

The Vyne, the Weather and Tree Rings

Today, we can measure the atmosphere using instruments on the ground, on boats, on ocean buoys, on aeroplanes, on satellites and with radar. But if we want to know what the weather was doing before we had these sorts of instruments, we have to look at other ways temperature and rainfall are recorded.

Trees respond to the weather – and they can live a long time, recording the weather over tens or even hundreds of years in their annual growth rings. What’s more, wood from trees which lived a long time ago can be found in old furniture, in houses and ships and also preserved in lakes, permafrost or bogs.

Look at the stump of a recently felled tree, and you’ll see the rings – one pair of light and dark rings for each year of the tree’s growth. The tree grew light coloured wood in spring and early summer, and dark coloured wood in late summer and autumn.

Oak trees are particularly useful –they live long and were well used in houses and ships, particularly in Medieval times.

By looking at the wood in the growth ring, we can analyse the carbohydrates that the tree made using photosynthesis. The ratios of the different isotopes of carbon in the ring, for example, can tell us how fast photosynthesis was occurring. That relates to summer sunshine and temperature. In a similar way, the ratios of the different isotopes of oxygen in the ring can tell us how wet the summer was.



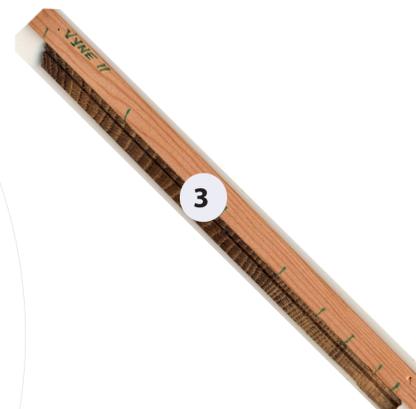
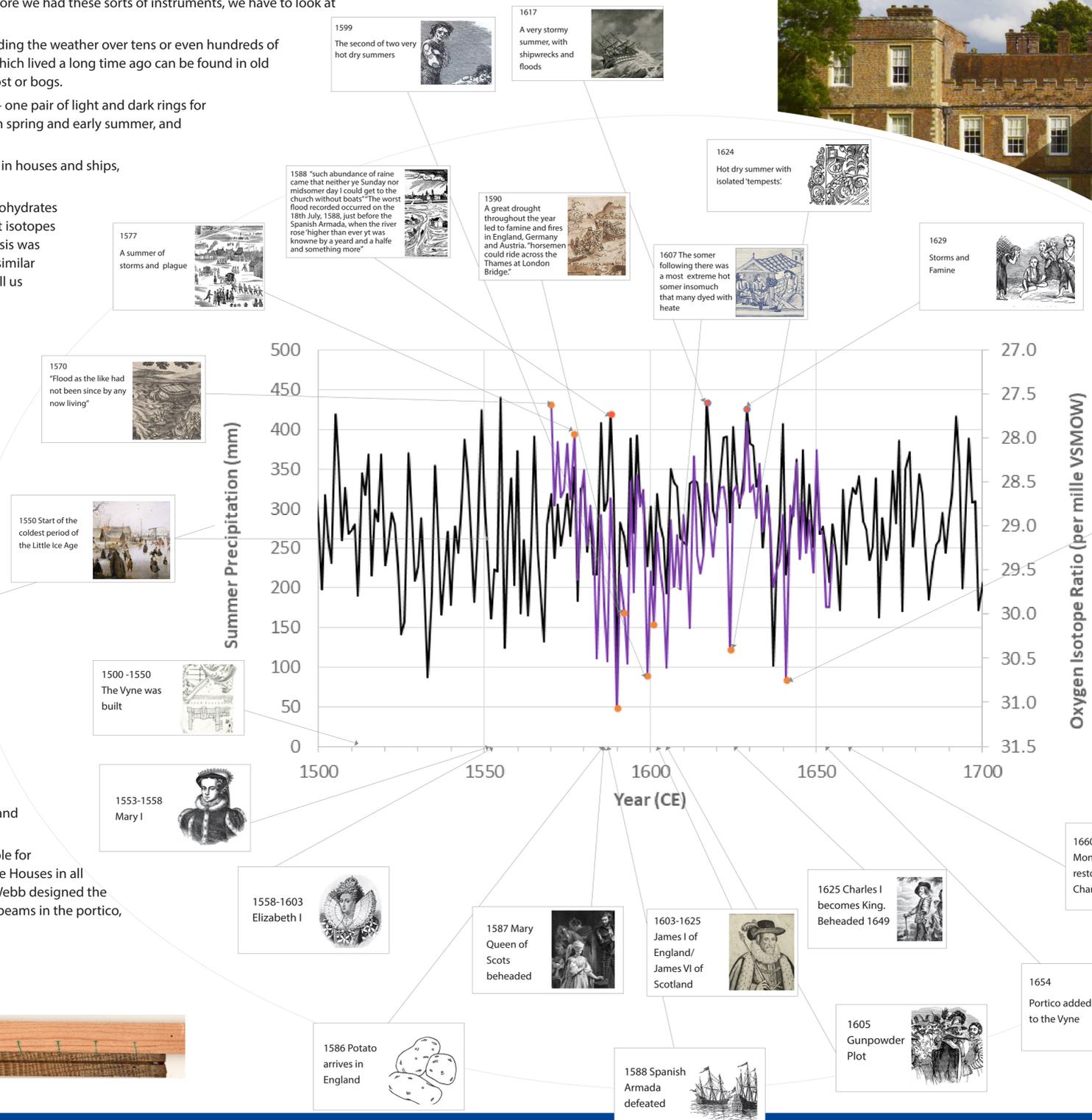
Credit: National Trust Images, Arnhel de Serra

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Key to Images

- 1 The Vyne, Hampshire
- 2 Vyne portico roof north end truss
- 3 Wood sample from the truss
- 4 Wood sample from the truss

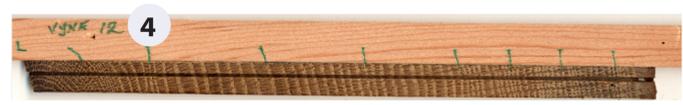
Graph showing the relationship between oxygen isotopes measured in a sample of tree-rings from the portico of The Vyne, Hampshire (purple) and reconstructed summer precipitation (mm) for the south central England region (black).



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The Vyne in Hampshire is a Tudor palace over 500 years old, now in the care of the National Trust. It's been visited by Tudor kings, holds the ring that inspired Tolkein to write "the Lord of the Rings" and was home to evacuees during the 2nd World War.

William Sandys, Lord Chamberlain to King Henry VIII, was responsible for turning a collection of medieval buildings into "one of the Principale Houses in all Hamptonshire". After ownership passed to the Chute family, John Webb designed the classical portico in 1654. Our wood sample comes from one of the beams in the portico, from a tree felled the year the portico was constructed.



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For teaching resources linked to using tree rings to study past climate change go to <http://www.metlink.org/secondary/using-tree-rings-for-past-weather-and-climate>