











*Acknowledgements.* We thank Arnold van Dijk for analytical support and Gert-Jan Reichart (Utrecht University) for discussions. DRG's research is supported by NSERC (Canada). AS thanks the European Research Council under the European Community's Seventh Framework Program for funding through ERC Starting Grant #259627. Author Contributions: J. S. Eldrett conducted palynological analyses; D. R. Greenwood carried out bioclimatic analyses; M. Polling conducted isotope analyses; J. S. Eldrett, D. R. Greenwood, H. Brinkhuis and A. Sluijs co-wrote the paper. The authors declare no conflict of interest. This article contains supporting information online at <http://www.climate-of-the-past.net/home.html>.

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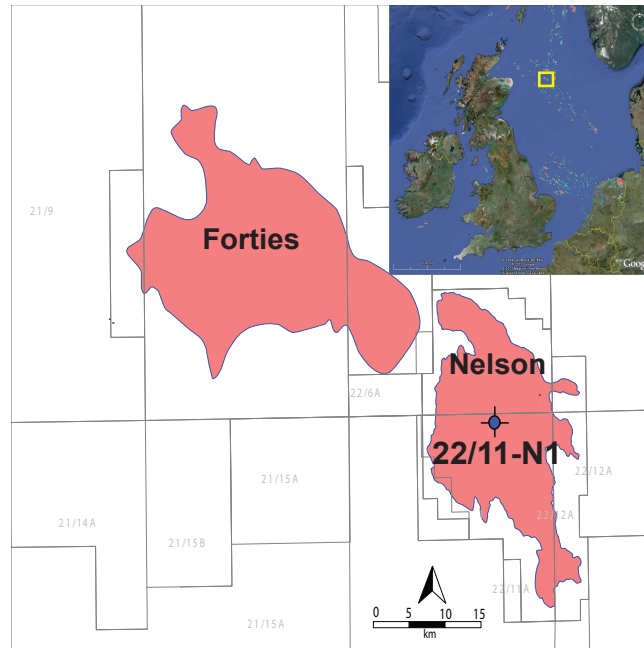
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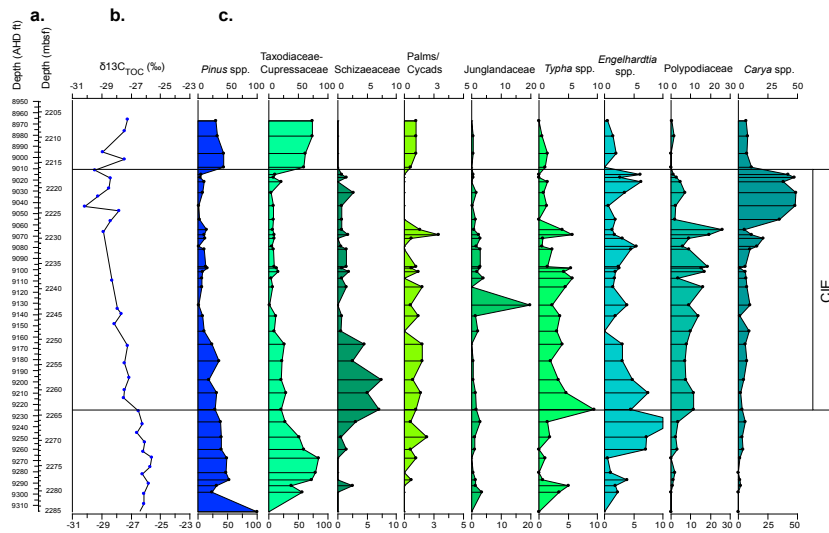
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5850



**Fig. 1.** Location map of well 22/11-N1, Nelson Field, Central North Sea (CNS). Coloured polygons representing oil and gas fields.

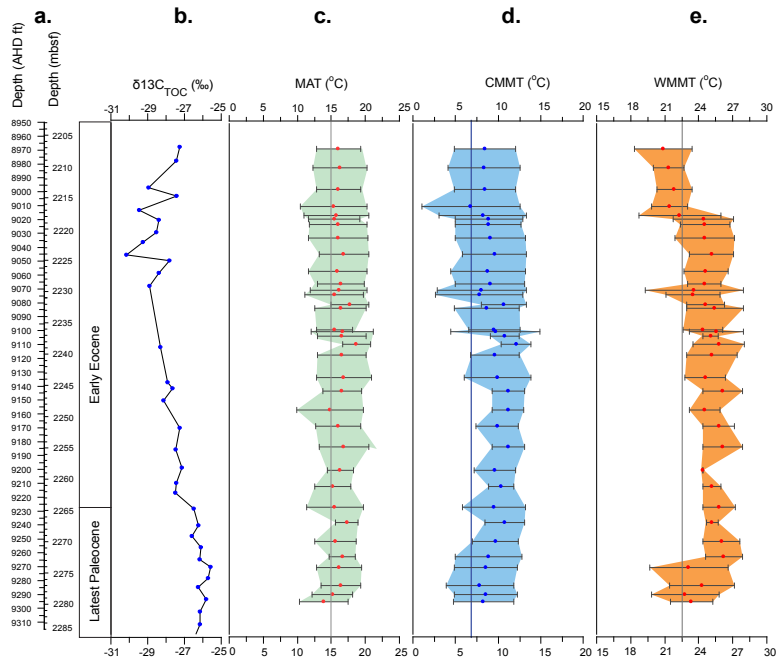
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**Fig. 2.** Data from well 22/11-N1. (a) Carbon isotope data ( $\delta^{13}\text{C}_{\text{TOC}}$ ), (b) selected spore and pollen percentage abundance.

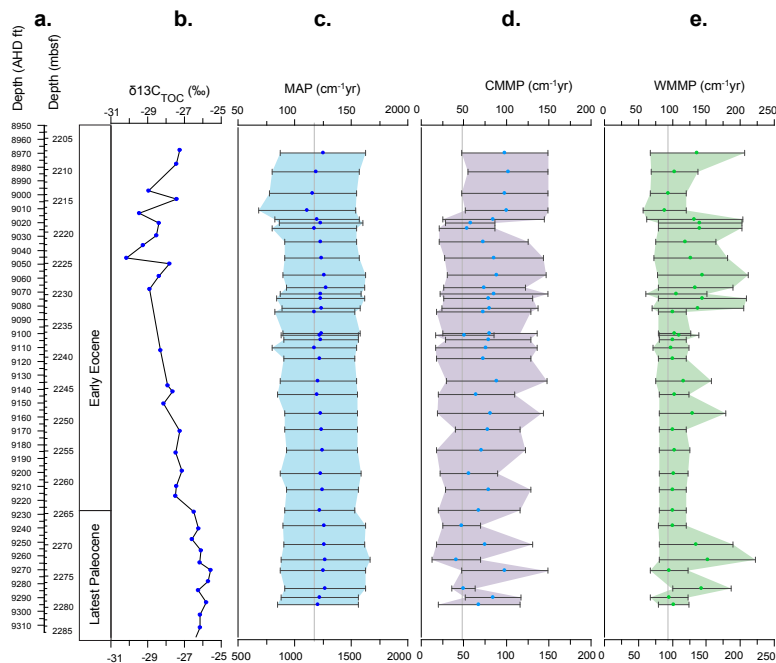
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**Fig. 3.** Record of Paleocene-Eocene temperature data from well 22/11-N1. **(a)** Depth and age, **(b)** carbon isotope data ( $\delta^{13}\text{C}_{\text{TOC}}$ ), **(c)** MAT; **(d)** CMMT; **(e)** WMMT. **(c–e)** Horizontal error bars and shaded area represent the minimum and maximum estimate returned from the method.

5853



**Fig. 4.** Record of Paleocene-Eocene precipitation data from well 22/11-N1. **(a)** Depth and age, **(b)** carbon isotope data ( $\delta^{13}\text{C}_{\text{TOC}}$ ), **(c)** MAP; **(d)** CMMP; **(e)** WMMP. **(c–e)** Horizontal error bars and shaded area represent the minimum and maximum estimate returned from the method.

5854