Case Study:
Building the Australian Hydrological Geospatial Fabric (Geofabric)
Geoscience Australia
Australian Hydrological Geospatial Fabric (Geofabric)

The Australian Hydrological Geospatial Fabric (Geofabric) is a specialised Geographic Information System (GIS). It registers the spatial relationships between important hydrological features such as rivers, water bodies, aquifers and monitoring points.

By detailing the spatial dimensions of these hydrofeatures and how they are connected, we are able to see how water is stored, transported and used through the landscape.

To learn more about the Geofabric watch our short information video. For a detailed explanation and demonstration of the Geofabric [watch our webinar](#).

Get data via [Geofabric Web Services](#), download data and the sample toolset from the [Geofabric FTP site](#) or visualise the [Geofabric product via the MapConnect portal](#).

An [ESRI sample toolset](#) has been developed for the Geofabric to perform common hydrological tasks such as creating catchment areas for a set of user defined points. Read the tutorial for more information.

For more information on the Geofabric please contact [ahgf@hom.gov.au](mailto:ahgf@hom.gov.au)
The Bureau of Meteorology's Mandate

10-year Australian Government program began in July 2007

$450m funding

- 110 new staff + systems + R&D
- Administered funding support for data providers

Legislative backing

- Water Act 2007
- Water Regulations 2008

Relies on collaboration with data providers and leveraging water information as part of a national effort
Geofabric collaborators (the geofabricators)

STATE AGENCIES
South Australian Department of Environment and Heritage:
Tasmanian Department of Primary Industries and Water:
Northern Territory Department of Planning and Infrastructure:
Queensland Department of Environment and Resource Management:
Western Australia Landgate:
New South Wales Land and Property Authority:
Victorian Department of Environment and Sustainability:
Building on Strong Foundations

Foundation data GA inputs

(ISO 19115)

ISO 9001 QA focus

**GEODATA** 1:250,000 hydrology (AusHydro)

9 second DEM derived streams

9 second catchment boundaries

Geofabric Product Suite (ISO 19131) DPS Delivering OGC Services

**Geofabric Surface Cartography** (Geofabric Surface Hydrology Cartography 1:250,000 scale - Version 1)

**Geofabric Surface Network** (Geofabric Surface Hydrology Network 1:250,000 scale - Version 1)

**Geofabric Surface Catchments** (Geofabric 9 second Catchments – Derived Contracted Catchments 1:250,000 scale – Version 1)
Conceptual Model used for FSDF
Standards Used

ISO19100 series Geographic information has been considered,

AS4590:2006 Interchange of client information

AS1199.0-2003 Sampling procedures for inspection by attributes

Australian Water Act 2007

Open Geospatial Consortium (OGC) Web Feature Service (WFS) Implementation

Specification 1.1.0 (OGC Document No. 04-094)

Open Geospatial Consortium (OGC) Web Map Service (WMS) Implementation Specification 1.3.0 (OGC Document No. 06-042)
Geofabric data products – multiple related representations derived data products

**Contracted nodes**
Persistent identifiers for nodes that relate segments & catchments across multiple representations

**Streams** represented as multiple geometries & topologies
**Catchments** represented as multiple geometries & topologies
Water Information Research and Development Alliance WIRADA
Collaboration between BoM and CSIRO

“Adopt, adapt, invent” principle: adopting existing standards, protocols and procedures where possible, adapting where necessary and inventing as a last resort

WDTF principles has been built on
International Standard Organisation’s (ISO) General Feature Model ISO 19109

The XML encoding for WDTF is based on a GML Simple Features (GML– SF) implementation of the Observations and Measurements (O&M) standard. GML– SF is a profile that only uses a subset of GML, reflecting the most common WFS (Web Feature Service) use of GML3
Development of Geofabric models - input to HY_Features in OGC

HY_Features, is designed as a set of interrelated application schemas using ISO 19103 Conceptual Schema Language and ISO 19109 General Feature Model.

Future is to “Adopt, adapt, invent” learn from the Geofabric and apply to FSDF
Issues

• Minimal adoption of agreed data standards

• “Evidence based decision making”

• Discovering and integrating data from multiple sources
  • because problems are multidimensional
  • geographic basis of issues and actions
  • geography is shared

• Spatial Data Infrastructures
  • manage spatial data once, and share it
  • efficiency and efficacy

• Machine to Machine readable
SO what do we need from standards

Some common ground with business needs

Must be able to show a benefit back to the business

Must be relatively straightforward to conform with