



Natural Flood Management

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The Eddleston upland sub-catchment of the river Tweed was established as a test observatory in 2011 to investigate Natural Flood Management and floodplain restoration options. Within the catchment the British Geological Survey (BGS) continues to monitor groundwater and soil water content at two sites in the Eddleston Catchment.

- **Integrated catchment research** is needed to better understand hydrological connectivity between surface water, soil and groundwater, and ensure the most effective land use and flood management measures.
- **Long term measurements** are essential for developing understanding of flooding events and how these events can be mitigated.



Figure 1 – Combined surface water and groundwater flooding in the Tweed valley.

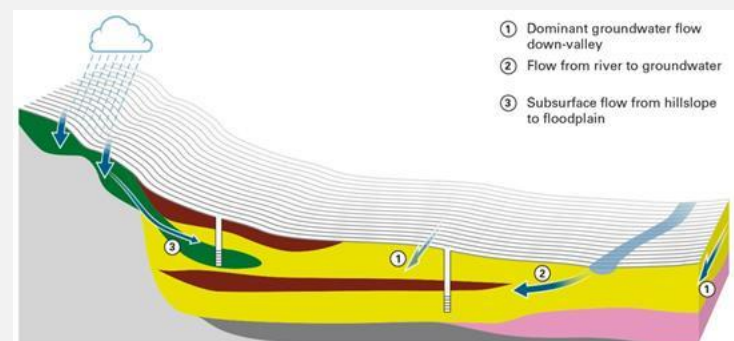


Figure 2 – Subsurface flows are important in transferring water through hillslopes and floodplains

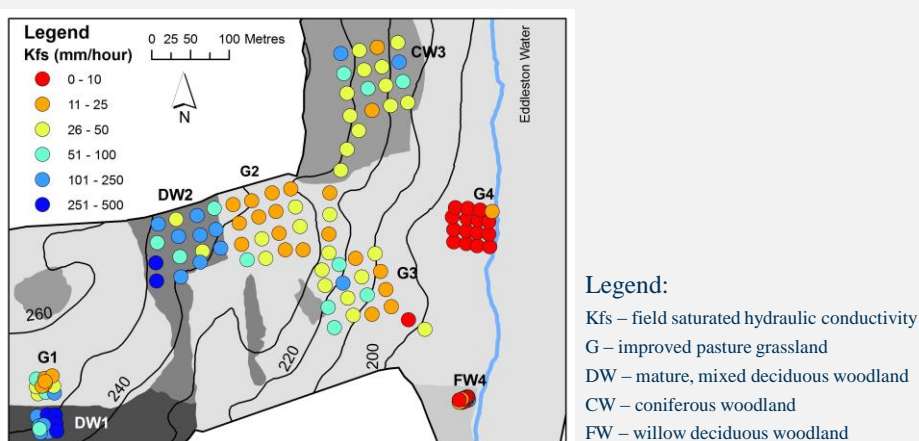
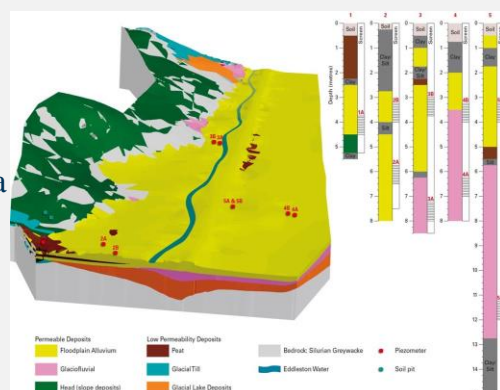


Figure 3 – Soil permeability under mature deciduous woodland is 10–15 times higher than under neighbouring coniferous woodland and improved grassland.

Figure 4 – The 3D geology of the hillslope and floodplain is a key control on hydrological storage and connectivity.



BGS is working with other researchers including Forest Research, the Universities of Dundee, Edinburgh and Abertay; and with the Tweed Forum, SEPA and the Scottish Government. We are investigating how hydraulic characteristics of soil and aquifers vary across floodplains and wider catchments; how rainfall, surface water, soil water and groundwater interact; and how this influences flooding.

This work is funded by the Scottish Government, BGS, Tweed Forum, University of Dundee and SEPA

References

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 MacDonald et al. 2014, *Hydrology Research* 45 (6), 755-773.
 Archer et al. 2013, *Journal of Hydrology* 497, 208-222.