Integration of Statistical and Geospatial Information –
A Statistical Spatial Framework

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1. Evolution of the Framework in Australia

2. The Australian application of the Framework and linkage to other country systems
1. Evolution of the Framework in Australia
ABS - a strong geospatial history

Population Census – collect, process and disseminate

National Regional Profile

Land Account

Australian Statistical Geography Standard (ASGS)
2. Rateable value and land use

2.1 Land use and rateable land value

<table>
<thead>
<tr>
<th>Data item</th>
<th>Value (Unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area of this SA1 region</td>
<td>10,340.8 Ha</td>
</tr>
<tr>
<td>Rateable value</td>
<td>37.1 $m</td>
</tr>
<tr>
<td>Agriculture</td>
<td>52.6 %</td>
</tr>
<tr>
<td>Retail Wholesale</td>
<td>- %</td>
</tr>
<tr>
<td>Transport storage</td>
<td>0.2 %</td>
</tr>
<tr>
<td>Industrial</td>
<td>0.1 %</td>
</tr>
<tr>
<td>Sport, recreation, accommodation</td>
<td>- %</td>
</tr>
<tr>
<td>Community services</td>
<td>0 %</td>
</tr>
<tr>
<td>Residential</td>
<td>7.1 %</td>
</tr>
<tr>
<td>Vacant land - urban</td>
<td>8.1 %</td>
</tr>
<tr>
<td>Vacant land - rural</td>
<td>2.1 %</td>
</tr>
<tr>
<td>Other</td>
<td>4.7 %</td>
</tr>
<tr>
<td>Total rateable area</td>
<td>75 %</td>
</tr>
</tbody>
</table>

Source: Queensland Department of Environment and Resource Management (DERM)

2.2 Land use

<table>
<thead>
<tr>
<th>Data item</th>
<th>Value (Unit)</th>
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<tbody>
<tr>
<td>Area of this SA1 region</td>
<td>10,340.8 HA</td>
</tr>
<tr>
<td>Conservation and natural environments</td>
<td>13.4 %</td>
</tr>
<tr>
<td>Production from relatively natural environments</td>
<td>34.4 %</td>
</tr>
<tr>
<td>Production from dryland agriculture and plantations</td>
<td>0.0 %</td>
</tr>
<tr>
<td>Production from irrigated agriculture and plantations</td>
<td>47.4 %</td>
</tr>
<tr>
<td>Intensive uses</td>
<td>2.7 %</td>
</tr>
<tr>
<td>Water</td>
<td>2.1 %</td>
</tr>
</tbody>
</table>

Source: Australian Bureau of Agricultural and Resources Economics and Sciences (ABARES)
Australian Statistical Geography Standard (ASGS)
Changing information environment

- Growing demand for geostatistics
  - for smaller, more flexible regions
  - from administrative data
  - opportunities from big data & open data
- Maturing geospatial data infrastructure
- National statistical leadership role in geostatistics
- Statistical architecture modernisation
  - changes within Australian Bureau of Statistics
  - international collaboration
ANZLIC - Foundation Spatial Data Framework
Statistical Community

NSS Socio-Economic Datasets

Core Statistical
- Census, Demographics, Agriculture, Building, Labour Force, etc.

Tax
- Income and Business Tax

Immigration

Health
- Medicare, Pharmaceuticals, Workforce

Land Valuation and Use

Social Welfare
- Unemployment, Disability, Family Support

Others ...

Spatial Community

Foundation Spatial Data Frameworks
- Fundamental Elements

Data layers:
- Admin. & statistical boundaries
- Addressing, Place Names
- Transport, Water
- Land and Property
- Elevation and Depth
- Imagery
- Positioning

SSF bridge
Metcalf’s law
2. The Australian application of the Framework and linkage to other country systems
Vision

Informed decision making is enhanced by using location in a common framework to allow seamless integration of administrative, statistical and geospatial information resources.
The General Framework

- Standards & Guidelines
- Metadata interoperability
- Common geographic boundaries
- Data management: geocoded unit record data
- Authoritative geospatial infrastructure and geocoding
Authoritative geospatial infrastructure and geocoding

Use Foundation Spatial Data as geospatial inputs. Undertake geocoding using relevant National Address Management Framework (NAMF) protocols.

- PSMA G-NAF (geocoded address file), basemap and cadastre
- National Address Management Framework (NAMF)
- Geocoding guidance material
- Point-of-entry address validation

- Consistent address/location information
- Consistent geocoding
- Consistent management of geocoding and geocoding issues
### Data management – geocoded unit record data

Geocodes stored on unit records are location coordinates and ASGS Mesh Blocks. Use statistical data management frameworks.

<table>
<thead>
<tr>
<th>SSF Principle</th>
<th>SSF Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Aust. SSF</strong></td>
<td>• Consistent and interpretable geocode information</td>
</tr>
<tr>
<td><strong>SSF Outcomes</strong></td>
<td>• Flexibility in production of regionalised data into the future</td>
</tr>
<tr>
<td></td>
<td>• Effective data management to ensure privacy and metadata management</td>
</tr>
<tr>
<td></td>
<td>• Simplified aggregation of data to regions or conversion between regions</td>
</tr>
</tbody>
</table>

- Latitude and longitude data
- ASGS Mesh Blocks
- Geocode metadata*
- Mesh Block allocation tables
- Geographic correspondences
Australian Statistical Geography Standard (ASGS)
Common geographic boundaries

Data is released for Australian Statistical Geography Standard (ASGS) Statistical Area structure regions – as a minimum

- ASGS classifications and boundaries
- Guidance material on the use of regions (geographies) in statistics
- Metadata to support dissemination regions*

- Data from disparate sources are integrated using common geography
- Metadata for dissemination regions supports data integration and use
- Use of population-based functional geography simplifies visualisation and analysis
Interoperable Metadata

Use international statistical and geospatial metadata standards*

• Statistical frameworks* - SDMX and DDI, GSBP and GSIM
• Geospatial standard - ISO19115 Metadata Profile
• Semantic web – the near future*

SSF Outcomes

• Discovery, use and integration of information is supported by statistical and geospatial metadata frameworks
• Semantic web enables machine to machine access and dynamic linkage
Common Statistical Production Architecture

**Business Architecture**
- General Statistical Business Process Model – GSBPM

**Information Architecture**
- General Statistical Information Model – GSIM

**Application Architecture**
- Data Documentation Initiative – DDI
- Statistical Data and Metadata Exchange – SDMX

**Technology Architecture**
- National Statistical Office - NSO

Geospatial Data and Metadata
Policies, standards and guidelines support the creation and use of geospatially enabled information*

- Guidance on the SSF content
- Guidance on other topics: Privacy, Dissemination*, Visualisation*, Analysis*

- Statistical practitioners have resources to assist them in implementing the SSF
- Experienced and novice data users have resources to assist them using geospatial information
Vision

Informed decision making is enhanced by using location in a common framework to allow seamless integration of administrative, statistical and geospatial information resources.
For more information
E-mail: geography@abs.gov.au
Visit: www.nss.gov.au