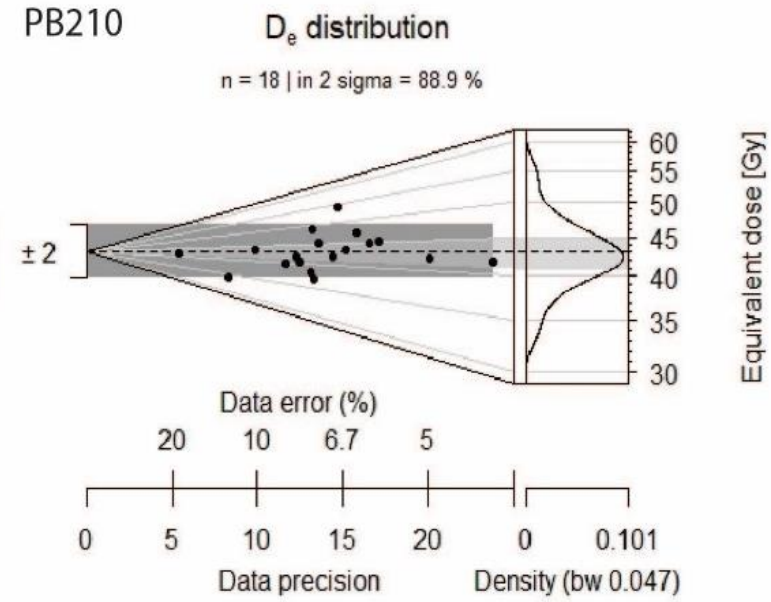


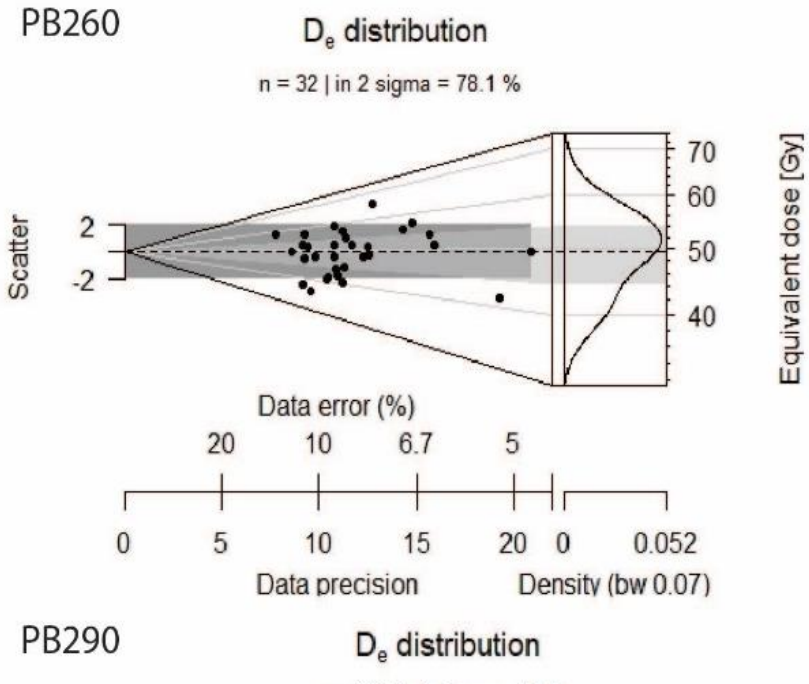
- Loess distribution in Britain
- Thickest in SE England
- 3.5 m of loess at Pegwell Bay, Isle of Thanet, E. Kent
- Best studied UK section
- But not dated in detail!



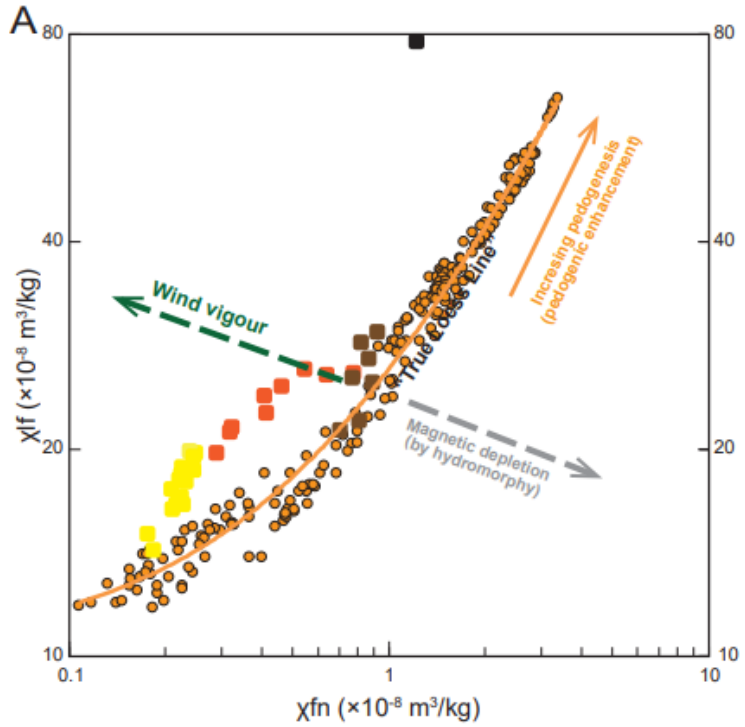
- Stratigraphy: calcareous loess (yellow), non-calcareous loess (brown) and brown earth Holocene soil (grey-brown)
- Detailed quartz SAR OSL dating (63-90µm)
- Bayesian modelling – age v depth model using Bacon (Blaauw and Christen, 2011).
- ***Rapid onset of loess deposition at c. 25 ka***
- ***Two peaks in accumulation: c. 25-23.5 ka and c. 20-19 ka.***
- ***Cessation or near cessation of loess deposition soon after***

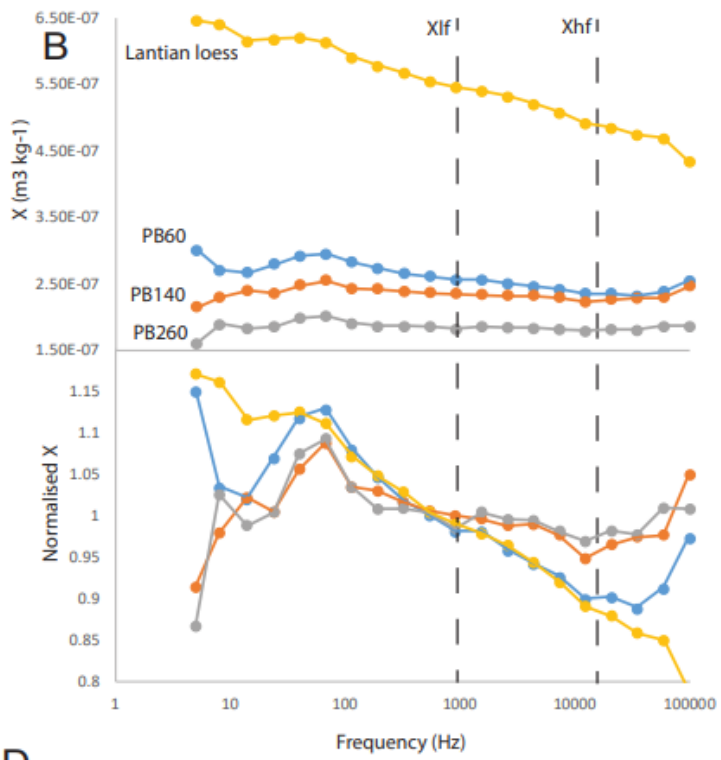


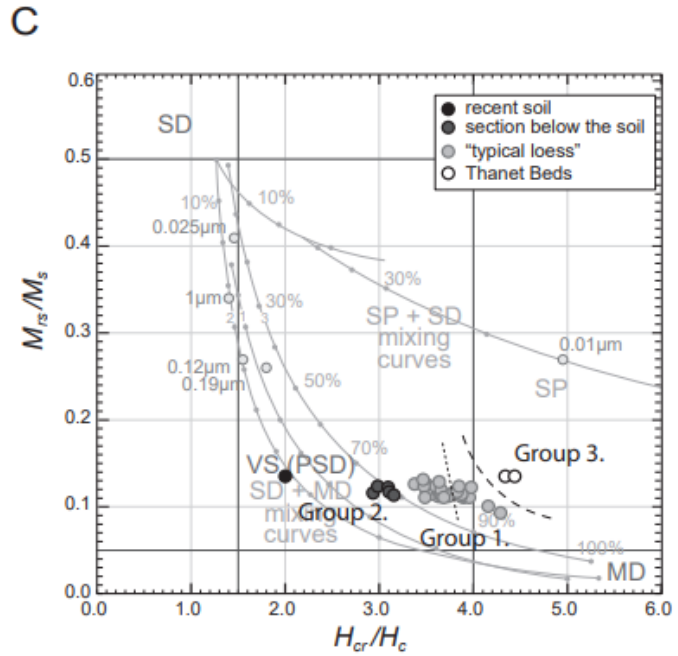


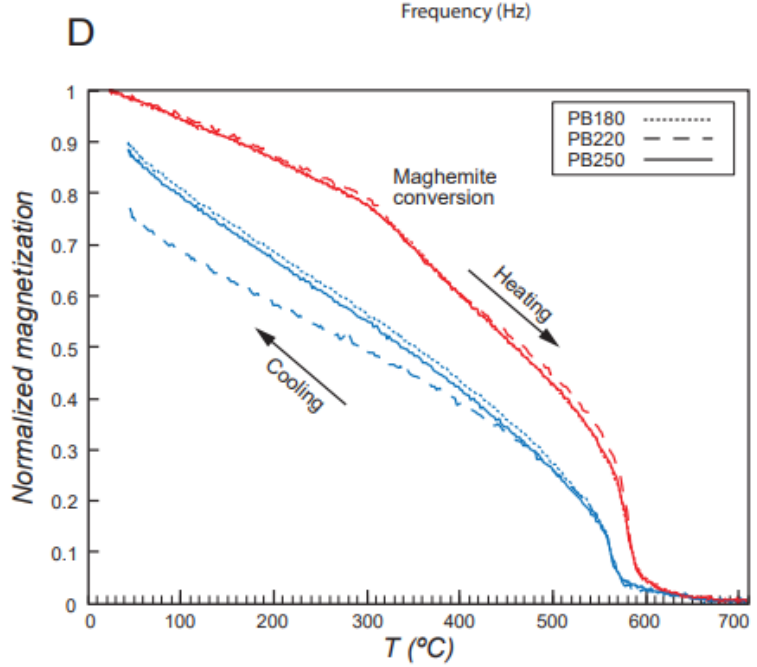


- Quartz is fast component dominated
- Passes internal tests (SAR)
- De distributions are broadly normal



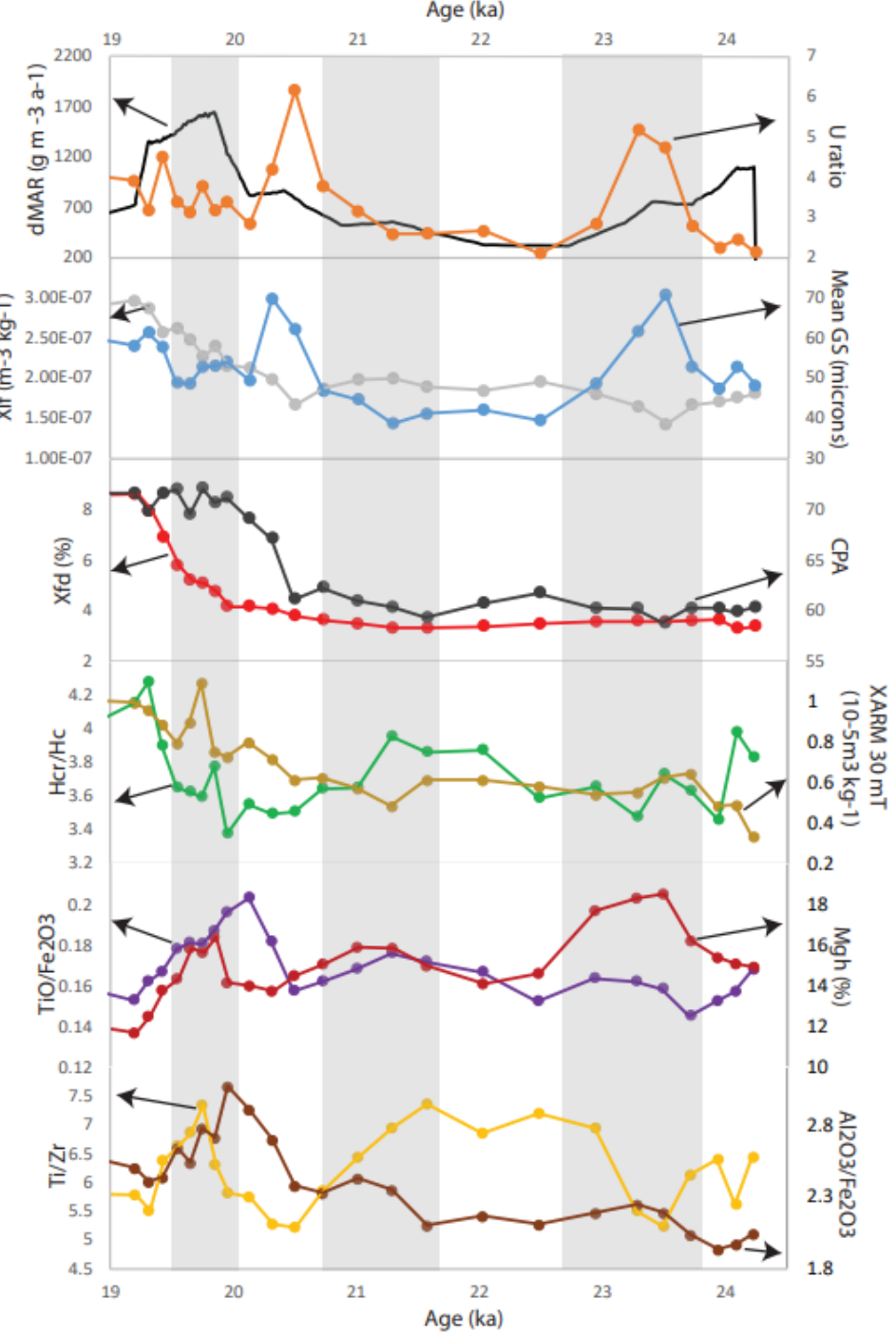




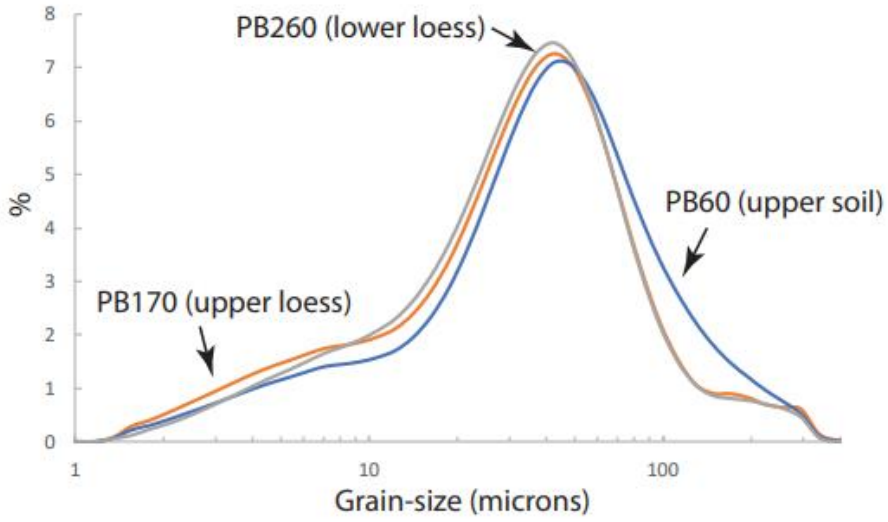


Detailed rock magnetic analysis presented in Stevens et al., 2020.

Including frequency dependent MS, hysteresis, coercivity, temperature dependent MS, broad-band frequency dependent MS

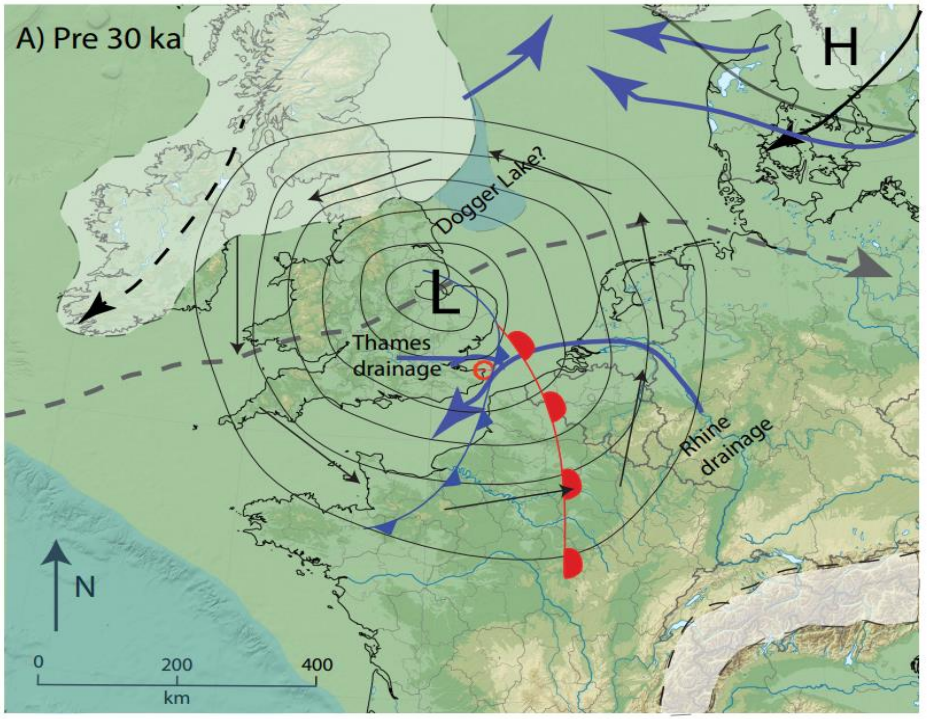


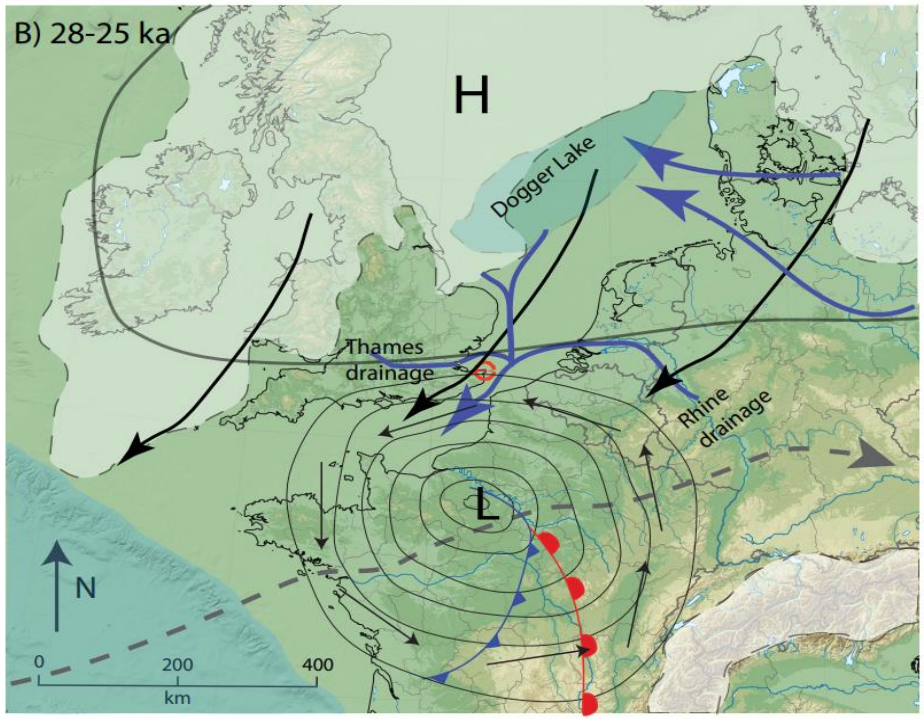
- Climate/environment proxies plotted by luminescence age model age
- Dust MAR (top, black line) and GS distributions calculated
- Geochemical, enviromagnetic, grain size and dust MAR show some coupled variation



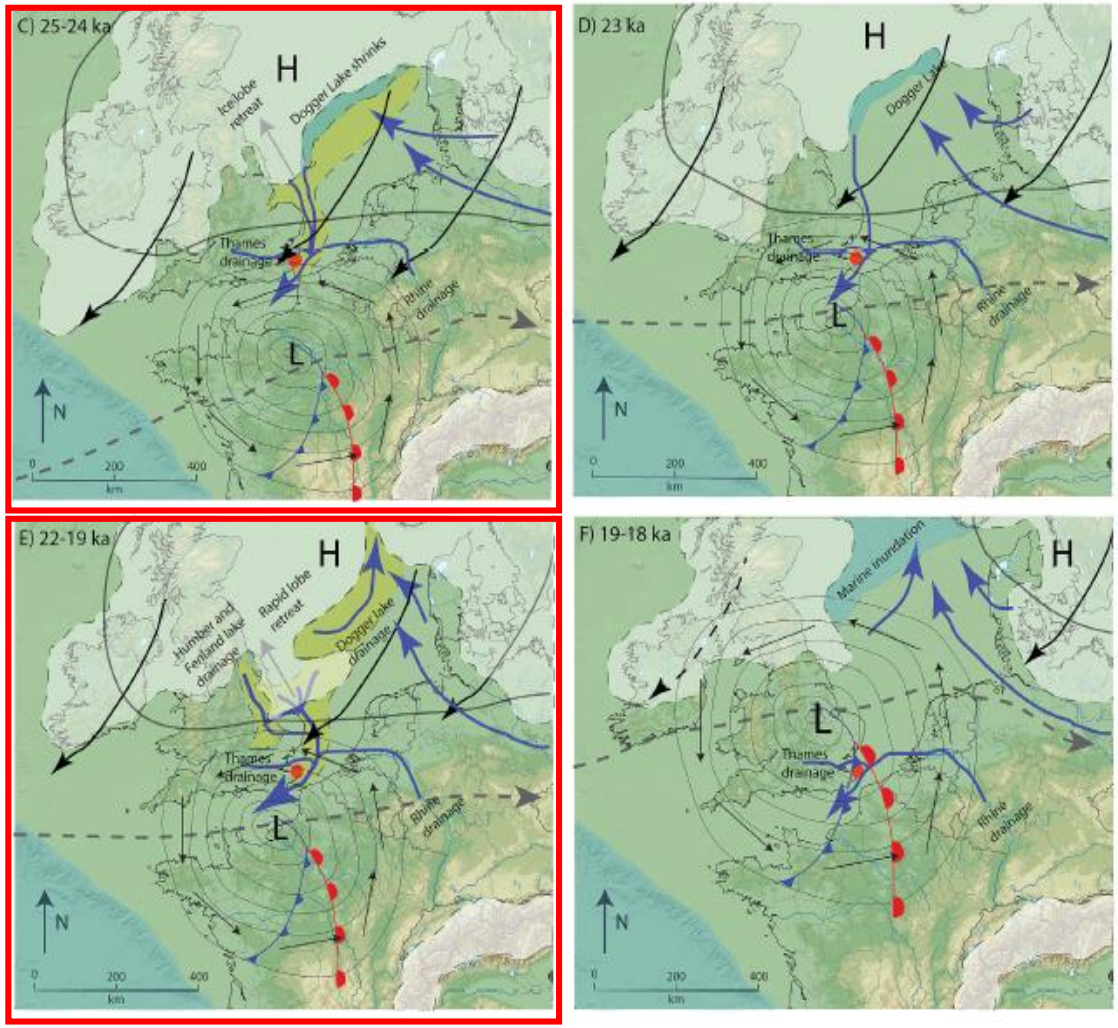
Dust-loess deposition closely coupled to ice sheet dynamics and drainage

- Age model allows construction of event time line…
- Onset of dust accumulation requires coupling of British-Irish and Fennoscandian Ice Sheets
- Reroutes meltwater drainage south via S. North Sea and Channel
- Abrupt increase in sediment availability in S North Sea area





Event time line – two enhanced dust accumulation phases



- Two phases of enhanced dust accumulation (red) coincide with surge and retreat of the North Sea Lobe (NSL) of the British-Irish Ice Sheet
- Advance and retreat of NSL causes outburst floods, glacial lake damming and drainage
- Meltwaters penetrate into southern North Sea basin
- Meltwaters sediment rich; easterly winds provide near source transport mechanism
- <u>Ice sheets and drainage control last glacial dustiness in SE England</u>

Thanks for reading! For more info please see:

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Abrupt last glacial dust fall over southeast England associated with dynamics of the British-Irish ice sheet

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