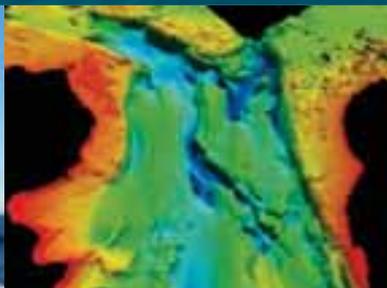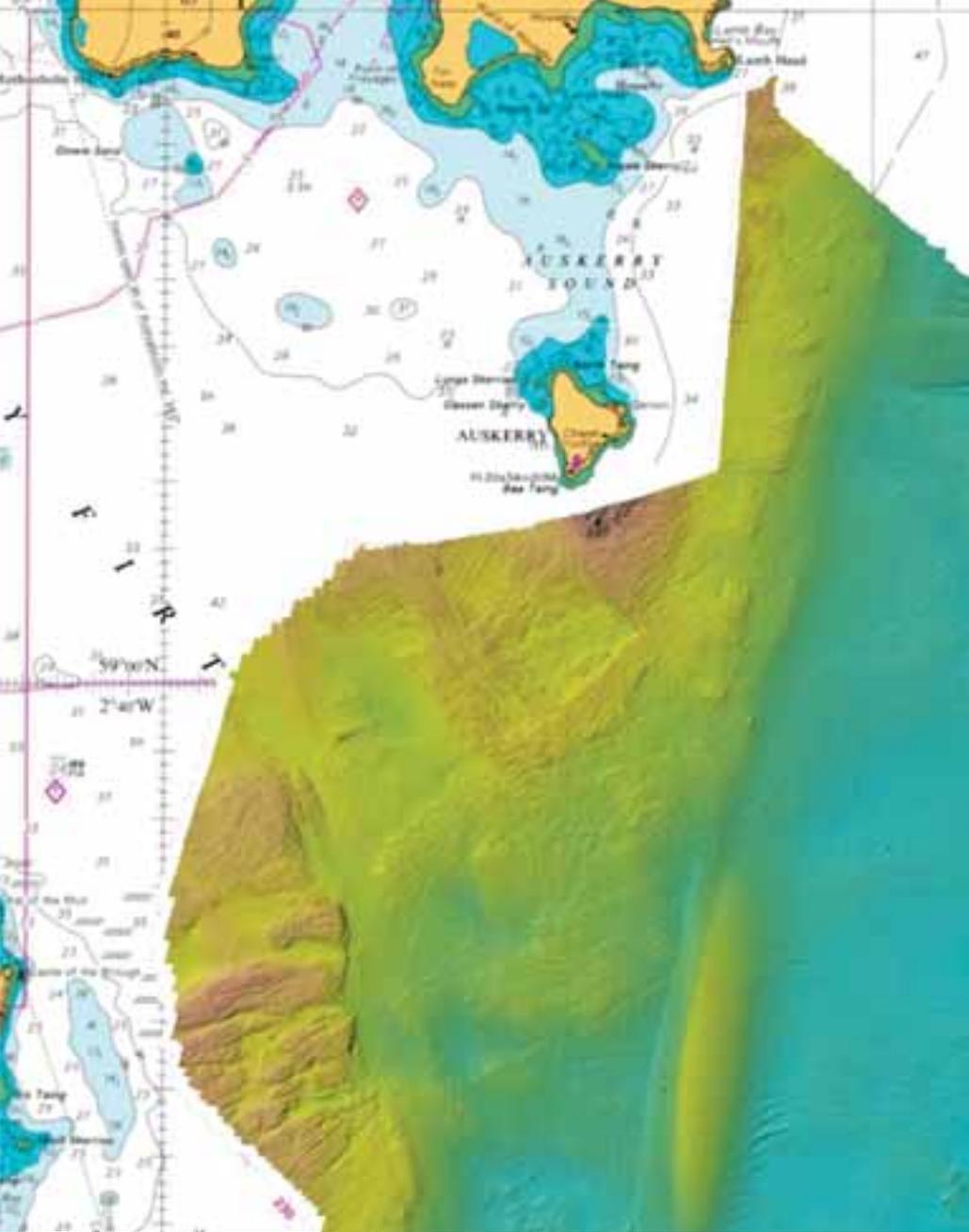Duncan Mallace

Managing bathymetric data in a hydrographic survey company

Overview

- Brief Introduction to MMT

- Why we need to manage bathy data

- The BIS

- Inputting Data to the BIS

- Using the BIS

- How MMT use GIS

- GIS Product workflows

Company Profile

- High Resolution Seabed Mapping, Pipeline, Geophysical and Geotechnical Surveying
- MMT Swedish company founded in 1976, MMT UK (NetSurvey) established 2002
- Offices in Gothenburg, Sweden & Banbury, UK
- Privately owned
- 230 specialists
- 8 vessels

MMT

SV Franklin

SV Ping
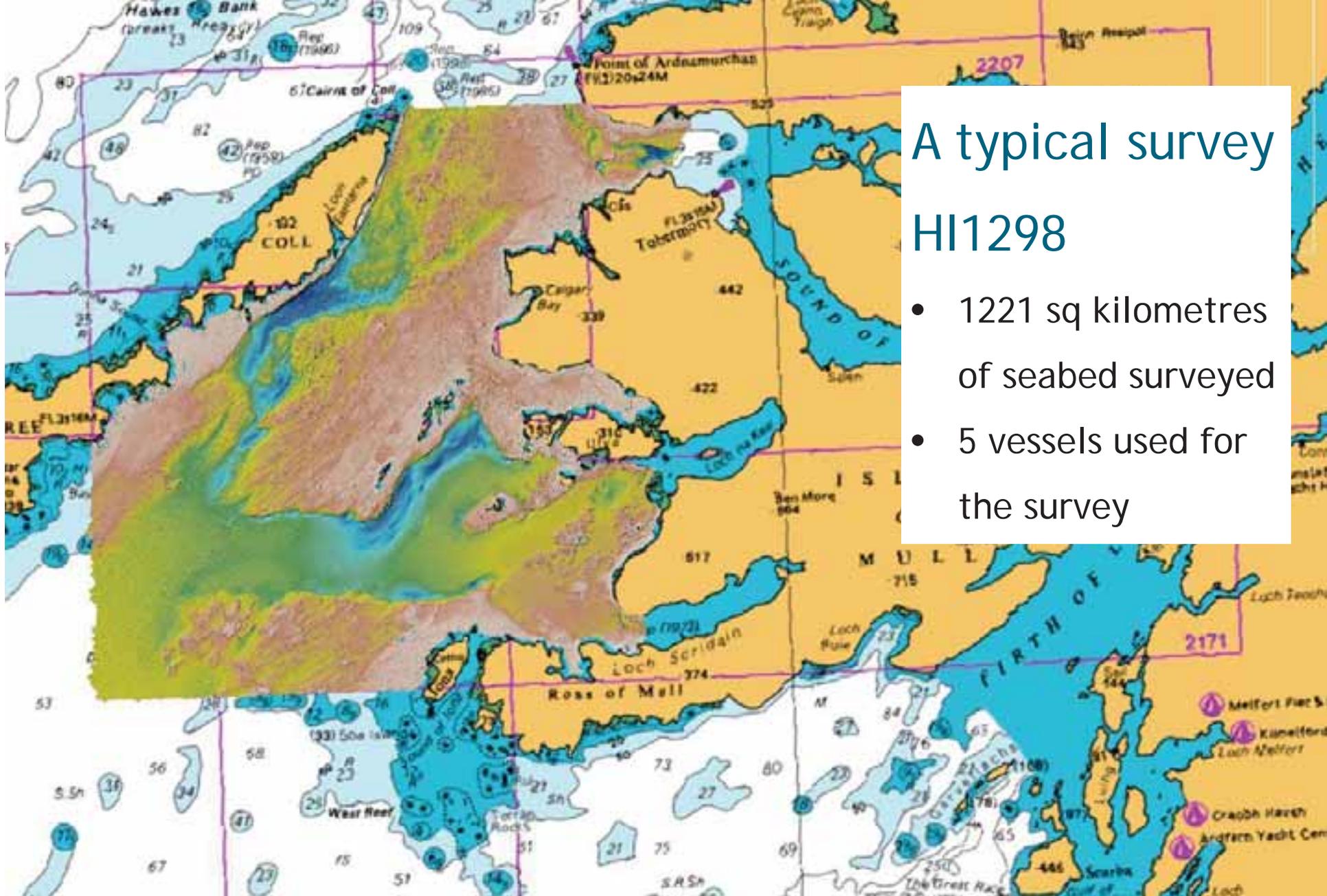
Fishing trawl scour off Humber or P for Perfect Survey?
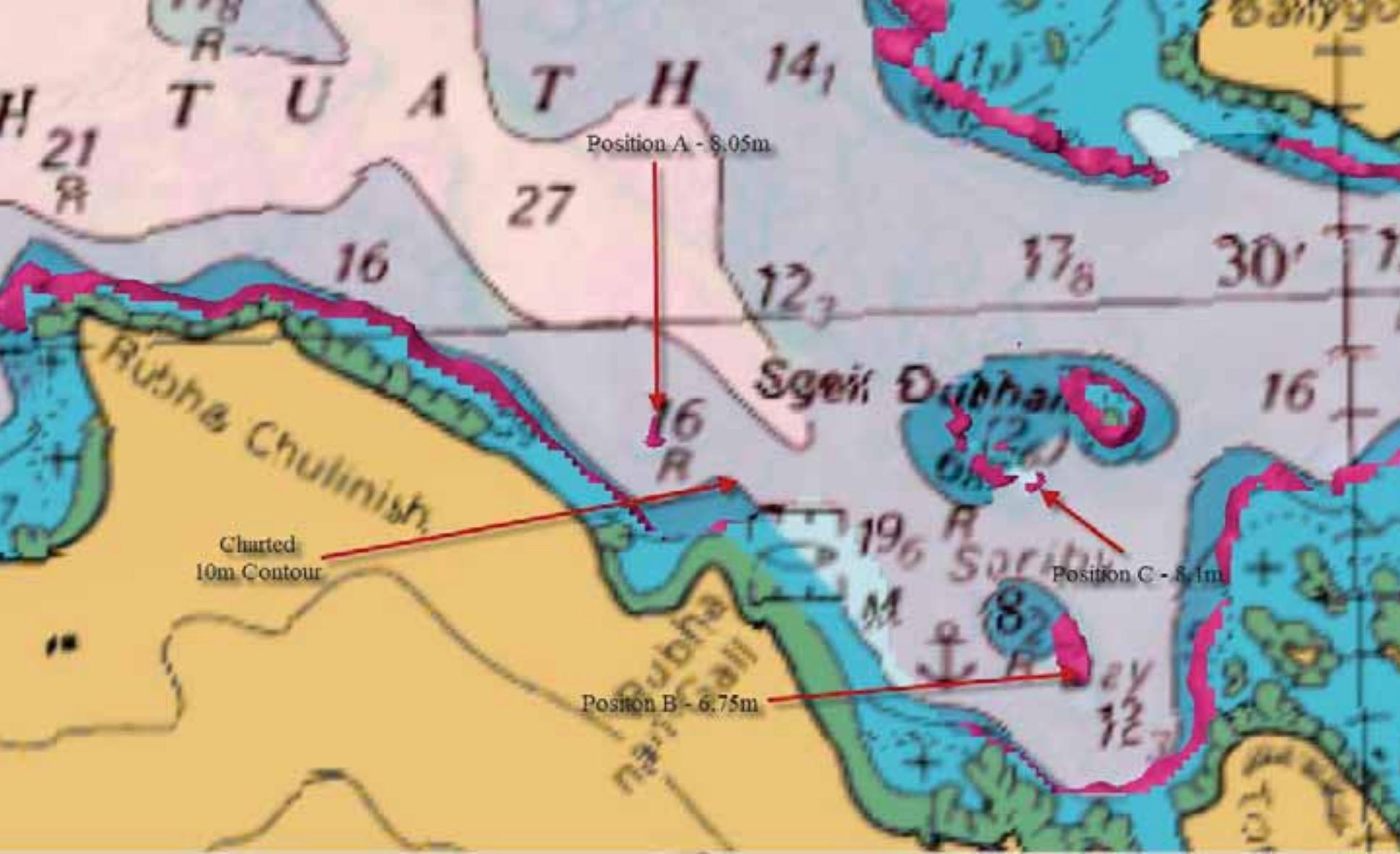
UK Hydrographic Surveys in 2012

- 10 Individual areas surveyed and rendered
- Over 10,000 sq kilometres of seabed surveyed (1/72th of UK EEZ)
- 10.5 TBs of raw data collected
- 1st CUBE deliverable from a main Hydrographic Instruction
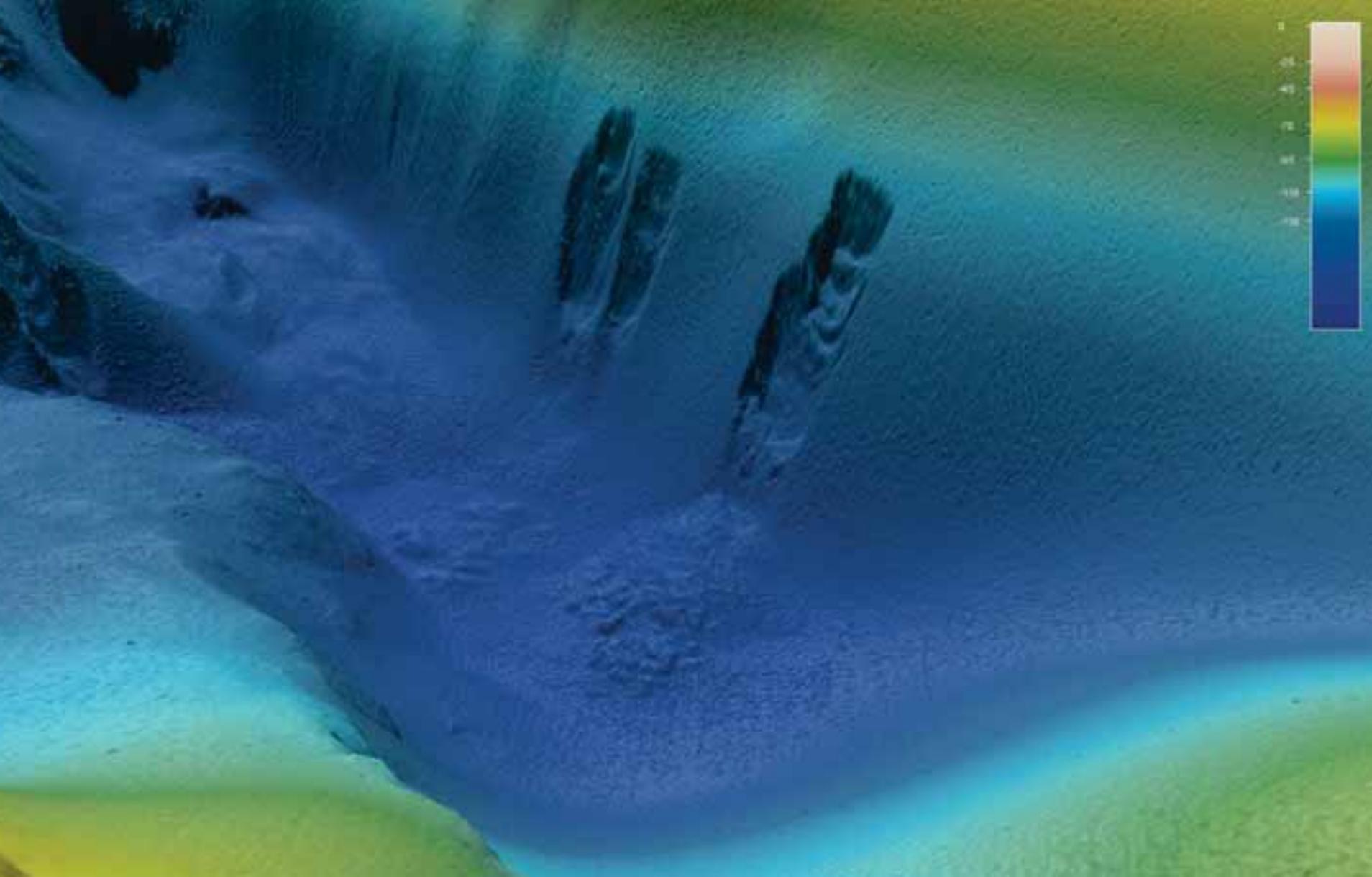- 8 vessels used

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A typical survey HI1298
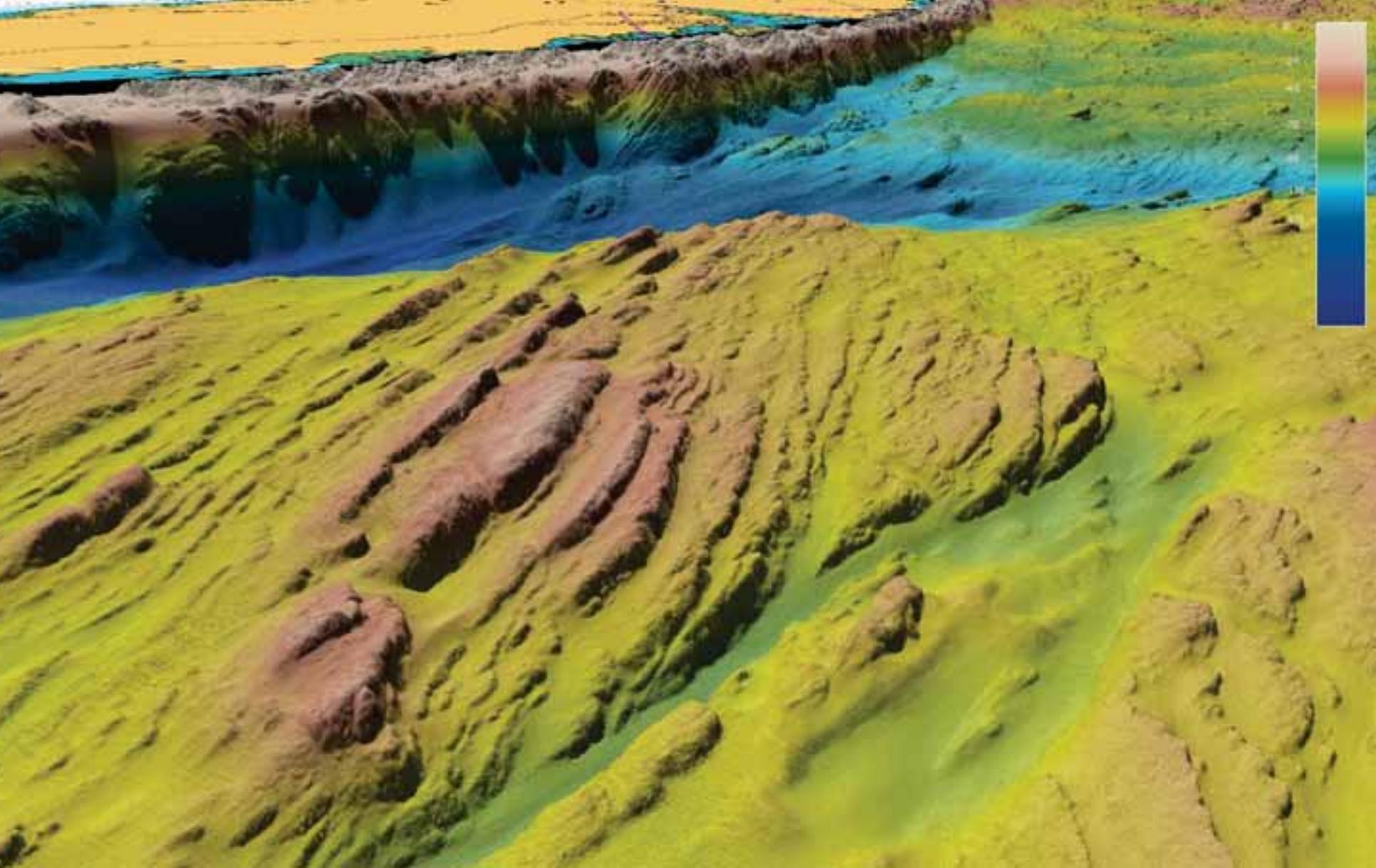
- 1221 sq kilometres of seabed surveyed
- 5 vessels used for the survey

Example Chart Discrepancy

Seabed Slump to North of Mull

Beautiful Bathymetry

Market segments & Clients

Oil & Gas
- Pipeline route survey
- Site survey
- Pipeline inspections

Renewables
- Wind park surveys
- Site surveys wave & tidal energy

Hydrographic
- Large scale IHO mapping

Environmental
- Environmental impact assessment
- Habitat mapping
- Species Assessment

Cables
- Power cable route survey
- Telecommunication cable survey

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The problem

IT naughty chair!

DO WE PRODUCE SEABED MAPS OR CHARTS?

WHAT TYPES OF PRODUCT DO WE NEED TO CREATE?

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Folder View

100853-Dong 2012 Annual Pipeline Inspection	02/10/2012 13:31	File folder
101010_Suldalsvatnet	14/09/2012 08:11	File folder
500197-HI1298	19/10/2012 16:53	File folder
500199-HI1362	01/11/2012 08:26	File folder
500203-HI1297	18/10/2012 15:48	File folder
500205-HI1372 - Inner Approaches to Moray Firth	16/10/2012 11:53	File folder
500206-HI1371 Sound of Jura	26/10/2012 12:52	File folder
500207-HI1370 Approaches to Sound of Jura	31/10/2012 18:16	File folder
500208-HI1392 - Approaches to Inner Sound	30/08/2012 14:54	File folder
500211-HI1394 - Eddrachillis Bay	17/09/2012 14:59	File folder
500213-Chatham Docks 2012	09/05/2012 11:47	File folder
500215-JNCC_Backscatter_Processing	13/07/2012 14:52	File folder
500216-Skandi Inspector Survey Support	17/10/2012 18:23	File folder
500230-HI1393 - Approaches to Loch Inver	13/07/2012 16:02	File folder
500232-Operation Iceberg	02/10/2012 14:46	File folder
500234-HI1405 St Catherine's Deep	06/09/2012 18:38	File folder
500238-Ramsgate_Harbour	18/09/2012 16:51	File folder
500239-HI1408_Sefton	22/10/2012 09:28	File folder
500244-MoD-Moray Firth	12/07/2012 16:52	File folder
500247-HI1397-East Anglia RR	10/10/2012 14:00	File folder
500248-HI1398-Thames Estuary-RR	19/10/2012 17:03	File folder
500249-HI1399-Dover Strait-RR	25/07/2012 19:07	File folder
500250-HI1355-Kintyre Renewables Area	09/10/2012 13:05	File folder
500257-MCA_RichardMontgomery_2012	08/10/2012 17:13	File folder
500263-CEFAS	17/10/2012 08:37	File folder

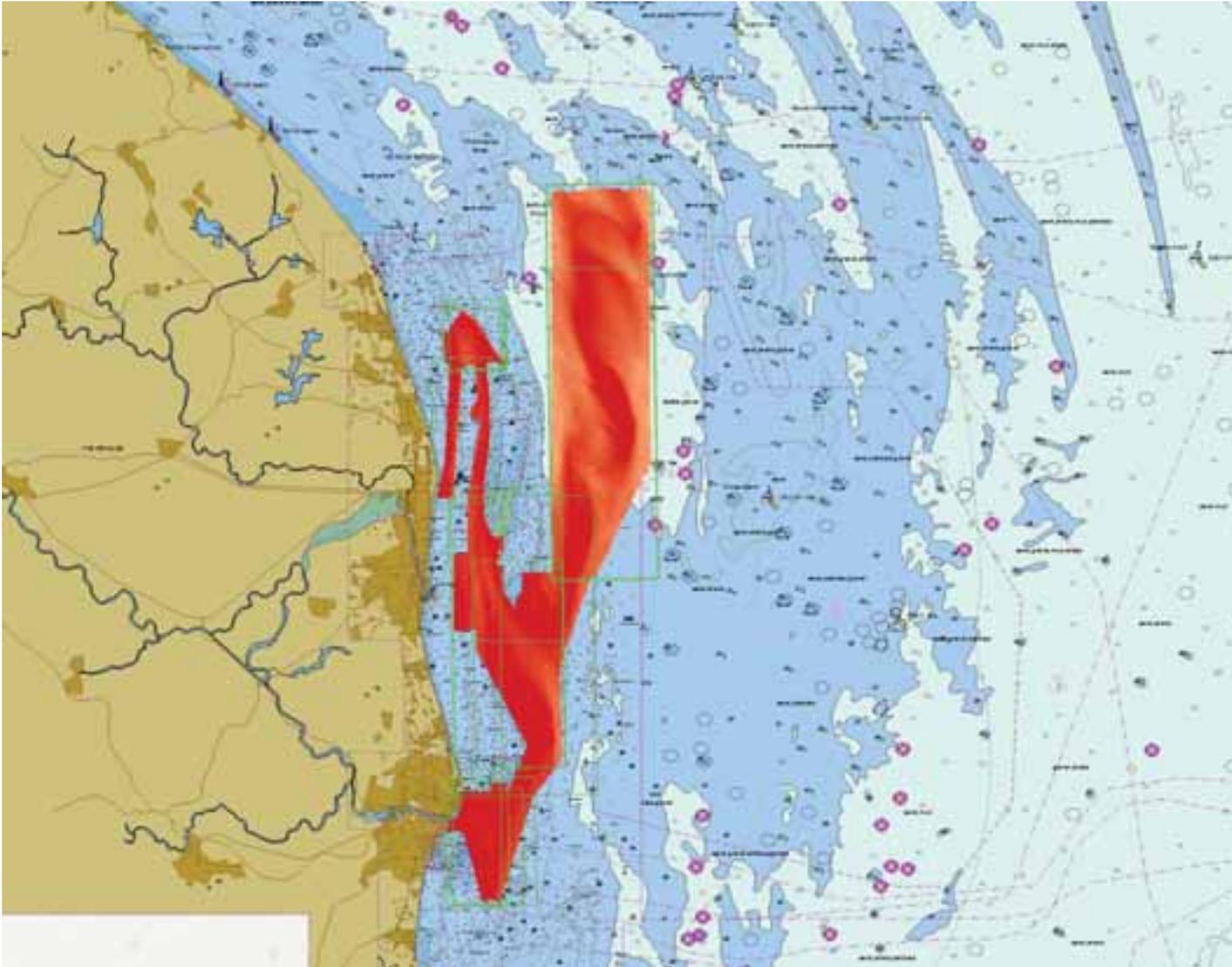For a spatially aware profession we have a strange view of file storage!

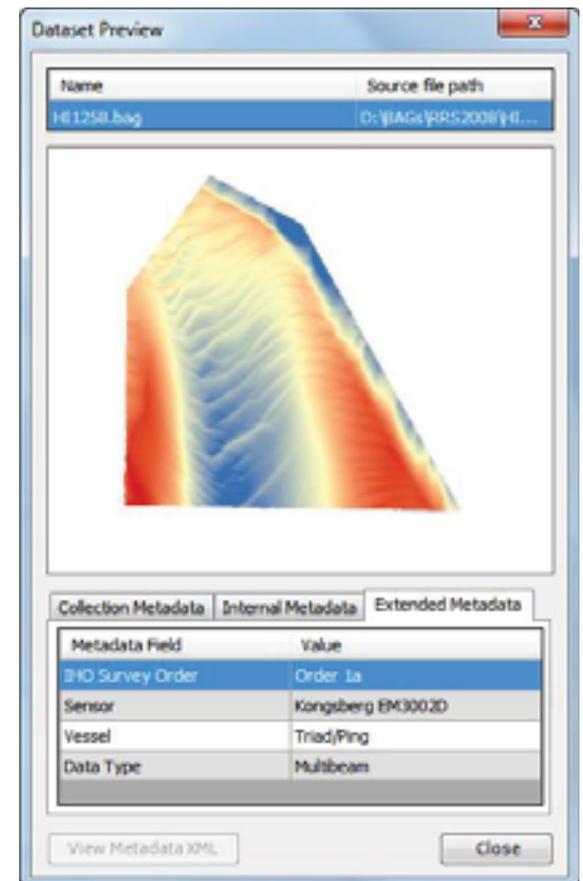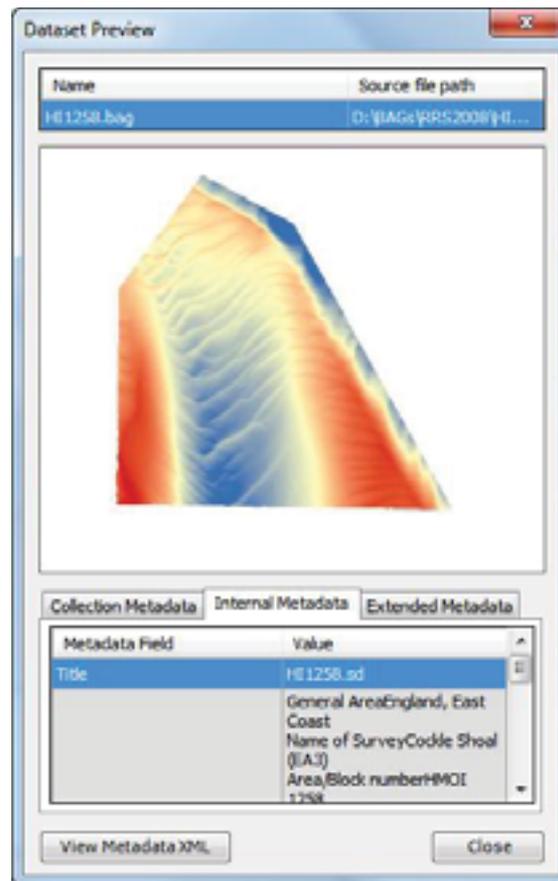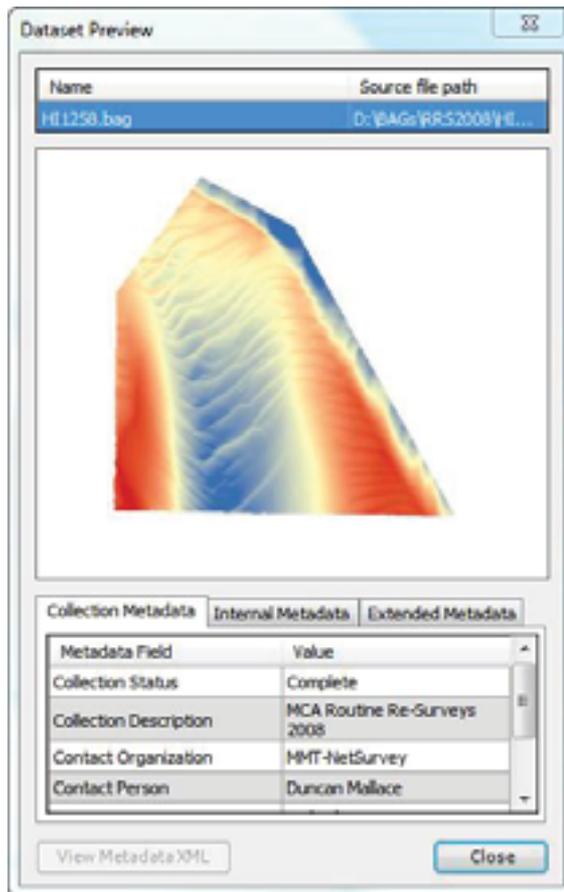iPhoto - Even my home computer has better spatial awareness!
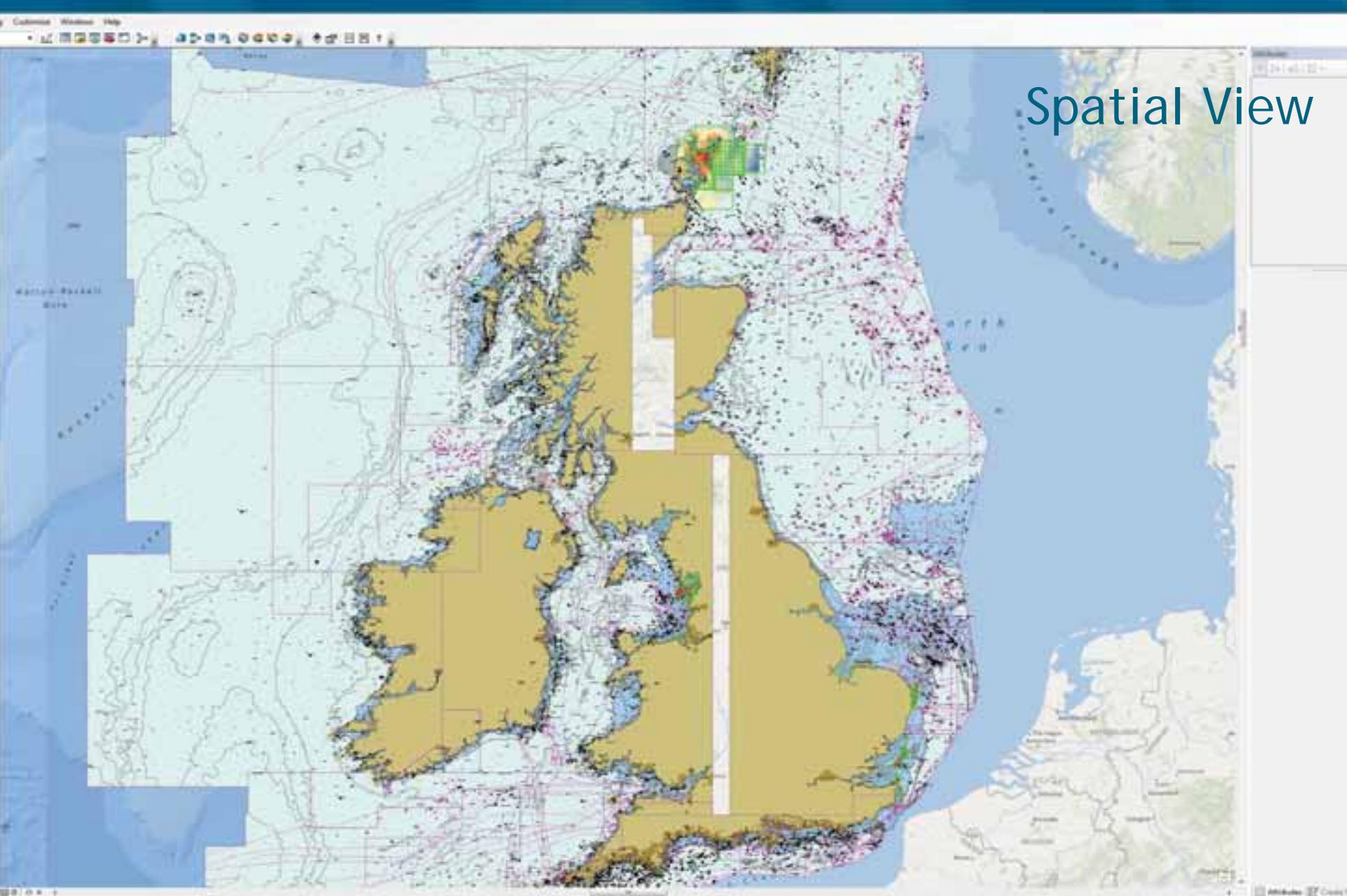
Spatial View

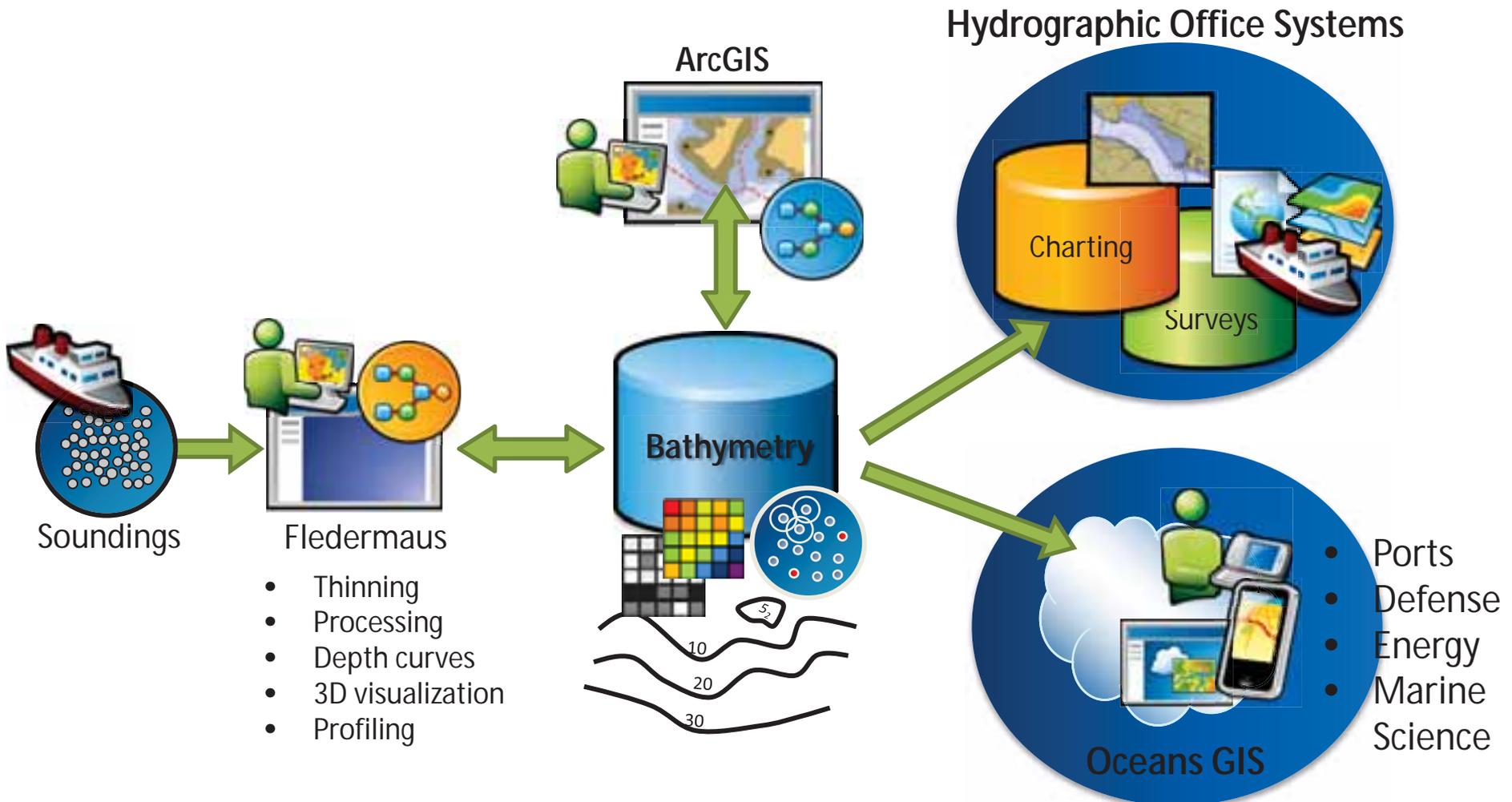# Spatial View

Outline of individual surveys shown in green

MMT

Spatial View
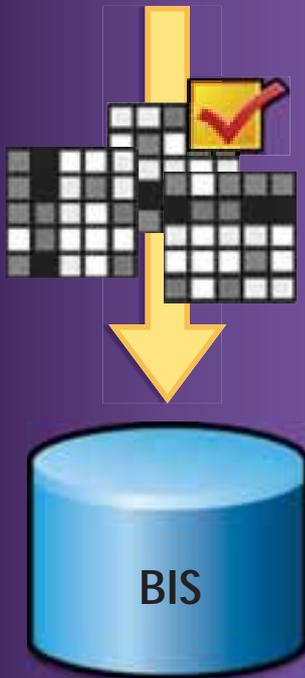
Previews of individual surveys with associated metadata

ArcGIS for Maritime: Bathymetry
Part of the ArcGIS system

Hydrographic Office Systems
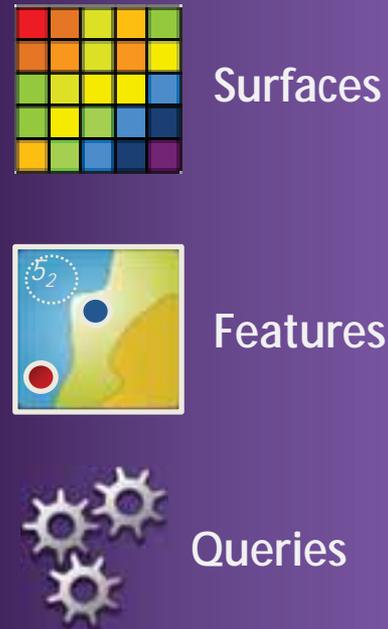
ArcGIS

Charting

Surveys

Soundings

Fledermaus

- Thinning
- Processing
- Depth curves
- 3D visualization
- Profiling

Bathymetry

5
10
20
30

Oceans GIS

- Ports
- Defense
- Energy
- Marine Science

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ArcGIS for Maritime: Bathymetry
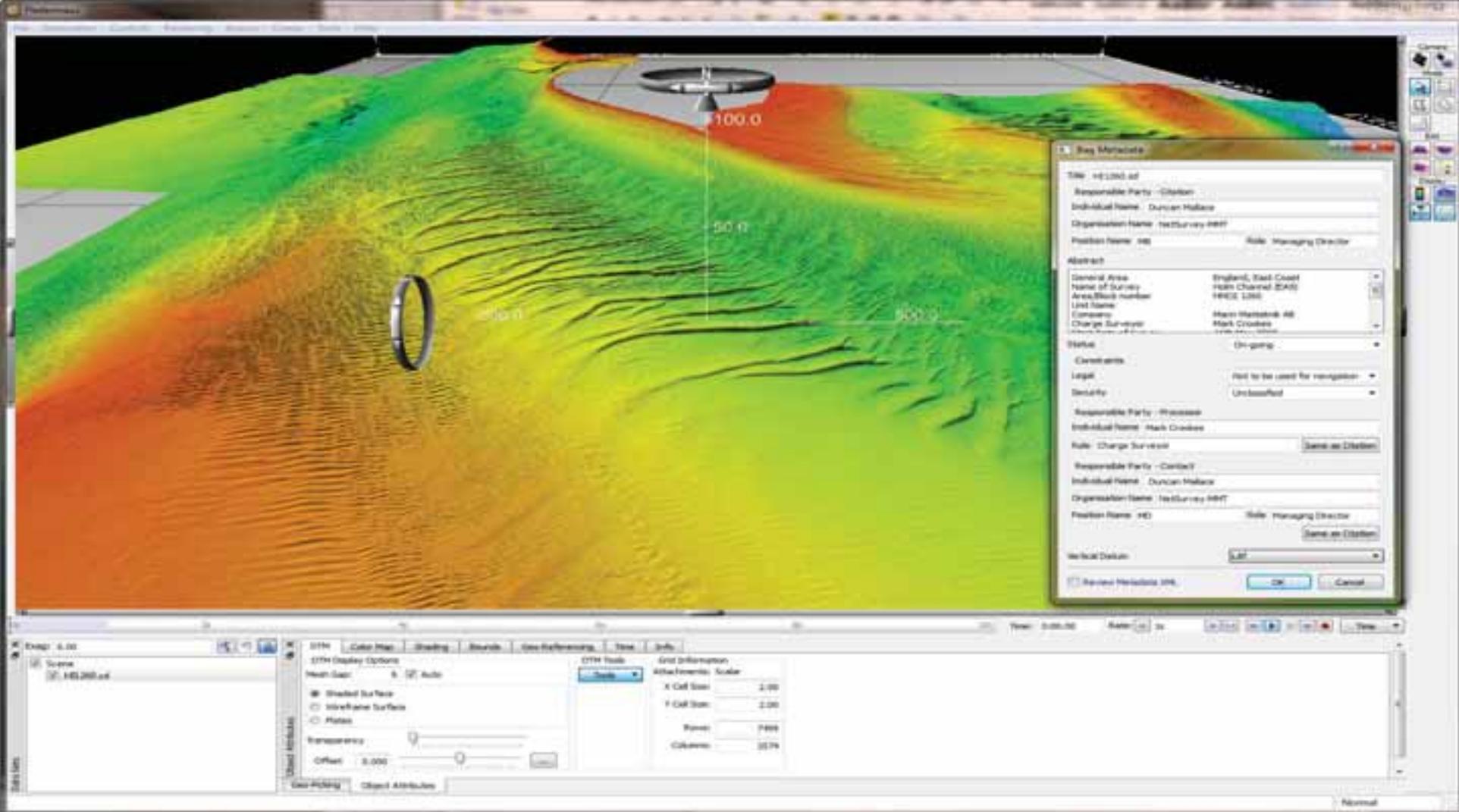
Inputting data into the BIS

Bathymetric Attributed Grids (BAGs) are referenced rather than duplicated.

Creating a BIS and

Setting Up Collections

Loading the BIS
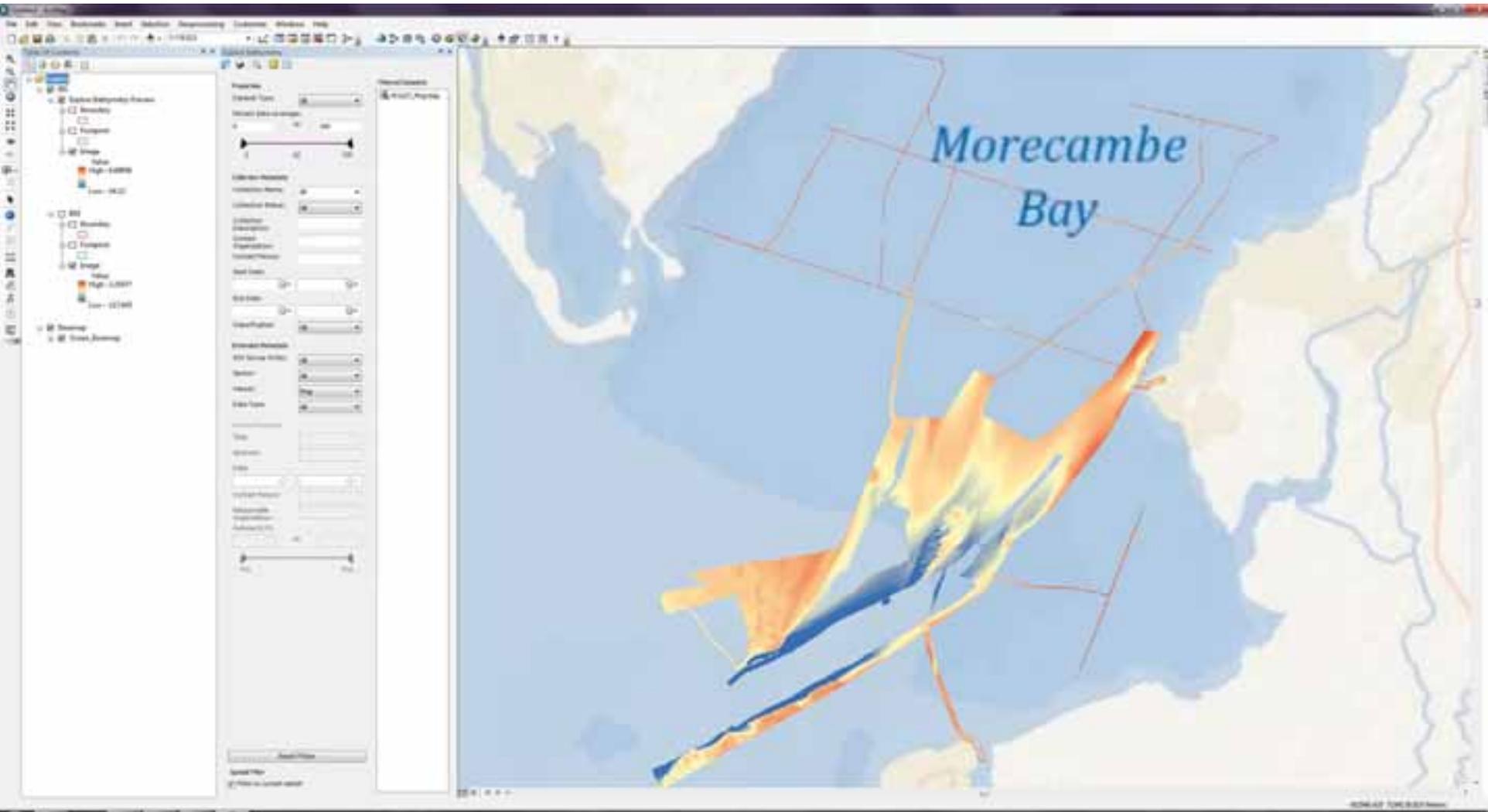
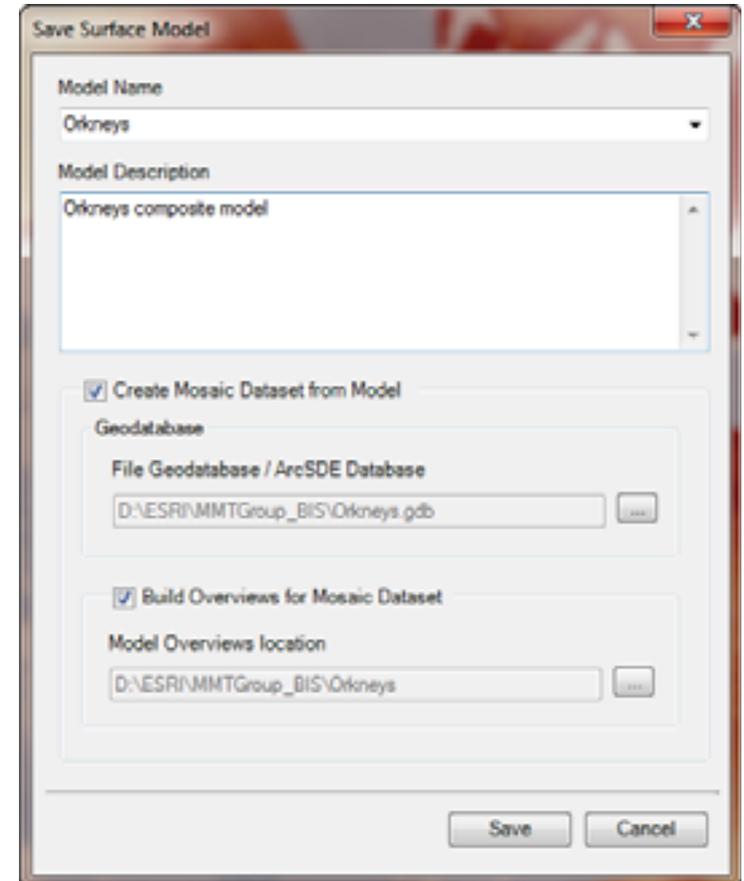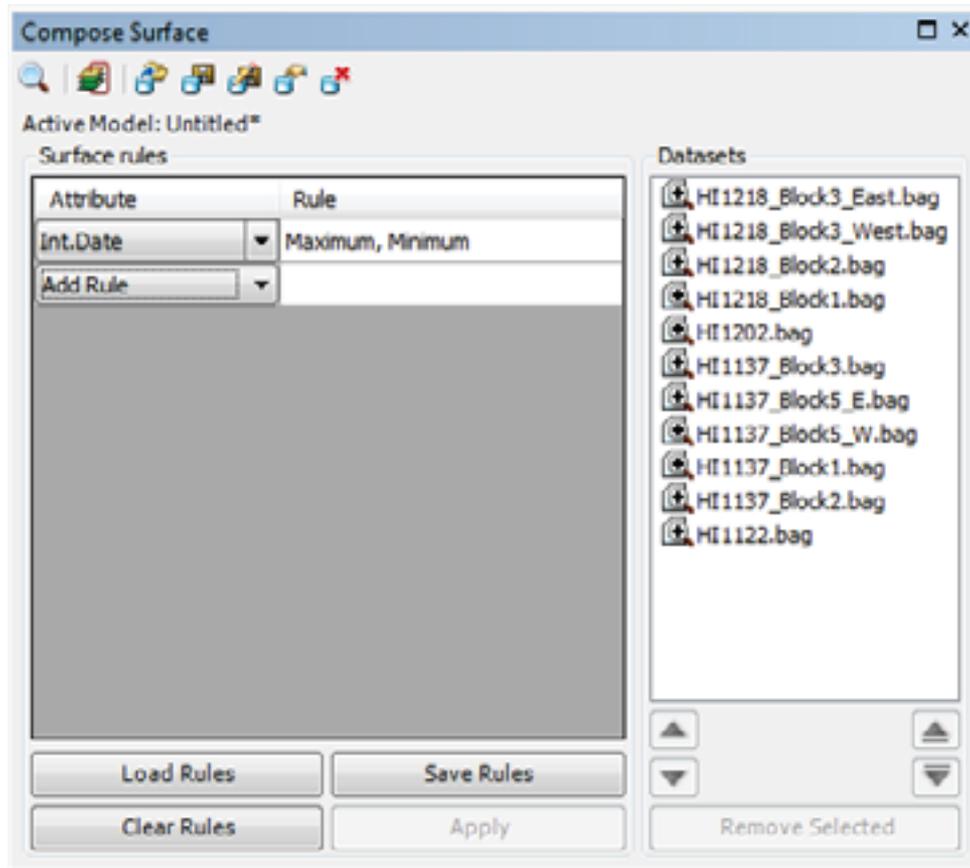# Using the BIS – Viewing data by vessel

Hydrographic Survey consisting from 4 different vessels
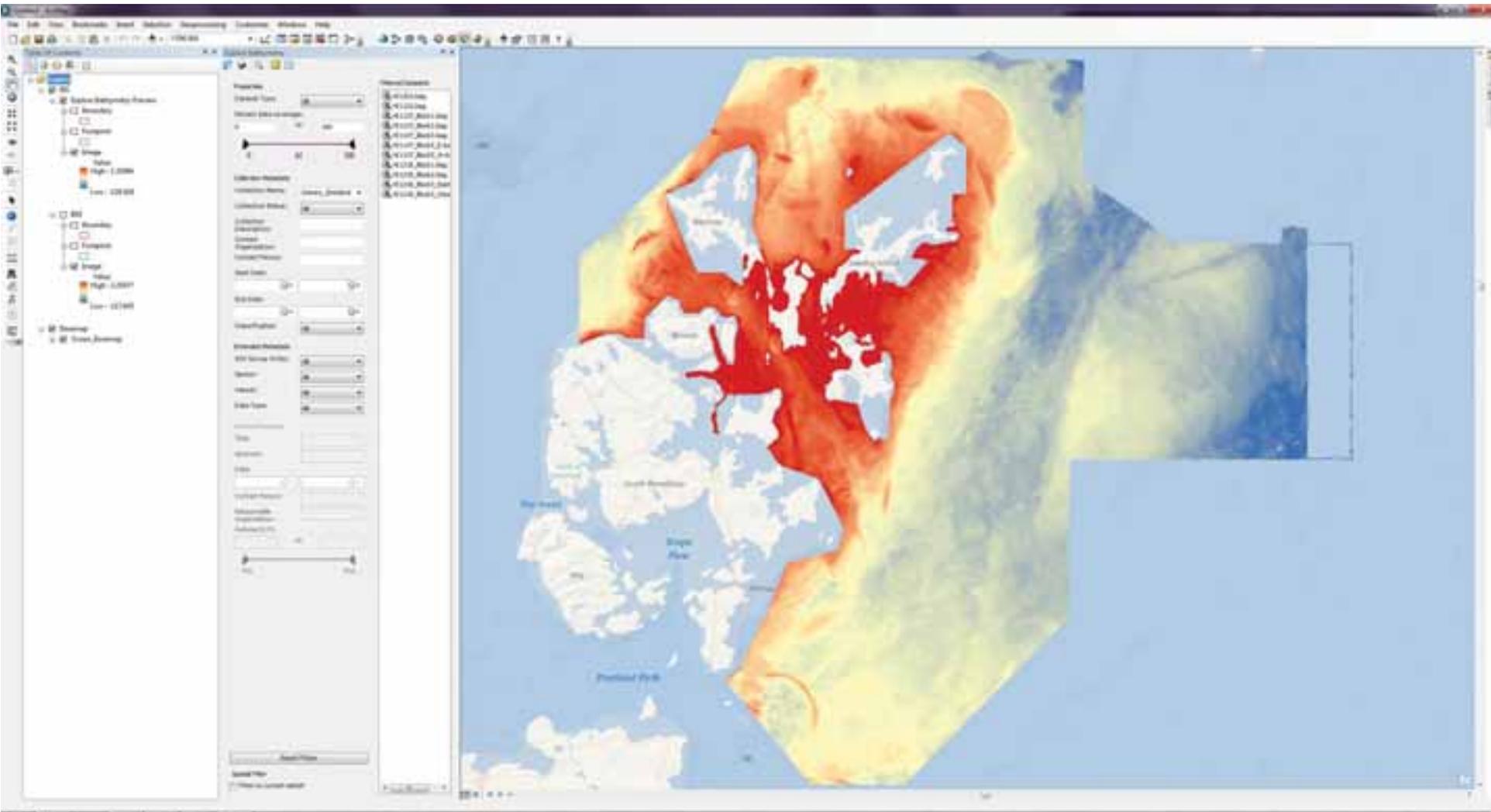
Using the BIS – Viewing data by vessel

Data just from Survey Vessel Ping by filtering the other three vessels out

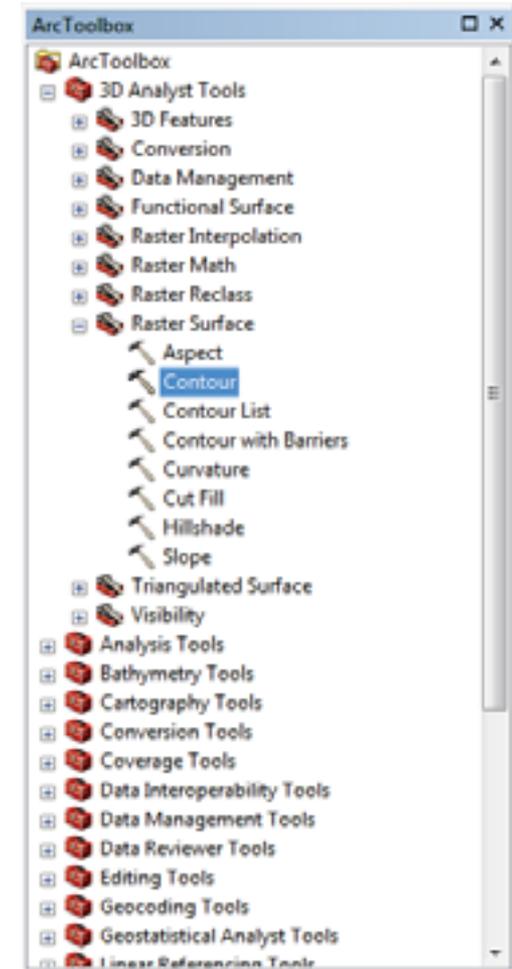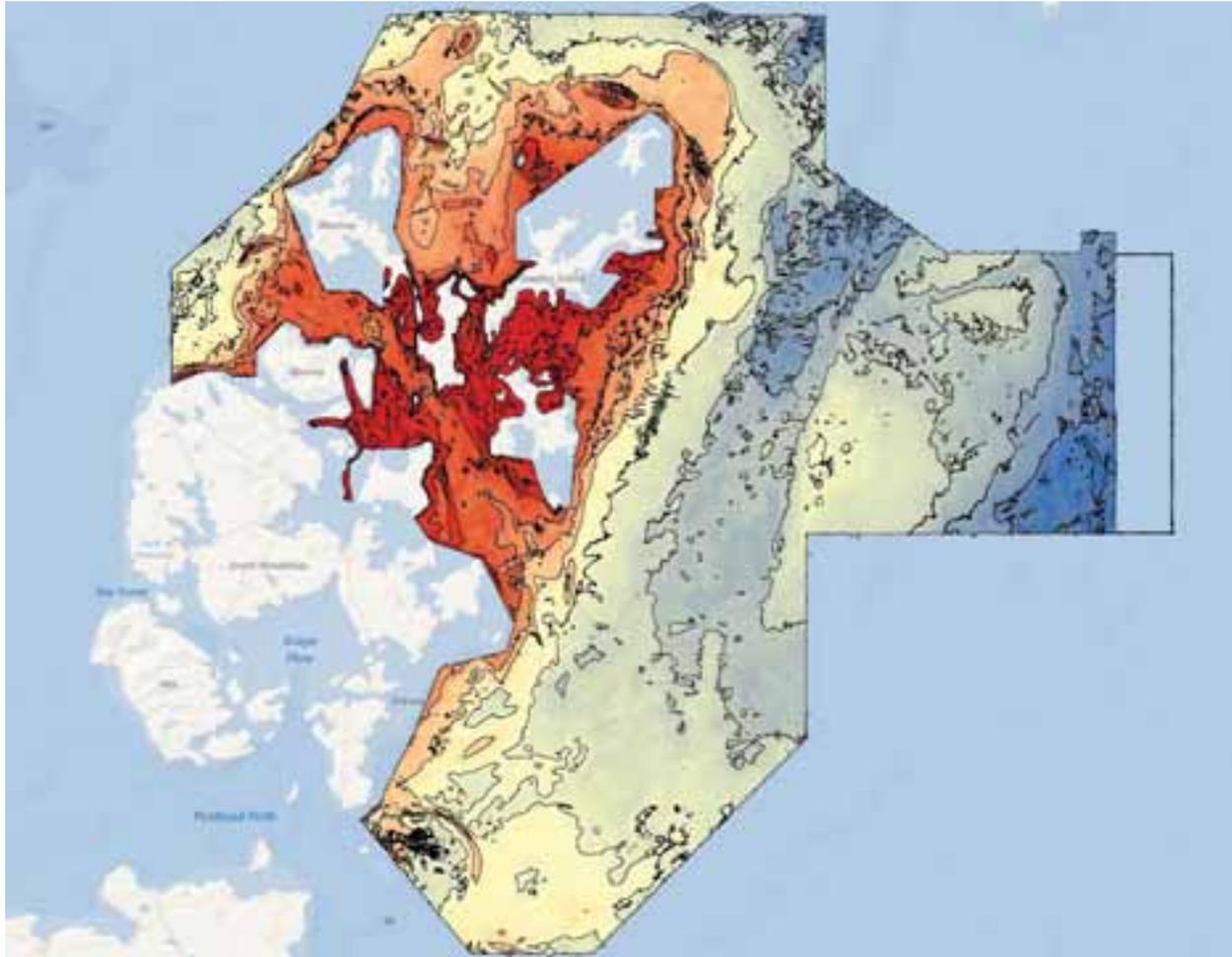# Using the BIS – Combining datasets to create one huge surface

Rules used to define how the surface is built;
Newest first, highest accuracy, IHO Order number, Type of sonar….

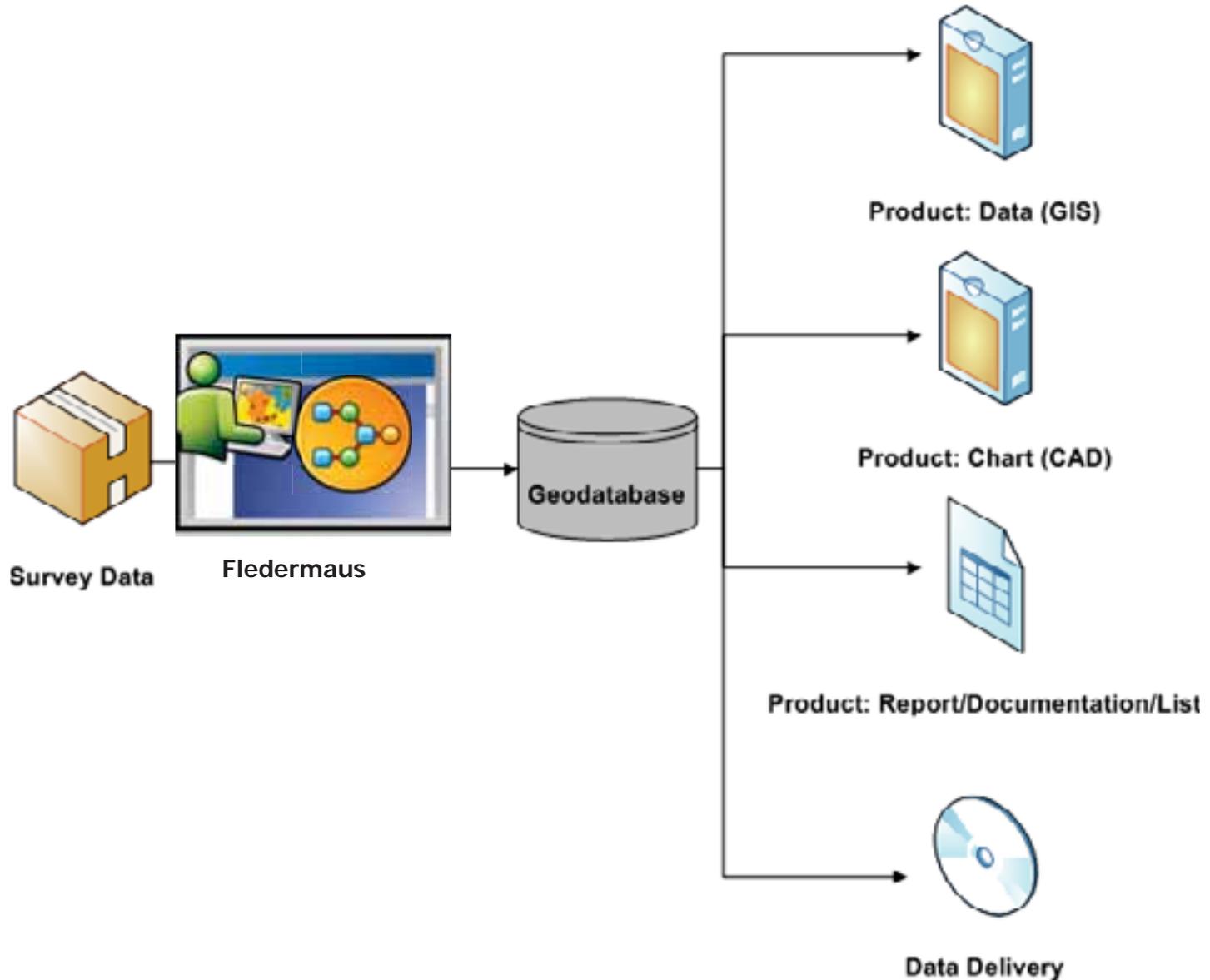# Using the BIS – Combining datasets to create one huge surface

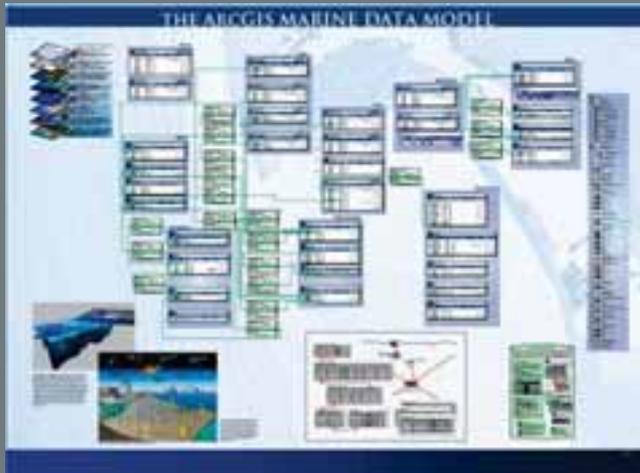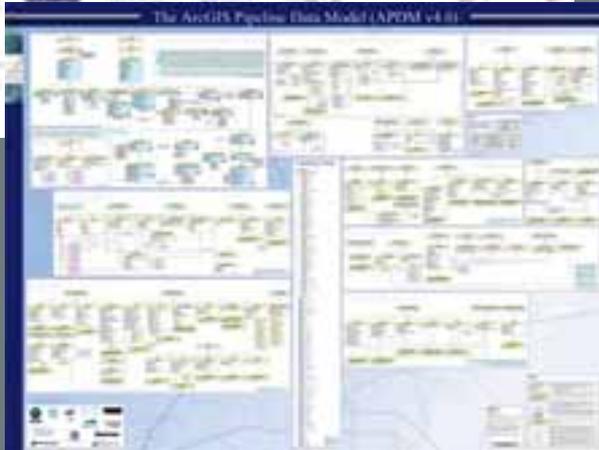# Geospatial tools can then be applied to the one surface

Usage: Route surveys, Pipeline surveys, Very large area surveys
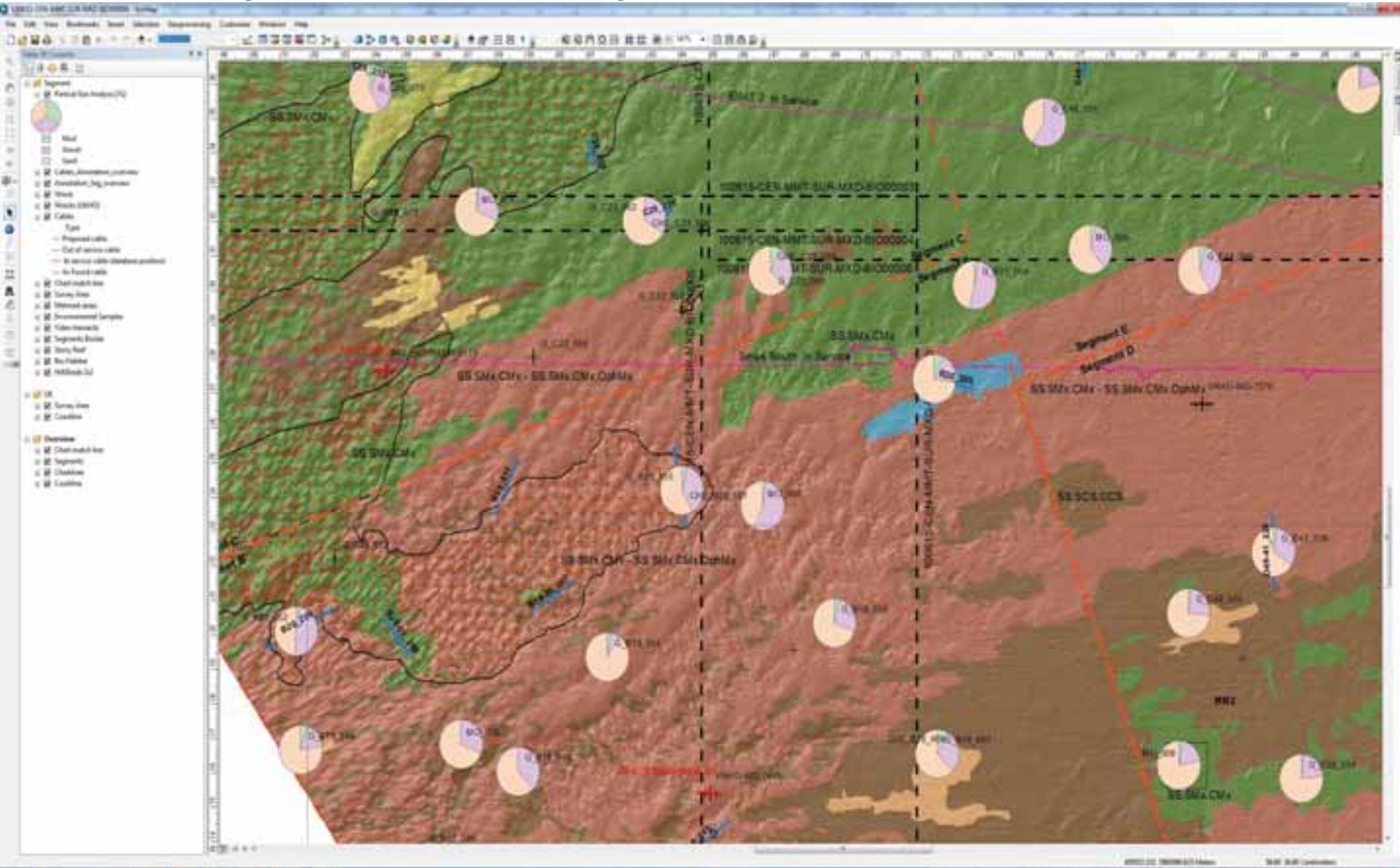
MMT OPTIMISED GIS WORKFLOW

Example of Industry Standards

- OGP Seabed Survey Data Model (SSDM)
- ArcGIS Pipeline Data Model (APDM)
- ArcGIS Marine Data Model (AMDM)

An example SSDM

An example Wind Farm product

New ways to distribute the data – ArcGIS.com

Conclusions

- It is simply a better way to store data
- The data is always there and accessible to either consume or view
- It is no good stopping at bathymetry – ArcGIS allows you to combine all the survey data and then perform complex calculations
- Our clients require it and the SSDM is becoming a standard Oil & Gas & Renewable deliverable

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MEASURE THE DIFFERENCE!