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Methods: sediment coring



Methods: sediment analysis

Total P and other element concentrations by EDXRF (Bruker S2 Ranger) at Liverpool



Total C and N, and isotopes of C and N have been measured commercially.



Organic matter by TGA at Liverpool (Perkin Elemer STA6000)

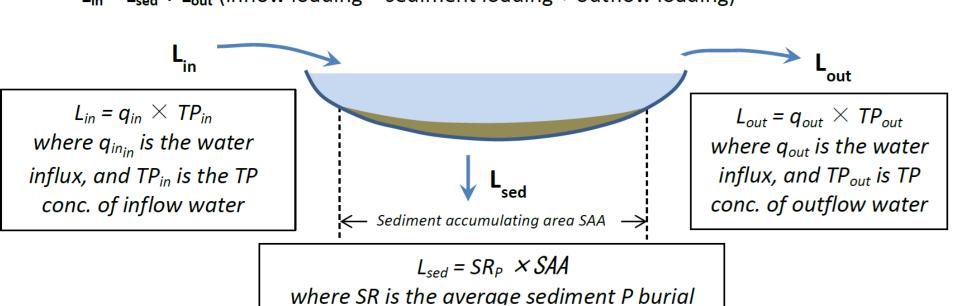
²¹⁰Pb by gamma assay at UCL (Ortec HPGe GWL series well-type germanium detectors)



Methods: from core to lake

Lake P fluxes (or loadings, L) in a box model

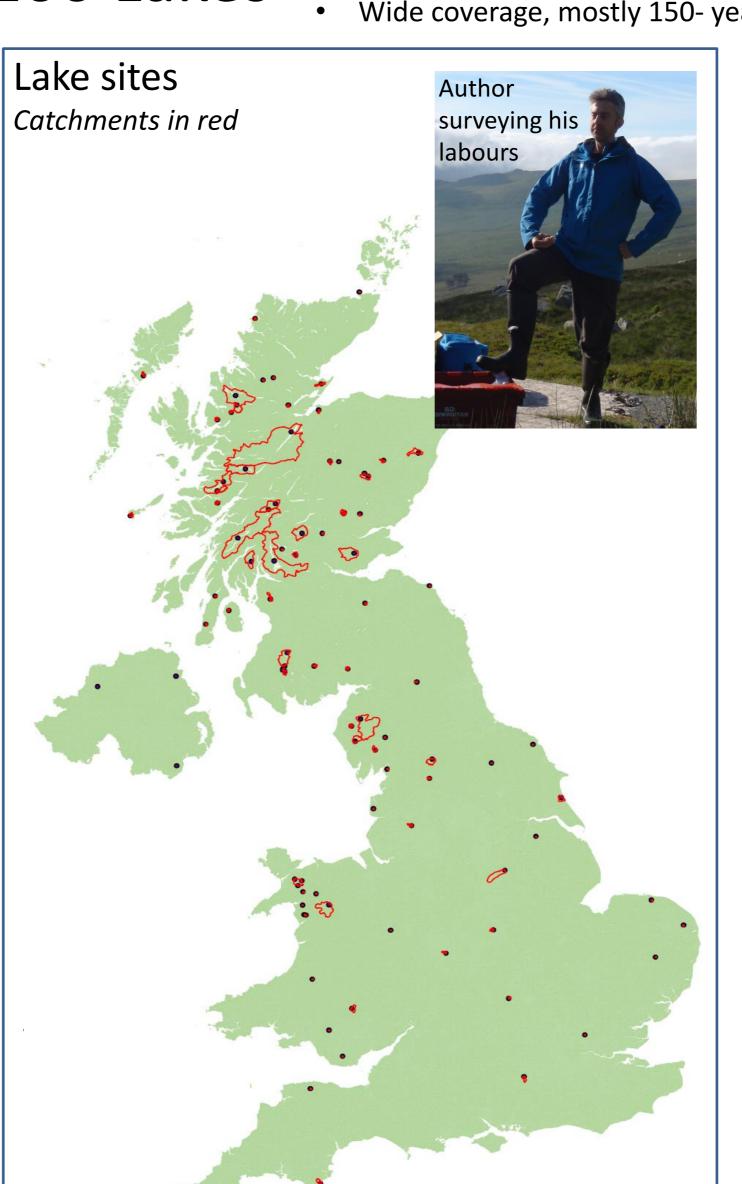
 $L_{in} = L_{sed} + L_{out}$ (inflow loading = sediment loading + outflow loading)

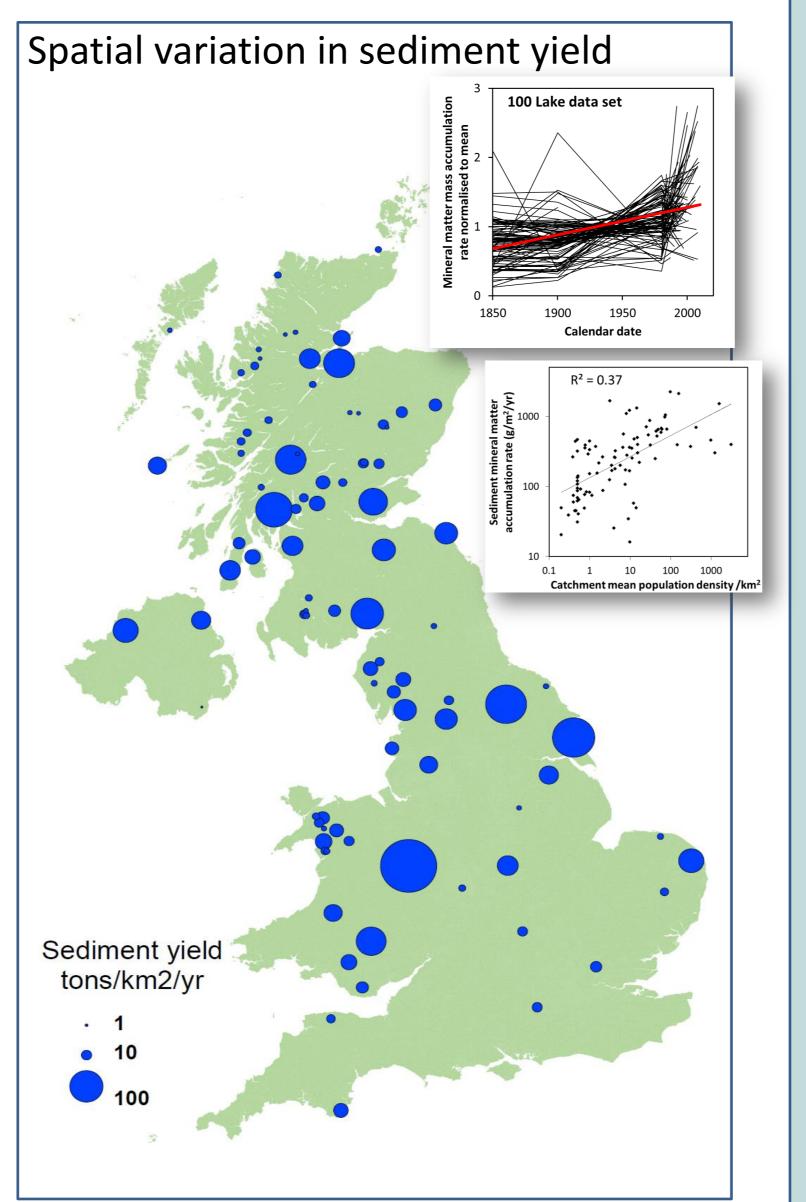


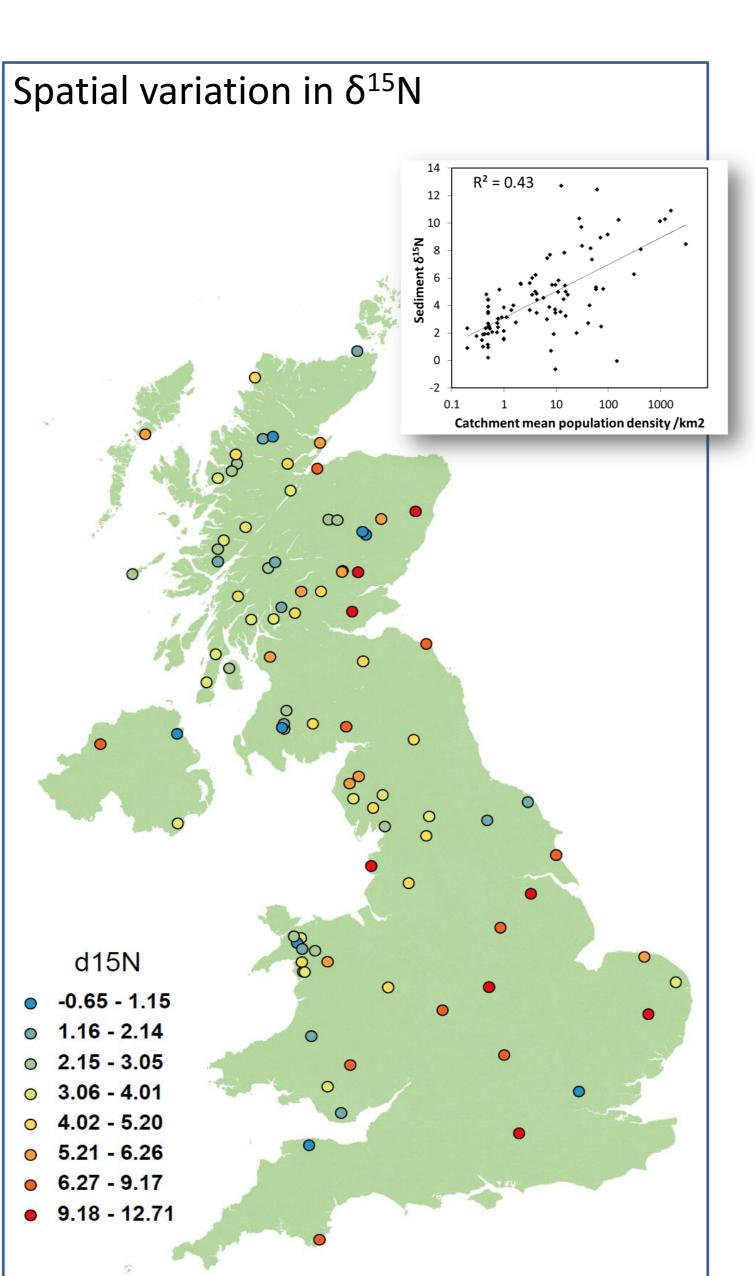
- 1. Catchment P yield = L_{in} ., where $L_{in} = L_{sed} + L_{out}$
 - a. L_{sed} (= $SR_P \times SAA$) is estimated from sediment cores
 - b. Lout is approximated using the empirical model of Kirchner and Dillon (1975)
- 2. SR_P is estimated using the Håkanson model, based on a linear relationship of local P burial rate with local water depth
- 3. SAA is estimated using the Håkanson model, based on effective fetch and local water depth

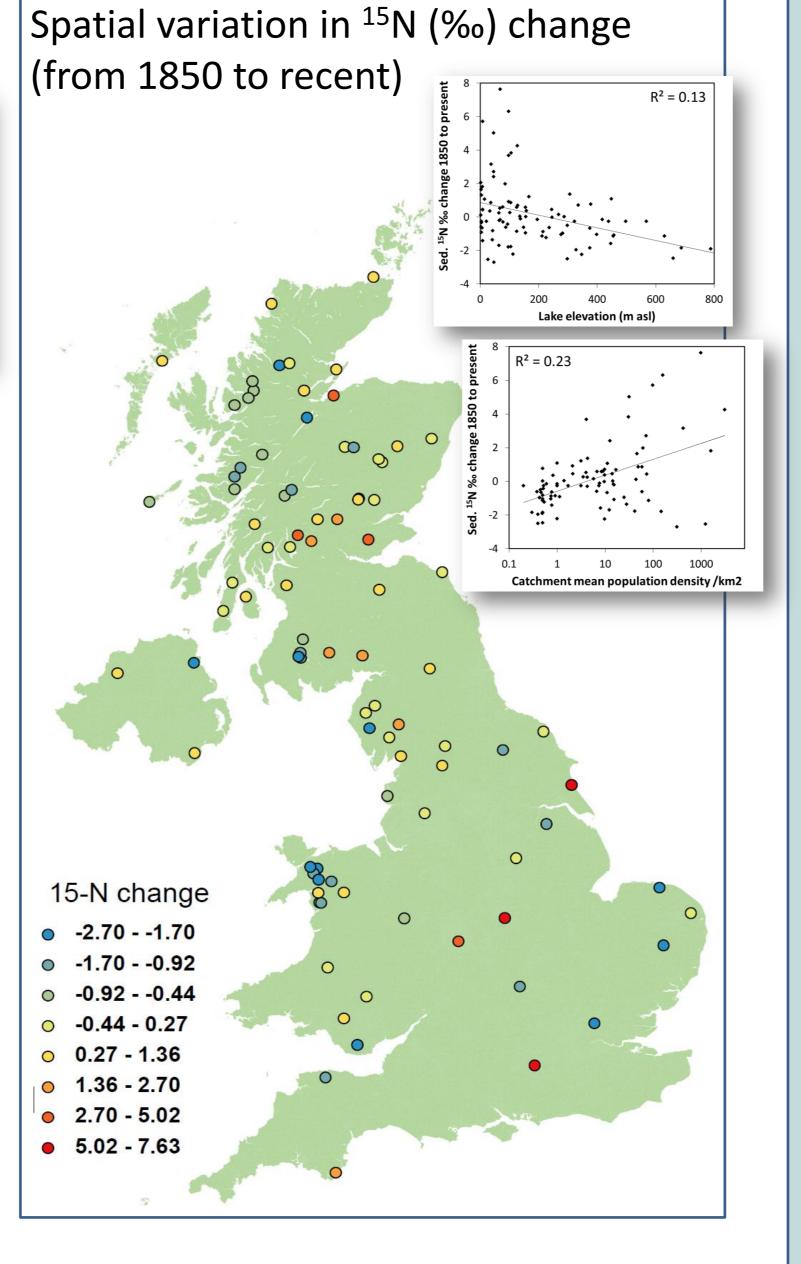
100 Lakes

Exploiting an existing resource – the UCL sediment core archive (²¹⁰Pb dated, diatom counts)
 Wide coverage, mostly 150- years extent, but low temporal resolution, single core per lake



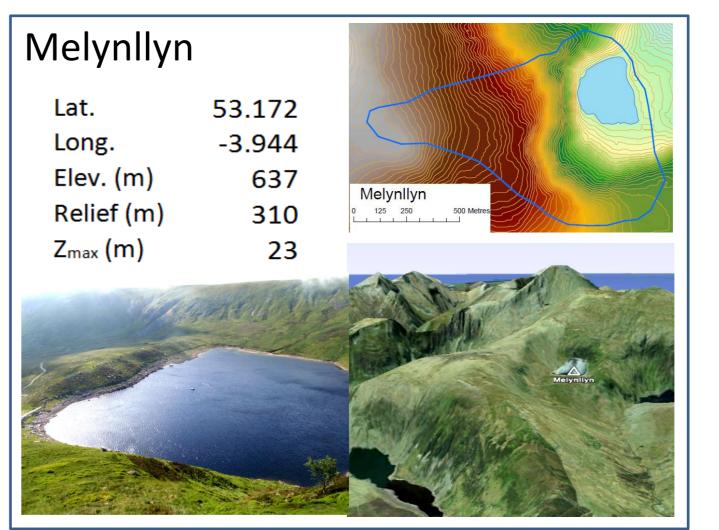


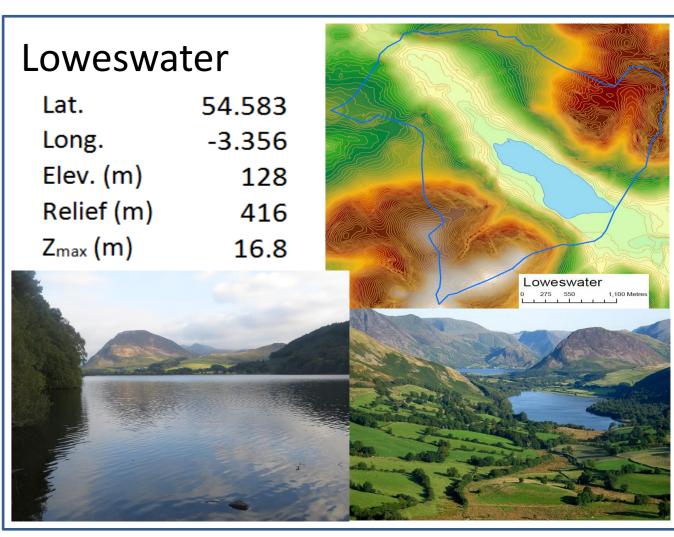


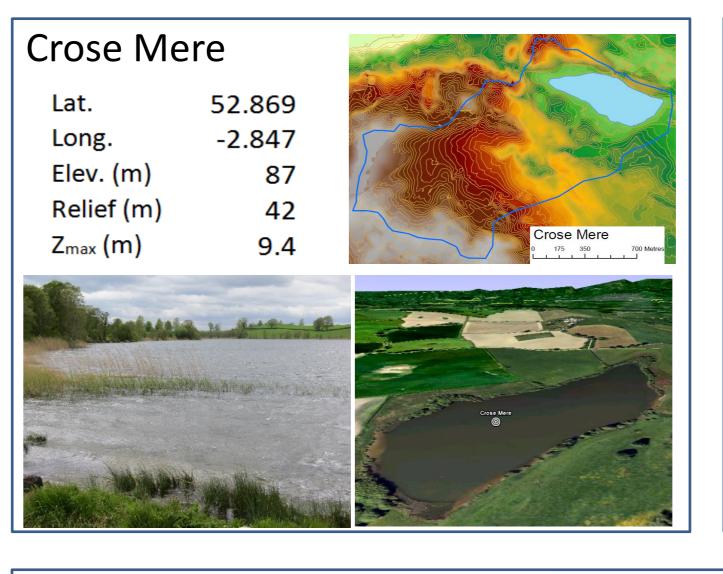


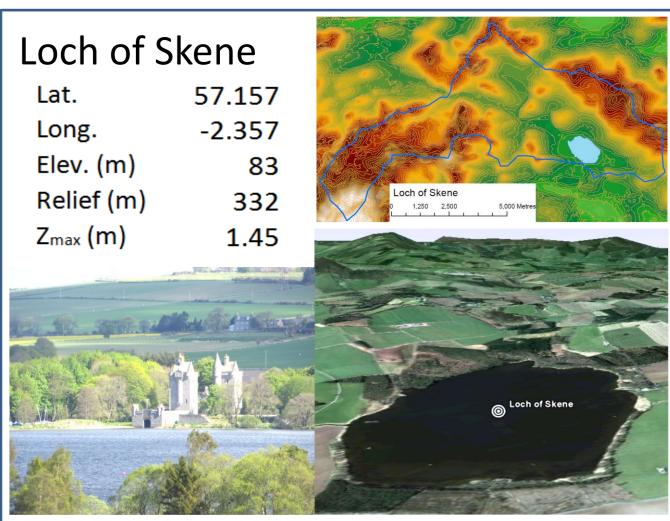
4 sites in detail

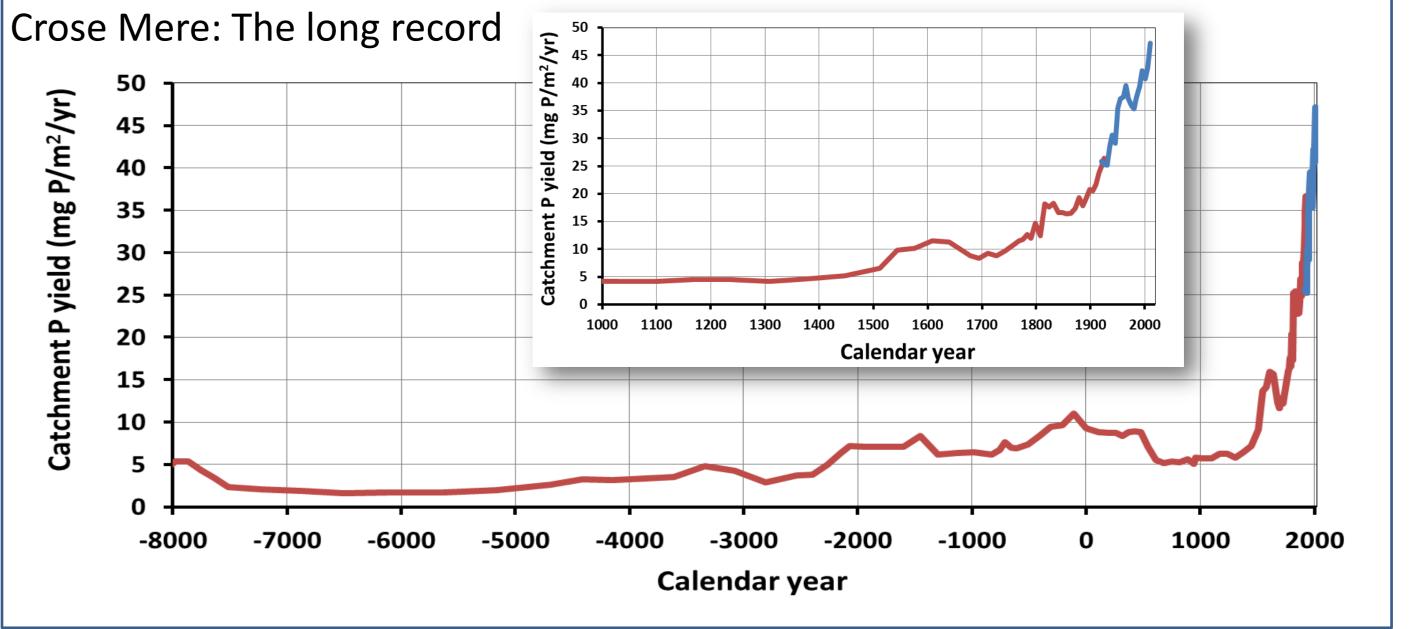
High resolution long records of C, N & P with good lake mean average values
Limited spatial coverage, long record, high temporal resolution, multi core

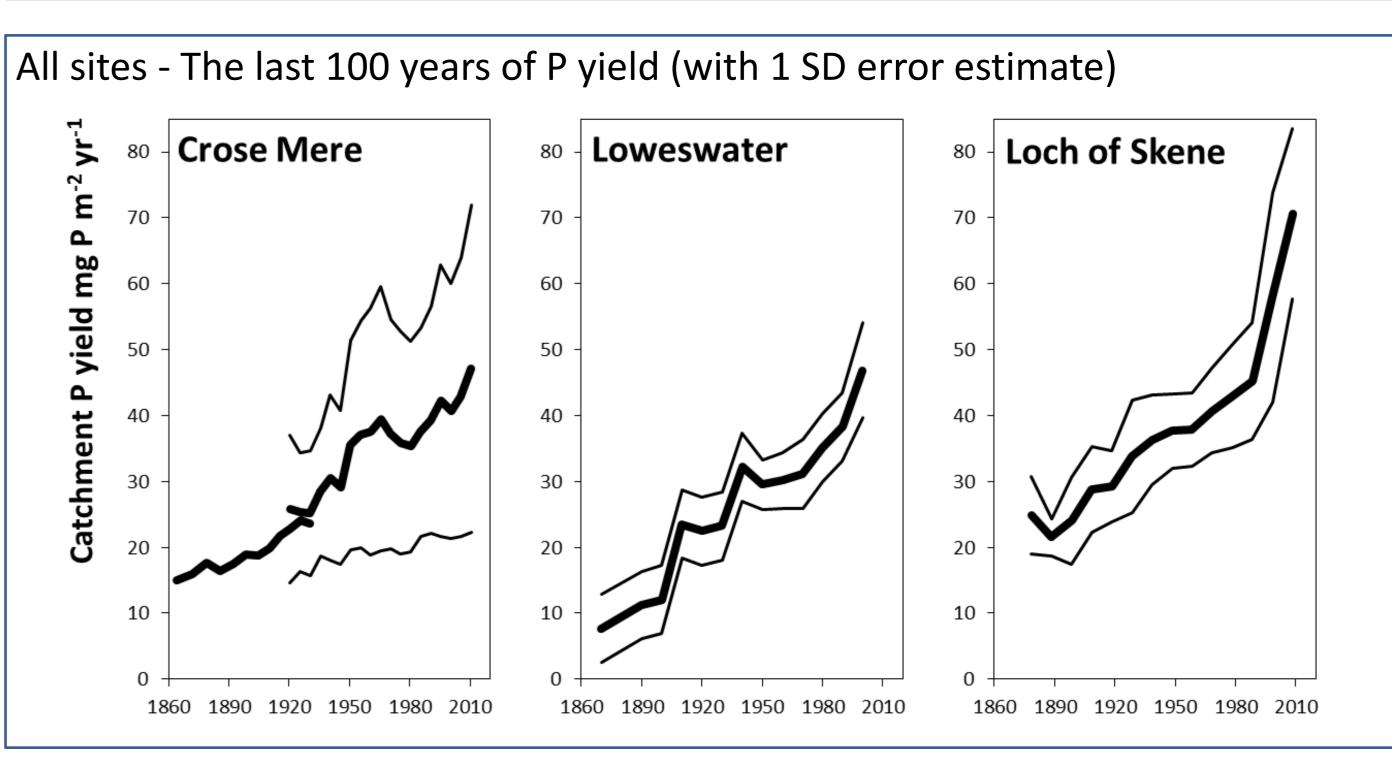




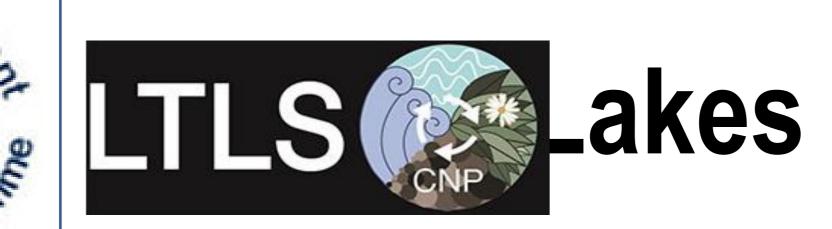












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