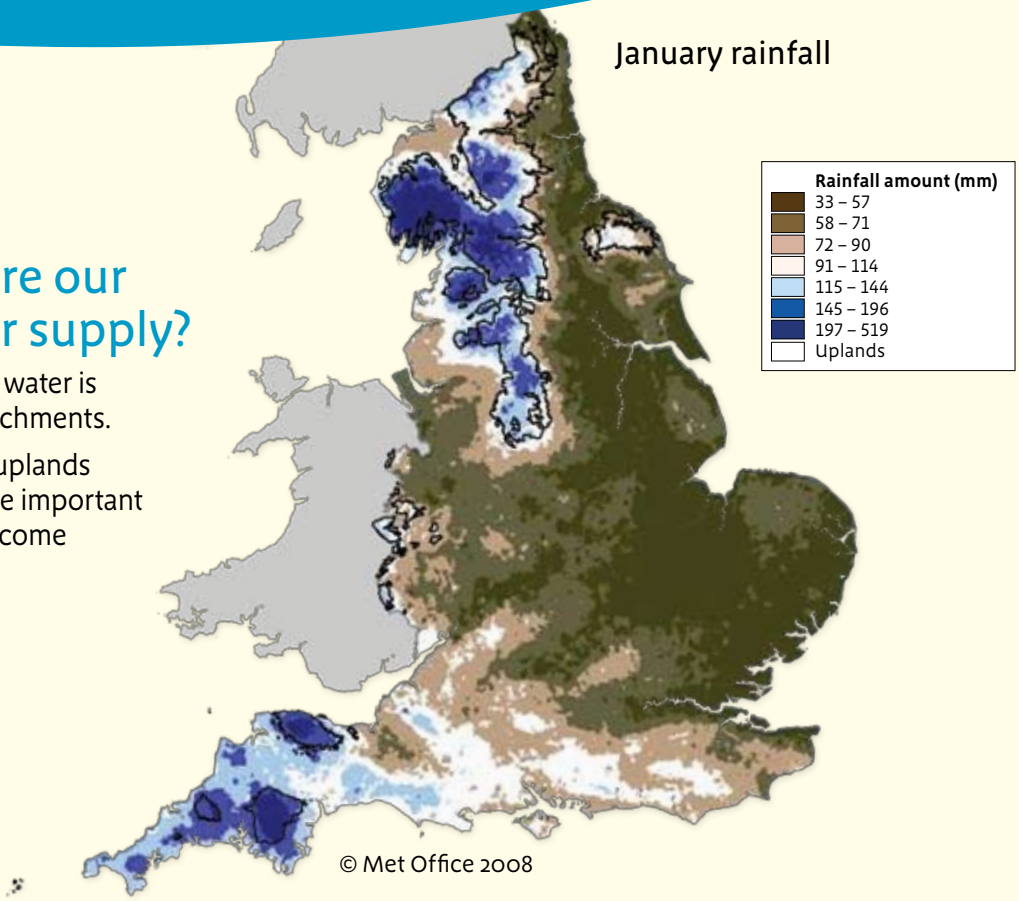
Water: supply, quality and reducing flood risk

How important are our uplands for water supply?

- About 70% of UK drinking water is collected from upland catchments.
- With climate change, the uplands may become an even more important source as the lowlands become hotter and drier.

January rainfall



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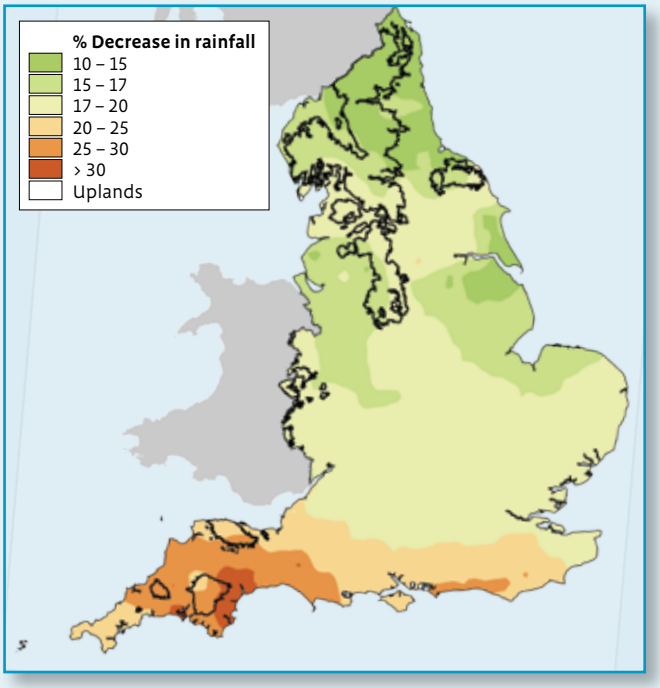
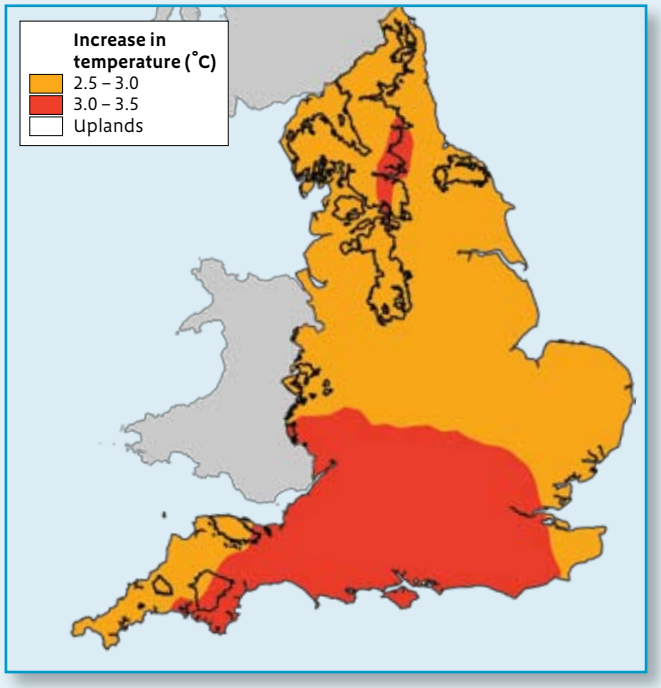
Projected decrease in summer rainfall by 2050



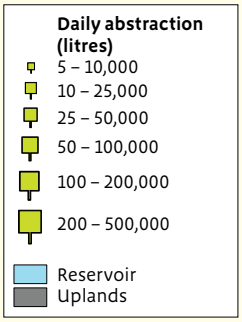
Projected increase in summer temperatures by 2050



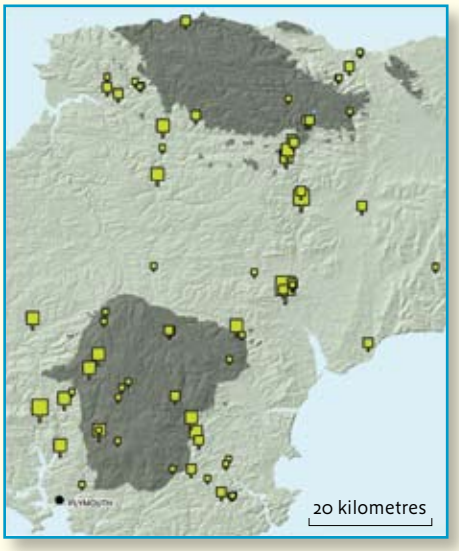
© UK Climate Projections 2009

What is the demand like?

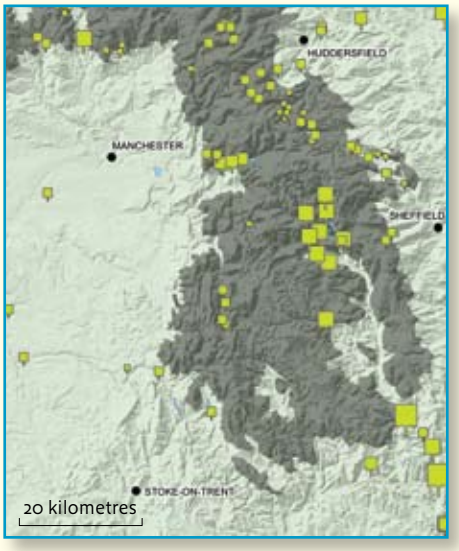
The numerous abstraction points from rivers, lakes and reservoirs throughout the uplands illustrate the demand for upland water. Water is often piped considerable distances to consumers in the lowlands, eg water from Thirlmere reservoir in the Lake District travels 90 miles through pipes to supply much of Manchester.



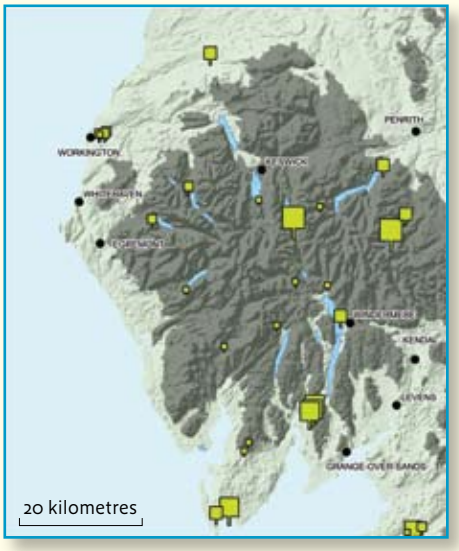
Water abstraction volume in Dartmoor & Exmoor



Water abstraction volume in the Peak District



Water abstraction volume in the Lake District



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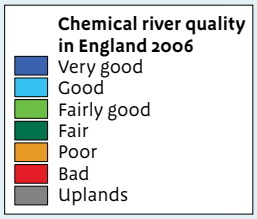
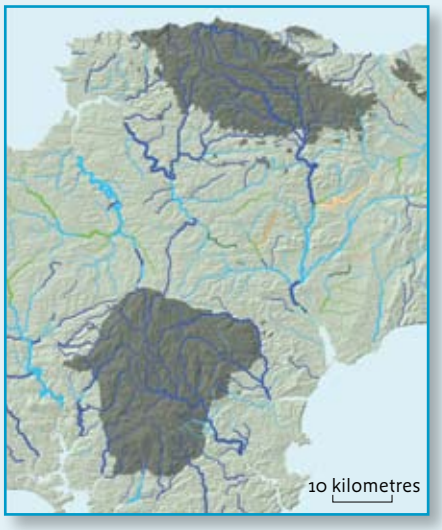
What is water quality like in the uplands?

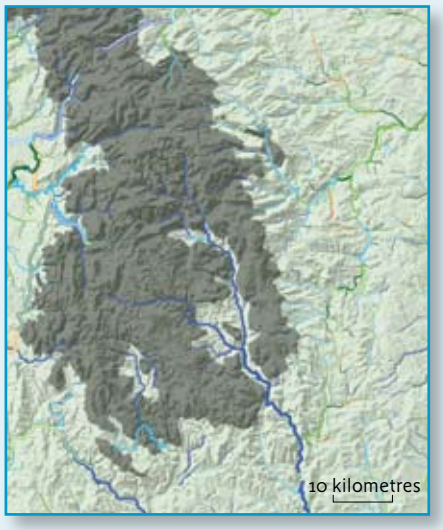
Overall, the chemical water quality from upland rivers and lakes is much better than in the lowlands. However, upland catchments are naturally nutrient poor and can be sensitive to pollutants from agriculture.



Chemical river water quality in Dartmoor & Exmoor



Chemical river water quality in the Peak District



Chemical river water quality in the Lake District

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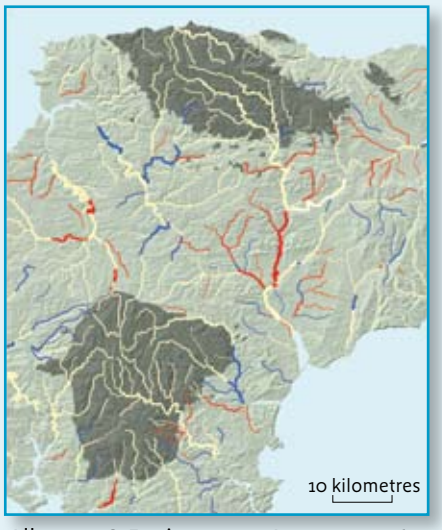
Is water quality getting better or worse?

In most upland areas, chemical water quality is stable and in some it is improving. In a few key rivers water quality is declining. This is likely to be linked to changes in land use or management practices, and to climatic variation.

Chemical water quality
Improving
Static
Declining
Uplands

Line thickness denotes river flow.
Canals shown as hollow.

Trends in chemical river water quality in Dartmoor & Exmoor



Trends in chemical river water quality in the Peak District

Trends in chemical river water quality in the Lake District

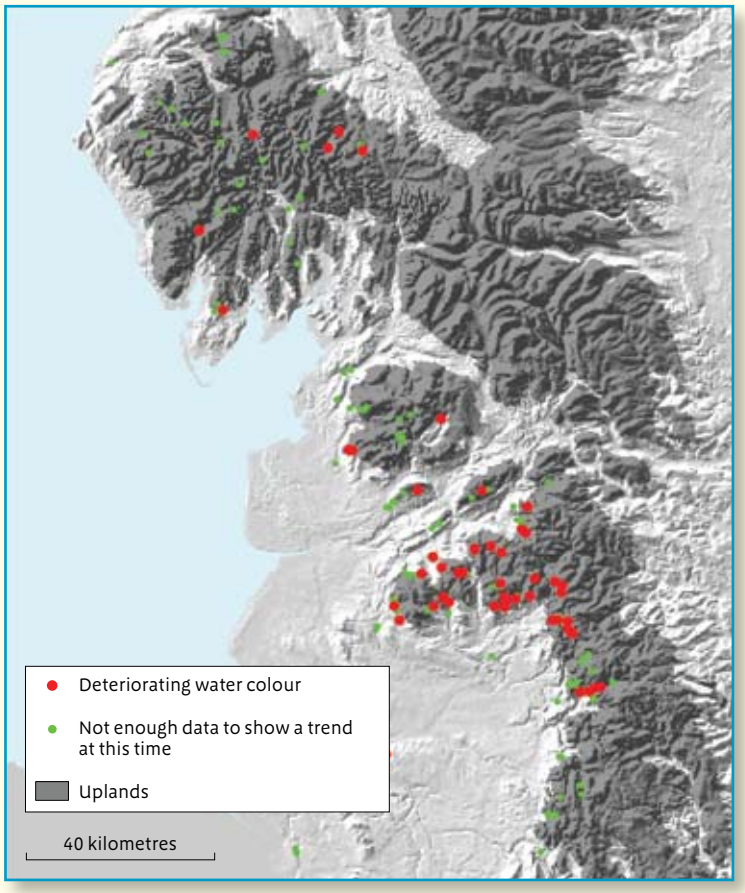
All maps © Environment Agency 2006

But what about water colour?

- Water colour (brown water from peat soils) is a significant challenge to the provision of acceptable drinking water in the uplands. In many places water colour is increasing.
- Colour in water is removed because it is aesthetically undesirable and may react in the treatment process to form unwanted substances.
- Removing colour is expensive and uses significant amounts of energy and chemicals producing a sludge by-product which has to be disposed of.
- Grip blocking and restoring degraded moorland to favourable condition may help stabilise water colour in the long term.

Peat stained water in an upland river

Deteriorating raw water colour trend in United Utilities supply



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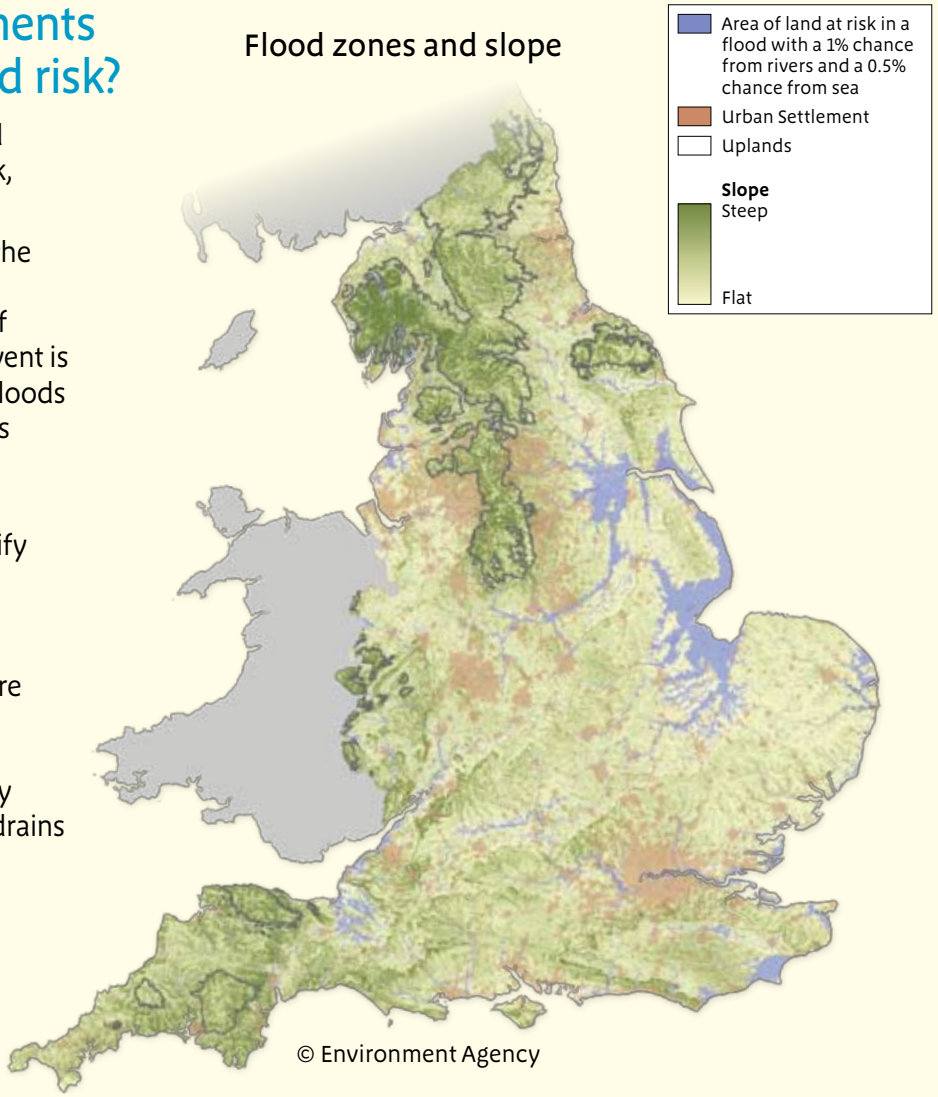
How can upland catchments affect downstream flood risk?

- The uplands are the source of flood waters for towns and cities like York, Sheffield, Carlisle and Tewkesbury.
- The much steeper slopes found in the uplands relative to the rest of the country means the speed of run-off from the land following a rainfall event is much faster than in the lowlands. Floods arise when the capacity of the rivers further downstream to absorb the upland run-off is exceeded.
- It is, of course, not possible to modify slope to reduce run-off from the uplands. Catchment roughness can however be increased by changing vegetation cover to encompass more scrub and trees. The absorbancy of catchments can be improved by reducing soil compaction caused by grazing livestock, and by blocking drains on upland peat soils.

Flood zones and slope



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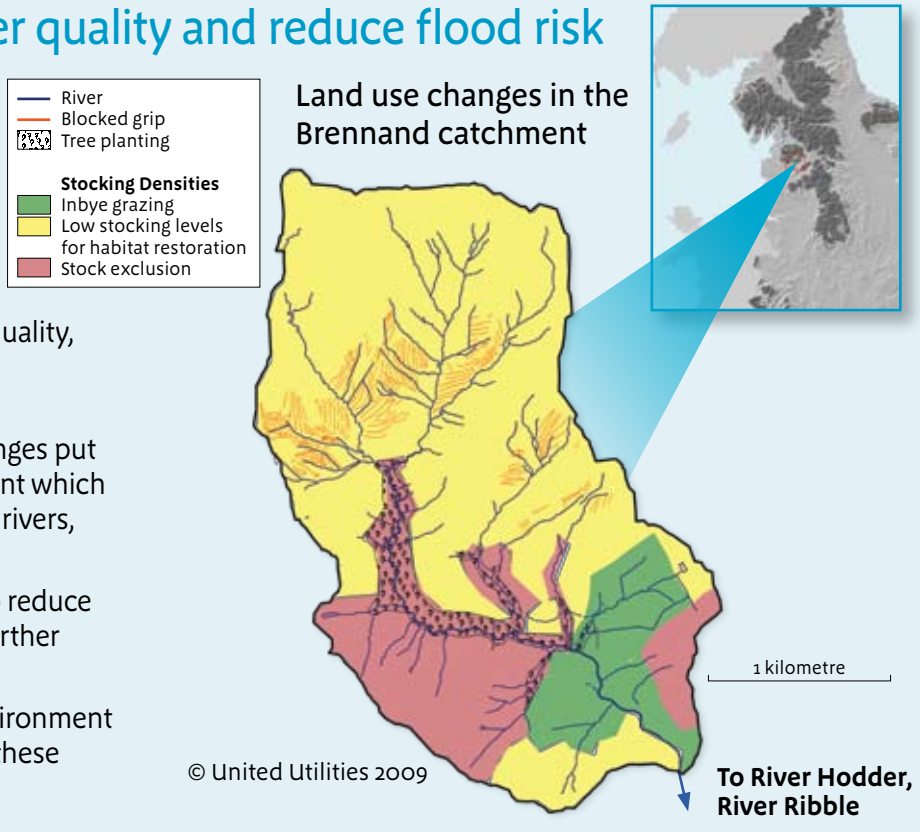
Action to improve water quality and reduce flood risk

- The land use changes put in place through United Utilities' Sustainable Catchment Management Programme (http://www.unitedutilities.com/scamp.htm) aim to improve biodiversity. It is hoped these changes will also improve water quality, and minimise peak water flows following heavy rainfall.
- This map shows the land use changes put in place in the Brennand catchment which feeds into the Hodder and Ribble rivers, upstream of Preston.
- It is hoped such changes will help reduce flood risk in villages and towns further downstream.
- Research is underway by the Environment Agency to assess the impacts of these changes on river flows.

Land use changes in the Brennand catchment



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