南京晓庄学院
NANJING XIAOZHUANG UNIVERSITY

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Evaluating the effectiveness of soil conservation at the basin scale using floodplain sedimentary archives

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2. Samples

3. Method

4. Results and discussion

5. Summary

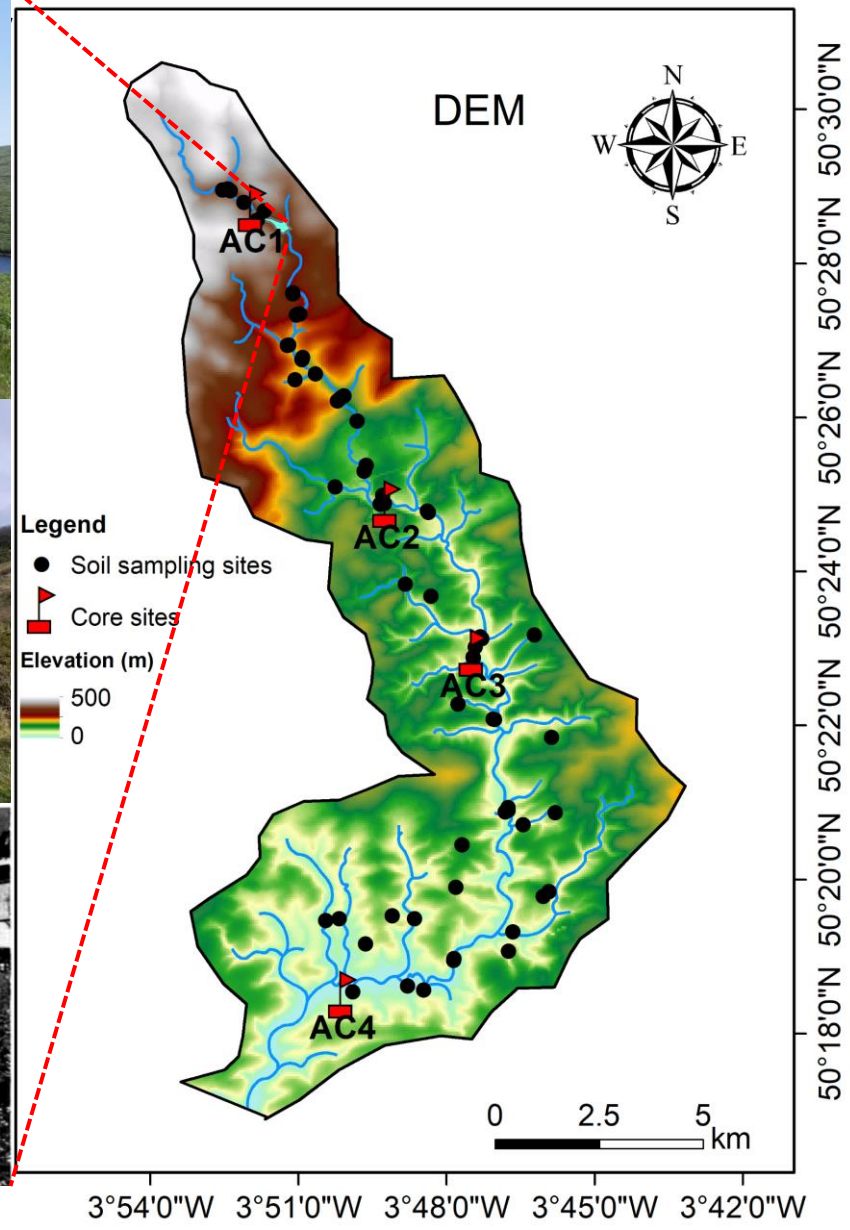
1. Introduction

Evaluation of the spatial and temporal composition of floodplain sediments and soils is critical in the creation of advanced soil management strategies for riverine catchments.

2. Samples

Bogle et al., 1959

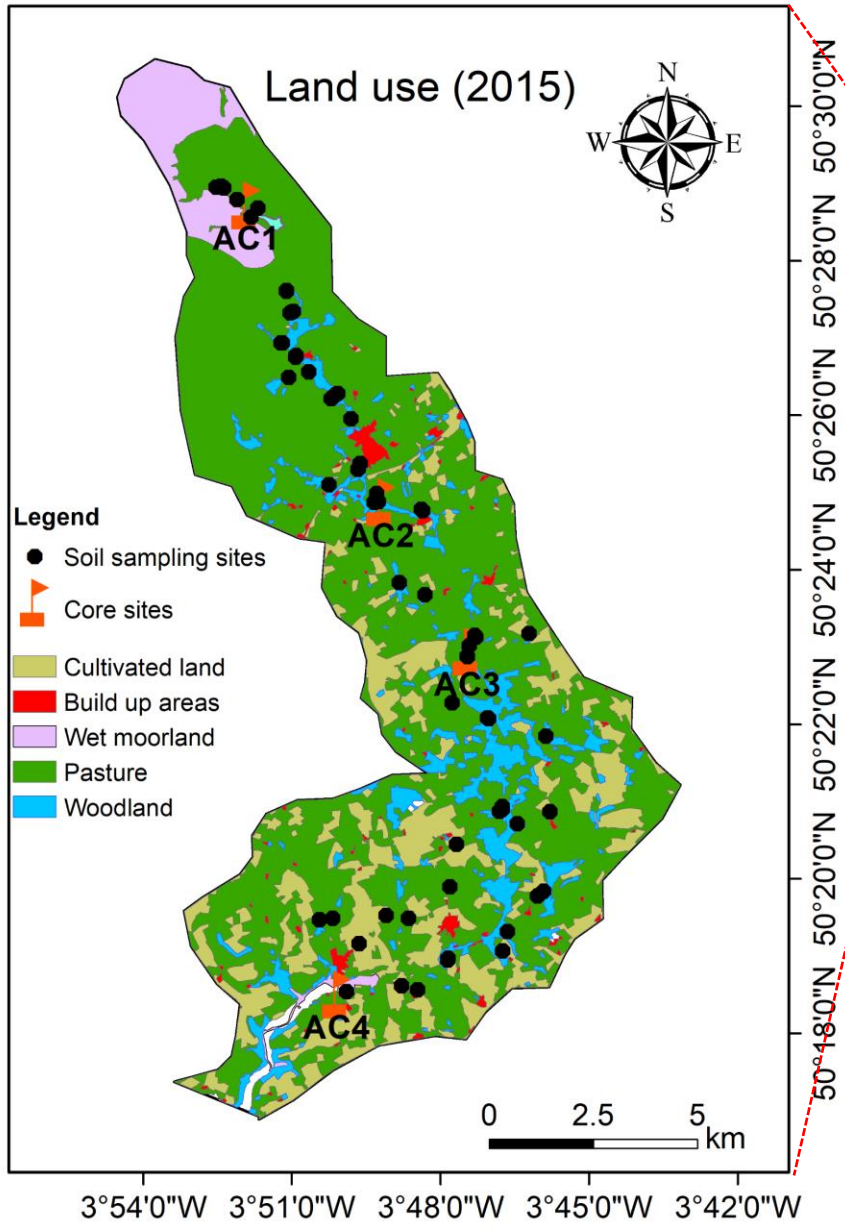
Study area



4 cores

64 soil samples

2. Samples

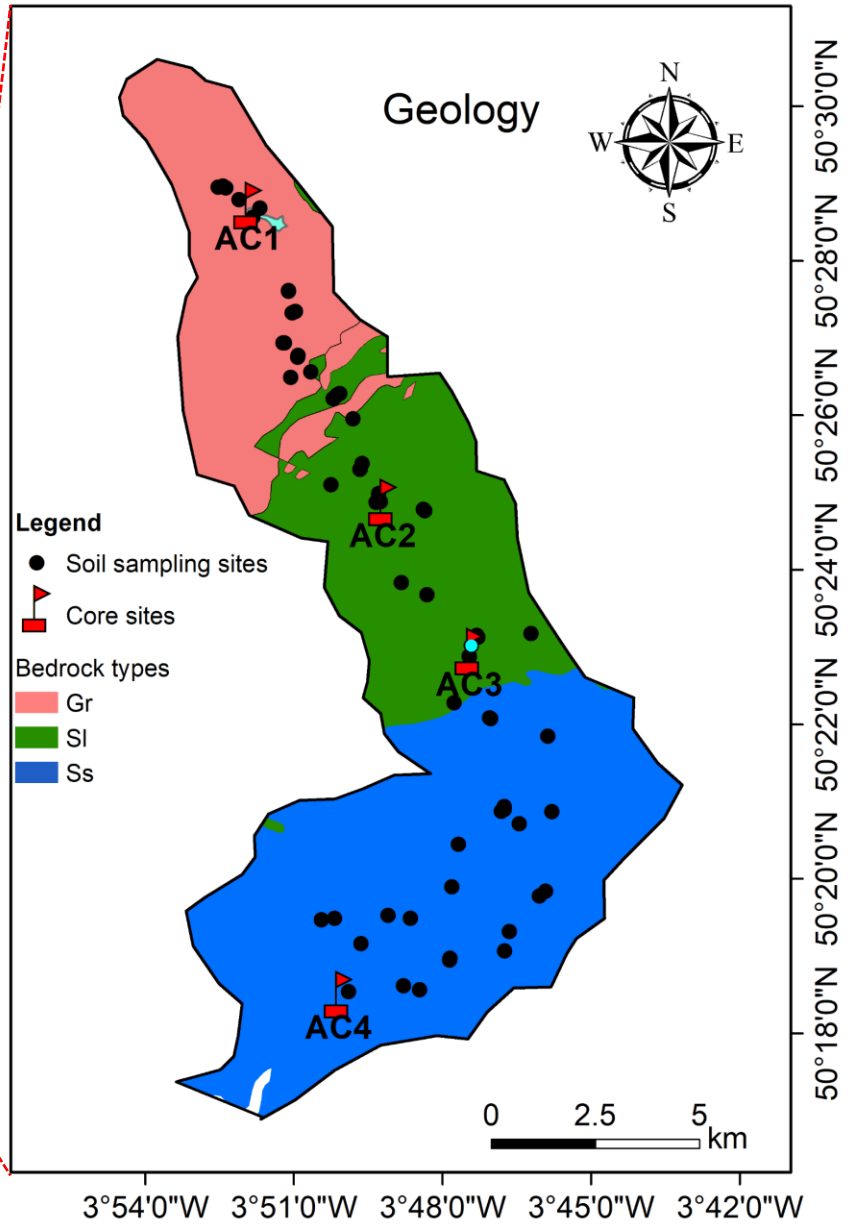


Samples classification

Land use	Sum of soil samples
CB	10
CU	5
WM	6
PP	22
WL	21

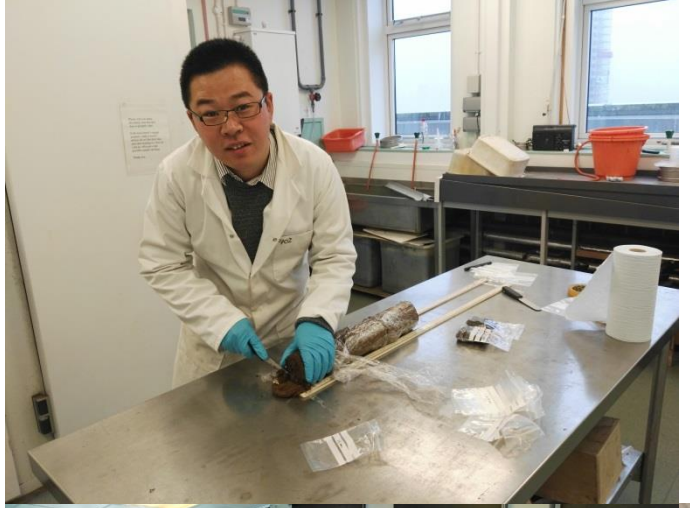
64 soil samples

Geology	Sum of soil samples
Gr	17
Sl	23
Ss	24

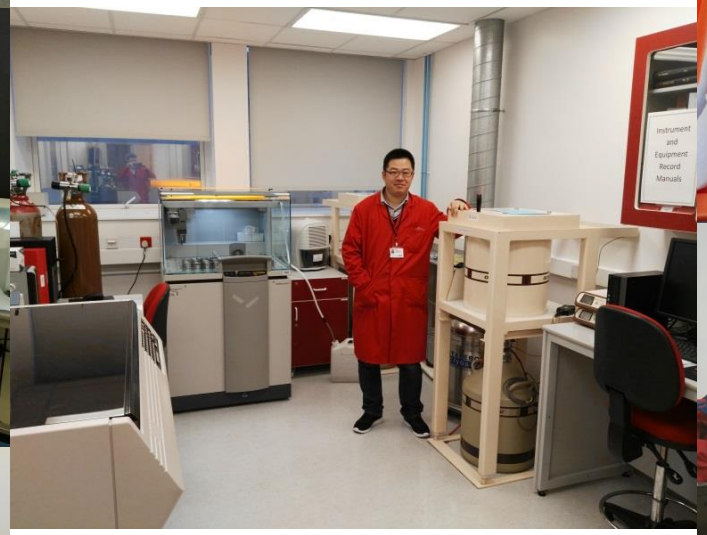


3. Method

Lab works

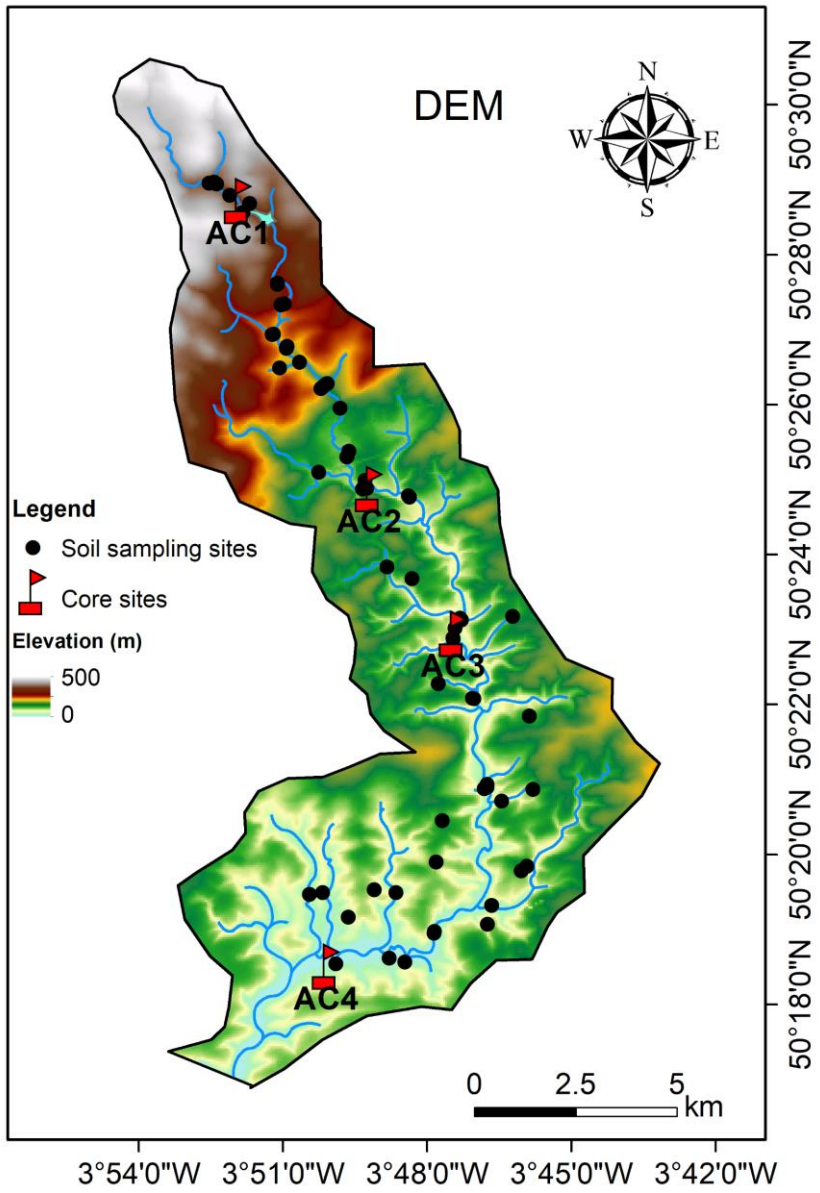


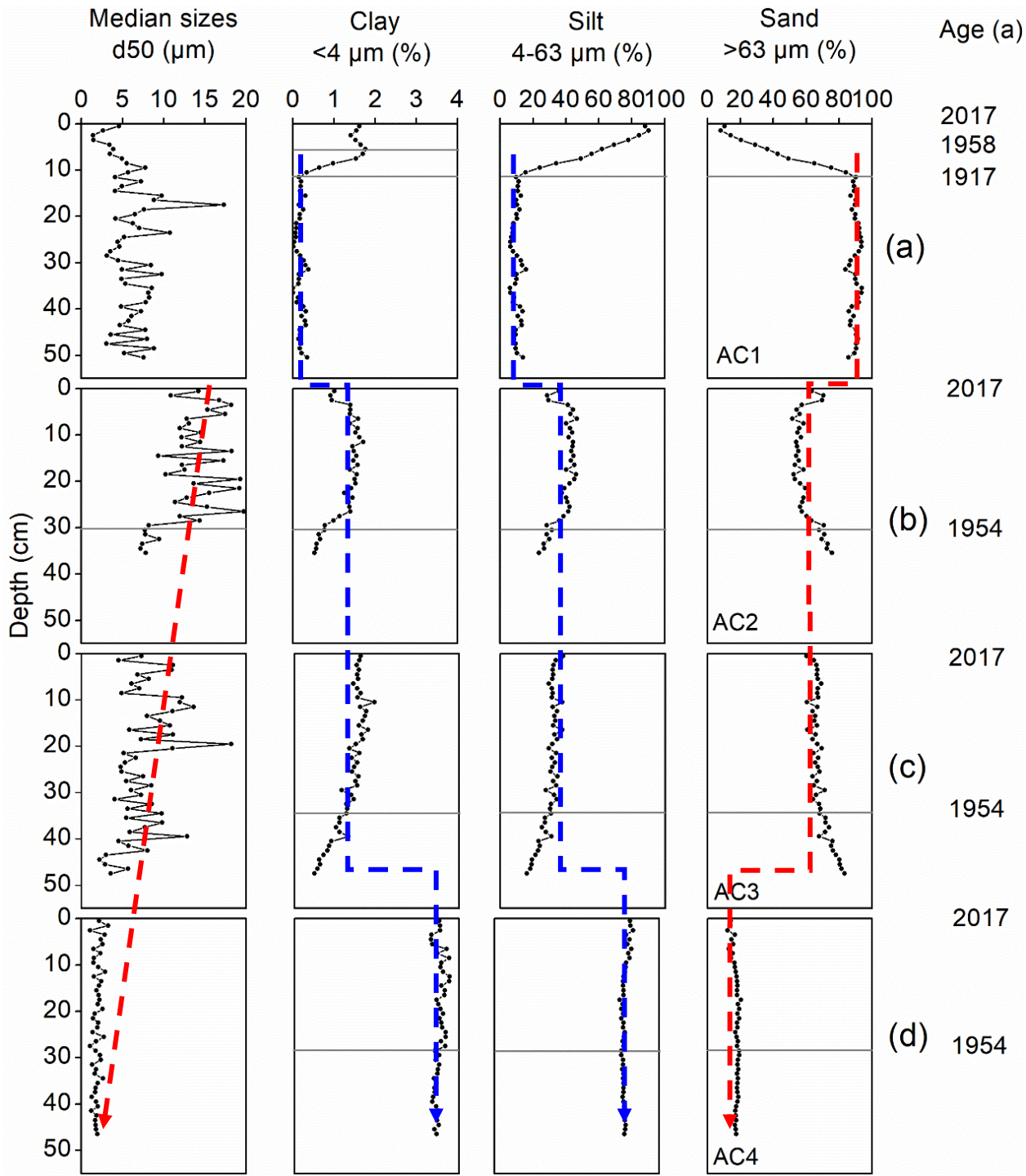
University of Plymouth in 2017



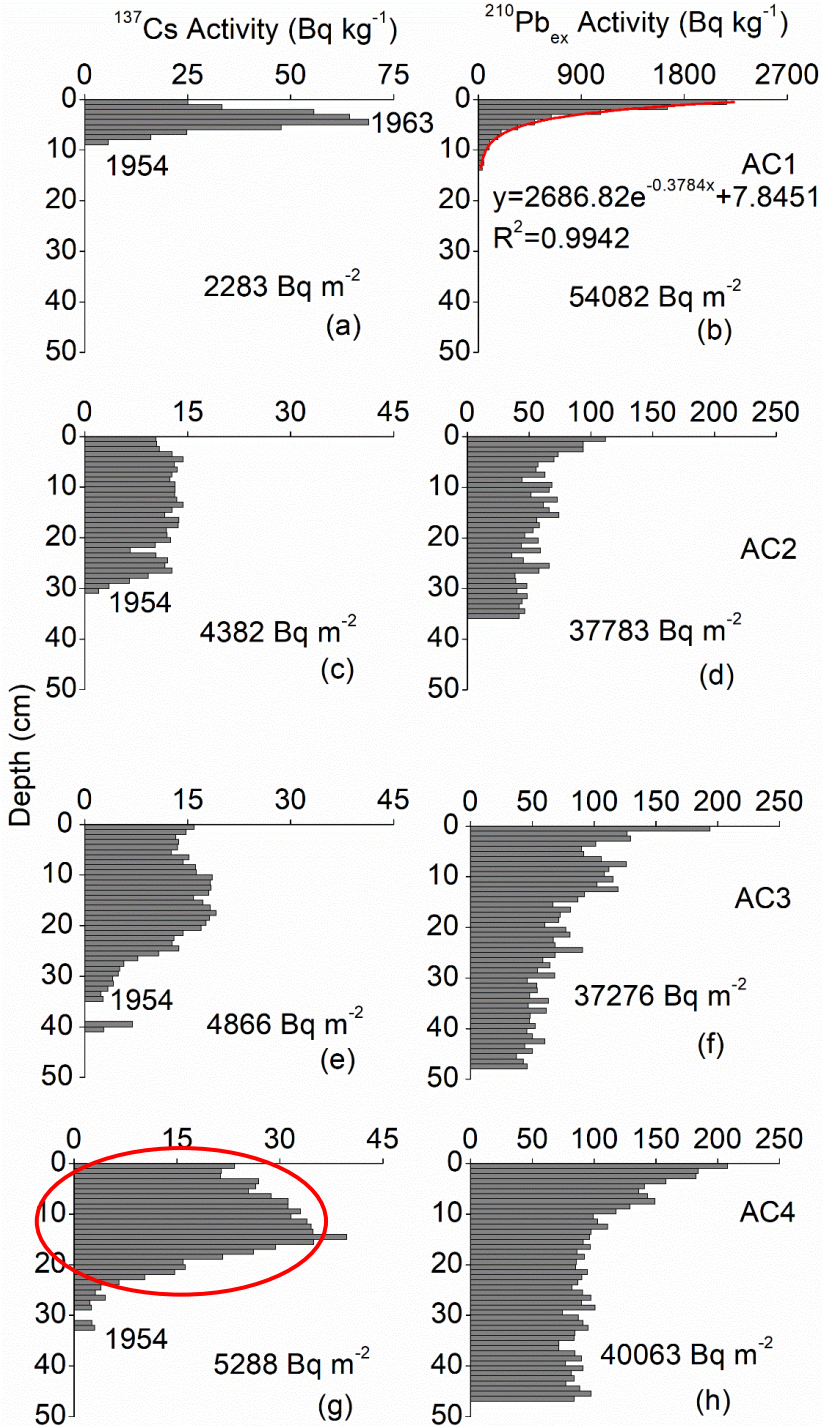
4. Results and discussion

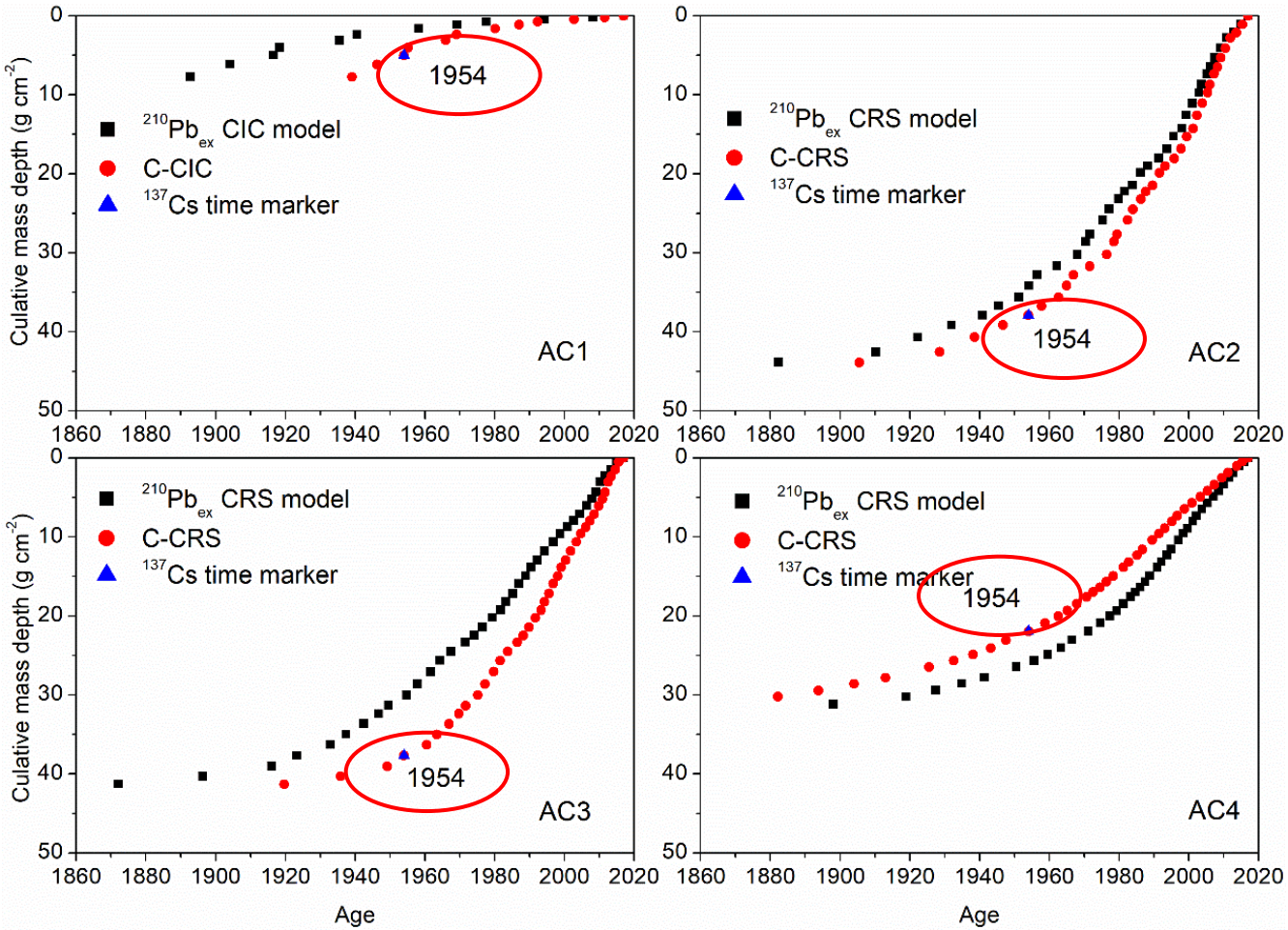
Vertical distribution of particle sizes



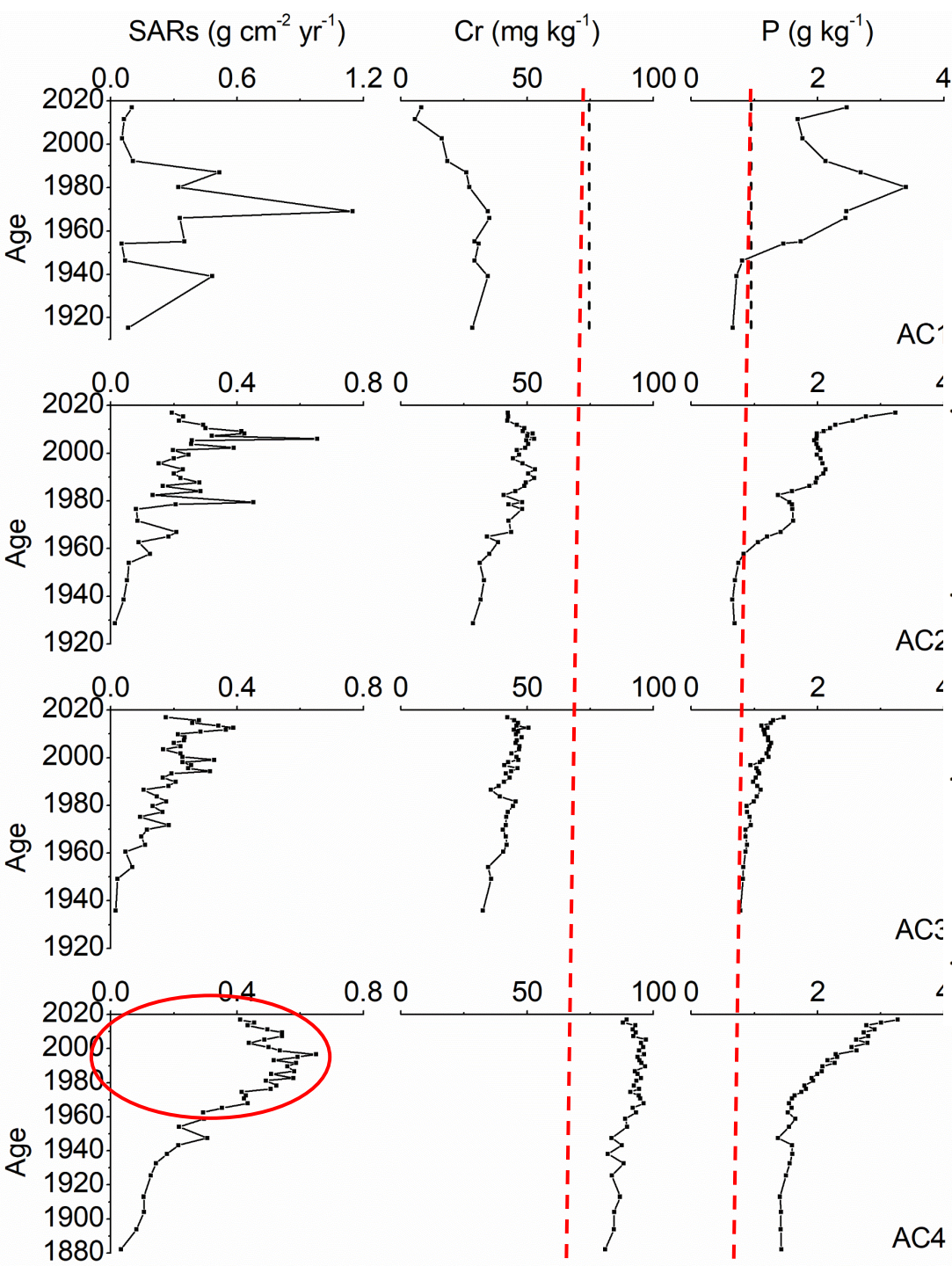


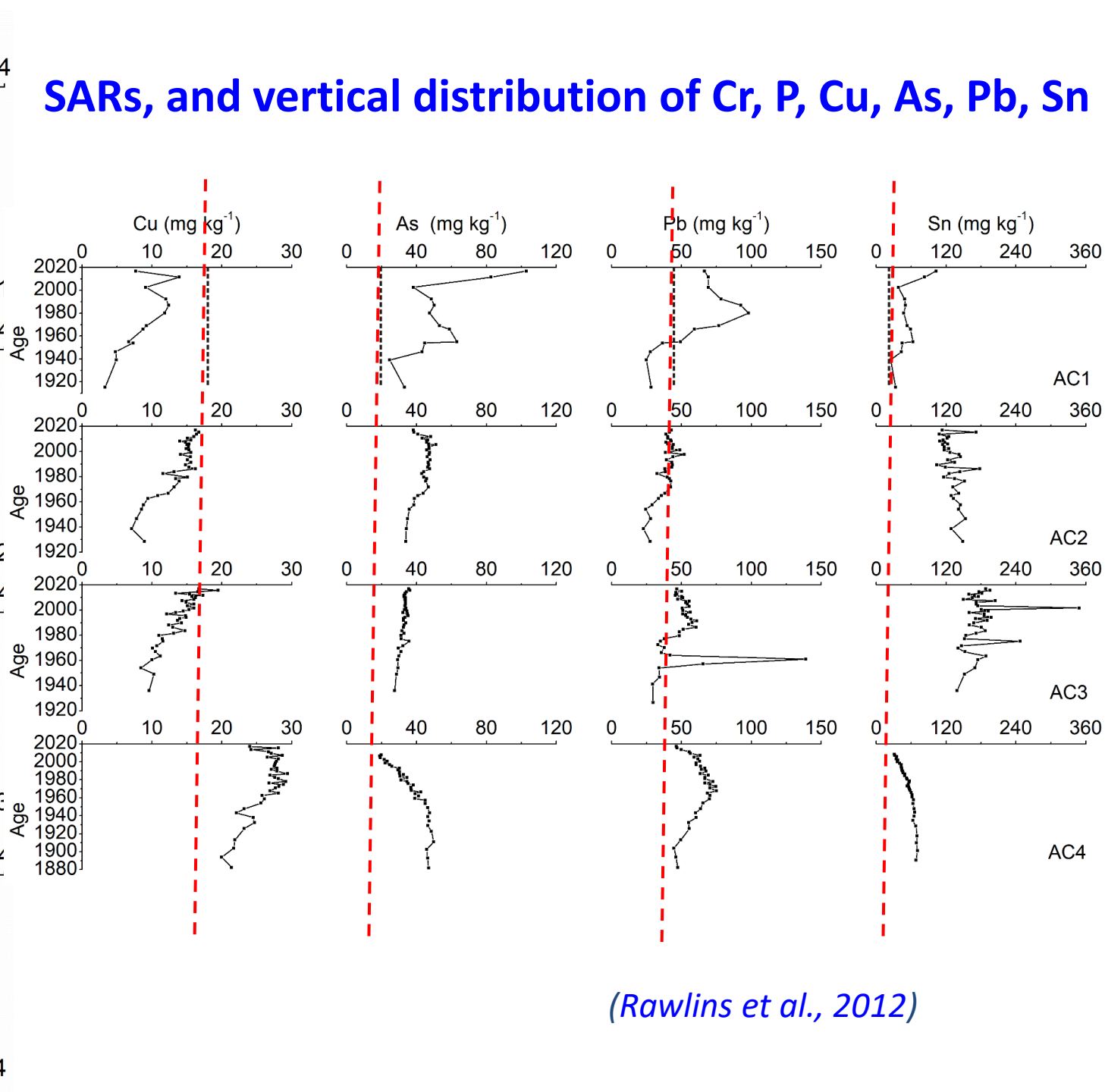
Radionuclides dating and chronology





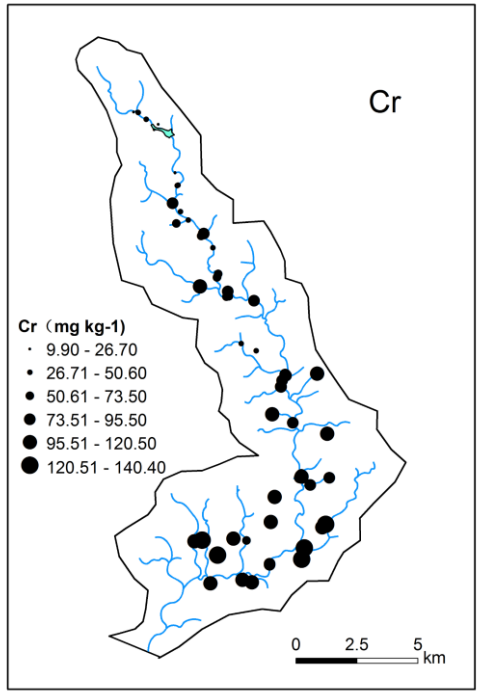
SARs, and vertical distribution of Cr, P, Cu, As, Pb, Sn

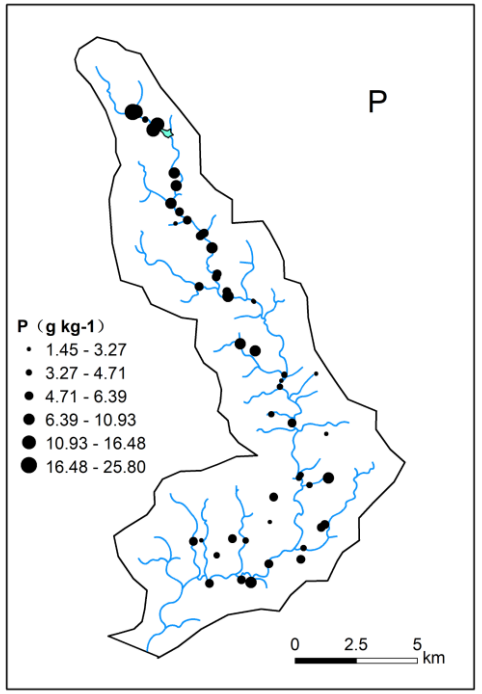


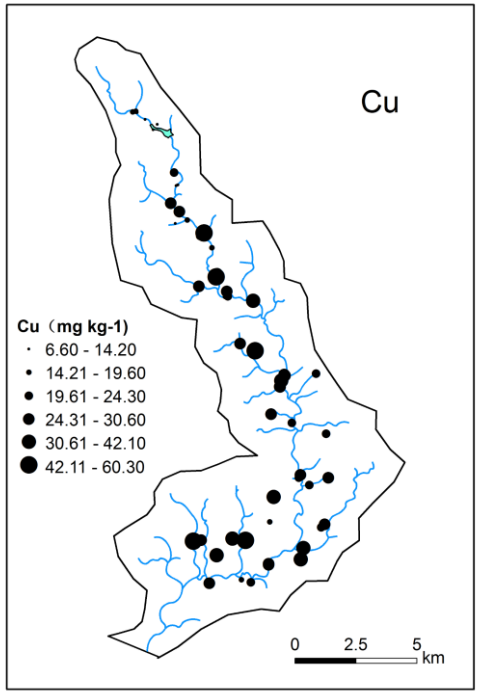


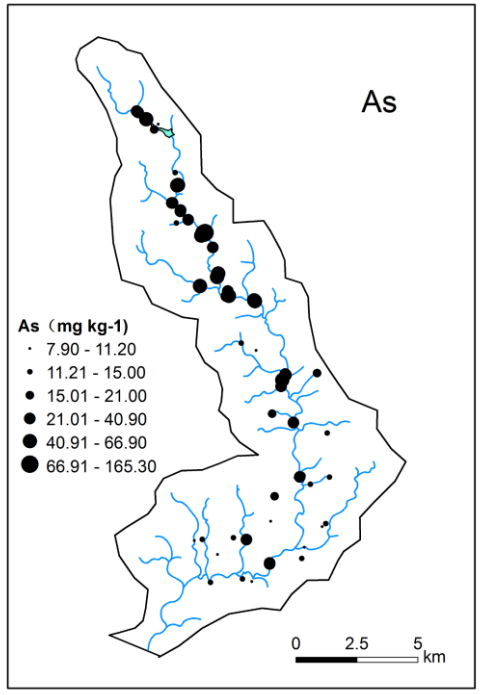
(Rawlins et al., 2012)

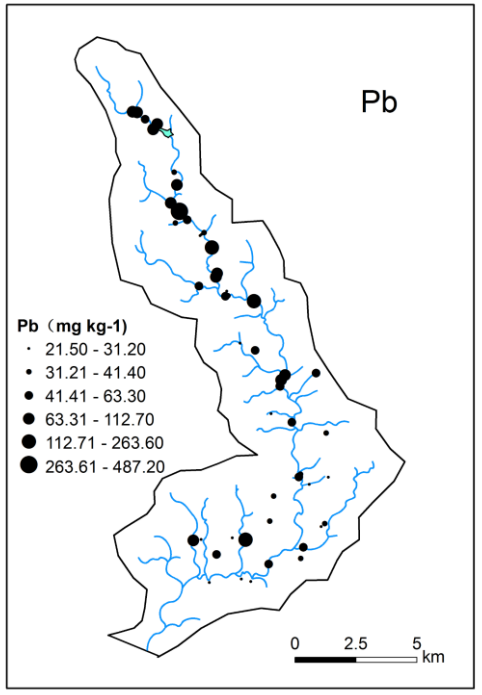
Spatial distribution of elements

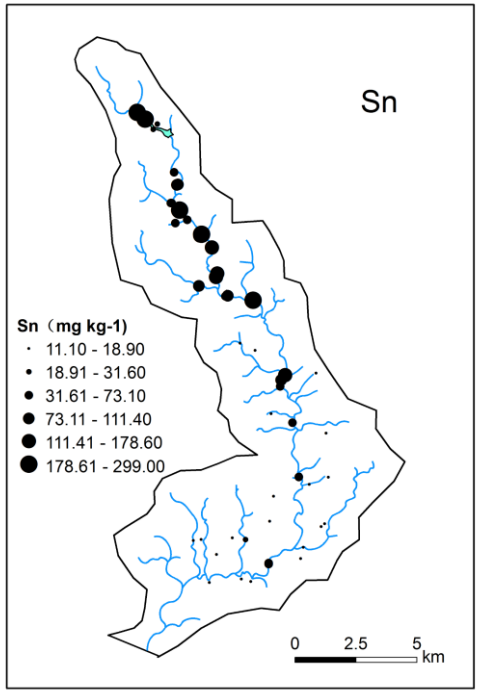




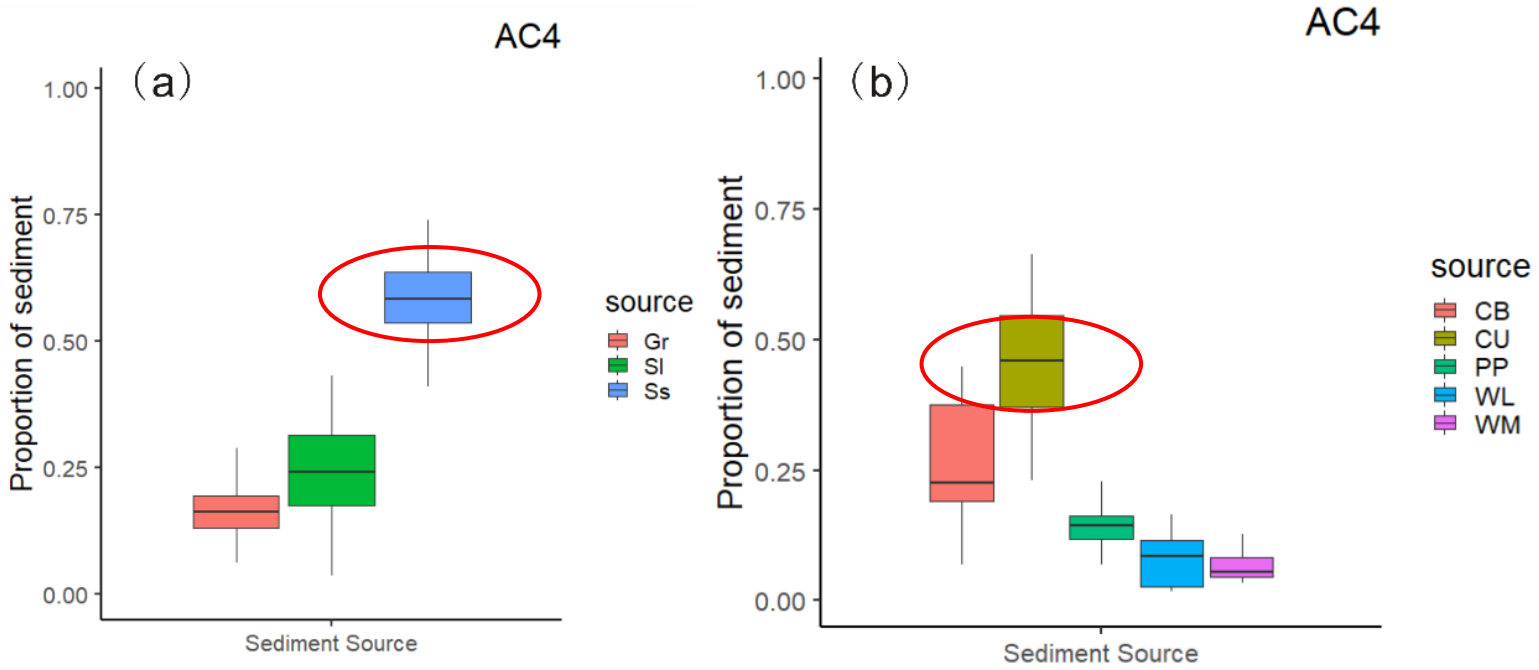




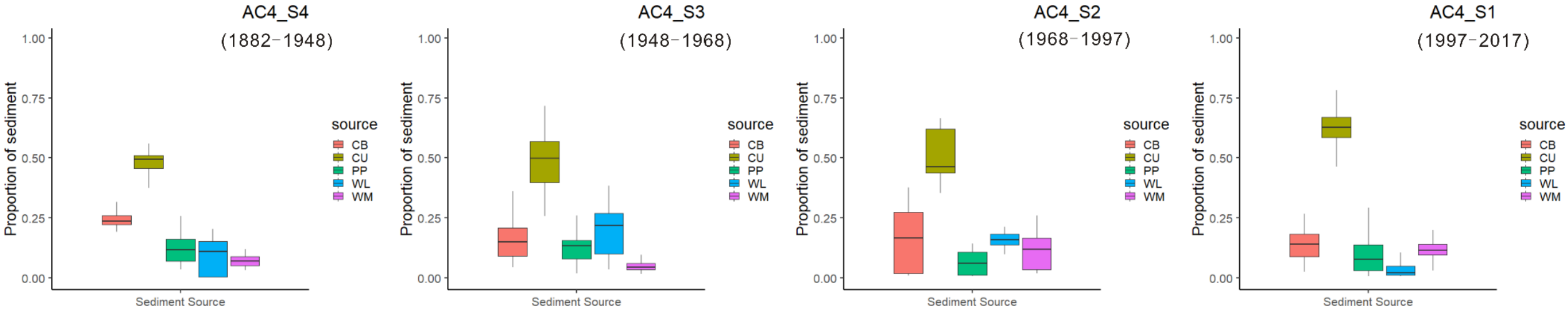




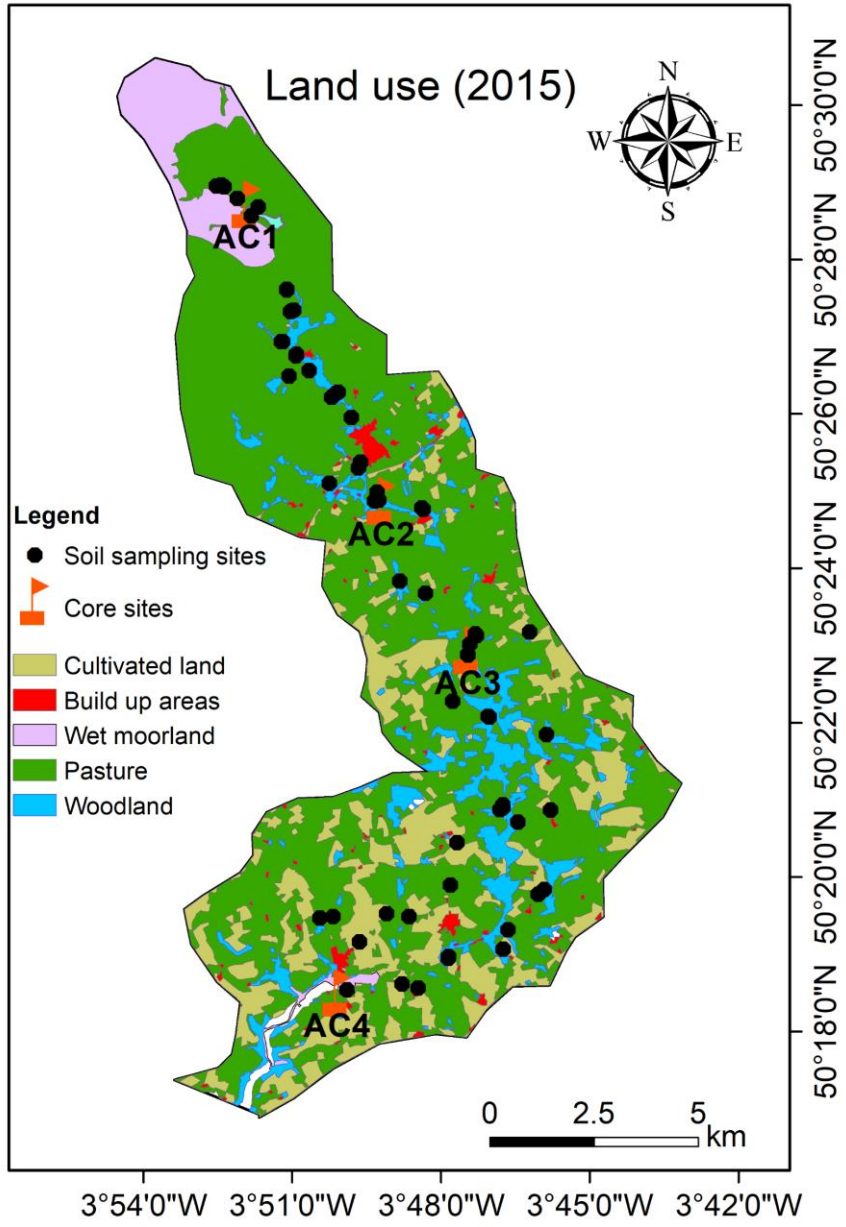
Spatial sources of geology and land use

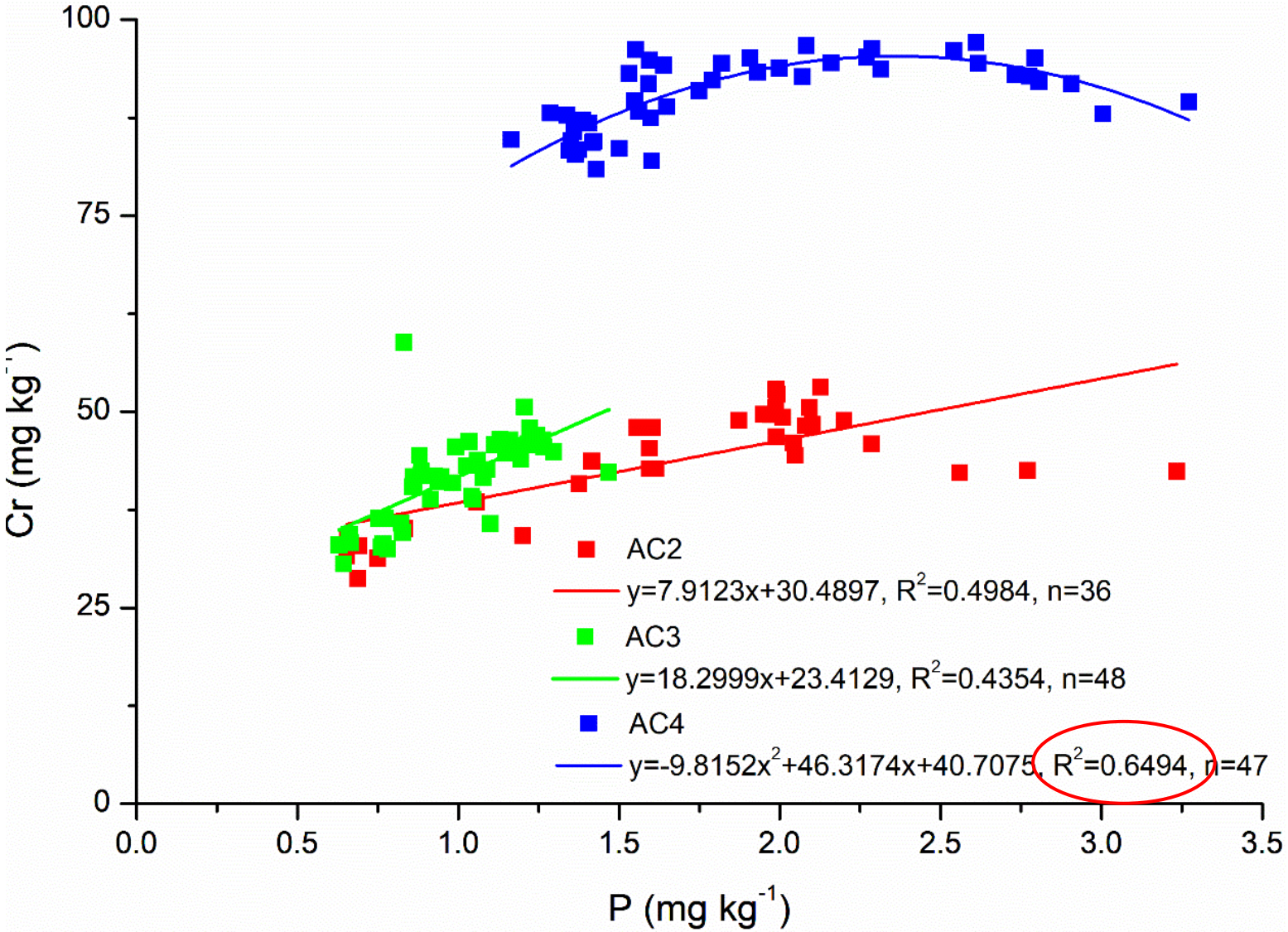


Temporal sources of land use



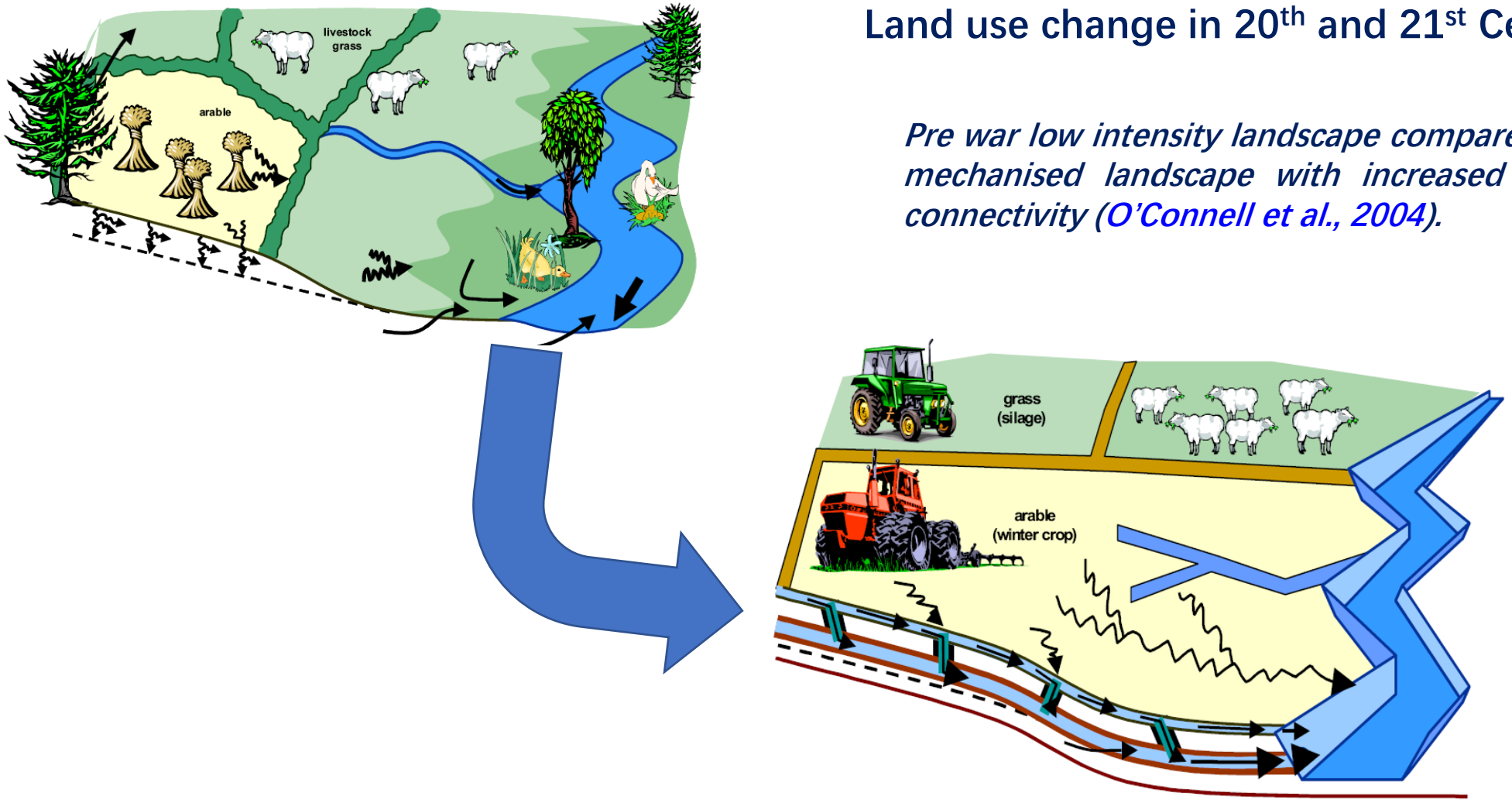
Relationship between Cr and P in sediment cores AC2-AC4





Land use change in 20th and 21st Century

Pre war low intensity landscape compared to modern mechanised landscape with increased hydrological connectivity (O'Connell et al., 2004).



- In 20th Century, land use change followed typical pattern with post World War 2 increase in food production i.e. conversion of much pasture to arable land (especially in the south).
- In the late 20th Century this was accentuated by increased cultivation of steepland (4WD tractors) and increase in contract farming of lowland fields (potatoes) with local stakeholder concern about increased soil erosion *(Boardman 2020; Cooper et al., 2020).*

Prospects and challenges for soil conservation between UK and China

Soil management projects	Country
Catchment Sensitive Farming (CSF)	UK
Grain-for-Green (GFG)	China

5. Summary

a) The particle size of the sediments changed from coarse grained deposits upstream to fine grained solids downstream.

b) Time-integrated sources of sediment decreased during the past two decades possibly due to moderation of sediment fluxes from the reservoir.

c) CU and Ss were the dominant contributor in Land use and geology, respectively.

d) Cr concentrations were correlated with P, indicating a potential fertilizer source.

e) Refinement of land management initiatives for farmed catchments.

For more details: Wang, X.L., Blake, W.H., Taylor, A., et al., 2021. Evaluating the effectiveness of soil conservation at the basin scale using floodplain sedimentary archives. Science of the Total Environment, 2021, 792, 148414, https://doi.org/10.1016/.scitotenv.2021.148414

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Thanks for your attention!