# A COMPARISON OF THE UPPER WYE AND UPPER SEVERN CATCHMENTS

Both are typical upper river catchment areas in many ways :-

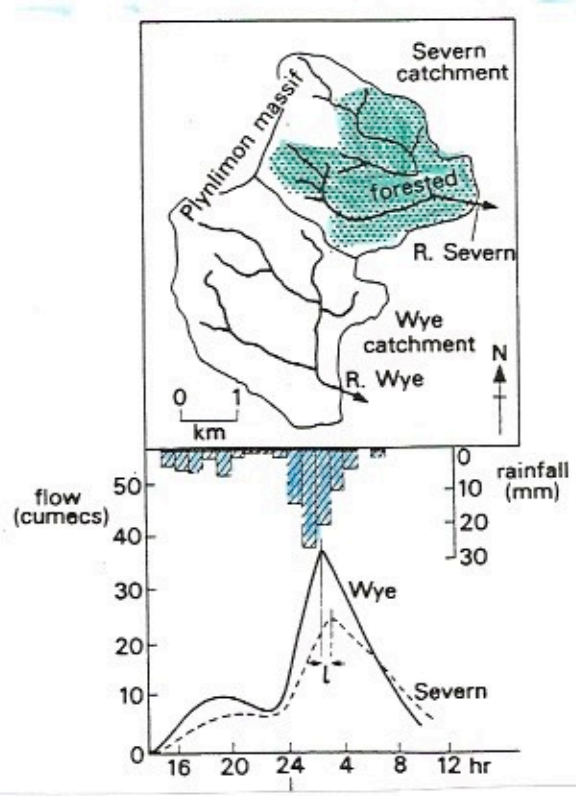
- Steep slopes with well defined boundaries (watersheds).
- High rainfall totals, above 2400 mm and fairly low evapotranspiration rates.
- Thin soils and underlying impermeable rocks, shales and grits.
- Soils often saturated (silty clays) giving much overland flow.
- High percentage of rainfall reaches the rivers (much overland and through flow).
- Both upper catchments have areas of around 10 sq, km.

But. Upper Wye is covered by coarse grass and moorland, whereas the upper Severn has over 50% coniferous woodland.

The character of the upper basins mean that they respond rapidly to rainfall events. The storm hydrography of both show a short lag time between peak rainfall and peak stormflow, steep rising limbs, high peak storm flow and relatively steep falling/recession limbs. The hydrographs are typically 'flashy', making floods likely.

The upper Severn has steeper slopes than the upper Wye and shorter distances to the channels, so it should respond quicker to rainfall. However, it is more thickly wooded than the upper Wye which causes more interception, interception loss and evapotranspiration. This gives the Severn hydrography a lower peak stormflow, longer lag time and gentler rising and falling limbs than the Wye hydrograph.
This is illustrated by the fact that the upper Wye basin loses only about 15% of incoming water by evaporation, whereas the upper Severn less around 27%.

The diagram opposite illustrates how the upper Wye and upper Severn catchments react very differently to the same rainfall events.



# RIVER WYE : BASIN CHARACTERISTICS

Rainfall : Varies from 2400mm in the upper basin to 700-800mm in the lower basin

Relief :
High in the west rising to 752m in central Wales, much lower on the flood plain to the east near the Severn estuary

Spacial variations :
High rainfall in the west due to relief rainfall in the Welsh mountains and frontal depressions moving west to east with the prevailing winds. Lowlands in the east are in the rain shadow and have lower rainfall
Evapotranspiration is higher in the east due to the lower altitude and higher temperatures
In the upper basin river flow as a percentage of rainfall is 77%, in the lower basin to the east it is 48%

Seasonal variations :
There are seasonal variations in rainfall, run off, river flow and evapotranspiration
winter maximum rainfall, runoff and river flow
summer maximum evapotranspiration

| UPPER WYE | JUNE | | DEC | |
|---|---|---|---|---|
| % of rainfall | river flow | evapotr. | river flow | evapotr. |
| | 46% | 54% | 88% | 12% |