




ICSM
INTERGOVERNMENTAL COMMITTEE ON
SURVEYING & MAPPING

ICSM delivering benefits through collaboration

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**Chair and Queensland Member
Australia and New Zealand's
Intergovernmental Committee on Surveying and Mapping**



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through collaboration**

Overview

**Who is ICSM & why do we exist?
Recent achievements, benefits
& future challenges**



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Need for national coordination of surveying and mapping



Australia Government
Geoscience Australia

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Who is ICSM?

Representatives from government:

- ◆ surveying and mapping agencies
- ◆ civilian and defence sectors
- ◆ of Australian and New Zealand governments





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What is ICSM's role?

ICSM's vision is:

"... to assist decision makers in national approaches to major surveying, mapping and land information issues..."

and

"...to consider matters relating to the development of national standards..."



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what is ICSM?

we are a Standing Committee of






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What does ICSM do?

- ◆ we develop strategies to implement policy developed by ANZLIC the Spatial Information Council
- ◆ we provide national coordination of activities and research
- ◆ we develop standards relating to these activities and research
- ◆ we facilitate the acquisition and maintenance of national datasets
- ◆ we support learning



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How does ICSM work?

We use a sub-committee system:

- Cadastral Reform** (PCCR)
- Geodesy** (GTSC)
- Topographic Information** (PCTI)
- Elevation** (ESIG)
- Airborne Imagery** (ISIG)
- Roads** (RWG)
- Geographical Names** (CGNA)
- Tides & Mean Sea Level** (PCTMSL)
- Data Framework** (DFTSC)
- Electronic Lodgment** (ePlan)
- Street Addressing** (ASIG)



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A brief overview of some significant ICSM projects



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Geocentric Datum of Australia 1994 (GDA or GDA94)

The rapid growth of GPS technologies in the 1980's brought about the need for nations around to world to adopt a consistent, geocentric datum

Following the decision at ICSM's first meeting to move towards GDA, ICSM was instrumental in the successful introduction of GDA in Australia



Three separate functions, with a separate working group for each:

- Developing GDA
- GDA promotions
- GDA implementation




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Geocentric Datum of Australia 1994 (GDA or GDA94)

Strategies adopted to develop and implement:

- an AGD to GDA migration plan
- a GDA technical manual
- promotional & educational awareness strategies
- industry and user support strategies.

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Geocentric Datum of Australia 1994 (GDA or GDA94)


Benefits through collaboration:

- A nationally consistent datum
- National adoption of the datum

Current issues and challenges:

- Height modernisation
- Positioning infrastructure
- The datum for the future





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Standardising Survey Practice

ICSM's first significant publication was:
Standards and Practices for Control Surveys (SP1)


These national guidelines provide :

- ◆ clear standards of accuracy for control surveys which are independent of technique
- ◆ guidelines for survey and reduction practice
- ◆ recommended marking and documentation practices

This is regularly reviewed to ensure that it remains valid for use by the surveying industry

It remains a very popular document with an 2009 average of 2,000 downloads per month

Benefits through collaboration:
SP1 referenced as a standard in a number of jurisdictions




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Monitoring Our Tides

Tidal observations provide the basis for:


- Definition of AHD – based on observed MSL
- Definition of Chart Datum – based on LAT
- Tidal modelling & predictions
- Monitoring sea level change

PCTMSL deals with matters related to tidal measurement

- SP9 the *Australian Tides Manual* (recommended operating procedures for tide gauges on the national network)
- Designed to enable the user to apply consistent and repeatable techniques, and produce verifiable results

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Monitoring Our Tides

Benefits through collaboration:


- Support for the Australian Height Datum (AHD)
- Coordinated national monitoring of sea level change

Future challenges:

- Link between Tidal Reference Levels and the Australian Height Datum (AHD)
 - ◆ Determination at tide gauges
 - ◆ Model tidal reference levels
 - ◆ Publish information
- Development of a Tidal Data module within the Harmonised Data Model (HDM)

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Data models

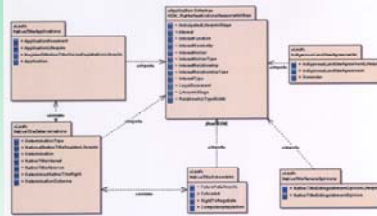
Transfer of data between organisations relies on agreed format for exchange

1990s SDTS - 4 models:

- cadastral data
- topographic data
- street address
- place names

Harmonisation

- resolve ambiguities
- avoid duplication
- consistent treatment of data (e.g. metadata)
- resulted in a single data model



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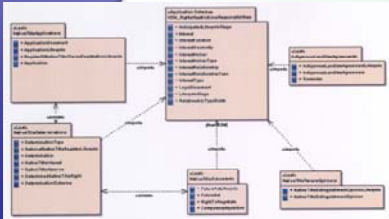
Data models

Conversion to UML model

- Designed to support web services
- XML reference implementations
- Scope for additional modules

Benefits through collaboration

- Shared cost of model development
- Access to modelling specialists
- Reference for system design in jurisdictions



The diagram shows a complex UML class structure with multiple classes and their interrelationships, including inheritance and associations.

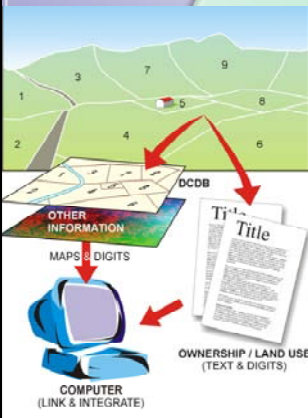
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Improving Land Development Processes

ICSM has created a national standard for the electronic capture, recording and transfer of cadastral survey records


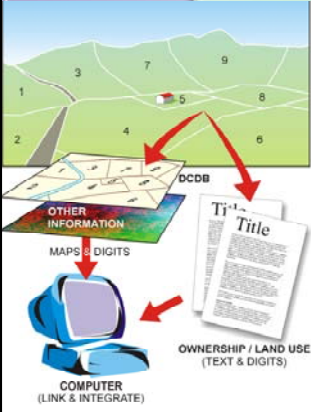
ePlan standard:

- covers the 'whole of life' process for transfer of data from capture in the field, to dissemination, recording in land titling systems and mapping products
- to enable consistency with international practice, ePlan is based on LandXML
- developed in close collaboration with industry as well as government
- drew on experience of New Zealand in implementing electronic lodgement
- is being implemented in Australian States and Territories



The diagram illustrates the ePlan standard process flow. It shows a field map with numbered points (1-9) and a surveyor. Red arrows indicate the flow of data from the field to a 'DCDB' (Digital Cadastral Database), then to 'OTHER INFORMATION', 'MAPS & DIGITS', and finally to a 'COMPUTER (LINK & INTEGRATE)'. A 'Title' document is also shown, with an arrow pointing to 'OWNERSHIP / LAND USE (TEXT & DIGITS)'.

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Improving Land Development Processes


Benefits through collaboration:

- single national system supported by survey software vendors
- joint development of the standard avoided duplication of effort
- continues to draw on experience as ePlan is being implemented

Challenges for the future:

- Vendor adoption: conversion & validation
- Model governance: maintenance and development
- Full 3D capability: complex shapes and strata developments

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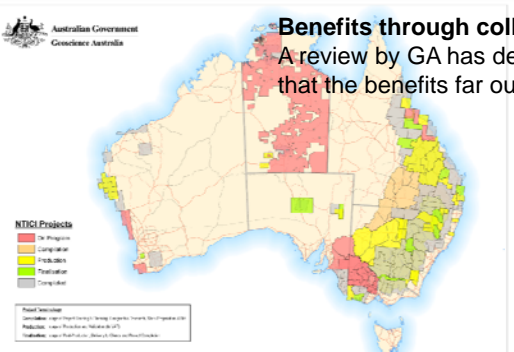
Coordination – Topographic Information

ICSM has renewed its emphasis on one of its original charters – national coordination of topographic mapping

NTICI is based on “map once – use many”

Projects on program or further progressed in all states and territories except Tasmania

Benefits through collaboration:
A review by GA has demonstrated that participants consider that the benefits far outweigh the costs





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Street Addressing

ICSM was a key player in developing a nationally consistent standard for street addresses:
AS/NZS 4819:2003




The most significant change was in rural areas where street numbers are to be based on a distance from a key point – such as a road intersection.

It also enabled the development of important products such as PSMA's G-NAF database

The Standard is now subject to review, as dictated by Standards Australia protocols. ICSM is leading this review

ICSM members who were involved in developing the original standard are assisting other countries in developing a similar standard



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Information for the General Public

Three areas of note where ICSM has worked to broaden the knowledge base in the community are

- ◆ Geographic Names
- ◆ Mapping
- ◆ Addressing

Particular emphasis on materials for school students

Benefits through collaboration:
Joint investment in development of educational materials

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Geographic Names information for the public



ICSM's *Committee for Geographic Names of Australasia* is the oldest ICSM sub-committee. Its record of achievement includes:

Gazetteer of Australia <http://www.ga.gov.au/map/names/>

Schools Teaching Package <http://www.icsm.gov.au/icsm/cgna/lesson/index.html>

Geographic Names Quiz <http://www.icsm.gov.au/icsm/cgna/quiz.htm>


Place Names video narrated by Ernie Dingo

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Mapping information for the public

Topographic Map Index
This interactive web package is a tool to discover what topographic maps have been published in Australia
<http://mapconnect.ga.gov.au/ICSM/imf.jsp?site=ICSM>



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Welcome to the ICSM Topographic Map Index

ICSM Home | Contact Us

1 Click Search Area

2 Drag a box on the map

3 Click Search

Search Area Active Click on the map, select an area to search. [Demonstration](#)

Clear Map Details Off Refresh Map

Dataset Shown: None

Map Scale 1: 71,857,736

Extent Search

Search Map Name (* wildcard)

Links to State/Territory and Commonwealth Surveys

Have some comments? Click here to provide feedback

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Mapping information for the public

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Values of distortion

Fundamentals of Mapping

This web information package is one year old and already receiving 10,000 downloads a month. It is a consolidated summary of maps and mapping concepts

Design Criteria

- General use, e.g. high school students and interested adults
- Easy to understand
 - Does not assume knowledge
 - Avoids use of jargon
 - Provides definitions for technical terms
 - Uncluttered layout
- Assists discovery
 - provides a consolidated introduction to a subject with numerous hyperlinks to more specialised sites
 - every module has a **Reference** section

Fundamentals of Mapping

Topics Currently Included

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Fundamentals of Mapping

Mapping Home

- Overview
- History of Mapping
- Types of Maps
 - General Reference Maps
 - Thematic Maps
 - Topographic Maps
 - Cadastral Plans and Maps
 - Navigation Charts
 - Series Maps
- Earth's Coordinate System
 - Datums 1: The Basics
 - Datums 2: More About Datums
- About Projections
- Commonly used Map Projections
- Map as a Summary of the World
- Making Your Map
- Marginalia Information
- Cartographic Considerations
- Map Specifications
- Tactical Mapping

Purpose of this site

ICSM has designed this site to provide a comprehensive general overview of maps, mapping, cartography and map production. **It is not intended to be a definitive reference, but rather to supply a consolidated summary of mapping concepts, principles and practice.** Hyperlinks are provided to other sites which offer more detailed information. Also, it is planned that existing pages will be continually up-dated and additional pages added from time to time.

Contents

- Overview to the Fundamentals of Mapping**
This is a brief outline of the core components to mapping the Earth.
[Read the Overview to the Fundamentals of Mapping Package -->](#)
- History of Mapping**
This is a brief outline of the sequence of the development of the science of map making. It lists some of the significant developments and people involved.
[Read more about the History of Mapping -->](#)
- Types of Maps**
There are many different types of maps, which are generally classified according to what they are attempting to show.
[Read more about different types of maps -->](#)
- Earth's Coordinate System**
The first step in converting the information contained in the real-world onto a 'piece of paper' was to devise a system where everything could be uniquely located in that world.
[Read more about Earth's Coordinate System - Latitude and Longitude -->](#)
- Datums 1: The Basics**

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Future Issues & Challenges

- Refining the geodetic datum
- Vertical datum and links to chart datum
- 3 D Cadastre
- Remaining aligned to international standards
- Standards governance
- Remaining responsive to changes in technology, user requirements and potential uses of information
- Continuing our work in times of limited funds



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Thank you



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Roads Information

Need for improved roads information to meet needs at national and international level:

- Security
- Emergency management
- Critical infrastructure protection
- Transport
- Tourism

Robust and nationally consistent approach needed to capture, maintain and distribute roads data

ICSM RWG formed in 2005

- Government mapping agencies
- Liaison with road transport authorities, other government users, industry and international bodies



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Roads Information


Achievements

- Agreed consistent jurisdictional practices for representation of features and national road classification
- Draft data dictionary and start on data model

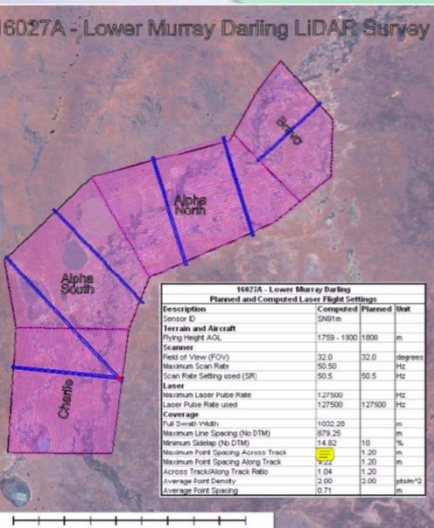
Ongoing stakeholder consultation and input

- ICSM working groups – road names, addressing
- Industry groups and users – data dictionary, desired attribution, role of government versus industry in capture and maintenance of roads information
- International groups - EuroRoadS

Aim to finalise data model in next 2 years



16027A - Lower Murray Darling LIDAR Survey



Description	Planned	Completed	Planned	Unit
Sensor ID	S981m			
Terrain and Aircraft Flying Height AGL	1750 - 1800	1800		m
Scanrate	32.0	32.0		degrees
Maximum Scan Rate	50.50			Hz
Scan Rate Setting used (SR)	50.5	50.5		Hz
Laser				
Maximum Laser Pulse Rate	127500			Hz
Laser Pulse Rate used	127500	127500		Hz
Coverage				
Full Swath Width	1000.20			m
Maximum Line Spacing (No DTG)	879.25			m
Maximum Spacing (No DTG)	14.82	10		%
Maximum Point Spacing Across Track	1.20			m
Maximum Point Spacing Along Track	7.22	1.20		m
Across Track/Along Track Ratio	1.04	1.20		
Average Point Density	2.00	2.00		pts/m ²
Average Point Spacing	0.71			m



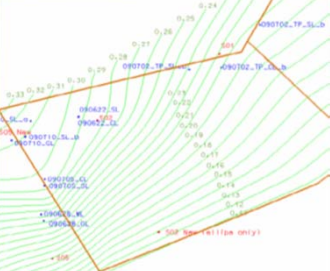
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Elevation Information

Requirements

- Technical guidelines and standards for the acquisition, processing and quality assurance of elevation data.
- Generic best practice 'Statements of Work' that may be used by agencies in developing project deliverables.
- National awareness of guidelines, best practice and standards

Elevation SIG established to address these requirements

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Elevation Information

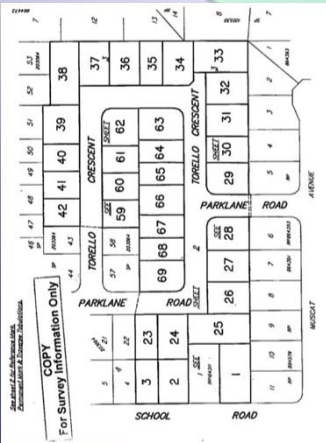
Achievements and Priorities:

- Version 1.0 of the National Guidelines for Elevation Data Acquisition was released in August 2008.
- "Best Practice" RFT Templates to be released late 2009
- NEDF "nested" Product specifications (early 2010)
- Metadata specifications (alignment of imagery and elevation) (mid 2010)
- Optimising management, processing and dissemination (commence early 2010)



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Cadastral Reform



Achievements

- Cost/benefit methodology for DCDB upgrade
- National (Australia & NZ) workshop on cadastres

Challenges:

- Understanding 3D cadastres including user demand and applications.
- Comparing jurisdiction practices to identify improved procedures and practices and increase consistency.
- Recognising the changing nature of cadastres and uses of cadastral data. For example:
 - ♦ Complex bundles of rights with multiple 'owners'
 - ♦ Uses of cadastral data include land and water management, fire recovery etc.