

Christmas Island
Geographic Information System
System Documentation
October 2002 Release

**Prepared for the
Territories Office, Commonwealth Department of
Transport and Regional Services**

by Keith Porritt, Kane Orr, Andrew Lucas
Geoscience Australia
Commonwealth Department of Department of
Industry, Tourism and Resources

October 2002



GA Catalogue #41796

Disclaimer

The data in this GIS were assembled by the Mineral Resources and Advice Project of the Geoscience Australia (GA). In compiling the product, GA has translated and integrated data as received from many other sources. GA has undertaken initial checks as to the accuracy or completeness of these externally supplied datasets and the result of these examinations are reported throughout this documentation manual.

It should be noted that the Christmas Island GIS datasets may contain information that is not totally accurate or complete. Therefore you should not rely solely on the information in this GIS when making a commercial decision. Please read the accompanying documentation and where further information is required please contact:

Ms. Debra Blaskett,
Assistant Director,
Territories Office Perth,
Department of Transport and Regional Services.
Ph: (08) 9237-6039
Fax: (08) 9221-8683
Email: deb.blaskett@dotars.gov.au

Jane Bennett
Project Officer
Christmas Island Administration
PO Box 863 Christmas Island
Indian Ocean 6798
Ph: 08 9164 7901 ext 7930
Fax: 08 9164 8245
jane.bennett@dotars.gov.cx

The CIGIS manuals and CD ROMs should remain with your employer if you leave your present position to work for another organisation.

Table of Contents

DISCLAIMER	2
TABLE OF CONTENTS.....	3
LIST OF FIGURES AND TABLES.....	5
ACKNOWLEDGMENTS	7
CHRISTMAS ISLAND GIS TEAM	7
CHRISTMAS ISLAND GIS DATA	7
NEW IN 2002	8
CHRISTMAS ISLAND	9
GEOGRAPHY AND CLIMATE	9
SOCIAL ASPECTS AND GOVERNMENT	9
INTRODUCTION.....	10
BACKGROUND	10
GENERAL FEATURES.....	10
GETTING STARTED	10
THEMATIC LAYERS AND DATA	11
VIEWERS.....	11
DATA FORMATS.....	11
PROJECTION.....	11
1997 ORTHOPHOTOGRAPHY	13
1987 ORTHOPHOTOGRAPHY	19
DIGITAL ELEVATION MODEL.....	23
<i>DEM-derived contours.....</i>	<i>25</i>
CADASTRE AND GROUND AUDIT	25
<i>Cadastre - 2002</i>	<i>25</i>
<i>Ground Audit – 1997/2001</i>	<i>27</i>
UTILITIES.....	28
WATER RESOURCES.....	30
REGISTER OF NATIONAL ESTATE.....	32
MINE LEASE BOUNDARIES.....	33
1:25 000 TOPOGRAPHY AND CULTURAL DATA	34
<i>Accuracy.....</i>	<i>34</i>
<i>Data source.....</i>	<i>35</i>
<i>Manipulation of Data.....</i>	<i>35</i>
<i>‘Auslg25k’ national park boundaries.....</i>	<i>35</i>
1:1 000 DETAILED TOPOGRAPHY AND CULTURAL DATA	38
<i>Accuracy.....</i>	<i>38</i>
<i>1:1000 scale National Park boundaries</i>	<i>39</i>
<i>Roads 1:25000 scale update</i>	<i>42</i>

TOWN PLAN	43
CRAZY ANT GRID	44
PINNACLE FIELD BOUNDARIES	45
VEGETATION	46
GEOLOGY	47
VALLEY NETWORKS	48
IRVINE HILL FOREST BOUNDARIES	49
REFERENCES.....	50
GA CATALOG DETAILS FOR THE 2002 CHRISTMAS ISLAND GIS (#41796)	51
APPENDIX 1: CD-ROM HTML DOCUMENTATION	52
APPENDIX 2: METADATA	53
APPENDIX 3: GROUND AUDIT LISTING.....	54
APPENDIX 4: DATA LICENSING AND AGREEMENTS	55
COMMONWEALTH CHRISTMAS ISLAND GIS DATA LICENCE	56
TO—DOLA ARRANGEMENT FOR CADASTRE.....	60
APPENDIX 5: ECOWISE ENVIRONMENTAL DATA DOCUMENTATION.....	61
APPENDIX 6: CHRISTMAS ISLAND GIS DATA CD-ROMS	62

List of Figures and Tables

Figure 1: An image captured from the Christmas Island GIS orthophotography at approximately 1:800 scale, showing clarity and resolution of land and underwater features. The current orthophotography was created from aerial photography flown in 1997.	13
Figure 2: <i>Laecena</i> (dark grey – green stipple pattern) growing along tracks, <i>Saw Tooth Fern</i> (pale green growing amongst pinnacles in areas of higher grade phosphate) and <i>Macaranga</i> regrowth trees (bright green).	14
Figure 3: Flight lines and photo centres of the 1997 aerial photographs used for the Christmas Island GIS orthophotography. Flight lines are numbered at one end of the line.	15
Figure 4: Shows the limits of the 1997 orthophotography coverage.....	15
Figure 5: Index of the 1997 orthophotography showing the names and limits of each orthophotography coverage. Each .ecw file is associated with an .ers file which georeferences the image. The index file is stored as a shapefile (97_ecw_plan.shp) for use within ArcView and ArcExplorer.....	16
Figure 6: Index of the orthophotography showing the names and extent of each orthophotography tile made to date. Each .tif file is associated with a .tfw file which georeferences the image. The index file is stored as a shapefile (97_1ktilbnd.shp) for use within ArcView and ArcExplorer.	16
Figure 7: 1997 orthophotography example showing National Parks Australia nursery.....	17
Figure 8: 1997 orthophotography example in the vicinity of Rocky Point suburb.	17
Figure 9: 1997 orthophotography example showing newer homes in west Silver City.	18
Figure 10: 1997 orthophotography example showing the Christmas Island hospital.....	18
Figure 11: An image captured from the Christmas Island GIS orthophotography at approximately 1:800 scale, showing clarity and resolution of land and underwater features.	19
Figure 12: One Km graticule providing the base layout for the 157 1Km X 1Km orthophotography tiles created for the Christmas Island GIS from the 1987 aerial photographs. Where a tile would have only a small land component it was generally amalgamated with the adjacent tile and the top left number for the joined pair was used (see Fig. 6).	21
Figure 13: Flight lines and photo circles of the 1987 aerial photographs used for the Christmas Island GIS orthophotography. Flight lines are numbered at one end of the line.	22
Figure 14: Index of the orthophotography showing the names and extents of each orthophotograph tile. Each '.tif' file is associated with a '.tfw' file which georeferences the image. The index file is stored as a shapefile ('1ktilbnd.shp') for use within ArcView and ArcExplorer projects.....	23
Figure 15: Three-dimensional drape of orthophotography over DEM (South Point area), showing that the DEM surface is not always the ground surface. In this case much of the DEM surface is tree canopy. The DEM cell size over rainforest is 5 metres, while over disturbed areas it is 1 metre.	24
Figure 16: Shiny colour drape DEM tiles supplied with the CIGIS. Further tiles can be generated by GA. The colour range for each tile has been generated so as to give a maximum of information, hence colours may not match at adjoining edges.	24
Figure 19: Cadastral data including some of the ground audit data relating to Location No 113.....	27
Figure 21: All utilities layers with default symbology in Poon Saan area.	29
Figure 22: Default drainage symbology if the GHD font is not installed.	29
Figure 23: Examples of utilities legends in ArcView after installation of the font containing the GHD symbol set.	30
Figure 24: Christmas Island Aquifer classification map produced by Ecowise - from the Ecowise <i>Groundwater Investigations And Monitoring Report</i> November 1999.....	31
Figure 25: Register of National Estate attributes for the Administrators House are shown in the 'Identify Results' dialog box.	32
Figure 26: An example of mine lease boundary using orthophotography as background.	33
Figure 27: Coastline, Cliffs, Streams, Pools and National Park (1:25000 data)	35
Figure 2: Vegetation of Christmas Island (1:25000 data)	36
Figure 29: Built Environment (1:25000 data, township region)	36
Figure 30: Ten metre contours (1:25000 data).....	37
Figure 31: Spot height data points (1:25000 data)	37
Figure 32: Screen capture of part of Rocky Point showing typical line and point features of the 1:1000 detail survey data. This data was digitised directly from the 1987 aerial photography so when compared to the orthophotography it matches very well.	38
Figure 34: Point infrastructure of north-east region (1:1000 data)	39

Figure 35: Line Infrastructure of north-east region (1:1000 data, detail of phosphate loading area, Flying Fish Cove)	40
Figure 36: Vegetation of north-east region (1:1000 data, detail of Poon Saan Area with roads added for reference)	40
Figure 37: One metre urban and two metre elsewhere contours of north-east region (1:1000 data)	41
Figure 38: Spot heights for north-east region (1:1000 data)	41
Figure 39: Spatial and attribute updates from the Shire of Christmas Island roads shapefile	42
Figure 40: The updated roads file showing the alterations made to the Golf Course and Casino Road and also the intersection of Lily Beach Road and Quarry Road.	42
Figure 3: Data from the Christmas Island Town Planning Scheme (TPS) as prepared by the WA Ministry of Planning.	43
Figure 42: Crazy ant grid showing concentration of ants at each site	44
Figure 43: Pinnacle field area east of the airport (50m across N-S). The automated classification process has produced a smooth boundary at this close scale.	45
Figure 44: Vegetation boundaries in the southern coastline of Christmas Island.	46
Figure 45: Geology boundaries and lineations in the northern section of Christmas Island	47
Figure 46: Valley Networks derived from the 1999 DEM of Christmas Island	48
Figure 47: Limits of the Irvine Hill forest boundaries with orthophotography as a backdrop.	49
Figure 48: Christmas Island GIS GA Catalog entry — #41796	51
Table 1: The following spreadsheet lists 15 fields of Ground Audit data that displayed first in the attribute table. Records are sorted by the 'Location Number' field. Page order for columns is 'Down, then over'.	54

Acknowledgments

Christmas Island GIS Team

The Mineral Resources and Advice Project of Geoscience Australia (GA) would like to acknowledge the support of Mr. Hugh Moore and Mr. Peter Lawler of Territories Office whose efforts made the undertaking of this work possible.

A number of people from GA contributed to the Christmas Island GIS. Dr. William McKay provided management support and advice. For the October 2002 release, Mr. Kane Orr produced the data dictionary, provided documentation edits and updates of metadata sheets, and revamped the HTML document. Mr. Martin Sholtez developed a substantial proportion of the original HTML documentation and contributed data edits and documentation for a number of June 2001 datasets. Mr. Andrew Lucas had a substantial input to the development of the 1996, 2001, and 2002 versions of the Christmas Island GIS.

Through this team effort, valuable spatial and attribute data, that over time may have become lost, are now readily accessible in one integrated system.

Christmas Island GIS Data

The Commonwealth (usually Territories Office) commissioned data capture in a variety of projects over the last fourteen years for nearly all of the data.

Geoscience Australia generated the 1997 orthophotography in 2002 from aerial photography flown by Fugro in November 1997.

BHP Engineering, Land Technologies Division generated orthophotography in 1996 from aerial photography flown by the Australian Survey Office Canberra on 16-Aug-87 to 1-Sep-87.

The Australian Land Information Group (AUSLIG) Western Region office digitised cultural and topographic themes at 1:1,000 scale for Christmas Island in the early 1990's on behalf of Territories Office.

The Western Australian Ministry of Planning was commissioned by the Commonwealth Government to carry out a planning study that assembled the *Town Planning Scheme* data, which was completed on the 24th September 1996.

The Western Australian Department of Lands Administration (DOLA) extracted the cadastre snapshot packaged on this cd-rom set from the DOLA database on 22-May-01. Responsibility for the cadastral information passed from AUSLIG to DOLA in 1992. On-going maintenance of cadastre is undertaken by DOLA under a Memorandum of Arrangement with Territories Office.

AUSLIG, DOLA and the Australian Valuation Office (AVO) jointly developed data underpinning the March 1996 ground audit of Christmas Island through Australian Estate Management (AEM) as consultants to Territories Office.

The Australian Land Information Group (AUSLIG) Canberra office digitised cultural and topographic themes at 1:25000 scale for the Christmas Island to produce the AUSLIG 1995 1:25,000 topographic map of Christmas Island.

New in 2002

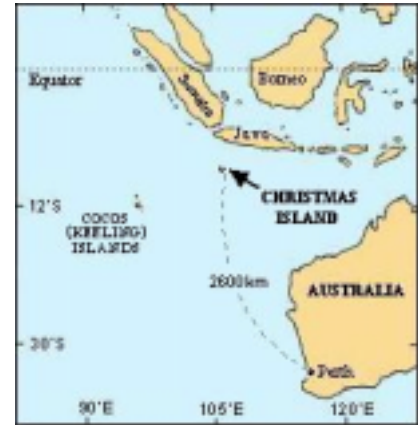
Following on from the June 2001 release of the Christmas Island GIS, Geoscience Australia has added a number of new features and layers. Most significantly is the 1997 orthophotography layer covering parts of the Island. A geology layer has been produced by 'heads up' digitising of the hardcopy 1966 Geology and Topological map of Christmas Island (originally hand drawn from field work undertaken by J. Barrie in 1965). A vegetation layer has been similarly produced from a hardcopy map drawn by Mitchell in 1985. Geoscience Australia gratefully acknowledges financial support provided by PANCI in the creation of the geology and vegetation shapefiles.

A whole of Island DEM was created from height information available in the 1:25 000 and 1:1 000 topographic layers (stored on CD #2 at "*cigis\infra_topo\dem*"). From this DEM a valleys layer was developed (the ArcView hydrology v1.1 extension was used to produce a series of ArcView grids) from which file *valley_net.shp* was produced. Additional line and peg grids have been added into the line-peg shape file. Roads have been labelled with names and a newer Crazy Ants grid shapefile and coastline have been incorporated into the 2002 release.

Both a CI GIS data dictionary and a CI GIS ArcExplorer manual have been created for the 2002 release. See the "What's new in 2002" section on cd-rom #1 for more detail about any of the above.

Christmas Island

Christmas Island is located in the Indian Ocean, at latitude 10° 30' South and longitude 105° 40' East. It is approximately 380 kilometres south of Java Head at the southern entrance to the Sunda Strait, approximately 1,350 kms from Singapore and approximately 2,650 kms from Perth. The nearest point of the Australian mainland is Northwest Cape which lies approximately 1,565 kms to the south east. The island has an area of 135 square kilometres.



Geography and Climate

The Island is the summit of a submarine mountain. It rises steeply to a central plateau dominated by stands of rainforest. The plateau reaches heights of up to 361 metres and consists mainly of limestone with layers of volcanic rock. The Island's 80 kilometre coastline is an almost continuous sea cliff, ranging in height to 20 metres. In a few places (about 13) breaks in the cliff give way to shallow bays and small sand and coral beaches. The largest of these bays forms the Island's port at Flying Fish Cove. The Island is surrounded by an encircling coral reef. There is virtually no coastal shelf and the sea plummets to a depth of about 5000 metres within 200 metres of the shore.

The climate is tropical and temperatures range from 21°C to 32°C. Humidity is around 80-90% and south-east trade winds provide pleasant weather for most of the year. During the wet season, between November and April it is common for some storm activity to occur, producing a swell in seas around the island. The average rainfall is 2,000 mm per annum.

Social Aspects and Government

The 2001 Census indicated that there were 1408 people ordinarily resident in Christmas Island. Results from the 1996 census indicated that the population of the island has an ethnic composition of approximately 70% Chinese, 20% European and 10% Malay.

Local Government legislation based on that of Western Australia was introduced in 1992. The Shire Council is comprised of nine members and has similar responsibilities to a local government in mainland Australia. For the purposes of enrolment and voting in federal elections, Christmas Island is an electoral district of the Commonwealth Division of the Northern Territory. The Commonwealth is currently responsible for delivering Commonwealth, State and some Local Government type services to Christmas Island. State Government type services are provided through Service Delivery Arrangements (SDAs) between the Commonwealth and WA State Government agencies, through informal arrangements with WA agencies, directly by the Christmas Island Administration and through agency arrangements with other Government bodies and the Shire Council. The Australian Federal Police provide policing and regulatory services, such as immigration and customs.

Chapter

1

Introduction

Background

This documentation accompanies the delivery of the Christmas Island Geographic Information System (CI GIS) October 2002 release to the Territories Office, Department of Territories and Regional Services (DoTaRS) and also to CI GIS stakeholders under a support and supply arrangement with DoTaRS.

The CI GIS was first developed by the Australian Geological Survey Organisation (AGSO) for DoTRS in 1996. Subsequently there were ad hoc updates through follow-on CI GIS data development projects and the provision of three on-Island-training courses to PRL, CIA, PANCI and CI Shire during 1998. Fostering and facilitating data sharing between CIGIS stakeholders and the supply of CIGIS cd-roms and manuals is now on a more formal basis through a Memorandum of Understanding (MoU) with Territories Office dated 23rd May 2000. In November 2001 AGSO merged with AUSLIG to form Geoscience Australia.

General Features

The Christmas Island Geographic Information System is a collection of spatial data, viewing and analysis tools dealing with the Christmas Island. The data include orthophotography, topographic, cultural and environmental features both of the islands and the ocean immediately surrounding them.

The data are presented in both ESRI ArcView and ArcExplorer projects. The ArcView projects require a licensed copy of ArcView. ArcExplorer is a free viewer and is distributed on the Christmas Island GIS cd-rom No.1. Data are stored as ESRI shapefiles and therefore readily useable with most modern GIS applications.

Data were received from a variety of custodians and in many cases had no accompanying documentation. Lack of documentation made it difficult for AGSO and now GA to interpret, translate and document the data. GA has attempted to include metadata for many of the datasets to the ANZLIC core metadata standards, but the value of this is limited by the poor initial documentation.

In some cases further work could be done by GA to improve the value of the data. As data is improved or new data is developed and agreed as available it will be distributed to stakeholders on an annual basis under the scope of the current MoU.

Getting Started

CD-ROM # 1 automatically runs a web (HTML) document containing details and tools for getting started with the Christmas Island GIS. A hard copy of most of the HTML documentation is included in this guide as Appendices 1 and 2.

Chapter 2

Thematic Layers and Data

Viewers

The Christmas Island GIS cd-rom # 1 contains ESRI's free data viewer ArcExplorer 2.0. This enables viewing of all the vector data and the TIFF versions of the raster data.

If editing or more complex GIS analysis is required, ArcView GIS is recommended. GA has gone to considerable effort to correct errors in the source data that might have obstructed use by GIS software packages. Use of the data in ArcInfo or most other available GIS software packages should be straightforward.

Data Formats

The Christmas Island GIS uses ESRI shapefiles as its major vector format. This enables editing within ESRI ArcView GIS rather than requiring a more expensive software package. It also allows preservation of 3-D data components. The existence of a 3-D component, which enables viewing in a 3-D viewer such as ArcView's 3-D Analyst, was preserved wherever possible to maximise data value. In cases where this may limit shapefile portability to other software packages, the 3-D component can be removed by saving as a 2-D shapefile from ArcView.

The primary format for raster data is uncompressed Tagged Image File Format (TIFF) full colour. A secondary image format is the Enhanced Compressed Wavelet (ECW) (a compressed file format distributed with ERMMapper and viewable in ArcView after the installation of a plugin). This format significantly reduces file size and loads to view quickly in ArcView. GA has observed some spatial accuracy variability at higher resolutions with some ECW format images.

Source files are in a variety of formats, as received from the data custodian. Source formats include Microstation Design Files (DGN), ESRI Shapefiles, ESRI Coverages, ESRI ArcInfo Export (E00), MapInfo (TAB, MID/MIF) as well as various tabular and database formats.

Projection

Data within the CIGIS is in the Christmas Island Grid 1985 projection (CIG85). As defined on the AUSLIG 1992 1:1000 dyeline plans;

CHRISTMAS ISLAND GRID 1985 (CIG85)

CIG85 is a plane rectangular grid coordinate system with True Origin coinciding with a point at UTM GRID ZONE 48 coordinates 570 000mE and 8 840 000mN (WGS 72). At that point the false origin is 20 000mW and 60 000mS of True Origin.

The surveyor¹ on Christmas Island advised that in 1995 the CIG85 was the grid in use. GA have accepted this coordinate system as the basis for the Christmas Island GIS.

CIG85 is merely a shift on UTM. It is important to correctly apply the two shifts that are involved. UTM uses 500 000 and 10 000 000. CIG85 shifts eastings by 550 000 and northings by 8 780 000. To go directly between geographics and CIG85 you need to apply the correct combination of both shifts.

The Western Australian Department of Land Administration (DOLA), who became the custodians of the cadastral data in 1992, devised a new local grid called Christmas Island Grid 1992 (CIG92). However, the Island's surveyor and the mining company had not adopted this new grid. Furthermore all existing data for Christmas Island from either the mine or from AUSLIG was in CIG85 and conversion of all these datasets to CIG92 was beyond the scope of the original project. Projection of source data to CIG85 when required was complex due to spatial inaccuracy in some source data and lack of metadata accompanying most source data.

Since 1997 the surveyor on the Island has successfully produced CIG85 co-ordinates from differential GPS. He has accurately mapped old tracks by driving along them with a GPS recording continuously. The points he has supplied agree perfectly with the tracks as visible on the CIGIS orthophotography. In the near future, it is expected that DOLA will do away with CIG92 and move its cadastral coordinate system for the Island to the Geocentric Datum of Australia 1994 (GDA94) and have a transformation available.

¹ Russell Payne, The Christmas Island Surveying Company Pty Ltd (cisurvey@iocomm.com.au).

1997 Orthophotography

Digital orthophotography has been prepared from aerial photography that was flown by Fugro Spatial Solution Pty Ltd on 2 November 1997 (commissioned by Parks Australia North Christmas Island). In June 2002, Geoscience Australia commissioned Fugro to generate orthophotography from the 1997 aerial photography at minimal cost as a component of the Christmas Island GIS project and as part of other work undertaken on behalf of Territories Office in 2002.



Figure 1: An image captured from the Christmas Island GIS orthophotography at approximately 1:800 scale, showing clarity and resolution of land and underwater features. The current orthophotography was created from aerial photography flown in 1997.

The orthophotography has a 15cm on-the-ground pixel size. The quality of the orthophotography is impressive, with reasonable resolution down to 1:500 scale. The pale red colour associated with the image is a result of Geoscience Australia trying to best highlight variances in vegetation species related to revegetation in areas of mining disturbances. The image also has warping in localised areas, in particular building outlines. This may be a result of the image having been pinned down by a broader DEM.

The 1997 orthophotography was generated in Christmas Island Grid 1985 (CIG85) by directly correlating the 1997 aerial photography with the 1987 aerial photography for which there had been good survey control points.

To decrease storage, GA has supplied the 1997 orthophotography in two reduced size formats:

1. As 256 colour .tif tiles suited to both ArcExplorer and ArcView (pixels were down sampled to 30cm). See figure 6 for converted .tif tiles, and
2. As full colour, 15cm pixels Enhanced Compressed Wavelet (ECW) compressed imagery. See figures 4 and 5 for ECW coverage that can be viewed in ArcView using a plugin² provided on the cd-roms.



Figure 2: *Laecena* (dark grey – green stipple pattern) growing along tracks, *Saw Tooth Fern* (pale green growing amongst pinnacles in areas of higher grade phosphate) and *Macaranga* regrowth trees (bright green).

ORTHOPHOTOGRAPHY DETAILS

Aerial Photography:

Fugro Spatial Solutions Pty Ltd

Division: Geomatics

Address: 121 Hill Street, East Perth WA 6004

Phone: 61-8-9325 2644

Aerial Photography for Christmas Island (Indian Ocean)

Film No: -

Film Type: colour

Photo Scale: 1:10000

Dates: 2/11/97

O/Lap: 60% approx.

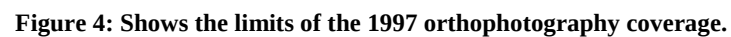
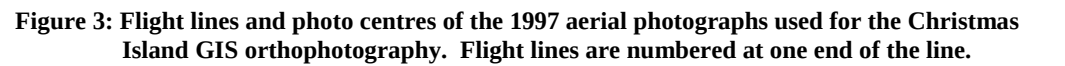
Project Name: CHRISTMAS ISLAND 1997

Run No(s): 1 to 9

Scanning for CHRISTMAS ISLAND GIS: Fugro Spatial Solutions Pty Ltd

Orthorectification for Christmas Island GIS: Fugro Spatial Solutions Pty Ltd

² File 'ArcView_3.2a_ECW_Plugin_v2.5.exe' is on CD2 in folder '\tools\extensions'.



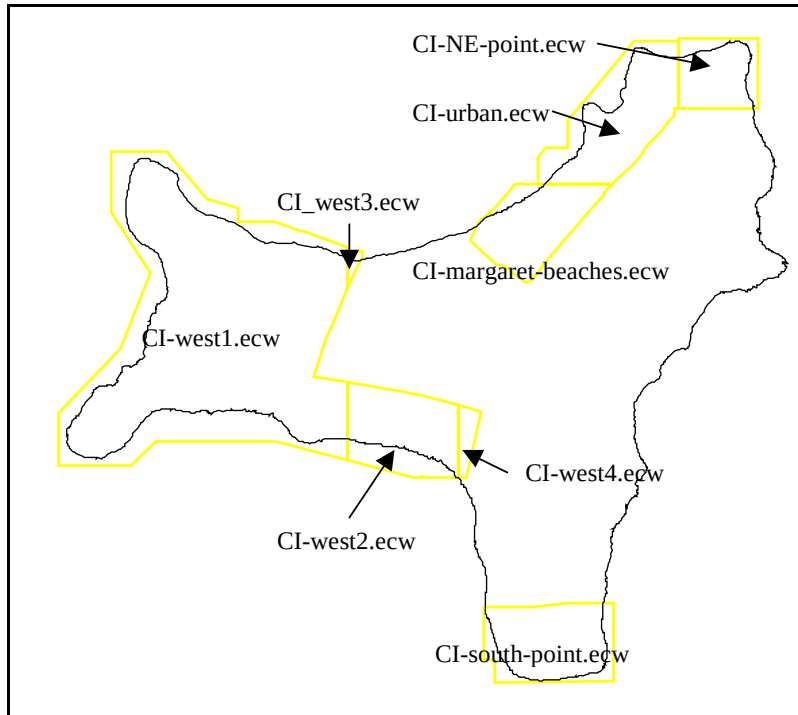


Figure 5: Index of the 1997 orthophotography showing the names and limits of each orthophotography coverage. Each .ecw file is associated with an .ers file which georeferences the image. The index file is stored as a shapefile (97_ecw_plan.shp) for use within ArcView and ArcExplorer.

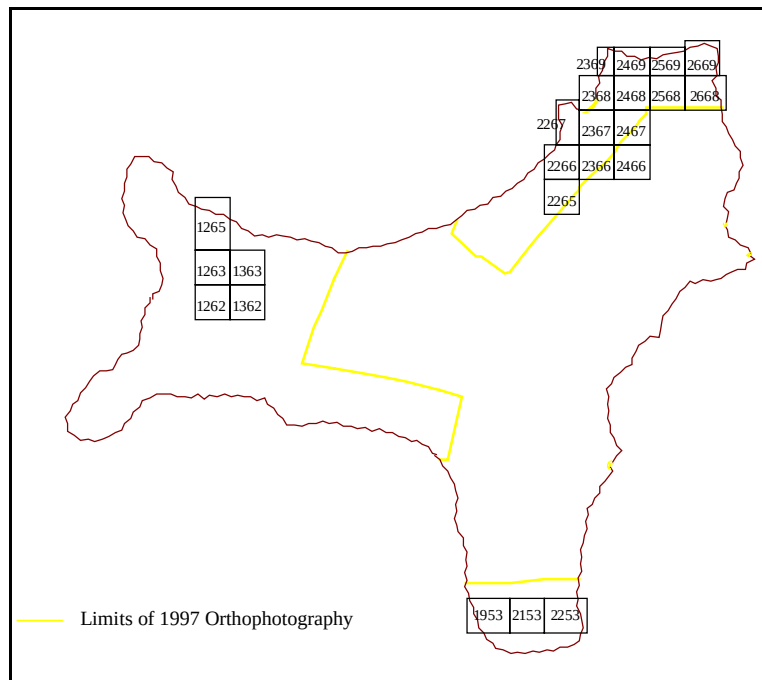


Figure 6: Index of the orthophotography showing the names and extent of each orthophotography tile made to date. Each .tif file is associated with a .tfw file which georeferences the image. The index file is stored as a shapefile (97_1ktilebnd.shp) for use within ArcView and ArcExplorer.



Figure 7. 1997 orthophotography example showing National Parks Australia nursery.



Figure 8. 1997 orthophotography example in the vicinity of Rocky Point suburb.



Figure 9. 1997 orthophotography example showing newer homes in west Silver City.



Figure 10. 1997 orthophotography example showing the Christmas Island hospital.

1987 Orthophotography

Digital orthophotography has been prepared from aerial photography flown on the 16th, 20th, and 21st of August and the 1st September 1987 by the Australian Survey Office Canberra. AGSO commissioned BHP Engineering, Land Technologies Division to generate orthophotography from the 1987 aerial photography as a component of this Christmas Island GIS project that AGSO undertook on behalf of Territories Office in 1996.

The orthophotography has a 30cm on-the-ground pixel size. A 'pixel' or 'picture element' is the smallest component in a digital image — a pixel is an individual square of colour. The quality of the orthophotography is impressive, with reasonable resolution down to 1:500 scale.



Figure 11: An image captured from the Christmas Island GIS orthophotography at approximately 1:800 scale, showing clarity and resolution of land and underwater features.

The orthophotography is considered to be the most accurately located dataset overall. This high quality locational accuracy results from the use of surveyed ground control points in conjunction with recognisable features and a 3D model. In addition, there are intersecting flight lines, which also underpin positional accuracy. Hardcopy sketches of the survey ground control points are held in archive and are available for inspection.

Orthophotography was generated in Christmas Island Grid 1985 (CIG85) by directly applying the aerial photography survey control as it was originally surveyed on the ground in CIG85.

From ongoing use of the orthophotography and subsequent GPS checks, AGSO expects the Christmas Island orthophotography over the Island to generally be within a meter of its true position as determined by the CIG85 projection. Exceptions to this high level of accuracy could be the more inaccessible parts of the Island such as SW point, which did not have reliable ground control available (see Fig 30 in the 1996 System Documentation).

The original orthophotography consists of one hundred and fifty-seven 1km X 1km 24-bit colour Tagged Image File Format ('.tif') tiles taking up about 5.4Gb of disk space for the whole of the Island. To decrease storage, AGSO supplied orthophotography in two reduced size formats:

3. as 256 colour '.tif' tiles suited to both ArcExplorer and ArcView use, and
4. as full colour Enhanced Compressed Wavelet (ECW) compressed imagey which can be viewed in ArcView using a plugin³ provided on cd-rom 2.

An attempt has been made to match the digital orthophotography colour to that of the source aerial photography.

ORTHOPHOTOGRAPHY DETAILS

Aerial Photography:

Australian Survey Office, Canberra

Aerial Photography for Christmas Island (Indian Ocean)

Film No: SOC 728 & SOC 729,

Film Type: colour

Photo Scale: 1:10000

Dates: 16-8-87, 20-8-87, 21-8-87, and 1-9-87

O/Lap: 60% approx.

Project Name: CHRISTMAS ISLAND

Run No(s): 1 to 17

Scanning for CHRISTMAS ISLAND GIS: Kevron Aerial Surveys

Orthorectification for Christmas Island GIS: BHP Engineering Land Technologies Division

³ File 'ArcView_3.2a_ECW_Plugin_v2.5.exe' is on CD1 in folder '\cigis\tools\freeware'.

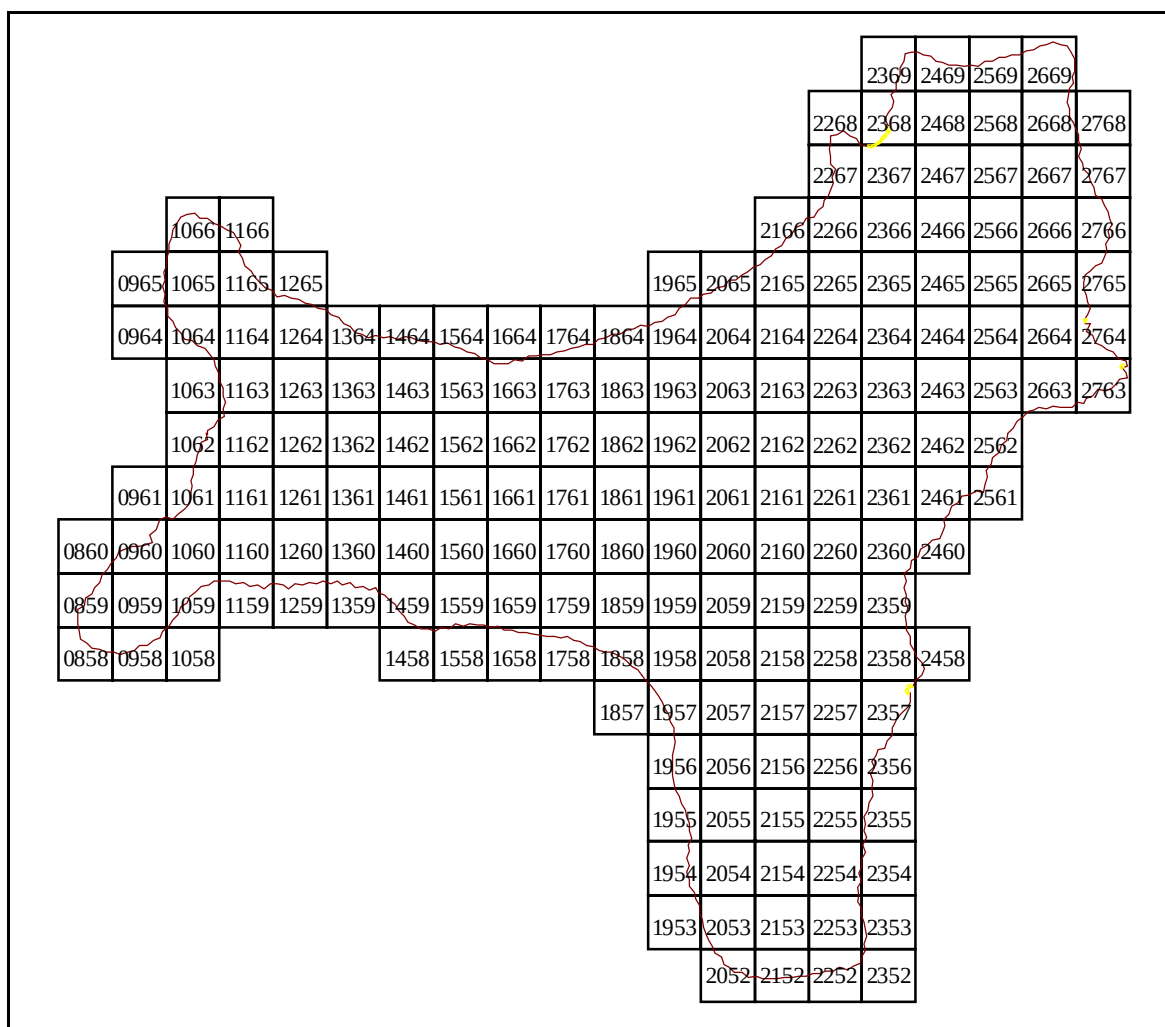


Figure 12: One Km graticule providing the base layout for the 157 1Km X 1Km orthophotography tiles created for the Christmas Island GIS from the 1987 aerial photographs. Where a tile would have only a small land component it was generally amalgamated with the adjacent tile and the top left number for the joined pair was used (see Fig. 6).

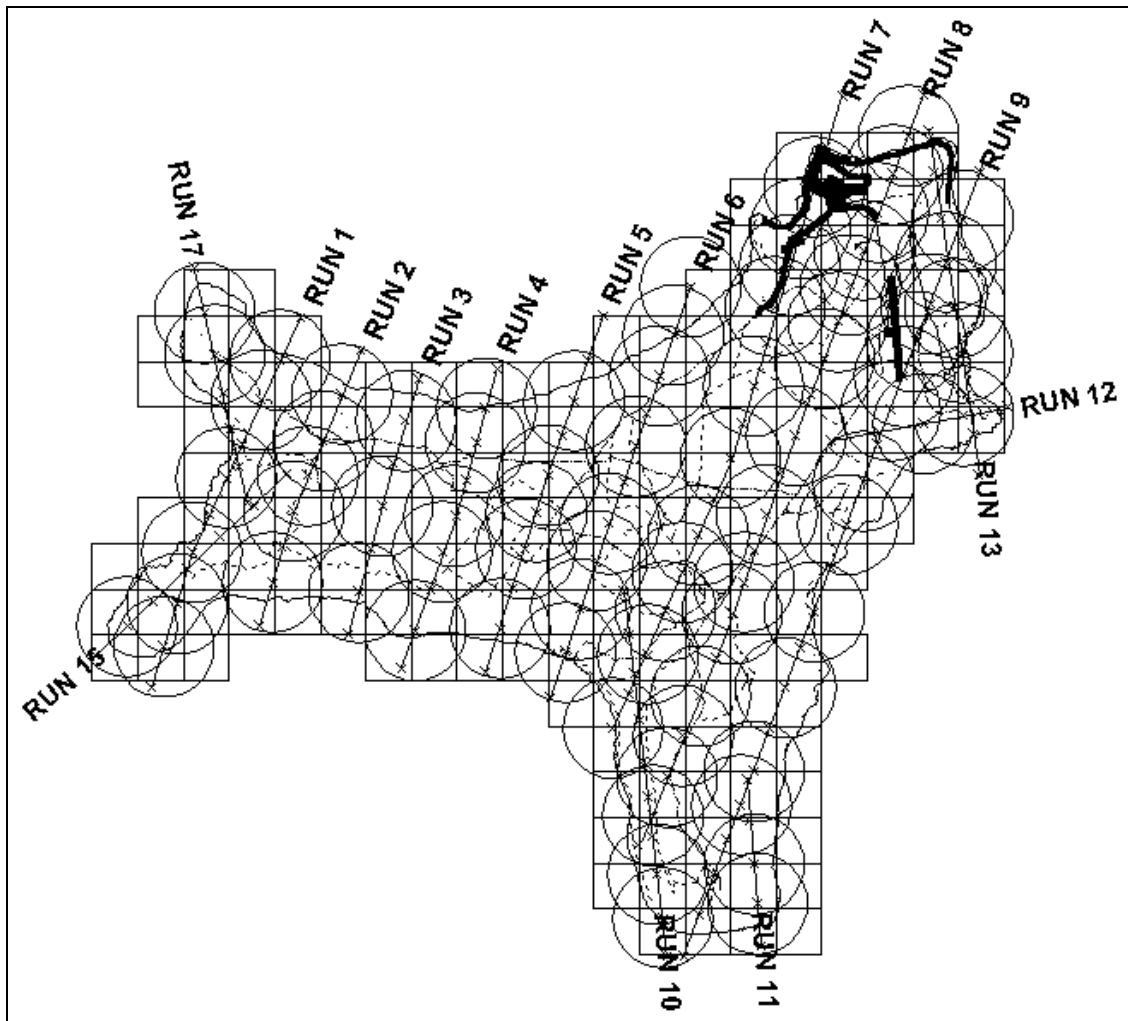


Figure 13: Flight lines and photo circles of the 1987 aerial photographs used for the Christmas Island GIS orthophotography. Flight lines are numbered at one end of the line.

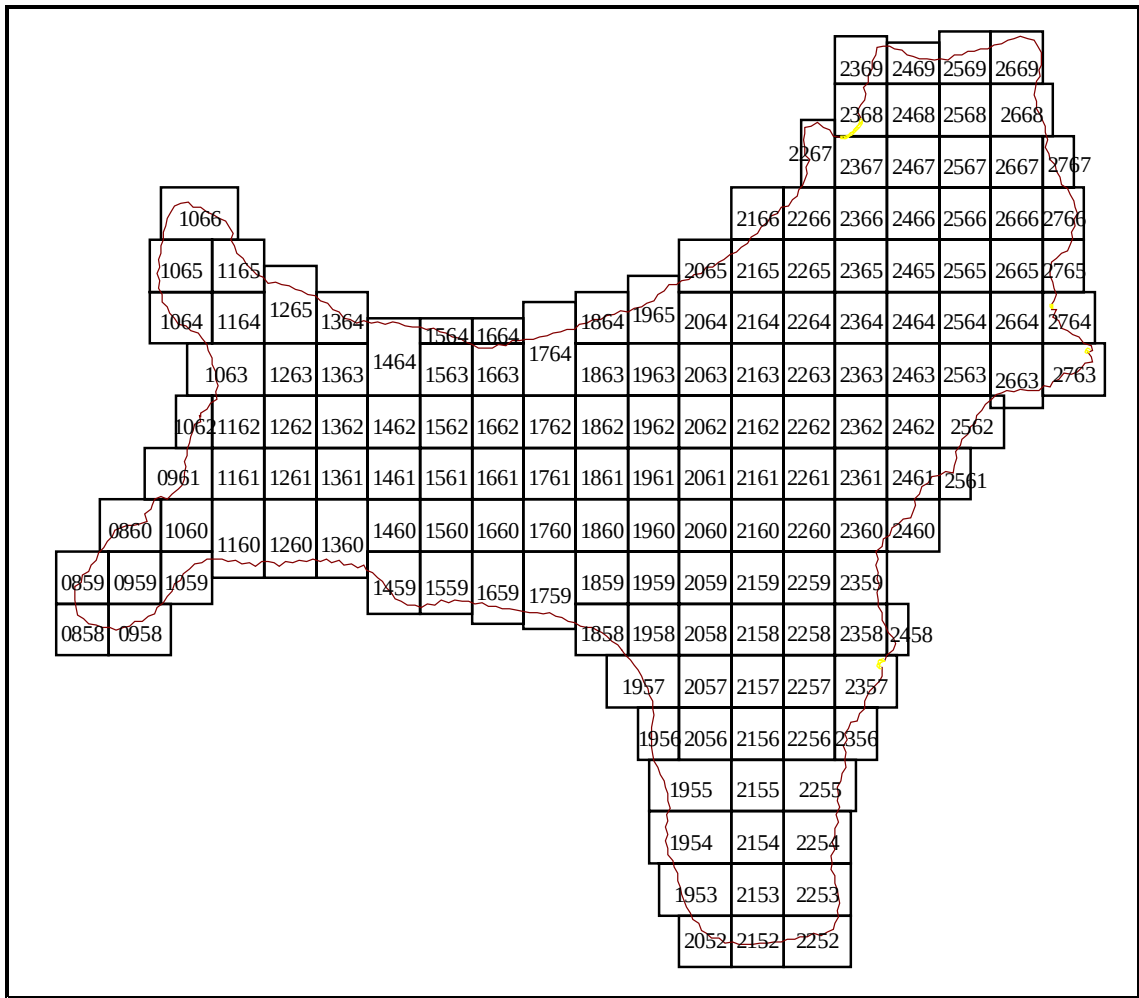


Figure 14: Index of the orthophotography showing the names and extents of each orthophotography tile. Each '.tif' file is associated with a '.tfw' file which georeferences the image. The index file is stored as a shapefile ('1ktilbnd.shp') for use within ArcView and ArcExplorer projects.

Digital Elevation Model

The CIGIS Cd-roms contain representations of a Digital Elevation Model (DEM) prepared by BHP Engineering as part of the orthophotography production. GA applied a shiny colour drape algorithm to the DEM tiles in ERMapper® and the results were saved as 8-bit (256 colour) Tagged Image File Format (TIFF) images. These are stored in the 'cigis\demtiles' directory. The colour range for each individual tile has been optimised so as to give a maximum of information. A consequence of this is that colours may not match at adjoining edges. Tiles over disturbed areas have a one metre cell size, while those over primary rainforest have a five metre cell size.

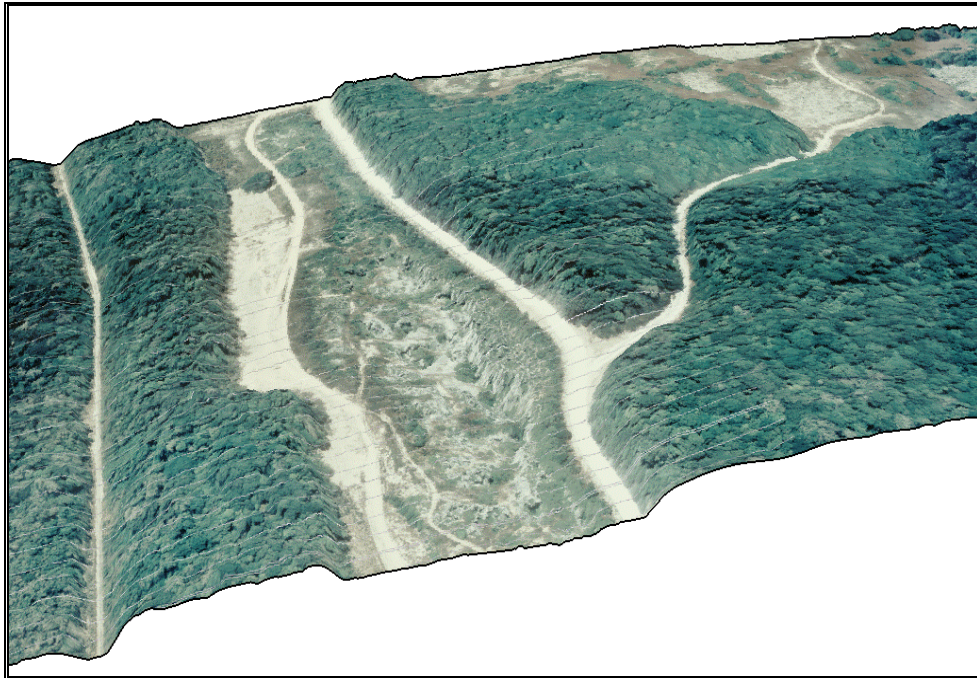


Figure 15: Three-dimensional drape of orthophotography over DEM (South Point area), showing that the DEM surface is not always the ground surface. In this case much of the DEM surface is tree canopy. The DEM cell size over rainforest is 5 metres, while over disturbed areas it is 1 metre.

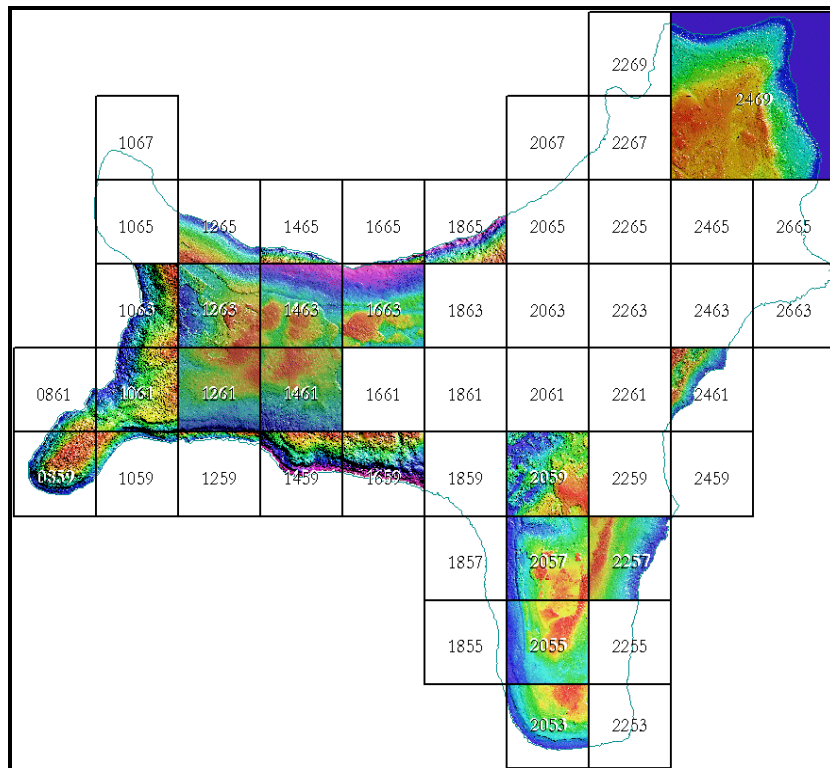


Figure 16: Shiny colour drape DEM tiles supplied with the CIGIS. Further tiles can be generated by GA. The colour range for each tile has been generated so as to give a maximum of information, hence colours may not match at adjoining edges.

There is one 4 kilometres by 4 kilometres tile (tile number 2469) at the northeastern extremity of the island. Other tiles are 2 kilometres by 2 kilometres (except for some partial tiles along the coast). Further TIFF images like these can be prepared on a cost recovered basis. The original DEMs are not supplied on CD-ROM 1 or 2 as they take up a large amount of space and are not useful without additional software.

DEM-derived contours

A useful spin off of the digital orthophotography is the opportunity to get one metre contours over the disturbed areas of the Island. For the north-east area of the Island 2km X 2km DEM contour tiles have been trialed in the CIGIS. Most are at a contour interval of 5 metres but tiles 2269 and 2469 have been done at a one metre contour interval. They have been saved on CD-ROM 2 in the 'cigis\demtiles\dcontour' directory. The DEM contours are surface contours. They pick up the reflective surface beneath the aircraft. The reflective surface may be a surface other than the ground (eg. dense vegetation canopy, rooftops). Further one metre contour coverage can be prepared on a cost recovered basis.

Cadastre and Ground Audit

Cadastre - 2002

The 2002 Cadastre was supplied by DOLA as an extract from their database to Christmas Island Administration (ESRI shapefile dated 1 August 2002). This shapefile was then passed onto Geoscience Australia.

Geoscience Australia adjusted the cadastre shapefile in the following ways:

1. Polygon outlines rather than solid-fill polygons were set to be the default display by including an .avl file.
2. The data was projected to CIG85 so the cadastre now plots with the other layers in the CIGIS.
3. Duplicate polygons were deleted.
4. The location numbers were extracted from the last few characters of the 'piparcel' field, both as a string for sorting and as a number for numerical queries.
5. Field headings from the attribute table were updated to conform to suggestions received from Christmas Island Administration in August 2002. Requested attributes that were not present in the cadastre but were present in the ground audit were then copied from the ground audit attribute table to the cadastre attribute table. This was achieved by joining the tables using the "Pin" fields in both shapefiles. Attributes that displayed information such as property gross income, house value, etc were removed from the CIGIS public release in view of government guidelines relating to privacy.

The data is concerned with the north-east portion of Christmas Island and is mostly complete for that area. A few location numbers have been found to be incorrect because a global method of attaching the location numbers was used. GA recognises that there is considerable work to be done to yield an up to date and error free data set with all fields proposed by CIA filled with values.



Figure 17: Cadastre lines and Location Numbers over west Silver City.

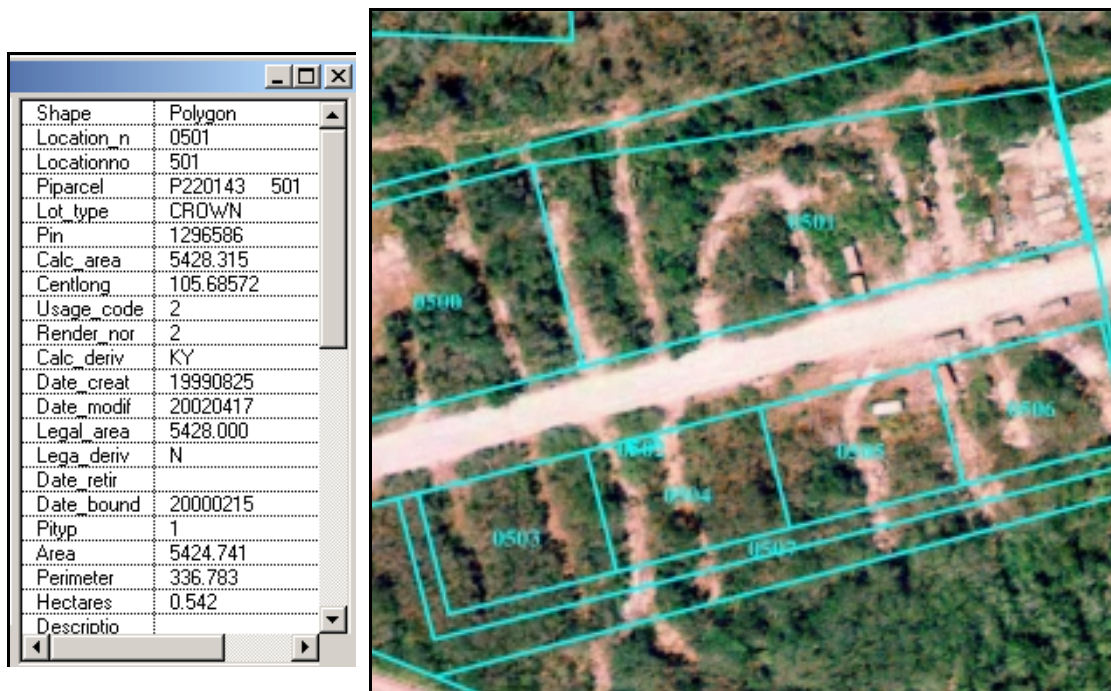


Figure 18: Screen capture of cadastral data including some attributes relating to lot No. 501.

Ground Audit – 1997/2001

The ground audit cadastre version from the 2001 CIGIS release is included in the 2002 release for comparison and verification puposes.

Australian Estate Management (AEM) supplied ground audit data in a flat MS Access table in 1997 (in contrast to the relational database structure identified in the *Ground Audit Module 1 Final Report*). In addition to this data GA identified and joined data from other sources where value could be added.

Filling of the attributes appears incomplete. Examples of probable missing data are:

- ❑ Some fields have no data in them for all records;
- ❑ Nearly all fields have some blank entries;
- ❑ A postcode is only entered for some lots.

AGSO originally joined the ground audit data to the cadastral shapefile using the following steps:

- ❑ Exporting the MS Access table to DBASE V,
- ❑ Adding the DBASE table to ArcView and
- ❑ Joining using Ground Audit “Pin” field to the cadastre shapefile’s “A_pin” field.



Figure 19: Cadastral data including some of the ground audit data relating to Location No 113.

On receipt of the 2001 cadastre, GA joined the 1998 table to the new cadastre using Pin and A_pin and calculated revised values for fields supplied with the cadastre, and

for area and perimeter fields. Cadastre polygons that have undergone boundary changes may no longer carry the detail previously attached. This is because the “Pin” field value will have changed in the DOLA database and no longer match the ground audit “Pin” field value. GA could look to address these parcels with CIA staff during our visit by selecting polygons and joining in the prior values as appropriate.

Further details on ground audit data sources and lineage (up to 1997) can be found in the *CIGIS Phase II Cadastre Documentation* (on the Cd-roms in ‘cigis\documents\grndaudt.pdf’).



Figure 20: Screen capture of ground audit information of the Poon San area.

Utilities

Utilities data were supplied to GA by Gutteridge Haskins & Davey Pty Ltd (GHD) via cd-rom on 25th May 2001. Utilities data supplied are of the following major categories; electrical, stormwater, telecommunications (Telstra), wastewater, water sources and water supply. The cd-rom contained all data as ESRI shapefiles with the original CAD files in a subdirectory.



Figure 21: All utilities layers with default symbology in Poon Saan area.

An example of the utilities data can be seen above. It shows a zoomed in area at Poon Saan with all the utilities themes turned on, orthophotography and the 1998 cadastre has been included as a backdrop.

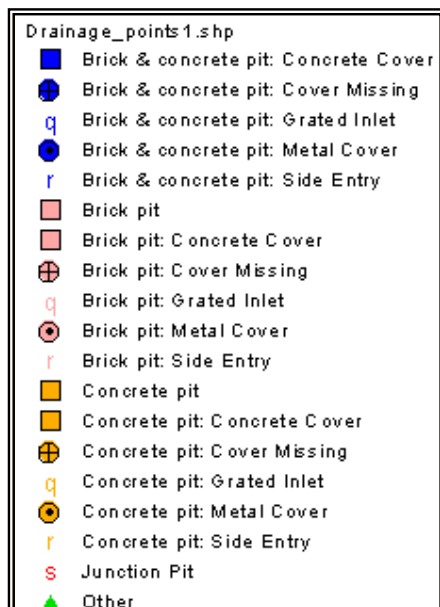


Figure 22: Default drainage symbology if the GHD font is not installed.

GHD compiled the utilities data from original CAD drawings collected over many years through management of island infrastructure by the Commonwealth Department of Administrative Services. These were converted into ESRI shapefiles by GHD and georeferenced to align with CIG85.

The cd-rom supplied by GHD contained a number of customisations to enhance ArcView's interface. These included a 'metatool' (for viewing the utilities metadata sheet), hotlinks to CAD files and a GHD special font set.

The GHD-supplied custom font allows ArcView to generate point theme legends with custom symbols preferred by GHD. Examples of these can be seen in Figure 22. GA considers that GHD did not adequately document how to implement this special font

Premade ArcView projects on the GHD-supplied cd-rom contained hotlinks that attempt to display original CAD drawings with the new utilities vector layers. Through investigation of the GHD cd-rom this feature can be utilised by copying the necessary data using the folder structure found on the cd-rom and installing a GHD-supplied ArcView extension. Some of the GHD enhancements required registry edits, installation of DLLs in addition to ArcView extension (AVX) files. This requires a level of system access not available on most public service PCs. Consequently these particular enhancements were not implemented by GA.

The font used for GHD symbology is stored on CIGIS CD1 as 'cigis\infra_topo\water_res\ghdsym.ttf'. In order to view the symbols as GHD intended, install this font by opening your windows font directory (eg. C:\winnt\fonts), clicking 'File|Install New Font...', navigating to 'cigis\infra_topo\water_res', selecting 'GHD Utilities Geocomp Symbols (TrueType)' and pressing 'OK'.

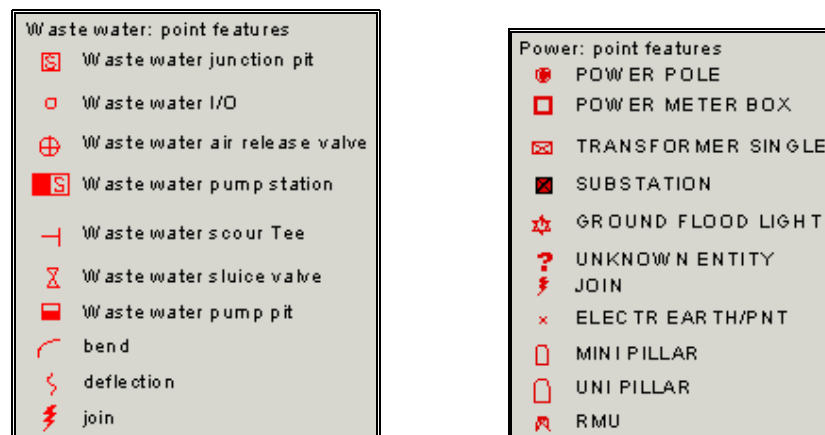


Figure 23: Examples of utilities legends in ArcView after installation of the font containing the GHD symbol set.

Water Resources

Water resources data for Christmas Island were supplied on cd-rom by Ecowise Environmental in Canberra. These data were assembled as part of ongoing groundwater investigations and monitoring undertaken on Christmas Island during the period from October 1996 to June 1999. The relevant reports are supplied as PDF documents on cd-rom 1. The Ecowise report describing the supplied data layers is in appendix 5 (it is stored as 'cigis\documents\ecowise\Report.doc').

Layers were supplied as ESRI shapefiles in CIG85 projection. They include aquifer boundaries (both saline and freshwater), bores and wells, caves and sections. GA are impressed by the quality of the data and documentation supplied by EcoWise. The following table lists the shapefiles supplied to GA by Ecowise.

Directory	Shapefiles
.\Cigis\infra_topo\water_res	Mb_pre1996.shp mb_install1996.shp non_developed.shp water_collection_locations.shp caves.shp h_brackish_saline.shp h_vulnerability.shp vh_vulnerability.shp vh_vuln_line.shp basal_aquifer_brackish.shp basal_aquifer_fresh.shp perched_aquifer_fresh.shp perched_aquifer_line.shp



Figure 24: Christmas Island Aquifer classification map produced by Ecowise - from the Ecowise Groundwater Investigations And Monitoring Report November 1999.

Register of National Estate

The Register of National Estate is maintained by the Australian Heritage Commission (AHC), Environment Australia. AHC provided three ESRI shapefiles containing point and polygon spatial data for Christmas Island national heritage sites. Associated attributes contain name, class and status information about each site.

The 'class' field distinguishes natural heritage and historic heritage data. Data attribute classes apply to the polygon themes and was subsequently used to separate the natural heritage data from the historic heritage data. Natural heritage data extends beyond the coastline and covers areas of pinnacle fields.

The original data supplied to AGSO by AHC was in Latitude - Longitude and needed to be converted into the CIGIS85 coordinate system, so a projection to WGS72 was done. The translation between projections highlighted differences in accuracy of the polygon data between the historic class and natural class. To resolve the offset in the historic data GA shifted these data by 16.5 metres westward to match existing data. The polygon data was then all merged together, but because of polygon overlap natural heritage data was converted into its own shapefile.

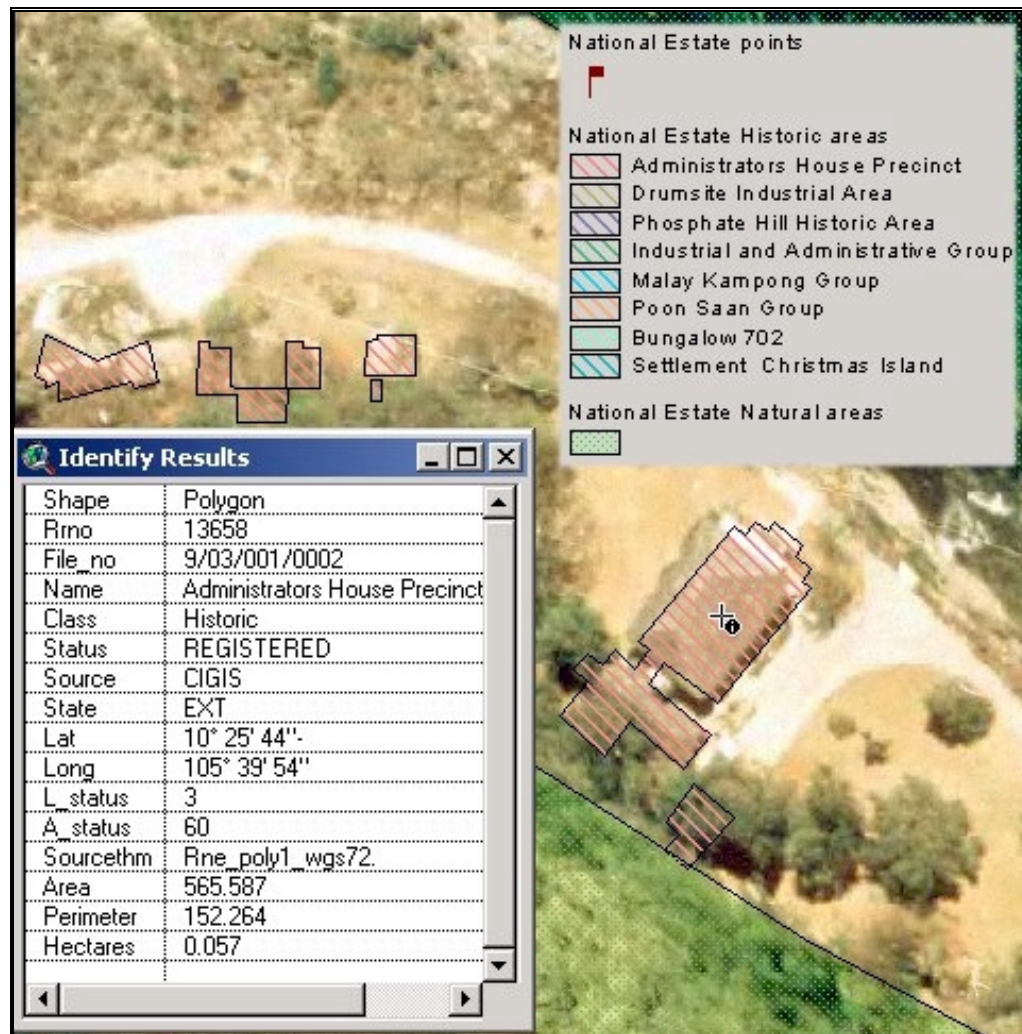


Figure 25: Register of National Estate attributes for the Administrators House are shown in the 'Identify Results' dialog box.

Mine Lease Boundaries

The mine lease boundaries supplied in the 1996 CIGIS were captured several years earlier by AUSLIG W.A. from field visits in conjunction with the use of the 1987 aerial photography. AUSLIG W.A. set the boundaries back from the forest edge.

Around 1995 the Department of Minerals and Energy W.A. (DOMEWA) became the designated authority for mine leases on Christmas Island on behalf of the Commonwealth. In 1998 the Commonwealth allowed an increase in the mine lease area up to the forest edge where the mine lease abuts Crown land, but not where it abuts National Park.

In response to this allowance, changes to the mine lease data were supplied to AGSO in 1998 by the surveyor to PRL at the time (Russell Payne). This data came to AGSO as a series of ESRI shapefiles, each containing a mine lease polygon. These boundaries were produced by digitising off the orthophotography in conjunction with site visits. GA merged all individual polygons that were supplied into the one ESRI shapefile, so as to allow easier access to the data.

In November 2002, the minelease boundaries were checked against the 2002 cadastral boundaries for discrepancies. Minelease ML133A was updated from the 2002 cadastre – changes relate to airport land and a communications tower in the north.



Figure 26: An example of mine lease boundary using orthophotography as background.

1:25 000 Topography and Cultural Data

This data set contains 1:25000 scale topographic data originating from the Australian Surveying and Land Information Group, Department of Administrative Services, Canberra, ACT, Australia (AUSLIG). Topographic data has been reproduced with permission of the General Manager, AUSLIG. The data covers the whole island, and includes polygons, lines and points describing both natural and built environment.

The AUSLIG data includes the following 1:25000 layers :

- roads,
- 10 metre contours,
- coastlines and cliffs,
- spot heights,
- buildings and other structures,
- hydrology,
- boundaries for the national park,
- boundaries for the mining leases and
- boundaries for four vegetation types.

The 1995 release of the AUSLIG digital data for Christmas Island was published at the 1:25000 scale. For this release the existing 1988 map was updated. The data was provided in Arc/Info format in the Christmas Island Grid projection. Only 'feature coded' data was available as AUSLIG do not see there being many sales of this dataset. Feature coded data are the lowest level of release for Arc/Info data by AUSLIG. There was basically no documentation with the data - only a list of feature codes and their frequency. GA have had to re-work the data into its present form.

The AUSLIG data are subject to copyright and GA hold a licence. The cost was \$300. Licence / royalty arrangement pro forma were submitted by GA for Territories Office and PRL in January 1996. Maps produced and distributed beyond the licensee that include the AUSLIG data are required to carry the following acknowledgment:

Topographic data reproduced with permission of the General Manager, Australian Surveying and Land Information Group, Department of Administrative Services, Canberra, ACT.

Accuracy

Publication at the 1:25000 scale has important implications for the use of the AUSLIG topographic data. Some of the plots GA have produced include enlargements to scales of 1:2000. This means the AUSLIG data are being displayed at over ten times its published scale. Users should view AUSLIG lines on such enlargements as representing a line around ten times as thick, the true line occurring somewhere within that much thicker line. It is far more expensive to capture data at small scales.

As the data was originally intended to be used at 1:25000 scale, zooming in past this will show visible offset from the orthophotographs, potentially by as much as 25 metres. On zooming, the orthophotography will be more accurate, having error of at most 6 metres.

Data source

The original data was obtained as two Arc/Info export files (xmas.e00 and xmasrel.e00), containing general data and contour/spot-height data respectively. Considerable work was necessary to make this useful for the GIS.

Manipulation of Data

A series of Arc/Info macros were used to strip out different feature classes and build them as separate point, line or polygon coverages as appropriate. In generating polygon coverages cleaning was required. To suit use in Surpac mining software a version of the contours as polygons was created.

'Auslg25k' national park boundaries

The AUSLIG 1:25000 scale national park boundaries were found to be of insufficient accuracy for a number of requirements of the CIGIS. This data subset has been moved to the 'defunct' subdirectory and should not be used. The value of keeping this data in the system is to help eliminate any spurious national park boundary data sets that may turn up from other sources over the years.

The best set of national park boundaries MREB could locate are stored in the 'CIA' directory. These were obtained from Auslig Perth as part of the 1987 cadastre data set and are accurate to 1:1000 scale.

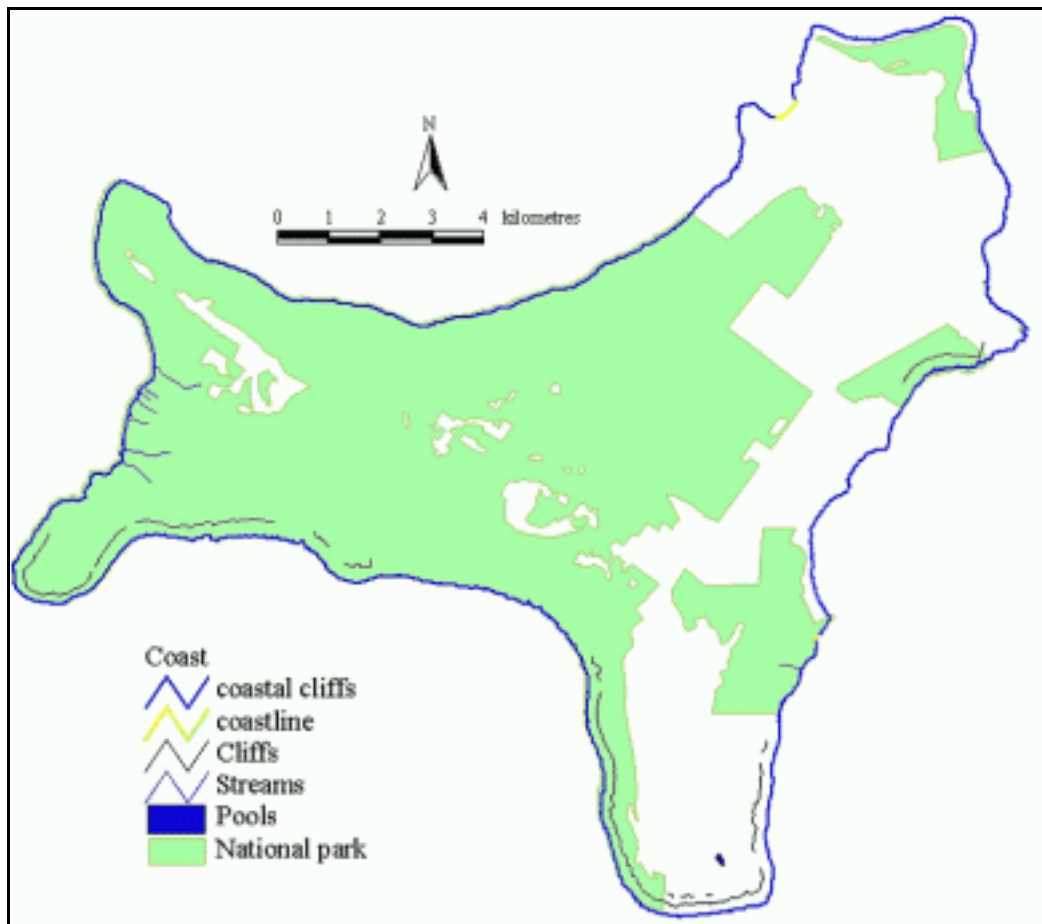


Figure 27: Coastline, Cliffs, Streams, Pools and National Park (1:25000 data)

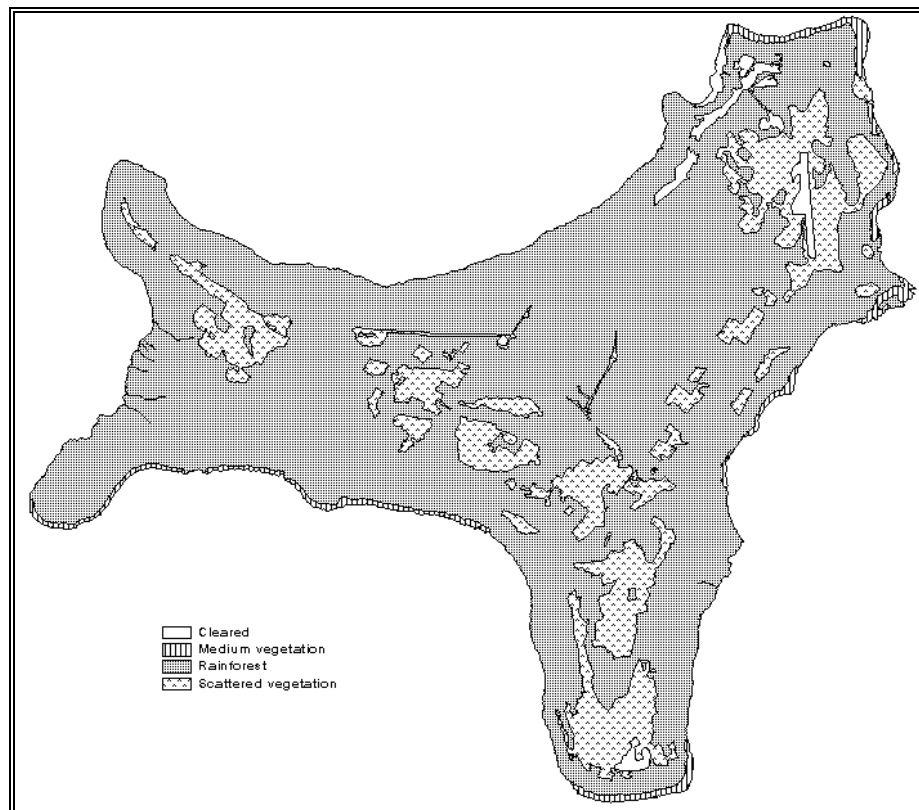


Figure 2: Vegetation of Christmas Island (1:25000 data)



Figure 29: Built Environment (1:25000 data, township region)

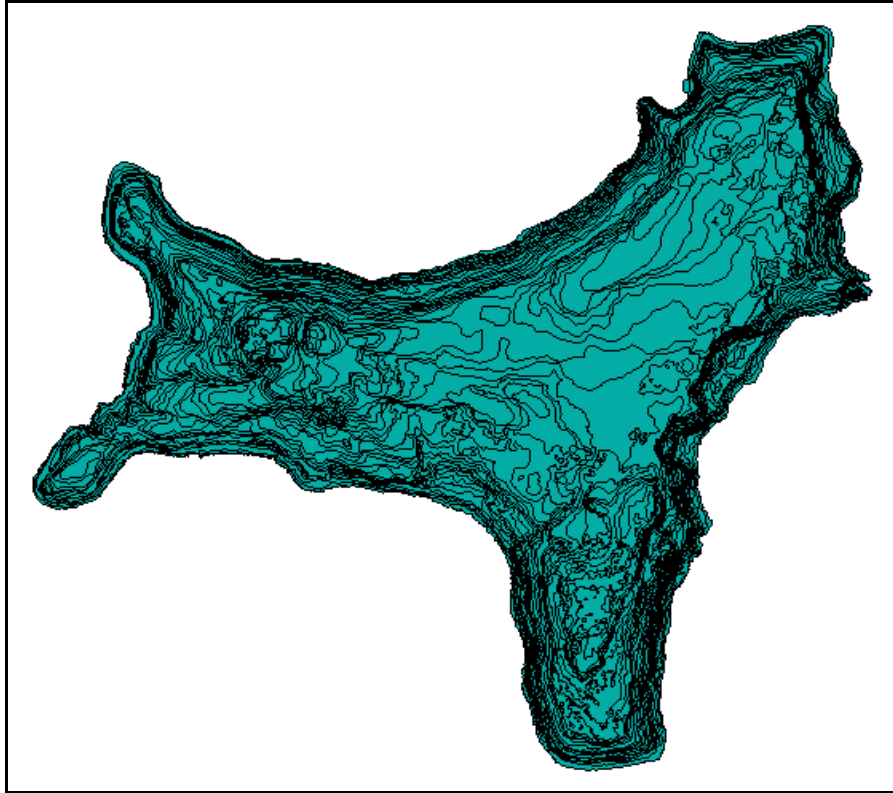


Figure 30: Ten metre contours (1:25000 data)

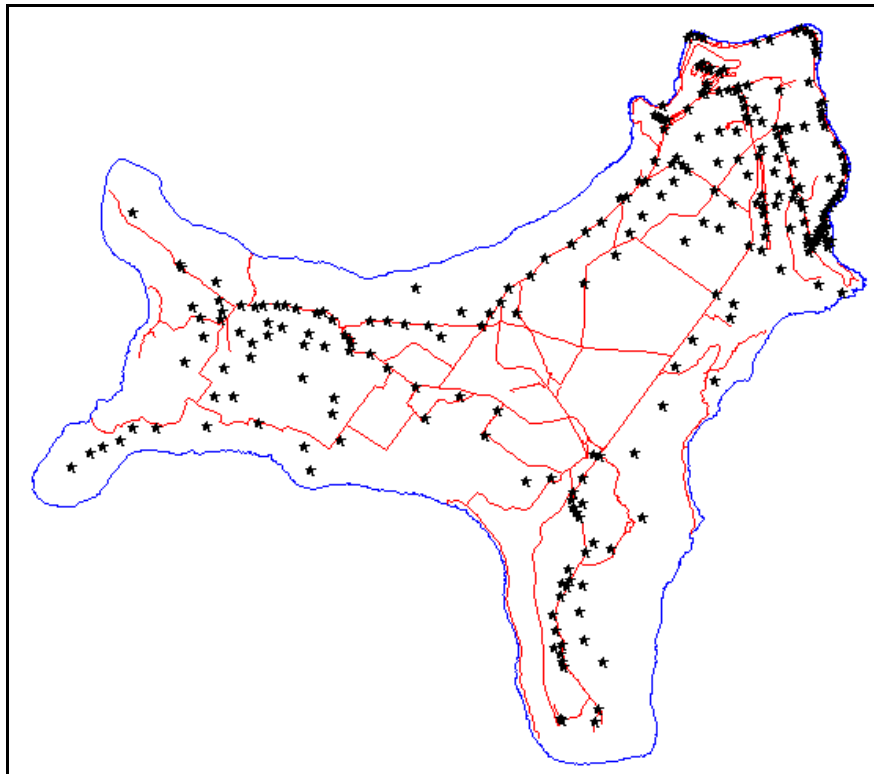


Figure 31: Spot height data points (1:25000 data)

1:1 000 Detailed Topography and Cultural Data



Figure 32: Screen capture of part of Rocky Point showing typical line and point features of the 1:1000 detail survey data. This data was digitised directly from the 1987 aerial photography so when compared to the orthophotography it matches very well.

The data presented in the 1:1000 detailed survey was prepared by AUSLIG (Western Region) for Christmas Island Administration and this work was paid for by the Commonwealth. This data is 1:1000 scale data and covers the north-east portion of the island. It contains essentially the same features as the AUSLIG 1:25000 topographic and cultural data but in more detail and more precisely located.

Accuracy

This data should be correct to about 1 metre. For most of the north east portion of the Island this data and the orthophotography have a very good correlation — usually well under one metre in difference. Around tall buildings and cliffs there may be a discrepancies between the data and the orthophotographs. This is a factor of aerial photography angles and interpretation and in these cases the 1:1000 vectors should be more reliable than the orthophotography.

The dataset includes contours where the ground could be estimated using a stereo plotter (see figure. 37). These contours do not have height values attached as the source CAD file did not include this. However, using spot heights (*spot_hgt.shp*) and the ArcView annotation layer called “contours” in the “\infra_topo\topo1k” directory, Geoscience Australia have observed 1m contours in the urban areas and 2m contours

elsewhere. These intervals were confirmed by looking at the 1987 Christmas Island AUSLIG 1:1000 and 1:2000 map series.

In the western most extremity of the data set the accuracy has been called into question by the orthophotography contractor. They observed, after checking the orthophotography against results from analytical stereo plotters, that “it appears that in the vicinity of the market garden, the mapping data supplied... may be in error by approximately 5 m in east”.

The data was provided as six Arc/Info export files that are stored on the CD#1 of the 2001 release in the directory ‘Cigis\Cia\source\e00’:

Detail of manipulation of the data for use in CIGIS is presented in the 1996 CIGIS System Documentation at Appendix 1. Separate data themes were split out of the provided export files via Arc/Info routines. In the 1996 Appendix 1 there is an example and description of the Arc/Info macro series that were used to do this.

1:1000 scale National Park boundaries

The national park boundaries in this directory cover the whole of Christmas Island and are the best GA could obtain. They originate from AUSLIG Perth as part of the 1987 cadastre data set and are accurate to 1:1000 scale. The cadastral data did not include internal boundaries of the park. Thus it was necessary for GA to add the mining lease boundaries (supplied as part of the cadastral data) to the data of national park boundaries to create the full national park boundaries. This process is explained in more detail in the 1996 CIGIS System Documentation at Appendix 1.

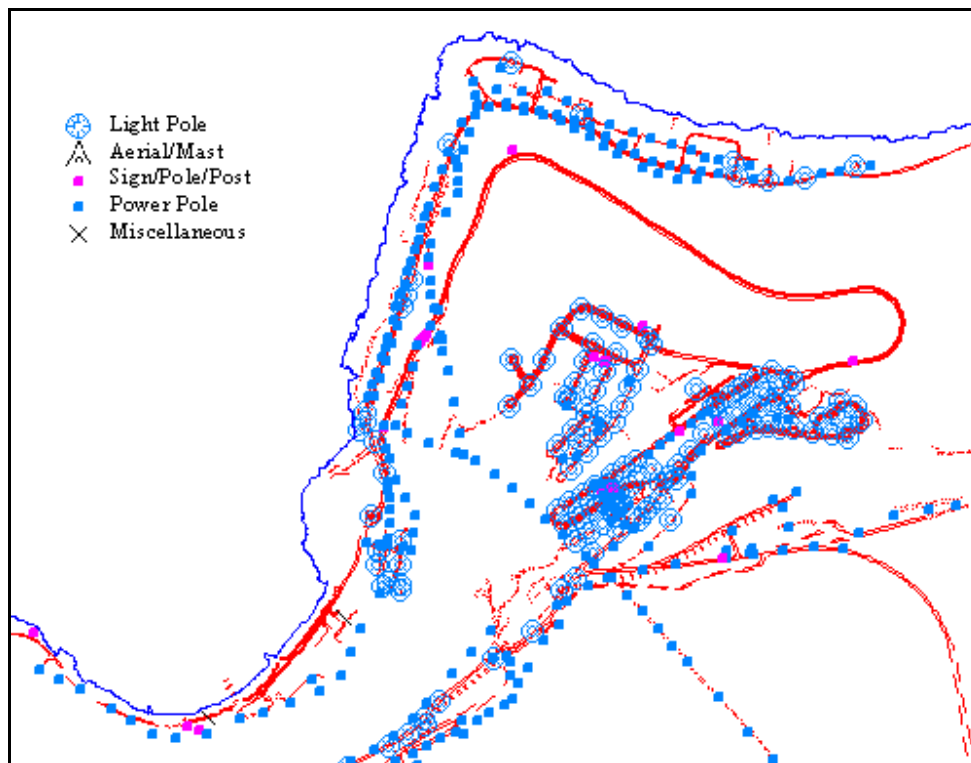


Figure 34: Point infrastructure of north-east region (1:1000 data)

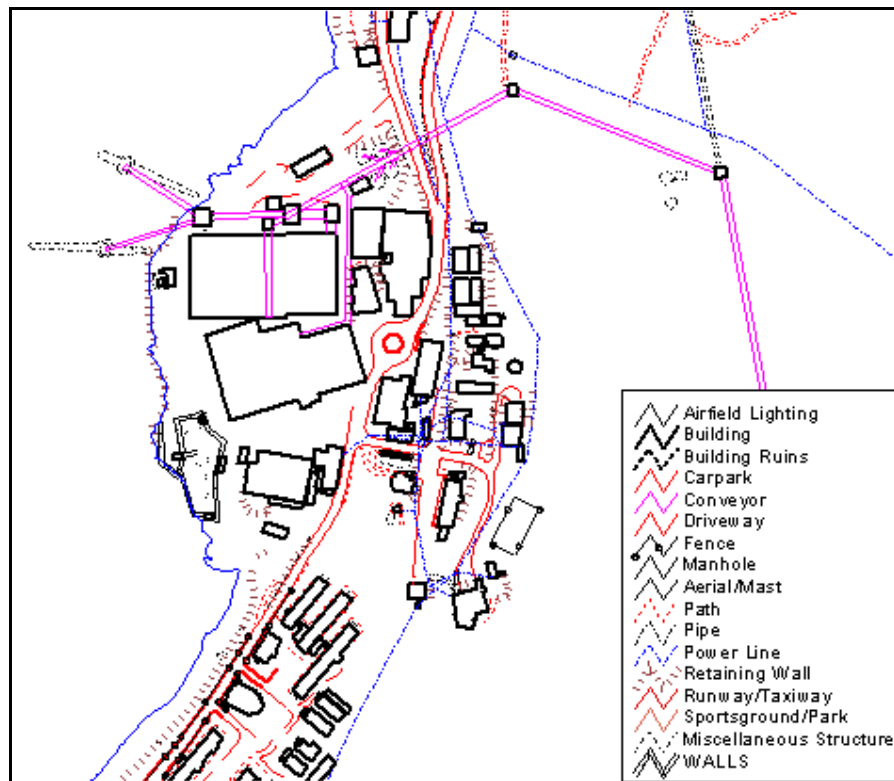


Figure 35: Line Infrastructure of north-east region (1:1000 data, detail of phosphate loading area, Flying Fish Cove)

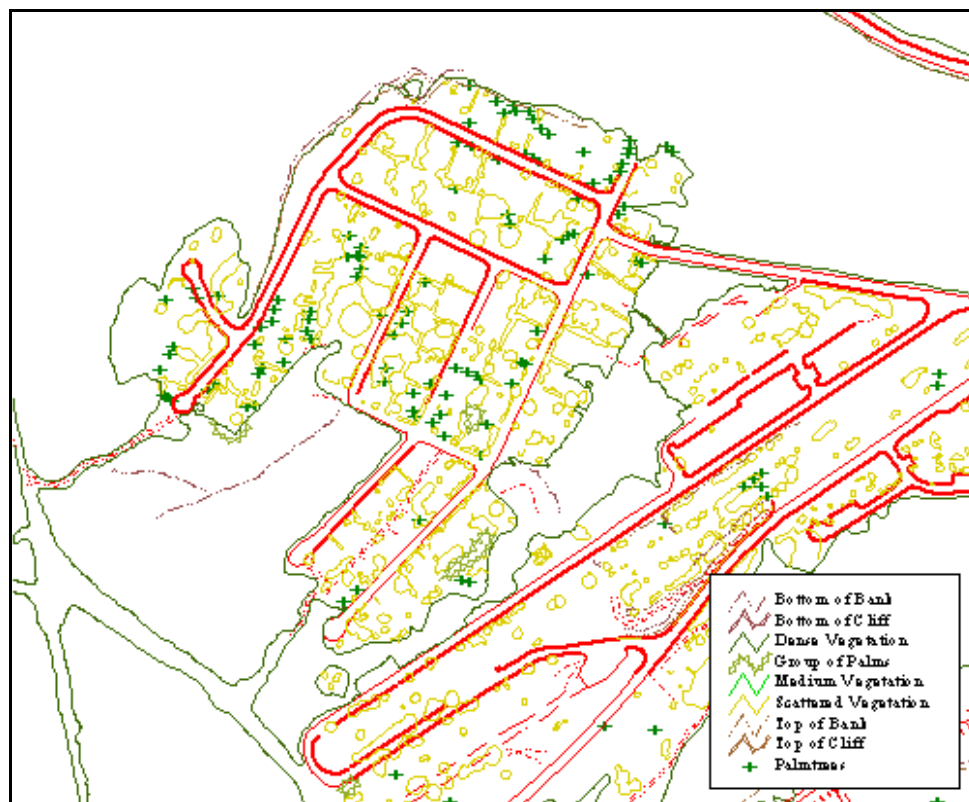


Figure 36: Vegetation of north-east region (1:1000 data, detail of Poon Saan Area with roads added for reference)

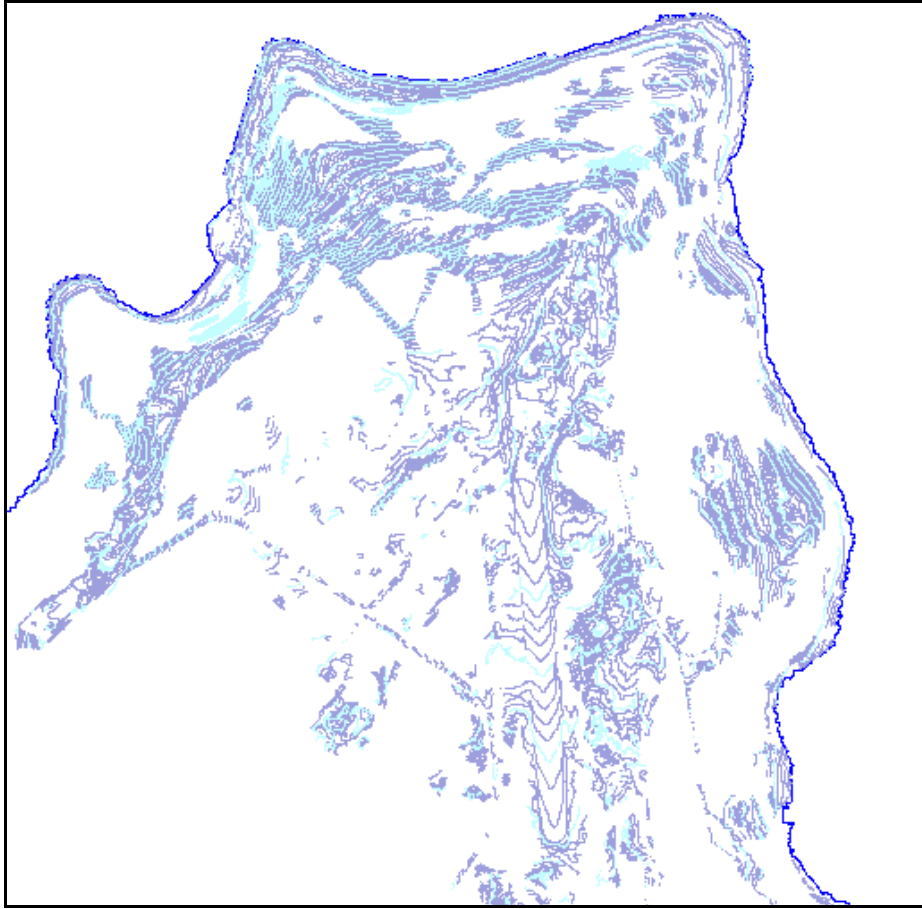


Figure 37: One metre urban and two metre elsewhere contours of north-east region (1:1000 data)

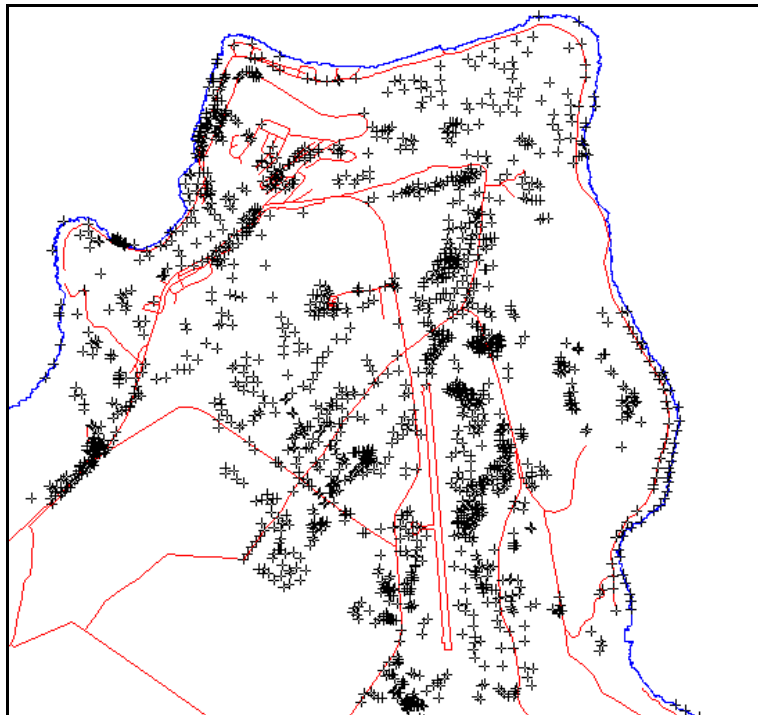


Figure 38: Spot heights for north-east region (1:1000 data)

Roads 1:25000 scale update

In 2002, GA received a shape file (coordshp_cig85.shp) from the Shire of Christmas Island that allowed considerable improvements to GA's 1:25000 roads shape file. The street names were added to the majority of the island's roads and additional roads, not known to GA, were also added using ArcView vector editing tools.

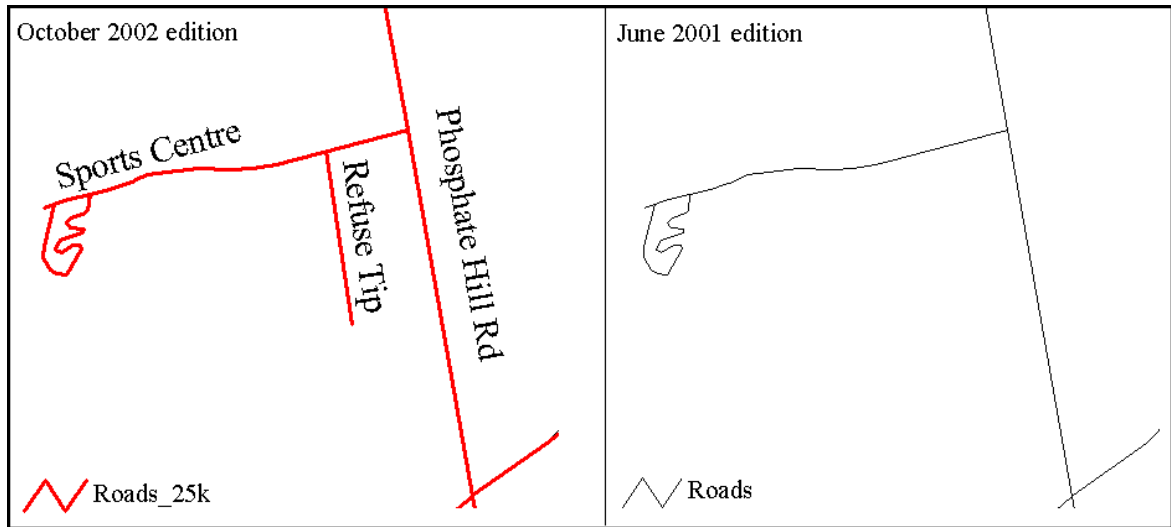


Figure 39: Spatial and attribute updates from the Shire of Christmas Island roads shapefile.

In 2002 GA redefined the Golf Course and Casino Road from the “coordshp_cig85” shapefile. GA also altered the Lily Beach Road and Quarry Road junction. Both edits were performed using ArcView vector editing tools. An update of the road surface attributes to include recent work upon the road surfaces (unsealed to sealed, etc) was also performed. This data was obtained from Christmas Island Shire Council in 2002.

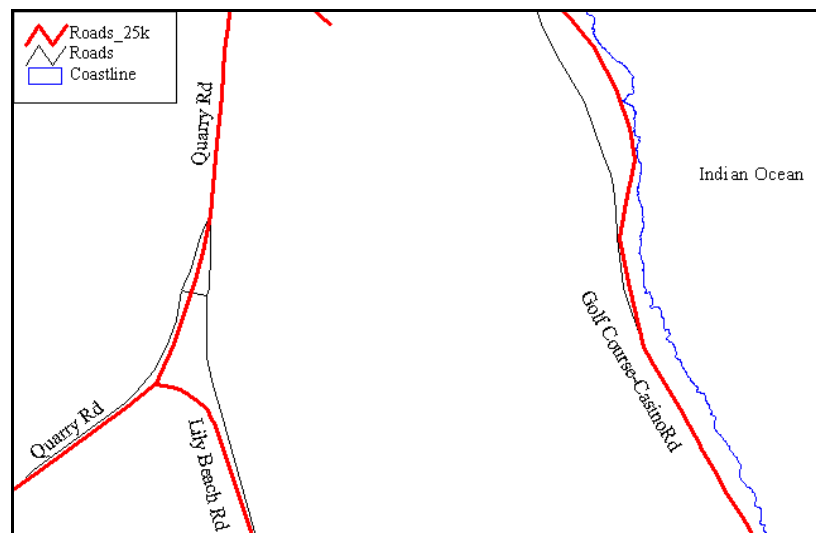


Figure 40: The updated roads file showing the alterations made to the Golf Course and Casino Road and also the intersection of Lily Beach Road and Quarry Road.

Town Plan

The Christmas Island Town Planning Scheme (TPS) data was prepared by the WA Ministry of Planning for the Commonwealth on a fee for service basis. A copy of the TPS data was supplied to AGSO as Arc Info export files on cd-rom in March 1998. The TPS has been signed off by the Minister and initialled as approved. Currently endorsement by the Shire is awaited for gazettal to proceed.

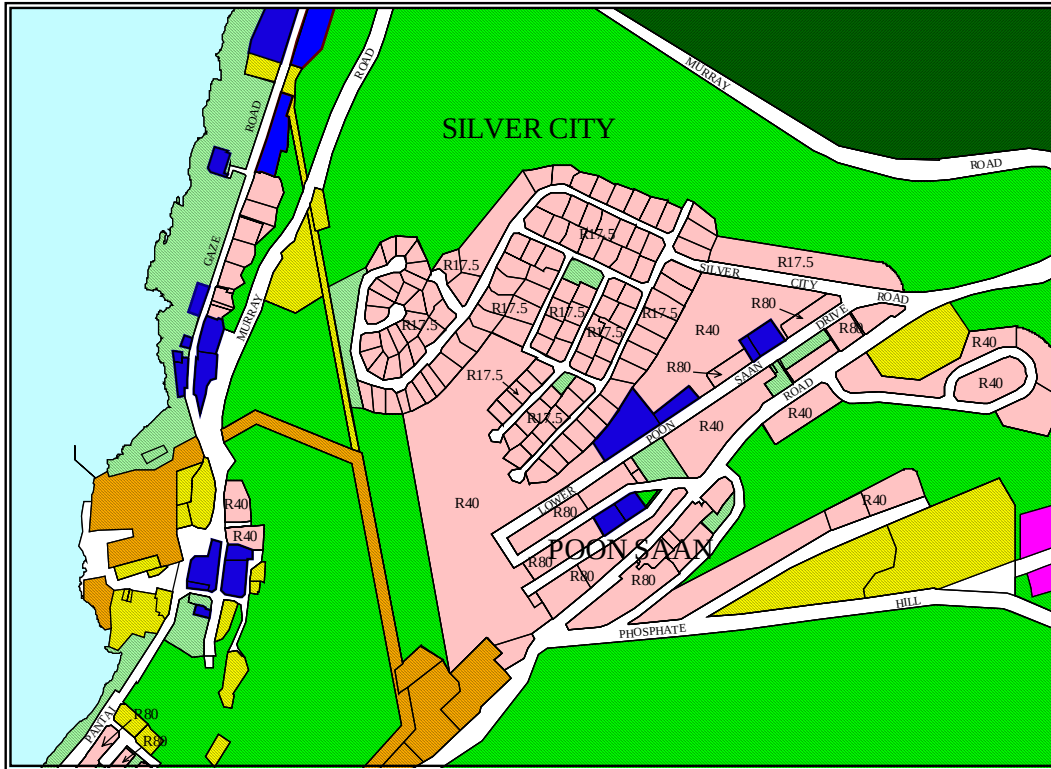


Figure 3: Data from the Christmas Island Town Planning Scheme (TPS) as prepared by the WA Ministry of Planning.

Reprojecting the Ministry of Planning data to Christmas Island Grid 1985 (CIG85) was not straightforward. GA has endeavoured to integrate the TPS data with the rest of the CIGIS as best as possible. The TPS data was supplied in a zone 50 projection despite Christmas Island being in zone 48. Ministry of Planning advised by phone that a standard Australian Map Grid had been used. However both AGD66 and AGD85 gave data over 200m out of place to the NE and so by trial and error a best match was sought and found to be WGS84. ArcInfo projection files (*z50_geo.prj* and *ll_cig85.prj* in the planning directory) were used to unproject the data to geographics and then reproject it to zone 48 CIG85. Note - there was a necessary final adjustment of two meters south and two meters west to get the TPS data into a better ultimate alignment with CIG85.

A "special points" dataset was included with the Ministry of Planning data. A number of inaccuracies in this data set were observed. The radio masts did not coincide with the masts visible on the orthophotography. GA moved five of these points by 20 to 70



metres so that they plot on top of a mast visible on the 1987 aerial photography. There are also some 'consult with Parks Australia' sites that could also well be similarly inaccurate. At two sites the radio mast points were duplicated in the TPS data.

There was a cadastre dataset included with the Ministry of Planning data. It contained many spurious polygons. There were 295 of the 1136 polygons supplied that had an area less than 2 square metres. These 295 polygons were distributed over the whole of the Island, generally in the vicinity of the coastline and most commonly in the 'Dogs Head' area. These cadastre polygons of less than 2 square metres were judged to be errors and deleted from the final shapefile "mopcadas.shp" (Ministry of Planning cadastre).

Selecting MoP cadastre polygons from 2 to 150 square metres in size showed land parcels of which some may actually be valid (eg a walkway of 28 sq metres). So a lesser selection was made of polygons between 2 and 20 square metres and this yielded 282 of the 841 remaining MoP cadastre dataset polygons. A brief inspection indicated these were all on the coastline. They were presumed to be relict sliver polygons and deleted. This left 559 of the original 1136 polygons. Many of these appear to be sliver polygons along the coast. If this MoP cadastre data set it to be taken seriously and used, a reliable way to select and eliminate these slivers needs be found (perhaps using the ratio of area and perimeter).

Crazy Ant Grid

An updated version of the crazy ant survey grid was received by Geoscience Australia from Parks Australia North Christmas Island (PANCI) in November 2001. This working version contains observation data made by PANCI employees during their research of the crazy ants colonies on Christmas Island.

Each of the points represents a surveyed crazy ant site. Using field methods (eg number of ants running across a sheet of paper), PANCI employees estimated the concentration of ants at each site. The results were then represented as total ants and incorporated into the shapefile "crazyants_grid" in the ".cigis/environment" directory".

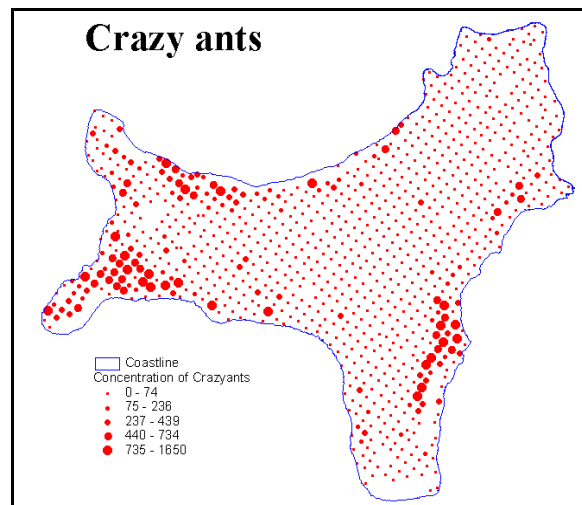


Figure 42: Crazy ant grid showing concentration of ants at each site.

Pinnacle Field Boundaries

The production of pinnacle boundaries was first initiated by AGSO in 1996 and GA completed digitising the NE part of Christmas Island. These original boundaries were generated for the pinnacle fields in the Dogs Head area by use of an automated classification utility associated with an image processing package. The resolution obtained by this method gave polygon outlines that appear "smooth" to a scale of at least 1:500. However this process of classifying regions of pinnacles proved very time consuming as many non-pinnacle areas were picked up by the automated classification (such as patches of bare earth beside roads etc).

Fortunately in 1998 the digitising of pinnacle boundaries was continued by the mine surveyors assistant (James Keogh). James completed the rest of the Island was by way of "heads - up" digitising (on screen digitising) using the orthophotography as the background.. From this work the typical scale that provides a "smooth" outline is no better than 1:10,000.

As part of the 2002 airport extension project, Geoscience Australia added eight new pinnacle boundaries to the existing dataset. Six of the fields were to the north and two were to the south of the runway. After reviewing the field closest to the southern section of the runway with the 2000 Airborne Laser Scanning, it was expanded from 30,606m² to 48,015m². The resolution obtained provides the eight polygon outlines with a "smooth" appearance to a scale of at least 1:500.

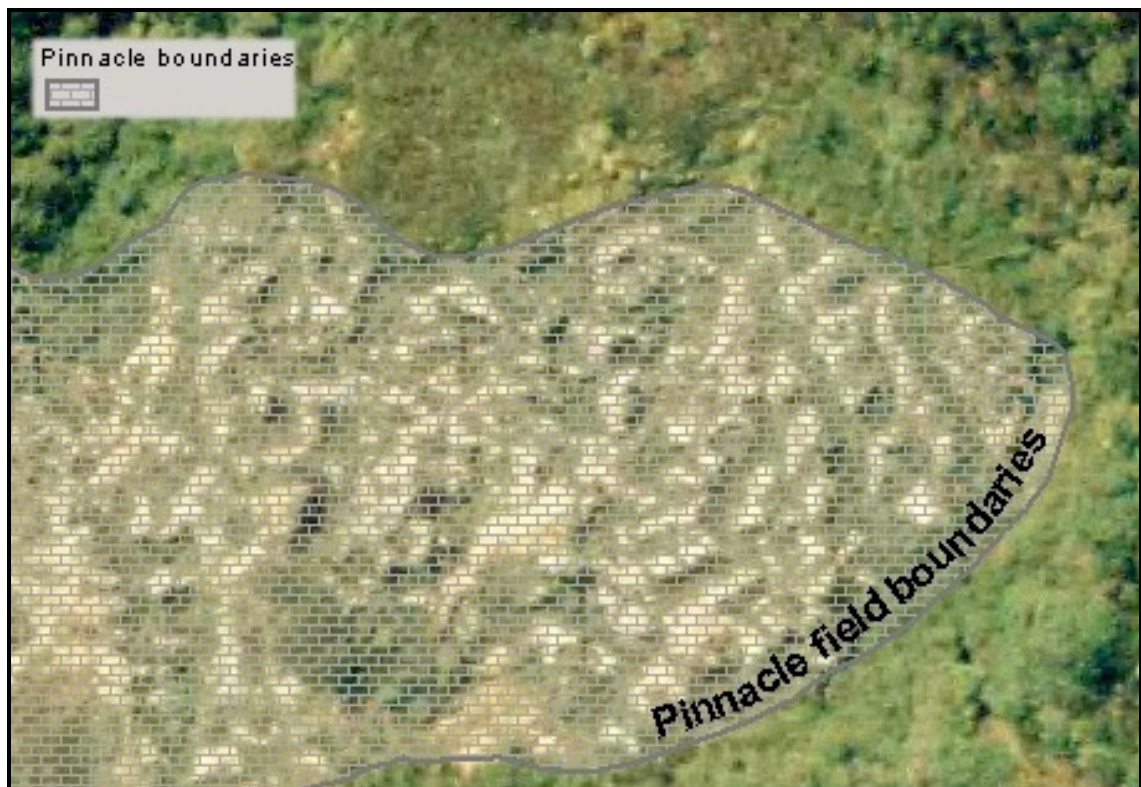


Figure 43: Pinnacle field area east of the airport (50m across N-S). The automated classification process has produced a smooth boundary at this close scale.

Vegetation

The vegetation dataset is derived from the 1:25000 vegetation map of Christmas Island by J. Barrie in 1966. On behalf of Parks Australia North Christmas Island, in October 2001 Geoscience Australia used ArcInfo to perform 'heads up' digitising upon a scanned copy of the original to formulate a raster based copy in CIG85 projection. Upon formulation of this digital copy all attributes relating to vegetation boundaries were extracted from the map and incorporated into the 'vegetation.shp' table. 'Vegetation.shp' is located in the *.data\environment* directory on CD#1. The table fields were based on Geoscience Australia's data dictionary guidelines.

Alias	Type	Precision	Width
Shape	FIELD_SHAPEPOLY	0	8
Ufi	FIELD_DECIMAL	0	6
Area	FIELD_DECIMAL	5	18
Perimeter	FIELD_DECIMAL	5	18
Map_symb	FIELD_CHAR	0	8
Desc	FIELD_CHAR	0	64
Categories	FIELD_CHAR	0	50
Feature	FIELD_CHAR	0	12
Plotrank	FIELD_DECIMAL	0	1

It should be noted that the positional accuracy of the scanned map is greater than the original 1966 map. The 'heads up' digitising process ensured that the original lines captured were many times larger than those on the printed map.

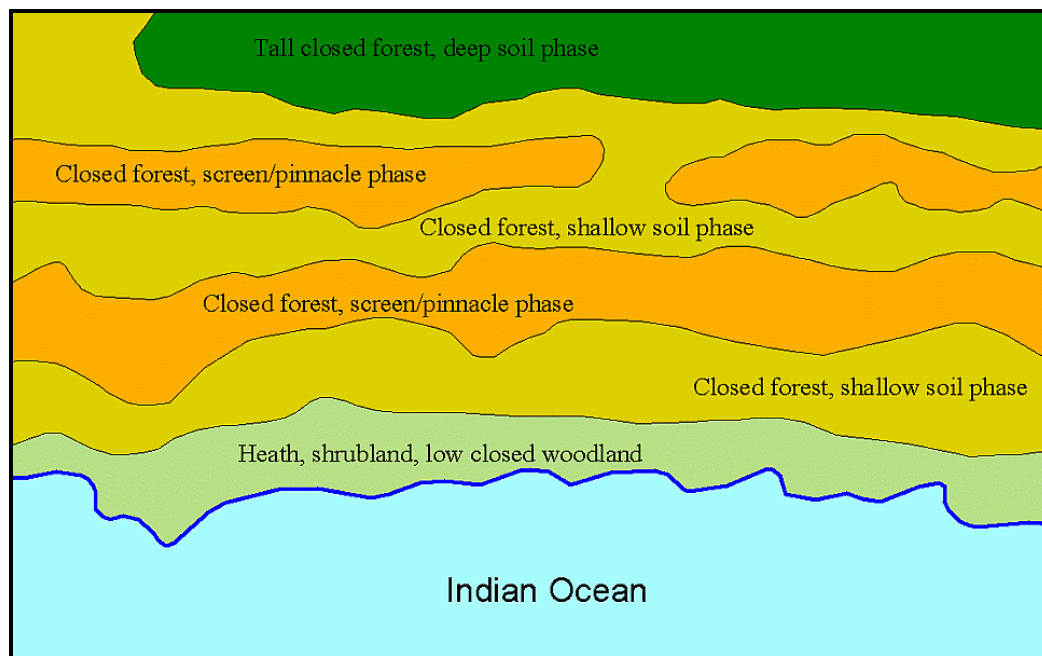


Figure 44: Vegetation boundaries in the southern coastline of Christmas Island.

Geology

The Geology dataset was digitised from the 1:27400 geology map of Christmas Island created by J. Barrie in 1966. Geoscience Australia used ArcInfo to digitise a scanned version of the map and project it into the CIGIS projection. The map was then populated with attributes according to the Geoscience Australia data dictionary guidelines. All information relating to the geological and lineations faults were extracted from the 1966 map and incorporated into the corresponding attribute tables. Details of the “geology.shp” fields can be seen below:

Alias	Type	Precision	Width
Shape	FIELD_SHAPEPOLY	0	8
Area	FIELD_DECIMAL	5	18
Perimeter	FIELD_DECIMAL	5	18
Map_symb	FIELD_CHAR	0	20
Lith_desc	FIELD_CHAR	0	254
Ufi	FIELD_DECIMAL	0	6
Stratno	FIELD_DECIMAL	0	7
Unitname	FIELD_CHAR	0	64
Unitage	FIELD_CHAR	0	100
Agerank	FIELD_CHAR	0	10
Feature	FIELD_CHAR	0	12
Rocktype	FIELD_CHAR	0	50
Plotrank	FIELD_DECIMAL	0	1

It should be noted that the positional accuracy of the scanned map is greater than the original 1966 map. The ‘heads up’ digitising process ensured the original lines captured are many times larger than those on the printed map.

The attributes capture all the information that was supplied on the original map. The Geoscience Australia QA & QC process ensured that all the fields have maximum attributes attached and also contain fields that expand and value add to the original map.

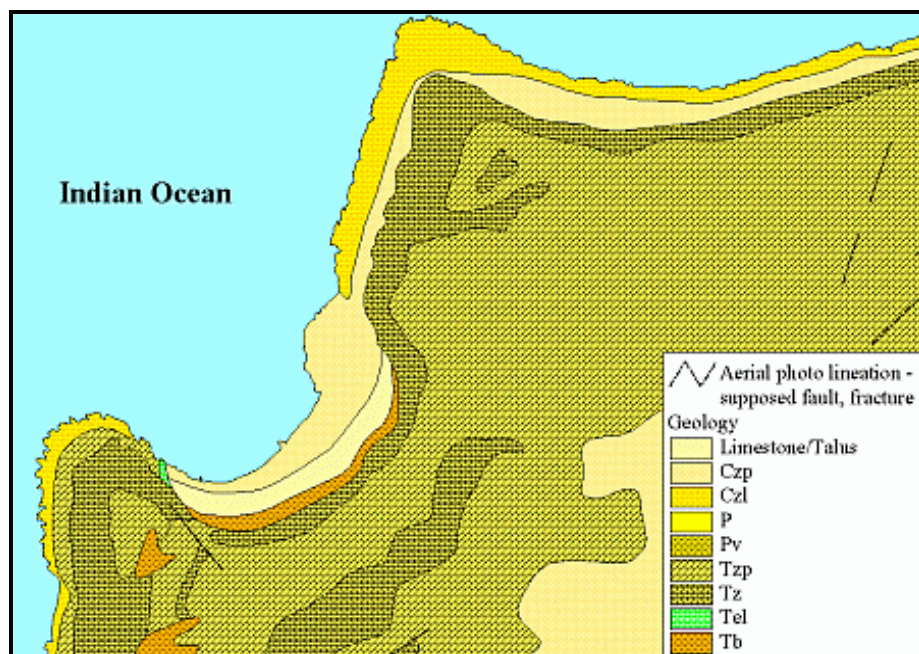


Figure 45: Geology boundaries and lineations in the northern section of Christmas Island

Valley Networks

The valley networks shapefile models the drainage networks for Christmas Island. It was produced from the 1999 DEM created from mostly 1:25000 scale vector data.

The valley networks are not entirely representative of the island's hydrology lines. The low elevation points are calculated from low elevation points in the DEM. The island primarily comprises of highly permeable limestone. Therefore, precipitation is not given the opportunity to form above ground streams or rivers shown in the 'valley_net' shapefile. The 'valley_net' shapefile does not take into account the sub-surface flows or sink holes that have a major bearing on the island's hydrology networks.

The shapefile 'valley_net.shp' was constructed using a sequence of ArcView hydro v1.1 extension grid commands, which produced filled sinks, flow direction, flow accumulation, and watersheds. Because of the size of the coverage's (256Mb) they were left off the CIGIS CD-ROMs.

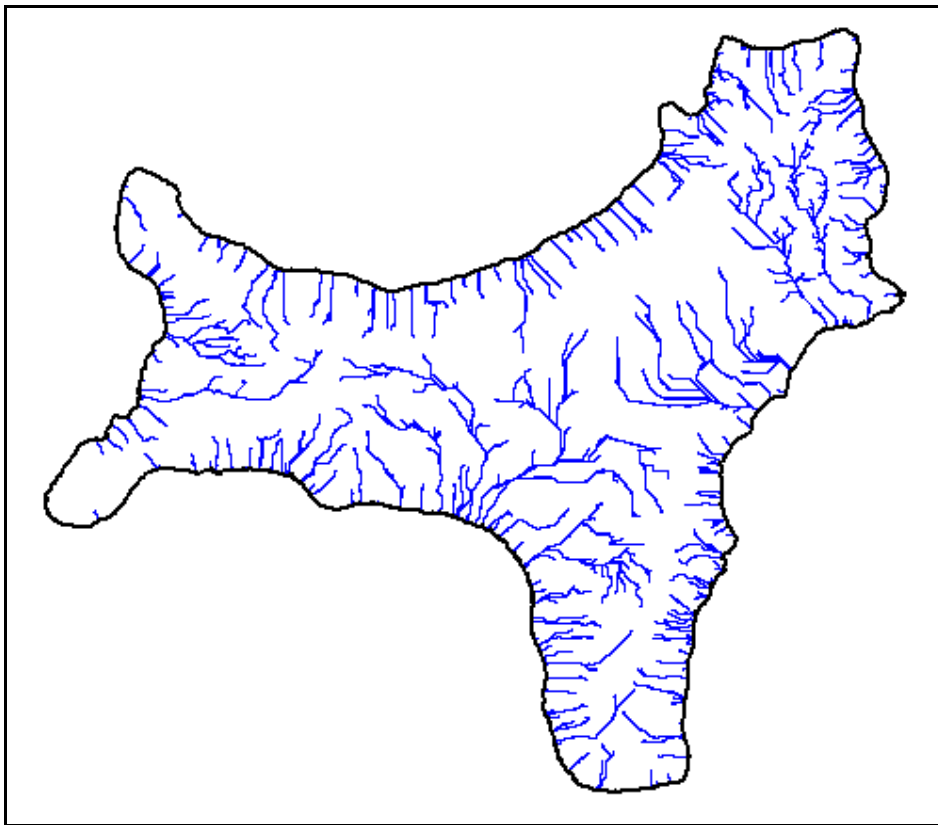


Figure 46: Valley Networks derived from the 1999 DEM of Christmas Island

Irvine Hill Forest Boundaries

The Irvine Hill forest area can be found in the north-east part of Christmas Island. An example of the extent of the forest boundaries can be seen in the following figure. This data was collected by surveying in flags placed by a National Parks officer to enclose patches of primary forest for conservation consideration should the Irvine Hill area be developed for urban use. GA built the surveyed points into the polygon shapefile 'forestedge_irvineh.shp'. There is possibly other data that may be of value in the source files from which these boundaries were extracted (see directory 'cigis\environment\source' on cd-rom #1).



Figure 47: Limits of the Irvine Hill forest boundaries with orthophotography as a backdrop.

References

- Australian Geological Survey Organisation, 1996, Geographic Information System for Christmas Island Phase II, System Documentation. Prepared for the Territories Office, Commonwealth Department of the Environment, Sport, and Territories.
- Australian Geological Survey Organisation, 1997, Geographic Information System for Christmas Island Phase II, Cadastre Documentation. Prepared for the Territories Office, Commonwealth Department of the Environment, Sport, and Territories.
- Australian Geological Survey Organisation, 1998, Geographic Information System for Christmas Island Phase IIA, Location Number Maps and Listing. Prepared for the Territories Office, Commonwealth Department of the Environment, Sport, and Territories.
- Australian Estate Management with input from AUSLIG, AVO and AGS, 1996, Indian Ocean Territories Ground Audit Module 1 Final Report. Prepared for the Territories Office, Commonwealth Department of the Environment, Sport, and Territories.
- Department of Land Administration (DOLA), 1992, Christmas Island & Cocos (Keeling) Islands Land Tenure System Project Planning & Detailed Costing Report
- ECOWISE Environmental Pty Ltd, Dec 1999, Draft Report on Water Resources Component Christmas Island GIS, by Vince Hazell, prepared for Christmas Island Administration and the Australian Geological Survey Organisation
- Tony Falkland, ACTEW Corporation Ltd and Rod Usback, Sustainable Environmental Solutions Pty Ltd, Oct 1999, Christmas Island Indian Ocean Water Management Plan, prepared for GHD Pty Ltd and Christmas Island Administration
- Tony Falkland, ACTEW Corporation Ltd, Oct 1999, Christmas Island Indian Ocean Groundwater Investigations and Monitoring Report, prepared for GHD Pty Ltd and Christmas Island Administration
- ANZLIC, 2001, ANZLIC Metadata Guidelines: Core metadata elements for geographic data in Australia and New Zealand Version 2 (February 2001), prepared for ANZLIC by the ANZLIC Metadata Working Group

GA Catalog details for the 2002 Christmas Island GIS (#41796)Cat # : 41796 **Flags** Product : Y Publication : N Dataset : N Resource : N WWW : N

Title : Christmas Island GIS

Medium :

Scale :

Contact : Keith Porritt

Type : Data Package

Sub Type : No Subtype Available

Project Id :

Pub'n Source :

Pub'n Year : 2000

Vol / Part :

ISBN :

Abstract : The 2002 Christmas Island Geographic Information System (CIGIS) is a collection of spatial data, viewing and analysis tools dealing with Christmas Island. The data include orthophotography, topographic, mining, cultural and environmental features of the island.

----- **Bounding Rectangle** -----

N Latitude : -10.4 **S Latitude :** -10.583 **W Longitude :** 105.517 **E Longitude :** 105.717

Comments :

Data projection is Christmas Island Grid 1985 (CIG85). Data scale is variable, due to the data being collated from various sources.

----- **List of Authors** -----**Name :**

1 Porritt, K.R.

2 Orr, K.J.

3 Lucas, A.P.

Theme :

GIS

culture

information management

topography

mineral exploration

Figure 48: Christmas Island GIS GA Catalog entry — #41796

Projections for Christmas Island

The most commonly used map projection (although Christmas Island Grid 1994 is becoming more widely used) for the island, is the CIG85 projection. This projection is currently used for the Christmas Island GIS data. However, it is foreseen that a migration of data to CIG94 will be necessary in coming years.

Definition of Christmas Island Grid 1985 (CIG85)

(From AUSLIG 1992 1:10 000 dyeline plans)

CIG85 is a plane rectangular grid coordinate system with True Origin coinciding with a point at UTM GRID ZONE 48 coordinates 570 000mE and 8 840 000mN (WGS72).

At that point the false origin is 20 000mW and 60 000mS of True Origin.

Collecting data

In general it is best to collect data unprojected (in geographic (latitude-longitude, geodetic) coordinates) and using the most universally accepted datum (WGS84).

Data intended to be used in the CIGIS needs projecting to CIG85, the map projection the GIS uses. Geoscience Australia has a discussion of datums and projections on their website at <http://www.auslig.gov.au/geodesy/datums/aboutdatums.htm>.

Projecting data

There are a number of packages available to project data, but the following discussion results from experience with ESRI products (ArcView 3.x and ArcGIS 8.x).

ArcView 3.x and ArcGIS 8.x have similar projection utilities.

Parameters for the CIG85 projection are:

- Projection: Transverse mercator
- Datum: WGS72
- Central meridian: 105° 0' 0"
- Scale factor: 0.9996
- False easting: -50000
- False northing: 1220000

These parameters were tested against reference data which were already in the CIG85 projection (AUSLIG 1:25000 and 1:1000 topographic data) with good results.

The orthophotography metadata states an accuracy of 0.3 - 0.5 metres in the north east area of the island (for other disturbed areas of the Island the accuracy ranges from 0.5 metres to 4 metres). However, the accuracy is not yet fully confirmed by GPS or surveying over most of Island. In this case, for the purposes of using the data with the GIS, attempting greater accuracy than approximately 0.5 metres is probably of little worth.

Note: In ESRI projection software we have had best results using ArcInfo Workstation and explicitly setting precision to 'double' and datum definitions to seven parameter. Using other utilities we have seen an unacceptable location offset of approximately 16 metres east and 4 metres north, so in this case an XY shift would be necessary, either to match existing data or to match a surveyed mark with a CIG85 location. Collecting data (if your GPS unit allows) in UTM Zone 48 (WGS72) and using an X (550000m) and Y (8780000m) shifts to CIG85 should get around this problem and result in adequate accuracy.

Christmas Island Grid 1994 (CIG94)

The current map projection for Christmas Island is CIG94. As this projection is becoming more widely used, the Christmas Island GIS is likely to migrate its data to this projection in the near future.

Parameters for this projection (as communicated by DOLA over phone – minus datum, datum from DOLA website) are:

- Projection: Transverse mercator
- Datum: WGS84/GDA94
- (DOLA 'WGS84 to GDA94 Christmas and Cocos Island' web page 10/05/2002 is unclear)
- Central meridian: 105 37' 30"
- Scale factor: 1.00002514
- False easting: 50,000
- False northing: 1,300,000

Chapter 3

Appendix 1: cd-rom HTML documentation

Hard copy print of the HTML pages comprising the autorun content for cd-rom # 1.

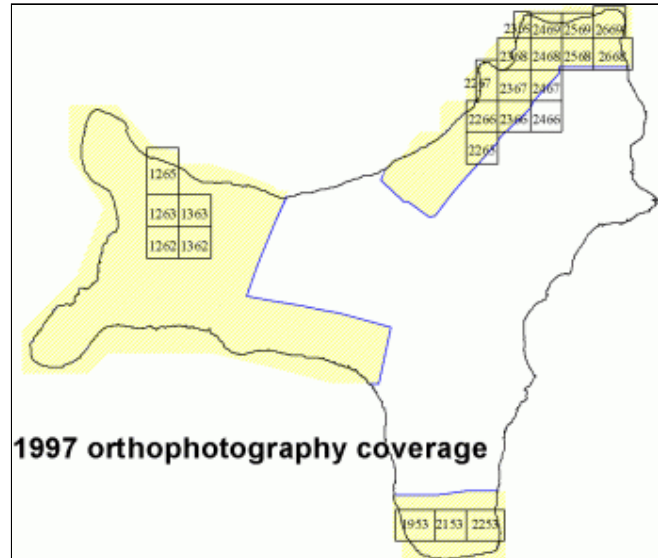
Chapter 4

Appendix 2: Metadata

On the following pages is a printout of all the metadata sheets. These metadata sheets were created to comply with ANZLIC core metadata standards. To aid with understanding the nature of each dataset, a picture has been added to the top of each metadata sheet.

As this is the first year of support for the CIGIS, metadata should be considered as a preliminary version only. Agencies who have involvement with the data for a particular metadata sheet are welcome to contribute back metadata element revisions or additions (by e-mail please) to improve that particular metadata sheet.

the **Christmas Island 2002 GIS** online



[1997 Orthophotography Snap Shots!](#)

[Metadata Home](#)



Dataset

Title	1997 Orthophotography of Christmas Island
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	An orthophotograph is a computer image of an aerial photograph in which various distortions due to the landscape and camera lens have been removed. The data are based on the aerial photography of Christmas Island taken in November 1997. Parks Australia North commissioned the aerial photography in 1997 to be flown over a two week period. However, due to cloudy weather only one day of photography was achieved. The data have been converted to detailed colour orthophotography (at a 15cm ground resolution) and presented as three blocks of photography that encompassed the settlement area in the north-east, the southern most extent of the south-eastern corner of the island and the western block. The pale redness associated with the image is a result of Geoscience Australia coloring the image so as to highlight variances in the vegetation over mining fields. In addition, the warping associated with this orthophotography is a result of the image being 'pinned down' by a broader DEM. Where there was a diagonal boundary to a 1997 orthophoto, the tile has been filled with 1987 orthophotography. Most orthophotography of the disturbed areas (mining or township) which were covered by the 1997 aerial photography is on CD1 as twenty three '.tif' tiles (see diagram above). Due to space limitations on CD1 all the 1997 orthophotography has not been converted to '.tif' tiles. CD2 has the full 1997 orthophotography coverage as eight .ecw tiles.
Search Word (s)	PHOTOGRAPHY AND IMAGERY Aerial PHOTOGRAPHY AND IMAGERY Orthophotography PHOTOGRAPHY AND IMAGERY Raster PHOTOGRAPHY AND IMAGERY Grid
Geographic Extent Name (s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	02 NOV 1997
Ending Date	02 NOV 1997

Dataset Status

Progress	Complete
Maintenance and Update Frequency	Not planned

Access

Stored Data Format	DIGITAL - TIFF/ECW
Available Format Type	DIGITAL - TIFF/ECW [View extents of .ecw tiles] [View extents of .tif tiles]
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	Colour orthophotography for Christmas Island, with 15cm ground resolution, was achieved by scanning fullsize colour transparencies of aerial photography. Original negatives were scanned at 15um (1700dpi) on a Helava Digital Photogrammetric Scanner DSW 200. This scanner provides geometric accuracy of better than 2um. Digital images were then imported into a Helava Digital Photogrammetric workstation using Socet Set software version 4.3. Images were interior orientated then triangulated. Initial approximations of the camera obtained from airborne DGPS was logged during the flight. Ground control was derived from existing supplied data (Geosciences Australia). Vertical control was extracted from a supplied DEM and horizontal control from a supplied orthoimage. An array of automatically generated tie points were also used in the triangulation. Separate aerotriangulations were conducted on the three independent blocks of photography these being; 1. The Settlement area in the north-east of the island, 2. The Southern block at the south-east corner of the island, and 3. The Western block. Ortho images were then generated in sheets as per the supplied sheet layout. Prior to ortho generation, all individual images were dodged to remove tonal changes across each photo and after mosaicing, a final batch colour balance was achieved in Photoshop. A number of the supplied sheets are only partially covered, limited by the extents of photography. Ortho images were produced as Tif images and reformatted to ECW. The quality of the orthophotographs is impressive, with acceptable resolution down to 1:500 scale. The following table shows the dates of the flights and their corresponding flight run numbers: <table border="1"> <thead> <tr> <th>Date</th><th>Run Number</th></tr> </thead> <tbody> <tr> <td>02-11-1997</td><td>1-9</td></tr> </tbody> </table> View the associated images:	Date	Run Number	02-11-1997	1-9
Date	Run Number				
02-11-1997	1-9				

	• 1997 flight lines, photocentres and coverage extent
Positional Accuracy	The 1997 orthophotography was georeferenced directly from the 1987 orthophotography. Therefore it is expected that the positional accuracy will be the same as the 1987 orthophotography (see 1987 orthophotography metadata sheet). Geoscience Australia has noticed, in using the data, that the 1997 orthophotography has more warping of buildings. This is because a broader DEM may have been used to pin down the orthophoto. The orthophotography shows approximately 6m of irregularity within the urban and NE of districts of the island.
Attribute Accuracy	Not Relevant.
Logical Consistency	Not Relevant.
Completeness	Orthophotos are complete and form a full set of tiles of which only a few may fit onto a CD-ROM. They are based on the aerial photography taken in November of 1997.

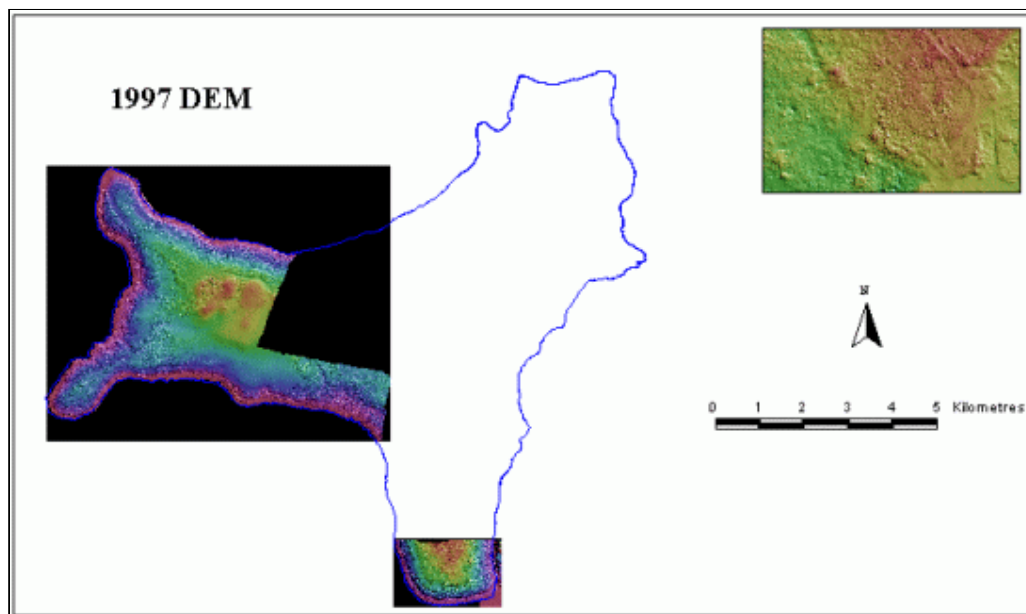
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	21-08-2002

Additional Metadata

Projection	CIG85
Printed	October 2002

the Christmas Island 2002 GIS online


[Metadata Home](#)


Dataset

Title	1997 DEM Tiles
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	1997 DEMtiles (a concatenation of "97DEM tiles") contains some samples of a representation of the Digital Elevation Model as TIFF and ECW images.
Search Word(s)	1997 DEM Digital Elevation Model IMAGES Tiff IMAGES Ecw PHOTOGRAPHY AND IMAGERY Digital Elevation Model PHOTOGRAPHY AND IMAGERY Raster PHOTOGRAPHY AND IMAGERY Grid
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	2002/11/02
Ending Date	2002/11/02

Dataset Status

Progress	ECW and TIFF Tiles have been made on an as needed basis that cover only certain parts of island (this can be seen above).
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - TIFF/TFW, ECW
---------------------------	-------------------------

Available Format Type	DIGITAL - TIFF/TFW, ECW
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	The DEM has had a shiny colour drape algorithm applied in ERMMapper® to produce a TIFF image of South Point that has then been reduced to 256 colours, while the ECW image of the West was left at 16 million colour to minimise storage on the CD's. Both images were originally created with a 1m cell size in areas of interest and 5m cell size elsewhere (the South Point image is represented by 1m cell sizes while the West image is a combination of both 1 and 5 metre cell sizes). The final images have been produced at 1m cell sizes.
Positional Accuracy	The positional accuracy mimics the accuracy of the 1997 orthophoto tiles.
Attribute Accuracy	Not Applicable.
Logical Consistency	All items within this dataset are Digital Elevation Models that describe Christmas Islands topography with elevation being replaced by a colour scale from a colour lookup table.
Completeness	1997 DEM tiles have been produced to cover parts of the island that are of active interest on an as needed basis. [1997 DEM tiles]

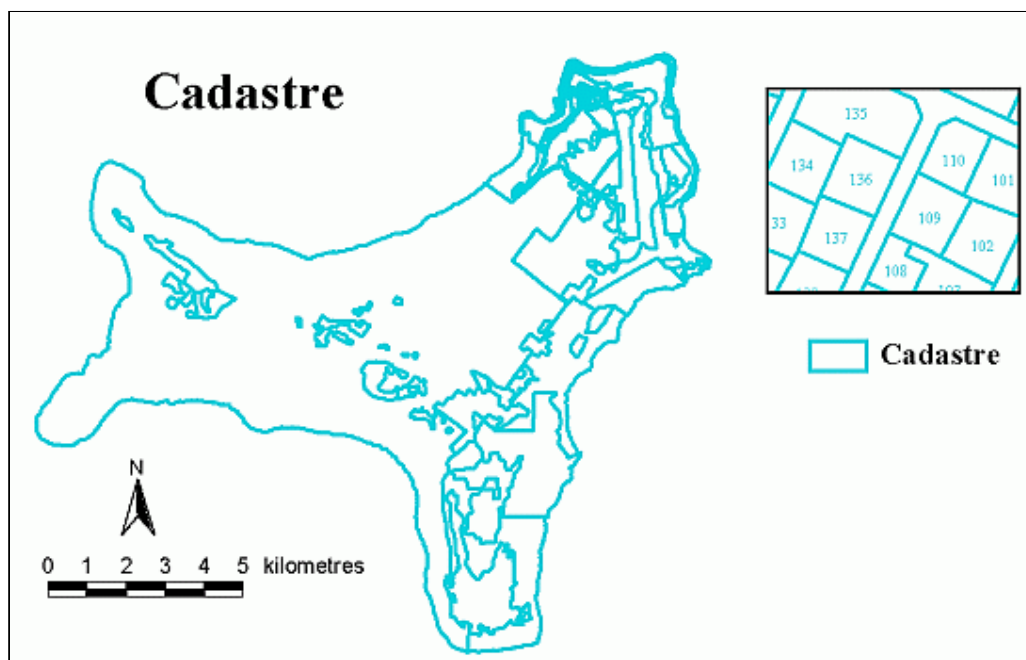
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	17-11-2002

Additional Metadata

Projection	CIG85
Printed	November 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	2002 Cadastre
Custodian	Department Of Land Administration (DOLA)
Jurisdiction	Western Australia

Description

Abstract	The cadastre shapefile is largely derived from a file source from the Department Of Land Administration, Western Australia (DOLA) dated 1 August 2002. Cadastral information for Christmas Island is maintained by DOLA on behalf of the Commonwealth under a Memorandum of Arrangement with Territories Office. Time and effort has been spent reworking the data for use in the CIGIS (see Lineage) to yield more useable information. A link to the DOLA source metadata can be found here
Search Word(s)	BOUNDARIES Administrative LAND Cadastre
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	1 August 2002
Ending Date	1 August 2002

Dataset Status

Progress	On going
Maintenance and Update Frequency	Cadastre boundaries are continuously maintained by DOLA - this is an extract as at 1 August 2002.

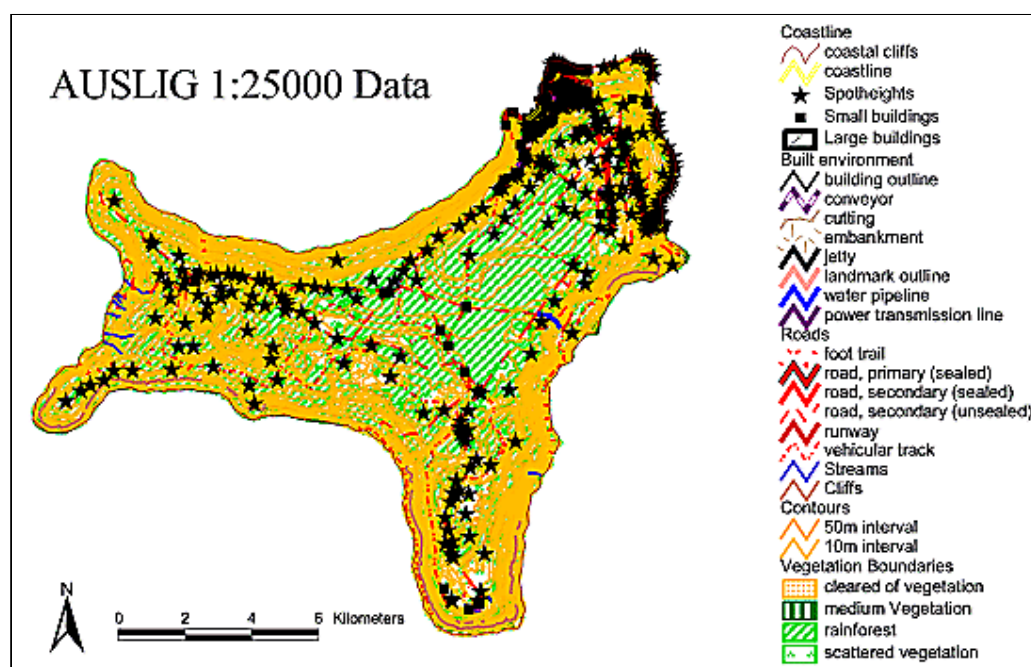
Access

Stored Data	DIGITAL - ESRI shapefile, polygon
--------------------	-----------------------------------

Format	
Available Format Type	DIGITAL - ESRI shapefile, polygon
Access Constraint	See contact details below for a more up-to-date extract.
Data Quality	
Lineage	The 2002 Cadastre was supplied by DOLA as an extract from their database to Christmas Island Administration (ESRI shapefile dated 1 August 2002). This shapefile was then passed onto Geoscience Australia soon after. GA adjusted the cadastre shapefile in the following ways: 1. Polygon outlines rather than solid-fill polygons were set to be the default display by including an .avl file. 2. The data was projected to CIG85 so the cadastre now plots with the other layers in the CIGIS. 3. Duplicate polygons were deleted. 4. The location numbers were extracted from the last few characters of the 'piparcel' field, both as a string for sorting, and as a number for numerical queries. 5. Field headings from the attribute table were updated to conform to suggestions received from Christmas Island Administration in August 2002. Requested attributes that were not present in the cadastre but were present in the ground audit were then copied from the ground audit attribute table to the cadastre attribute table. This was achieved by joining the tables using the "Pin" fields in both shapefiles. Attributes that displayed information such as property gross income, house value, etc were removed from the CIGIS public release in view of government guidelines relating to privacy.
Positional Accuracy	The cadastre shapefile received from DOLA in 2002 was projected by Geoscience Australia to conform with CIG85. This ensured the cadastre plotted over the other CIGIS layers.
Attribute Accuracy	Examination of the attributes fields will show that not all have complete records. A list of fields were given to Geoscience Australia in August 2002 by Christmas Island Administration. The list included field names for which Geoscience Australia has no data, therefore, many fields remain blank.
Logical Consistency	The data is concerned with the north east portion of Christmas Island and is mostly complete for that area. A few location numbers have been found to be incorrect. This is because a global method of attaching the location numbers was used. GA recognises that further work could be undertaken to yield a more up to date and error free data set.
Completeness	GA recognises that there is considerable work to be done to yield an up to date and error free data set with all fields proposed by CIA filled with values.
Contact Information	
Contact Organisation	Department of Land Administration (DOLA)
Contact Position	-
Mail Address	Midland Square (PO Box: 2222)
Locality	Midland
State	Western Australia
Country	Australia
Postcode	6056
Telephone	(08) 9273 7209
Facsimile	(08) 9273 7656
Electronic Mail Address	sales@dola.wa.gov.au
Metadata Date	27-08-2002
Additional Metadata	

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online



[Roads](#) | [Natural Features](#) | [Built Environment](#) | [Contours and Spot Heights](#)

[Data Directory](#)

[Data Dictionary Home](#)

[Metadata Home](#)



Dataset

Title	Auslig - 1:25000 Topography and Culture
Custodian	Australian Surveying and Land information Group, Dept. of Administrative Services, Canberra, ACT, Australia.
Jurisdiction	Australia

Description

Abstract	AUSLIG data covers the whole island at a scale of 1:25000, and includes polygons, lines and points describing both natural and built environment. The AUSLIG data includes the following 1:25000 layers: roads, 10 metre contours, spot heights, buildings and other structures, hydrology, boundaries for the national park, boundaries for the mining leases and boundaries for four vegetation types. Licence / royalty arrangement pro forma were submitted by MREB for Territories Office and PRL in January 1996.
Search Word (s)	BOUNDARIES Administrative BOUNDARIES Cultural BOUNDARIES Mining BOUNDARIES National Parks CONTOURS Topographic HUMAN ENVIRONMENT Structures and Facilities VEGETATION Boundaries WATER Hydrology
Geographic Extent Name (s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	01JAN1988

Ending Date	20AUG2002
--------------------	-----------

Dataset Status

Progress	Complete
Maintenance and Update Frequency	Not Planned

Access

Stored Data Format	DIGITAL - Arc/Info format in the Christmas Island Grid projection. ArcView3.1 shapefiles
Available Format Type	DIGITAL - Arc/Info format in the Christmas Island Grid projection. ArcView3.1 shapefiles
Access Constraint	Restricted. Maps produced and distributed beyond the licensee that include the AUSLIG data are required to carry the following acknowledgment (contact at AUSLIG is Ian Miller (02) 6201 4311):- Topographic data reproduced with permission of the General Manager, Australian Surveying and Land Information Group, Department of Administrative Services, Canberra, ACT.

Data Quality

Lineage	The 1995 release of the AUSLIG digital data for Christmas Island was published at the 1:25000 scale. For this release the existing 1988 map was updated. The data was provided in Arc/Info format in the Christmas Island Grid projection. Only 'feature coded' data was available as AUSLIG do not see there being many sales of this dataset. Feature coded data are the lowest level of release for Arc/Info data by AUSLIG. There was basically no documentation with the data - only a list of feature codes and their frequency. MREB have had to re-work the data into its present form. The original data was obtained as two Arc/Info export files (xmas.e00 and xmasrel.e00), containing general data and contour/spot-height data respectively. Considerable work was necessary to make this useful for the GIS. A series of Arc/Info macros similar to those applied to the CIA data were used to strip out different feature classes and build them as separate point, line or polygon coverages as appropriate. In generating polygon coverages cleaning was required. To suit use in Surpac mining software a version of the contours as polygons was created. The AUSLIG data are subject to copyright and MREB hold a licence. The road layer (.\\data\\infra_topo\\topo25k\\roads_25k.shp) was updated in June 2002 from a shapefile sent to GA from the Christmas Island Shire Council to include new and/or inaccurate road files. Street names within the Christmas Island Shire Council's shapefile were also added to the existing road_25k database. The updated version of the Christmas Island coastline spatially aligns the coastline around the North-eastern side of the island with a higher degree of accuracy. The "coast" shapefile found in the "environment" directory was built using a union of Dola's Cadastre and the original 1:25000 coastline.
Positional Accuracy	Publication at the 1:25000 scale has important implications for the use of the AUSLIG topographic data. Some of the plots MREB have produced include enlargements to scales of 1:2000. This means the AUSLIG data are being displayed at over ten times its published scale. Users should view AUSLIG lines on such enlargements as representing a line around ten times as thick, the true line occurring somewhere within that much thicker line. It is far more expensive to capture data at small scales. As the data was originally intended to be used at 1:25000 scale, zooming in past this will show visible offset from the orthophotographs, potentially by as much as 25 metres. On zooming, the orthophotography will be more accurate, having error of at most 6 metres. A special case is the mining lease boundaries, which is superseded by the CIA mining lease data. The AUSLIG mining lease data should not be used. This superseded data is stored in the "defunct" subdirectory. It is provide to assist with

	verification and cross comparison with other mining lease boundary information users may acquire.
Attribute Accuracy	Not documented.
Logical Consistency	AUSLIG data covers the whole island, and includes polygons, lines and points describing both natural and built environment.
Completeness	The AUSLIG data set was complete and up to date at the time of publication. GA recognises that further work could be done to update and fine tune the dataset to yield a more error free and precise data set.

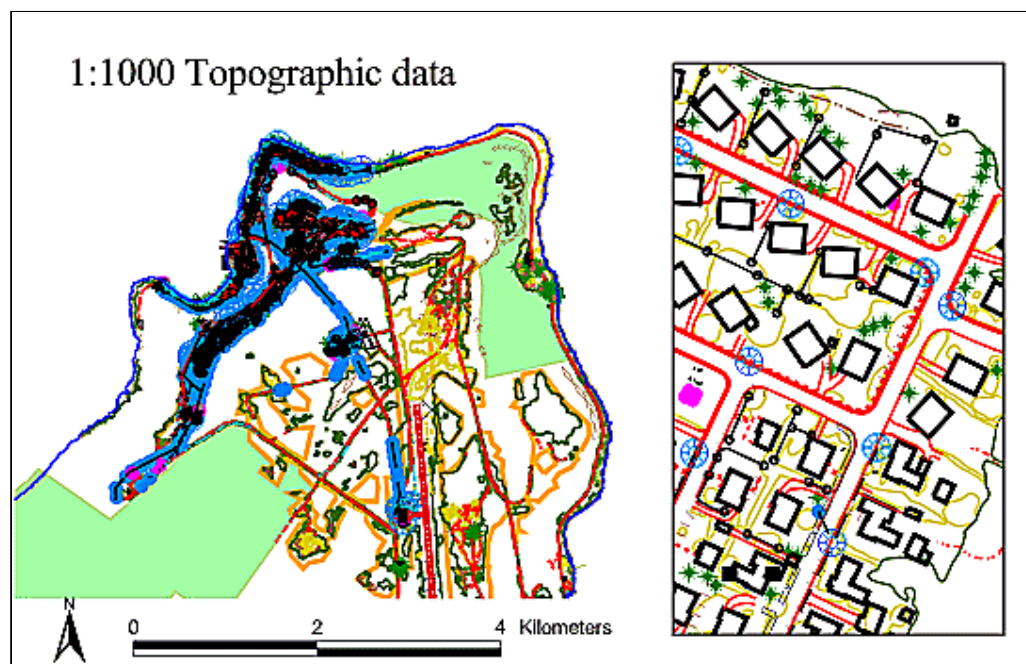
Contact Information

Contact Organisation	AUSLIG
Contact Position	-
Mail Address	PO Box 2
Locality	Beloconnen
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6201 4222
Facsimile	(02) 6201 4381
Electronic Mail Address	datasales@auslig.gov.au
Metadata Date	27-08-2002

Additional Metadata

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online



[Residential 1:1000 data](#) | [Industrial 1:1000 data](#)

[Data Directory](#)

[Data Dictionary Home](#)

[Metadata Home](#)



Dataset

Title	Christmas Island 1:1000 Topographic Data
Custodian	Christmas Island Administration
Jurisdiction	Australia

Description

Abstract	This data was obtained from AUSLIG (Western Region) and commissioned from Territories Office. This is the data used to produce the 1:1000 scale dyeline mapsheet series A1-2262 to A12284 from the 1987 aerial photography. The data only covers the north-east portion of the island and contains similar features to the AUSLIG 1:25000 data but has more detail and is more precisely located.
Search Word (s)	BOUNDARIES Administrative BOUNDARIES Cultural BOUNDARIES Mining BOUNDARIES National Parks CONTOURS Topographic HUMAN ENVIRONMENT Structures and Facilities VEGETATION Boundaries WATER Hydrology
Geographic Extent Name (s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	16AUG1987
Ending Date	01JUL1992

Dataset Status

--	--

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - Arc/Info files: Point, Line, Polygon DIGITAL - ArcView Shapefiles: Point, Line, Polygon DIGITAL - MapInfo files: Point, Line, Polygon NON DIGITAL - Dyeline paper maps
Available Format Type	DIGITAL - ArcView Shapefiles: Point, Line, Polygon DIGITAL - MapInfo files: Point, Line, Polygon
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	Detail of manipulation of the data for use in CIGIS is presented below. Separate data themes were split out of the provided export files via Arc/Info routines. The following is an example and description of the Arc/Info macro series that were used to do this. The steps involved are: 1. Import the cover; 2. Join the xcode and acode tables (containing the relevant information about the features on the coverage) to the point/polygon and arc tables respectively; 3. Alter the tables as required; 4. Build the Arc/Info coverages (points, lines and annotation -- polygons do not build in any of the AUSLIG WA coverages); 5. Unsplit the line work (in larger datasets where appropriate -- to speed up drawing); and 6. Create a spacial index for display speed. For all datasets, except annotation, shapefiles were created both for consistency and loading speed. Checks done by GA comparing shapefiles and coverages found that shapefiles were not significantly faster in drawing or calculation (and were in some cases slower), but were significantly quicker when loading. Since annotation does not convert to a shapefile, it was therefore left as an Arc coverage.
Positional Accuracy	This data should be correct to approximately one metre. For most of the north east portion of the island, this data and the orthophotography have a very good correlation usually well under one metre in difference. Around tall buildings and cliffs there may be discrepancies between the data and the orthophotographs. This is a factor of aerial photography angles and interpretation. In these cases, the 1:1000 vectors should be more reliable than the orthophotography. In the western most extremity of the data set the accuracy has been called into question by the orthophotography contractor. They observed, after checking the orthophotography against results from analytical stereo plotters, that "it appears that in the vicinity of the market garden, the mapping data supplied... may be in error by approximately 5 m in east". The data was provided as six Arc/Info export files which are stored on the core data CD in the directory 'cigis/cia/source'. The dataset includes contours where the ground could be estimated using a stereo plotter. These contours do not have a height value attached as the source CAD file did not include this. However, Geoscience Australia has observed 1m contours in the urban and industrial areas and 2m contours elsewhere. The accuracy of these contour lines was confirmed by looking at the 1:1000 and 1:2000 AUSLIG 1987 maps. The national park boundaries in this directory cover the whole of Christmas Island and are the best MREB could obtain. They originate from AUSLIG Perth as part of the 1987 cadastre data set and are accurate to 1:1000 scale. The cadastral data did not include internal boundaries of the park. Thus it was necessary for MREB to add the mining lease boundaries (supplied as part of the cadastral data) to the data national park boundaries to create the full national park

	boundaries.
Attribute Accuracy	Not documented from source, however through general use of the data the quality of attributes appears reliable.
Logical Consistency	CIA data covers the north-east portion of the island and includes polygons, lines and points describing both natural and built environment.
Completeness	This dataset only covers the north-east portion of Christmas Island and is mostly complete for that area. Contours in this dataset were only captured for a small but scattered portion of the area. GA recognises that further work could be undertaken to yield a more up to date and error free data set.

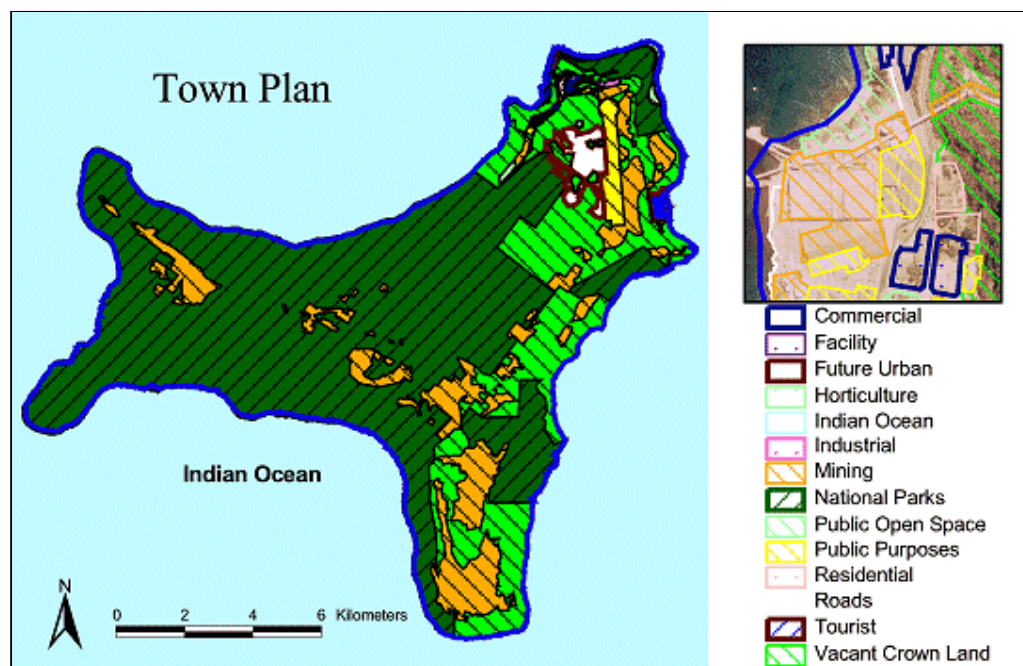
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	27-08-2002

Additional Metadata

Projection	CIG85
Printed	October 2002

the Christmas Island 2002 GIS online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Town Plan
Custodian	Christmas Island Administration
Jurisdiction	Australia

Description

Abstract	CAD files and Arc/Info files were converted into ESRI shapefiles and form the basis of this dataset. The town plan shapefile is "lazone.shp". A listing of the fields follow: <table><tr><th>Field</th><th>Type</th><th>Width</th><th>Decimal</th></tr><tr><td>Shape</td><td>FIELD_SHAPEPOLY</td><td>8</td><td>0</td></tr><tr><td>Zone</td><td>FIELD_CHAR</td><td>2</td><td>40</td></tr><tr><td>Lucode</td><td>FIELD_DECIMAL</td><td>4</td><td>0</td></tr><tr><td>Key</td><td>FIELD_CHAR</td><td>14</td><td>0</td></tr><tr><td>Area</td><td>FIELD_DECIMAL</td><td>18</td><td>5</td></tr><tr><td>Perimeter</td><td>FIELD_DECIMAL</td><td>18</td><td>5</td></tr><tr><td>Lga_num</td><td>FIELD_DECIMAL</td><td>4</td><td>0</td></tr><tr><td>Scheme_typ</td><td>FIELD_CHAR</td><td>2</td><td>0</td></tr><tr><td>Scheme_no</td><td>FIELD_CHAR</td><td>4</td><td>0</td></tr><tr><td>Addcode</td><td>FIELD_CHAR</td><td>4</td><td>0</td></tr><tr><td>Restcode</td><td>FIELD_CHAR</td><td>4</td><td>0</td></tr><tr><td>Alabel</td><td>FIELD_CHAR</td><td>1</td><td>0</td></tr><tr><td>Rlabel</td><td>FIELD_CHAR</td><td>1</td><td>0</td></tr><tr><td>Lazcig85_</td><td>FIELD_DECIMAL</td><td>11</td><td>0</td></tr><tr><td>Lazcig85_i</td><td>FIELD_DECIMAL</td><td>11</td><td>0</td></tr></table> The field "zone" is used as the legend and shows areas of: Commercial, Facility, Future Urban, Horticulture, Indian Ocean, Industrial, Mining, National Parks, Public Open Space, Public Purposes, Residential, Roads, Tourist and Vacant Crown Land.	Field	Type	Width	Decimal	Shape	FIELD_SHAPEPOLY	8	0	Zone	FIELD_CHAR	2	40	Lucode	FIELD_DECIMAL	4	0	Key	FIELD_CHAR	14	0	Area	FIELD_DECIMAL	18	5	Perimeter	FIELD_DECIMAL	18	5	Lga_num	FIELD_DECIMAL	4	0	Scheme_typ	FIELD_CHAR	2	0	Scheme_no	FIELD_CHAR	4	0	Addcode	FIELD_CHAR	4	0	Restcode	FIELD_CHAR	4	0	Alabel	FIELD_CHAR	1	0	Rlabel	FIELD_CHAR	1	0	Lazcig85_	FIELD_DECIMAL	11	0	Lazcig85_i	FIELD_DECIMAL	11	0
Field	Type	Width	Decimal																																																														
Shape	FIELD_SHAPEPOLY	8	0																																																														
Zone	FIELD_CHAR	2	40																																																														
Lucode	FIELD_DECIMAL	4	0																																																														
Key	FIELD_CHAR	14	0																																																														
Area	FIELD_DECIMAL	18	5																																																														
Perimeter	FIELD_DECIMAL	18	5																																																														
Lga_num	FIELD_DECIMAL	4	0																																																														
Scheme_typ	FIELD_CHAR	2	0																																																														
Scheme_no	FIELD_CHAR	4	0																																																														
Addcode	FIELD_CHAR	4	0																																																														
Restcode	FIELD_CHAR	4	0																																																														
Alabel	FIELD_CHAR	1	0																																																														
Rlabel	FIELD_CHAR	1	0																																																														
Lazcig85_	FIELD_DECIMAL	11	0																																																														
Lazcig85_i	FIELD_DECIMAL	11	0																																																														
Search Word (s)	BOUNDARIES Administrative HUMAN ENVIRONMENT Planning HUMAN ENVIRONMENT Structures and Facilities HUMAN ENVIRONMENT Urban Design																																																																

	LAND Use
Geographic Extent Name (s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	1994-06-23
Ending Date	1997-03

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - Arc/Info files: Point, Line, Polygon DIGITAL - ESRI Shapefiles: Point, Line, Polygon
Available Format Type	DIGITAL - ESRI Shapefiles: Point, Line, Polygon
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	-
Positional Accuracy	Positional accuracy is directly related to the scale of the source maps. For a 1:10000 scale map, the position of streets should be within +/-5m of their actual location, for a 1:25000 map they should be within +/-12m During digitizing every point created was within 0.5mm of the map object ensuring that the above accuracy was maintained.
Attribute Accuracy	Not documented from source, however through general use of the data the value and quality of attributes appear reliable.
Logical Consistency	Some of the country boundaries have been taken from the index covers for the TPS capture. These are considered to be more reliable than the supplied data. {Matt Devlin 26/9/96}.
Completeness	This data set has not been fully validated and compared with the maps and plans compiled from gazetted technical descriptions by the Statutory Drafting Section, Land Parcel Services Branch, Land Titles Division, DOLA, nor compared and fitted on a boundary by boundary basis with the current SCDB cadastral boundaries. Some preliminary investigation and comparisons were completed during 1992, but a full validation project was not undertaken. To improve currency of the boundaries, but not necessarily spatial positioning in relation to the SCDB, DOLA has amended these boundaries to reflect all gazetted boundary changes that have occurred between January 1986 and June 1994 which were not picked up during initial capture or have occurred since. Some of these have included substantial exchanges of territory between adjacent shires. The Shire of Ngaanyatjarraku, formerly part of the Shire of Wiluna, is now defined in this updated data set. GA recognises that further work could be undertaken to yield a more up to date and error free data set.

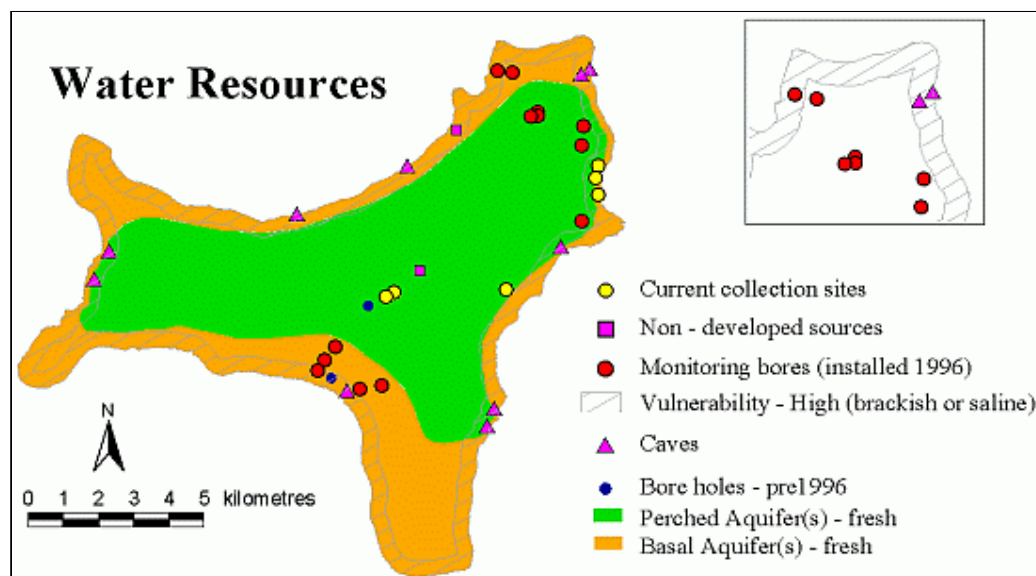
Contact Information

Contact Organisation	Geoscience Australia

Contact Position	Product Officer, Land Enquiry Centre
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	09-07-2001

Additional Metadata

Projection	CIG85
Printed	October 2002


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Water Resources
Custodian	Ecowise
Jurisdiction	Australia

Description

Abstract

These data is related to all facets of water on Christmas Island. This document seeks to provide a description of the Water Resources GIS data layers that have been compiled by ECOWISE Environmental as part of the Christmas Island Groundwater investigations and monitoring report (EHYD 99/17). This report was prepared for GHD Pty Ltd and Christmas Island Administration by Tony Falkland, ACTEW Corporation Ltd 1999. The GIS data and mapping developed for this report was complied by Vince Hazell and Steve Grey from ECOWISE Environmental Pty Ltd. The following data layers have been collated on a CD in ArcView shapefile format:

- Locations of freshwater Aquifers showing boundaries as best current information will allow.
- Assessment of freshwater Aquifer vulnerability.
- The location of monitoring bores, current water collection locations, caves, non-developed (possible) water collection sites and section data.

Additional data and information on the CD includes:

- Graphical data (. jpeg files) showing section profiles.
- Image files of maps included in the original report.

As required, outputs of this project include:

- Water resources layers with spatial data and attribute data on a CD (entitled Christmas Water Resources CD). This CD will be made available to the Australian Geological Survey Organisation for incorporation into the overall Christmas Island GIS and for subsequent distribution to the Christmas Island Administration, the Department of Transport and Regional Services and other authorised users. Separate copies of the CD can be made available, on request, to the Christmas Island Administration and the Department of Transport and Regional Services.

	This report summarising the data layers on the accompanying CD.
Search Word(s)	CLIMATE AND WEATHER Resources GEOSCIENCES Hydrogeology WATER WATER Groundwater WATER Hydrology WATER Lakes WATER Rivers WATER Quality
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	Not Known
Ending Date	1999

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - ESRI Shapefiles: Point, Line, Polygon
Available Format Type	DIGITAL - ESRI Shapefiles: Point, Line, Polygon
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	Metadata element still in progress
Positional Accuracy	Metadata element still in progress.
Attribute Accuracy	Metadata element still in progress.
Logical Consistency	Metadata element still in progress
Completeness	Metadata element still in progress.

Contact Information

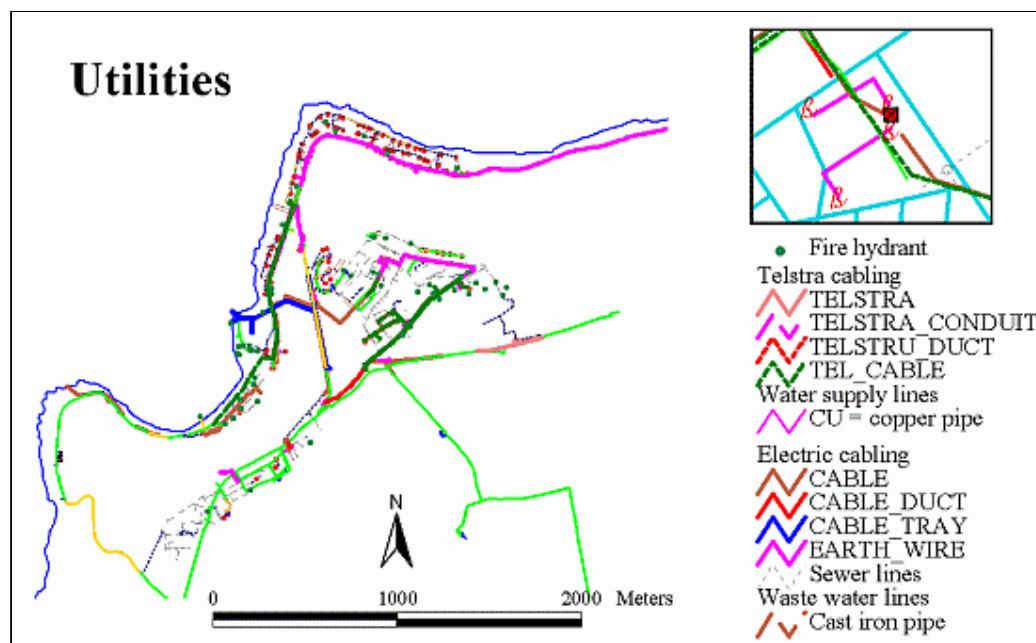
Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609

Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	09-07-2001

Additional Metadata

Projection	CIG85
Printed	October 2002

the Christmas Island 2002 GIS online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Utilities
Custodian	GHD (Gutteridge Haskins & Davey Pty Ltd)
Jurisdiction	Australia

Description

Abstract	These data as supplied by GHD contain the utilities of North-east Christmas Island. Data were collected and compiled by GHD from various CAD layers. The majority of these files are quite recent (1999 - 2000) however some CAD drawings date back to 1994 - 1995. There exists no documentation describing processes or methods used to compile data into its current form (as supplied to AGSO). Utility data that were supplied by GHD can be split into the following categories; electricity, stormwater, Telstra telecommunications, Wastewater, Water sources, Water supply.
Search Word(s)	HUMAN ENVIRONMENT HUMAN ENVIRONMENT Planning HUMAN ENVIRONMENT Structures and Facilities HUMAN ENVIRONMENT Urban Design UTILITIES WASTE Water WATER Waste
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	1994-04-20
Ending Date	2000-10-06

Dataset Status

Progress	Complete
-----------------	----------

Maintenance and Update Frequency	As Required
---	-------------

Access

Stored Data Format	DIGITAL - ESRI Shapefiles: Point, Line, Polygon DIGITAL - CAD generated files (DWG,DXF,DGN): Point, Line, Polygon
Available Format Type	DIGITAL - ESRI Shapefiles: Point, Line, Polygon
Access Constraint	Restricted, see contact details below.

Data Quality

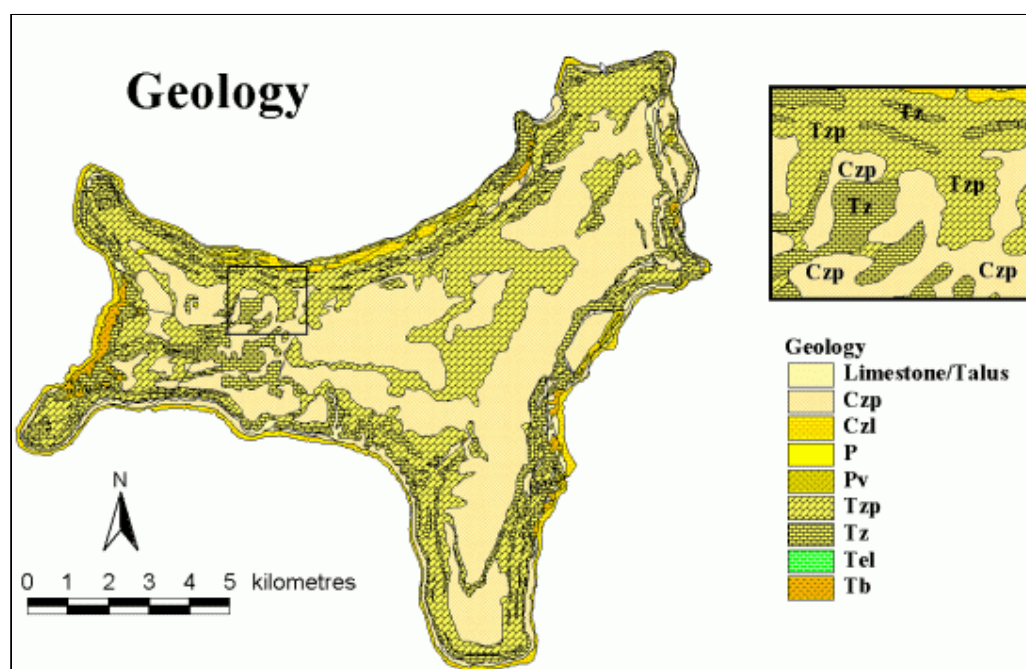
Lineage	Utility data were supplied to AGSO via a GHD Utilities CD-ROM on 25 May 2001. Data were sourced by GHD and supplied to GHD as CAD data types. Edits and adjustments of data had been undertaken by GHD to produce the useable shapefiles found on their CD-ROM, details of these have not been documented however some metadata does exist in MS Access 2000 database format. AGSO has converted this Access 2000 database into a Access '97 database to allow greater useage.
Positional Accuracy	Though use of the GHD data accuracy has been noted to be very good. Spatially the data coincides very closely with the orthophotography and the GA datasets.
Attribute Accuracy	Not documented from source, however through general use of the data the quality of attributes appears reliable and make logical sense.
Logical Consistency	The data is concerned with the north east portion of Christmas Island and is mostly complete for that area. GA recognises that further work could be undertaken to yield a more up to date and error free data set.
Completeness	The data is concerned with the north east portion of Christmas Island and is mostly complete for that area. GA recognises that further work could be undertaken to yield a more up to date and error free data set.

Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	07-09-2001

Additional Metadata

Projection	CIG85
Printed	October 2002

[Data Directory](#)[Data Dictionary Home](#)[Metadata Home](#)

Dataset

Title	Geology map
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	This dataset has been digitised from the 1:27400 1966 Geology map of Christmas Island. Geoscience Australia used ArcInfo to digitise a scanned version of the map. Once digitised the map was attributed according to the Geoscience Australia data dictionary guidelines. All information relating to geological boundaries and lineations/faults were extracted from the map and incorporated in the table.
Search Word(s)	GEOLOGY Boundaries GEOLOGICAL Features VEGETATION Boundaries
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	2001-10-26
Ending Date	2001-11-14

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data	DIGITAL - ESRI Arc coverage
--------------------	-----------------------------

Format	
Available Format Type	DIGITAL - ESRI Shapefile DIGITAL - ESRI Arc coverage
Access Constraint	Restricted, see contact details below.

Data Quality

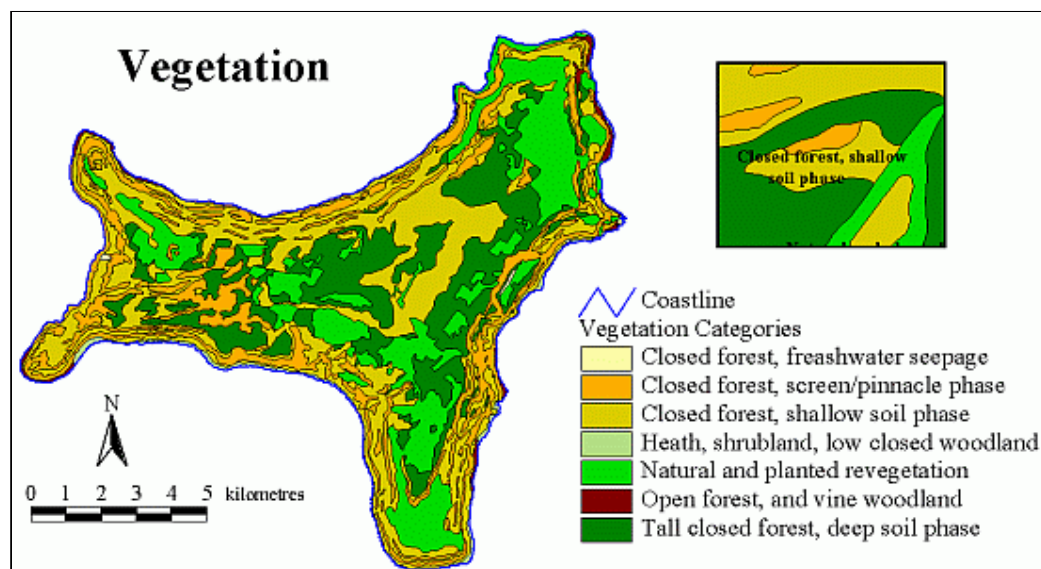
Lineage	The map was originally created by J.Barrie in 1966 and later scanned and translated to the CIGIS projection. The map was digitised by Geoscience Australia in late October 2001.
Positional Accuracy	The positional accuracy of the scanned map is greater than the original it was digitised from. The "headsup" digitising process ensures that the original lines being digitised are many times larger than that of the printed map.
Attribute Accuracy	The attributes capture all information that is provided on the original map. By going through the Geoscience Australia QA & QC process ensures the fields are full and contain fields that further describe the map that were not on the hardcopy map itself.
Logical Consistency	The geology coverage is complete both spatially and non-spatially. The tables are well populated and describe all attributes and labels of the map. Spatially, all the geological linework present on the hardcopy map has been captured.
Completeness	This coverage is complete based on the nature of the original data. All spatial linework and non-spatial attribute data has been extracted from the original hardcopy map. All fields are populated to meet with Geoscience Australia's data standards.

Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	2001-11-19

Additional Metadata

Projection	CIG85
Printed	October 2002

[Data Directory](#)[Data Dictionary Home](#)[Metadata Home](#)

Dataset

Title	Vegetation
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	This dataset has been digitised from the 1:25000 vegetation map of Christmas Island (accompanying Mitchell's 1985 report). The vector version was completed on behalf of Parks Australia Christmas Island. Geoscience Australia used ArcInfo to 'heads-up' digitise a scanned version of the map. Once digitised the arcs were built into polygons and the map was attributed based on the Geoscience Australia data dictionary guidelines. All information relating to vegetation boundaries was extracted from the map and incorporated in the table. The fields that were used follow: <table><thead><tr><th>Alias</th><th>Type</th><th>Width</th><th>Decimal</th><th></th></tr></thead><tbody><tr><td>Shape</td><td>FIELD_SHAPEPOLY</td><td>80</td><td></td><td></td></tr><tr><td>Ufi</td><td>FIELD_DECIMAL</td><td>6</td><td>0</td><td>- unique number</td></tr><tr><td>Area</td><td>FIELD_DECIMAL</td><td>18</td><td>5</td><td></td></tr><tr><td>Perimeter</td><td>FIELD_DECIMAL</td><td>18</td><td>5</td><td></td></tr><tr><td>Code</td><td>FIELD_CHAR</td><td>80</td><td>0</td><td>- Vegetation unit (map symbol)</td></tr><tr><td>Descript</td><td>FIELD_CHAR</td><td>64</td><td>0</td><td>- Description of unit</td></tr><tr><td>Categories</td><td>FIELD_CHAR</td><td>50</td><td>0</td><td>- vegetation categories</td></tr><tr><td>Feature</td><td>FIELD_CHAR</td><td>12</td><td>0</td><td>- (GA field)</td></tr><tr><td>Plotrank</td><td>FIELD_DECIMAL</td><td>1</td><td>0</td><td>- (GA field)</td></tr></tbody></table>	Alias	Type	Width	Decimal		Shape	FIELD_SHAPEPOLY	80			Ufi	FIELD_DECIMAL	6	0	- unique number	Area	FIELD_DECIMAL	18	5		Perimeter	FIELD_DECIMAL	18	5		Code	FIELD_CHAR	80	0	- Vegetation unit (map symbol)	Descript	FIELD_CHAR	64	0	- Description of unit	Categories	FIELD_CHAR	50	0	- vegetation categories	Feature	FIELD_CHAR	12	0	- (GA field)	Plotrank	FIELD_DECIMAL	1	0	- (GA field)
Alias	Type	Width	Decimal																																																
Shape	FIELD_SHAPEPOLY	80																																																	
Ufi	FIELD_DECIMAL	6	0	- unique number																																															
Area	FIELD_DECIMAL	18	5																																																
Perimeter	FIELD_DECIMAL	18	5																																																
Code	FIELD_CHAR	80	0	- Vegetation unit (map symbol)																																															
Descript	FIELD_CHAR	64	0	- Description of unit																																															
Categories	FIELD_CHAR	50	0	- vegetation categories																																															
Feature	FIELD_CHAR	12	0	- (GA field)																																															
Plotrank	FIELD_DECIMAL	1	0	- (GA field)																																															
Search Word (s)	BOUNDARIES Administrative BOUNDARIES National Parks FORESTS Natural VEGETATION Boundaries																																																		
Geographic Extent Name (s)	Christmas Island																																																		

Data Currency

Beginning	
------------------	--

Date	2001-10-10
Ending Date	2002-02-20

Dataset Status

Progress	Complete
Maintenance and Update Frequency	Not planned

Access

Stored Data Format	DIGITAL - ESRI Arc coverage
Available Format Type	DIGITAL - ESRI Shapefiles DIGITAL - ESRI Arc coverage
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	The map originally accompanied Mitchell's 1985 report, and was based on the geology and topography map of Christmas Island by J. Barrie in 1966. This map was scanned and translated to the CIG85 projection. The scanned map was included in the Christmas Island GIS. It was digitised by Geoscience Australia in mid October 2001 on behalf of Parks Australia North Christmas Island. Newveg.shp is the revised version of Vegetation.shp. Dr. Pete Green a Research Fellow from EA created this .shp file by taking the original vegetation file, making all the vegetation types semi-transparent, and superimposing this theme over a composite aerial photograph of the island (Christmas.ers, generated from the 1987 aerial photos). Dr. Green then adjusted the position of the clearing boundaries (category SV) around all previously mined fields, expanded these polygons to include all major roads, and added and subtracted polygons as required. In all cases Dr. Green tried to pick the original boundary of the clearing - there has been substantial regrowth around the borders of some mined fields, but this regrowth can be distinguished from the adjacent forest by its more regular canopy. Dr. Green made a concerted effort to ONLY adjust the position of forest/clearing boundaries, and NOT forest/forest boundaries. The aerial photos are excellent for judging the position of the former, but we have no prior evidence for adjusting the latter - as far as Dr. Green knows, the positions of forest/forest boundaries have never been ground-truthed. Where boundaries were indistinct on Christmas.ers, Dr. Green occasionally made reference to two sets of black and white aerial photographs of the island taken in 1976 and 1981.
Positional Accuracy	The positional accuracy of the scanned map is greater than the Mitchell's 1985 map it was digitised from. The "heads up" digitising process ensures that the original lines being digitised are many times larger than that of the printed map. Mitchell's (1985) hand-drafted vegetation map for Christmas Island has several inaccuracies; 1. Major roads were not considered - forest is often drawn as continuous across roads. 2. The boundaries of clearings are inaccurate, sometimes up to one or two hundred meters. 3. Some small, isolated forest blocks have been omitted. In addition, the accuracy of the forest/clearing boundaries of the newveg.shp will depend on how closely Dr. Green zoomed in on Christmas.ers. Dr. Green adjusted most boundaries when working at a scale of 1:1000 to 1:1500, but occasionally had to work at greater scales than this.

	In some areas (e.g. Field 25, and the area around the sports ground) the 1987 aerial photos are of particularly poor quality (shadows, distortion etc) and it was sometimes difficult to distinguish boundaries.
Attribute Accuracy	The attributes capture all information that is provided on the original map.
Logical Consistency	The geology coverage is complete both spatially and non-spatially. The tables are well populated and describe all attributes and labels of the map. Spatially, all the vegetation linework present on the hardcopy map has been captured.
Completeness	This coverage is complete based on the nature of the original data. All spatial linework and non-spatial attribute data has been extracted off the original hardcopy map. All fields are populated to meet with Geoscience Australia's data standards.

Contact Information

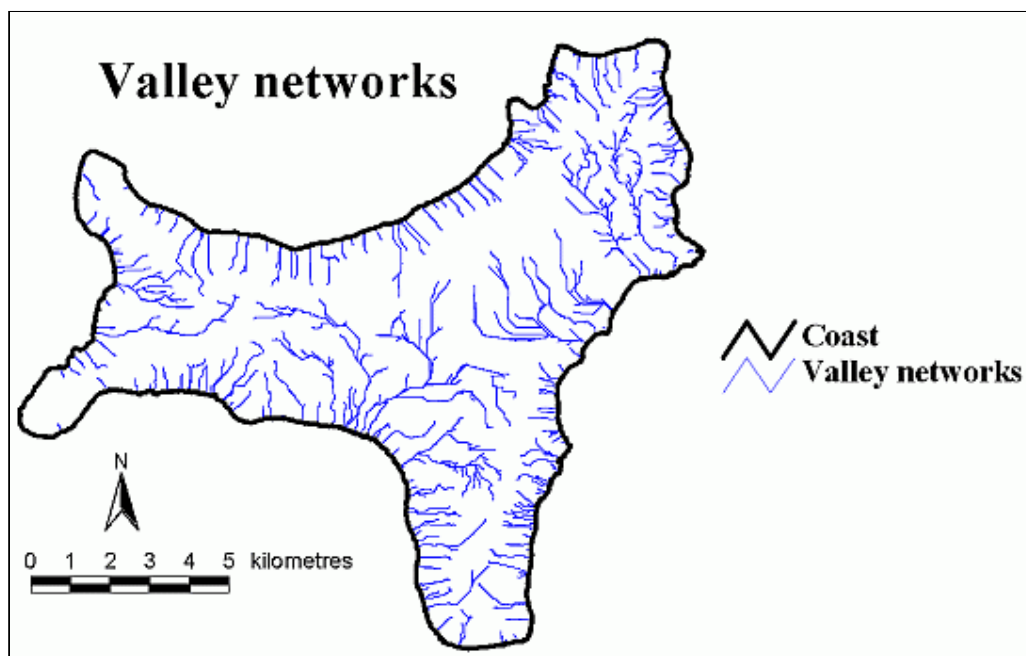
Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au

Additional Contact Information

Contact Organisation	Parks Australia North
Contact Position	Research Fellow - Peter Green
Mail Address	PO Box 867
Locality	Christmas Island
State	Indian Ocean
Country	Australia
Postcode	6798
Telephone	-
Facsimile	-
Electronic Mail Address	Peter.Green@ea.gov.au
Metadata Date	2001-11-19

Additional Metadata

Projection	CIG85
Printed	October 2002

[Data Directory](#)[Data Dictionary Home](#)[Metadata Home](#)

Dataset

Title	Valley Networks
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	The Valley Networks dataset covers the whole of Christmas Island. It contains low elevation lines that were constructed from the 25K Digital elevation map. The lines were obtained by running a series of ArcView grid commands using the Hydrologic Modeling v1.1 extention. The "valley_net.shp" contains the following fields: <table><tr><td>Field</td><td>Type</td><td>Precision</td><td>Decimal</td></tr><tr><td>-----</td><td>-----</td><td>-----</td><td>-----</td></tr><tr><td>Shape</td><td>FIELD_SHAPELINE</td><td>0</td><td>9</td></tr><tr><td>Id</td><td>FIELD_DECIMAL</td><td>0</td><td>11</td></tr><tr><td>Gridcode</td><td>FIELD_DECIMAL</td><td>0</td><td>10</td></tr><tr><td>Length</td><td>FIELD_DECIMAL</td><td>3</td><td>16</td></tr></table>	Field	Type	Precision	Decimal	-----	-----	-----	-----	Shape	FIELD_SHAPELINE	0	9	Id	FIELD_DECIMAL	0	11	Gridcode	FIELD_DECIMAL	0	10	Length	FIELD_DECIMAL	3	16
Field	Type	Precision	Decimal																						
-----	-----	-----	-----																						
Shape	FIELD_SHAPELINE	0	9																						
Id	FIELD_DECIMAL	0	11																						
Gridcode	FIELD_DECIMAL	0	10																						
Length	FIELD_DECIMAL	3	16																						
Search Word(s)	BOUNDARIES Hydrology BOUNDARIES Valleys FORESTS Water VEGETATION Streams																								
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068																								

Data Currency

Beginning Date	2002-08-20
Ending Date	2002-08-21

Dataset Status

Progress	Complete
Maintenance	

and Update Frequency	As Required
-----------------------------	-------------

Access

Stored Data Format	DIGITAL - ESRI Arc coverage DIGITAL - ESRI Shapefiles
Available Format Type	DIGITAL - ESRI Arc coverage DIGITAL - ESRI Shapefiles
Access Constraint	Restricted, see contact details below.

Data Quality

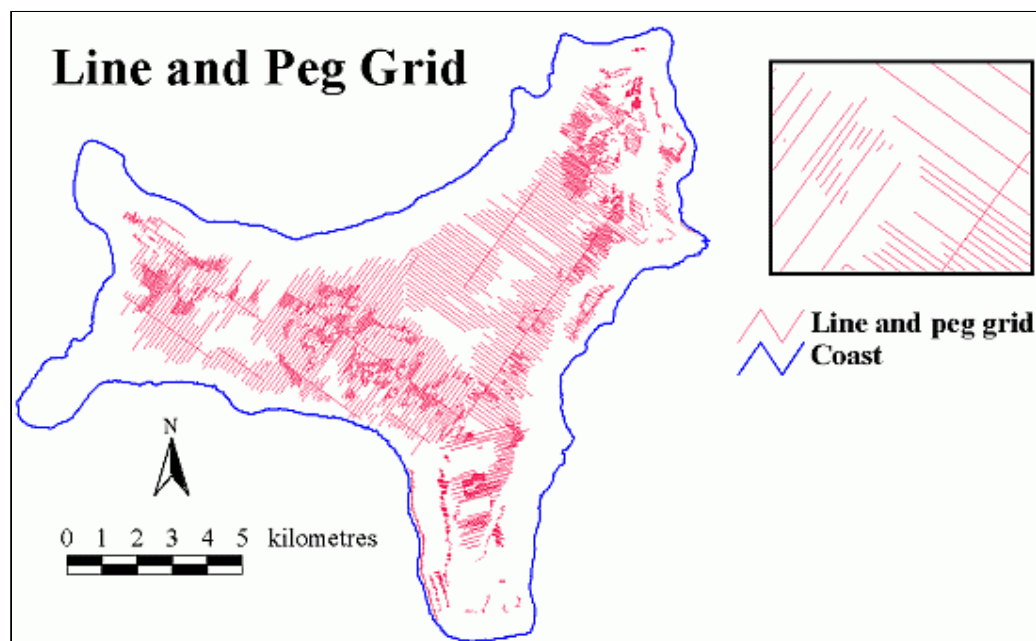
Lineage	The 1987 DEM was used with the hydrologic modelling v1.1 (stored on CD1) extention was used to derive the 'valleys_net' shape file. The following ArcView spatial operations were performed upon the ascii grid to create that shapefile: • The Spatial Analyses/Map Calculator was used to assign null values to attributes in the DEM that had the values of 0. The following command was used upon that grid: ([Dem25k].isnull).con(0.asgrid, [Dem25k]) to give an output grid suitable for the hydrological grid functions • Sinks [command] were filled using the grid derived from the DEM • Flow direction [command] was calculated by using the grid created by filling the sinks • Flow accumulation [command] was calculated from the flow direction grid • Watersheds were created by: ◦ Selecting 'Flow accumulation' and then selecting 'Flow accumulation' from the menu. ◦ The minimum number of cells for the watershed = 9000 • Flow accumulation was used to calculate stream networks grid • The Stream networks grid was then converted to a shapefile in ArcView • For simplicity, the stream networks were then edited to show only 5th order streams and above.
Positional Accuracy	The accuracy of the low point valley networks are directly related to the accuracy of the DEM.
Attribute Accuracy	The accuracy of the low point valley networks is restricted by: • The accuracy of the DEM • Christmas Island exhibites a permiable rock base. Therefore, water very rarely flows over the island's surface. The majority of the hydrological network is subsurface.
Logical Consistency	The valleys shapefile is complete. The tables are well populated and deccribe the attributes.
Completeness	This dataset covers the whole of Christmas Island. GA recognises that further work could be undertaken to yield a more accurate and up to date data set by using a more comprehensive DEM.

Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479

Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	2002-08-20
Additional Metadata	
Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Line and Peg Grid
Custodian	Parks Australia North Christmas Island (PANCI)

Description

Abstract	This line and peg grid was used by ANCA in its Abbott's Booby Bird surveys. The source of this data was an AutoCad map (abbsite.dwg) on ANCA's Christmas Island PC. The grid probably, in reality, runs along the bulldozed lines of an earlier mining grid (visible on the orthophotographs), but does not plot there when overlaid on the orthophotography. Transformation was based on Autocad® Release 7 maps, also existent on the PC.
Search Word (s)	GRID Line GRID Point
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	Not Known
Ending Date	11 NOV 1992 or Current

Dataset Status

Progress	Not Known
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - ArcView3.1 Line data shapefile. DIGITAL - Autocad® Release 7 DWG files.
Available Format Type	DIGITAL - ArcView3.1 Line data shapefile.

Access Constraint	Restricted, see contact details below.
------------------------------	--

Data Quality

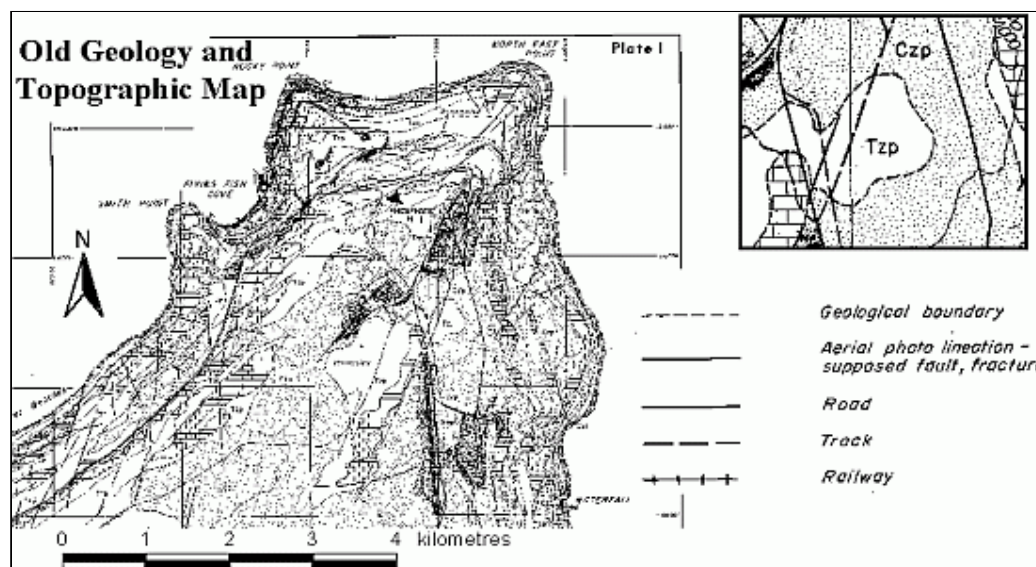
Lineage	The original data was retrieved from a hard drive on the ANCA PC in the Abbott's Booby Bird Office on Christmas Island. All raw data was in a local line and peg grid based on one of the island's mine grids, and was not referenced to a known projection. However, the disk did contain a number of maps created in Autocad® Release 7. Some of these had been rotated into a Universal Transverse Mercator (UTM, Zone 48) map projection (though in different units). Using these it was possible to derive a shift to Christmas Island Grid 1985 (CIG85). In addition to the Autocad® maps, a dBase® file (history.dbf) was retrieved from the PC. Spatial reference in this database was the line and peg coordinates which was projected to a Christmas Island Grid using the shift derived using the Autocad® maps. In 2002 GA was given an updated version of the line and peg grids from Parks Australia North Christmas Island. The new shapefile depicted approximately 2000 additional line and peg grids. The new line and peg grid shapefile was not spatially aligned to the original line and peg grid. Therefore, a shape warp was performed upon the new file in order to geographically align it with the old line and peg shapefile. The following steps were used to shapewarp the new line and peg grid shapefile to spatially conform with the old shapefile: 1. Copy ShapeWarp.avx into EXT32 directory 2. Start Arcview 3. Load the ShapeWarp extension [File/extensions] 4. Click on the ShapeWarp button (will only operate with Views and Layouts closed) 5. Load the 'FROM' file - "drill_lines.shp" (the file you want to warp) 6. Load the 'TO' file - "linepeg_grid.shp" (the file you want to warp to) 7. Choose the snapping [intersections] 8. Choose the tolerance [approx 10m on the ground] 9. Select Ground Control Points (GCP). The best results (RMS = 0.325 at the 3rd order polynomial) were met when 18 GCP's were chosen. 10. View the GCP's RMS - copy was captured "line_peg_warp_aug02" 11. Delete GCP's with high RMS values to improve total RMS value 12. Press 'GO' to begin ShapeWarp 13. Assign output shapefile name "line_peg_warp_aug02.shp"
Positional Accuracy	The error in the data appears to be in the vicinity of 100 metres. As clearing boundaries and coast (though highly simplified) of the same map plot in far better position (after transformation) in relation to the orthophotographs and other GIS themes, the majority of inaccuracy in this theme is probably inherited from the original map (abbsite.dwg). That is, it appears that the clearings and coast of abbsite.dwg are reasonably accurate though very imprecise (intended to be viewed at much greater scale), while the line and peg grid appears less accurate. Thus the grid on the GIS is mainly illustrative at this time. It is also notable that, since Abbott's Booby Bird sites from the more recent history.dbf plot beyond this grid, the grid has probably been extended. It may well be that a more accurate version exists.
Attribute Accuracy	Not documented.
Logical Consistency	This dataset outlines the Line and peg grid on Christmas Island. Some fields are directly related to the grid and are unique to it. A description of these fields and their purpose can be obtained by contacting ANCA.
Completeness	This dataset is a grid system of Christmas Island that is most likely based on an earlier mining grid. The grid covers the middle portion of the island and extends a little to the west. The grid (as seen above) appears to be incomplete and it is also notable that, since Abbott's Booby Bird sites from the more recent history.dbf plot beyond this grid, the grid has probably been extended. GA could undertake a correction to this data if common points with the orthophotography can be identified by ANCA.

Contact Information

Contact Organisation	Parks Australia North
Contact Position	-
Mail Address	PO Box 837
Locality	Christmas Island
State	-
Country	Australia
Postcode	2609
Telephone	(08) 9164 8055
Facsimile	(08) 9164 8755
Electronic Mail Address	David.Slip@ea.gov.au
Metadata Date	03-09-2002

Additional Metadata

Projection	CIG85
Printed	October 2002

[Data Directory](#)[Data Dictionary Home](#)[Metadata Home](#)

Dataset

Title	Old Geology and Vegetation Maps
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	The ANCA directory contains two scanned images, "geology.tif" and "veg.tif". The geology map contains the following information: Base map compiled from topographic base sheets prepared by Australian Aerial Mapping Pty. Ltd. and supplied by The British Phosphate Commissioners. Geology and compilation by J. Barrie 1965-66 Drawn by J. Kopros Bureau of Mineral Resources, Geology and Geophysics CHRISTMAS ISLAND SURVEY 1965-66. To accompany Record 1967/37. The vegetation map contains the following message: Vegetation map - Accompanies Mitchell's 1985 Report. ONLY COPY!! See File 80/13 for Report. It is based on J Barrie's geology map.
Search Word(s)	GEOSCIENCES Map GEOSCIENCES Geology VEGETATION Map VEGETATION Location
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	Not known
Ending Date	11NOV1966

Dataset Status

Progress	Complete
Maintenance and Update Frequency	Not Planned

Access

--	--

Stored Data Format	NONDIGITAL - Paper map
Available Format Type	DIGITAL - Raster TIF format from scanning of the paper map NONDIGITAL - Paper map obtained from ANCA
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	These two maps were obtained as dyelines from ANCA, scanned then registered and rectified for inclusion with the GIS. Registration of the geology map was accomplished using a formula derived empirically on the island, extended for conversion from Imperial Island Grid (lines visible on scan) to CIG85. As the vegetation map did not contain visible grid lines, the formula could not be used, so registration was dependant on scarce and imprecise common points between the vegetation map and the AUSLIG 1:25000 data in the GIS.
Positional Accuracy	Errors in the location of these scanned maps result from: 1. Error due to original intended accuracy and scale (1:25000). This could result in errors of up to 25 metres. 2. Error introduced in the scanning process (probably minimal) 3. Error introduced in registration. This will be significant in the vegetation map, but is probably minimal in the geology map. No statistical analysis performed but we intuitively estimate that 95% of the features are within 1 metre of their true location. This data was originally produced as 1:1000 Map Series CAD data and allowing for errors due to digitising and translation we deduce an error of 1m.
Attribute Accuracy	Not Relevant.
Logical Consistency	Not Relevant
Completeness	As these maps were originally produced as paper maps it lacks the rigour expected of a high quality digital maps. They were complete at time of printing and AGSO found that no changes or ammendments had taken place.

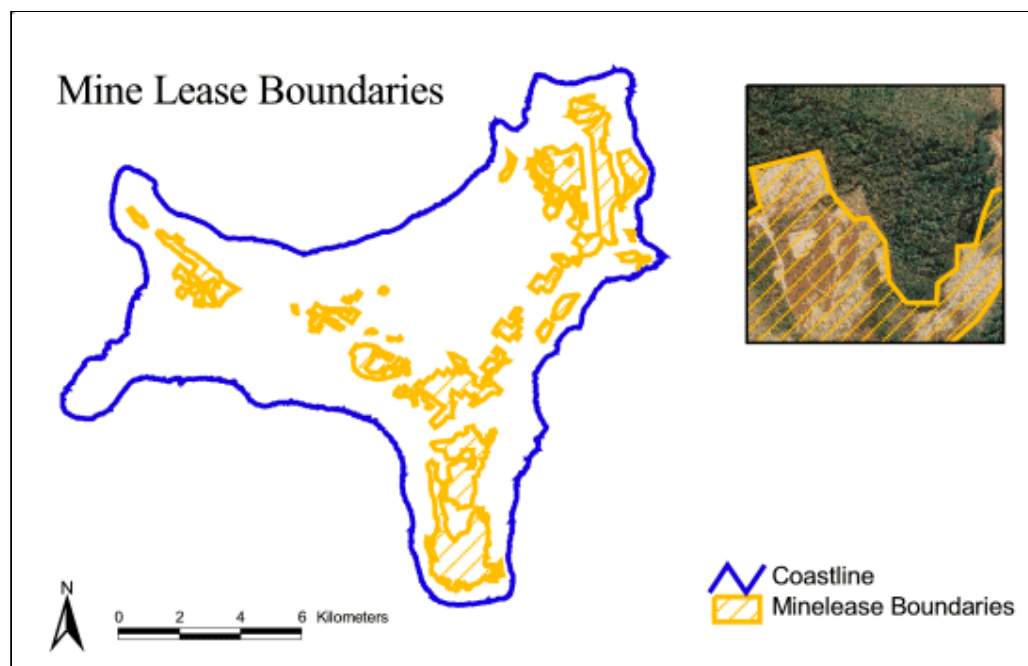
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	27-08-2002

Additional Metadata

Projection	CIG85
Printed	October 2002

the Christmas Island 2002 GIS online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Mine Lease Boundaries
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	Mining lease boudaries were supplied to AGSO as many small polygons. AGSO merged all these polygons to form one theme of mine lease boundaries. This data shows areas where mining of phosphate has been approved. The mine lease theme is "mineleases.shp" and contains the following fields: <table><tr><td>Field</td><td>Type</td><td>Width</td><td>Decimal</td></tr><tr><td colspan="4">-----</td></tr><tr><td>Shape</td><td>FIELD_SHAPEPOLY</td><td>8</td><td>0</td></tr><tr><td>Id_lease</td><td>FIELD_CHAR</td><td>8</td><td>0</td></tr><tr><td>Leasnum</td><td>FIELD_DECIMAL</td><td>5</td><td>1</td></tr><tr><td>Leasrdcd</td><td>FIELD_DECIMAL</td><td>2</td><td>0</td></tr><tr><td>Area</td><td>FIELD_DECIMAL</td><td>8</td><td>1</td></tr><tr><td>Perimeter</td><td>FIELD_DECIMAL</td><td>7</td><td>2</td></tr><tr><td>Hectares</td><td>FIELD_DECIMAL</td><td>16</td><td>3</td></tr></table>	Field	Type	Width	Decimal	-----				Shape	FIELD_SHAPEPOLY	8	0	Id_lease	FIELD_CHAR	8	0	Leasnum	FIELD_DECIMAL	5	1	Leasrdcd	FIELD_DECIMAL	2	0	Area	FIELD_DECIMAL	8	1	Perimeter	FIELD_DECIMAL	7	2	Hectares	FIELD_DECIMAL	16	3
Field	Type	Width	Decimal																																		

Shape	FIELD_SHAPEPOLY	8	0																																		
Id_lease	FIELD_CHAR	8	0																																		
Leasnum	FIELD_DECIMAL	5	1																																		
Leasrdcd	FIELD_DECIMAL	2	0																																		
Area	FIELD_DECIMAL	8	1																																		
Perimeter	FIELD_DECIMAL	7	2																																		
Hectares	FIELD_DECIMAL	16	3																																		
Search Word (s)	BOUNDARIES Administrative BOUNDARIES Cultural BOUNDARIES Mining HUMAN ENVIRONMENT Resources INDUSTRY Mining																																				
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068																																				
Data Currency																																					
Beginning Date	1991																																				

Ending Date	1998-12
--------------------	---------

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - ESRI Shapefiles: Point, Line, Polygon
Available Format Type	DIGITAL - ESRI Shapefiles: Point, Line, Polygon
Access Constraint	Restricted, see contact details below.

Data Quality

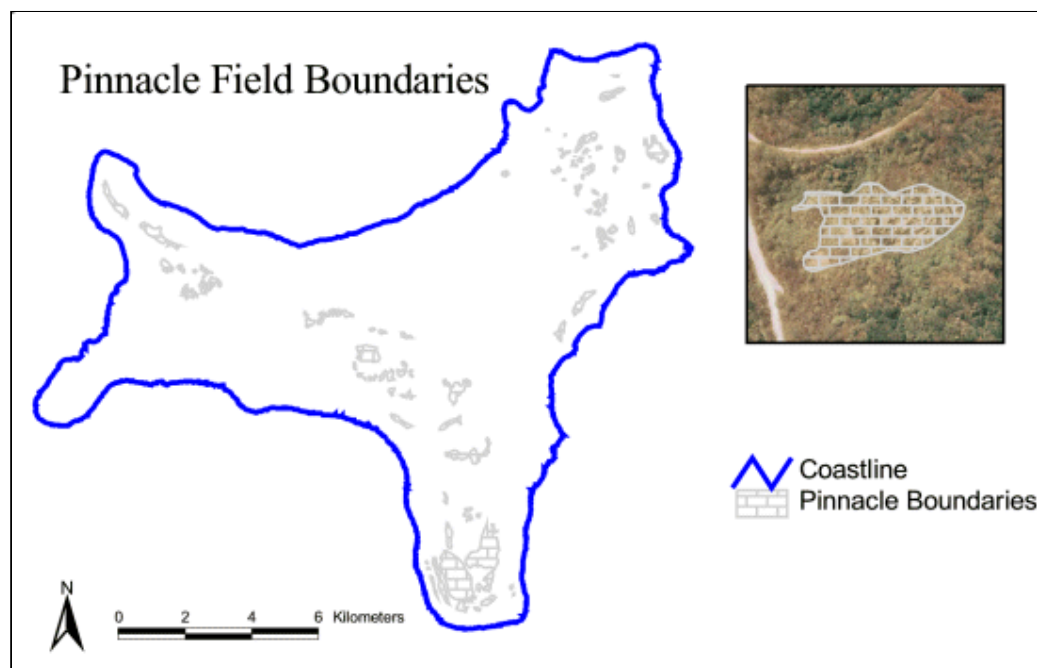
Lineage	In November 2002 the minelease boundaries were checked against the 2002 cadastral boundaries for discrepancies. Minelease ML133A was updated from the 2002 cadastre - changes relate to airport land and a communications tower in the north.
Positional Accuracy	Commissioning of the mine lease boundaries was originally undertaken by AUSLIG. The Department of Minerals and Energy W.A. (DOMEWA) is the designated authority for mine leases on Christmas Island on behalf of the Commonwealth. In 1998 the Commonwealth allowed an increase in the mine lease area up to the forest edge where the mine lease abuts Crown land, but not where it abuts National Park. The mine lease boundaries supplied in the 1996 CIGIS were captured by AUSLIG W.A. from field visits in conjunction with the use of the 1987 aerial photography. These boundaries were set back from the forest edge. Subsequent changes to the mine lease data were supplied to AGSO in 1998 by the surveyor to PRL at the time (Russell Payne). This data came to AGSO as a series of ESRI shapefiles, each containing a mine lease polygon. These boundaries were produced by digitising off the orthophotography in conjunction with site visits. AGSO merged all individual polygons that were supplied into the one ESRI shapefile, so as to allow easier access to the data.
Attribute Accuracy	This metadata element is in progress.
Logical Consistency	This metadata element is in progress.
Completeness	This metadata element is in progress.

Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479

Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	2001-07-09
Additional Metadata	
Projection	CIG85
Printed	October 2002

the Christmas Island 2002 GIS online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Pinnacle Field Boundaries
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract

The pinnacle field boundaries dataset covers the whole of Christmas Island. It contains polygons that have been digitised around areas or fields of pinnacles. The polygons were digitised in two goes. The first was a animated process initiated by AGSO using Erdas software, this resulted in high resolution polygons located over the north east portion of Christmas Island. This turned out to be a slow process so the task was then taken up by manual digitising off the screen using orthphotography as a back drop. This method was used in digitising the rest of the island. The lack resolution for these polygons can be seen by their blocky appearance, these are visible at scales of 1:10,000.

The pinnacle boundaries shapefile is "pinclbnd.shp" and contains the following fields:

Field	Type	Width	Decimal
Shape	FIELD_SHAPEPOLY	8	0
Area	FIELD_DECIMAL	12	3
Perimeter	FIELD_DECIMAL	12	3
Altpinn_cn	FIELD_DECIMAL	11	0
Altpinn_cn	FIELD_DECIMAL	11	0
Single_tre	FIELD_CHAR	16	0
Dxf_color	FIELD_DECIMAL	2	0
Dxf_thickn	FIELD_DECIMAL	12	3
Dxf_type	FIELD_CHAR	10	0
Dxf_elevat	FIELD_DECIMAL	12	3
Dxf_angle	FIELD_DECIMAL	12	3
Dxf_size	FIELD_DECIMAL	12	3
Dxf_text	FIELD_CHAR	80	0
Dxf_attrib	FIELD_CHAR	16	0
Dxf_iid	FIELD_DECIMAL	11	0
Hectares	FIELD_DECIMAL	16	3

Search Word(s)	BOUNDARIES Administrative BOUNDARIES Cultural BOUNDARIES Mining BOUNDARIES National Parks HAZARDS Manmade HUMAN ENVIRONMENT Structures and Facilities
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	metadata element in progress
Ending Date	metadata element in progress

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - ESRI Shapefiles: Polygon.
Available Format Type	DIGITAL - ESRI Shapefiles: Polygon.
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	The production of pinnacle boundaries was first initiated by AGSO in 1996. These boundaries were constructed around the pinnacle fields by use of an automated classification utility associated with the Erdas program. The process of classifying regions of pinnacles was very time consuming and so was taken over by the mines surveyors assistant (James Keogh). AGSO completed digitising the NE part of Christmas Island using Erdas software. The resolution obtained by this method allows polygon outlines to appear "smooth" to a scale of at least 1:500. The rest of the Island was completed by way of "headsup" digitising (on screen digitising) using the orthophotography as the background. James Keogh completed the task of digitising around the pinnacle fields. The typical scale that provides a "smooth" outline is no better than 1:10,000. As part of the Christmas Island airport extension project in November 2002, GA added eight previously undigitised pinnacle fields to the original shapefile. Six fields north and two to the south of the airport. Upon reviewing the field closest to the southern section of the runway with the 2000 Airborne Laser Scanning, it was expanded by 17,000m squared.
Positional Accuracy	The positional accuracy is of two standards. In the north-east of the island the areas were digitised using classification methods, so the positional accuracy is the same as in the orthophotography. For the rest of the island the accuracy of the outlines has been determined by the digitising methods. Here the method used was "headsup" digitising at a screen scale. By zooming in to a scale of 1:10,000 it is clear to see the blocky texture of the polygons. Once again it has been digitised from the orthophotography and spatially it is quite accurate.
Attribute Accuracy	This metadata element is in progress.

Logical Consistency	This metadata element is in progress
Completeness	This dataset covers the whole of Christmas Island and at the time of digitising was complete. GA recognises that further work could be undertaken to yield a more up to date and error free data set.

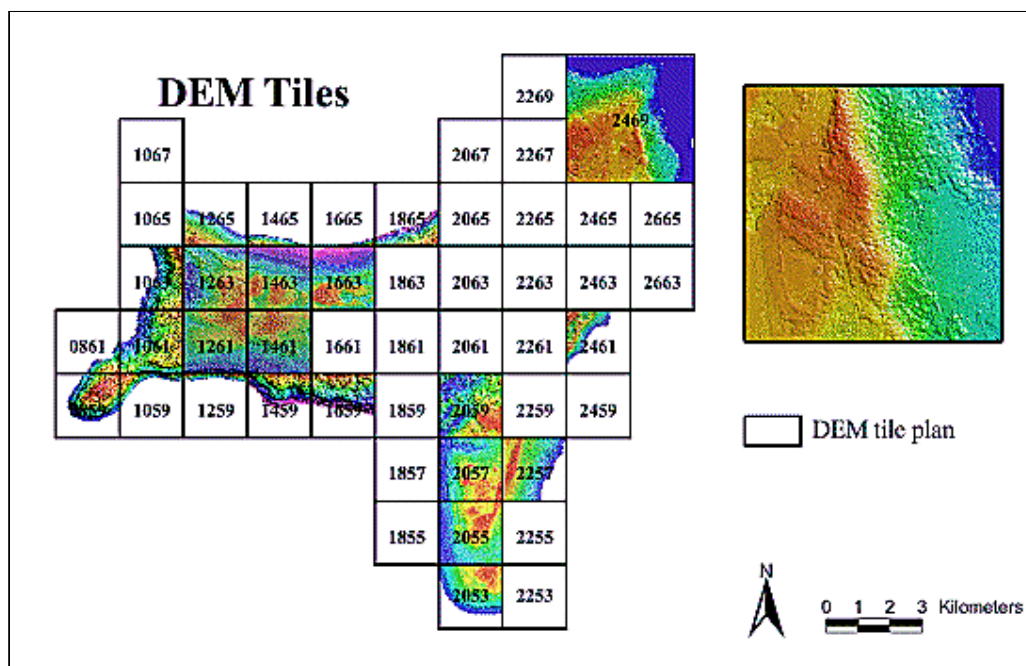
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	2001-07-09

Additional Metadata

Projection	CIG85
Printed	October 2002

the Christmas Island 2002 GIS online


[Metadata Home](#)


Dataset

Title	1987 DEM Tiles
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	Demtiles (a concatenation of "DEM tiles") contains some samples of a representation of the Digital Elevation Model as TIFF images.
Search Word(s)	DEM Digital Elevation Model IMAGES Tiff PHOTOGRAPHY AND IMAGERY Digital Elevation Model PHOTOGRAPHY AND IMAGERY Raster PHOTOGRAPHY AND IMAGERY Grid
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	31JUN1996
Ending Date	24APR1997

Dataset Status

Progress	Tiles have been made on an as needed basis that cover only certain parts of island (this can be seen above).
Maintenance and Update Frequency	As Required

Access

Stored Data	DIGITAL - TIFF/TFW
--------------------	--------------------

Format	
Available Format Type	DIGITAL - TIFF/TFW
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	The DEM has had a shiny colour drape algorithm applied in ERMapper® to produce an image that has then been reduced to 256 colours to minimise storage on disk. Tiles over disturbed areas have a one metre cell size, those over primary rainforest have a five metre cell size. There is one 4 kilometres by 4 kilometres tile number 2469 for the north eastern quarter of the Island, with the rest being 2 km x 2 km except for some partial tiles along the coast. The colour range for each individual tile has been optimised so as to give a maximum of information a consequence of this is that colours may not match at adjoining edges. Further TIFF images like these can be prepared on a cost recovered basis.
Positional Accuracy	The positional accuracy mimics the accuracy of the orthophoto tiles.
Attribute Accuracy	Not Applicable.
Logical Consistency	All items within this dataset are Digital Elevation Models that describe Christmas Islands topography with elevation being replaced by a colour scale from a colour lookup table.
Completeness	DEM tiles have been produced to cover parts of the island that are of active interest on an as needed basis. More 1987 DEM tiles can be generated by GA upon request on a cost recovery basis. [1997 DEM tiles]

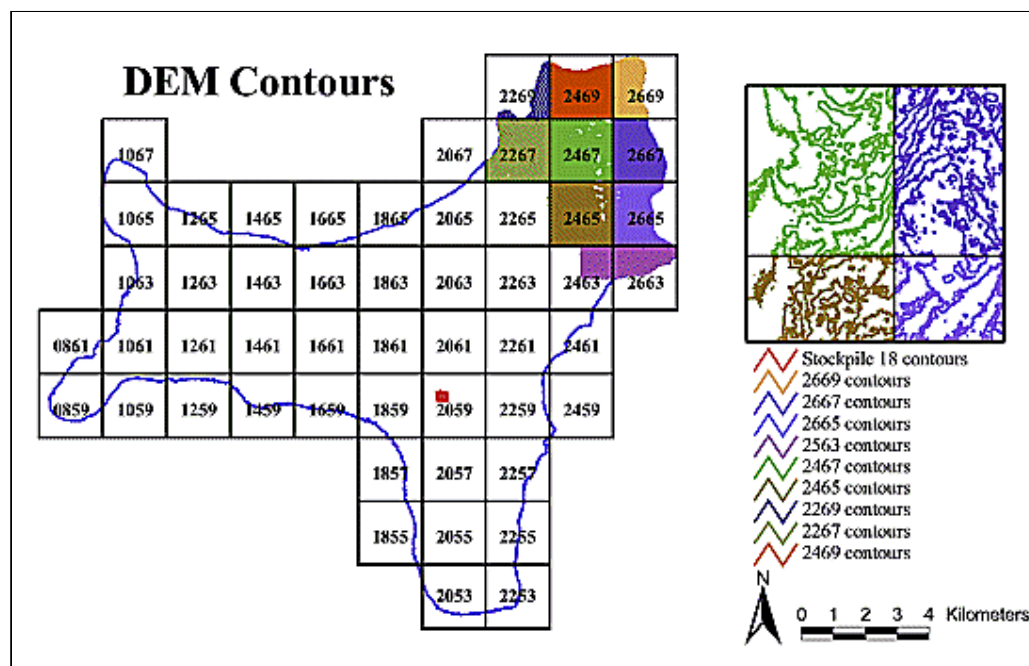
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	01-08-2002

Additional Metadata

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	DEM Contours
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	A useful spin off of the soft photogrammetry is the opportunity to get one metre contours over the disturbed areas of the Island. For the north-east area of the Island 2km X 2km DEM contour tiles have been trialed in the CIGIS. Most are at a contour interval of 5 metres but tiles 2269 and 2469 have been done at a one metre contour interval. The DEM contours are surface contours. They pick up the reflective surface beneath the aircraft. The reflective surface may be the ground or it may be a dense vegetation canopy or rooftops etc. Further one metre contour coverage can be prepared on a cost recovered basis.
Search Word(s)	DEM Contours DEM Digital Elevation Model PHOTOGRAPHY AND IMAGERY Digital Elevation Model
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	01JUL1983
Ending Date	11NOV1992

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - ArcView3.1 line shapefile
Available Format Type	DIGITAL - ArcView3.1 line shapefile
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	Contours were generated from the DEM in only a few parts of the island using.....
Positional Accuracy	The contours generated from the DEM replicate all the inaccuracies of the DEM. A very small rounding error is introduced into the spatial positioning of the contours.
Attribute Accuracy	Contour elevations will be a result of the DEM accuracy, where the DEM is accurate the contours will match. Total error would be in the tens of meters.
Logical Consistency	All items are associated with contours generated from the DEM.
Completeness	Only a small portion of the island has been generated only to display the capabilities and benefits of the DEM. GA could, if requested, generate contours for other parts of Christmas Island

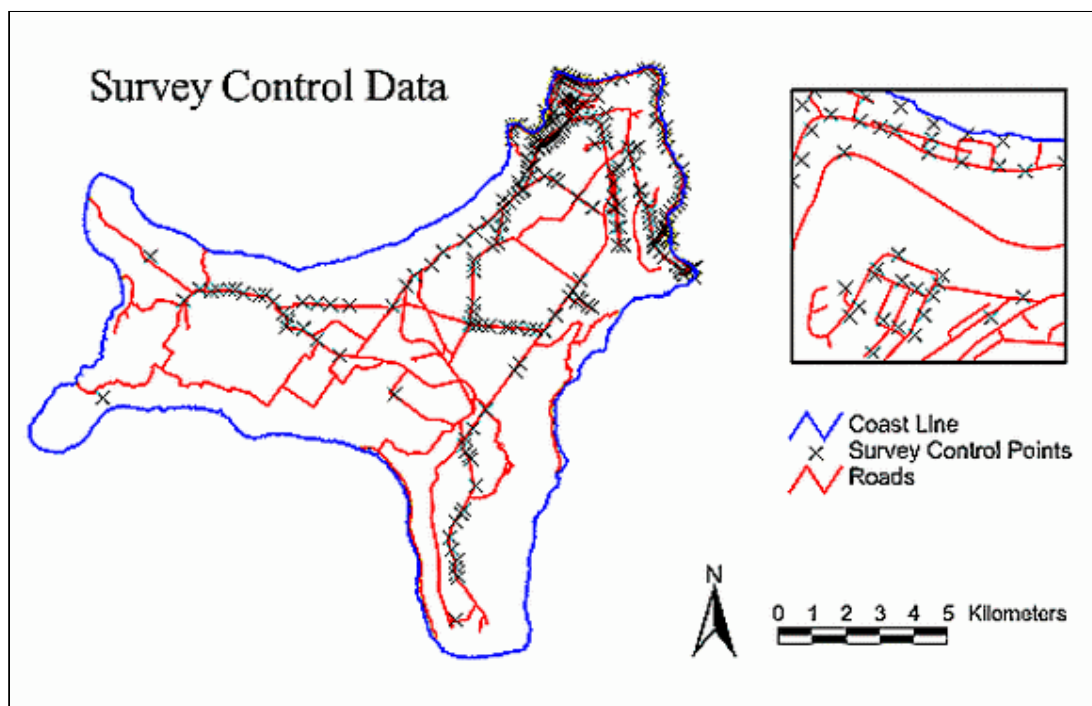
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	01-08-2001

Additional Metadata

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	DOLA survey control dataset
Custodian	Department of Land Administration (DOLA)
Jurisdiction	Western Australia

Description

Abstract	The DOLA survey control shapefile is based on GESMAR AGD84 data supplied by the Department of Land Administration (DOLA), Western Australia. It contains 260 surveyed points, with UTM, WGS84 (latitude and longitude), CIG92 and CIG85 coordinates. Many points also have attributed height data.
Search Word (s)	LAND Administration LAND Survey
Geographic Extent Name (s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	date
Ending Date	date

Dataset Status

Progress	Complete
Maintenance and Update Frequency	Not Planned

Access

--	--

Stored Data Format	DIGITAL - ArcView3.1 point data shapefile. 260 survey points
Available Format Type	DIGITAL - ArcView3.1 point data shapefile. 260 survey points
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	The format of the data has been extensively manipulated by MREB. MREB has added CIG85 coordinates from survey control data obtained from Auslig, Perth in paper published form which has been OCR scanned and matched by MREB. These CIG85 values were then used to display the points in ArcView as an event theme prior to conversion to a shapefile. Data was supplied from DOLA as CI.DAT. In CI.DAT three rows of data relate to each survey control point. The left most columns contain data relating to different map projections used (WGS84, CIG92, and UTM) each row pertaining to a particular map projection. The right most columns are not row-dependent and contain general control point data, height data (Christmas Island Height Datum (CIHD)) and error data. Each A4 page began with a header section. Supplied data was opened on Microsoft Excel and saved as doladata.xls and the following steps were taken to form a database favourable for use in the CIGIS. The steps to data expansion were as follows: • Copying of the station codes (using a macro) so that every row had an associated station code and database number • Sorting of the data by projection • Separation by projection type into three separate worksheets • Sorting of the rows of each projection worksheet by station code • Joining these worksheets into one final with each row having a unique station code and all its associated data. • Removal of duplicate columns. Columns were added to contain the eastings and northings of CIG85. These were filled from data obtained from AUSLIG, Perth as 'CHRISTMAS ISLAND CONTROL PLAN CON-2' (W.A. Regional Office Plan A2-38I) . MREB scanned this plan using Optical Character Recognition (OCR) as an MS Excel worksheet. After checking the data for scanning errors the survey control I.D.s were matched with those in the original DOLA data (CI.DAT sourced). The file was exported using File Save As in MS Excel. It was exported in CSV format (Comma delimited). This format preserved the correct data. Attempts were made to export the data in various DBF formats, as this is a more useful format to view, but all failed to preserve significant digits. The CSV version of the data was, for ease of use in ArcView, renamed doladata.txt (ArcView doesn't recognise the extension .csv). The table was added to an ArcView project and 'Add Event Theme' used to display the CIG85 coordinates of the data. The shapefile attribute table was joined by station-ID to the CIG92 data attribute table, resulting in a final shapefile containing all points with valid data for both CIG85 and CIG92. In addition to this, another shapefile ('92contrl.shp') contains all survey control points with CIG92 coordinates. This is in CIG92 projection and therefore not used in the GIS, but is stored in the 'DOLA' directory for future use / reference. Finally, the theme was then converted to a shapefile for consistency and speed of access. The name of the final CIG85 shapefile is '85contrl.shp'.
Positional Accuracy	The accuracy of each DOLA point is contained as attributes of the shapefile (method, order and accuracy in both horizontal and vertical).
Attribute Accuracy	Not documented.
Logical Consistency	The DOLA data is a point dataset that is concerned with the land survey of Christmas Island and contain latitude, longitude and some also contain elevation.

Completeness	Although complete when supplied the majority of points lie in the north east of the island with a smaller number of points scattered through the rest of the island.
---------------------	--

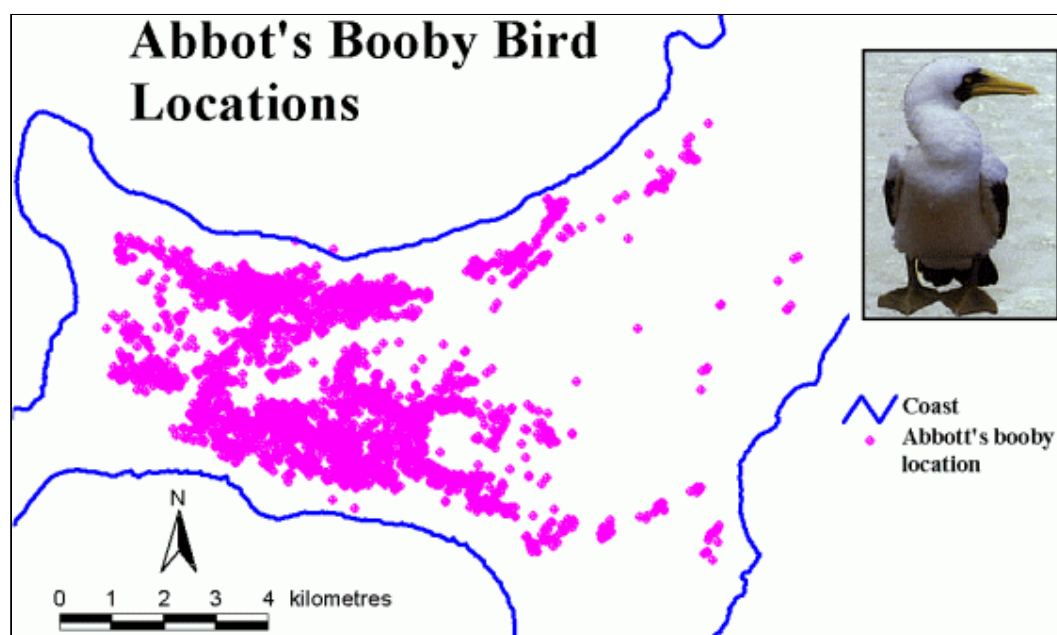
Contact Information

Contact Organisation	Department of Land Administration (DOLA)
Contact Position	-
Mail Address	Midland Square (PO Box: 2222)
Locality	Midland
State	Western Australia
Country	Australia
Postcode	6056
Telephone	(08) 9273 7209
Facsimile	(08) 9273 7656
Electronic Mail Address	sales@dola.wa.gov.au
Metadata Date	01-08-2000

Additional Metadata

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Abbot's Booby Bird Data
Custodian	Parks Australia North Christmas Island (PANCI)
Jurisdiction	Christmas Island (Australia)

Description

Abstract	Abbott's Booby Bird sites on Christmas Island are displayed as point data in the GIS. There are 6272 points. The source of this data was a dBase file from the ANCA PC on Christmas Island (file 'history.dbf' dated 11/11/1992). The shapefile's table contains all fields and data (essentially unmodified) of the original dBase file. The spatial coordinates of the original file were based on a line and peg grid, probably using the bulldozed lines of an old mining grid. Transformation was based on Autocad® Release 7 maps also existent on the PC.
Search Word (s)	FAUNA Native FAUNA Birds HERITAGE Natural HUMAN ENVIRONMENT Planning
Geographic Extent Name (s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	01JUL1983
Ending Date	11NOV1992

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - ArcView3.1 point data shapefile. 6272 records. DIGITAL - dBase file (history.dbf) based on the Line Peg Grid.
Available Format Type	DIGITAL - ArcView3.1 point data shapefile.
Access Constraint	Restricted, see contact details below.

Data Quality

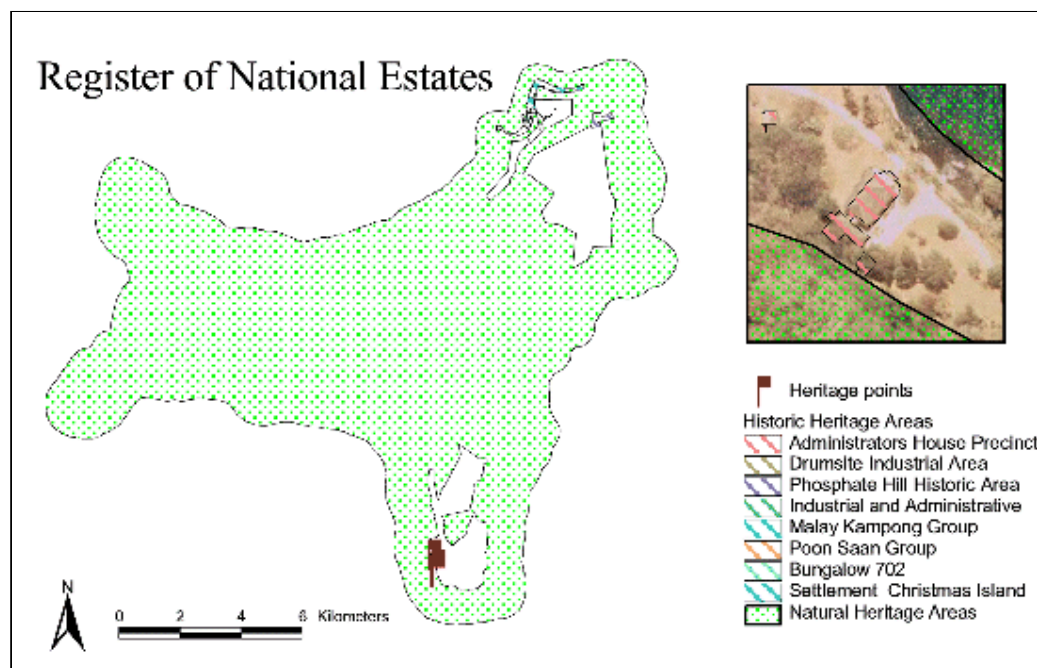
Lineage	The original data was retrieved from a hard drive on the ANCA PC in the Abbott's Booby Bird Office on Christmas Island. Almost all raw data was in a local line and peg grid based on one of the island's mine grids, and was not referenced to a known projection. However, the disk did contain a number of maps created in Autocad® Release 7. Some of these had been rotated into a Universal Transverse Mercator (UTM, Zone 48) map projection (though in different units). Using these it was possible to derive a shift to Christmas Island Grid 1985 (CIG85). In addition to the Autocad® maps, a dBase® file (history.dbf) was retrieved from the PC. This contains abundant data for each Abbott's Booby Bird site. Contact ANCA for an explanation of these attributes. Spatial reference in this database was line and peg coordinates (as described above) and, thus, could be projected to Christmas Island Grid using the shift derived using the Autocad® maps.
Positional Accuracy	Since these data points (projected to Christmas Island Grid 1985) plot similarly to those in the map abbsite.dwg, used in the transformation, it is likely the errors are similar. The lines in this map do not appear to be accurately surveyed. The error in the data appears to be in the vicinity of 100 metres. As clearing boundaries and coast (though highly simplified) of the same map plot in far better position (after transformation) in relation to the orthophotographs and other GIS themes, the majority of inaccuracy in this theme is probably inherited from the original map (abbsite.dwg). That is, it appears that the clearings and coast of abbsite.dwg are reasonably accurate though very imprecise (intended to be viewed at much greater scale), while the line and peg grid appears less accurate. Thus the grid on the GIS is mainly illustrative at this time. It is also notable that, since Abbott's Booby Bird sites from the more recent history.dbf plot beyond this grid, the grid has probably been extended. It may well be that a more accurate version exists. GA could undertake a correction to this data if common points with the orthophotography can be identified by ANCA.
Attribute Accuracy	Not documented.
Logical Consistency	All items in the dataset are points that describe the sighted locations of the Abbots' Booby bird breeding areas of Christmas Island. Many fields within the dataset are unique to the data collection process and exact uses and description of these fields can be obtained from ANCA.
Completeness	As this data was originally collected for a study of the breeding habits of the Abbot's Booby bird, most of the data has been collected starting in July 1983, there is no clear end date that describes the end of the study period (and the end of data collection). AGSO undertook considerable work to translate these database points into a form suitable form for GIS use. GA also recognises that there is still more work that can be done to yield an up to date and error free data set.

Contact Information

Contact Organisation	Parks Australia North
Contact Position	-
Mail Address	PO Box 837
Locality	Christmas Island
State	-

Country	Australia
Postcode	6798
Telephone	(08) 9164 8055
Facsimile	(08) 9164 8755
Electronic Mail Address	David.Slip@ea.gov.au
Metadata Date	28-08-2002
Additional Metadata	
Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Register of National Estate
Custodian	Environment Australia
Jurisdiction	Australia

Description

Abstract	Data were provided to AGSO by Environment Australia - Register of the National Estate and contain natural and historical heritage data (point and polygon) for Christmas Island. Heritage data are in both points and polygon form. There are currently 4 records in the heritage points theme and 61 records in the natural and heritage themes. AGSO noted that in a previous version of the heritage points theme there are 38 registered points in comparison to the 4 in the new dataset. These two polygon datasets that were supplied have been separated into two shapefiles, 'natural heritage' and 'historic heritage' respectively. Natural data encompasses natural features including some areas of pinnalce fields and extends offshore. Historic heritage data is comprised of features that are of manmade origin and that are of historic significance. These features include the cantilevers, the Christmas Island Administrators house, and some others.
Search Word(s)	HUMAN ENVIRONMENT Structures and Facilities HUMAN ENVIRONMENT Urban Design LAND Use
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	Not Known
Ending Date	2001-05-07

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - ArcView Shapefiles: Point, Polygon
Available Format Type	DIGITAL - ArcView Shapefiles: Point, Polygon
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	Data were provided to AGSO via an email from Environment Australia. Projection of supplied data is geographic (WGS72)/decimal degrees. No other metadata was supplied by RNE. AGSO then projected the data to Christmas Island Grid 1985 (CIG85). With the apparent low resolution of the polygon natural heritage data, they were found to compare well to the AUSLIG 1:25000 features. The historic heritage data appears to be of higher resolution (polygon data consists of building outlines) but does not overlay with the orthophotography or cadastre. As a result of this AGSO shifted these data by 16.5 metres westward to match existing data. The polygon data was then all merged together, but because of polygon overlap natural heritage data was converted into its own shapefile. The heritage data is now presented as points data and polygons named historic and natural heritage data.
Positional Accuracy	The overall accuracy of the merged data is correct to approximately 3 metres. In the case of the original historic data, comparisons made against orthophotography found a difference of 16.5m. The coastline of the natural heritage data closely matches the form of the AUSLIG 1:25000 data so positioned to this.
Attribute Accuracy	Not documented from source, but all fields are full and because the data is concerned with heritage items most of the fields contain names and locations. The fields name, class and status appear to be most beneficial to users as they describe the name of the heritage feature, the class they are in, and whether the feature is registered or not.
Logical Consistency	These data supplied by Environment Australia contain fields that follow logical data structure and consistency. All points and polygons have a name, class, registered number (from Register of National Estate of Environment Australia) and a location.
Completeness	These data covers the whole island, however all items of historical heritage are located in the North East of the island. The natural heritage polygon covers the entire island and extends offshore.

Contact Information

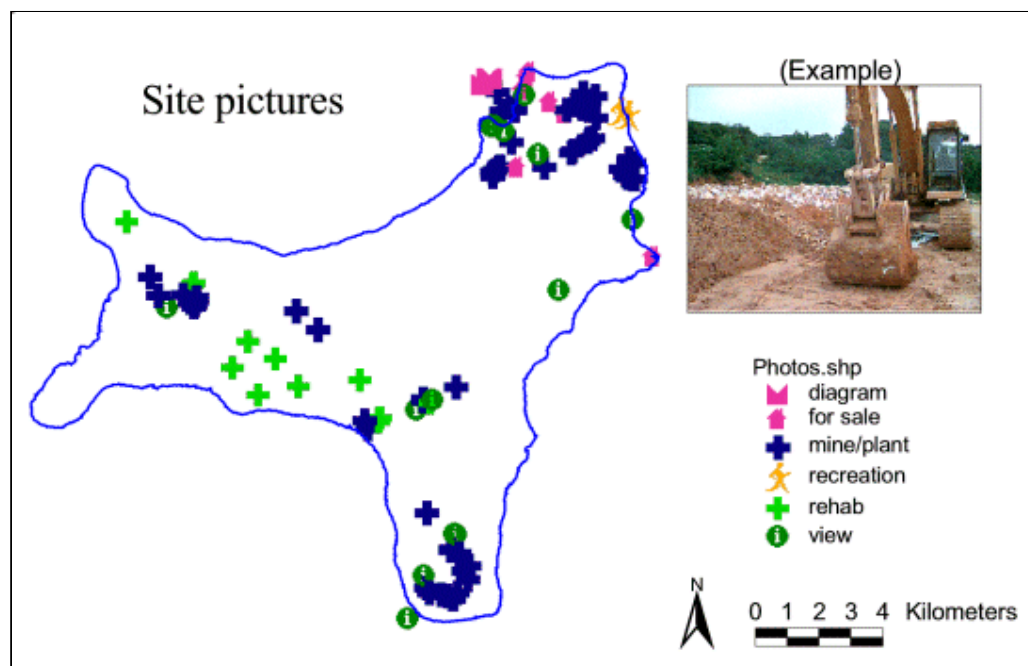
Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia

Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	2001-07-09

Additional Metadata

Projection	CIG85
Printed	October 2002

the Christmas Island 2002 GIS online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Site pictures data
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	The Sitepics (abbreviated "site pictures") directory contains 71 scanned pictures (as TIFF images) from various sources (mostly Mineral Resources and Energy Branch photographs, GA ferived, some PRL and tourist brochure photographs). The images include historical pictures, diagrams, photographs of mining, mined areas and mining equipment, photographs of 1997 orthophotography, photographs of rehabilitation, and some scenic pictures. Most are referenced by a hotlink to the theme 'photos.shp' (clicking on the marker, geographically positioned, with the hotlink tool pops up the image). MREB welcome your feedback on the true site from where such photographs were taken so they can be more accurate positioned.
Search Word(s)	HUMAN ENVIRONMENT PHOTOGRAPHY AND IMAGERY
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	Unknown
Ending Date	Unknown

Dataset Status

Progress	Complete
Maintenance and Update Frequency	Not planned

Access

Stored Data Format	DIGITAL - ArcView3.1 shapefile; TIFF photography
Available Format Type	DIGITAL - ArcView3.1 shapefile; TIFF photography
Access Constraint	Restricted, see contact details below.

Data Quality

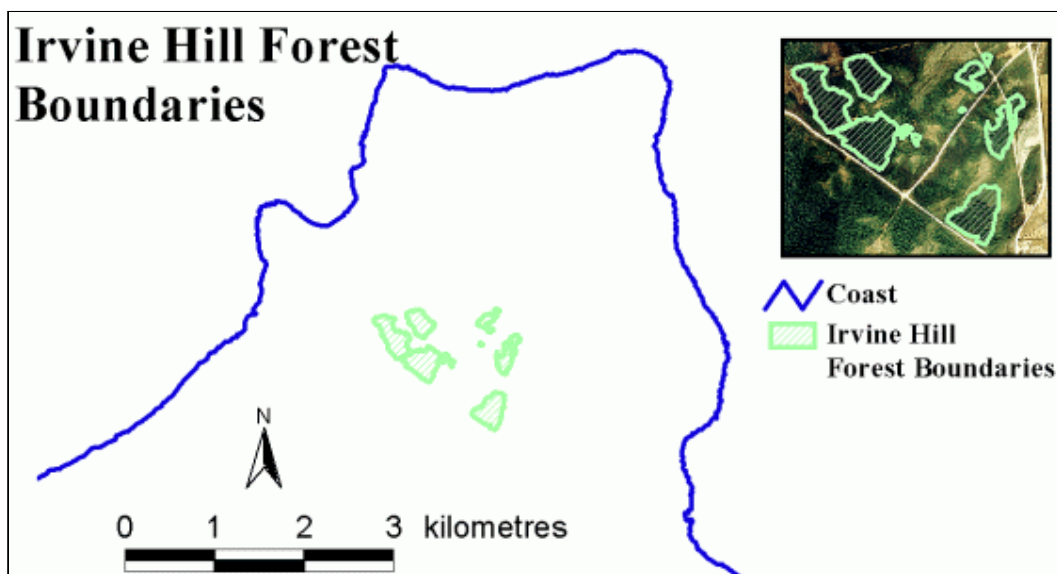
Lineage	-
Positional Accuracy	Photographs in this dataset have been positioned by eye and from memory, thus resulting in a dataset that in a number of instances the geographic positioning of the photographs is a guess or illustrative (eg the photograph of a truck being filled by a front end loader).
Attribute Accuracy	Not Relevant.
Logical Consistency	This dataset provides the user with a pictorial overview of Christmas Island. Photographs used show various aspects of Christmas Island and include historical pictures, diagrams, photographs of mining, mined areas and mining equipment, photographs of 1997 orthophotography, photographs of rehabilitation, and some scenic pictures.
Completeness	GA also recognises that there is still more work that can be done to yield an up to date and error free data set.

Contact Information

Contact Organisation	Geoscience Australia
Contact Position	Product Officer, Land Enquiry Centre
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	01-08-2000

Additional Metadata

Projection	CIG85
Printed	October 2002


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Irvine Hill Forest Boundaries
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	This dataset contains polygons that bound parts of Irvine Hill forest. The polygons were constructed by drawing lines that join points which were pegged out as being boundaries of the Irvine Hill area. The main points were supplied by Whelans. The line joins and polygon making process was done by AGSO. The shapefile containing the data is: "forestedge_irvineh.shp". Details of the fields can be seen below: <table><tr><th>Field</th><th>Type</th><th>Width</th><th>Decimal</th></tr><tr><td>Shape</td><td>FIELD_SHAPEPOLY</td><td>8</td><td>0</td></tr><tr><td>Area</td><td>FIELD_DECIMAL</td><td>12</td><td>3</td></tr><tr><td>Perimeter</td><td>FIELD_DECIMAL</td><td>12</td><td>3</td></tr><tr><td>Plot3pef2_</td><td>FIELD_DECIMAL</td><td>11</td><td>0</td></tr><tr><td>Plot3pef2_</td><td>FIELD_DECIMAL</td><td>11</td><td>0</td></tr><tr><td>Entity</td><td>FIELD_CHAR</td><td>14</td><td>0</td></tr><tr><td>Layer</td><td>FIELD_CHAR</td><td>32</td><td>0</td></tr><tr><td>Elevation</td><td>FIELD_DECIMAL</td><td>18</td><td>5</td></tr><tr><td>Thickness</td><td>FIELD_DECIMAL</td><td>18</td><td>5</td></tr><tr><td>Color</td><td>FIELD_DECIMAL</td><td>11</td><td>0</td></tr><tr><td>Pointnumbe</td><td>FIELD_DECIMAL</td><td>11</td><td>0</td></tr><tr><td>Pointheigh</td><td>FIELD_DECIMAL</td><td>18</td><td>5</td></tr><tr><td>Pointcode</td><td>FIELD_CHAR</td><td>8</td><td>0</td></tr><tr><td>Sourcethm</td><td>FIELD_CHAR</td><td>16</td><td>0</td></tr><tr><td>Hectares</td><td>FIELD_DECIMAL</td><td>16</td><td>3</td></tr></table>	Field	Type	Width	Decimal	Shape	FIELD_SHAPEPOLY	8	0	Area	FIELD_DECIMAL	12	3	Perimeter	FIELD_DECIMAL	12	3	Plot3pef2_	FIELD_DECIMAL	11	0	Plot3pef2_	FIELD_DECIMAL	11	0	Entity	FIELD_CHAR	14	0	Layer	FIELD_CHAR	32	0	Elevation	FIELD_DECIMAL	18	5	Thickness	FIELD_DECIMAL	18	5	Color	FIELD_DECIMAL	11	0	Pointnumbe	FIELD_DECIMAL	11	0	Pointheigh	FIELD_DECIMAL	18	5	Pointcode	FIELD_CHAR	8	0	Sourcethm	FIELD_CHAR	16	0	Hectares	FIELD_DECIMAL	16	3
Field	Type	Width	Decimal																																																														
Shape	FIELD_SHAPEPOLY	8	0																																																														
Area	FIELD_DECIMAL	12	3																																																														
Perimeter	FIELD_DECIMAL	12	3																																																														
Plot3pef2_	FIELD_DECIMAL	11	0																																																														
Plot3pef2_	FIELD_DECIMAL	11	0																																																														
Entity	FIELD_CHAR	14	0																																																														
Layer	FIELD_CHAR	32	0																																																														
Elevation	FIELD_DECIMAL	18	5																																																														
Thickness	FIELD_DECIMAL	18	5																																																														
Color	FIELD_DECIMAL	11	0																																																														
Pointnumbe	FIELD_DECIMAL	11	0																																																														
Pointheigh	FIELD_DECIMAL	18	5																																																														
Pointcode	FIELD_CHAR	8	0																																																														
Sourcethm	FIELD_CHAR	16	0																																																														
Hectares	FIELD_DECIMAL	16	3																																																														
Search Word(s)	BOUNDARIES Administrative BOUNDARIES National Parks FORESTS Natural VEGETATION Boundaries																																																																
Geographic	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency -																																																																

Extent Name(s)	AUSLIG Mapsheet 94/068
-----------------------	------------------------

Data Currency

Beginning Date	1998-04-01
Ending Date	1998-04-08

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - ESRI Shapefiles: Polygon
Available Format Type	DIGITAL - ESRI Shapefiles: Polygon
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	Irvine Hill forest boundaries supplied by Whelans. AGSO then built polygons from the data provided. Details are provided below: For plot3pef.shp the following processes gave closed polygons for the points: • Arc: shapearc plot3pef plot3pef • Arc: arcedit • Arcedit: edit plot3pef arc • Arcedit: snapenvironment plot3pef arc plot3pef point add 50 • Arcedit: add A line was digitised with vertices approximately on the points. These vertices then snapped to the points automatically. Where vertex order was uncertain the "Pointnumber" order was followed. The following point numbers were not included in the polygon outlines as they appeared inconsistent with a hardcopy of the polygon outlines: • 664 • 4022 • 4781 After the polygon outlines had been digitised as arcs, the polygons were built in arcedit: • Arcedit: build • Arcedit: save In arcview the resultant coverages were merged into the shapefile forestedge_irvineh.shp using the xtools extension Merge / Themes menu choice.
Positional Accuracy	This metadata element is under construction.
Attribute Accuracy	Not documented from source, however through general use of the data the quality of attributes appears reliable.
Logical Consistency	This metadata element is under construction.
Completeness	This dataset is concerned with the Irvine Hill forest boundaries and so only covers and is

	complete for that area. GA recognises that further work could be undertaken to yield a more up to date and error free data set.
--	---

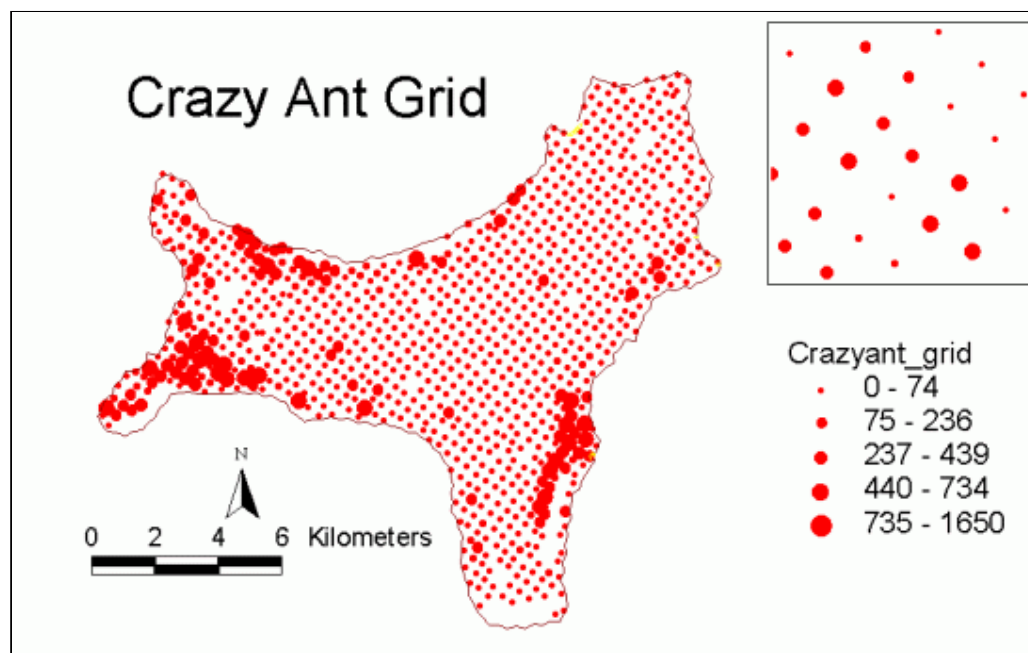
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	2001-07-09

Additional Metadata

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Crazy Ants
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	The version of the Crazy Ants shapefile in the 2002 CIGIS release was built from Parks Australia North Christmas Island (PANCI) working database file as at December 2001. This data contains observation data made by PANCI employees during their research of Crazy Ants colonies on Christmas Island.
Search Word(s)	GEOLOGY Boundaries GEOLOGICAL Features VEGETATION Boundaries
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	-
Ending Date	-

Dataset Status

Progress	-
Maintenance and Update Frequency	-

Access

Stored Data Format	DIGITAL -
Available Format	DIGITAL - ESRI Shapefile

Type	
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	-
Positional Accuracy	-
Attribute Accuracy	-
Logical Consistency	-
Completeness	-

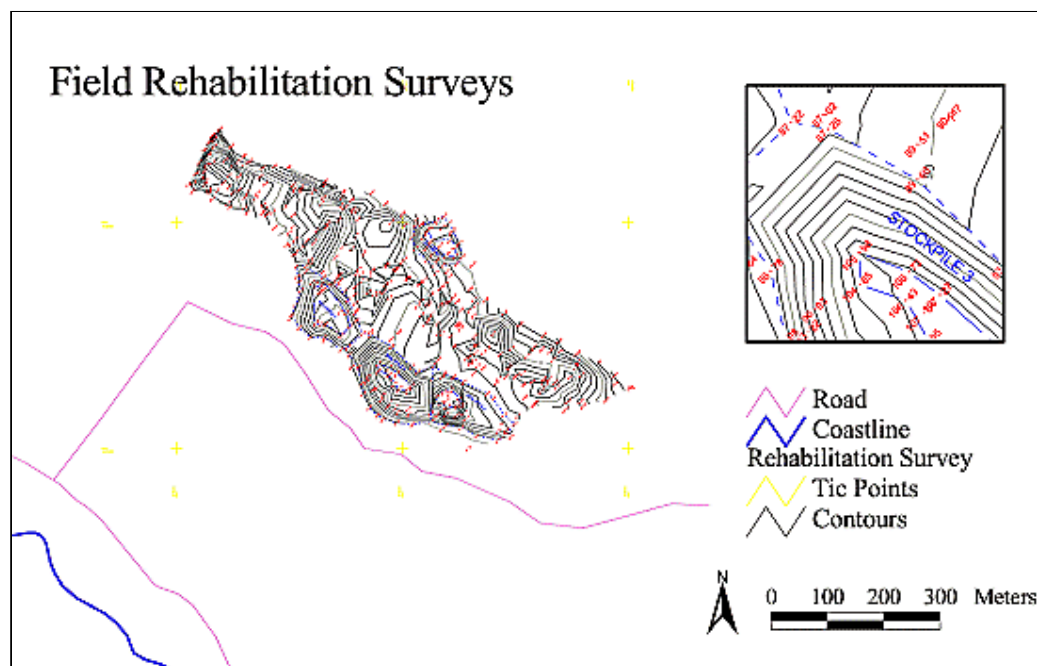
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	-

Additional Metadata

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	Field Rehabilitation Surveys
Custodian	Parks Australia North Christmas Island (PANCI)
Jurisdiction	Christmas Island (Australia)

Description

Abstract	After 1985, in preparation for rehabilitation of some previously mined areas, ANCA commissioned ground surveys of those areas. Three of these, Fields 20s and 22a, and Field 19a are included in the GIS. Fields 20s and 22a were provided in CIG85, while Field 19a, the most recently completed, is probably in Christmas Island Grid 1992 (CIG92).
Search Word(s)	ENVIRONMENT Planning HERITAGE Natural REHABILITATION Fauna REHABILITATION Flora REHABILITATION Native
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	1985-07-01
Ending Date	1992-11-11

Dataset Status

Progress	Not Known
Maintenance and Update Frequency	As Required

Access

--	--

Stored Data Format	DIGITAL - Autocad® Release 7 DWG files.
Available Format Type	DIGITAL - Autocad® Release 7 DWG files.
Access Constraint	Restricted, see contact details below.

Data Quality

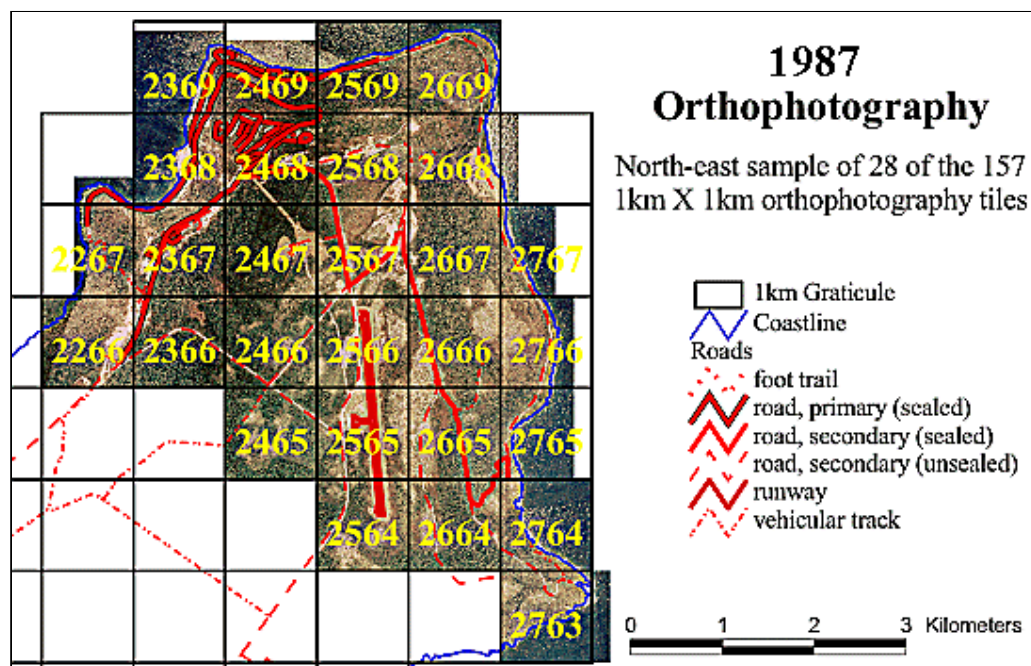
Lineage	In preparation for rehabilitation of some previously mined areas, ANCA commissioned ground surveys of those areas. Contact ANCA for an explanation of these attributes. Spatial reference in this database was line and peg coordinates (as described above) and, thus, could be projected to Christmas Island Grid using the shift derived using the Autocad® maps.
Positional Accuracy	The positional accuracy of this data is not well known. GA is not yet aware of a simple conversion between CIG85 and CIG92 and vice versa, so a trial rectification of Field 19a to plot in its true position in the GIS has not been undertaken. Since the GIS provides Digital Elevation Models (DEMs) and contours of the island, this sort of survey would be largely unnecessary in future.
Attribute Accuracy	Not documented.
Logical Consistency	Items in the dataset are concerned with rehabilitation issues, in particular the preparation for rehabilitation of some previously mined areas.
Completeness	As this data was originally produced for the purpose of printing paper maps it lacks some of the rigour expected of a high quality GIS data set. AGSO undertook considerable work to translate these mapping lines into a form suitable for GIS use. However, GA recognises that still more work is necessary to yield an up to date and error free data set.

Contact Information

Contact Organisation	Parks Australia North
Contact Position	-
Mail Address	PO Box 837
Locality	Christmas Island
State	-
Country	Australia
Postcode	6798
Telephone	(08) 9164 8055
Facsimile	(08) 9164 8755
Electronic Mail Address	David.Slip@ea.gov.au
Metadata Date	01-08-2000

Additional Metadata

Projection	CIG85
Printed	October 2002


[Metadata Home](#)


Dataset

Title	1987 Orthophotography of Christmas Island
Custodian	Christmas Island Administration
Jurisdiction	Australia

Description

Abstract	An orthophotograph is a computer image of an aerial photograph in which various distortions due to the landscape and camera lens have been removed. This data is based on the aerial photography of Christmas Island flown in August and September 1987. This has been converted to detailed colour orthophotography (at a 30cm ground resolution) presented as one hundred and fifty-seven 1km tiles for the whole of the Island. On most systems not all the orthophotography will be in this directory, due to limitations of disk size. Most orthophotography of disturbed areas (mining or township) is on the "core" CD-ROM.
Search Word(s)	PHOTOGRAPHY AND IMAGERY Aerial PHOTOGRAPHY AND IMAGERY Orthophotography PHOTOGRAPHY AND IMAGERY Raster PHOTOGRAPHY AND IMAGERY Grid
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	16AUG1987
Ending Date	01SEP1987

Dataset Status

Progress	Complete
Maintenance and Update Frequency	Parks Australia North Christmas Island (PNCI) are endeavoring to re-fly the aerial photography. So far, over two dry seasons in the last few years half of the island has been reflown. Processing to orthophotography has been held off until the flying is complete. See

[1997 Orthophotography](#) metadata sheet

Access

Stored Data Format	DIGITAL - TIFF/TFW.
Available Format Type	DIGITAL - TIFF/TFW.
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	Colour orthophotography for Christmas Island, with 30cm ground resolution, was achieved by scanning fullsize colour transparencies of aerial photography. The orthophotography was then colour balanced and cut into 1km tiles. The quality of the orthophotographs is impressive, with acceptable resolution down to 1:500 scale. The following table shows the dates of the flights and their corresponding flight run numbers: <table border="1"> <thead> <tr> <th>Date</th><th>Run Number</th></tr> </thead> <tbody> <tr> <td>21-08-1987</td><td>1, 2, 15</td></tr> <tr> <td>01-09-1987</td><td>3-7, 10, 14, 16</td></tr> <tr> <td>20-08-1987</td><td>11, 17</td></tr> <tr> <td>16-08-1987</td><td>8, 9, 12, 13</td></tr> </tbody> </table> View the associated metadata sheets: • Flight Lines and Photocentres • Aerial Photograph Circles	Date	Run Number	21-08-1987	1, 2, 15	01-09-1987	3-7, 10, 14, 16	20-08-1987	11, 17	16-08-1987	8, 9, 12, 13
Date	Run Number										
21-08-1987	1, 2, 15										
01-09-1987	3-7, 10, 14, 16										
20-08-1987	11, 17										
16-08-1987	8, 9, 12, 13										
Positional Accuracy	As a general rule the orthophotography is accurate to between 0.3 metres and 0.5 metres in the north east area of the Island. For other disturbed areas of the Island the accuracy ranges from 0.5 metres to 4 metres depending largely on the proximity of, and enclosure by, the aerial photography survey control points ('PP points'). Worst accuracy is in the distant and more inaccessible areas of primary rainforest and these accuracies range from 4 metres to 6 metres with the south west point being an area of lowest accuracy. Also in the orthphoto directory are the digitised outer boundaries of some pinnacle fields.										
Attribute Accuracy	Not Relevant.										
Logical Consistency	Not Relevant.										
Completeness	Orthophotos are complete and form a full set of tiles of which only a few may fit onto a CD-ROM. They are based on the aerial photography flown in August - September of 1987.										

Contact Information

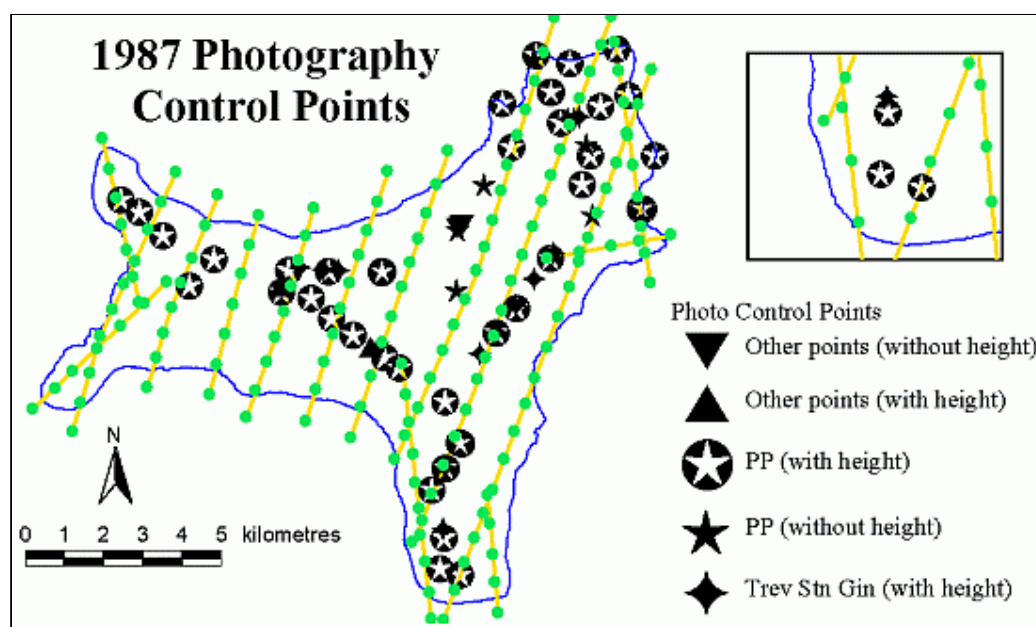
Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT

Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	2001-07-09

Additional Metadata

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	1987 Aerial Photography Survey Control Points
Custodian	AUSLIG
Jurisdiction	Australia

Description

Abstract	This dataset contains a variety of survey control points, many of which (especially the PP points) were used in the triangulation for the CIGIS orthophotography. They were obtained from copies of AUSLIG survey field books, photo-control point sketches and a coordinate listing of photo control points (copies of all items are on BRS file No. 96-001757).
Search Word (s)	LAND Geography SURVEY Control Points
Geographic Extent Name (s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	unknown
Ending Date	unknown

Dataset Status

Progress	Complete
Maintenance and Update Frequency	As Required

Access

Stored Data Format	DIGITAL - ArcView3.1 shapefile
Available	DIGITAL - ArcView3.1 shapefile

Format Type	
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	The data was originally in field notebooks, photo-control point sketches and coordinate listings, copies of which were obtained from AUSLIG. To convert it to digital form, the coordinate listings were OCR scanned. The OCR output was then imported into Microsoft® Excel, corrected and saved as a comma-delimited text file. The table was then added to an ArcView® project, and made into an event theme. Finally, for consistency and portability, the event theme was converted to a shapefile. The attributes of the data in its final form are "Point Number", "Description", "Easting", "Northing" and "Height". Eastings and northings are in CIG85. Height is in metres. A column labelled "PP points" has been added by MREB and contains an abbreviation of the station description coupled with a flag as to whether the station has been height-surveyed. This has been used to divide the ArcView® legend, and relates to usefulness for the preparation of the orthophotography.
Positional Accuracy	The Bureau of Resource Sciences does not have all accuracy data relating to these photo control points. The station summary sheets for PSM114 (PP9), PSM102 (PP17) quote orders of accuracy for easting and northing as "2" and the orders of accuracy for R.L. as "4". In addition, PSM1 (PP24) and PSM3 (PP25), which do not have surveyed height, agree with orders of accuracy for easting and northing of "2". It is likely, then, that the other PP points have the same accuracy. Further information should be obtained from AUSLIG.
Attribute Accuracy	The attributes of the data in its final form are "Point Number", "Description", "Easting", "Northing" and "Height".
Logical Consistency	All the data in this shapefile is concerned with the survey control points
Completeness	GA recognises that there is still more work that can be done to yield an up to date and error free data set.

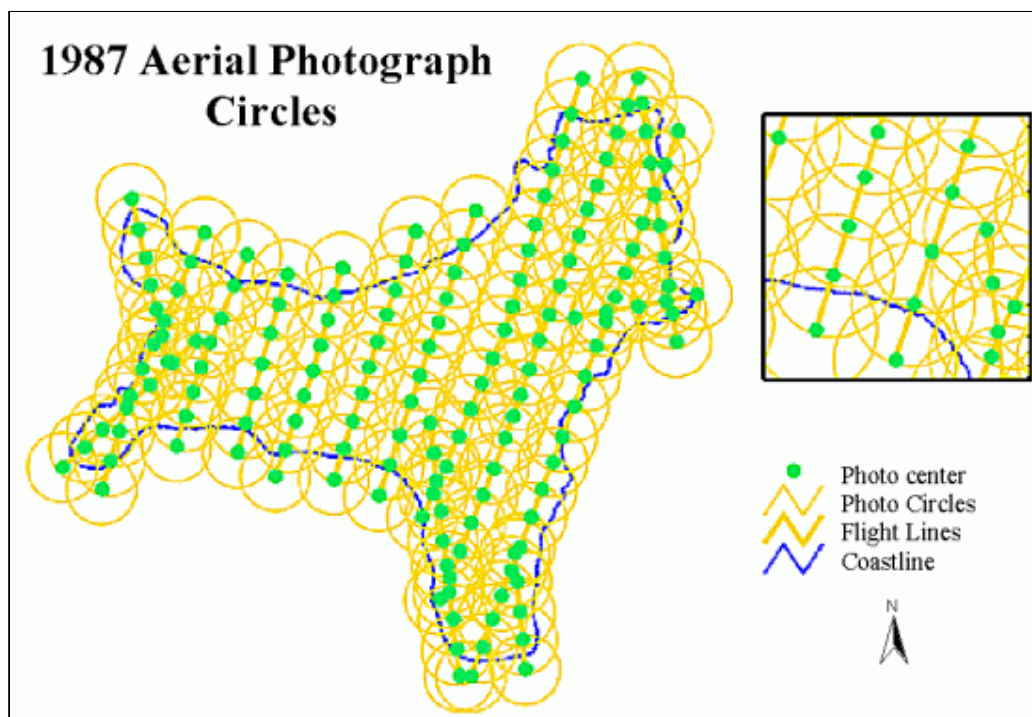
Contact Information

Contact Organisation	AUSLIG
Contact Position	-
Mail Address	PO Box 2
Locality	Beloconnen
State	ACT
Country	Australia
Postcode	2616
Telephone	(02) 6201 4222
Facsimile	(02) 6201 4381
Electronic Mail Address	datasales@auslig.gov.au
Metadata Date	01-08-2000

Additional Metadata

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	1987 Aerial Photography Plan Data - Photograph Circles
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	This theme consists of circles as approximations of aerial photograph extent. This is a useful way to depict aerial photographs as the centre of the photograph is truer.
Search Word(s)	PHOTOGRAPHY AND IMAGERY Aerial PHOTOGRAPHY AND IMAGERY Plan
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	Unknown
Ending Date	Unknown

Dataset Status

Progress	Complete
Maintenance and Update Frequency	Not Planned

Access

Stored Data Format	DIGITAL - ArcView3.1
Available Format	DIGITAL - ArcView3.1

Type	
Access Constraint	Restricted, see contact details below.

Data Quality

Lineage	The circles were derived from the aerial photograph centres already described. Ungenerate in Arc/Info obtained an ASCII file, a radius field was added to this file using UNIX's vi editor, and Generate Circles (in Arc/Info) created a circles coverage. The radius was chosen by measuring the dimensions of a scanned and registered aerial photograph.
Positional Accuracy	They are only intended to be approximate and have proven adequate for our purposes.
Attribute Accuracy	Not documented.
Logical Consistency	Consistency.
Completeness	GA recognises that there is still more work that can be done to yield an up to date and error free data set.

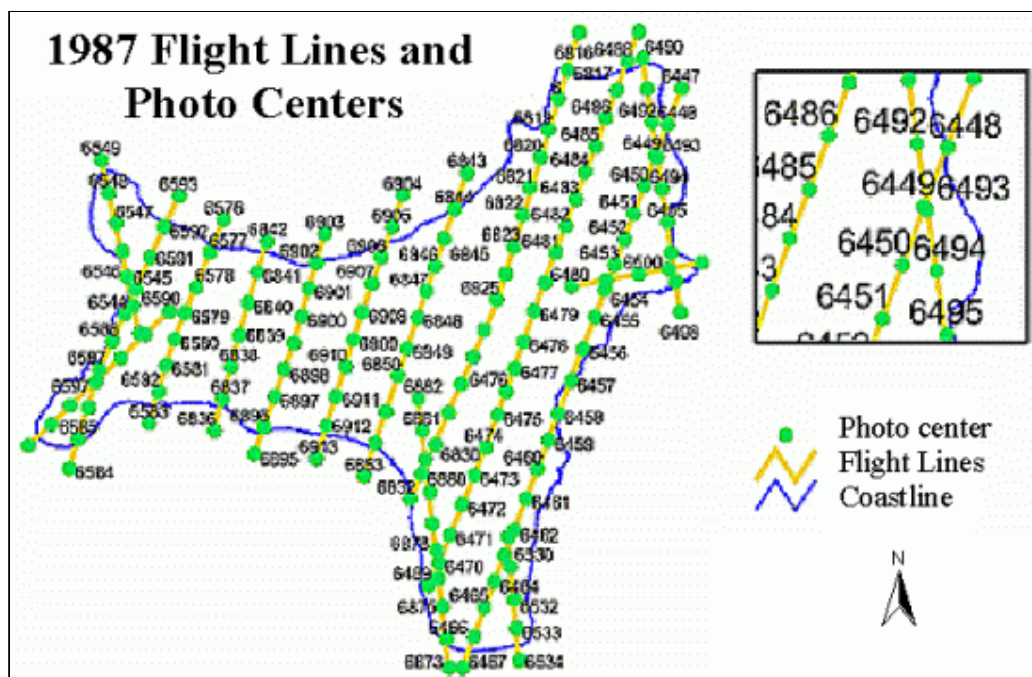
Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	28-08-2002

Additional Metadata

Projection	CIG85
Printed	October 2002

the **Christmas Island 2002 GIS** online


[Data Directory](#)
[Data Dictionary Home](#)
[Metadata Home](#)


Dataset

Title	1987 Aerial Photography Plan Data - Flight lines and photograph centres
Custodian	Geoscience Australia
Jurisdiction	Australia

Description

Abstract	This dataset shows the approximate flight lines and centres of the aerial photography in relation to Christmas Island
Search Word(s)	PHOTOGRAPHY AND IMAGERY Aerial PHOTOGRAPHY AND IMAGERY Plan
Geographic Extent Name(s)	Christmas Island Edition 2 1995 1:25000 for the Australian Nature Conservation Agency - AUSLIG Mapsheet 94/068

Data Currency

Beginning Date	unknown
Ending Date	unknown

Dataset Status

Progress	Complete
Maintenance and Update Frequency	Not Planned

Access

Stored Data Format	DIGITAL - ArcView3.1
Available Format Type	DIGITAL - ArcView3.1
Access Constraint	Restricted, see contact details below.

Data Quality

--	--

Lineage	These were digitised from the aerial photography flight line diagram. Digitising was on-screen based on a hard copy map as polylines and points respectively.
Positional Accuracy	They are only intended to be approximate and have proven adequate for our purposes.
Attribute Accuracy	Not documented.
Logical Consistency	Consistency.
Completeness	GA recognises that there is still more work that can be done to yield an up to date and error free data set.

Contact Information

Contact Organisation	Geoscience Australia
Contact Position	-
Mail Address	Cnr Jerrabomberra Ave and Hindmarsh Drive
Locality	SYMONSTON
State	ACT
Country	Australia
Postcode	2609
Telephone	(02) 6249 9479
Facsimile	(02) 6249 9983
Electronic Mail Address	Keith.Porritt@ga.gov.au
Metadata Date	28-08-2002

Additional Metadata

Projection	CIG85
Printed	October 2002

Chapter

5

Appendix 3: Ground Audit Listing

Table 1: The following spreadsheet lists 15 fields of Ground Audit data that displayed first in the attribute table. Records are sorted by the 'Location Number' field. Page order for columns is 'Down, then over'.

Included fields

Location_n
Locationno
Piparcel
Lot_type
Pin
Calc_area
Centlat
Centlong
Usage_code
Render_nor
Calc_deriv
Date_creat
Date_modif
Legal_area
Lega_deriv
Date_bound
Pityp
Area
Perimeter
Hectares
Hect_Dola
Telephon
Watr
Sewr
Elec
Crown_les
Minelse_n
Heritage_i
Lnd_status
Land_reco

**Fields left out
due to lack of
attribute data**

Description
Street
Bcp
Owner
Fax
Land_value
Improvalue
Rental_val
Date_or_va
Income_gr
Subur
Lot_n
Telephon
Land_usecc
Commen
Heritage_i
Contam
Reserv_no

Chapter
6

Appendix 4: Data Licensing and Agreements

Data Licensing and Agreements

The collection of nearly all the data sets on the four cd-roms comprising the Christmas Island GIS was commissioned by the Territories Office (Commonwealth Government) under a series of consultancy arrangements with various data suppliers over the past thirteen years. An exception is the Environment Australia Marine Environment data layer. The Christmas Island GIS is an assembly of multiple data collections (each of which may comprise some man-years of work) into a single easy-to-use integrated system and so represents a valuable Commonwealth asset.

Commonwealth Christmas Island GIS data licence

The copyright for all the data in the Christmas Island GIS resides with the Commonwealth (see data acknowledgments on page 7). Legal advice to Geoscience Australia and Territories Office recommends the protection of the Commonwealths interests in any distribution of the Christmas Island GIS by way of a licence agreement. Following are a one-page licence agreement and an associated covering letter. This licence now also includes the 1:25000 scale topographic and cultural data layers for which a separate AUSLIG licence was previously required.

Risks of not licensing the data include: -

- allegations of liability for damages as a result of errors in the data,
- commercialisation of the data,
- proliferation of faceless data variants,
- inequitable government support between competing businesses,
- perceived breaches of privacy, and
- future denial of access by the Commonwealth to the data.

Arguments against licensing include: -

- it may in some cases stultify legitimate and effective use of the data for public good purposes, and
- it introduces a cumbersome overhead for both the data supplier and the data user.

The covering letter is only half a page. The Licence Terms are just over one page in length. It is important to retain this brevity. Experience indicates that long-winded licence agreements are often not read and their conditions are consequently at a greater risk of being ignored. Some users are put off using the data when there is a long and complex licence agreement to come to grips with. Consequently an important public-good benefit that might be delivered by the use of the data may never be realised.

An electronic copy of the Commonwealth Christmas Island GIS data licence is stored on the Christmas Island GIS Cd-rom #1 at directory '\cigis\documents\licenses' in file 'cigis_license.doc'. A generic covering letter is also stored in this directory (file 'generic_licensecover.doc' and together the two documents comprise the licensing advice to each stakeholder. The covering letter should be edited to correctly describe the particular proposed licensee and two copies of both documents printed for packaging with the data. One original signed copy of the Commonwealth Christmas Island GIS data licence is to be retained by the licensee and one original signed copy is to be posted back.

Our Reference: CIGIS2001
Contact: Ms. Debra Blaskett

Monday, 3 February 2003.

Organisation name:
Organisation address:

Dear Sir/Madam,

Thank you for your request for Territories Office to supply *Organisation name* with a copy of the Christmas Island GIS ('Licensed Data'), which is in the package accompanying this letter. Territories Office offers *Organisation name* a right to use the Data in accordance with the Licence Terms enclosed with this letter. A copy of the Licence Terms is also inside the package.

BEFORE OPENING THE PACKAGE, all of the Licence Terms should be read and accepted by the User, or an authorised representative of the User. Acceptance of the Licence Terms is indicated by the User's authorised signature in the space provided below on both copies of this letter, and returning one copy to Territories Office. A fee waiver is granted for Use by *Private Organisation*, however such Use is limited to work for the Commonwealth. Use of the data by *Private Organisation* for other clients requires a separate negotiation. *OR* A fee waiver is granted for Use by *Government Organisation*, however provision of new data back to the Christmas Island GIS pool by *Government Organisation* is expected in return.

If the Data is used, then acceptance of the Licence Terms is deemed to have occurred even if the acceptance procedure described in the preceding paragraph has not been followed. If the Licence Terms are unacceptable, then the package, together with both copies of this letter should be immediately returned to Territories Office and the Data must not be Used by any person for any purpose. This data licence is not intended to affect the terms of, or any obligation of the parties under any separate services agreement already in place between DoTRS and *Organisation name*.

Territories Office grants permission for *Organisation name* to freely distribute hardcopy products or hardcopy digital equivalents (eg bitmap images or powerpoint slides) created from the licensed CIGIS.

Yours Faithfully

Mr. Keith Porritt
Australian Geological Survey Organisation
representing the Commonwealth of Australia
for Territories Office
Date:

... ..
User / User's Authorised Representative
Name:

Position in User's Organisation:

Date:

TERMS OF A LICENCE CONCERNING DIGITAL DATA

from the Territories Office of the Commonwealth Department of Transport and Regional Services (‘Licence’)

IMPORTANT NOTES

‘**Territories Office**’ means the Commonwealth of Australia represented by the Territories Office of the Commonwealth Department of Transport and Regional Services.

‘**Data**’ means the Licensed Data, including any copy, reproduction, modification, adaptation, digital manipulation or graphical representation of the Licensed Data made by the User in any form, including electronic or hard-copy form.

‘**Fee**’ means the fee payable to Territories Office for the right to use the data in accordance with this Licence.

‘**including**’ is not a word of limitation.

‘**Licensed Data**’ means Territories Office’s data, including metadata and documentation, supplied by Territories Office under the letter from Territories Office to which these Licence Terms are attached.

‘**Use**’ as a noun means any use or disclosure, and, as a verb, has an equivalent meaning.

‘**User**’ means any person who Uses the Data, or, if the Use is in connection with the person’s employment, the person’s employer.

The Data is intended for use only by people who have professional knowledge of the use and application of geographic information system (GIS) data.

TERMS

The User:

- (a) must pay the Fee to the Commonwealth in accordance with Territories Office’s directions;
- (b) may, on a non-exclusive basis, use and disclose the Data only for the User’s internal business purposes carried out in person by its employees, or by the User’s consultants exclusively for work on the User’s internal business, or, if the User is an individual, the User’s personal use (**‘Purpose’**);
- (c) may make back-up copies of the Data; and
- (d) must not, except as provided under **paragraph (b)**, distribute or transmit the whole or any part of the Data, whether alone or in combination with any other data or information in any form, to any person.

Nothing in this Licence affects ownership of any person’s rights in the Data.

WARRANTY

To the full extent allowed by the applicable law Territories Office excludes from this Licence all warranties, express or implied, including any warranty of fitness of the Data for any purpose. If Territories Office breaches any warranty that, by the applicable law, cannot be excluded, then Territories Office’s sole liability to the User for that breach will be, at its choice, to resupply the Data without additional charge to the User or refund the Fee.

ASSUMPTION OF RISK

The User assumes sole risk and responsibility for its Use of the Data.

Territories Office does not warrant or make any representations:

- (a) that the Data will be complete, accurate, reliable or error free;
- (b) as to the accuracy, reliability or content of any information obtained from Using the Data.

Territories Office disclaims any and all liability for any injury, damage or loss (including, but not limited to, economic loss) howsoever arising out of any Use of the Data.

Territories Office is not responsible for any failure to carry out its obligations under this Licence if that failure is for any cause beyond Territories Office’s reasonable control.

TERMINATION

Territories Office may terminate this Licence immediately by written notice if the User breaches this Licence or for convenience on 30 days notice.

When this Licence ends the User must return or destroy all copies of the Data in its possession or under its control.

APPLICABLE LAW

This Licence will be interpreted according to the laws of the Australian Capital Territory, Australia.

ALTERATION

This Licence be altered only in writing signed by Territories Office and an authorised representative of the User.

WAIVER

Waiver of any provision or right under this Licence:

- (a) must be in writing signed by the party entitled to the benefit of that provision or right; and
- (b) is effective only to the extent set out in the written waiver.

ENTIRE AGREEMENT

This Licence:

- (a) constitutes the entire agreement between Territories Office and the User as to its subject matter; and
- (b) in relation to that subject matter, supersedes any prior understanding or agreement between Territories Office and the User and any prior condition, warranty, indemnity or representation imposed, given or made by Territories Office or the User.

UN CONVENTION

Territories Office and the User agree that the provisions of the United Nations Convention on Contracts for the International Sale of Goods are expressly excluded from this Agreement.

DISPUTE RESOLUTION

The parties (meaning Territories Office and the User) must attempt to resolve any dispute or difference that may arise between them in relation to this Agreement (‘Dispute’) through amicable consultation, based on principles of mutual benefit, equality, cooperation and trust. Accordingly, a party must not start arbitration or court proceedings (except proceedings seeking interlocutory relief) about a Dispute unless it has complied with the following paragraphs (a) - (e):

- (a) A party claiming that a Dispute has arisen must notify the other party to the Dispute giving details of the Dispute (**‘Notification’**);
- (b) On receipt of a Notification each party must negotiate in good faith to resolve the Dispute and, if necessary to resolve the Dispute, involve the Chief Executive Officers or other senior officers of the parties directly in those negotiations;
- (c) If the Dispute involves technical matters and has not been resolved by negotiations under paragraph (b) within a reasonable time, then the parties will refer the Dispute for

- determination by an independent expert agreed by the parties in the technical field the subject of the Dispute;
- (d) If the Dispute is not resolved under **paragraph (b)** or **(c)** within thirty days (or longer period agreed between the parties), and if the User's principal address is in Australia, then the parties must refer the Dispute for mediation by the Australian Commercial Dispute Centre Limited ('ACDC') for resolution in accordance with the Mediation Rules of the ACDC;
- (e) If the Dispute is not resolved under **paragraph (b)** or **(c)** within thirty days (or longer period agreed between the parties), and if the User's principal address is not in Australia, then the parties must refer the Dispute to arbitration for resolution in accordance with the UNCITRAL Model Law on International Commercial Arbitration. Notwithstanding any provision of the UNCITRAL rules to the contrary, the parties agree that:

- (i) the number of arbitrators shall be one;
- (ii) the place of arbitration will be Canberra, Australian Capital Territory, Australia;
- (iii) all proceedings will be conducted in the English Language;
- (iv) the applicable law is the law of the Australian Capital Territory; and
- (v) the determination of the arbitrator shall be final and binding on the parties and the costs of the arbitration shall be borne and paid for as the arbitrator directs.

- (f) If the Dispute is not resolved under **paragraph (d)** or **(e)** within sixty days after referral (or longer period agreed between the parties) either party may initiate proceedings in a court

FURTHER INFORMATION

Historical information may be contained in the Data, metadata or documentation of the Data. If the User requires further information about the Data or its history, then contact

Ms. Debra Blaskett,
Assistant Director,
Territories Office Perth,
Department of Transport and Regional Services.
Ph: (08) 9237-6039
Fax: (08) 9221-8683
Email: deb.blaskett@dotrs.gov.au

TO—DOLA Arrangement for cadastre

Through Territories Office, the Commonwealth pays the Western Australian Department of Lands Administration (DOLA) to maintain the cadastre as passed from Australian Land Information Group (AUSLIG) in 1992. Following is a copy of the Arrangement under which Territories Office contract DOLA to do this work.

CI and Cocos cadastre is owned by the Commonwealth but maintained by DOLA.

Prior to contracting DOLA in the 1990's, the Commonwealth through AUSLIG WA had maintained the cadastre data for Christmas Island and Cocos. Subsequently (in 1992) the Commonwealth Australian Surveying and Land Information Group, West Australian branch (AUSLIG WA) provided DOLA with the cadastre information for the IOTs. Ex-AUSLIG WA senior staff employed by the Commonwealth at the time include Matt Eagan (Ph 08 9268 4570 - now at LandInfo, a subsidiary of SKM), Ian Jackson and Glenn Bush. Matt reports that in the course of the data hand over to DOLA, the Commonwealth never relinquished ownership of the data.

An interesting recent development has been the merging of AUSLIG and AGSO to form Geoscience Australia in November 2001.

External customers seeking the IOT cadastre data from DOLA obtain it through the standard DOLA WA data provision system which includes a standard DOLA cadastre data licence agreement. DOLA staff have speculated that perhaps DOLA might introduce a separate licensing agreement for Christmas and Cocos data. However, it has been canvassed that there is convenience in a standard delivery system and extra cost and confusion could result from trying to run two licensing systems.

The attached Arrangement between the Commonwealth (represented by Territories Office) and DOLA states in paragraph 4.1 that: -

"4.1 All assets purchased in accordance with this Arrangement and on the basis of reimbursement under this Arrangement, will be and continue to be the property of the Commonwealth."

Chapter
7

Appendix 5: Ecowise Environmental Data Documentation

Description of the Water Resources GIS data layers supplied by Ecowise.

Chapter
8

Appendix 6: Christmas Island GIS Data Cd-roms