

EPA Hydrological Data

The EPA is the competent authority for river basin management planning in Ireland under the Water Framework Directive (WFD). The EPA also runs a national surface water and groundwater monitoring and assessment program. As part of these responsibilities, the EPA GIS Team manages a number of national hydrological GIS layers:

- 1:50,000 River network, and the WFD river water body units Ireland's rivers are divided into
- 1:50,000 lake polygons and a selection of approximately 800 lakes that are designated as Lake Water Bodies under the WFD
- National transitional, coastal and groundwater bodies.
- A suite of catchment layers generated to help with River Basin Management planning
- A suite of catchment layers pre-dating the WFD generated before 2005

What Catchments layers does the EPA make available and what data should I use?

What catchments data is available?

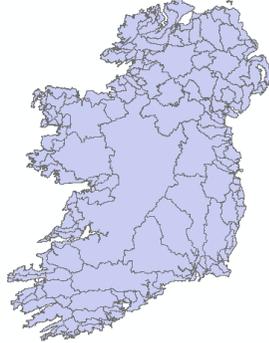
The EPA has eight different "catchments" layers which have different levels of granularity and come from different sources. The latest additions are the new WFD catchments and subcatchments layers, released in January 2016, which were developed specifically for catchment characterisation for the 2015 – 2021 river basin management planning cycle for Ireland (under the WFD). Details of each layer are below.

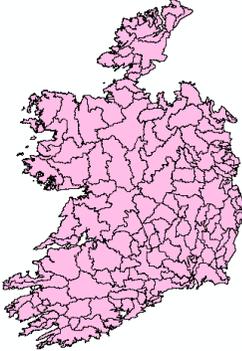
The WFD catchments, subcatchments and river waterbodies (#7, 8, 10 below) are being used as the main reference data for WFD river basin management planning from 2015 to 2021. If you are involved in WFD characterisation and/or measures then you should use these layers as

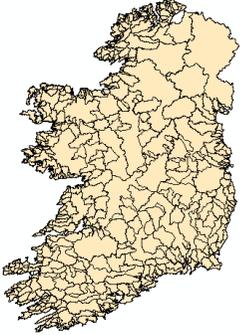
your reference data. Please note that in some cases river basin management priorities, such as engagement of local communities, over-ride hydrological boundaries.

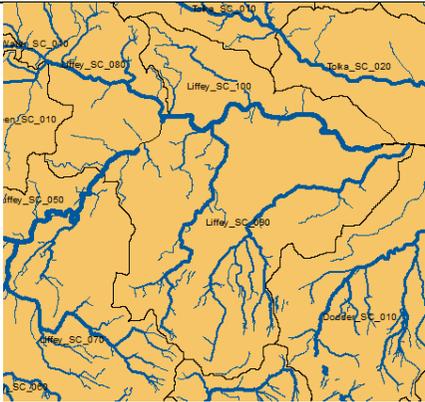
If you wish to refer to a national hydrological map, then the 1958 OSI River Basins map (#5 Water_RiverBasin, below) remains a good national standard.

Name	Number of areas	Source	Image
1. WFD_RiverBasinDistrict	8	Ireland's river basin district (RBD) units for river basin management planning from 2009 – 2015. They are made up of amalgamation of major river basins.	 <p>National RBD map</p>

Name	Number of areas	Source	Image
2. Water_HydrometricAreas	40	Ireland's hydrometric areas, used as management units for hydrological areas (EPA, OPW, ESBI, Local Authorities etc). They are made up of amalgamations of large river basins.	 <p data-bbox="1451 901 1816 930">Ireland's 40 hydrometric areas</p>
3. Water_Catchments_AllIreland	170	Major basins amalgamated from a digitised version of a 1958 OSI Basins map	 <p data-bbox="1451 1345 1760 1374">National Catchments map</p>

Name	Number of areas	Source	Image
4. WFD_WaterManagementUnits	152	During 2009, river basin district offices created groups of water management units to help aggregate their data.	 <p>2009 – 2015 Water Management Units</p>
5. Water_RiverBasin	372	Catchments digitised from the 1958 OSI “Ireland’s Rivers and their Catchment Basins” map	 <p>River Basins from OSI 1958 map</p>

Name	Number of areas	Source	Image
6. Water_SubCatchments	539	Subdivisions of the River basin (1958 catchments)	 <p>National subcatchments map</p>
7. WFD_Catchments (NEW)	46	Catchments for use in River Basin Management planning, 2015 - 2021	 <p>National WFD 2015 – 2021 catchments</p>

<p>8. WFD_SubCatchments (NEW)</p>	<p>583</p>	<p>Subcatchments for use in River Basin Management planning, 2015 - 2021</p>	 <p>National WFD 2015 – 2021 catchments</p>
<p>9. Water_RivNetRoutes</p>	<p>102070</p>	<p>1:50,000 GIS layer of Ireland's rivers (also available as a geometric network geodatabase)</p>	 <p>Detail of the EPA river stretches, lower end of Liffey</p>

<p>10. WFD_RiverWaterbodies</p>	<p>3192</p>	<p>Divisions of river stretches (above) into smaller units for river basin management planning and assessment</p>	 <p>The same stretch of Liffey showing river waterbody units and surrounding river waterbody polygons (grey outlines).</p>
<p>11. Riverwaterbodypolygons (WFD_RiverSubBasins)</p>	<p>3194</p>	<p>The area directly around a river water body unit.</p>	

How do the layers relate?

The layers numbered 7 to 11 in the table above all have a topological relationship (their features and boundaries all match up). This is a result of how the layers were generated. The river stretches (Water_RivNetRoutes) were digitised from OSI 1:50,000 source lines, connected and then attributed with names. This line data was used to create a geometric river network.



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From 2013 to 2015 the river stretches data was divided into river waterbody units, which are the working units for rivers for WFD river basin planning. Using a tool called ArcHydro, the direct area that drains to each line was delineated. These areas are called the River waterbody polygons. Each river waterbody is a set of lines that has its own river waterbody polygon. The river waterbody polygons were used as the building blocks for the WFD_Catchments (#7 above) and WFD_Subcatchments (#8 above). The WFD catchments and subcatchments were created by merging river waterbody polygons, as outlined below. The WFD Catchments and subcatchments are “nested” within each other (i.e. their outer boundaries always match).

How WFD River waterbodies and polygons were delineated

As the WFD Monitoring Programme (MP) is designed to track known pressures, it was decided that the new RWBs and their equivalent sub basin would be defined by the location of a MP station. The monitoring station was used as the location from which the immediate watershed (polygon) for the river was generated. A polygon includes the length of river, including tributaries between one MP station and the next MP station of the source, whichever is applicable. The creation of this dataset involved the generation of a catchment for each of the monitoring stations, to determine the area that, potentially, would drain through the river at that monitoring point. Once these catchments were created, other factors such as the slope, the catchment size and the location of fish monitoring sites were considered to readjust the boundaries.

The sub basins are named according to the main river channel of that RWB. For example, the sub basin at the source of the Avoca is named Avoca_010. The next downstream sub basin is Avoca_020.

How WFD Catchments were delineated

The Catchments dataset is predominantly based on an EPA developed Hydrometric Areas dataset, which divides the island of Ireland into 40 areas. 37 of these areas are either partially or completely contained within the Republic of Ireland.

There are two main differences between the Hydrometric Areas dataset and the Catchments dataset;

- The area boundaries have been altered so that all river water bodies are entirely nested with their parent Catchments. A full explanation of this is given below.
- Hydrometric Areas 25 and 26 (comprising of the Shannon Catchment) were divided into 11 separate Catchments. These Catchments are named as 25A-25D and 26A-26G (both inclusive). The main reason for this is that the existing areas were not practical water management units as they were too large and each includes major rivers such as the Brosna, Inny, Suck and Mulkear.

The development of a new river water body sub basins (RWBs) dataset, using newer and more accurate technology and source data, resulted in some RWBs not being entirely contained within a Catchment boundary. Some RWB boundaries might overlap into a bordering Catchment, in some instances only by a couple of metres, in other instances it was a more significant overlap.

The Catchments dataset was developed, using the RWBs boundaries to form the Catchments boundaries. The result of this is that every RWB is entirely nested within its parent Catchment, with no overlap in a bordering Catchment.

In the instance that a RWB overlapped two old hydrometric areas (dataset no. 2 above), it was assigned to the equivalent catchment based on percentage area that was located in one catchment as opposed to the other. For example, if 99% of a RWB is located in Catchment ABC and

1% of the RWB is located in the neighbouring Catchment XYZ, the RWB was assigned to Catchment ABC. All RWBs that were assigned to Catchment ABC were then merged to form the Catchment ABC boundary.

How WFD Subcatchments were delineated

The dataset consists of subcatchments, the majority of which areas are approx. 100-200km². Integrated subcatchment assessment is being undertaken within each individual subcatchment, and these assessments will form the building block for developing the Water Framework Directive Programme of Measures in the River Basin Management Plans. The subcatchment areas were selected as 100-200km² as literature and experience in other countries suggest that this is the most appropriate scale for communities and local groups to work together to improve their water quality.

When the subcatchments were originally delineated based on the water body layer, in each main catchment there was one narrow subcatchment that extended from the headwaters to the catchment outlet along the main channel. It was decided to break this main channel subcatchment up, as long narrow subcatchments are not suitable for community engagement because of size, and also because a main channel often forms parish and county boundaries. To promote community engagement the waterbodies in the main channel subcatchment were split each side of the main channel and combined with the most connected adjacent subcatchment.

The layers numbered 1 to 6 in the table above all predated the WFD, or were created as part of the first cycle of WFD river basin management from 2009 to 2015.

The River Basin District layer (#1 WFD_RiverBasinDistrict) was created from the Water_HydrometricAreas (#2) layer. The outer RBD boundaries were ground-truthed by EPA hydrometric staff in 2003 - 2004.

The remaining catchment layers (#3 to #6) were generated at different times for different purposes. They are not completely “nested” within each other, i.e. their outer boundaries do not always match.

Known Issues

- The EPA presents all of the catchments layers listed above for download and use, but on the basis that they are not currently nested within each other.
- No topological assessment has been carried out on the EPA catchments layers. While the EPA would like to create a completely nested, topologically sound set of catchments and surface water data available in the long term the catchments layers listed above are made available until this long term objective is achieved.
- The EPA river stretches (#9 Water_RivNetRoutes) and river waterbodies (#10 WFD_Riverwaterbodies) are 1:50,000 scale as this is a suitable scale for river basin management planning. This 1:50,000 representation does not include small streams and drains. Should large scale data like this be required you should contact the Ordnance Survey of Ireland.

If you have any queries please [Contact Us](#) on the EPA Geoportal. (<http://gis.epa.ie/ContactUs>)