

Fact Sheet

The Vindolanda Trust is collecting high quality, complex, large amounts of data with the specific goal to understand how the changing climate is impacting buried archaeology. We do so primarily through a set of probes buried at both our sites.

What are the probes measuring?

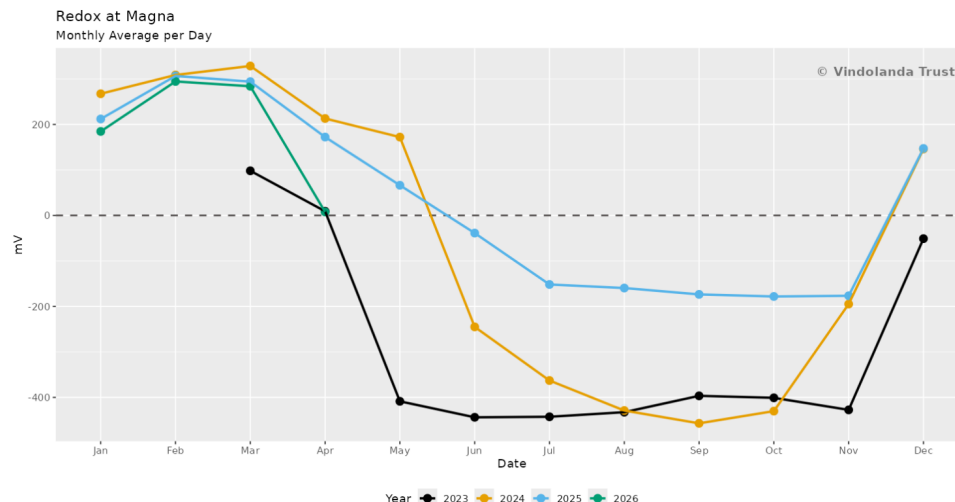
At Vindolanda and Magna Roman Forts, underground probes record soil moisture, pH and oxidation-reduction potential (as well as many other datapoints) every 15 minutes at multiple depths. The probes were installed after changes in organic artefact preservation were observed, and need little human intervention once set to task. We use the data to understand what changes are happening below the soil and how to best react to them.

What is the difference at the two sites?

The probe at Magna is inserted in a peatland environment in the north field, away from the fort platform. A second set of probes has now been installed in the southern ditch of the fort. The data from Magna fluctuates seasonally between aerobic and anaerobic. The Vindolanda probes are inserted in different environments: ditches, ramparts, roads. The data from them fluctuates more erratically, with switches between aerobic and anaerobic environments in a way that is even more reactive to weather changes above ground.

What is the impact of extreme weather patterns?

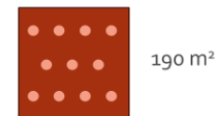
As the climate shifts, the UK is experiencing more extreme weather: warmer, drier, longer summers and more sudden, high volume rains. These sudden events have an impact underground, changing the soil conditions and putting fragile organic artefacts at significantly greater risk of deterioration.



Redox (oxidation-reduction potential) measurements 2023 - 2026 at Magna Roman Fort

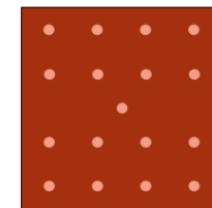
Writing Tablets

- 2017: 11 writing tablets found in 190 m²
- Period IV, c. 105-118 CE



190 m²

- 2023: 17 writing tablets found in 350 m²
- Only period I and II, c. 85-100 CE



350 m²



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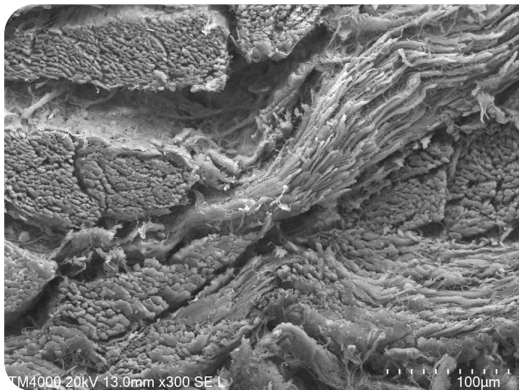
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What will we lose and why?

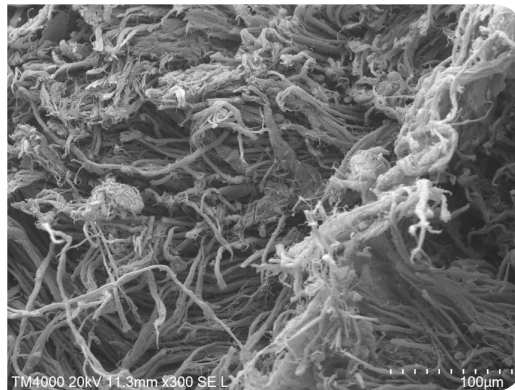
Research at Vindolanda shows that soil conditions are changing and this is affecting the preservation of organic artefacts. The last textile was excavated in 2018. Studies of leather objects show increased cellular degradation since the 1990s. Some sturdier artefacts will still be found, but many may survive in poorer condition, risking the loss of important evidence about life 2,000 years ago.

What is so special about the Trust's climate work?

So far, we are the only site on Hadrian's Wall to have installed probes to empirically measure the impact of climate change on our buried heritage. We are committed to maintaining the probes for at least 10 years, thus making sure we satisfy the need for continuous long term data rather than occasional measurements. Data is great, but you also need someone to read it and interpret it. The Trust is committed to partnerships with research entities who will help us to do just that.



Modern cow submerged in acid solution for three weeks.



Modern cow submerged in alkaline solution for three weeks.

How are we changing policy?

Archaeology has long followed the principle from the Valletta Convention (1992) that *'if it is buried, it is safe'*. New evidence shows this is no longer always true. Changing soil conditions mean some buried artefacts are deteriorating even without excavation. Current research aims to understand these changes and help develop new approaches to protecting vulnerable archaeological remains.



'Climate change is a myth'

While it is important to understand why the climate is different now than in the past, research at the Trust is focusing more on the impact of such changes on archaeology. The changes in the soil conditions mean we are losing organic artefacts and what they tell us about life 2,000 years ago. For the first time, humans have the opportunity to have a positive influence on the impacts of climate change. We can research, excavate, and manage sites in a sensitive way, prioritising what we are likely to lose. We can also look at the ecology of our sites, and try and mitigate the impact soil changes are having.



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