Australian Hydrological Geospatial Fabric (Geofabric)

Data Product Specification

Hydrology Reporting Catchments

Version 2.1 – November 2012

Australian Government
Bureau of Meteorology

Water Information
DATA · INFORMATION · INSIGHT

Contact details

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Preface

This document is based upon the AS/NZS ISO 19131:2008 Geographic information - Data product specifications standard[1]. The document provides a framework for the completion of a Data Product Specification (DPS) for geographic data product produced as part of the Geofabric project.

[1] AS/NZS, "AS/NZS ISO 19131:2008 Geographic information - Data product specifications" (AS/NZS, July 21, 2008), www.saiglobal.com/online/.

1 Overview

1.1 Data product specification title

Geofabric Hydrology Reporting Catchments

1.2 Reference date

2012-08

1.3 Responsible party

Contact organisation: Bureau of Meteorology

Contact position: Geospatial Data Unit

Mail address: GPO Box 2334

Locality: Canberra

State: ACT

Country: Australia

Postcode: 2601

Electronic mail address: ahgf@bom.gov.au

1.4 Data product specification language

English

1.5 Terms and definitions

Please refer to the Glossary on the Geofabric website.

1.6 Abbreviations and acronyms

AHGF	Australian Hydrological Geospatial Fabric
ANZLIC	Australian and New Zealand Land Information Council
Bureau	Bureau of Meteorology
DEM	Digital Elevation Model
DPS	Data Product Specification
ESRI	Environmental Systems Research Institute Inc.
FGDC	Federal Geographic Data Committee
GDA94	Geodetic Datum of Australia 1994
ISO	International Organization for Standardization
SDE	Spatial Database Engine

1.7 Informal description of data product

Geofabric Hydrology Reporting Catchments comprises two related views of hydrological catchments to be used for analysis and reporting purposes. Firstly, a topological network view of hydrological catchments represented as a simplified node-link network using a subset of the contracted nodes (AHGFNode) and the links (AHGFLink) between them; and secondly, a catchments view of the hydrology using the contracted catchments (AHGFContractedCatchment).

The AHGFNode feature class contains contracted nodes that are points of hydrological significance that carry identity. They include the confluence of major named streams, coastal stream termini, waterbody inflow and outflows and inland sinks. It also contains a new class of node called diffuse nodes that represent diffused flow from groups of nodes at coastal, delta or inter-catchment outlets.

The AHGFLink feature class provides the topological connectors between a subset of contracted nodes that participate in the simplified node-link network.

The AHGFContractedCatchment feature class contains catchment polygons (that are aggregations of AHGFCatchments) for the subset of contracted nodes that participate in the simplified node link network. These catchments are part of a hierarchy that can be aggregated based on upstream relationships.

The data product extent is Geographic Australia (as defined by *Acts Interpretation Act 1901*). The product will be updated periodically to reflect changed attribution and new data sources.

2 Specification scope

2.1 Scope identification

Global

2.2 Level

Dataset

2.3 Level name

Global scope

2.4 Level description

This is the default root level global scope used by this data product and relates to all data within the product.

2.5 Extent

2.5.1 Description

Data for this scope relates to Australia, excluding external Territories - Geographic Australia (as defined by *Acts Interpretation Act 1901*).

2.5.2 Geographic extent

West bound longitude

112.8 °

East bound longitude

154.1 °

South bound latitude

-44.0 °

North bound latitude

-8.9 °

2.5.3 Temporal extent

Start date

1992-01-01

End date

Now

3 Data product identification

3.1 Title

Geofabric Hydrology Reporting Catchments

3.2 Alternate title

Geofabric Hydrology Reporting Catchments 1:250,000 scale 2012

3.3 Product ID

ANZCW0503900107

3.4 Abstract

Geofabric Hydrology Reporting Catchments comprises two related views of hydrological catchments to be used for analysis and reporting purposes. Firstly, a topological network view of hydrological catchments represented as a simplified node-link network using a subset of the contracted nodes (AHGFNode) and the links (AHGFLink) between them; and secondly, a catchments view of the hydrology using the contracted catchments (AHGFContractedCatchment).

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The AHGFContractedCatchment feature class contains catchment polygons (that are aggregations of AHGFCatchments) for the subset of contracted nodes that participate in the simplified node link network. These catchments are part of a hierarchy that can be aggregated based on upstream relationships. This product contains five feature types including: Node, Link, Contracted Catchment, Node-Link Connectivity (upstream), and Node-Link Connectivity (downstream).

3.5 Purpose

Geofabric Hydrology Reporting Catchments is designed to meet two specific use cases. Firstly, the contracted catchments are designed to build stable reporting regions and secondly, the simplified node-link network is designed to be used as input to hydrological modelling environments, to identify nodes, reporting reaches and their associated catchments.

The AHGFContractedCatchment feature class is designed to represent geographic surface boundaries that have a hydrological relationship to surface water features.

These catchment boundaries in their current form may not completely satisfy legislative or business requirements, but are intended to provide the building blocks for reporting regions such as those given in Geofabric Hydrology Reporting Regions. The AHGFNode and AHGFLink feature classes provide a simplified, dendritic node link network for input into hydrological models.

3.5.1 Use case

The product provides access to the topological connections between important hydrological features that can be used for stream tracing operations and hydrological modelling. The Geofabric Contracted Catchments can also be aggregated to create stable reporting regions based on reporting requirements.

3.6 Topic category

003 - boundaries

007 - environment

012 - inland water

013 - location

3.7 Spatial representation

vector

3.8 Spatial resolution

3.8.1 Spatial denominator

250,000

3.8.2 Resolution distance

250 metres

3.9 Geographic bounding box

3.9.1 West bound longitude

112.8 °

3.9.2 East bound longitude

154.1 °

3.9.3 South bound latitude

-44 °

3.9.4 North bound latitude

-8.9 °

3.10 Geographic identifier

3.10.1 Identifier authority

ANZLIC – the Spatial Information Council

3.10.2 Identifier code

AUS

3.10.3 Code space (register URL)

ANZLIC

http://asdd.ga.gov.au/asdd/profileinfo/anzlic-allgens.xml

3.11 Reference to specification scope

Global

4 Data content and structure

4.1 Description

The product consists of the following components which combine to give a complete data product:

Vector data

The data is available as an ESRI File Geodatabase: Geofabric Hydrology Reporting Catchments. The ESRI File Geodatabase reflects the stored environment of the data in a spatial database engine (SDE) export format.

In its native ESRI File Geodatabase format, Geofabric Hydrology Reporting Catchments consists of a single feature dataset/theme – HR_Catchments – containing five feature classes, and two relationship classes. The geodatabase structure provides greater efficiencies in the management and revision of source topographic data, which are now reflected in a more sophisticated data product suitable for a range of hydrological applications.

Geofabric Product Guide

This guide describes Geofabric Hydrology Reporting Catchments, particularly the geodatabase format, with the aim of describing:

- important and common geospatial data characteristics
- geodatabase components and data concepts
- hierarchy of feature structure and attributes
- accuracy of the data.

Licence Agreement Creative Commons

The licence agreement details the conditions of use for the data including any referencing requirements.

4.2 Feature information

4.2.1 Application schema

Refer to Geofabric Hydrology Reporting Catchments – Geodatabase Product Schema V2.1 2012 available from www.bom.gov.au/water/geofabric/documentation.shtml

4.2.2 Feature catalogue

The following table lists the feature classes, their geometry and AHGF feature type number for Geofabric Hydrology Reporting Catchments.

Table 1 - Product Feature Type Registry for Geofabric Hydrology Reporting Catchments

HR_Catchments - Feature Class/TableName.Subtype(Type)	Feature Class Geometry	AHGF Feature Type Number
AHGFNode.NetworkJunctionNode*	points	4
AHGFNode.NetworkTerminusNode*	points	5
AHGFNode.NetworkArtificialNode*	points	6
AHGFNode.NetworkWaterAreaNode*	points	7
AHGFNode.NetworkGhostNode*	points	8
AHGFNode.NetworkHeadNode*	points	9
AHGFNode.NetworkCliffNode*	points	10
AHGFContractedCatchment.ContractedArea	polygon	22
AHGFContractedCatchment.NonContractedArea	polygon	23
AHGFContractedCatchment.NoFlowArea	polygon	24
AHGFLink	line	65
NodeLinkConnectivityUp	na	table
NodeLinkConnectivityDown	na	table

* Subset of AHGFNetworkNode features corresponding to logically contracted nodes
Highlighted text indicates a Bureau created feature

4.3 Reference to specification scope

Global

5 Reference systems

5.1 Spatial reference system

5.1.1 Name

GDA94

5.1.2 Code

4283

5.1.3 Code space

EPSG_v65

5.2 Temporal reference system

Gregorian calendar

5.3 Vertical reference system

Not applicable

5.4 Reference system scope

Global

6 Data quality

6.1 Data quality scope

6.1.1 Scope code

Dataset

6.1.2 Extent

Australia (excluding external territories)

6.1.3 Scope description

The data quality metadata relates to the entire dataset comprising this data product.

6.2 Data quality lineage

6.2.1 Lineage statement

Data sources

Geofabric Hydrology Reporting Catchments is part of a suite of Geofabric products produced by the Australian Bureau of Meteorology.

The geometry of this product is derived from the Geofabric Surface Network product. It consists of Node, Link and Contracted Catchments as well as Node-Link Connectivity tables for both upstream and downstream network tracing. The outflow point for each Contracted Catchment is based on a Contracted Node and the boundaries of the underlying Catchments.

The feature class terminology for Geofabric Hydrology Reporting Catchments components has been modified to distinguish it in terms of the product's underlying data model.

The AHGFContractedCatchments are aggregations of the 9 second catchments that participate in a relationship of common areal extent, based upon the location of a Contracted Node from both the Geofabric Surface Cartography and Geofabric Surface Network products. The types of contracted nodes and the levels of contracted confidence are further described in the Geofabric Product Guide, which is available at www.bom.gov.au/water/geofabric/documentation.shtml

Processing steps:

1. Re-composited feature classes in the Geofabric Maintenance Geodatabase Feature Dataset are assigned unique Hydro-IDs using ESRI ArcHydro for Surface Water (ArcHydro: 1.4.0.180 and ApFramework: 3.1.0.84).
2. Feature classes from the Geofabric Maintenance Geodatabase Feature Dataset are extracted and reassigned to the Geofabric Hydrology Reporting Catchments Feature Dataset within the Geofabric Hydrology Reporting Catchments Geodatabase.

A complete set of data mappings, from input source data to Geofabric Products, is included in the Geofabric Product Guide, Appendices, which is available at www.bom.gov.au/water/geofabric/documentation.shtml

6.3 Quality scope

Global

7 Data capture

7.1 Data capture statement

This product is derived from the Geofabric Surface Network and Geofabric Surface Catchments.

7.2 Data capture scope

Global

8 Data maintenance

8.1 Maintenance and update frequency

Irregular

8.2 Other maintenance information

The product will be updated periodically, as deemed necessary, to reflect changed attribution and new data sources.

8.3 Maintenance scope

Global

9 Portrayal information

9.1 Portrayal information

Not applicable

9.2 Portrayal scope

Global

10 Data Product Delivery

10.1 Delivery format

10.1.1 Format name

ESRI ArcGIS File Geodatabase

10.1.2 Format version

ArcGIS v9.3

10.1.3 Language used within the dataset

English

10.1.4 Character set coding

Utf8

10.2 Delivery medium

10.2.1 Units of delivery

National dataset

10.2.2 Estimated size of a unit in the specified format

HR_Catchments.gdb = 85 MB

10.2.4 Medium name

onLine

10.2.5 Online delivery URL

www.bom.gov.au/water/geofabric/download.shtml

10.3 Other delivery information

Also supplied as ESRI Shapefiles (requires written request to ahgf@bom.gov.au).

10.4 Delivery scope

Global

11 Additional information

11.1 Additional information

Licensing and access constraints

Licensed for use under Creative Commons Australia Attribution.

We request attribution as © Commonwealth of Australia (Bureau of Meteorology) 2012.

Special features of the supplied data product or its component parts

Spatial data in the ESRI File Geodatabase, Geofabric Product Guide and Geofabric Data Product Specifications.

Limitation or constraints on product use

As per Creative Commons Australia Attribution licence.

Layer files or queries that operate on the data product

Geofabric Hydrology Reporting Catchments – V2.1.lyr

Related data products

- Geofabric Surface Cartography
- Geofabric Surface Network
- Geofabric Surface Catchments
- Geofabric Groundwater Cartography
- Geofabric Hydrology Reporting Regions.

11.2 Additional information scope

Global

12 Metadata

Metadata format requirements

Metadata compliant with ANZLIC Metadata Profile Version 1.1 of AS/NZS ISO 19115 was produced for this data product. The metadata profile is available at dataset level. Feature level metadata is provided within the ArcGIS ArcCatalog FGDC style sheet for all feature types included within this product and describes the lineage of feature.

Metadata encoding requirements

ArcGIS FGDC and ANZLIC compliant feature metadata.

References to metadata for data product and component parts

An ISO 19115 compliant XML file of the Geofabric Surface Hydrology Reporting Catchments metadata statement accompanies the Product (HR_Catchments.xml) and is viewable using either the ArcGIS ISO 19139 ArcCatalog metadata style sheet or the ANZMet Lite version 1.0.1 metadata creation tool available from http://www.spatial.gov.au

Water Information
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Through the *Water Act 2007*, the Australian Government has given the Bureau of Meteorology responsibility for compiling and delivering comprehensive water information across Australia.

For more information
Visit our website at www.bom.gov.au/water
Send an email request to waterinfo@bom.gov.au

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