Summary River Typology and Water Body Delineation

1. Summary Typology

The Water Framework Directive (WFD or the Directive) requires Member States to identify the location and boundaries of bodies of surface water and to carry out an initial characterisation of all such bodies (Annex II). The surface water bodies identified must be differentiated according to hydromorphological type. The types are defined in Annex II under 'System A' or 'System B'.

Northern Ireland adopted System A in deriving the basic typology for natural rivers. The typing categories are summarised in Table 1 and are similar to those used in England and Wales by the Environment Agency (EA). It is anticipated in Ecoregion 17 that this typology will be further developed, when the data become available, into a System B typology using hardness as a surrogate for geology (if available), mean slope and river discharge. This System B will be compared with the System A typology to ensure both its ecological relevance and its usefulness as a water quality management tool.

Table 1 WFD Rivers typology – System A

Fixed typology	Descriptors
	Altitude typology High: >800m Mid-altitude: 200 to 800m Lowland: <200m Size typology based on catchment area Small: 10 to 100 km^2 Medium: >100 to 1000 km^2 Large: >1000 to 10000 km^2 Very Large: >10000 km^2 Geology Calcareous Siliceous Organic

The typology theoretically generates 36 river types, although in practice many of these do not exist or are not significantly populated. This System A typology, when applied to the Northern Ireland river network, produces a typology map with 12 river types (see Map 4, Characterisation Summary Report). The dominant type of river water body in the Northern Ireland network is NI Type 17, lowland (<200m), small (10-100 km2) and calcareous. This type is also the dominant type in England and Wales. There are 237 water bodies of this type in the base Northern Ireland network.

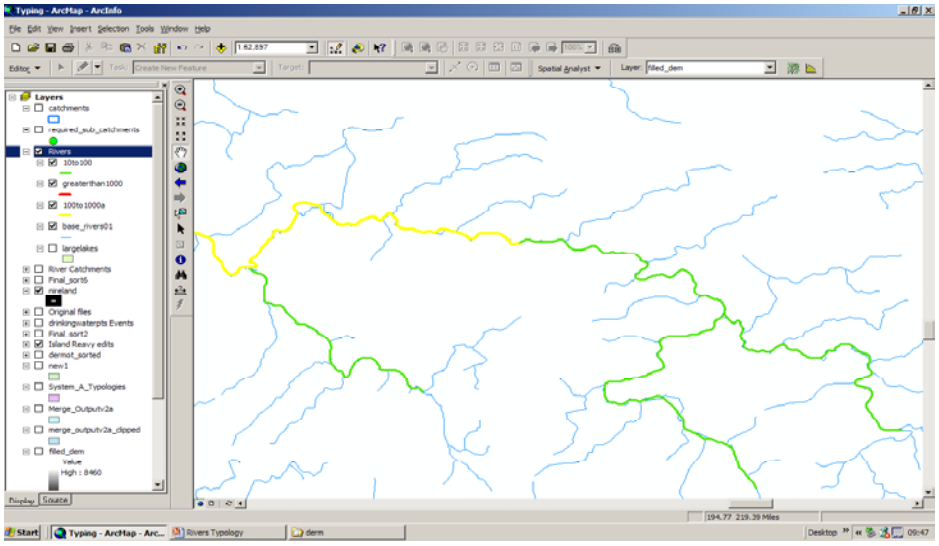
This typology does not deal with artificial linear watercourses (canals). It does not include small coastal catchments either.

2. Water Body Delineation

The Northern Ireland river network was manipulated in GIS to produce an area accumulation network that highlighted the points on the network corresponding to the system A catchment parameters. This was used to identify the individual water bodies for Northern Ireland based on river confluences.

- Each polygon represents a stretch between river confluences obtained from an area accumulation grid. This grid showed where the physical change on the river network, which corresponded to System A typology size parameters, occurred (Figure 1).
- The stretches have been typed with the attributes of mean catchment altitude, dominant geology and catchment size.

Figure 1: Area accumulation grid showing where physical changes corresponding to WFD System A catchment size occur



3. Construction of Northern Ireland River Typology Maps

The construction of the typology maps was carried out using ArcView GIS (Geographical Information Systems). The following data inputs were required:

- OSNI panorama (Digital Elevation Model or DEM)
- GSNI solid geology dataset 1:250,000, GSNI drift geology 1:250,000 (a system for classifying dominant geology was constructed similar to that used in Great Britain (GB))
- Environment and Heritage Service (EHS) flow accumulation grid
- Base rivers dataset produced from Centre for Ecology and Hydrology (CEH) Northern Ireland river network at a scale of 1:50,000.

The typology map was produced using an automated GIS method similar to the method used by the EA in England and Wales.