PRODUCTION OF THE GAZETTEER OF AUSTRALIA

Prepared for
Brian Goodchild[1], Chair,
Committee for Geographical Names in Australasia (CGNA)

by
Richard Broers[2] and Lynette Sebo[3]
Geoscience Australia

Committee for Geographical
Names in Australasia (CGNA)
PO Box 2222, Midland WA 6936
Ph:(08) 9273 7198 Fax: (08) 9273 7674
[1]Email: Brian_Goodchild@dola.wa.gov.au

Geoscience Australia
PO Box 2, Belconnen ACT 2616
Ph: 02 6201 4238 Fax:02 6201 4377
[2]Email: richardbroers@auslig.gov.au
[3]Email: lynsebo@auslig.gov.au

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ABSTRACT

This paper is an account of the history, production, maintenance and revision of the Gazetteer of Australia. It details the organisations involved in the production of the Gazetteer and describes in detail the Gazetteer product, data requirements, production methodology, associated production issues and quality control procedures.

Features of the interactive web version of the Gazetteer are outlined in addition to the underlying tools that allow the web Gazetteer to function. Project management and resources allocated to production of the Gazetteer, marketing and distribution, recent developments and the future of the Gazetteer are also discussed.

INTRODUCTION

The Gazetteer of Australia is the authorised database of Australia's geographical place names and is the result of the cooperative effort of Commonwealth, State and Territory governments. The Gazetteer is compiled annually by the National Mapping Division of Geoscience Australia on behalf of the members of the Inter-governmental Committee on Surveying and Mapping (ICSM), using data provided by the Committee for Geographical Names in Australasia (CGNA), an ICSM sub-committee formed in 1984. CGNA members from each State, Territory and Commonwealth government represent their jurisdictions on place name issues, and are custodians of the place name data that falls within their jurisdiction.

Geoscience Australia produces the Gazetteer by collating each of the jurisdictional datasets. Associated documentation, publishing and packaging of the final product are also undertaken by Geoscience Australia as part of its national CGNA responsibilities.

THE GAZETTEER PRODUCT

Purpose
The purpose of the Gazetteer is to provide government, business and the general public with authoritative information on the location and spelling of approved geographical names in a standard and consistent non-proprietary format. The supply format allows computer users of all skill levels to easily import the data into common Geographic Information Systems and Database Management Systems. Yearly revision ensures the user community of data reliability and useability.

Product Overview
The Gazetteer of Australia data files, user documentation and licence are provided on one CD-ROM. The complete Gazetteer of Australia provides datasets supplied both in a single file and as nine separate files for each of the State, Territory and Commonwealth authorities. Each file is in ASCII text in a fixed width format, with one record per line. File names that form the Gazetteer are detailed in Figure1.

Authority	Filename
ACT	act_gaz_2001.txt
GA*	ga_gaz_2001.txt
AHO#	aho_gaz_2001.txt
NSW	nsw_gaz_2001.txt
NT	nt_gaz_2001.txt
QLD	qld_gaz_2001.txt
SA	sa_gaz_2001.txt
TAS	tas_gaz_2001.txt
VIC	vic_gaz_2001.txt
WA	wa_gaz_2001.txt
Combined	all_gaz_2001.txt

File Topic	Filename
Licence	Gazetteer Licence.pdf
User Guide	Gazetteer User Guide.pdf

* Geoscience Australia
#Australian Hydrographic Office

Figure 1: Gazetteer file names

PROJECT MANAGEMENT AND RESOURCES

The Gazetteer of Australia is produced on behalf of CGNA by the National Mapping Division of Geoscience Australia. A wide range of tasks are undertaken during the production of the Gazetteer such as the acquisition of data, compilation of jurisdictional datasets, quality control, product development, web design, marketing and customer support. All these activities call upon a wide range of skills and human resources from across the National Mapping Division. The National Gazetteer is project managed with risk management strategies in place to allow timely completion of activities to ensure a December release of the data.

DATA SUPPLY

The geographical names in the Gazetteer are a subset of complete data sets held by each of the relevant agencies. For example, the full dataset held by the Geographical Names Board of NSW contains information on the history of a name and its derivation. Some features such as the names of roads, which may not be held uniformly by the naming authority, have not been supplied.

The State and Territory nomenclature agencies are the relevant authority responsible for geographical names in the respective State or Territory. The Australian Hydrographic Office (AHO) is the authority for maritime place name features. Geoscience Australia provides additional information on Norfolk Island, Heard Island and McDonald Island, and unofficial homestead names for New South Wales (NSW), Queensland (QLD), Victoria (VIC) and Tasmania (TAS). The other States and Territories provide official homestead names. Through a CGNA agreement, each of the Commonwealth, State and Territory place name authorities have agreed to supply revised place name data annually. This agreement specifies the preferred format of the data files, the fields to be present and the supply date of 1st October each year.

Because each jurisdictional representative has different levels of control and understanding of their databases, it is not possible to ensure that all the data supplied is in a consistent format. In response to this, several alternative formats were agreed upon by CGNA to ensure that revised data were delivered to Geoscience Australia on time.

CGNA agreed that the file format should be comma delimited ASCII, but formats such as Excel and Dbase are considered equally acceptable. It was further agreed that each file would contain standard fields of data with defined maximum widths and data types and consistent contents. Figure 2 specifies the fields, data types and allowable entries of files supplied by jurisdictions for the Gazetteer.

Field	Description	Width & Data Type	Allowable Entries
1. Authority	Custodian State or Territory	3 char	NSW, VIC, TAS, QLD, SA, WA, NT, ACT, AHO, GA
2. Record ID	Unique identifier for each feature*	12 char	various
3. Name	Name of the feature	90 char	various
4. Feature Code	Code indicating the type of feature	4 char	to comply with feature code list
5. Status	Indicates if the name is authorised	1 char	Official, Unofficial, Historical
6. Variant Name	Variant or alternative name	100 char	various
7. Longitude	Longitude in decimal degrees (GDA 94)	9.5 num	up to 5 decimal places
8. Latitude	Latitude in decimal degrees (GDA 94)	9.5 num	negative values up to 5 decimal places
* Some jurisdictions do not store data in a way that allows unique ID's. Duplicate ID's occur in instances where there are alternate or historic place names.			

Figure 2: Agreed file format

A series of check-lists have been designed to streamline the Gazetteer production process. The Data Supply Information Form was drafted to ensure that the contents of the delivered files are suitable for further processing and meet the agreed minimum standard. The use of this checking form also ensures the early detection of errors within the supplied data files and acts as a record of the delivery of the data.

The first supply of data from the jurisdictions is checked upon receipt and comments about the data are documented as shown in Figure 3. Many jurisdictional representatives rely upon the assistance of others within their agency to extract the data required for the Gazetteer. Because there is limited understanding of Gazetteer requirements by these areas, data files provided do not always comply with the agreed format or the content is incorrect. Where the data files are found to be unsuitable for further processing the supplier is informed and a new supply is requested.

Gazetteer of Australia 2001 revision

Data Supply Information Form

State:	Northern Territory
Date Received	22nd October 2002
Supply format	Uncompressed ASCII file
Number of features	11597

Comments on data supplied

Data supplied three weeks behind schedule, however AUSLIG was given early notice the data would be unavoidably delayed
Format compatible with Excel and opened easily
Several extraneous fields exist
Stuart Duncan also warned there would be up to five alternative names in the variant name field

Figure 3: Data Supply Information Form

PRODUCTION METHODOLOGY

All steps involved in production of the Gazetteer including converting files, editing and checking of data are outlined in this section of the paper. Overall production methodology is detailed in Figure 4.
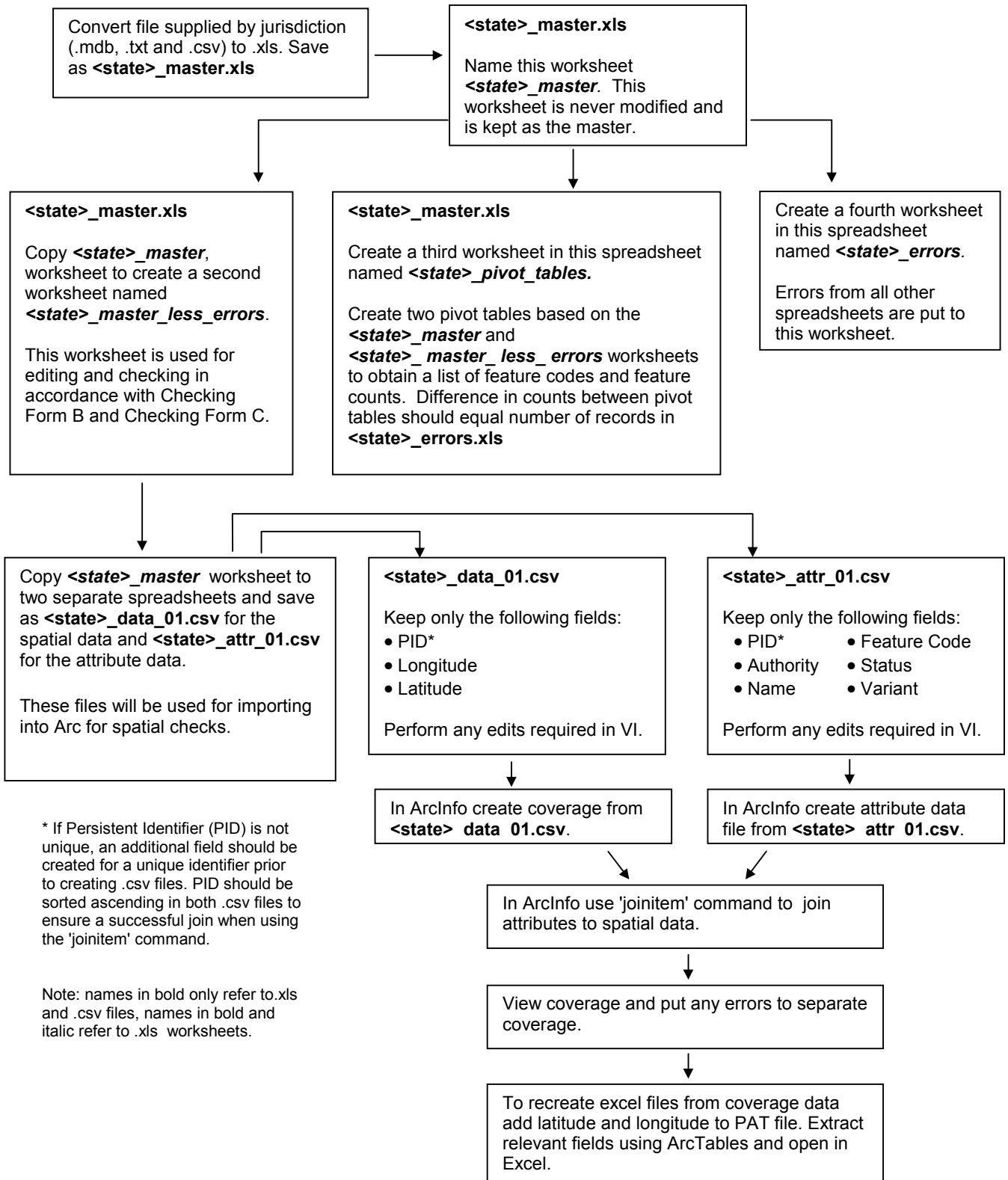
Convert file supplied by jurisdiction (.mdb, .txt and .csv) to .xls. Save as **<state>_master.xls**

<state>_master.xls

Name this worksheet *<state>_master*. This worksheet is never modified and is kept as the master.

<state>_master.xls

Copy *<state>_master*, worksheet to create a second worksheet named *<state>_master_less_errors*.

This worksheet is used for editing and checking in accordance with Checking Form B and Checking Form C.

<state>_master.xls

Create a third worksheet in this spreadsheet named *<state>_pivot_tables.*

Create two pivot tables based on the *<state>_master* and *<state>_ master_ less_ errors* worksheets to obtain a list of feature codes and feature counts. Difference in counts between pivot tables should equal number of records in **<state>_errors.xls**

Create a fourth worksheet in this spreadsheet named *<state>_errors*.

Errors from all other spreadsheets are put to this worksheet.

Copy *<state>_master* worksheet to two separate spreadsheets and save as **<state>_data_01.csv** for the spatial data and **<state>_attr_01.csv** for the attribute data.

These files will be used for importing into Arc for spatial checks.

<state>_data_01.csv

Keep only the following fields:
- PID*
- Longitude
- Latitude

Perform any edits required in VI.

<state>_attr_01.csv

Keep only the following fields:
- PID*   • Feature Code
- Authority   • Status
- Name   • Variant

Perform any edits required in VI.

* If Persistent Identifier (PID) is not unique, an additional field should be created for a unique identifier prior to creating .csv files. PID should be sorted ascending in both .csv files to ensure a successful join when using the 'joinitem' command.

Note: names in bold only refer to.xls and .csv files, names in bold and italic refer to .xls worksheets.

In ArcInfo create coverage from **<state> data 01.csv**.

In ArcInfo create attribute data file from **<state> attr 01.csv**.

In ArcInfo use 'joinitem' command to join attributes to spatial data.

View coverage and put any errors to separate coverage.

To recreate excel files from coverage data add latitude and longitude to PAT file. Extract relevant fields using ArcTables and open in Excel.

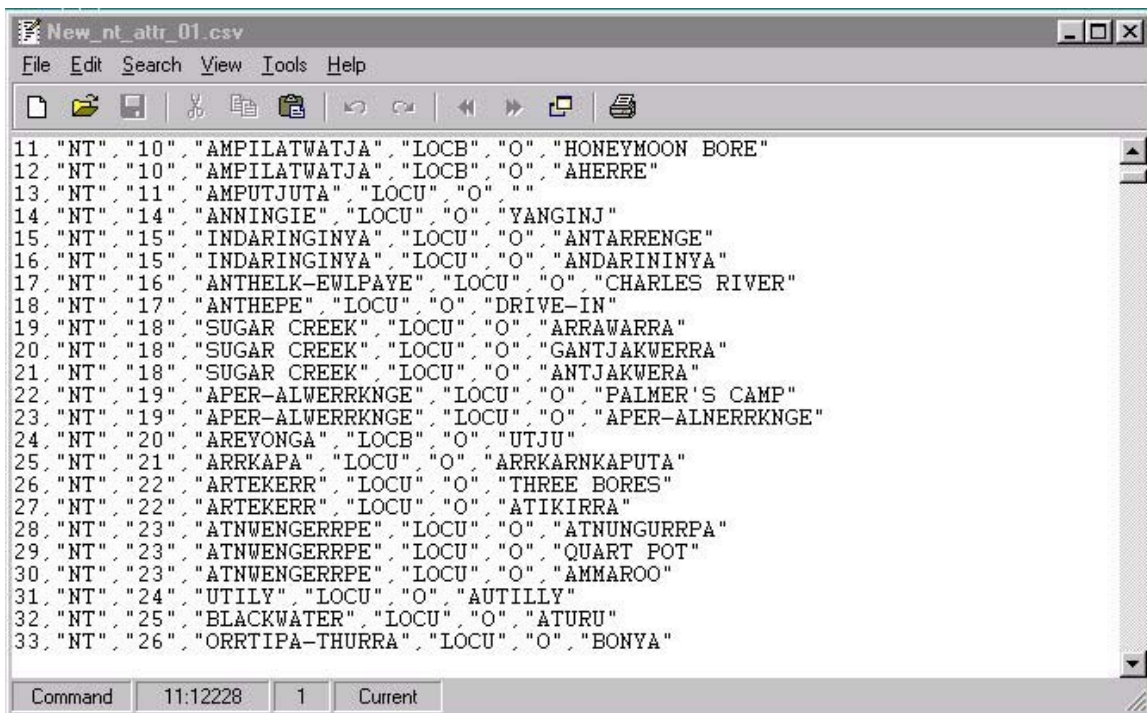*Figure 4: Data Processing Workflow Diagram*

Initial Processing

Processing the data is a multi-step procedure that requires the use of several proprietary softwares and an understanding of their functionality. The initial processing is carried out within a visual text editor and Microsoft Excel and is designed to make sure the data are consistent and meets the product specifications.

Step 1: Pre Processing

The first step depends on the format of the supplied data file.
- Where the data are supplied as Excel or Dbase files they can be opened immediately in Microsoft Excel and checked for content and layout.
- Where the data have been supplied as an ACSII comma delimited text file, several pre-processing steps must be undertaken prior to opening in Excel. These files are first edited within a visual text editor to:
  – delete all leading spaces
  – change all multiple internal spaces to single spaces.
  – determine if all attribute fields are present for all rows. Where there is missing data the rows will either have to be corrected or deleted and written to a separate errors file.
  – ensure all rows have the same number of attribute fields present.
  – make sure all fields contain at least a space. This guarantees that the data are positioned in their correct columns in the resulting output file.
  These steps are taken to correct any content errors prior to importing into Microsoft Excel.

Figure 5: Processing with a visual text editor

Step 2: Correcting Layout in Excel

The data files are then checked within the Excel environment for content and layout. A new electronic checking form developed in Microsoft Word facilitates an easy and consistent checking procedure. This electronic form consists of text blocks, check boxes and drop-down menus that enable the user to select the appropriate values for each question. See Figure 6: Gazetteer Checking Form B.

The form is designed to document the initial checking process and to validate the data within the supplied file. The form is not a record of corrections applied to the data file but acts as a record of the condition and layout of the data when they were supplied to Geoscience Australia. It provides detail of

the changes required to the data to enable it to meet the specification. Comments made on this form are useful in completing the data correction process.

Gazetteer 2001 checking form B

File content

State	**QLD**	Format Supplied	Excel file

File Name   npndb.xls

Fields present		**Extraneous fields**	
Authority	☐	Northing	☐
PID	☒	Easting	☐
Name	☒	Zone	☐
Feature Code	☒	Other	☐
Status	☒		
Variant Name	☒		
Latitude	☒		
Longitude	☒		

Comments: Latitude and Longitude values up to 8 decimal places.
Comments in name field (LGA name)
All latitudes are positive values
All status values are invalid

Number of feature rows in file	40445
Width of Feature identifier (PID)	5
Does the PID contain State ID	No
Does the Name field contain lower case characters	No
Does the Feature Code field contain comments	Yes
Are the status codes correct	No
Does the Status field contain extraneous values	No
Does the Variant name field contain comments	No
Are Latitude values in Decimal Degrees	Yes
Are Latitude values negative	No
Are Longitude values in Decimal Degrees	Yes

Figure 6: Gazetteer Checking Form B

Step 3: Correcting the Data Content and Layout.

With the aid of the completed checking form the next step in the process is to bring the supplied data file to a state where it meets the specification. Comments and entries made on the form enable a straightforward and consistent methodology to be undertaken when correcting the data file. Where the data are not in the correct structure, corrections are made if possible and where fields are missing altogether they are added if appropriate. For example:

- If a Persistent Identifier does not exist it must be added to the Excel file. This number will be an integral part of the data processing and is used to identify individual feature entities; or
- Where the authority code does not already exist it must be added to the Excel file. This code is used in the final product to identify the data custodian.

Values within columns must also meet the required specification and are corrected where they fail to do so. For example, latitude and longitude values must be in decimal degrees and latitude values must be negative. Where extraneous fields exist they are removed, as they are part of the State or Territory database and are not required for the final Gazetteer product.

Jurisdictional feature codes often do not directly correspond with those used for the National Gazetteer. To ensure consistency, jurisdictional codes are mapped to Gazetteer codes. Because datasets consist of tens of thousands of records, the checking process is accelerated through the use of pivot tables in Excel which readily produce lists of feature codes and counts, allowing invalid feature codes to be more readily identified and mapped to Gazetteer codes. Counts are particularly useful during the quality control stage to account for all records. Similarly, this pivot function can be applied to the status and authority fields.

Figure 7: Feature Code List Using Pivot Tables

At this stage the data are also checked for gross errors and if necessary the data file is rejected and a new supply is requested. An errors worksheet is maintained for the purpose of reporting errors and

omissions to jurisdictions during this phase. If no gross errors are present, the data are placed in a standard arrangement before further processing.

Two "C" scripts created in-house are commonly used during Gazetteer production. The first converts DOS files to Unix files (dos2unx), and the other converts coordinates in degrees, minutes and seconds to decimal degrees (dms2dec). The Unix Visual Editor (VI) is also used for editing tasks such as checking for and deleting additional spaces and editing out unnecessary punctuation.

Production Issues

There are many factors that influence the accuracy of the final Gazetteer product. Of particular note are the difficulties that arise from feature code inconsistencies between jurisdictions. Like feature codes in different jurisdictions do not necessarily map to the same feature code, or alternately, different feature codes from different jurisdictions may map to one Gazetteer feature code.
Difficulties in processing also occur due to inconsistencies in the data, particularly in regard to the storage of variant and historical names. Some jurisdictions supply variant and historical names as a separate record with the same record identifier number; in other cases the variant or historical name is included in the same record. Alternately, some jurisdictions store variant or historical names separately with different record identifiers. Duplication of place name across jurisdictions is also a matter of concern.

Not all jurisdictions provide data for all feature classes. From a processing point of view this is not a concern, however, the absence of such feature classes generates queries from Gazetteer users.

QUALITY CONTROL

Final quality control of the data is undertaken with the aid of another checking form and the standard functionality of two proprietary software packages, Microsoft Excel and ArcInfo GIS. See Figure 8 Gazetteer Checking Form C – Quality Control. In addition to editing and testing in textual formats, spatial checks are also performed on the Gazetteer. Excel files are converted to .csv files to allow import into ArcInfo for visual checks.

While the data are being processed and viewed in the Microsoft Excel environment, corrections to feature attributes are made. The functionality of Excel facilitates the quick and accurate checking and correcting of the data. Functions like find, sort, validate and pivot tables are useful tools for finding invalid and missing entries. Checking form C is used to document the checks that have been carried out. It is here that final checks for consistency, omissions and spatial errors are made.

During this final quality control phase, any changes or deletions are placed into the errors worksheet for reporting back to jurisdictions.

Attribute Checks

A number of queries have been set up in Access to perform quality checks on the Gazetteer data. These checks have only been recently developed and are subjected to further development with each new release of the Gazetteer. Ideally these checks would be performed using a Graphical User Interface that allows the user to select a radio button to perform tests and obtain results in a text file format.

Automated checking methods are performed by exporting ArcInfo tables into Excel and then placing the data into Access tables. Each field is subject to a check to verify that all fields are populated by comparing field counts with record counts. Valid entries for each field are also verified. Supplementary manual checks are undertaken to highlight errors not identified through automated checking procedures.

Spatial Checks

To verify place name coordinate positions, spatial checks are performed in ArcInfo by creating coverages for each state. Spatial checks can be further streamlined by selecting place names by feature code and putting records to separate land based, waterbody, coastal and ocean coverages. These coverages are then visually checked in ArcInfo or ArcMap against coastal and state boundary

framework coverages. Some of the checks performed are as follows:

- State - all features lie within State boundary;
- Coast - all features lie on coastal region;
- Sea - all features lie in the sea;
- Land - all features lie on the land; and
- Homestead - all homesteads lie within State and on land.

Because many features such as island, beach and reef exist in more than one of these categories, it is difficult to determine if the feature is in the correct position. It is examples such as these that suggest better techniques for verification may need to be investigated.

Gazetteer checking form C - Quality Control

The following tests have been conducted on this dataset prior to supply to IMA.

Jurisdiction: VIC	Date: 15/11/2001	Signature:

File name: vic final data.xls	Date supplied: 21 September

Number of features in original supply:	35325

Number of errors:	564

Number of features in final file:	34761

Data Quality Checks

1.	All field definitions are correct and consistent with the documentation and between jurisdictions.	√
2.	Data falls within appropriate State / Territory limits	√
3.	All trailing blanks are removed	√
4.	All leading blanks are remove	√
5.	All consecutive multiple internal blanks are changed to a single blank.	√
6.	The latitude and longitude values are in decimal degrees.	√
7.	All latitude values are negative.	√
8.	No comments exist in alternative names field	√
9.	All records exist where they should exist (ie data have not been incorrectly mapped. or deleted)	√
10.	All feature codes are valid (no extraneous codes exist)	√
11.	All status codes are valid (no extraneous codes exist)	√
12.	All records contain a valid PID	√
13.	All genuine new feature codes are properly documented.	√
14.	All Feature Code mapping is documented and applied consistently between jurisdictions.	√
15.	All characters will be in upper case.	√
16.	The number of records incorporated in the final product per state equals the number supplied less those rejected as errors or as inappropriate.	√
17.	No duplication exists between data supplied by jurisdictions. (Names of geographic features crossing state borders excepted)	√

Comments:

Figure 8: Checking Form C - Quality Control

When the production and quality control processes are completed, data are provided in Excel format to the Corporate Information Management and Access Unit for creation of the CD product and the web version of the Gazetteer.

WEB GAZETTEER

Graphical User Interface

The web Gazetteer allows users to access Gazetteer of Australia data on the web free of charge. Searches for place names can be made by typing in a name or selecting a custodian or feature type through the use of pick-lists. For a search to be successful, the user must enter a minimum of three characters in the name field. One limitation of the web Gazetteer is that the search is programmed to not operate if less than three characters are entered. Similarly, all place names for a particular feature code or State cannot be downloaded. This limitation is by design to reduce the number of results returned and to prevent downloading of entire data sets free of charge.

Methodology

The methodology for producing the web page has changed with each version of the Gazetteer as programs are refined and more suitable methods for making the data available on the web are identified. The functionality of the web Gazetteer relies upon a series of files as follows:

Access database
Used to generate two fixed width text files *Text File 1* and *Text File 2*. Also used to extract data for the CD products after a Visual Basic program has added the 100K map numbers.

Text File 1: Contains the pre-existing 8 fields of the complete Gazetteer in addition to the following three fields:
- A 100K map number generated by Visual Basic Program;
- A single digit reference code manually generated which categorises like-feature codes into pick-list groupings; and
- A unique 6 digit record number applied to every single Gazetteer record.

Text File 2: This file is an index file that references *Text File 1* through a unique 6 digit record number when searches are conducted. This file is a much longer file containing all names and alternative names. Only two fields exist in this database as follows:
- Unique 6 digit record number; and
- Name, includes alternative names(first 42 letters only).

HTML page: Entry of search terms through this page activates ***"C" Program 1*** and ***"C" Program 2***.

"C" Program 1: This program returns a list of matches using ***Text File 1*** and ***Text File 2***

"C" Program 2: This program provides full place name details and indicates the position of any placename selected through "***C" Program 1***.

The main function of *Text File 2*, in conjunction the *"C" Program 1*, is to enable more successful searches by managing common leading prefixes and other terms. A typical user conducting a search for all place names that include the word 'Bunbury' will type this string in, however, the user will not get 'East Bunbury' or 'South Bunbury' in the search matches. Through the use of this index database and "C" program, common prefixes and terms used in place names such as 'the', 'east' and 'national park' are manipulated to allow place names like 'East Bunbury' to be included in search results. The "C" program also accelerates the search by identifying all records that match the search terms and finds the corresponding record number. This record number then links to the corresponding record number in *Text File 1* to return complete records including alternative names.
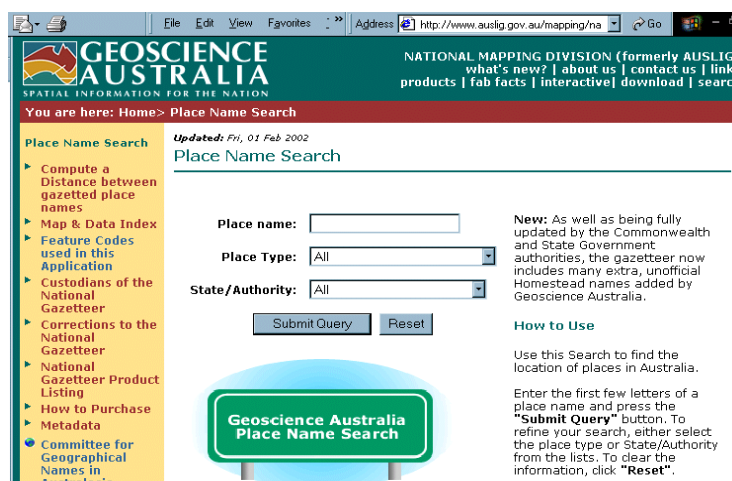

Figure 9: Gazetteer Search Page

User Statistics

The Gazetteer of Australia is accessed approximately 3300 times per week through the Place Names Search. The Gazetteer is also the basis of a range of other products including the "As the Cocky Flies" program, by providing data for distance calculations. This service is used about 859 times per

week. Another use for the data is in the sun and moon times astronomical programs that enable automatic input of coordinates. Statistics for these programs are more difficult to calculate and although these pages receive several thousands of hits, not all use the Gazetteer data.

MARKETING AND DISTRIBUTION

The Gazetteer of Australia is marketed and distributed through Geoscience Australia and the ICSM, with both groups promoting the Gazetteer on their web sites. The Gazetteer is also promoted through the "What's New" web site, product catalogues, printed product briefs, direct mail to existing customers and notification to distributors. The mere presence of the online Place Name Search also generates additional publicity.

Licencing Options and Product Costs

Users have a range of licencing options including standard licence with restricted use and copyright with individual jurisdictions. Licencing costs are as follows:

- All of Australia (single user) - $540
- All of Australia (single user) - upgrade from previous edition $100
- All of Australia (multiple user) - $1080
- All of Australia (multiple user) - upgrade $200
- All of Australia (Internet use) - $1620
- All of Australia (Internet use) - upgrade $300

Sales of the Gazetteer by data distributors are low, however, this can undoubtedly be attributed to the availability of place name information through the online Place Names Search.

Revenue

Geoscience Australia retains $70 from the sale of each copy of the Gazetteer. The remaining revenue, less GST (except for international sales) is directed to ICSM to support their activities. Recent sales are as follows:

- 2000/01 - 22 copies sold generating $13,672.
- 2001/02 (first half) - 12 copies sold generating $9827.29.

RECENT DEVELOPMENTS

Implementation of Protocol for Changes to Gazetteer

The web has encouraged greater use of the Gazetteer by the public and in turn has provided opportunity for users to provide feedback. The nature of the feedback received is always positive and largely relates to incorrect coordinates, missing place names and the history of place names. Because each of the jurisdictions is responsible for the currency and reliability of their data, it was considered appropriate for Geoscience Australia to forward any feedback to the relevant jurisdictions.

To allow streamlining of the feedback process, Geoscience Australia put a proposal to the CGNA chairman and members to develop a protocol to manage feedback. The Protocol was agreed to by CGNA members in a teleconference, and implemented in October 2001. It has proven to be an effective tool for managing feedback. The protocol ensures prompt turn-around in customer response, and results in changes being posted to the web to alert both web users and CD users of changes made to the Gazetteer. Since its implementation, the protocol has resulted in 17 changes that are listed on the web. It is important to note that not all queries result in changes to the Gazetteer, particularly in regard to queries seeking historical place name information.

Consistency Between Jurisdictions

Many jurisdictions are making positive moves toward consistency in datasets. WA has transposed those place names that include point, bay and cape. Victoria has expanded all abbreviations to full terms such as ST to Saint and MT to Mount.

Incorporation of Elevation Values into the Gazetteer

The web version of the Gazetteer of Australia is being further developed in response to customer demand by including elevation data for approximately 1,300 built-up areas, 14,750 localities and 350 mountains. Two digital data products and a range of GIS tools were used to derive the elevation values. Two digital products are used to extract elevation values: the GEODATA 9 Second DEM, a gridded digital elevation model with a grid spacing of nine seconds in longitude and latitude (approximately 250 metres), and the TOPO-250K Series 2 GEODATA comprising of locality and built up area layers. TOPO-250K Series 1 GEODATA has been used where Series 2 tiles are not yet available.

In ArcMap, location and built-up area layers from the TOPO-250K GEODATA were clipped into tiles to correspond with nine second DEM tiles and reprojected to UTM coordinates. These clipped and projected GEODATA tiles were then converted to ArcGRID format. The nine second DEM was then imported into ArcGRID format and also reprojected to UTM coordinates. Using ArcView-SpatialAnalyst-Tabulation, the GEODATA was overlaid on the nine second DEM. These tables were then processed to obtain elevation values for all possible locations. Final results are stored in Excel and will be linked to the existing Gazetteer data in the near future.

Although this will be a very useful product, it is important for users to be mindful of the standard of accuracy of each dataset used in this process and of the further changes in accuracy that occur when datasets are merged to derive new values.

THE FUTURE

In keeping with continuous improvement and the future needs of customers, it is important to consider what future developments can be made to the Gazetteer to keep abreast of customer needs. Detailed below are some suggestions:

- The use of Microsoft access has been considered as an alternate approach for producing the Gazetteer as it has considerable storage capacity and permits easier data manipulation through relational tables. In association with this activity, the opportunity could be taken to further develop the graphical user interface of the web version of the Gazetteer. The Global Map data could be used as an additional base map for the geographic display of place names, providing the user with the option to view place name data over the map index or the 1:1M Global Map data.

- Moves are currently being made by Geoscience Australia to include external territory place names that are not held by those jurisdictions responsible for administering external territories.

- Establishment of a feature code dictionary to be used as an authoritative guide to harmonise feature codes between jurisdictions and for mapping jurisdictional codes to Gazetteer codes.

- Consider the inclusion of additional fields in the Gazetteer such as historical information or significant roads. This would be dependent upon agreement by CGNA and the willingness of jurisdictions to provide additional data. There is also the further issue that jurisdictional datasets may not contain all data required.

- Increased use of GPS by the community has led to a demand for improved accuracy in all spatial datasets and this applies to the Gazetteer. At present, jurisdictions store data on different datums and coordinate systems, and at different levels of accuracy. These issues will need to be eventually addressed and should be considered by CGNA.

CONCLUSION

The Gazetteer of Australia has proven to be a popular product in its current form and has great potential for value adding. It is important to embrace opportunities to further develop the Gazetteer of Australia as customers are becoming increasingly aware of the usefulness and availability of spatial data, are using it more, and in turn are demanding products with higher levels of accuracy that are easy to use.