Australian Government
Bureau of Meteorology

Australian Hydrological
Geospatial Fabric (Geofabric)

Toolset

Legend
- Monitoring Stations
- Monitoring Station Stream Links
- Monitoring Station Catchments
- Geofabric Network Streams

219027
219013
219033
219001
219017
BROGO RIVER
219025
BEMBOKA RIVER
219003
219900
BEGA RIVER
219022
219032
TANTAWANGALO CREEK
219006
219034
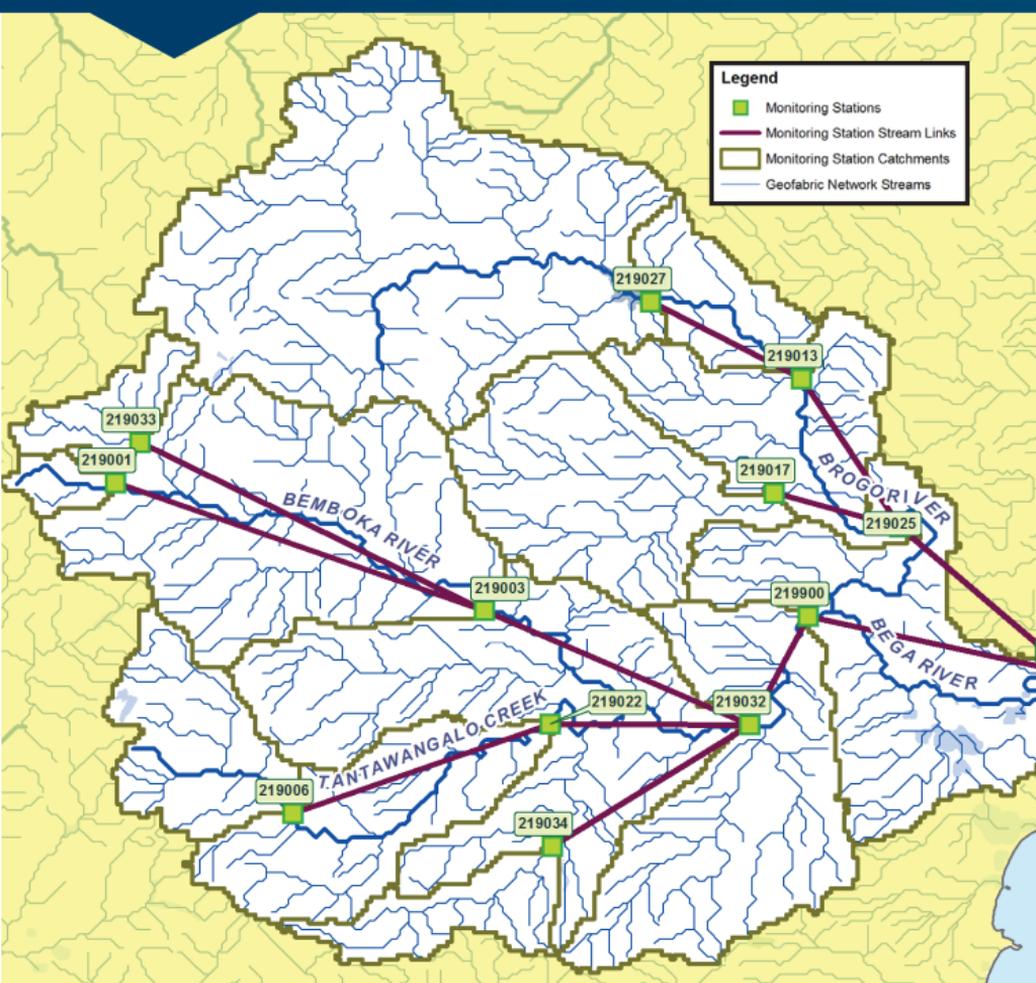
Create, model and analyse custom catchments

A user guide to the Geofabric
sample toolset 1.6

What is the Geofabric?

The Geofabric is a specialised suite of hydrological spatial data products, like a digital street directory of Australia's important water features.

Understanding the complex connections between rivers, lakes, water storages and catchments is vital for the effective management of water resources.

Why use the Geofabric toolset?

Visualise flow as it travels downstream through a set of monitoring stations using time-series data.

Report on resources within a region using custom created catchments.

Plan for environmental effects by mapping contamination in a waterway.

Understand flood risks by integrating catchments with flood modelling software.

The Geofabric toolset 1.6 demonstrates how to perform the common hydrological task of creating catchments for a set of user defined points using the Geofabric with ESRI ArcGIS Desktop.

Water managers can use it to identify contributing catchment areas and manage water assets. Hydrologists can spatially derive catchment and routing input data for rainfall/runoff models.
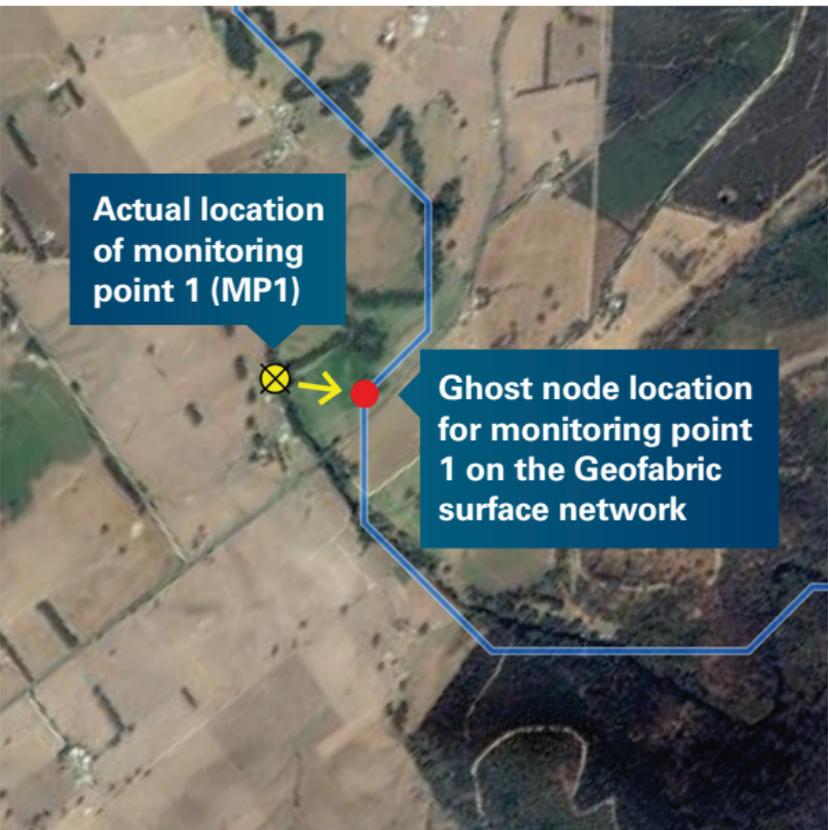
1 | Align points to Geofabric network

Align points of interest and interact with the Geofabric network.

- Create a set of candidate ghost nodes.

- Automatically select the best ghost nodes.

This creates a new ghost node layer representing the logical position of your points on the Geofabric network.

Actual location of monitoring point 1 (MP1)

Ghost node location for monitoring point 1 on the Geofabric surface network

- Add ghost nodes to a topology file.

This associates them with the existing fully connected and flow-directed Geofabric network features.

2 | Create catchments

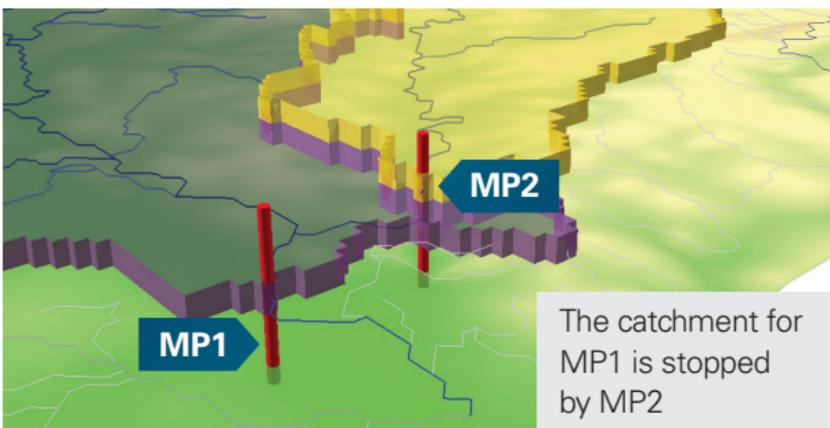**Use Geofabric nodes or your own ghost nodes to create custom catchments.**

- Use the catchment tools to merge base catchments into custom catchments.

The base catchment represents the area which drains directly into each stream segment.

Merged catchments can be either total upstream drainage area catchments...

MP2

MP1

Catchments for MP1 and MP2 overlap upstream of MP2
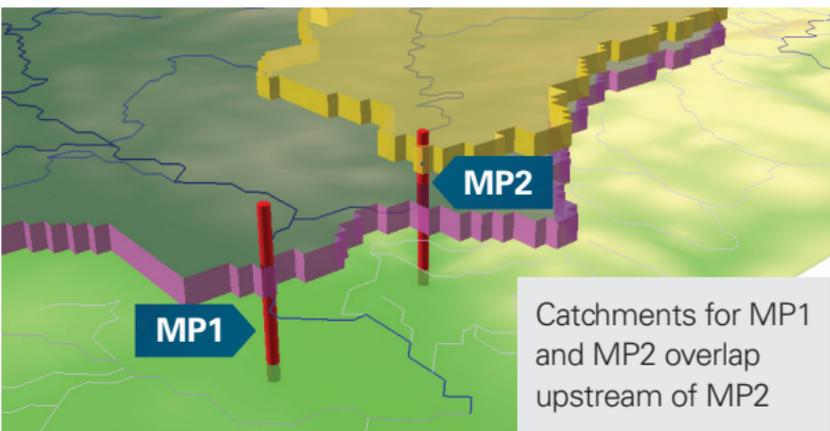
…or non-overlapping subcatchments (aka reach catchments).

MP2

MP1

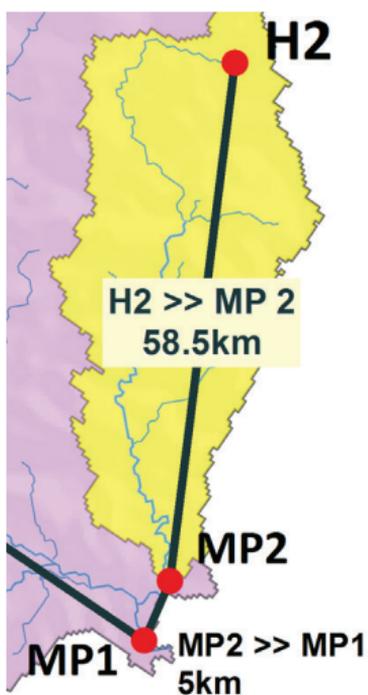The catchment for MP1 is stopped by MP2

3 | **Integrate and analyse**

Integrate

- Download and relate time-series data from Water Data Online using monitoring point station IDs, selecting type of data and time period required.

- Start modelling by creating stream links with the link creation tool.

H2

H2 >> MP 2
58.5km

MP2

MP1   MP2 >> MP1
5km

Model stream links for a set of monitoring points

- Export for use in Unified River Basin Simulator modelling software.

Analyse

- Define catchment statistics such as total rainfall or land use and land cover percentages using custom catchments and geoprocessing tools.

- Analyse potential of risk to biodiverse areas and managing water storage levels.

Important terms

Monitoring point (MP)
Point on or near to the stream where observations of physical phenomena are made e.g. stream flow rate.

Ghost node
Node on the Geofabric stream network that represents the logical location of a monitoring point or other feature along the network.

Topology
The spatial relationship between features e.g. stream 1 connects to stream 2.

Catchment
Polygon feature that describes the total contributing upstream area at a point on the stream network.

Subcatchment
Non-overlapping polygon feature that describes the catchment area between points along the network. Also known as reach catchments.

Time-series data
Collection of observations or measurements taken over a period of time.

Unified river basin simulator
Specialised rainfall runoff routing model.

Find out more

For more information about the Geofabric visit www.bom.gov.au/water/geofabric or contact ahgf@bom.gov.au

Subscribe to our newsletters and product notices to receive regular updates at www.bom.is/enviro-news