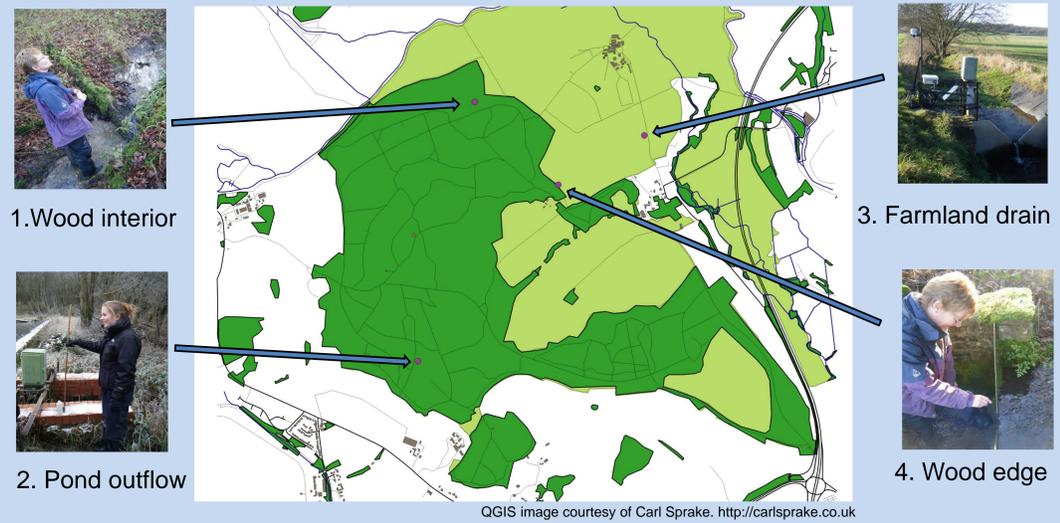


Introduction

- The Environmental Change Network (ECN) is the UK's long-term, integrated environmental monitoring and research programme. It has been collecting, managing, analysing and interpreting environmental data of air, soil, water, fauna and flora at over 50 freshwater and terrestrial sites since 1992. The ECN datasets are a unique national resource, improving our understanding of how and why environments change.
- Wytham Woods is one of the twelve terrestrial ECN sites and is one of the most researched woodlands in the world. Equal areas of ancient and secondary woodland as well as plantations make up the woods, which measures approximately 400 ha.
- The ancient woodland has, to our knowledge never been cleared, there has been continuity of tree cover since the prehistoric 'wild wood'.
- Secondary woodland (NVC W8, *Fraxinus excelsior* - *Acer campestre* - *Mercurialis perennis*) has grown up naturally in the last 200 years after the abandonment of wood pasture, pasture or cultivation.
- The oldest plantations are beeches and some date back approximately 200 years, but most are 50 - 60 years old.

Methods

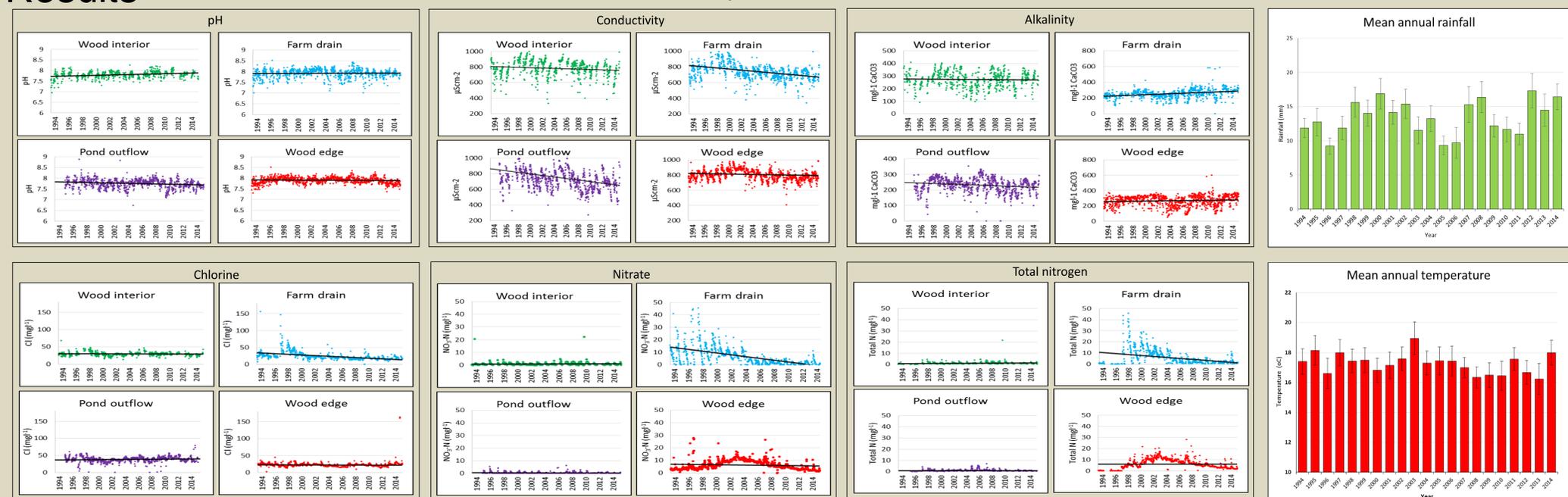
- Four water courses were chosen for this study:
 - Spring fed stream within ancient woodland
 - The outflow from a pond
 - The extension of the spring fed stream as a farmland drain
 - Spring fed stream on the edge of the wood
- 250ml of flowing water was collected weekly and analysed for pH, conductivity, alkalinity, sodium, potassium, calcium, magnesium, iron, phosphate, nitrate, chlorine, sulphate, dissolved organic carbon and total nitrogen.



Results

Water chemistry

Climate



Summary

- Over the past 20 years there has been no long-term change in the abundance of the majority of target ions in the four water courses. However there were changes in trends in conductivity, alkalinity, chlorine (Cl^-), nitrate (NO_3^-) and total nitrogen (N).
- There was a decreasing trend in conductivity (an indicator of the concentration of dissolved electrolyte ions) at all sites. This was most obvious for the pond outflow and farm drain. There was a temporary increase in the stream sampled at the woodland edge and the farm drain around 2000.
- The alkalinity in the farm drain and the wood edge increased over time, but slightly decreased in the pond outflow and the wood interior.
- For Cl^- , NO_3^- and total N, there was no upward or downward trend in the pond outflow or wood interior water courses.
- In the farm drain and wood edge there was a rise in NO_3^- and total N in the early 2000s. In the farm drain there was a rise in Cl^- in the late 1990s.
- The observed site differences in water chemistry are most likely due to human influence. Changes were largely due to agricultural practices and woodland management. Between 1995 - 2001 pits for the disposal of culled animals were dug uphill of the wood edge stream. In 2001 farm management changed from conventional to organic resulting in a cessation of artificial fertiliser application to pasture and arable land.

ECN is a multi-agency programme sponsored by: Agri-Food and Biosciences Institute, Biotechnology and Biological Sciences Research Council, Countryside Council for Wales, Department for Environment, Food and Rural Affairs, Defence Science Technology Laboratory, Environment Agency, Forestry Commission, Natural England, Natural Environment Research Council, Northern Ireland Environment Agency, Scottish Environment Protection Agency, Scottish Government, Scottish Natural Heritage and the Welsh Government. A full list of ECN sponsors and research partners is shown on the ECN website.