



**Australian Government**  

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**Geoscience Australia**

# **Australia's River Basins 1997**

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## ***Product User Guide***

**National Mapping Division,  
Geoscience Australia**

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**Technical support:**

For up to date information on *Australia's River Basins 1997* refer to the Geoscience Australia website:

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**Acknowledgments:**

Geoscience Australia gratefully acknowledges contributions to map content. Information is supplied by Commonwealth, State, Territory and local government, private sector agencies and individuals. A comprehensive list is available from our web site.

**About this product user guide**

This product user guide sets out the fundamental concepts and characteristics of *Australia's River Basins 1997*. The guide begins with general information and provides more details in later sections. The overview of data content and structure will allow you to make immediate use of the data.

The information in this product user guide was correct at the time of publication and is subject to change. Geoscience Australia assumes no liability resulting from any statements, errors or omissions in the publication or from the use of information contained in this product user guide.

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# 1 User information

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## 1.1 User support/contact information

A copy of the licence conditions are supplied at the time of purchase or download, and should be retained for proof of licensing.

Geoscience Australia welcomes feedback on any aspect of its product or services. Please direct your comments or any queries regarding this document or data to:

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## 1.2 Geoscience Australia - National Mapping Division

Geoscience Australia is the national agency for geoscience research and spatial information. It serves government and supports the community through its output areas of geoscience for urban centres, oceans and coasts, and regional and rural areas.

The National Mapping Division within Geoscience Australia undertakes national mapping, remote sensing maritime boundary and land information coordination activities in support of Australia's economic and social development.

## 1.3 Other contributors

The following agencies contributed data to this product, and thus custodianship of the data is vested as follows.

**Table 1:** Data custodians

Data	Agency
<b>Basin boundaries</b>	
New South Wales	Department of Land and Water Conservation
Northern Territory	Department of Lands, Planning and Environment
South Australia	Department of Natural Resources
Queensland	Department of Environment and Natural Resources
Tasmania	Department of Primary Industry and Fisheries
Victoria	Department of Natural Resources and Environment
Western Australia	Water and Rivers Commission
<b>Basin centroids</b>	
Australia	Geoscience Australia
<b>Coastline</b>	
Western Australia (excluding islands)	Water and Rivers Commission
Remainder of Australia	Geoscience Australia
<b>State borders</b>	
Australia	Geoscience Australia

## 2 About Australia's River Basins 1997

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### 2.1 Australia's River Basins 1997 components

Your *Australia's River Basins 1997* data package has two components which combine to give you a complete data product. The components are:

- **Product user guide**  
This guide describes the structure and content of *Australia's River Basins 1997*.
- **Data files**  
The number of files will vary with the application format of the data.

### 2.2 The Australia's River Basins 1997 product

*Australia's River Basins 1997* is the result of a joint State and Commonwealth project to create a national spatial database of major hydrologic basins. The data has been derived from topographic maps at scales ranging from 1:10 000 to 1:250 000. These basins are the primary building block for the collection of national hydrologic data and the assessment of water resources.

Australia is divided into drainage divisions. The drainage divisions are sub-divided into water regions, which are in-turn sub-divided into river basins. Statistics are gathered and used at all three levels.

This database contains boundary information for 12 divisions, 77 regions and 245 basins. It also contains, for each basin, information relating to its individual basin/region/division name and number. State borders are also included in the data. Data for Division XIII Distant Islands Division is not included.

The former Australian Water Resources Council (AWRC) formally defined the drainage divisions and river basins in the early 1960s and, with minor modifications resulting from improved mapping of the inland arid zone area, has been the basis for the study of Australian hydrology since. The drainage divisions were defined by both the major topographic features of the continent and the main climatic zones to give broadly homogenous hydrologic regions. Within the drainage divisions, the river basins are defined by the major watershed lines.

### 2.3 Coordinate system

*Australia's River Basins 1997* data is available in geographical coordinates (latitude and longitude) in decimal degrees using the Australian Geodetic Datum (AGD66).

## 3 Data loading

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### 3.1 Application formats

The *Australia's River Basins 1997* data is supplied in three application formats:

- ArcInfo Export;
- ArcView Shapefile; and
- MapInfo mid/mif.

### 3.2 Description of files

The downloaded *Australia's River Basins 1997* package contains the following files.

**Table 2:** *Australia's River Basins 1997* files

Documentation files			
File name	File content		
42343_user_guide.pdf	This user guide		
Data files			
File name	ArcInfo Export (*e00)	ArcView Shapefile (*dbf, *.shp, *.shx)	MapInfo mid/mif (*mid, *.mif)
	File size (KB)	File size (KB)	File size (KB)
rbasin	(*e00 - *.e11) 24 781	(+_chain) 9 226 (+_point) 304 (+_polygon) 13 517	(+_chain) 12 800 (+_point) 190 (+_polygon) 19 046
<b>Total</b>	24 781 KB/ 24.2 MB	23 047 KB/ 22.5 MB	32 036 KB/ 31.3 MB

## 4 Data characteristics and concepts

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### 4.1 Australia's River Basins 1997 data concepts

Each feature in *Australia's River Basins 1997* is defined by a spatial object and an attribute object. These features fit into the hierarchy of theme and layer. At the highest level, associated features are grouped into themes. Themes are subdivided into layers according to the spatial objects used to represent the features.

#### Vector data

Vector data describes spatial data in which the location of a real world phenomenon is defined by points and straight lines (vectors) between these points. The vector data model used also includes polygons - areas bounded by straight lines.

#### Feature-based data

*Australia's River Basins 1997* uses a feature-based data model described by the following definitions. These are used to describe data that represent phenomena in the real world:

- **Entity:** A real world phenomenon which cannot be divided into phenomena of the same type.
- **Feature instance:** A single occurrence of a feature which has a unique set of spatial and attribute object values.
- **Attribute:** A descriptive characteristic of a feature. Attributes can be spatial (or locational) and aspatial (or non-locational).
- **Attribute value:** A value assigned to an attribute, either for a feature instance or its attributes.
- **Feature class:** A group of feature instances defined by a set of rules and having common attributes and relationships that are the properties of the corresponding real world phenomena.
- **Entity class:** A group of entities of the same kind, matching the members of a feature class.

The structure of a feature instance in the feature based data model can be summarised as:

*feature instance* = [ *spatial object* + *attribute object* ]

#### Spatial object

*Spatial objects* are the locational attributes of the feature. They comprise the special cases of points, chains and polygons. Spatial objects have a spatial address which consists of one or more couplets (x, y) or triplets (x, y, z).

#### Point

A *point* is a geometric representation defined by a single (x, y) coordinate couplet or a (x, y, z) triplet. Three special points are used.

- **Entity point**  
An *entity point* is used to locate point entities, or area entities represented by a point because of the scale of the source material and/or scale of the final product. ●
- **Polygon label point**  
A *polygon label point*, contained within every polygon feature instance, locates information about that polygon. It is linked to the bounding chains of the polygon. In proprietary GIS software packages, this point type is sometimes known as a centroid. +
- **Node**  
A *node* is a junction of two or more feature instances or an end point of a feature instance. Nodes may carry attribute information. ■

**Chain**

A *chain* is a spatial object composed of a sequence of non-intersecting line segments which is bounded by nodes at each end. Chains may carry topological information such as a reference to the polygons to the left and right (with respect to the direction of digitising) and reference the start and end nodes.

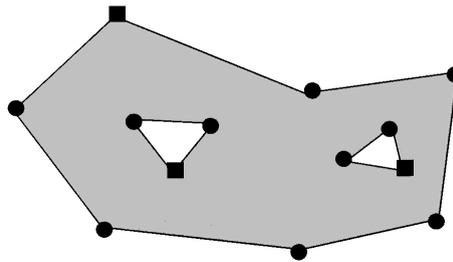
A line segment is a straight line between two consecutive vertices in a chain. Each vertex is defined by a single (x, y) coordinate couplet.



**Figure 1:** Chain spatial object

**Polygon**

A *polygon* is a bounded, continuous region consisting of an interior area, and an outer boundary defined by a set of chains. A polygon may also contain one or more non-nested inner boundaries also defined by sets of chains.



**Figure 2:** Polygon spatial object

## 5 Data structure and content

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### 5.1 Data structure

The topological data model for River Basin data consists of lines, polygons and polygon label points. The River Basin, Water Region and Drainage Division areas are represented by polygons. The Drainage Divisions are sub-divided into Water Regions, which are in-turn sub-divided into River Basins. The label point of each River Basin polygon carries the attributes to identify the Basin, Region and Division. Lines represent Basin, Region and Division boundaries, coastline and State borders. Each line has attributes to identify the characteristics of the line.

The following table shows the counts of features and attributes within the data.

**Table 3:** Data feature and attribute statistics

<b>Feature</b>	<b>Count</b>
Points	1309
Lines	2628
Polygons	1309
<b>Attribute</b>	<b>Count</b>
River Basin names	245
River Basin numbers	46
Water Region names	77
Water Region letters	13
Drainage Division names	12
Drainage Division numerals	12

## 5.2 Data dictionary

**Table 4:** Attribute table of *Australia's River Basins 1997*

Feature	Description	Object	Attribute	Attribute values
RIVER BASIN (dbasin_cent)  Note: island_cent is used as the feature code for minor island contained within river basins.	<p>A polygon representation of the River Basin.</p> <p>Where the River Basin includes islands, the islands carry the same attributes except for the feature code. In these cases the 'island_cent' feature code is used instead of 'dbasin_cent'. For example, River Basins consisting entirely of offshore islands have the 'dbasin_cent' code attached to the main island(s) and 'island_cent' attached to all minor islands.</p> <p>Where islands are in watercourses or very close to the coast, they are attributed the same as the mainland River Basin. River Basins intersected by State borders are treated as several polygons, each label point carrying identical attributes.</p>	Polygon/entity point	BASIN NAME (bname)	River basin name
			BASIN NUMBER (bnum)	Ranges from 1 to 46
			REGION NAME (rname)	Water region name
			REGION CODE (rnum)	Ranges from A to M
			DIVISION NAME (dname)	Drainage division name
			DIVISION NUMBER (dnum)	Ranges from I to XII
			FEATURE CODE (f_code)	Dbasin_cent = <i>River basin</i> Island_cent = <i>minor island contained within river basin</i>
BOUNDARIES AND BORDERS	<p>This represents the River Basin, Water Region and Drainage Division boundaries, coastline and State borders.</p> <p>Where Basin, Region, or Division boundaries are coincident with State borders, the boundary is attributed to indicate dual classification. This situation occurs for Region and Division boundaries on the Queensland - New South Wales border bear the coast and also occurs on the Victoria - New South Wales border along the upper reaches of the Murray River. The attribute values used are 'divn_state' and 'region_state' where Drainage Division boundaries and Water Region boundaries respectively coincide with State borders.</p>	Chain	FEATURE CODE (f_code)	Basin_bdy = <i>River Basin boundary</i> Region_bdy = <i>Water Region boundary</i> Divn_bdy = <i>Drainage Division boundary</i> Coast_jbt = <i>Coastline - Jervis Bay Territory</i> Coast_nsw = <i>Coastline - New South Wales</i> Coast_nt = <i>Coastline - Northern Territory</i> Coast_qld = <i>Coastline - Queensland</i> Coast_sa = <i>Coastline - South Australia</i> Coast_tas = <i>Coastline - Tasmania</i> Coast_vic = <i>Coastline - Victoria</i> Coast_wa = <i>Coastline - Western Australia</i>

Feature	Description	Object	Attribute	Attribute values
				State_border = <i>State border</i> Divn_state = <i>Drainage Division boundary coincident with State border</i> Region_state = <i>Water Region boundary coincident with State border</i>

## 6 Data quality information

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*Australia's River Basin* data complies with the following rules for topology:

- The data has a node/chain structure;
- Every line feature has a node at each end;
- Every line feature has a node at intersections;
- Every line feature has a node at the point where an attribute of the feature changes;
- There are no unnecessary pseudo nodes;
- Every polygon is closed;
- Every polygon contains a polygon label point;
- There are no coincident features;
- There are no undershoots, overshoots, broken lines or other artefacts;
- Divisions, Regions or Basins that are intersected by State borders have identical label point attributes each side of the State border; and
- Lines intersected by State borders, except for coastline, have identical attributes.

## Appendix A: Metadata

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**Note:** This dataset description is metadata (data about data) which describes the actual dataset in accordance with the ANZLIC (Australia New Zealand Land Information Council) Core Metadata [Guidelines](#) Version 2.

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### Dataset citation

**ANZLIC unique identifier:** ANZCW0703005427

**Title:** Australia's River Basins 1997

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### Custodian

**Custodian:** Geoscience Australia

**Jurisdiction:** Australia

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### Description

**Abstract:**

*Australia's River Basins 1997* is the result of a joint State, Territory and Commonwealth Government project to create a national spatial database of major hydrological basins. It shows the boundaries of Australia's basins as defined by the Australian Water Resources Management Committee (WRMC).

Australia is divided into drainage divisions which are sub-divided into water regions which are in-turn sub-divided into river basins. The data includes the name and number of each of the 245 drainage basins, 77 regions, and 12 divisions.

**ANZLIC search words:**

- BOUNDARIES Mapping
- WATER Hydrology Mapping

**Geographic extent name:**

AUSTRALIA EXCLUDING EXTERNAL TERRITORIES - AUS - Australia - Australia

Note: The format for each Geographic extent name is: Name - Identifier - Category - Jurisdiction (as appropriate) See [GEN Register](#)

**Geographic bounding box:**

**North bounding latitude:** -9°

**South bounding latitude:** -44°

**East bounding longitude:** 154°

**West bounding longitude:** 112°

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### Data currency

**Beginning date:** Not Known

**Ending date:** 1997-06-30

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### Dataset status

**Progress:** Complete

**Maintenance and update frequency:** Not Known

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## Access

**Stored data format:**

Digital: ArcInfo

**Available format type:**

Digital: ArcInfo Export

Digital: ArcView Shapefile

Digital: MapInfo mid/mif

**Access constraints:**

The data are subject to Copyright. Data files may be downloaded from Geoscience Australia's website at [www.ga.gov.au/download/](http://www.ga.gov.au/download/). A licence agreement is required.

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## Data quality

**Lineage:**

Data for basin boundaries have been captured by relevant State and Territory authorities from 1:10 000 and 1:250 000 scale source material. The balance of the data are from Geoscience Australia's *GEODATA Coast 100K* which includes coastlines and State and Territory borders.

**Positional accuracy:**

Variable - dependant on scale of source material.

**Attribute accuracy:**

Not Documented

**Logical Consistency:**

*Australia's River Basin* data complies with the following rules for topology:

- The data has a node/chain structure;
- Every line feature has a node at each end;
- Every line feature has a node at intersections;
- Every line feature has a node at the point where an attribute of the feature changes;
- There are no unnecessary pseudo nodes;
- Every polygon is closed;
- Every polygon contains a polygon label point;
- There are no coincident features;
- There are no undershoots, overshoots, broken lines or other artefacts;
- Divisions, Regions or Basins that are intersected by State borders have identical label point attributes each side of the State border; and
- Lines intersected by State borders, except for coastline, have identical attributes.

**Completeness:**

Complete for Australia.

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## Contact information

**Contact organisation:** [Geoscience Australia](http://www.ga.gov.au)

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**State:** ACT

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## **Metadata information**

**Metadata date:** 2003-04-02

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## **Additional metadata**

**Metadata reference XHTML:** <http://www.ga.gov.au/meta/ANZCW0703005427.html>

**Metadata reference XML:** <http://www.ga.gov.au/meta/ANZCW0703005427.xml>

**Size of dataset:** 22.5 - 31.3 MB depending on the format.

**Scale/resolution:** 1:100 000 to 1:250 000

**Projection/datum:** Geographical coordinates using the Australian Geodetic Datum 1966 (AGD66).

## Glossary

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**Attribute**

A descriptive characteristic of a feature. An attribute has a defined set of attribute values.

**Attribute object**

The attribute object holds the non-locational or semantic information about the feature instance.

**Australian Geodetic Datum 1966 (AGD66)**

This datum was adopted in 1966 and is defined by the parameters of the Australian National Spheroid and the coordinates of the Johnston Geodetic Station. This datum is used for the determination of coordinates for some Geoscience Australia products. Superseded by the Geocentric Datum of Australia (GDA94).

**Chain**

A line composed of a sequence of non-intersecting line segments bounded by nodes. Chains reference the polygons to the left and right of the chain.

**Datum**

A mathematical surface from which heights or positions are referenced.

**Entity**

A real world phenomenon which cannot be divided into phenomena of the same type.

**Entity class**

A group of entities of the same kind, matching the members of a feature class.

**Entity point**

An entity point is used to locate point entities represented by a point because of the scale of the source material.

**Feature**

A feature is the cartographic or digital representation of a class of entity.

**Feature class**

A feature class is a group of feature instances defined by a set of rules and having common attributes and relationships that are the properties of the corresponding real world phenomena.

**Feature instance**

A single occurrence of a feature which has a unique set of spatial and attribute object values.

**Geodetic datum**

A datum defines the basis of a coordinate system. A local or regional geodetic datum is normally referred to an origin whose coordinates are defined. The datum is associated with a specific reference ellipsoid which best fits the surface (geoid) of the area of interest. A global geodetic datum is now related to the centre of the earth's mass, and its associated spheroid is a best fit to the known size and shape of the whole earth. The position of a point common to two different surveys executed on different geodetic datums will be assigned two different sets of geographical coordinates.

**Geographical coordinates**

A position given in spherical coordinates commonly known as latitude and longitude.

**Geographic Information System (GIS)**

A spatial database which is manipulated via a set of spatial operators or commands.

**Latitude**

The latitude of a feature is its angular distance on a Meridian, measured northwards or southwards from the terrestrial Equator.

**Layer**

The features in a theme are subdivided into one or more layers on the basis of the spatial objects used to represent the features. Linear networks, polygons and point features are placed in separate layers.

**Linear network**

A layer consisting of linear features which are connected and which form a pathway along which movement is possible.

**Longitude**

An angular distance measured east or west from a reference meridian (usually Greenwich) on the earth's surface.

**Node**

A point that is a junction of two or more chains or which is the end point of a chain. Connectivity of chains is indicated by the sharing of nodes at their intersections.

**Node/chain structure**

The structuring of linear features in a layer so that they consist of chains broken by nodes at intersections or at the point where an attribute of the feature changes.

**Point**

A geometric representation defined by a single (x,y) coordinate pair or an (x,y,z) triplet.

**Polygon**

A continuous area defined by a set of bounding chains. There is only one external polygon and there may be one or more internal, non-nested inner boundaries.

**Polygon label point**

A point within a polygon feature instance used to locate labels or information about that polygon. This point is sometimes known as a centroid.

**Positional accuracy**

Statistical estimate of the degree to which planimetric coordinates and elevations of features agree with their real world values.

**Projection**

Any systematic way of representing the meridians and parallels of the earth upon a plane surface or map.

**Segment**

A direct line between a pair of points or a point and a node.

**Spatial object**

The spatial object holds the locational information of a feature instance. It is composed of either a point, chain or polygon.

**Theme**

The information contained in map production material can be divided into themes which contain logically related geographic information. Each theme is capable of being used as a dataset in its own right.

**Vector Data**

Vector data uses points and straight lines (vectors) to describe features on, or characteristics of, the earth's surface. Vector data can also include polygons, which are areas enclosed by a number of vectors. To record additional information, data attributes can be attached to individual vector features.

**Vertex**

The connecting point of two line segments.