Digital Information in the Peel-Harvey Catchment Area

Dennis van Gool
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DIGITAL INFORMATION IN THE
PEEL-HARVEY CATCHMENT
AREA

JANUARY 1993

Compiled by Dennis van Gool
Peel-Harvey Catchment Support Group
Introduction

This paper presents a summary of the main features of the digital mapping data available in the Peel-Harvey Catchment area. This type of information is essential for Geographic Information System (GIS) users to assess projects involving the use of digital data such as plotting of mapped themes, topological overlays, area calculations and reporting.

To anybody using computer generated mapping the most important information listed is the source of the digital information and the scale at which it is meant to be used. Many Government Departments Consultants and other agencies provide information and mapping prepared from digital data. This information can be displayed, plotted or interpreted at any scale using a GIS system. As a rule of thumb a digital map is only as accurate as the least detailed theme used in its preparation (as listed under source). For example, 1:25,000 drainage information displayed on 1:50,000 cadastral should be used at 1:50,000 scale, unless further field checks are done (including local knowledge).

This data is stored on floppy disks as Intergraph design files (Interactive Graphics Design Software or IGDS). Direct any inquiries regarding access or use of the digital information to Dennis van Gool at the Peel-Harvey Catchment Support Group at the Department of Agriculture, South Perth, or the Community Catchment Centre at Pinjarra. A copy is also held by the Geographic Information Systems Group, and the Commercial Land Resource Information Group at the Department of Agriculture.

To date this digital information has been used:

1. As a component in Strategic Plans for sustainable landuse in Local Government Local Rural Strategies and a number of State Government Planning documents

2. To help address nutrient management issues in the Peel-Harvey catchment, (ie as a general planning aid at the Community Catchment Centre)

1 Strategic Planning

For Strategic Planning this information has mainly been used as a computer aided drafting (CAD) tool. The mapping is largely manually interpreted as only one component of a plan. Additional CAD benefits have been: rapid calculation of areas, easy plotting at any scale and the display of land quality or land capability information from the database attached to the soil landscape mapping. Examples of this type of interpretation are given in appendix 5.

One Local Rural Strategy which used GIS technology, where the computer did the topological overlays is the Environmental Component of the Serpentine Jarrahdale Local Rural Strategy. This type of analysis will become easier as more digital information is captured and recorded in data dictionaries or similar reports. The absence of data dictionary information made this GIS project more difficult and expensive than anticipated.

2 Nutrient management

For nutrient management issues there is a need to provide accurate information about where nutrients (mainly phosphorus) are coming from, and how best to control them. We have a lot of information about point sources, but recent monitoring results have indicated that some of the assumptions that have been made about soil types and non-point sources are questionable and must be tested.
At the Community Catchment Centre in Pinjarra the GIS is being used to combine the water and soil-landscape information listed in this report, plus recent monitoring results done by the community, the Waterways Commission and the Community Catchment Centre. This will help test the effect of soil types, or more accurately, soil-landscape mapping unit information (called land qualities) on phosphorus losses through the drainage system.

The land use mapping is incomplete and the vegetation mapping (which can be defined as a land use) is not accurate enough to be very useful. These gaps are being filled.

Description of the digital themes

The main themes listed in this document include:

1 Surface water mapping - the main surface drainage system and the drainage subcatchments based on various water quality monitoring points.

The Peel-Harvey Catchment has been audit monitored by the Environmental protection Authority (EPA) and Waterways Commission (WWC) for many years. Because of the level nature of the plain you need comprehensively mapped drainage information to depict subcatchment areas for specific monitoring points. In 1991 Garry Headly of the Peel-Harvey catchment Support Group digitised the main drainage information for the Coastal Plain from Department of Land Administration (DOLA) topographic maps and aerial photographs and did a first draft of the audit subcatchment areas on the Coastal Plain (only).

In 1993 Water Authority gazetted drains on the Coastal Plain and digital mapping from The Department of Conservation and Land Management in the Scarp were used to complete the drainage system in the Peel-Harvey Catchment. It was now possible to delineate the eastern boundary of the physical catchment from north to south by: the top of the Birrega Drain, the Serpentine Pipehead Dam, South Dandalup Dam, Baden Powell Water Spout, Drakesbrook Dam, Sampson Brook Dam, Logue Brook Dam and the Harvey Weir Diversion (refer to figure A2.1a in Appendix 1). The draft audit subcatchments were refined and extended to give a true picture of the actual areas being drained to a particular audit monitoring site. New subcatchments were also drawn for community monitoring points and other monitored sites coordinated by the Peel-Harvey Catchment Support Group were.

2 Soil-landscape mapping

The department of Agriculture has recently completed 1:50,000 scale soil-landscape mapping covering the entire Coastal Plain portion of the Peel-Harvey Catchment area. The metropolitan private land in the Darling Scarp is covered by similar 1:50,000 scale mapping. State forest and private land south of the metropolitan region is covered by 1:250,000 soil association mapping.

3 Land use

All other digital themes are presently combined under land use because their use by the Department of Agriculture in strategic planning and nutrient management has been limited to date.

Appendix 1 - lists some of the current uses for the digital information.

Appendix 2 - is a glossary and lists the abbreviations used in this report.
INTRODUCTION

DESCRIPTION OF DIGITAL THEMES

DIGITAL THEMES

1 Surface Water

1.1 Surface Drainage

1.2 Surface drainage subcatchments

1.3 Water Authority gazetted drainage and irrigation boundaries

2 Soil-Landscape

2.1 Soil-Landscape mapping:
   2.11 Coastal
   2.12 Southern portion of Darling Range
   2.13 Soil-Landscape mapping site observations

2.2 Soil association mapping

3 Land use

3.1 Cadastre
   3.11 Cadastre
   3.12 Lot Numbers
   3.13 Main Roads, Towns, Shires, River names

3.2 Vegetation mapping

3.3 Administrative boundaries

3.4 Land use mapping:
   3.51 Northern portion of the Peel-Harvey Catchment
   3.52 Southern portion of the Peel-Harvey Catchment

3.5 CALM reserves

3.6 System 6 reserves

3.7 Old Town Planning Scheme Maps

3.8 Rural zones in the Metropolitan Region
Appendix 1  DIAGRAMS, SUBSETS OF MAIN DIGITAL THEMES AND
GENERAL BROAD SCALE INFORMATION

1.1  Main Roads and Rivers

1.2  Waterways Commission:
    2.1  Catchments
    2.2  Catchment diagrams

1.3  Remnant vegetation in Rockingham

1.4  Example of soil-landscape map database interrogation

1.5  Example of breakdown of subcatchment areas for reporting

1.6  Land Conservation Districts, Agricultural Regional Office
    Districts & Shire boundaries

1.7  Coastal Plain General Groundwater Information

1.8  Wetlands - Serpentine-Jarrahdale

Appendix 2  GLOSSARY AND ABBREVIATIONS
LIST OF FIGURES AND ASSOCIATED DIGITAL FILE NAMES

Initial capture and storage as Intergraph design files (IGDS)
The common coastline for most of the diagrams is phcoast.dgn.
The physical catchment boundary is in phys.dgn.
Filenames are correct 29-12-92.
Filenaming conventions (eg filename.edi) are user defined and not consistently applied.

1 Water

Figure 1.1  Surface drainage  nall.edi
Figure 1.2  drainage subcatchments  hacat.dgn
Figure 1.3 a) gazetted drainage & irrigation areas  drbnd.dgn
Figure 1.3 b) gazetted drainage & irrigation areas  drbnd.dgn
surface drainage  nall.edi

2 Soil-landscape

Figure 2.11 a) coastal soil landscape mapping  phsoil.dgn
administrative catchment  phadm.dgn
Figure 2.11 b) legend for soil-landscape surveys  survey.dgn
Figure 2.12 scarp soil landscape mapping  scpsoil.dgn
Figure 2.13 soil survey site observations  sjsite.dgn
survey boundaries  mdsite.dgn
phssite.dgn
survey.dgn
Figure 2.2 a) soil association mapping  pinjarra.edi
Figure 2.2 b) soil association mapping  collie.edi
(collie.txt)
Figure 2.2 c) soil association mapping  perth.edi
unit labels  system6.txt
Figure 2.2 d) coastal soil association mapping  horti.edi
unit labels  horti.txt

3 Land use

Figure 3.11 a) cadastre  ph *.cad
Figure 3.11 b) legend for cadastre (urban removed)  phcad.leg
Figure 3.11 c) legend for cadastre (urban included)  oldcad.leg
Figure 3.11 d) Cadastral files at the Dept. of Agriculture
Figure 3.2 vegetation mapping  phveg.dgn
Figure 3.3 administrative boundaries phadm.dgn
Figure 3.41 a) northern landuse mapping phland.dgn
Figure 3.41 b) design file sheet for landuse mapping
Figure 3.42 southern landuse mapping hvylu.dgn
Figure 3.5 CALM reserves phcalm.dgn
Figure 3.6 System 6 reserves system6.dgn
Figure 3.7 Old Town Planning Schemes phpts.dgn phpts.txt
Figure 3.8 Rural zones in the Metropolitan Region rural.dgn

Appendices

Figure A 1 main roads and rivers phroadma.dgn
Figure A 2.1 a) Waterways Commission catchments wwccat.dgn
Figure A 2.1 b) Legend for WWC catchments wwwcpx.leg
Figure A 2.2 a) Dirk Brook catchment diagram
Figure A 2.2 b) Harvey River catchment diagram
Figure A 3 Remnant vegetation - Rockingham remveg.dgn
Figure A 4 a) High capability agricultural land phhorti.pax
Figure A 4 b) Salinity risk phsalt.pax
Figure A 4 c) Heavy soils phheav.pax
Figure A 5 Example catchments for reporting ghcat.dgn
Figure A 6 a) Land Conservation Districts cwalcd.dgn
Figure A 6 b) Agriculture regional Office Districts cwareg.dgn
Figure A 7 a) Coastal Plain Groundwater Information hydro.dgn
Figure A 7 b) file design sheet for groundwater information
Figure A 8 a) Wetlands - Serpentine-Jarrahdale manage.dgn sjwet.dgn
Figure A 8 b) Legend for WAWA wetlands sjwet.dgn
Figure A 8 c) Legend for Murdoch management manage.dgn
Surface drainage

Prepared for use at 1:25,000 - 1:50,000

Surface drainage, including gazetted Water Authority drains and all other drains, rivers and streams relevant to the scale.

Sources include:
- Drains digitised by Garry Heady, Peel-Harvey Catchment Support Group from DOLA 1:25,000 topographic maps (files = phriver.dgn, phdrain.dgn).
- Metropolitan Region Water Authority Drains digitised by R King from 1:25,000 drainage sheets (file = drainage.met).
- Waroona and Harvey Drainage and Irrigation districts digitised by Ian Loh, WAWA, 1:25,000 drainage sheets (files = dvg_dr.dgn, irrig.dgn).
- Missing gazetted drains, Metropolitan region and Murray Shire digitised by Dennis van Gool, 1992 using 1982 WAWA 1:50,000 drainage sheets.
- Irrigation district drains (only) updated using 1:5,000, 1982 WAWA irrigation district plans, and a very quick "windscreen" survey. Dennis van Gool, 1992.

Drains in the northern section of the Scarp digitised (or scanned?) by CALM from DOLA 1:50,000 topo-cadastral sheets. Obtained from WAWA 1992 (chanwet*.dgn). Remainder digitised by Peel-Harvey Catchment Support Group.

Compiled by

Computer edits
Extensive manual editing.
Weeded to 1 metre.
Clean data.
Edited using a test copy of MicroGIS (for the PC).

Notes
The main purpose for this drainage data is to depict the subcatchment boundaries for nutrient monitoring in the Peel-Harvey Catchment. The gazetted drains clearly show the drainage flow path. The DOLA drains help to complete the picture, but are not as useful as they are not continuous, overlap or run parallel to the coast. This is partly a feature of the level nature of the plain, and because they are included on DOLA maps only as identifiable features.

File names
nall.edi  level 2 = WAWA gazetted drains
          level 3 = WAWA irrigation channels used as drains
          level 4 = DOLA drains - mainly modified or man made
          level 5 = DOLA drains - mainly natural

databases
WAWA is preparing a database for the gazetted drains that they manage, which also entails updating the digital gazetted drains.
1.2 Surface drainage catchments

Scale
Prepared for use at 1:50,000

Description
Drainage subcatchments based on monitoring points depicted using the surface drainage files. These indicate the total land area from which surface drainage is generated.

Source
Subcatchments based on:
* existing drainage information
* 1:20,000 aerial photography
* Conservation & Land Management 1:100,000 hills catchment areas (obtained from WAWA 1992 - possibly digitised straight from topo-cadastral maps)
* Water Authority 1:25,000 subcatchments for the metropolitan region. Unpublished digital data obtained 1992)

Compiled by

Computer edits
Weeded to 1 metre.
Clean data.

notes
A few field checks were done to check some of the subcatchments.

filenames
hacat.dgn level 1 = lines/polygons
level 2 = manually placed notes
level 3 = monitoring sites
level 4 = catchment numbers

associated files
sub50.leg legend
wwccat.dgn (subset of hacat.dgn prepared for Waterways Commission)
nall.edi drains in the Peel-Harvey area

databases
Waterways Commission monitoring data (spreadsheets).
Community Catchment Centre monitoring data (spreadsheets).
| 1.3 | **Water Authority gazetted drainage and irrigation boundaries** |
| Scale | Prepared for use at 1:50,000 |
| Description | Water Authority gazetted drainage and irrigation boundaries. |
| Source | 1:50,000 WAWA drainage maps (1982).  
Southern drainage and irrigation areas (Waroona & Harvey)  
supplied by Ian Loh, WAWA, (1992), as IGDS files. |
| Compiled by | Dennis van Gool, Peel-Harvey Catchment Support group, WA Dept of Agriculture, 1992. |
| Computer edits | clean linework. |
| notes |  |
| filenames | `drbnd.dgn` level 3 = drainage district, level 5 = irrigation district. |
| associated files | `nall.edi` (surface drainage) |
| databases |  |
Figure 1.3 a) gazetted drainage & irrigation areas  drbdn.dgn
2.11 Soil-landscape mapping - coastal

Scale
Prepared for use at 1:50,000

Description
Soil-landscape mapping units based on geomorphic elements described by McArthur and Bettenay (1960). Soil-landscape mapping summarises soil and landscape features with similar land qualities that affect landuse and land management. It is not a soil map, which describes the soil properties only.

Source
King & Wells (1990). Darling Range Land Capability Study. WA Department of Agriculture, Land Resources Series No 3


** van Gool (1990). Land resources in the northern section of the Peel-Harvey catchment. WA Department of Agriculture (Map only)

** van Gool (1992). Land resources in the southern section of the Peel-Harvey catchment. WA Dept of Agriculture (Map only)

* digitised from published map
** digitised from aerial photography

Compiled by
Dennis van Gool, Peel-Harvey Catchment Support group, WA Department of Agriculture, 1992.

Computer edits
Minor editing of survey boundaries (using air photos) to ensure map continuity.

Mandurah-Murray map sheet excessively weeded resulting in "blocky" linework.

Mandurah-Murray map resealed or sheet rubber sheeted to match the cadastre. (may need to be rubber sheeted again when the cadastre is updated)

notes
<table>
<thead>
<tr>
<th>filenames</th>
<th>phsoil.lnk</th>
<th>Coastal Plain soils only</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>level 1 = map unit lines (weeded to 5 metres to conserve space, therefore some &quot;blockiness&quot; of lines)</td>
</tr>
<tr>
<td></td>
<td>phsoil.dgn</td>
<td>level 1 = map unit lines (weeded to 1 metre)</td>
</tr>
<tr>
<td></td>
<td>scpsoil.dgn</td>
<td>Darling Scarp soils only. level 1 = lines</td>
</tr>
<tr>
<td></td>
<td>allsoil.dgn</td>
<td>(refer to full description attached)</td>
</tr>
<tr>
<td></td>
<td>allsoil.txt</td>
<td>This is a large file that includes all the 1:50,000 scale soils mapping including scpsoil.dgn. This file will also eventually incorporate some 1:250,000 soil association mapping to complete a few minor missing portions. (This file is weeded to 1 metre only)</td>
</tr>
</tbody>
</table>

These composite files were made up from all the individual survey maps, indicated in survey.dgn. These files were often modified slightly based on the most recent mapping to ensure map unit continuity between the surveys. Additionally, the Jandakot mapping units were correlated by D van Goor, (1990) to match the other mapping units on the coastal Plain. This was not done for the Scarp mapping, where the mapping units are based on soil associations rather than broad geomorphic elements. The most recent files that were used in the preparation of the composite maps listed above are:

<table>
<thead>
<tr>
<th>phmand3.edi</th>
<th>Mandurah</th>
<th>clean linework</th>
</tr>
</thead>
<tbody>
<tr>
<td>phmand2.txt</td>
<td></td>
<td>map unit labels</td>
</tr>
<tr>
<td>phlino.edi</td>
<td>Peel-Harvey</td>
<td>clean linework</td>
</tr>
<tr>
<td>phlino.txt</td>
<td>North</td>
<td>map unit labels</td>
</tr>
<tr>
<td>(phlino includes Jandakot and Rockingham)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ps4.edi</td>
<td>Peel-Harvey</td>
<td>clean linework</td>
</tr>
<tr>
<td>phsall2.txt</td>
<td>South</td>
<td>map unit labels</td>
</tr>
<tr>
<td>jandp.wed</td>
<td>Jandakot</td>
<td>clean linework</td>
</tr>
<tr>
<td>jandp.txt</td>
<td></td>
<td>map unit labels</td>
</tr>
<tr>
<td>newsew.wed</td>
<td>Rockingham</td>
<td>clean linework</td>
</tr>
<tr>
<td>newsew.txt</td>
<td></td>
<td>map unit labels</td>
</tr>
</tbody>
</table>

(Note: These files may still vary slightly from the original published information)

<table>
<thead>
<tr>
<th>associated files</th>
<th>phdb.txt</th>
<th>level 19 = text for database link</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>phdisp.txt</td>
<td>level 18 = text for display plots</td>
</tr>
<tr>
<td>all.leg</td>
<td>legend for the mapping unit descriptions</td>
<td></td>
</tr>
<tr>
<td>survey.dgn</td>
<td>legend diagram for the surveys</td>
<td></td>
</tr>
<tr>
<td>sjsite.dgn</td>
<td>survey site descriptions</td>
<td></td>
</tr>
<tr>
<td>mndsite.dgn</td>
<td>phssite.dgn</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>databases</th>
<th>phsdb.db</th>
<th>DMRS database (structure described in phsoil.dll)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>This database is linked to phsoil.lnk, listed above</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ph1.dmr, ph2.dmr, ph3.dmr, ph4.dmr are the raw data (ascii files)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Much of this data has also been transferred to spreadsheets and to Info. (ARC/Info)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>site specific survey data stored on the Departments oracle database</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(refer to Eddie Peluso Geographic information Systems group)</td>
<td></td>
</tr>
</tbody>
</table>
Soil-Landscape mapping in the Peel-Harvey Coastal Catchment Area

Figure 2.11 a) coastal soil landscape mapping
administrative catchment
phsoil.dgn
phadm.dgn
2.12 Soil-landscape mapping - southern portion of Darling Range

Scale
Prepared for use at 1:50,000

Description
Soil-landscape mapping units based on landform/soil associations of the Atlas of Natural resources, Churchward and Mc Arthur, (1980)
Soil-landscape mapping summarises soil and landscape features with similar land qualities that affect landuse and land management. It is not a soil map, which describes the soil properties only.

Source
King, Wells (1990). Darling Range rural land capability study. WA Department of Agriculture, Land Resources Series No 3. Digitised from 1:20,000 aerial photography.

Compiled by
Dennis van Gool, Peel-Harvey Catchment Support group, WA Department of Agriculture, 1992.

Computer edits
Has been weeded - tolerance unknown

notes
This file is a subset of the published Darling Range mapping. The files used were scarpnew.plt for the linework and scarpfin.txt for the mapping unit labels.

filenames
scpsoil.dgn level 1 = map unit lines, southern portion only
scp.txt level 19 = text for database link and display
allsoil.dgn Combined coast and scarp soils map, weeded to 1 metre
allsoil.txt level 19 = database text

associated files
survey.dgn legend diagram for the surveys
scarpnew.plt the linework for the entire Darling Range
scarpin.txt map unit labels for the Darling Range

databases
Darling scarp mapping has been linked to resurv.dbs on the VAX filenames are sca*,.* (scarp.link)
Much of this data has also been transferred to spreadsheets and to Info. (ARC/INFO)
site specific survey data stored on the Departments oracle database (refer to Eddie Peluso Geographic information Systems group)
2.13 Soil-landscape mapping site observations

Scale Prepared for use at 1:50,000

Description Soil-landscape mapping site observations that were collected during the field survey.

Source (refer to 1:50,000 soil landscape mapping)

Compiled by Dennis van Gool, Peel-Harvey Catchment Support group, WA Department of Agriculture, 1992.

Computer edits Manual editing only. (This is a text/point file only)

Notes Rockingham and Jandakot sites have been lost. Darling Scarp sites are available and can be placed into a design file from the Departments of Agricultures Oracle database, which contains all available soils site observations as part of the National Soils database.

Filenames sjsite.dgn

mndsite.dgn

phssite.dgn

Associated files phsoil.wed

Databases (Oracle database - refer to notes section above)
2.2 Soil-association mapping

Scale
Prepared for use at 1:250,000

Description
Broadscale Landform/soil association mapping. Used as infill in the Eastern portion of the Peel-Harvey area where 1:50,000 mapping is not available.

Source

Compiled by

Computer edits
Unknown, data has been edilined and seems reasonably clean

notes
Largely superceded by 1:50,000 soil-landscape mapping, except for a small section in the darling scarp at the eastern edge of the physical catchment.

This very broadscale mapping was refered to in the early stages of the Peel-Harvey Program.

filenames
horti.edi level 1 = map unit lines
Pinjarra.edi level 1 = map unit lines
Collie.edi level 1 = map unit lines
Perth.edi level 1 = map unit lines

associated files
horti.txt level 19 = text labels
collie.txt level 19 = text labels
system6.txt level 19 = text labels for Perth and Pinjarra.edi

databases
Soil.dbs, collie.dbs, pinjarra.dbs - unknown content.
Phdata.dbs (created by Craig Mckay, 1989 - never completed)
Land capability interpretations available from Geoff Moores
Potential for Horticulture study (internal report done for WAWA)
Crude estimate of Mapping unit land qualities, similar to the land qualities for the 1:50,000 scale mapping are available on a Spreadsheet and in Info. (ARC/Info)
Figure 2.2 b) soil association mapping

collie.edi
(collie.txt)
3.11 Cadastre

Scale
Prepared for use at 1:25,000 - 1:50,000

Description
Cadastral boundaries.

Source
DOLA digital cadastre.
Metropolitan region - 1:25,000 - generated 1990.
South of the Metropolitan region - 1:50,000 - generated 1988.

Compiled by
Dennis van Gool, Peel-Harvey Catchment Support group, WA Department of Agriculture, 1992.

Computer edits
Townsite lots manually deleted to facilitate plotting of maps.

The cadastre is used for display/mapping purposes only and the data is unclean.

notes
Closed roads, railway lines and other common features normally found on a road map may not be shown on the digital cadastre. The cadastral generation date is not the date of capture.

This information would need editing if it was to be used in a database to interrogate lot sizes etc. The format of the files is not consistent (as explained below). Late in 1992 there were some updates of the DOLA cadastral information held by the Department of Agriculture. Some of this information is "cleaner" and split on levels (see below), however only the metropolitan region would have updates of the actual lot boundary information. The DOLA cadastral files held by the Department of Agriculture are indicated on figure 3.11d).

filenames
Some files have road boundaries on level 4 and lots on level 1.
All files have the boundaries of manually edited urban areas on level 10
phn1.cad Split on levels 1 and 4
phn2.cad Split on levels 1 and 4 except for a small section in Rockingham (on the coast). Additionally the coastal cadastre doesn't match the other cadastre exactly
mand.cad All linework is on level 1
ph5new.cad Split on levels 1 and 4
phscal & 2.cad All linework is on level 1. There is also some DOLA legend information on level 2

associated files
phpi.cad level 19 = lot numbers - generated 1988
phname.dgn road/town names
phcad.leg legend for cadastral files
pholdcad.leg Legend for the early Peel-Harvey Cadastre
The only difference between this and the new cadastre is that the urban areas have not been edited out, making the files much larger. These areas also cause difficulties when doing pen plots because of the density of the information.

databases
Not relevant for this project.

(DOLA has lot numbers and related information. The titles office has current owner information etc.)
Figure 3.11 d) Cadastral files at the Dept. of Agriculture
3.12 Lot numbers

Scale Prepared for use at 1:25,000 - 1:50,000

Description Lot numbers relevant to the cadastre.


Compiled by Dennis van Gool, Peel-Harvey Catchment Support group, WA Department of Agriculture, 1992.

Computer edits Townsite lot numbers manually deleted.

All other polygon-parcel information was deleted using DMRS database and World Mapping System to place edited text at the right coordinates.

notes The lot numbers were prepared for display purposes as a mapping aid only.

Lot numbers for the cadastre extending into the Scarp have not been completed yet.

filenames phpi.cad level 20= lot numbers - generated 1988

associated files *.cad Cadastral files in the Peel-Harvey area (Coastal Plain only)
phname.dgn Road/town names

databases phpi.dbs (No longer relevant. These lot numbers are for display purposes only)
3.13 Main roads, towns, shires and river names

Scale Prepared for use at 1:50,000

Description Main roads, towns, shires and river names. Labelling for the major mapped features.

Source DOLA topographic maps.
            (mostly early 1980s)
            Metropolitan street directory (1988).

Compiled by Dennis van Gool, Peel-Harvey Catchment Support group. WA Department of Agriculture, 1992.

Computer edits Not relevant - manually edited display labels only.

notes Prepared for display purposes only. Roads and towns in the Darling Scarp not completed.

filenames phname.dgn

associated files phpni.cad level 19 = lot numbers - generated 1988
ph * .cad cadastre
allcat1.dgn legend for cadastral files

databases (Not relevant)
### 3.2 Vegetation mapping

#### Scale
Prepared for use at 1:50,000 (roughly)

#### Description
Vegetation areas mapped directly from aerial photos or photo mosaics. Generally, no field verification was done. Areas depicted include mainly trees and taller scrub that retains a distinct shape on the photo. (ie whether the understory is intact or not)

#### Source
Denise True, Geopgraphic Information Systems Group, WA Dept of Agriculture, 1987

Dennis van Gool has re-drawn the vegetation mapping using 1:20,000, 1991 aerial photography for Murray Shire (only).

The Rockingham portion of this mapping was only added by Nola Gasmier (GIS group) December, 1992.

#### Compiled by
Dennis van Gool, Peel-Harvey Catchment Support Group, WA Department of Agriculture, 1992

#### Computer edits
This information was captured before the digital cadastre was available. The existing remnant vegetation mapping was manually adjusted by Garry to roughly match the cadastre.

The linework, though rough, is clean.

#### notes
There is an urgent need to update this information. DOLA are presently preparing 1:25,000 orthophoto maps for much of the South West of WA. It is proposed that some of the vegetation mapping will be updated during 1993.

#### filenames
- phveg.dgn level 1 = lines/polygons

#### associated files
- remveg.dgn vegetation in the Rockingham area

#### databases
3.3 Administrative boundaries

Scale
Prepared for use at 1:50,000

Description
Peel-Harvey administrative and physical catchment boundaries; Shires, state forests, national parks, CALM pine plantations.

Source

Peel-Harvey Physical Boundary (refer to surface drainage catchments).

Other boundaries from 1:50,000 CALM forestry maps.

Compiled by
Dennis van Gool, Peel-Harvey Catchment Support group, WA Department of Agriculture, 1992.

Computer edits
clean linework.

notes
This file was originally only compiled for the coastal plain. Updates in the Scarp portion of the catchment are being done.

filenames

phadm.dgn  level 3 = State forest
level 5 = pine plantations
level 8 = Yalgurup National Park
level 15 = P-H administrative catchment
level 1 = P-H physical catchment
level 33 = Shire boundaries

associated files

databases
3.41  Land use mapping, northern portion of the Peel-Harvey Catchment

Scale  Prepared for use at 1:50,000

Description  Land use mapping, northern portion of the Peel-Harvey Catchment, reflecting the major current landuses as depicted from aerial photography and some local knowledge.

Source  Digitised from 1988 aerial photographs by Garry Heady (1991-92)
No field verification (other than local knowledge).

Compiled by  Garry Heady, Peel-Harvey Catchment Support group, WA
Department of Agriculture, 1988.

Computer edits  Unknown. Assume the data is unclean.

notes  Further land use mapping will be undertaken during 1993 using 1991 aerial photography.

filenames  phland.dgn  refer to design file sheet attached

associated files  hvylu.dgn

databases
<table>
<thead>
<tr>
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<th>DESCRIPTION</th>
<th>LV</th>
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</tbody>
</table>

Figure 3.41 b) File design sheet for landuse mapping
Land use mapping, southern portion of the Peel-Harvey Catchment

Scale
Prepared for use at 1:20,000

Description
Land use mapping, southern portion of the Peel-Harvey Catchment, reflecting the major current landuses as depicted from aerial photography and some local knowledge.

Source

Compiled by
Tony Alen, Peel-Harvey Catchment Support group, WA Department of Agriculture, 1992.

Computer edits
Unknown. Assume the data is unclean.

notes
Further land use mapping will be undertaken during 1993 using 1991 aerial photography.

filenames
hvylu.dgn refer to design file sheet attached

associated files
phland.dgn

databases
3.5 CALM reserves

Scale 1:50,000?

Description Some Department of Conservation and Land Management reserves.

Source Unknown.

Compiled by Craig McKay, (1989)

Computer edits clean linework.

notes out of date.

filenames phcalm.dgn

associated files

databases phdata.dbs (on the VAX) compiled by Craig McKay but never completed.
3.6 System 6 reserves

Scale Prepared for use at 1:25,000

Description System 6 (red book) reserves. Areas of land that have Environmental Protection Authority land use controls.

Source Geographic Information Systems Group, Department of Agriculture, 1992. Associated documentation indicates:
- based on system 6 red book, 1983
- used WAWA digital data and DOLA cadastre, 1:25,000 scale
- Edited by Dunnart mapping using DOLA cadastre, 1992
- Plotted at 1:50,000 scale

Compiled by Dunnart mapping, 1992

Computer edits Unknown
- Clean linework.

Notes

Filenames
- system6.dgn
  - level 50 = linework
  - levels 20-24 = polygons
  - level 52 = text (the reserve code numbers)

Associated files

Databases
3.7 Old Town Planning Scheme Maps

Scale
Prepared for use at 1:50,000

Description
Old Town Planning Scheme areas for the Coastal Plain only portion of Peel-Harvey only.

Source
Digitised from old State Planning Commission maps from the early eighties.

Compiled by
Craig McKay, Department of Agriculture, 1989.

Computer edits
Unknown, but some areas do not appear to match the cadastre. Clean linework.

notes
There have been many changes and scheme amendments and this map is probably too out of date to be of use, except for historical value ie to see what changes have in fact occurred.

filenames
phtps.dgn the zones
phtps.txt labels for the zones

associated files

databases
Phdata.dbs on the Western Australian Land Information System's VAX computer (linked to phtps.lph) compiled by Craig McKay but never completed.
3.8  Rural zones in the Metropolitan Region

Scale  Prepared for use at 1:50,000

Description  Rural zones in the Metropolitan Region.


Compiled by  Phil Goulding, Land Evaluation Group, Department of Agriculture, 1992.

Computer edits  Unknown. Must be fairly clean data because the areas have been polygonised and presumably linked to a database at DPUD.

notes  The complete scheme should be available from DPUD.

dependencies  Rural.dgn  polygonised rural zones

associated files  (check with DPUD)
Figure 3.8  Rural zones in the Metropolitan Region

rural.dgn
Appendix 1  Main roads and rivers

Scale  Prepared for use at 1:100,000 (and upwards)

Description  The main roads and rivers in the Peel-Harvey Catchment.

Source  General information.

Compiled by  Garry Heady, Peel-Harvey Catchment Support Group, WA Department of Agriculture.

Computer edits  Not relevant - display only.

notes  For display purposes only.

filenames  phroadma.dgn

associated files

databases
<table>
<thead>
<tr>
<th><strong>Appendix 2.1</strong></th>
<th><strong>Waterways Commission catchments</strong></th>
</tr>
</thead>
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<tr>
<td><strong>Scale</strong></td>
<td>Prepared for use at 1:50,000</td>
</tr>
<tr>
<td><strong>Description</strong></td>
<td>Diagrams of the surface drainage and surface drainage catchments for Waterways Commission nutrient audit.</td>
</tr>
<tr>
<td><strong>Source</strong></td>
<td>Prepared from the physical surface drainage catchments Dennis van Gool Peel-Harvey Catchment Support Group, WA Department of Agriculture, 1992.</td>
</tr>
<tr>
<td><strong>Compiled by</strong></td>
<td>Refer to source.</td>
</tr>
<tr>
<td><strong>Computer edits</strong></td>
<td>Clean linework.</td>
</tr>
<tr>
<td><strong>notes</strong></td>
<td></td>
</tr>
<tr>
<td><strong>filenames</strong></td>
<td>wwc.cat.dgn</td>
</tr>
<tr>
<td><strong>associated files</strong></td>
<td>wwcexpx.leg  legend plus polygonised catchments for cross-hatching</td>
</tr>
<tr>
<td><strong>databases</strong></td>
<td></td>
</tr>
</tbody>
</table>
Figure A 2.1 a) Waterways Commission catchments wwcат.дgn
Appendix 2.2 Waterways Commision catchment diagrams

Scale
Not really relevant because these are display diagrams only with no specific scale. They could be used down to 1:50,000.

Description
Every subcatchment was manually prepared from existing files as follows:

- wwcet.dgn catchment boundary
- nall.edi drains
- wwc1.cad an edited version of all the cadastre inside the Peel-Harvey catchment
- phname.dgn road names etc.

An example of the files created for Dirk-Brooke Lower catchment is as follows:

- dbl.leg legend
- dbl.cad cadastre
- dbl.nam road names etc
- dbl.drn drains
Dirk Brook Catchment

Figure A 2.2 a)  Dirk Brook catchment diagram
Harvey River Catchment

Location

Legend
- --- Variable catchment area (Split flow)
- --- Streams and drains
- --- Road cadastre
- --- Sample/Gauge site

Figure A 2.2 b) Harvey River catchment diagram
Appendix 3  Remnant vegetation in Rockingham

Scale  Prepared for use at 1:20,000

Description  Remnant vegetation in Rockingham.


Compiled by  Refer to source.

Computer edits  Clean linework.

notes  Includes all visible vegetation, with no distinctions for density or vegetation type. This file was prepared for DPUD’s South West structure plan as the existing vegetation mapping was incomplete in the Rockingham area.

filenames  remveg.dgn  vegetation mapping and diagramatic information for the Rockingham area

associated files  phveg.dgn  vegetation mapping for the Peel-Harvey area

databases
Appendix 4  Examples of soil-landscape map database interrogation

Following are a number of examples of a DMRS database interrogation of the 1:50,000 Coastal Plain Soils mapping on the Western Australian Land Information System’s (WALIS) VAX computer.

The files used are:

phsoil.lnk  the map
phsoil.dll  the database structure etc.
phsoil.dbs
phsoil1.ent
phsoil2.ent
phsoil3.ent
phsoil4.ent
phsoil100.ent

This information is consistent with the published (and unpublished) mapping and land capability work for this area. Refer to the source description for the 1:50,000 soil-landscape mapping given near the front of this data dictionary.

DMRS and the VAX are both virtually obsolete, however the land quality and land capability information is readily transferred to other systems. This information is presently available in ARC/INFO format on the Peel-Harvey Catchment Support Groups Sun (unix) Workstation. It could also be transferred to the Department of Agriculture’s Oracle database.

This information can be used as diagrams, but would also be relevant on a 1:50,000 scale map. The three examples provided include:

1 High capability agricultural land. This includes class 1 or 2 land for grazing, annual or perennial horticulture as defined by the methods of Wells & King, 1989.

2 Areas susceptible to salinity. (legend on the diagram)

3 Heavy Soils. This was manually interpreted from the mapping unit descriptions to include all soils with loamy surface soils or heavier. It also includes the sandy, gravelly foothills soils (ie F2b, F1b).
High capability agricultural land

Figure A 4 a) High capability agricultural land  pphorti.pax
"HEAVY" SOILS IN THE PEEL-HARVEY CATCHMENT AREA

Figure A 4  c) Heavy soils  phheav.pax
Appendix 5  Example of breakdown of subcatchment areas for reporting

These subcatchment diagrams are drawn using the surface drainage and subcatchment files. This can then be combined with the soil-landscape mapping to obtain catchment area by soil type which serves as a useful comparison for water monitoring results. (Refer to the surface drainage subcatchments and the Digital Themes sections in this report).

This topological overlay of soil-landscape units and subcatchment areas is being done using ARC/INFO on the Peel-Harvey Catchment Support Group’s Sun (unix) workstation.
Appendix 6  Land Conservation Districts, Agriculture Regional Office Districts & Shire boundaries

Scale  Variable.

Description  Land Conservation Districts, Agriculture Regional Office Districts & Shire boundaries.

Source  Geographic Information Systems Group, WA Department of Agriculture (corporate area), 1992.

Compiled by  Refer to source.

Computer edits  Unknown.
Because of the variable scales some of this file does not match the 1:50,000 and 1:25,000 cadastre in the Peel-Harvey area.

Clean linework.

notes  This information is for broadscale planning purposes and would need to be checked if it is used at more detailed scales. Scales are generally from 1:100,000 and greater. Some areas are accurate to 1:50,000 scale but these have not been documented.

filenames  
  cwalcd.dgm  Land Conservation Districts
  cwareg.dgm  Agriculture Regional Office Districts
  cwalga.dgm  Shire boundaries

associated files

databases
Figure A 6 a) Land Conservation Districts cwalcd.dgn
<table>
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<tr>
<th>Appendix 7</th>
<th>Coastal Plain general groundwater information</th>
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<td>Scale</td>
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<tr>
<td>Description</td>
<td>Broadscale general groundwater information for the:</td>
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<td>Leederville formation</td>
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<td>Yarragadee formation</td>
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<tr>
<td>Source</td>
<td>Water Authority information digitised by the Department of Agriculture for Geoff Moores' Potential for Horticulture Study, 1987. This is a precursor for the water allocations for horticulture report on the Swan Coastal Plain. The draft report became available late 1992.</td>
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<td>Compiled by</td>
<td>Dennis van Gool, Peel-Harvey Catchment Support Group, WA Department of Agriculture, 1989.</td>
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<td>None, prepared as diagrams only.</td>
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*Figure A 7 b) file design sheet for groundwater information*
Appendix 8  Wetlands - Serpentine-Jarrahdale

Scale  Prepared for use at 1:25,000 to 1:50,000.

Description  Broad wetlands categories for the Water Authority in the Shire of Serpentine-Jarrahdale. Murdoch university management categories of some specific wetland areas for the Shire of Serpentine-Jarrahdale.

Source  Western Australian Water Authority (WA WA), 1990.

Compiled by  Refer to Source.

Computer edits  Unknown.

Notes  The most recent wetlands mapping is available from the Water Authority, Perth: A City of Wetlands. Wetlands of the Perth to Bunbury Region: Coastal Wetlands from Wedge Island to Mandurah. (An information poster published by the Water Authority 1992). These wetland areas are classified by cross-sectional shape and water permanence. These general criteria are also a component of the soil-landscape mapping for this area. In most instances it is probably best to use the boundaries for the soil landscape mapping in this area.

The text with the wetlands mapping, provides additional information regarding the conservation value of these wetlands areas which would be valuable to general planning documents, such as Local Rural Strategies.

Use of this information is perhaps best vetoed by WAWA and (probably) CALM in the first instance, and/or the consultant who undertook much of this work for WAWA, Christine Semeniuk.

The Murdoch University wetlands management categories makes recommendations regarding specific wetland areas. The relevance of these recommendations to general planning is not known.

File names  manage.dgn  wetlands categories, plus Murdoch University recommendations (Shire of Serpentine-Jarrahdale)
            sjwet.dgn  WAWA wetlands categories only.

Associated files

Databases
Figure A 8 a) Wetlands - Serpentine-Jarrahdale

manage.dgn
sjwet.dgn
CHANNEL
PERMANENTLY INUNDATED (RIVER)
SEASONALLY INUNDATED (CREEK)

BASIN
PERMANENTLY INUNDATED (LAKE)
SEASONALLY INUNDATED (SUMPLAND)
SEASONALLY WATERLOGGED (DAMPLAND)

FLAT
SEASONALLY INUNDATED (FLOODPLAIN)
SEASONALLY WATERLOGGED (PALUSPLAIN)
MANAGEMENT CATEGORIES

STUDY SUB-GROUPS

- (H) HIGH CONSERVATION
- (C) CONSERVATION
- (O) OPEN SPACE
- (E) ENHANCEMENT
- (M) MULTIPLE USE
Appendix 2 - Glossary and Abbreviations used

Glossary

Computer edits
Weeding - Removes redundant points and reduces the size of a digital file to make GIS processing faster. Can result in coarse data, making the maps look blocky, if improperly used. (Similar to Clean in ARC)

Blocky - As a result of weeding digital information at too great a tolerance

Clean/unclean data Linework split at all vertices, no open polygons or overhangs. (Digital data does not have to be clean for display purposes only. Attaching a database or doing GIS analysis requires clean data)

EBSAL or rubber sheeting Software for matching one digital theme with a more accurate digital theme to limit distortions and improve accuracy

Ediline Removes or labels linework overhangs, undershoots and creates vertices at line intersections

Filenames
IGDS Interactive Graphics Design Software - Intergraph design file format. (Intergraph is probably the largest GIS vendor to Government agencies in Western Australia)

Levels IGDS files have 63 levels on which different themes of digital information can be stored. For example you may have blue lines on level 1, green lines on level 2 and text on level 3. Having this information on different levels makes display and database work easier

Databases
DMRS (redundant) Intergraph Data Management and Retrieval Software, a hierarchical and cumbersome database on the Western Australian Land Information System's (WALIS) VAX Computer. (Superceded by MGE & MGA on a unix workstation)

Oracle Relational Database used by the Department of Agriculture to store soils data

ARC/Info format Digital format of the other main GIS product used by Government agencies in WA. The vendor is ESRI Australia

Info Fairly old relational database associated with ARC. ARC is compatible with various other databases, including Oracle

Abbreviations Used

WAWA Western Australian Water Authority
WA Western Australia
DOLA Department of Land Administration
CALM Department of Conservation and Land Management
WALIS Western Australian Land Information System
WWC Waterways Commission