

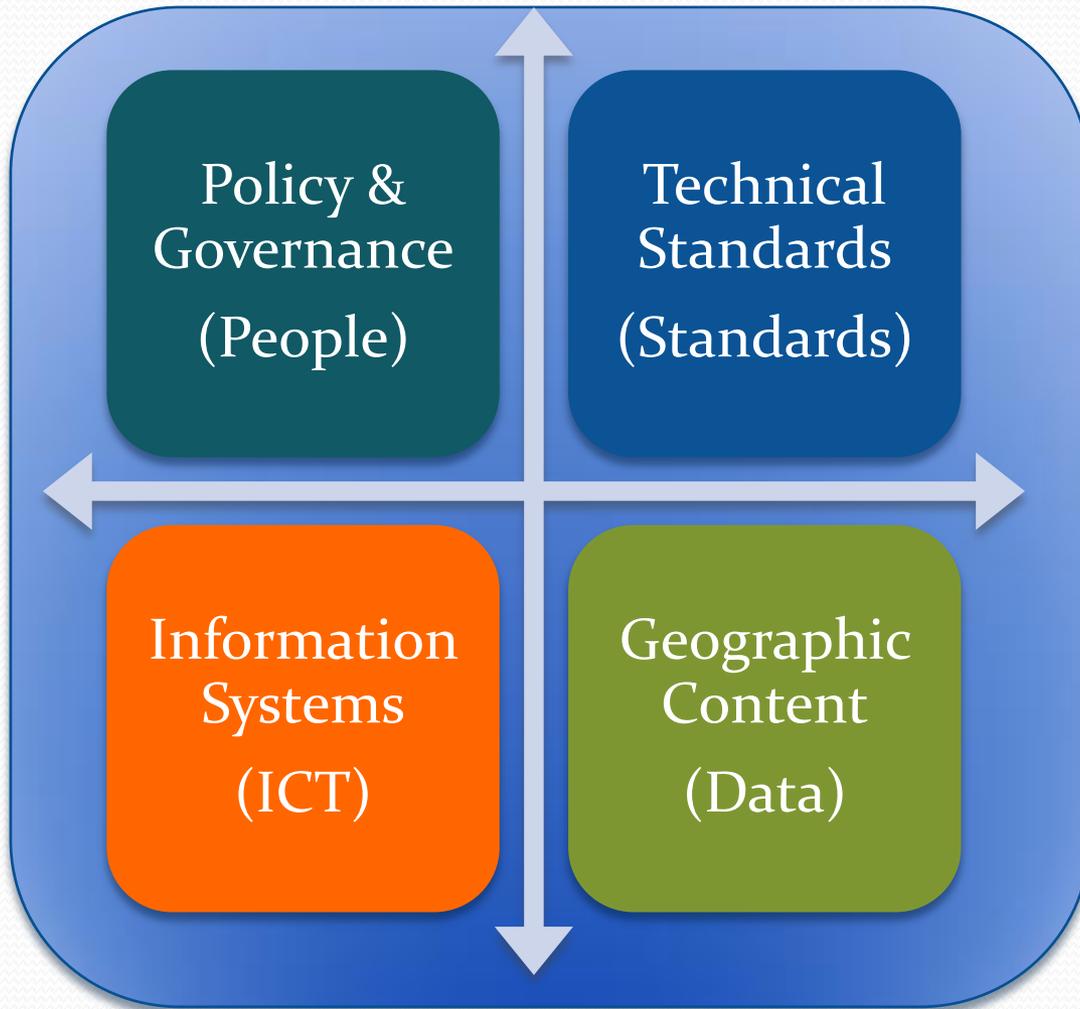
The Key Elements of SDI

Data

Dr Mike Osborne – OceanWise Ltd

Contents

- Key Components of SDI
- Approaches to Data
- Data Principles
- Legacy and Provenance
- Examples



National or Enterprise Spatial Data Infrastructure

- Training
- Specifications
- Change Management
- Data Strengthening

Geographic Content (Data)

National or Enterprise Spatial Data Infrastructure

- Training
- Specifications
- Change
Management
- **Data
Strengthening**

Data Policy & Strategy

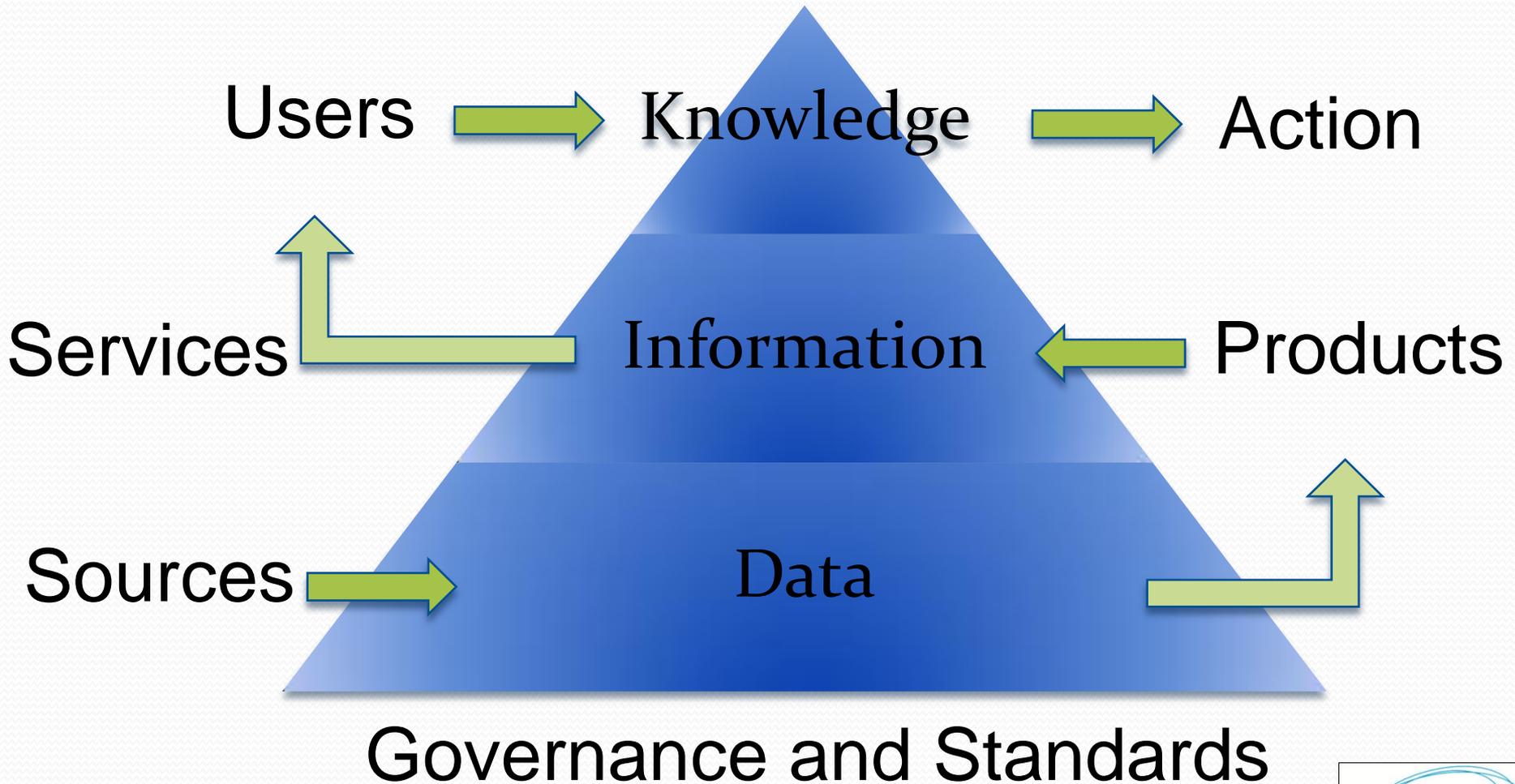
Ensure the effective running of business functions and processes by providing readily accessible 'fit for purpose' data and information

Implement principles and processes that identify, control and maintain the supply of data in accordance with required best practice

Data Management Principles

- ✓ A policy and strategy stating the importance of data and data management should be prepared and adopted by the highest level of management
- ✓ Data used in core business functions should be identified, recorded and controlled in the form of a register known as the Master Data Register (MDR)
- ✓ All personnel should be informed of the data policy and management system and appropriately trained in data management best practice
- ✓ Data should have an identified primary source and be managed as close to this source as possible. Data replicates should be kept to a minimum
- ✓ Data should be accompanied with metadata which accurately describes its purpose, provenance, Geographic Coordinate Reference System (CRS) and restrictions on use. An appropriate standard for metadata should be used for this.

Data - Information - Knowledge

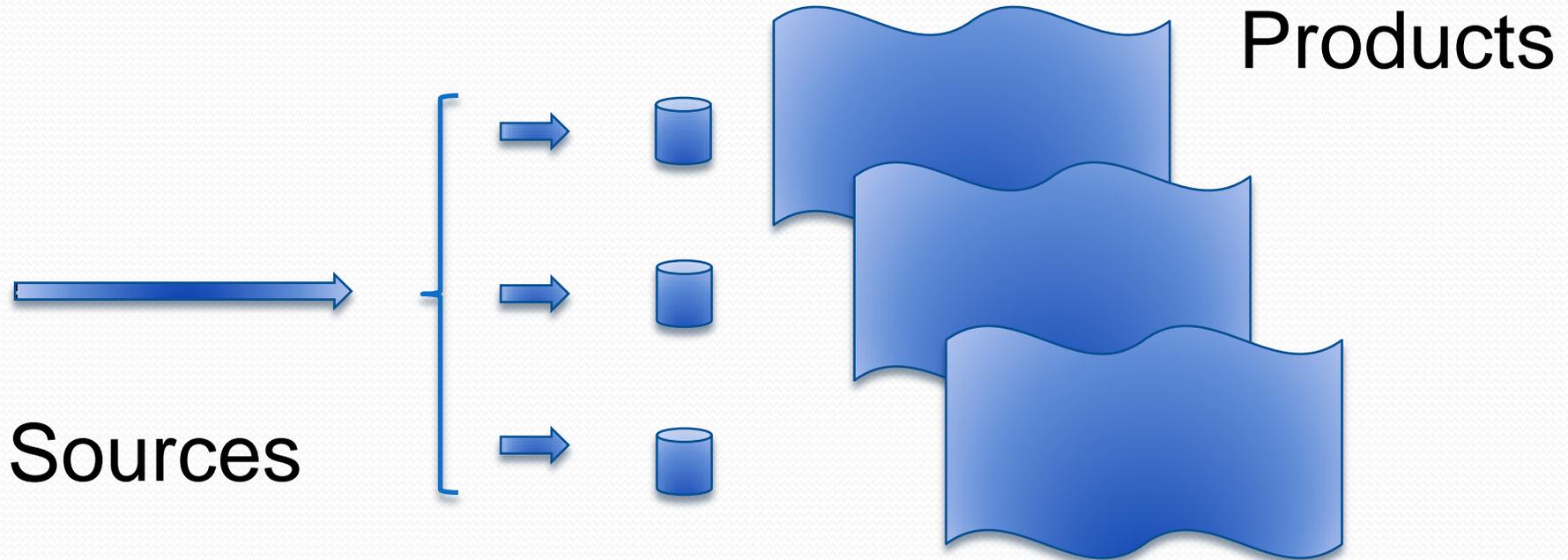


Data Management Approaches

- 1) Process or Product Driven 2) Data or Source Driven

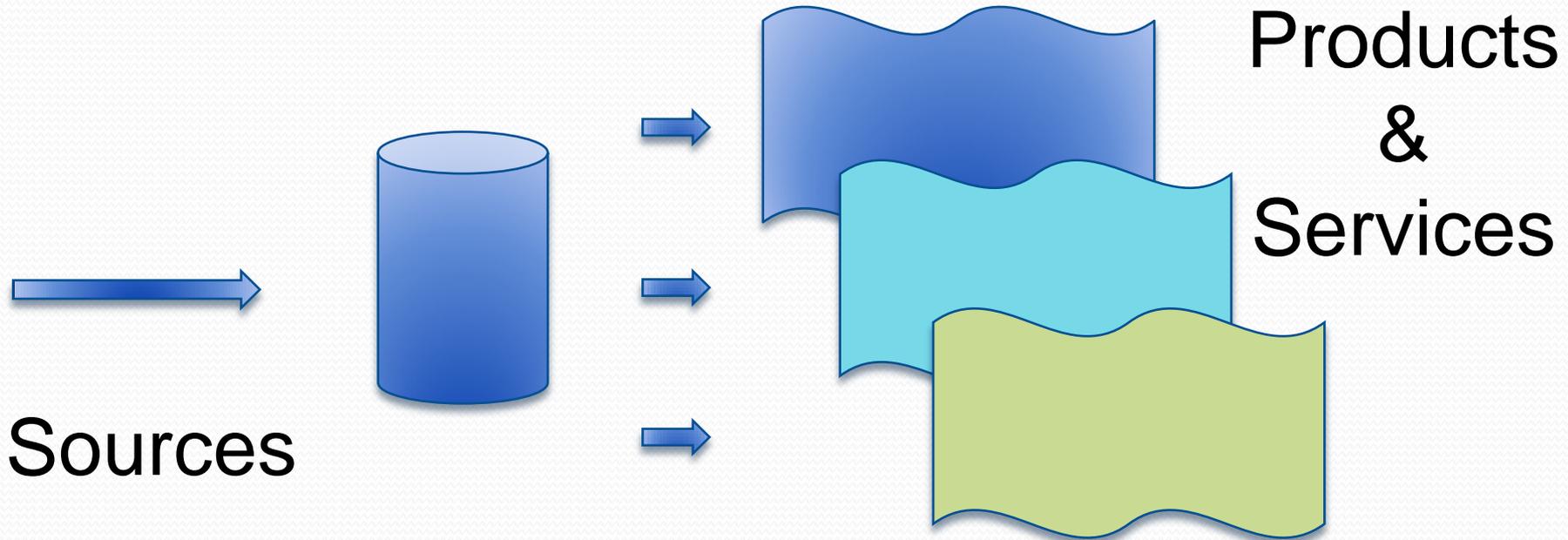


Process or Product Driven



Data is assessed used to update individual products at the output level

Data or Source Driven



Data is assessed and stored as a central resource for use in multiple products and services

Conceptual Model

Multiple Inputs

Source 1

Extract,
Transform
& Load

Source 2

Source 3

Source 4

...



Minimize



Maximize

Multiple Outputs

Product 1

Product 2 ...

Service 1

Service 2

...



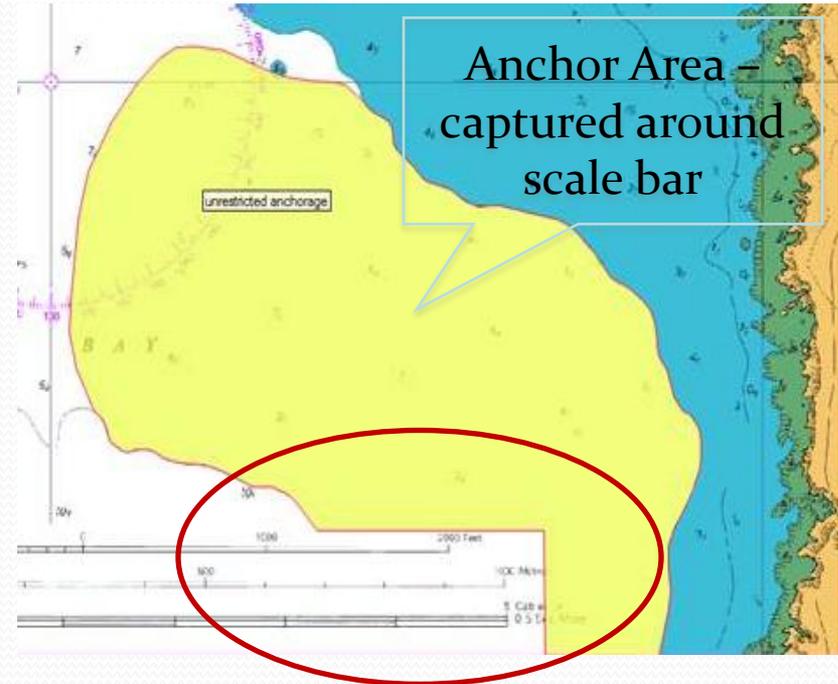
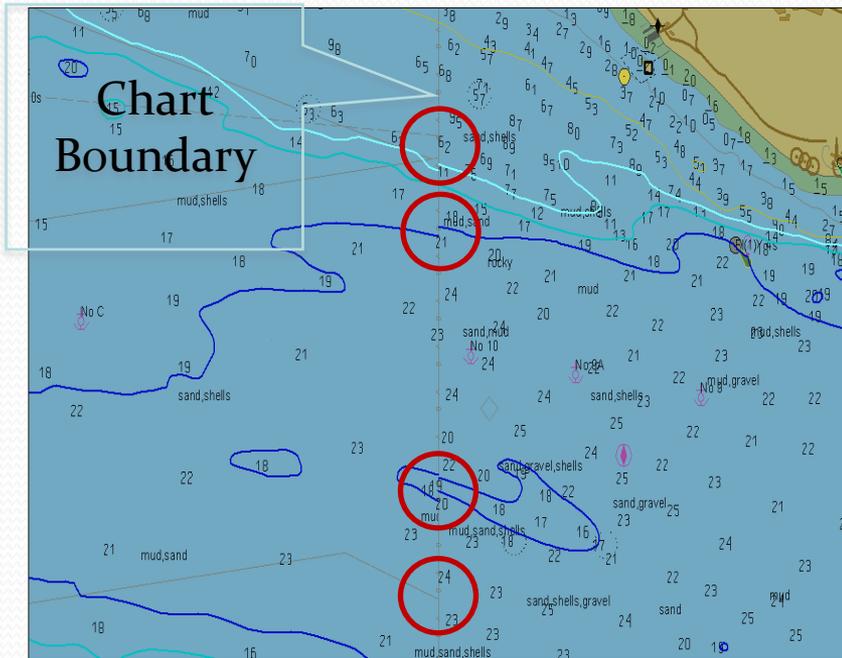
Publish



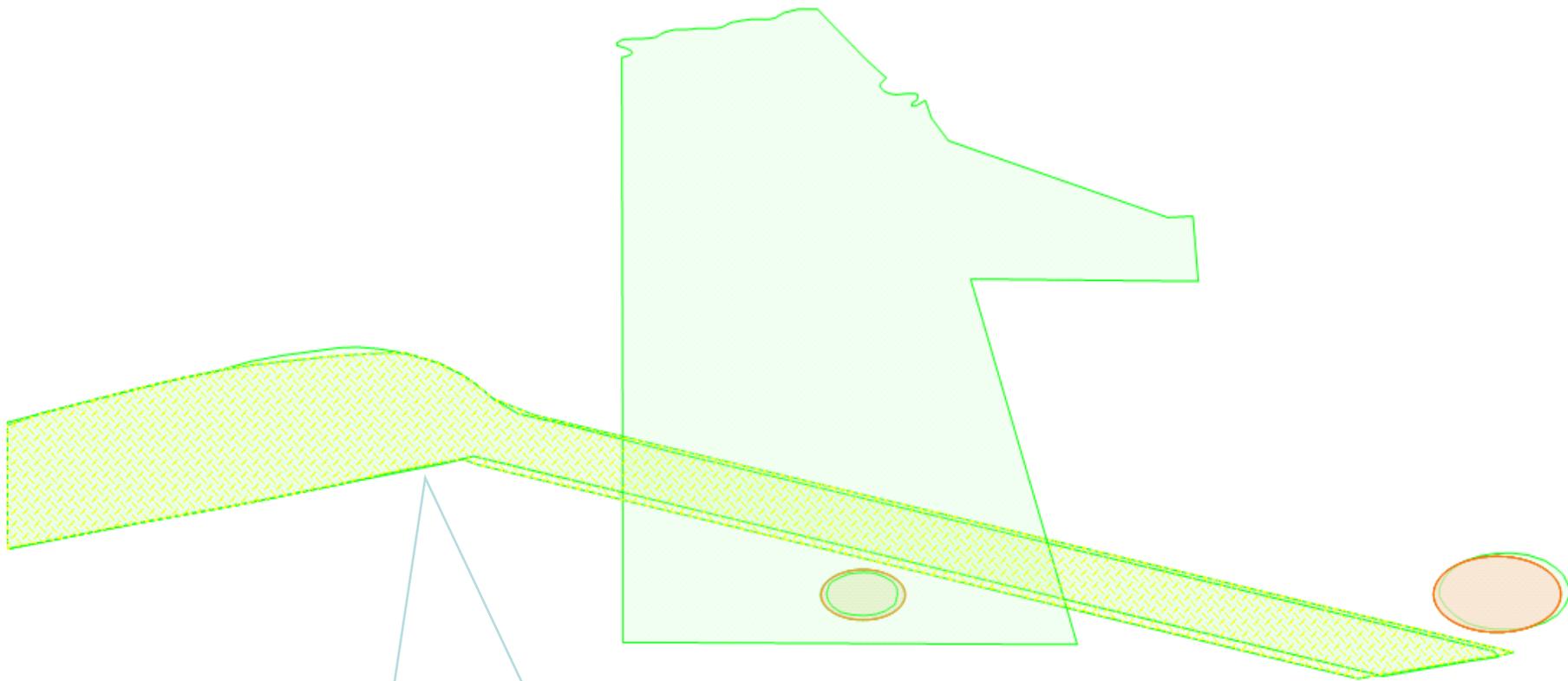
Sources may be internal (e.g. processed data from another department), an internal copy of an external dataset or link to external resource (URI).

Aim to minimize time spent on ETL and maximize data re-use

Legacy Issues

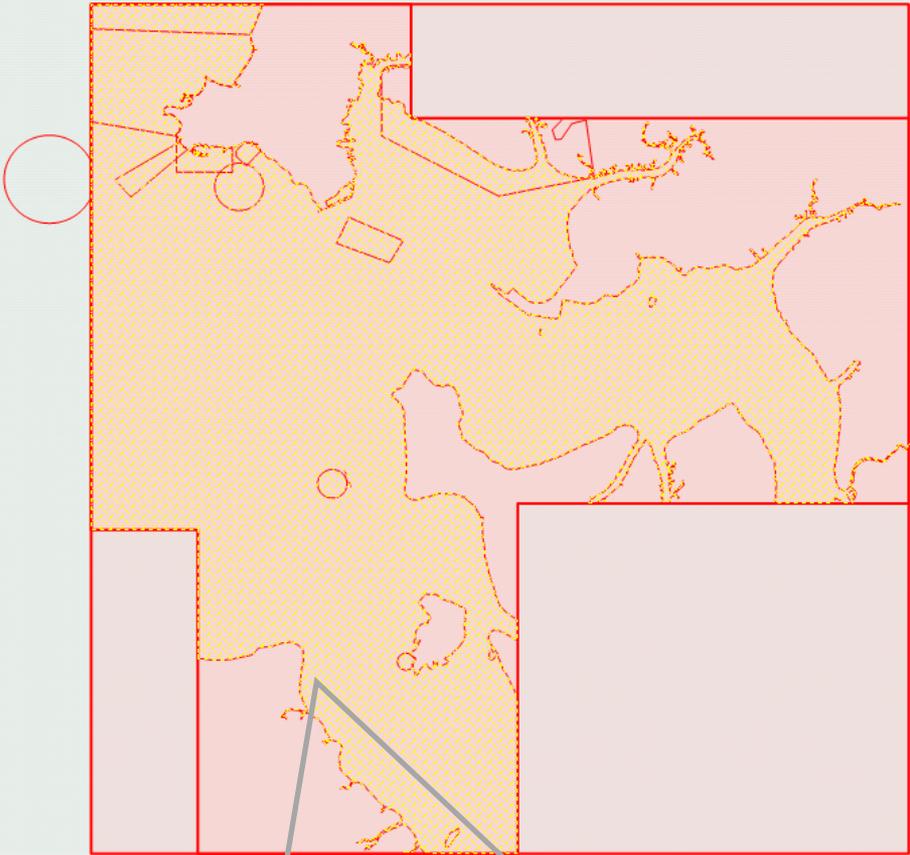


- Many ENC's are vector facsimiles of original paper charts
- Individual ENC's contain inconsistent and discontinuous features
- Spatial data management and GIS are now fundamental skillsets



Multiple geometries (RESARE) from
two different coastal scale ENC cells

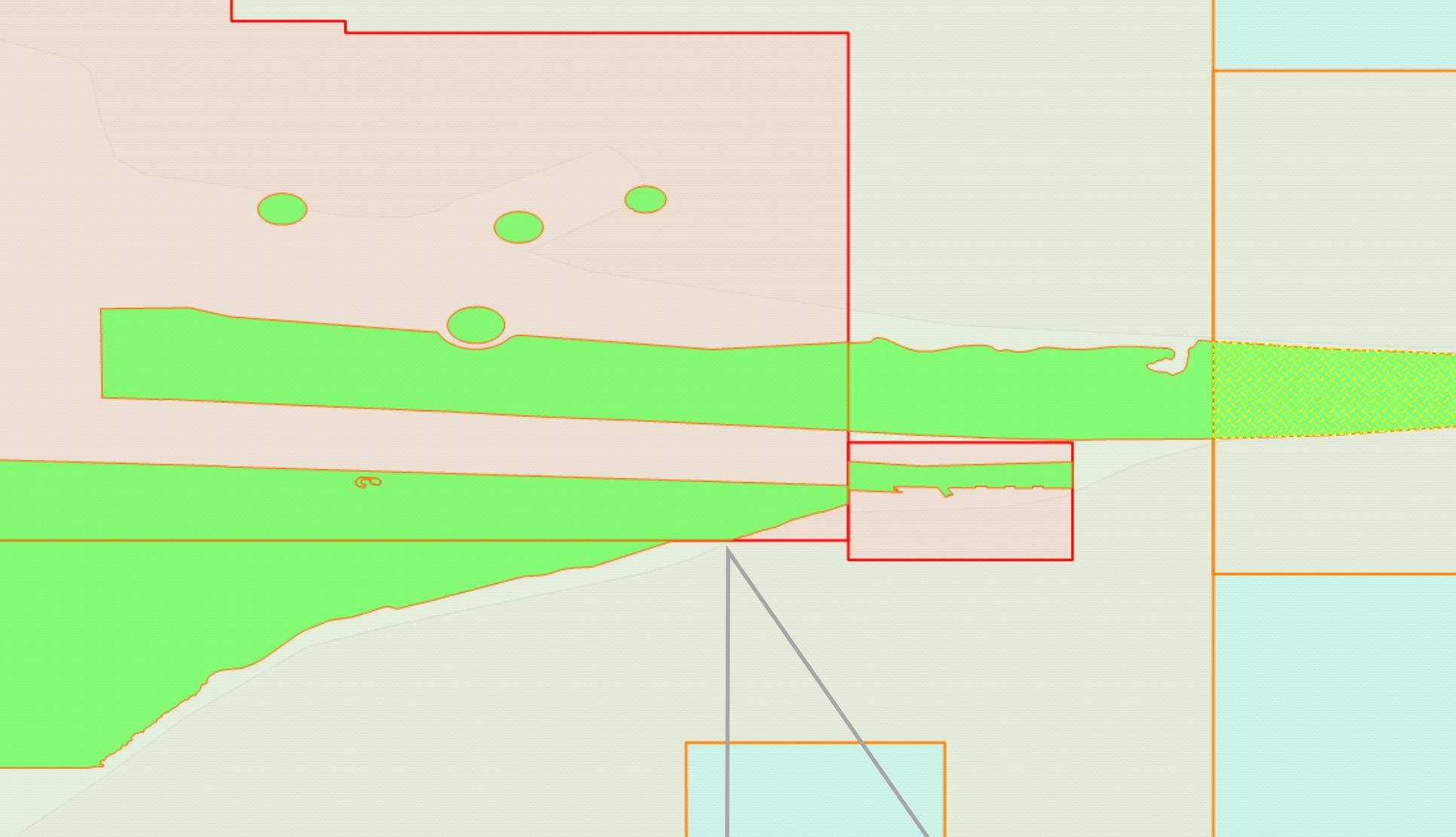
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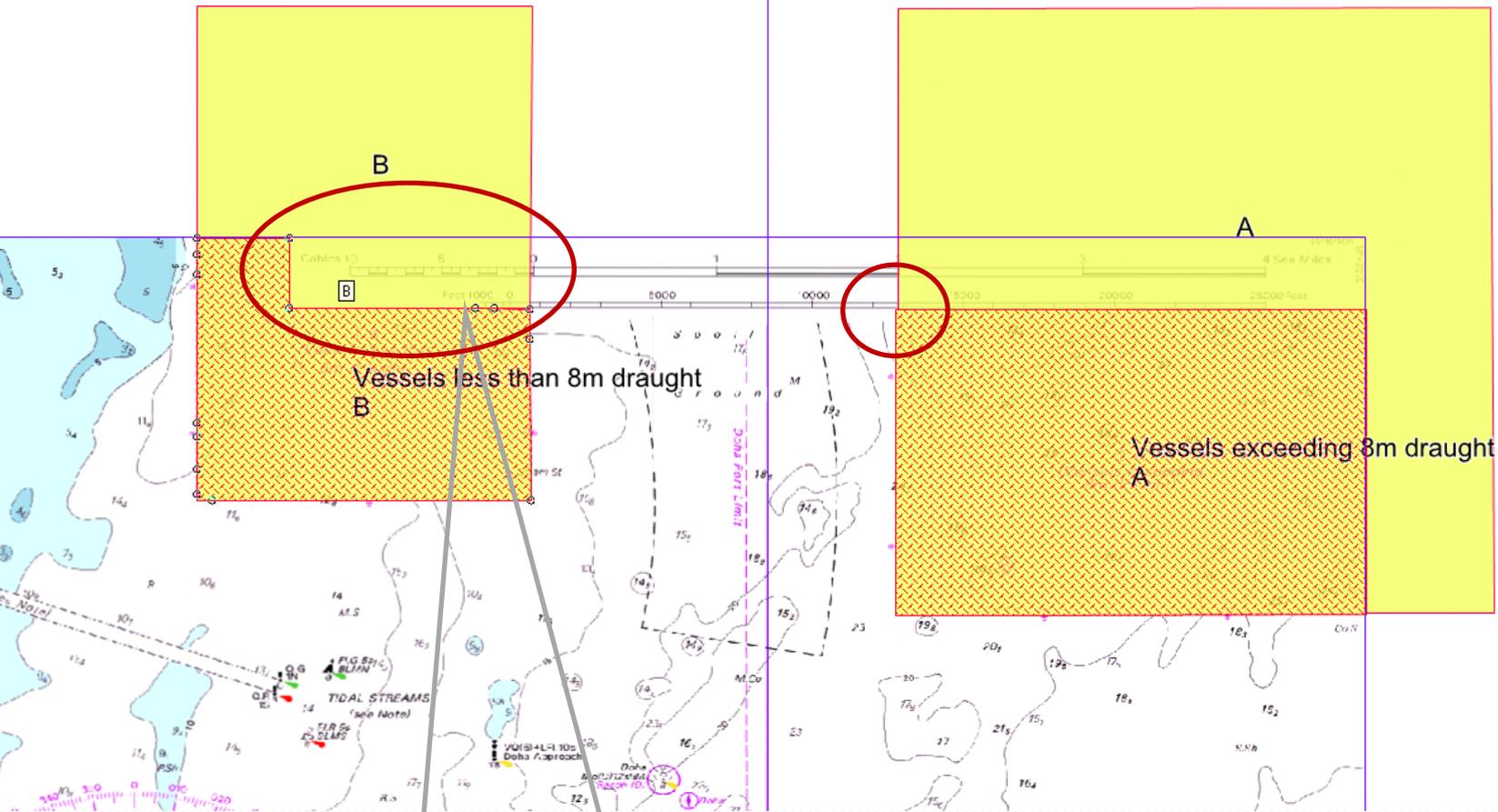
Geometry (RESARE) fills entire ENC cell

Property	Value
Schema	
GID	2003087385
THEME	5
FEATURE_CODE	54050
NAME	Darwin Security Regulated ...
DESCRIPTION	Restricted area
CATEGORY	
SOURCE_DATE	
SOURCE_INDICATION	S57;10-12666814-2
INFORMATION	
CONDITION	
STATUS	
RESTRICTIONS	entry restricted
NATIONALITY	
ACCURACY	
UPDATED	29/Nov/2012 00:00
CLASS	4
SOURCE_TABLE	
Attributes	
CLASS	4
DESCRIPTION	Restricted area
FEATURE_CODE	54050
GID	2003087385
NAME	Darwin Security Regulated ...
RESTRICTIONS	entry restricted
SOURCE_INDICATION	S57;10-12666814-2
THEME	5
UPDATED	29/Nov/2012 00:00
Geometry	
Area	129890806.234077
Clockwise	False
Simple	True
Length	170090.496661216
Number of loop edges	7963
Number of loops	23
Origin Latitude	-12.5071141008806
Origin Longitude	130.856169087475
Origin X	14566842.1099762
Origin Y	-1392285.5730034
Origin Z	0
Splinter factor	17.8123212845873
Straight	True
Size in X	17068.9848776538
Size in Y	17996.6547222291
Size in Z	0
Thin in X	False



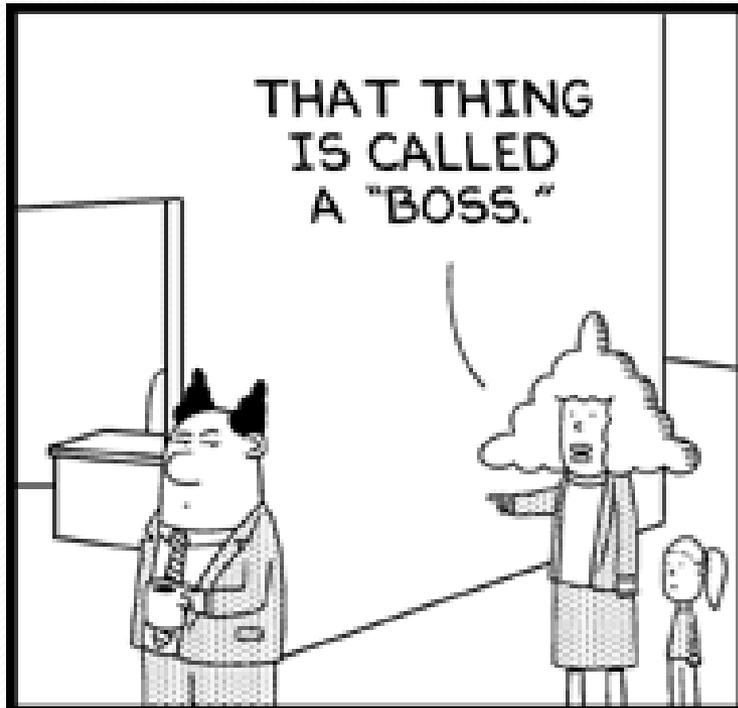


Geometry (RESARE) inconsistent within and between ENC scale bands



Different and inconsistent geometry
AND attributes

... equals inefficiency and limitation

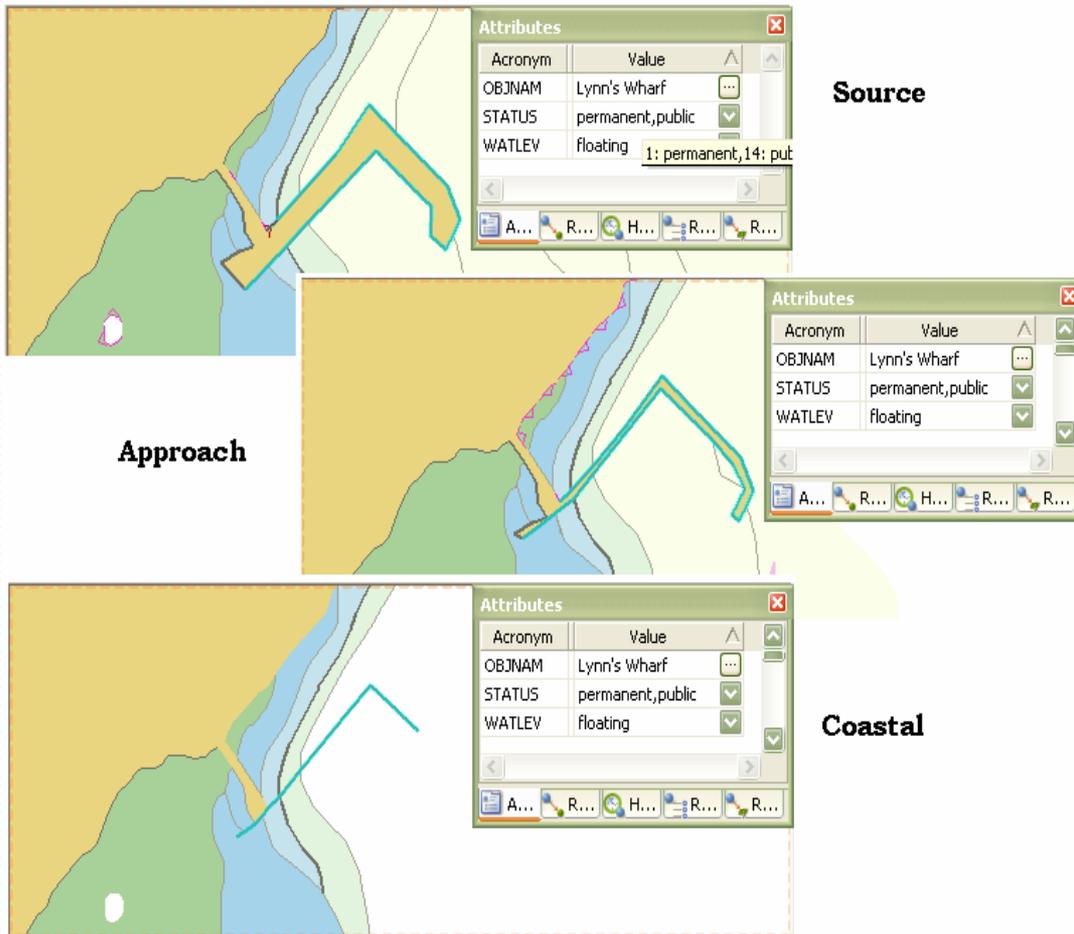


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Modern Data and GIS Practices



Multiple Geometries
aligned with ENC Use

Singular linked attributes

Connected nodes across
ENC boundaries

Supports:

- increased efficiencies
- data fit for e-navigation
- wider uses incl. MSDI

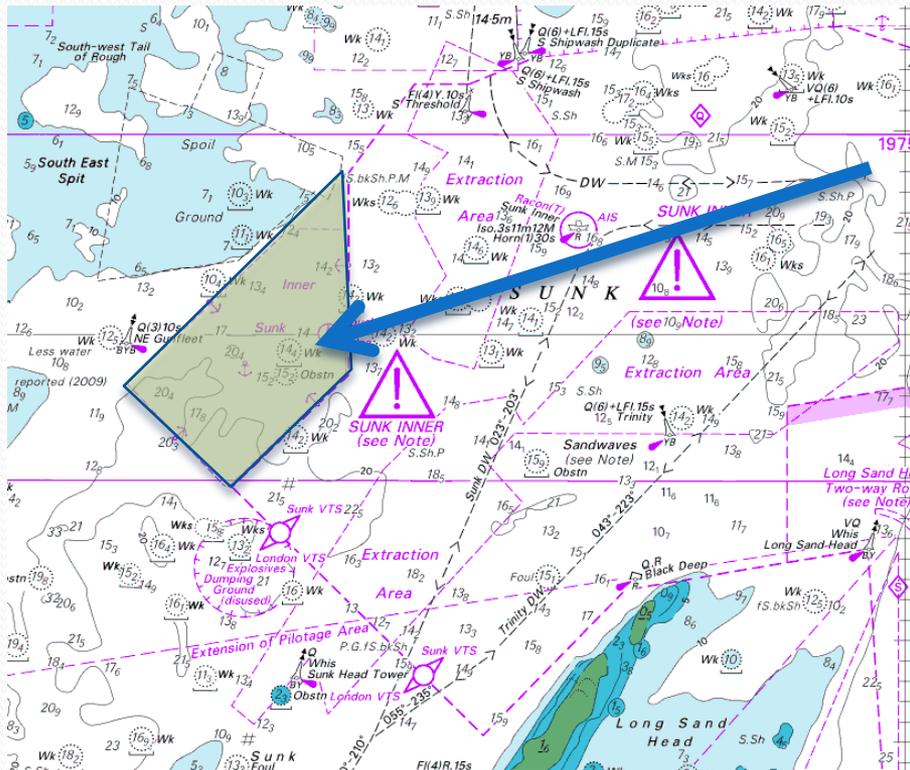
Source: CHC Proceedings, 2008

Source: OceanWise Marine Themes

Seamless
Accurate
Definitive
Comprehensive
Themed
Harmonised
Attributed
Linked
Reference Data
Layers



Provenance Issues



Example:

Anchor Area may only exist on original chart (and hence ENC)

Wider use requires provenance to be identified and potentially defended - in court possibly

Solution is to move to source database and link to responsible instrument (may be legal)

Finally ...

- Data or Source Centric Approach:
 - Increases efficiencies
 - Supports wider applications (including MSDI)
 - Legacy issues can be overcome (with care and expertise)
- Provenance issues will take longer to resolve
- Paper based practices are no longer appropriate
- Requires new approach and skills to be developed
- Implementing rules will ensure data is fit for purpose



Thank you ...

**End-to-End Marine and Coastal Data
Management and Decision Support**

www.OceanWise.eu