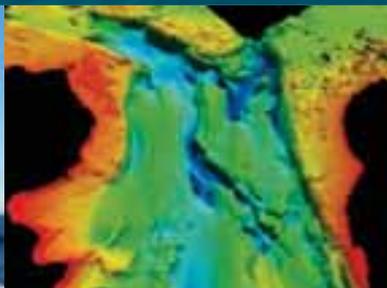


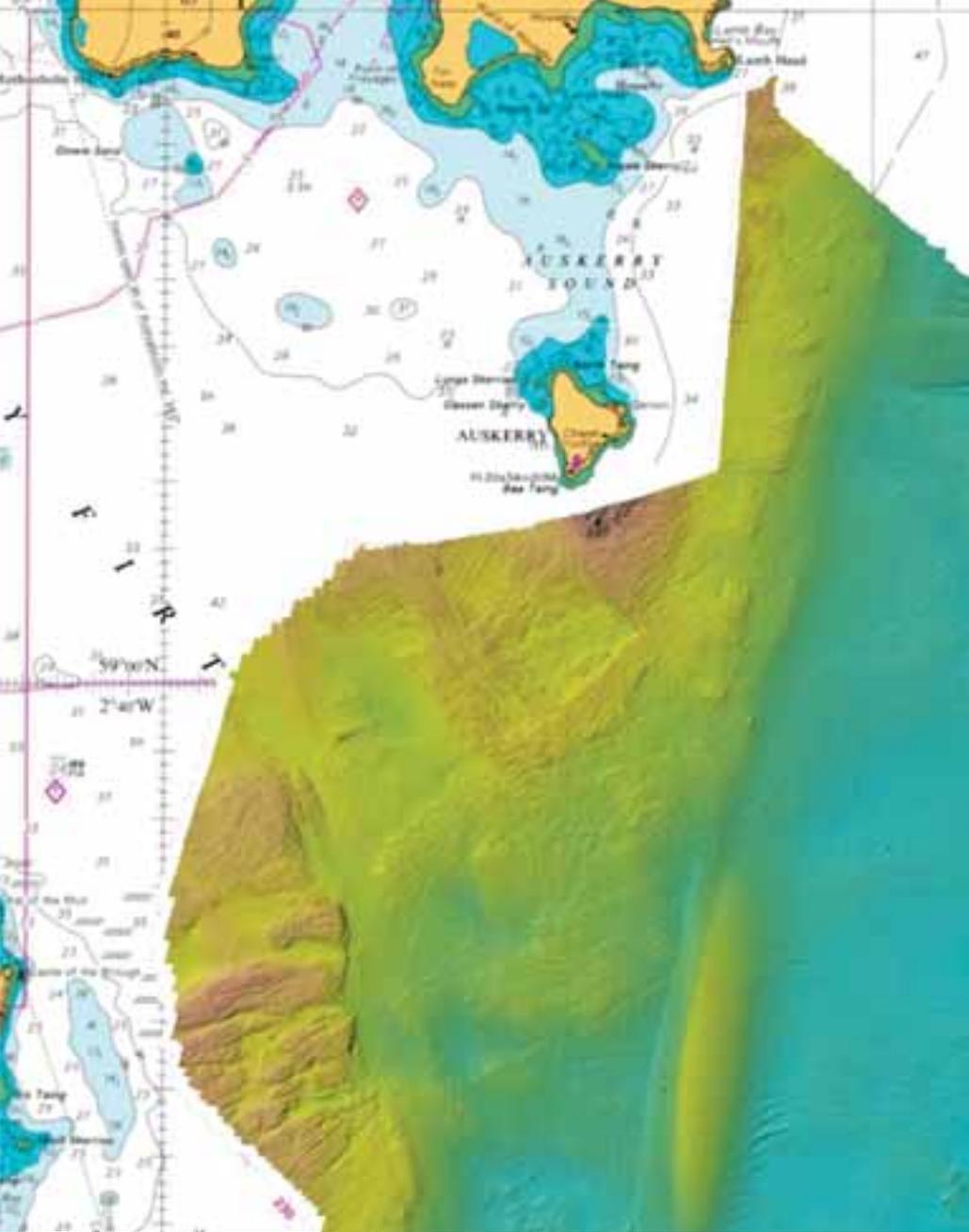


Duncan Mallace



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

SV Franklin



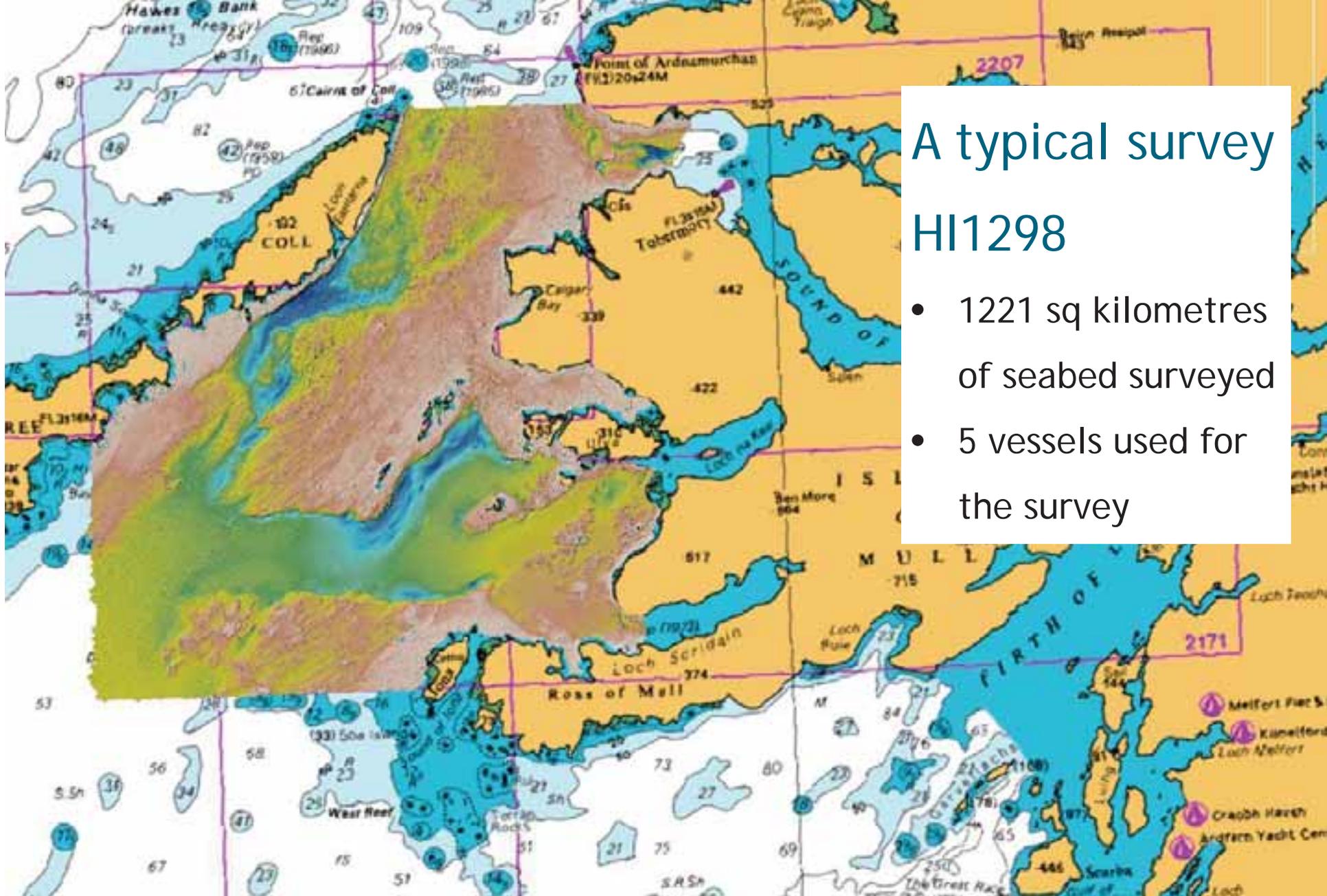
SV Ping



UK Hydrographic Surveys in 2012

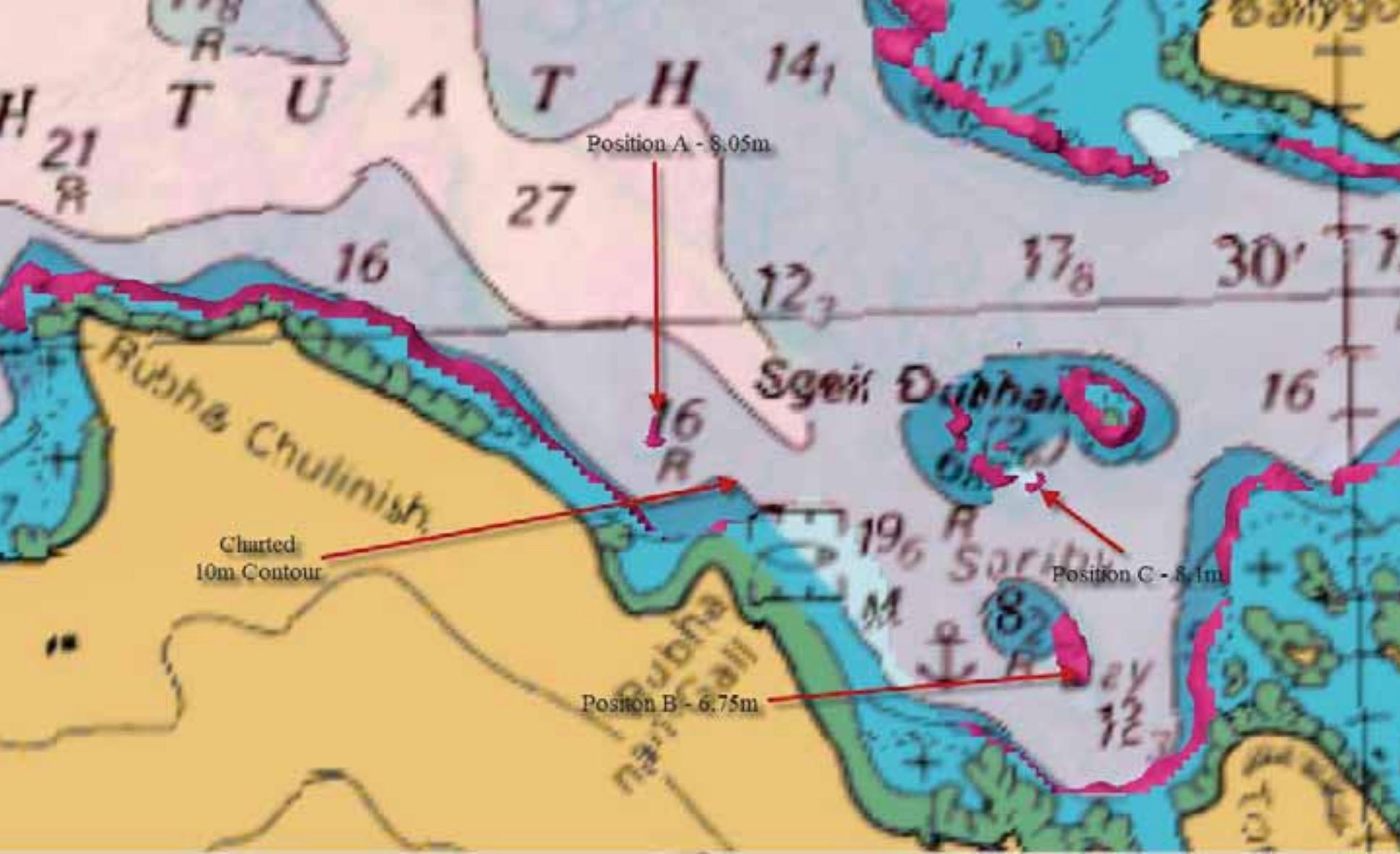
- 10 Individual areas surveyed and rendered
- Over 10,000 sq kilometres of seabed surveyed (1/72th of UK EEZ)
- 10.5 TBs of raw data collected
- 1st CUBE deliverable from a main Hydrographic Instruction
- 8 vessels used

*Fishing trawl scour off Humber
or P for Perfect Survey?*

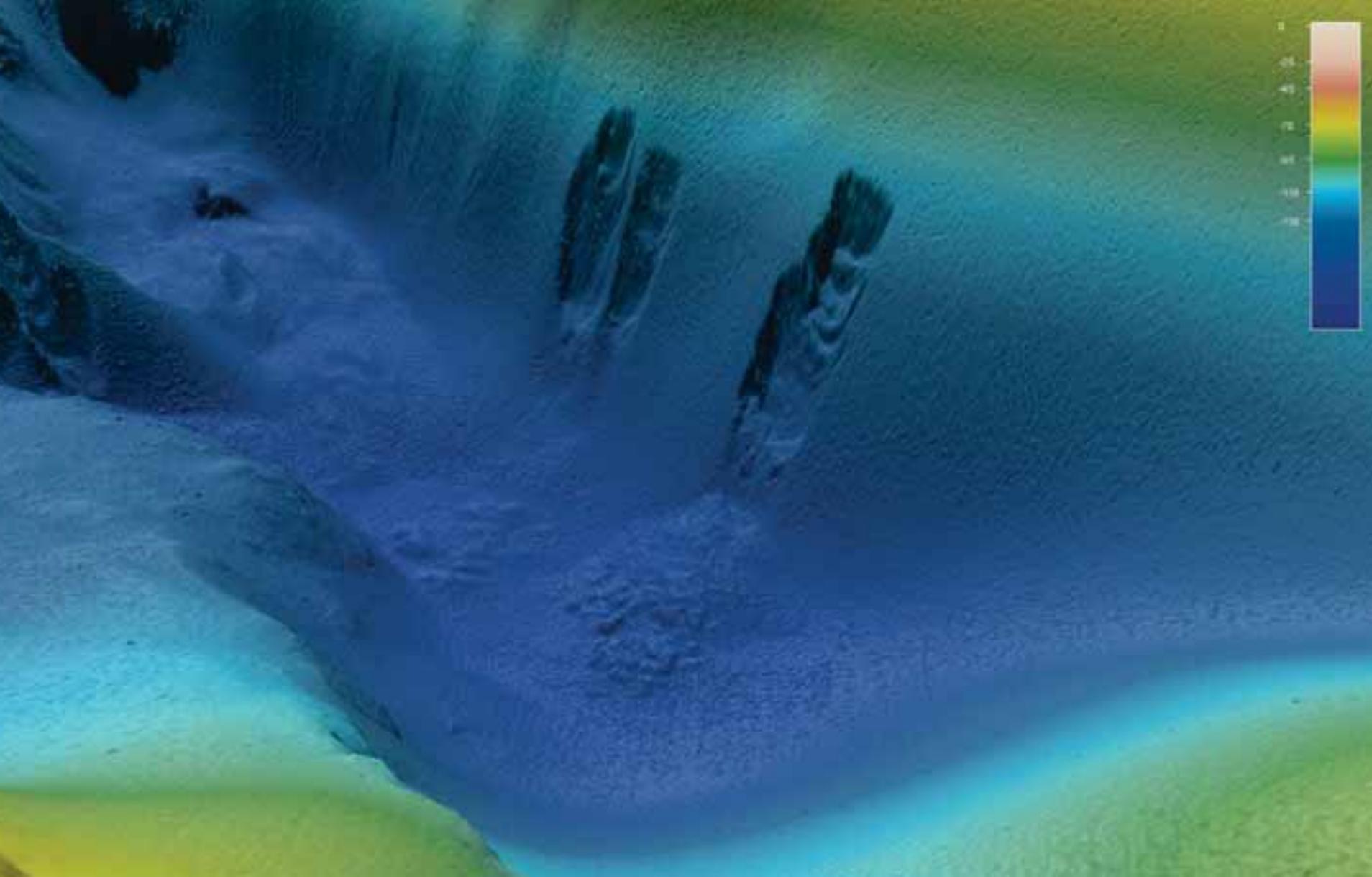


A typical survey HI1298

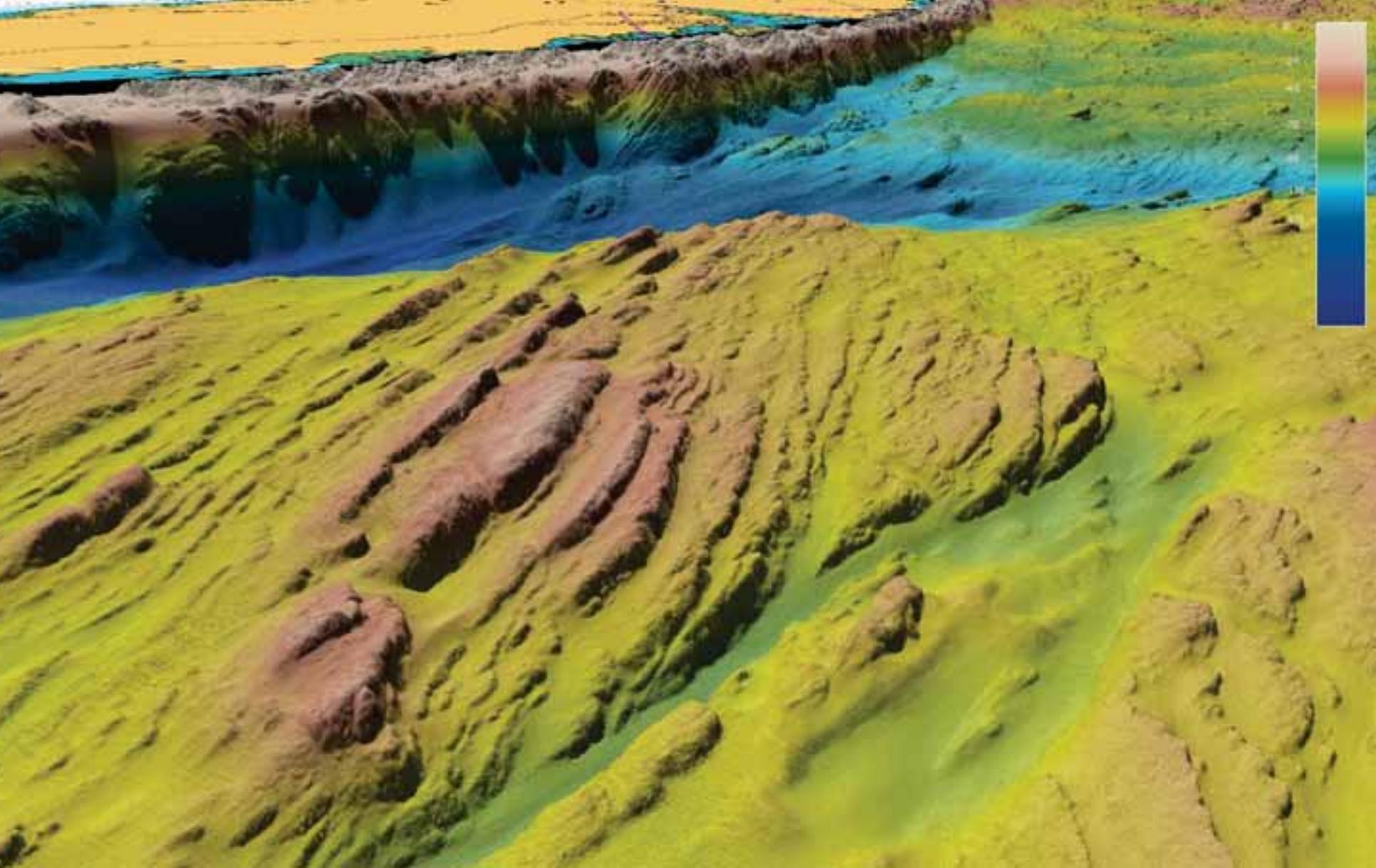
- 1221 sq kilometres of seabed surveyed
- 5 vessels used for the survey



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



The problem



IT naughty chair!



DO WE PRODUCE SEABED MAPS
OR CHARTS?

WHAT TYPES OF PRODUCT DO WE
NEED TO CREATE?



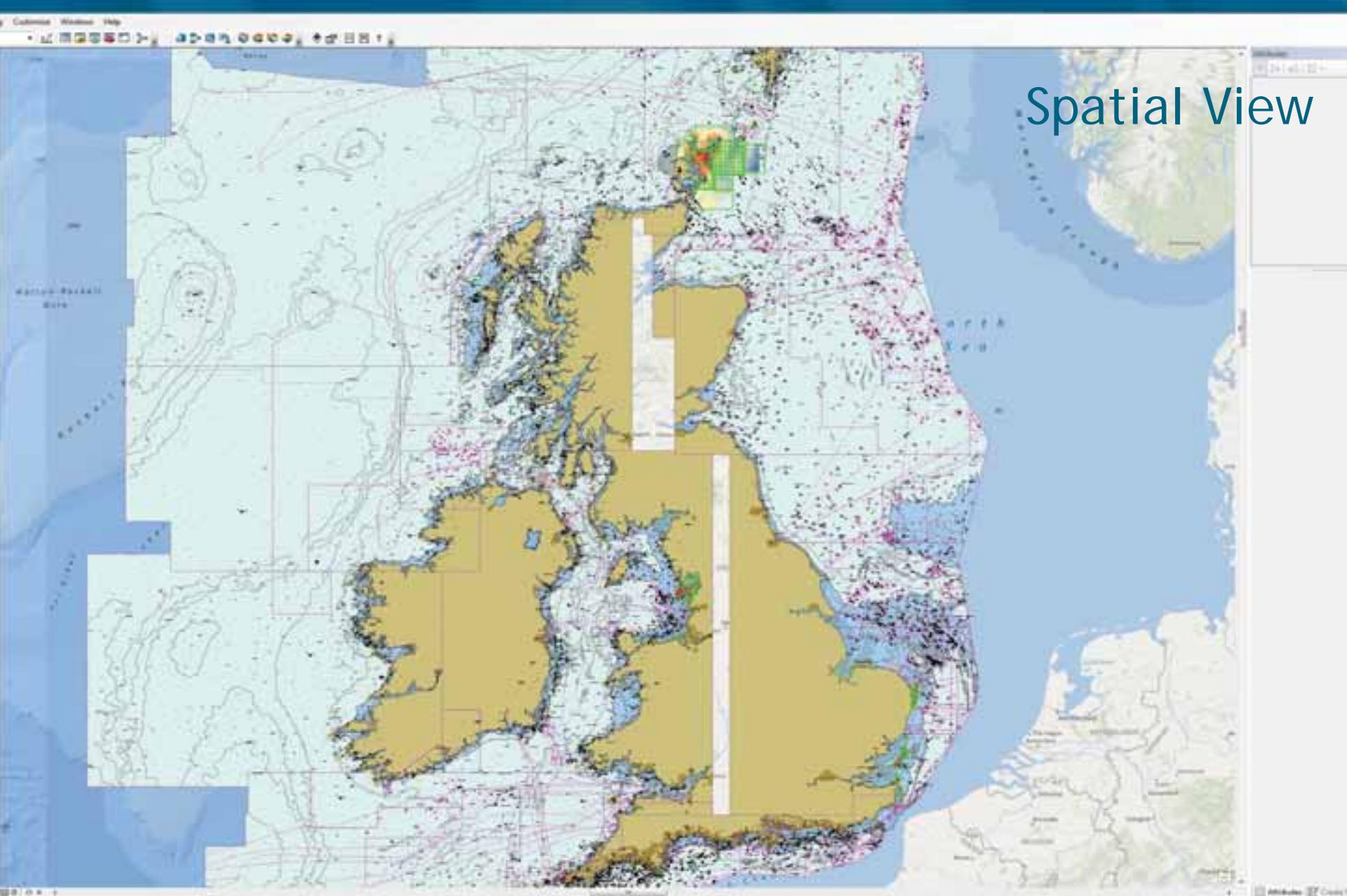
100853-Dong 2012 Annual Pipeline Inspection	02/10/2012 13:31	File folder
101010_Suldalsvatnet	14/09/2012 08:11	File folder
500197-HII298	19/10/2012 16:53	File folder
500199-HII362	01/11/2012 08:26	File folder
500203-HII297	18/10/2012 15:48	File folder
500205-HII372 - Inner Approaches to Moray Firth	16/10/2012 11:53	File folder
500206-HII371 Sound of Jura	26/10/2012 12:52	File folder
500207-HII370 Approaches to Sound of Jura	31/10/2012 18:16	File folder
500208-HII392 - Approaches to Inner Sound	30/08/2012 14:54	File folder
500211-HII394 - 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-HII393 - Approaches to Loch Inver	13/07/2012 16:02	File folder
500232-Operation Iceberg	02/10/2012 14:46	File folder
500234-HII405 St Catherine's Deep	06/09/2012 18:38	File folder
500238-Ramsgate_Harbour	18/09/2012 16:51	File folder
500239-HII408_Sefton	22/10/2012 09:28	File folder
500244-MoD-Moray Firth	12/07/2012 16:52	File folder
500247-HII397-East Anglia RR	10/10/2012 14:00	File folder
500248-HII398-Thames Estuary-RR	19/10/2012 17:03	File folder
500249-HII399-Dover Strait-RR	25/07/2012 19:07	File folder
500250-HII355-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

Folder View

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



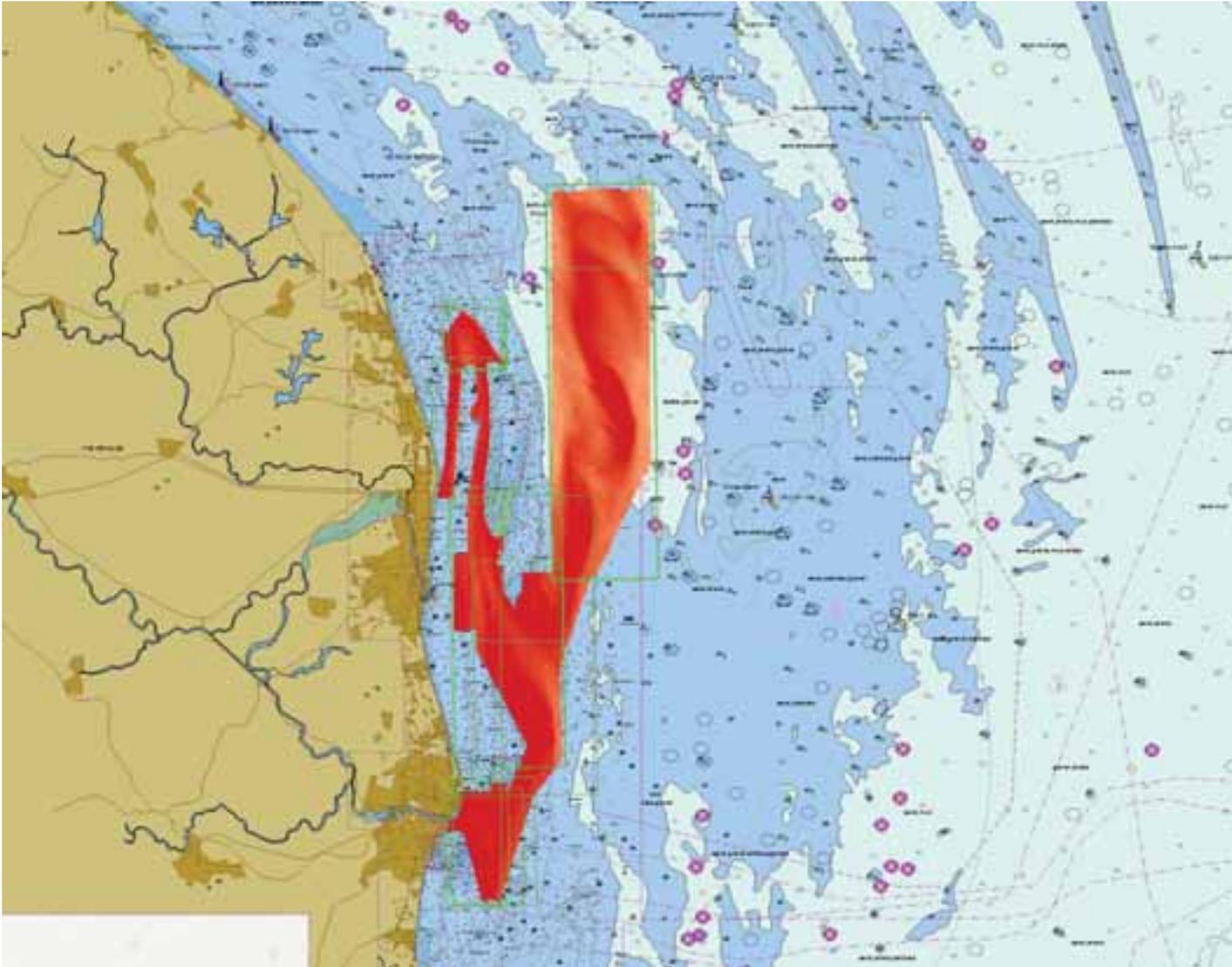
iPhoto - Even my home computer has better spatial awareness!

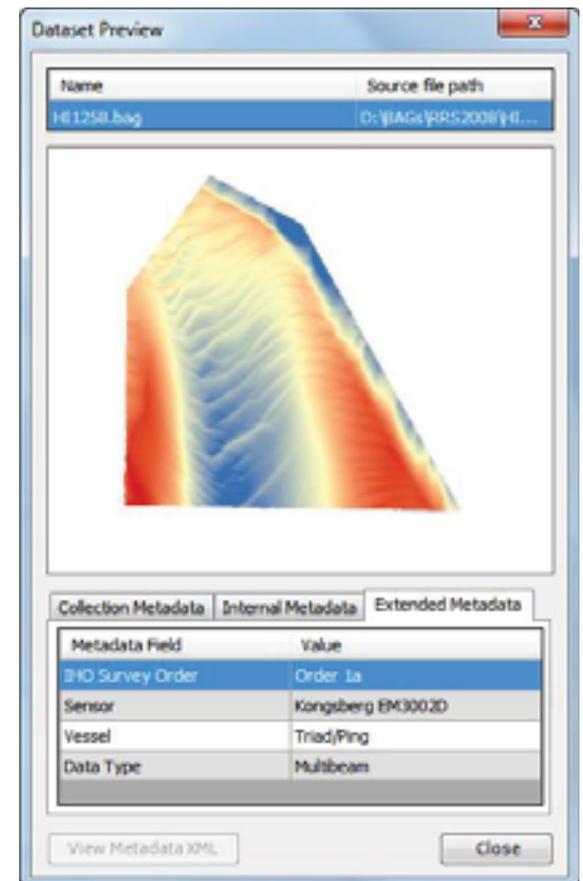
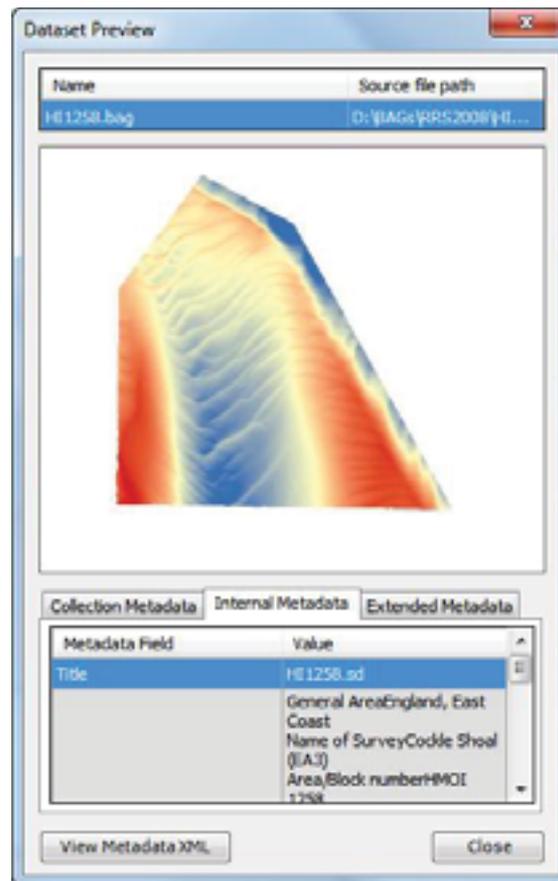
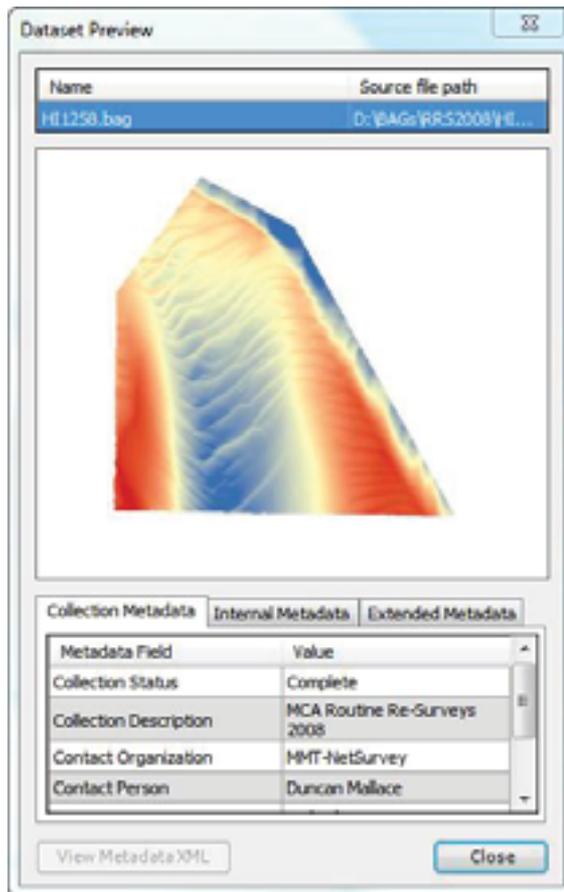


Spatial View

Spatial View

Outline of individual surveys shown in green



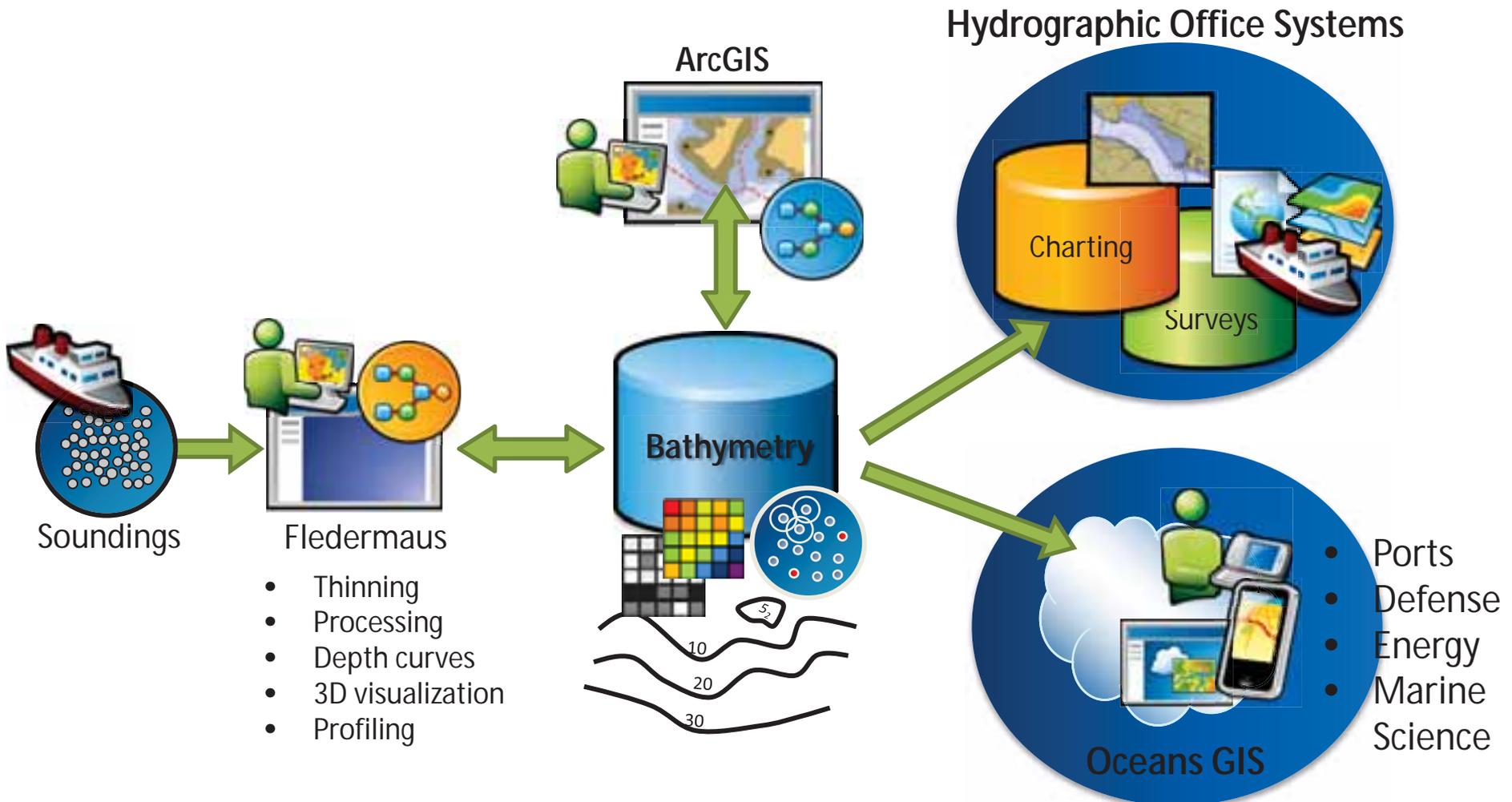


Spatial View

Previews of individual surveys with associated metadata

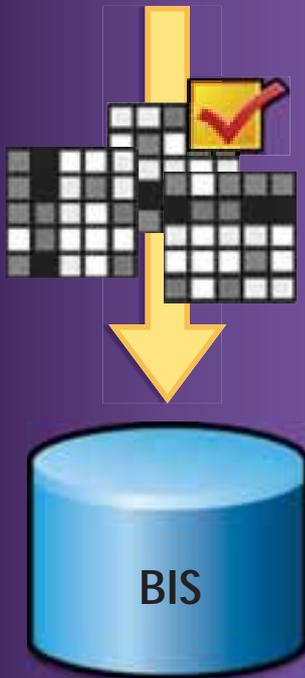
ArcGIS for Maritime: Bathymetry

Part of the ArcGIS system



ArcGIS for Maritime: Bathymetry

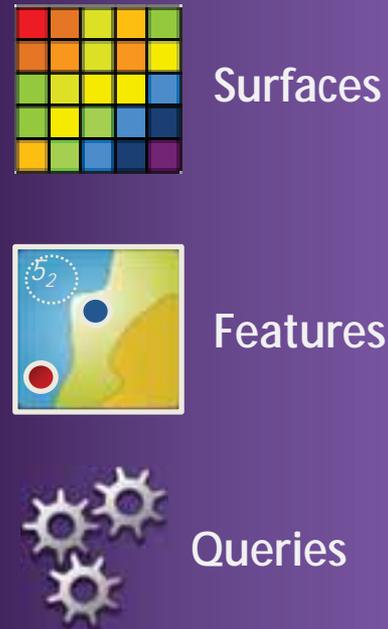
Register



Explore

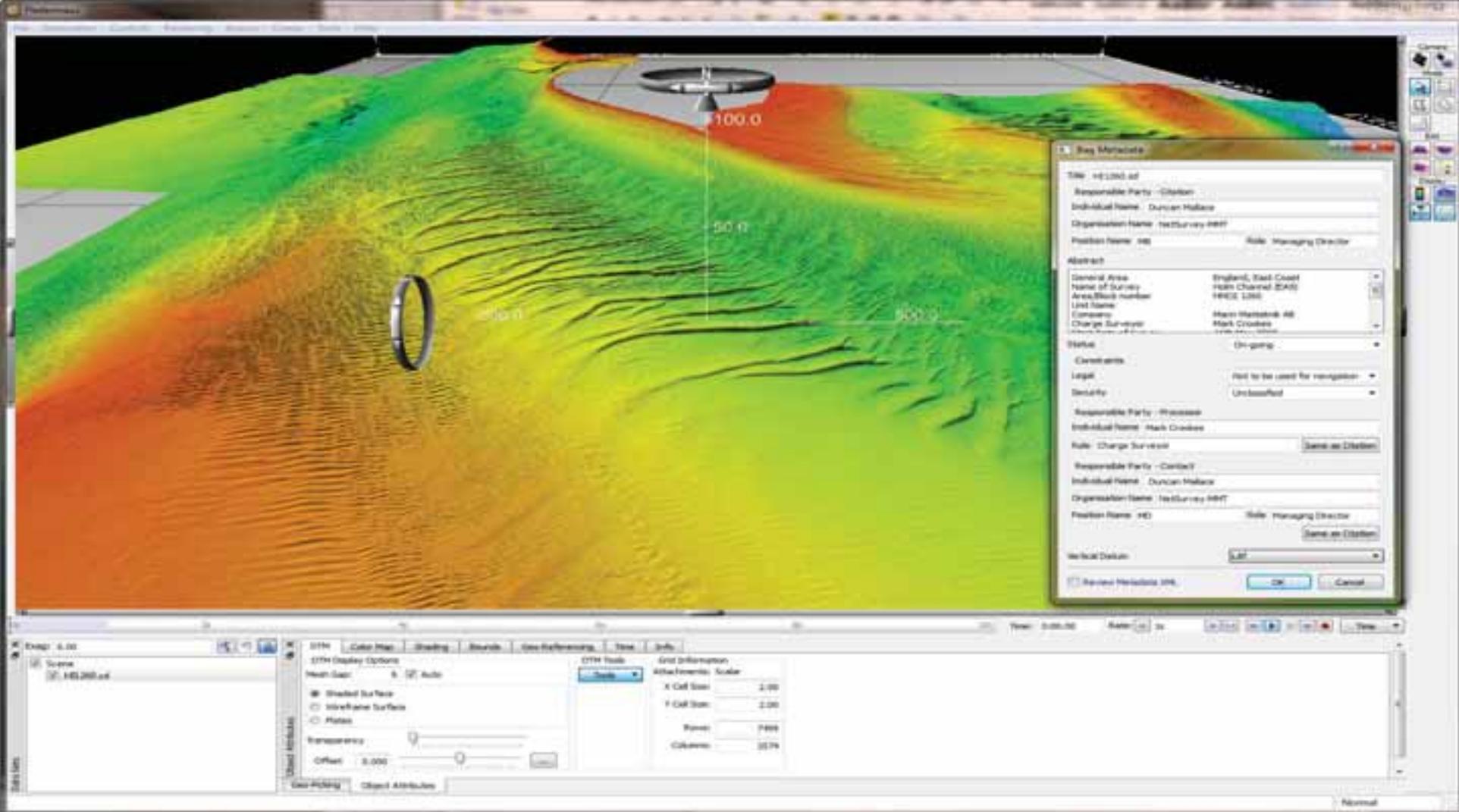


Compose



Share





Inputting data into the BIS

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

Create BIS Database

BIS Name
BIS_Example

Geodatabase
C:\Users\duncan\Documents\ArcGIS\BIS_Example.gdb

BIS Description (Optional)
Example Bathymetric Information System

BIS Paths
The BIS Paths should reference shared locations that are accessible to all users of the BIS.

Default copy location (Optional)

Overviews location

Metadata settings location

Make this the active BIS

OK Cancel

Manage Collections

Create new collection

Edit collection Select collection

Delete collection Select collection

View collection's data

Collection Name
MCA RRS 2008

Metadata Field	Value
Collection Status	Complete
Collection Description	MCA Routine Re-Surveys 2008
Contact Organization	MMT-NetSurvey
Contact Person	Duncan M Wallace
Start Date	15/05/2008
End Date	28/09/2008
Classification	Public

BIS Paths
The BIS Paths should reference shared locations that are accessible to all users of the BIS.

Default copy location
D:\ESRI\MMTGroup_BIS

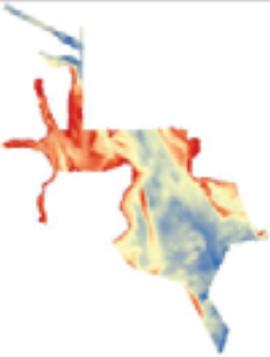
OK Cancel

Creating a BIS and Setting Up Collections

Loading the BIS

Dataset Preview

Name	Source file path
HI1202.bag	D:\BAGs\RRS2007...
HI1122.bag	D:\BAGs\Orkneya...
HI1137_Block1.bag	D:\BAGs\Orkneya...
HI1137_Block2.bag	D:\BAGs\Orkneya...
HI1137_Block3.bag	D:\BAGs\Orkneya...



Collection Metadata Internal Metadata Extended Metadata

Metadata Field	Value
Collection Status	In Progress
Collection Description	Surveys around the Orkn...
Contact Organization	MMT-NetSurvey
Contact Person	Duncan Mallace

View Metadata XML Close

Add Bathymetry

Add Gridded Data

All Datasets
D:\BAGs\RRS2007
HI1202.bag

Add Datasets to List Copy data to (Optional): D:\ESRI\MMTGroup_BIS

Collection Metadata:

MCA_RRS2007

Metadata Field	Value
Collection Status	Complete
Collection Description	MCA Routine Re-Surveys in 2007
Contact Organization	NetSurvey-MMT
Contact Person	Duncan Mallace

Extended Metadata

Metadata Field	Value
IHO Survey Order	Order 1a
Sensor	Kongsberg EM3002D
Vessel	Triad
Data Type	Multibeam

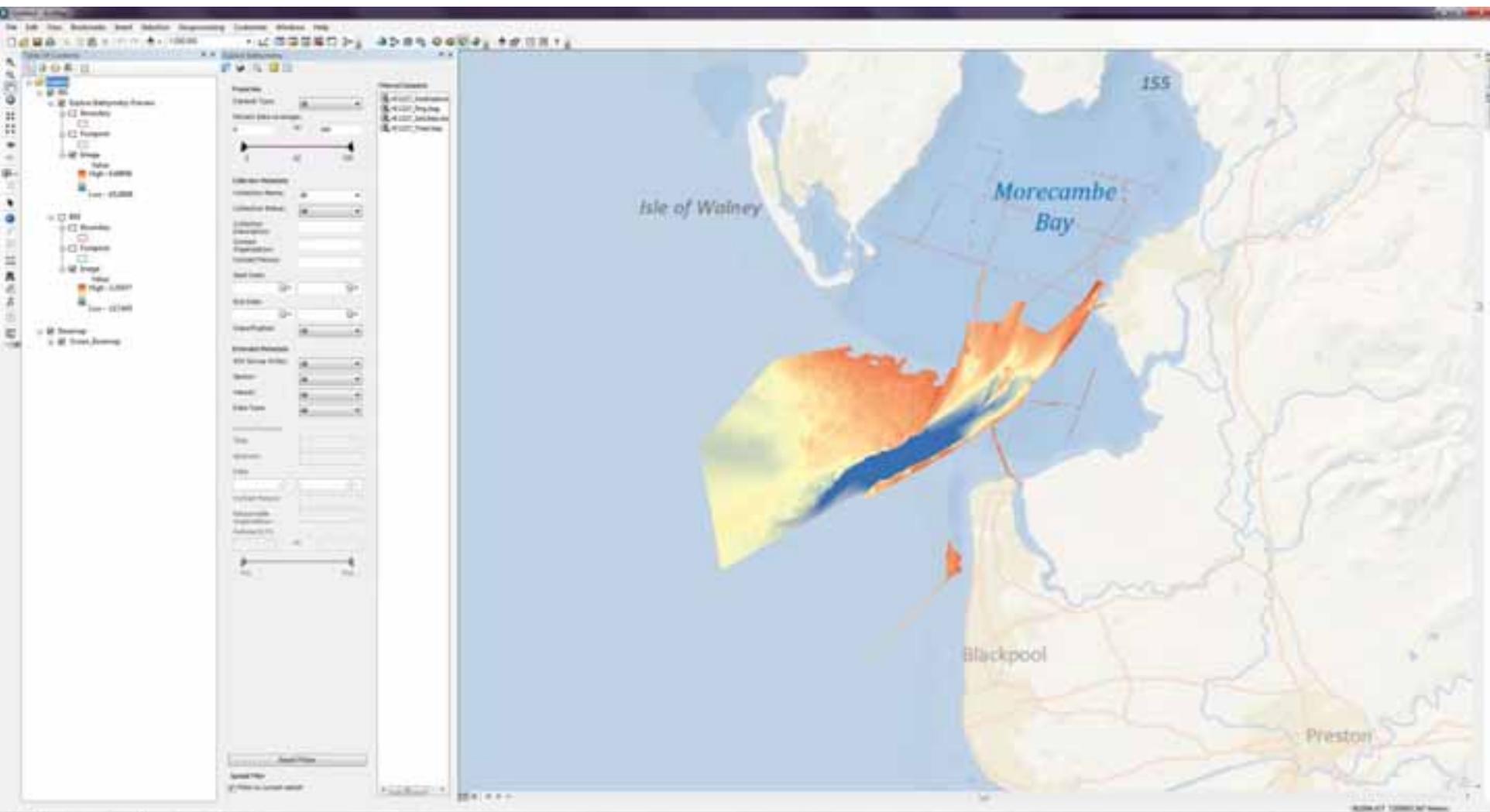
Internal Metadata

Metadata Field	Value
Title	HI1202.sd
Abstract	General Area:Scotland, OrkneyName of Survey:Westray and Str...
Date	2007-02-05
Contact Person	Duncan Mallace

View Metadata XML

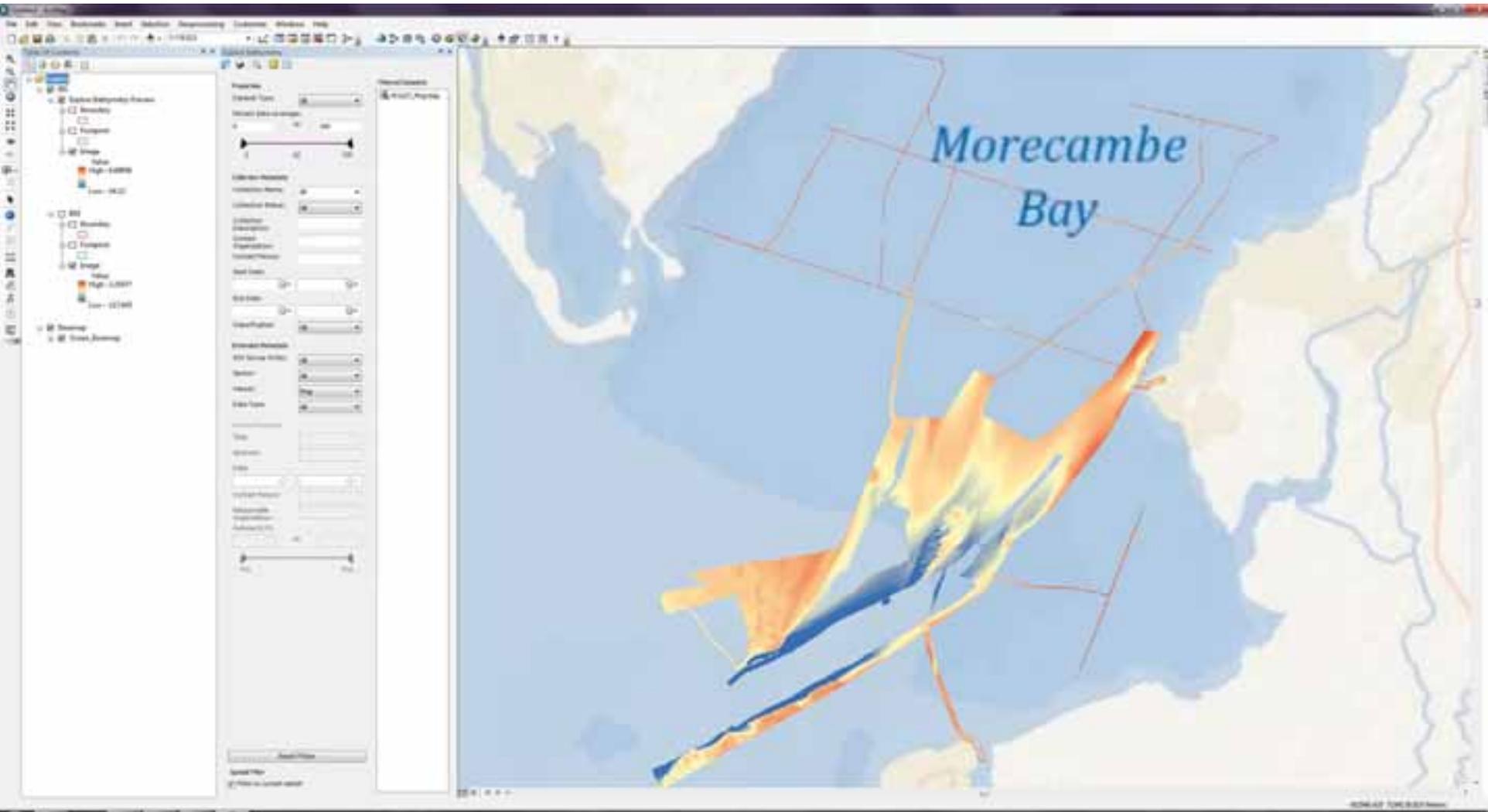
OK Cancel

Using the BIS - Viewing data by vessel



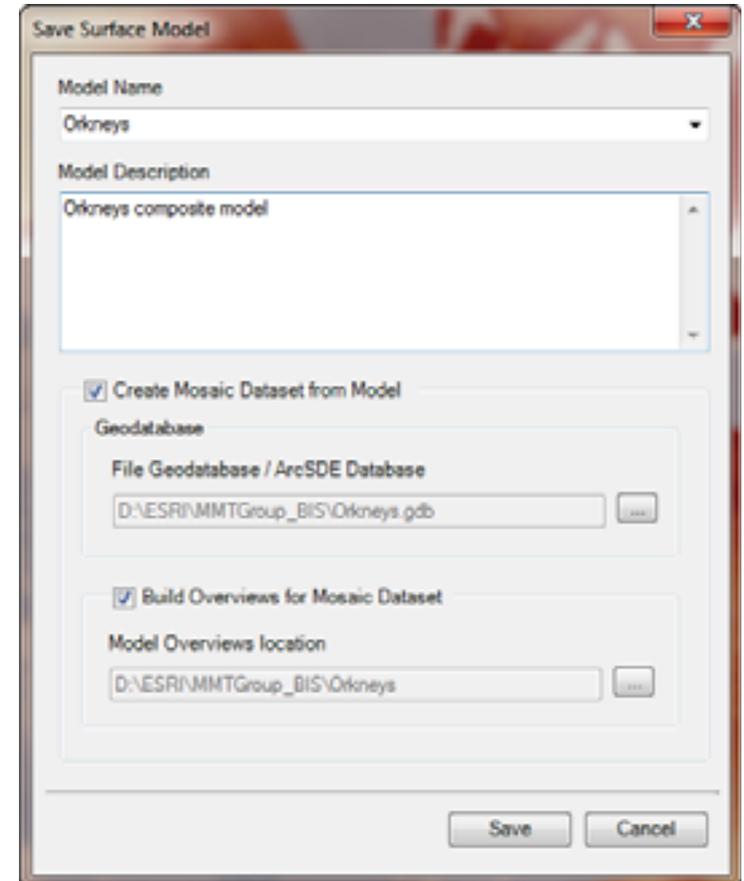
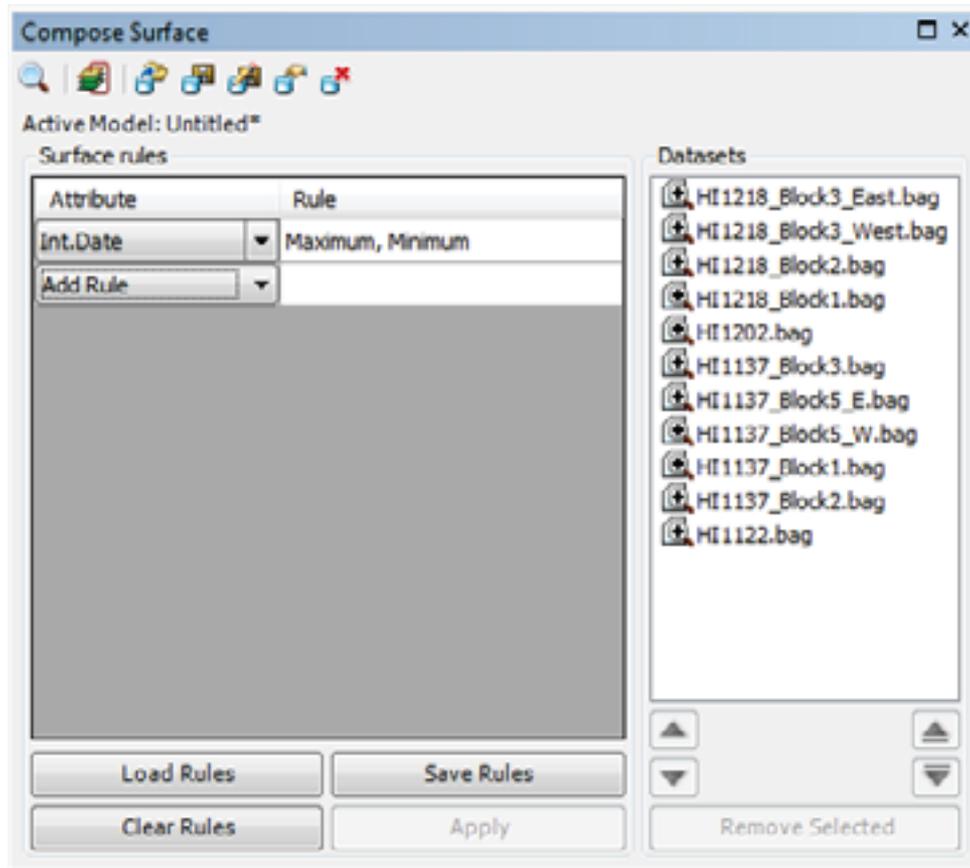
Hydrographic Survey consisting from 4 different vessels

Using the BIS - Viewing data by vessel



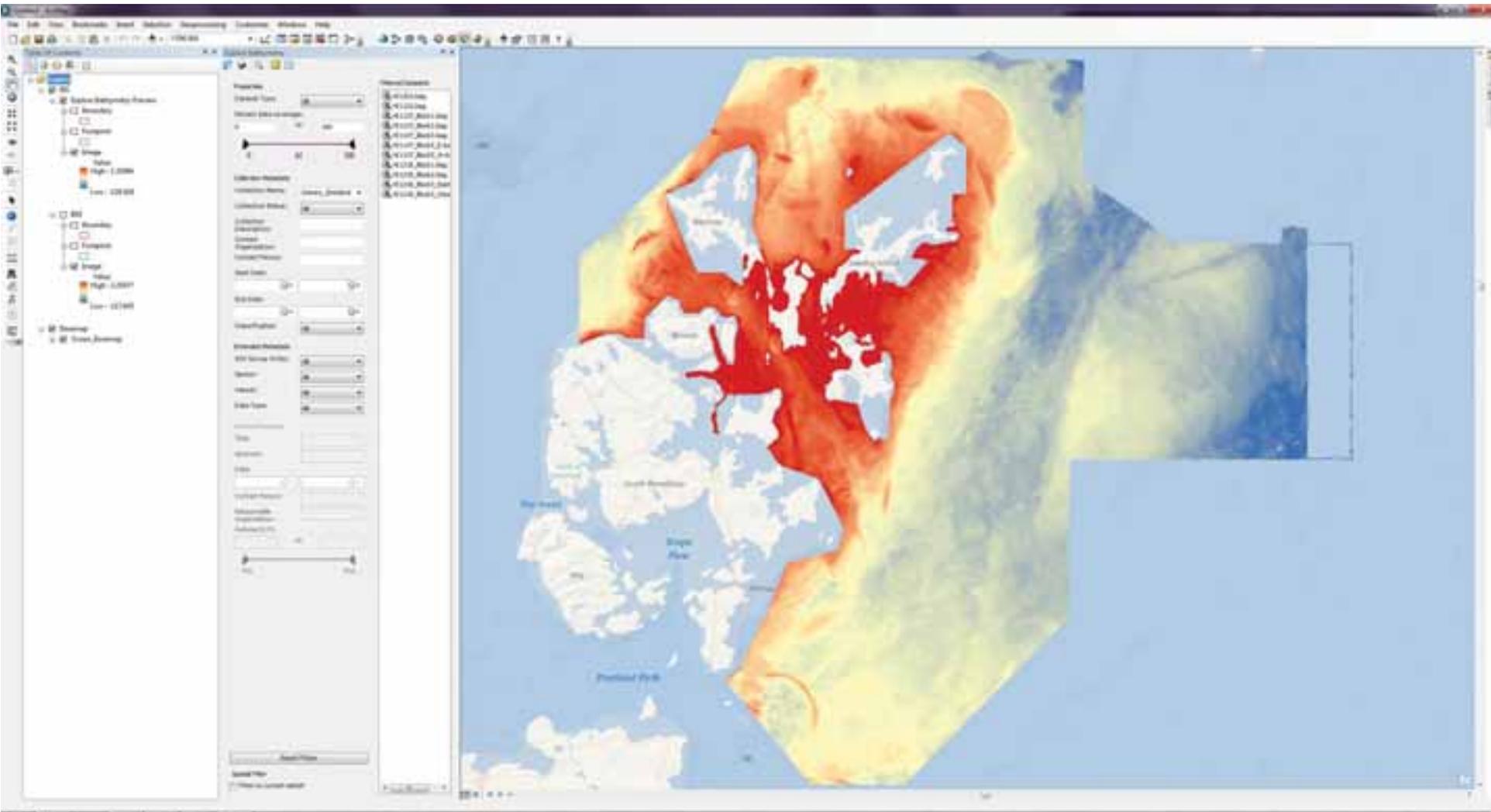
Data just from Survey Vessel Ping by filtering the other three vessels out

Using the BIS - Combining datasets to create one huge surface

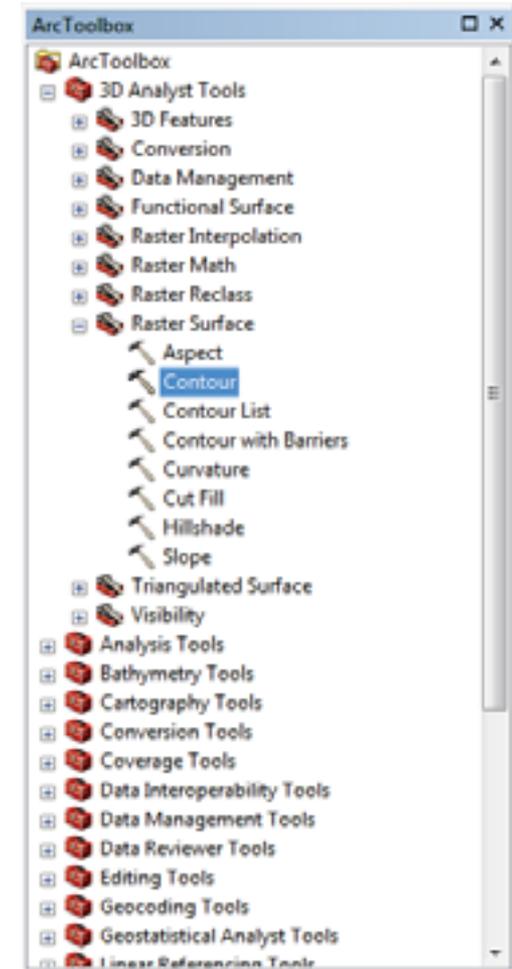
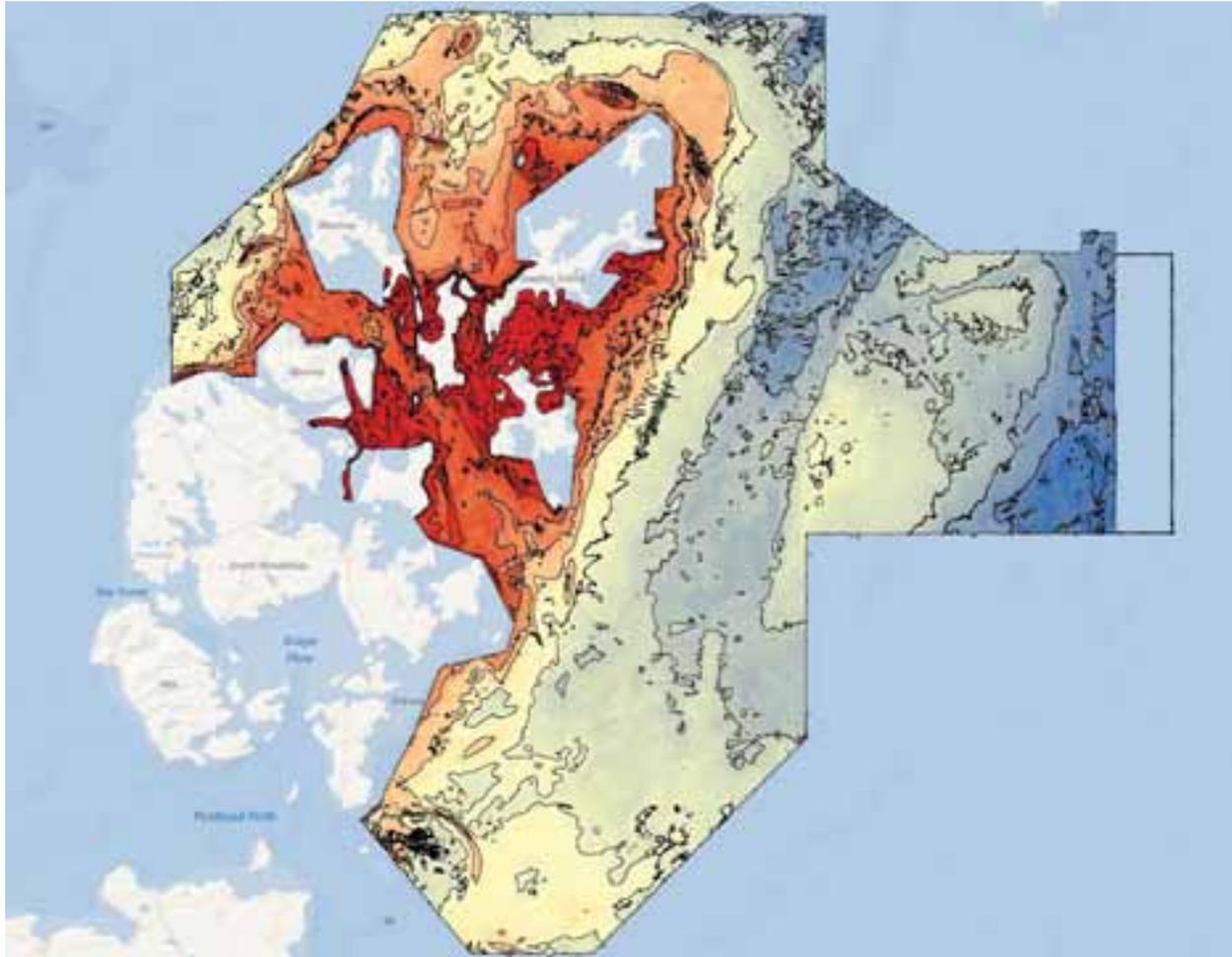


Rules used to define how the surface is built;
Newest first, highest accuracy, IHO Order number, Type of sonar....

Using the BIS - Combining datasets to create one huge surface

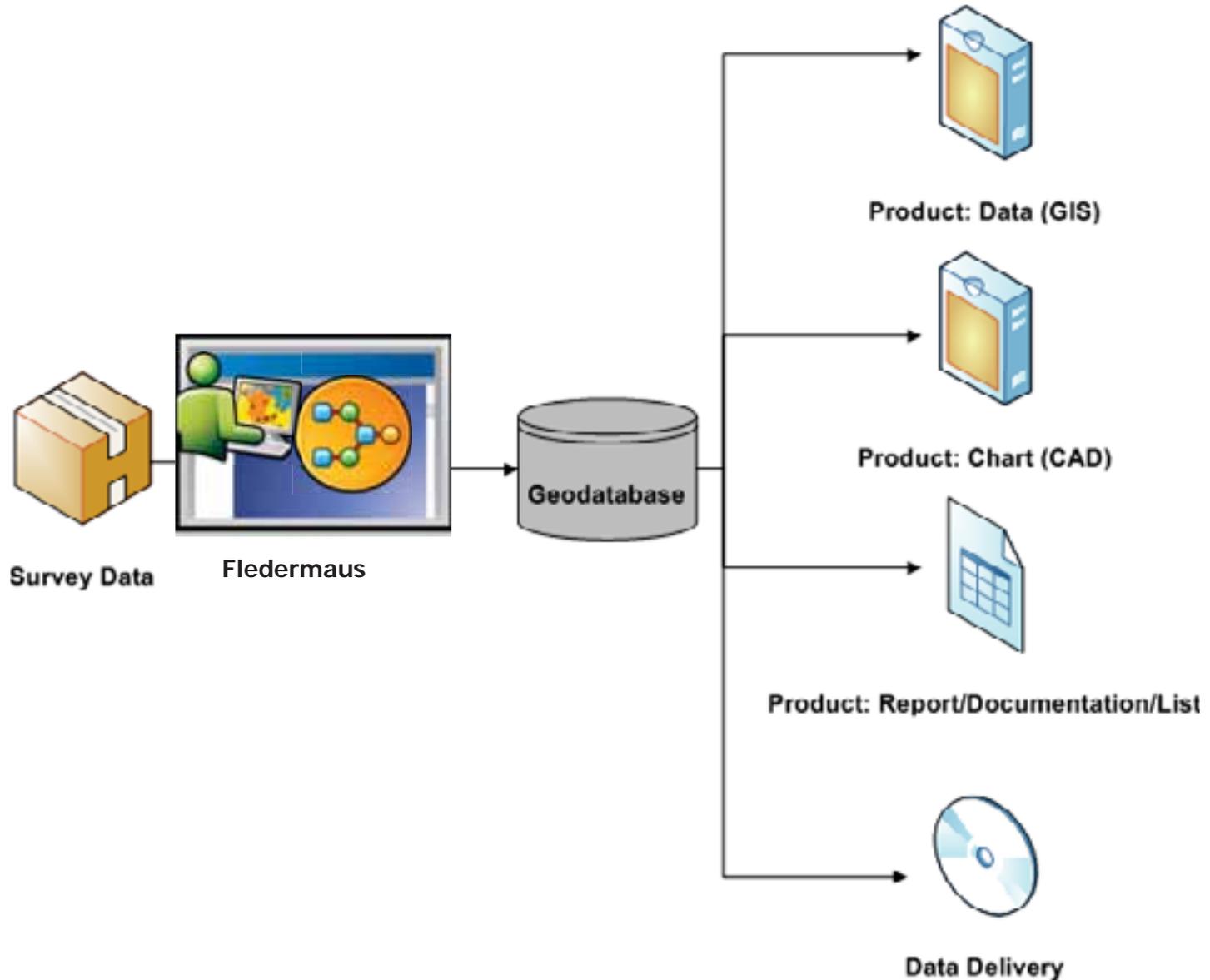


Geospatial tools can then be applied to the one surface

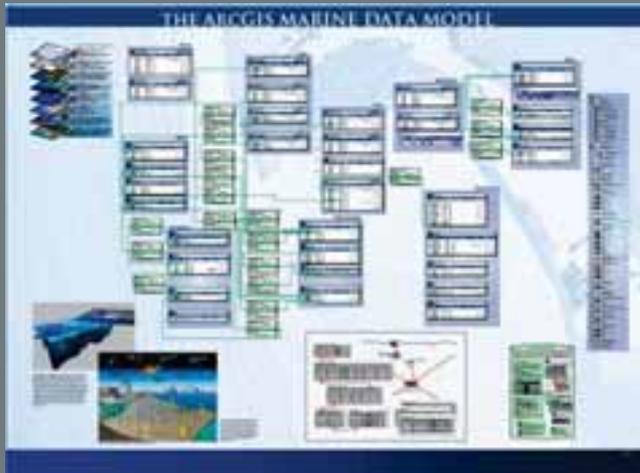
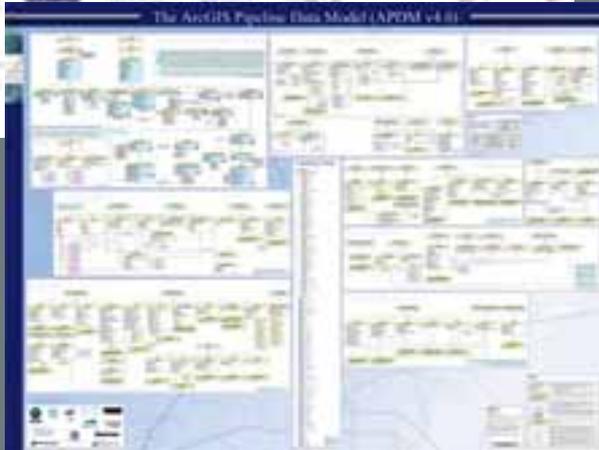


Usage: Route surveys, Pipeline surveys, Very large area surveys

MMT OPTIMISED GIS WORKFLOW

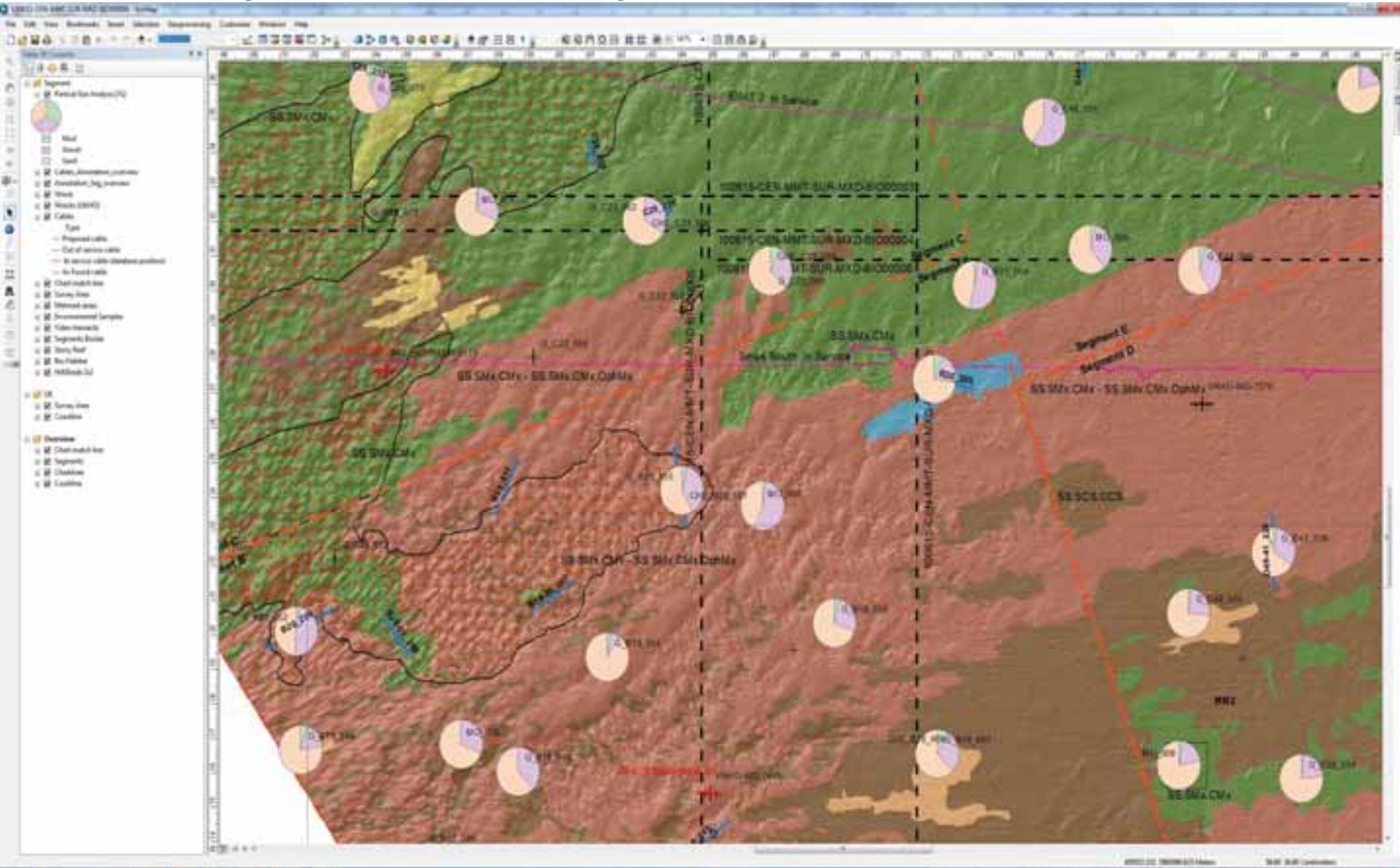


Example of Industry Standards



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

An example Wind Farm product





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





MEASURE THE DIFFERENCE!