



esri

Maritime

In partnership with





Ocean GIS

Geospatial Information for 71% of our Planet
by Rafael Ponce

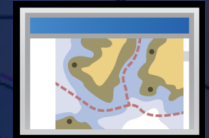
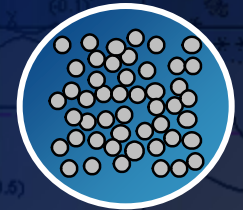
MACHC12 – Industry Day

St. Kitts & Nevis, 5-December-2011



Presentation Overview

- **GIS and its relevance**
- **Marine Spatial Data Infrastructure (MSDI)**
 - IHO and MSDI
 - Building a MSDI
- **Cloud computing and crowd sourcing**
 - ArcGIS online: GIS in the Cloud
 - Bathymetry in the Cloud
 - Ocean Basemap
 - Other authoritative content
- **Geospatial data in action**
 - A Geoportal
 - INSPIRE
 - SDI implementations
- **GIS for Hydrography: a Modern Hydrographic Workflow**
 - QPS Fledermaus
 - Bathymetric Information System
 - Nautical Information System
- **Enterprise Maritime Data Management**
 - No more stovepipe systems
- **Esri in Capacity Building and Education: new opportunities for MACHC**



A New GIS Pattern Is Emerging

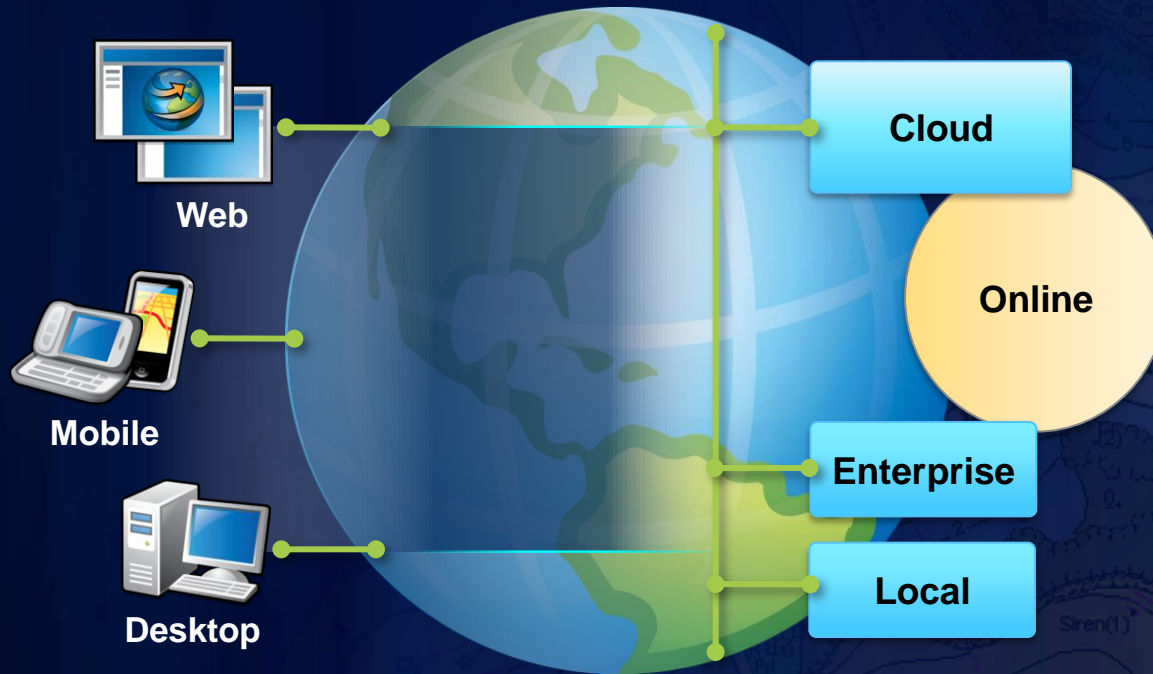
Making GIS Accessible to Everyone



... Virtually Anywhere and on Any Device

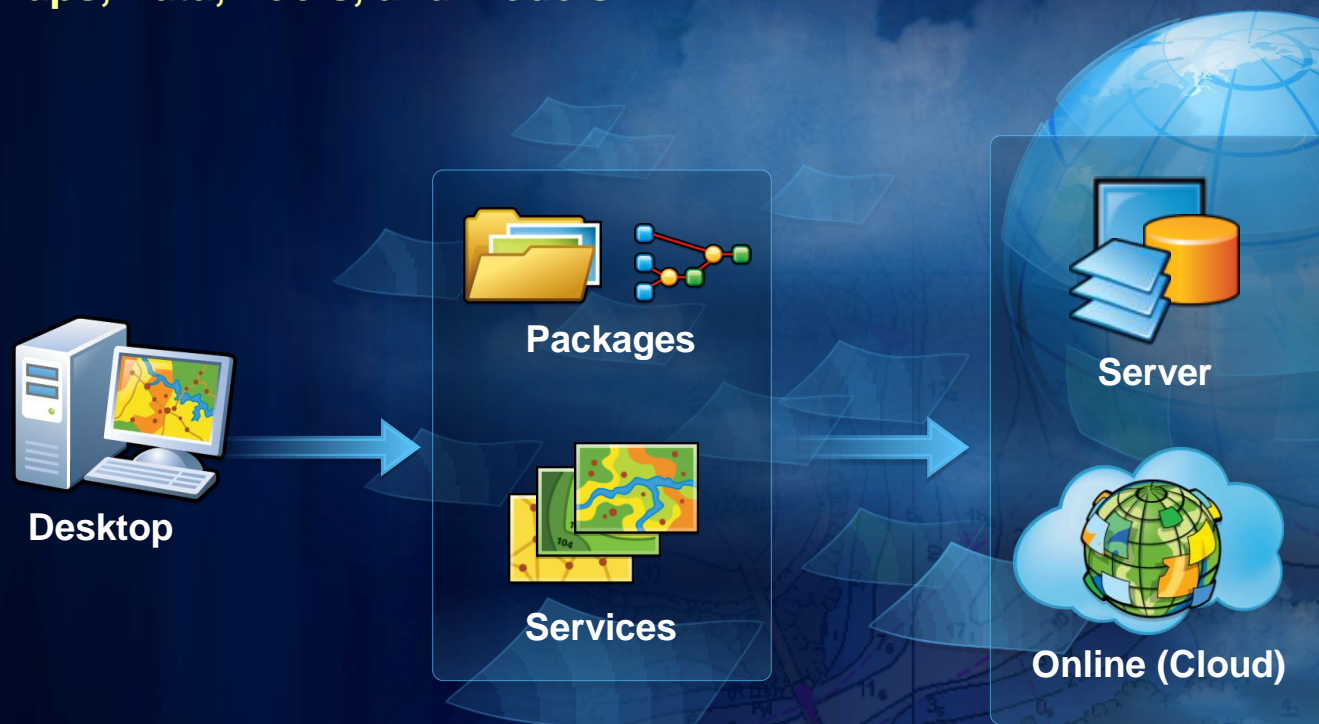
GIS and its relevance

Three main levels in a System for Geographic Information



New GIS Simplifies Sharing Your Work

Maps, Data, Tools, and Models . . .



. . . Automating the Process of Creating Services

GeoDesign Considers All the Geographic Questions

The World
As It Is



How Can
We Describe
Geography?

Data
Inventory

How Does
Geography
Operate?

Process
Models

How Can
We Alter
Geography?

Capability/
Sustainability
Models

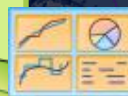
How Should
Geography
Be Changed?

Decisions/
Values



What Are The
Consequences
Of Change?

Evaluation/
Analysis



What Are The
Alternative
Scenarios?

Designing/
Sketching



The World
As It
Could Be

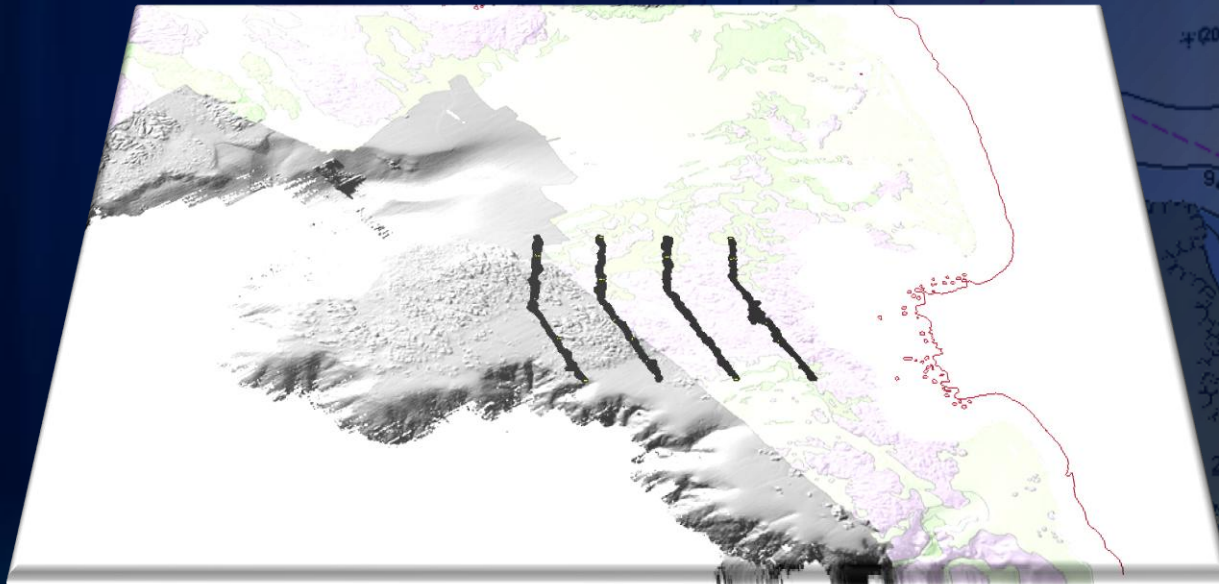
Geo-Accounting



... A Rapid & Adaptive Process
... Creating a Sustainable Future

What is Spatial Data?

- Data that identifies the geographic location of features (natural and constructed) and boundaries on Earth.
- Stored as coordinates and topology and can be mapped.
- Often accessed, manipulated and analyzed through a Geographic Information System (GIS).



Spatial Data Is Very Valuable to Government

and to everybody...



Port Management

Conservation

Science/Modeling

Land Management

Congestion

Crime

Defense/Security

Emergency Management

Pollution

Water

Agriculture/Forestry

Business Efficiency

Natural Resources

Biodiversity

Economic Recovery

Global Warming

Human Health

Energy

Oceans

Land Use

Population

Education

Public Safety

Development

Logistics

Facility Management

Urbanization

Humanitarian Relief

Law Enforcement

National Security

Environmental Protection



✓ *Improving Planning, Management, and Decision Making . . .*

GIS Supporting Place-Based Policies

Increasing the Impact of Government Programs & Projects

- Targeting Priority Places
- Coordinating Projects & Programs
- Developing Coordinated Plans
- Supporting Integrated Decision Making

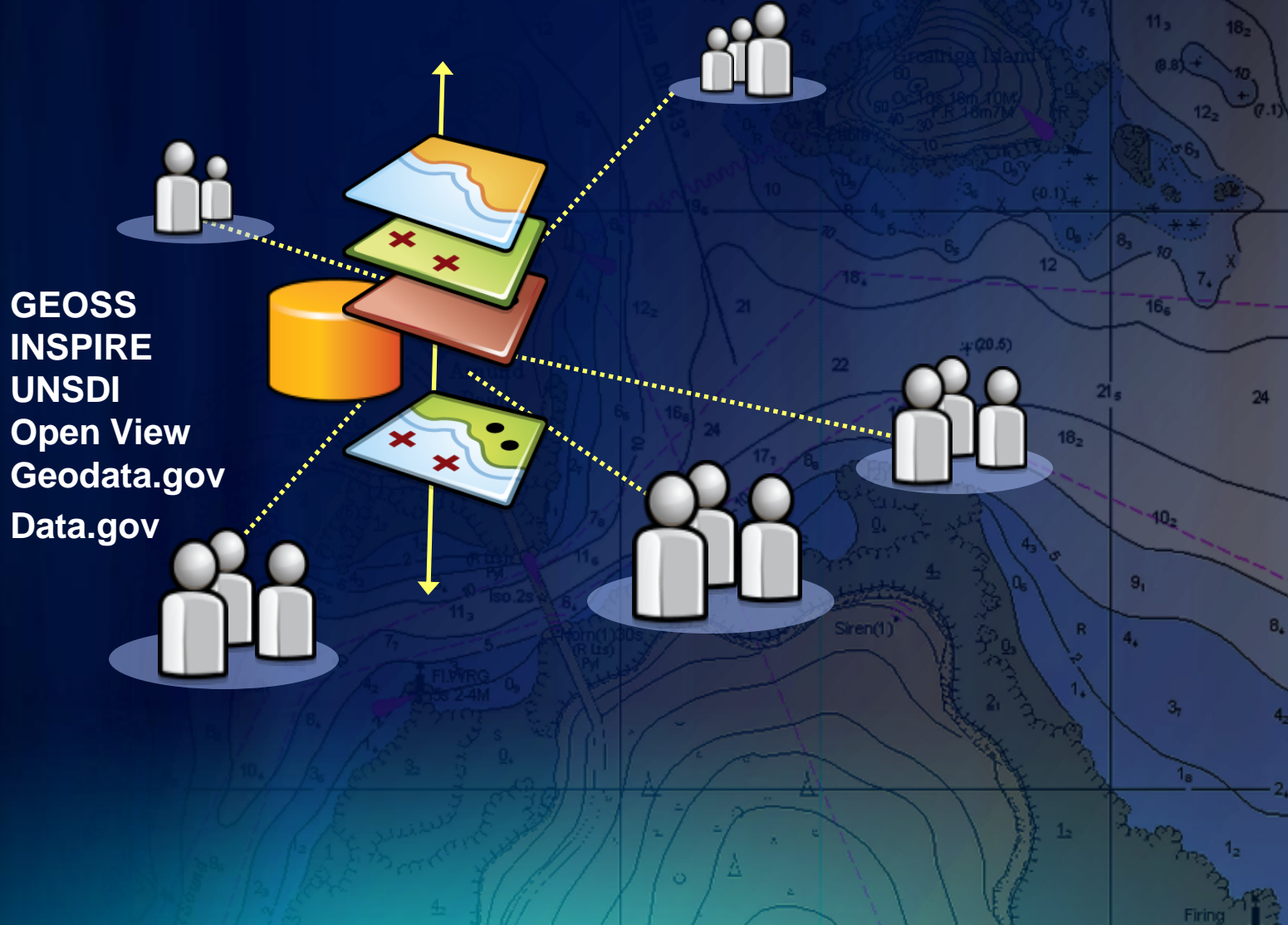


- Marine Sanctuaries
- Coastal Zone Management
- Regions
- Bays

Using Geography & GIS as a Framework for Integrated Problem Solving

Data Sharing Has Been a Key to This Success

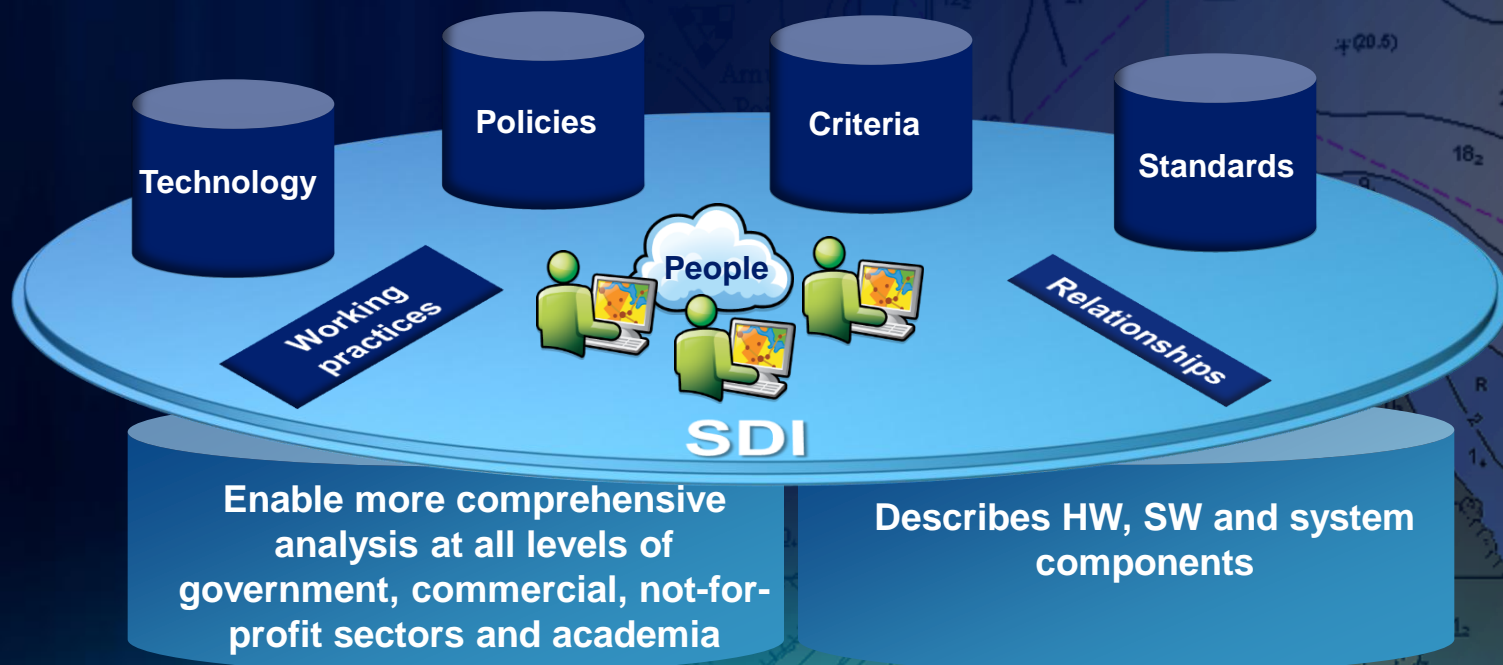
Many Agencies Consider Sharing Part of their Mission



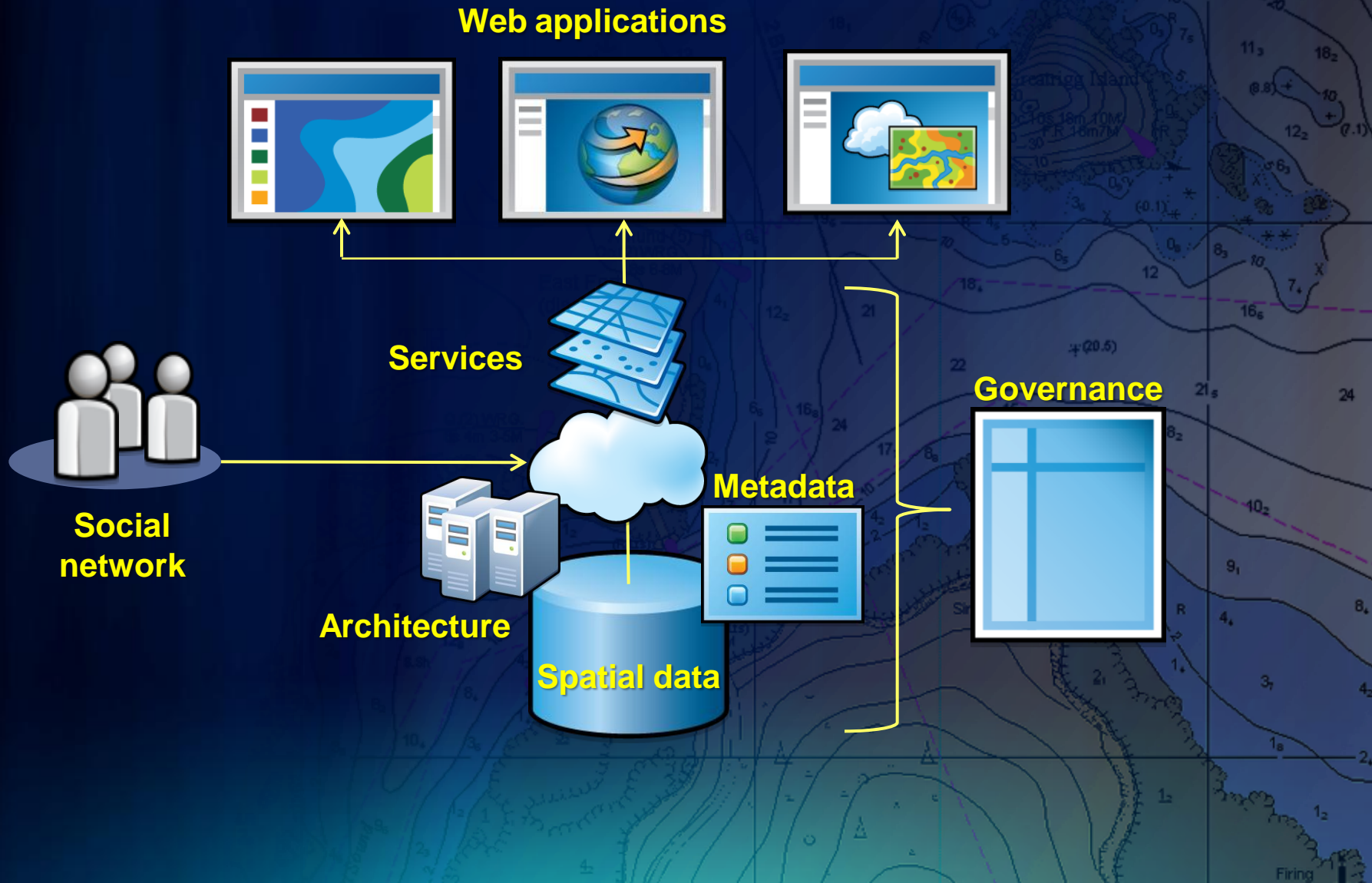
Spatial Data Infrastructure

Constituents

- SDI is “the relevant base collection of technologies, policies and institutional arrangements that facilitate the availability of and access to spatial data.” (Ref: Global Spatial Data Infrastructure Cookbook).

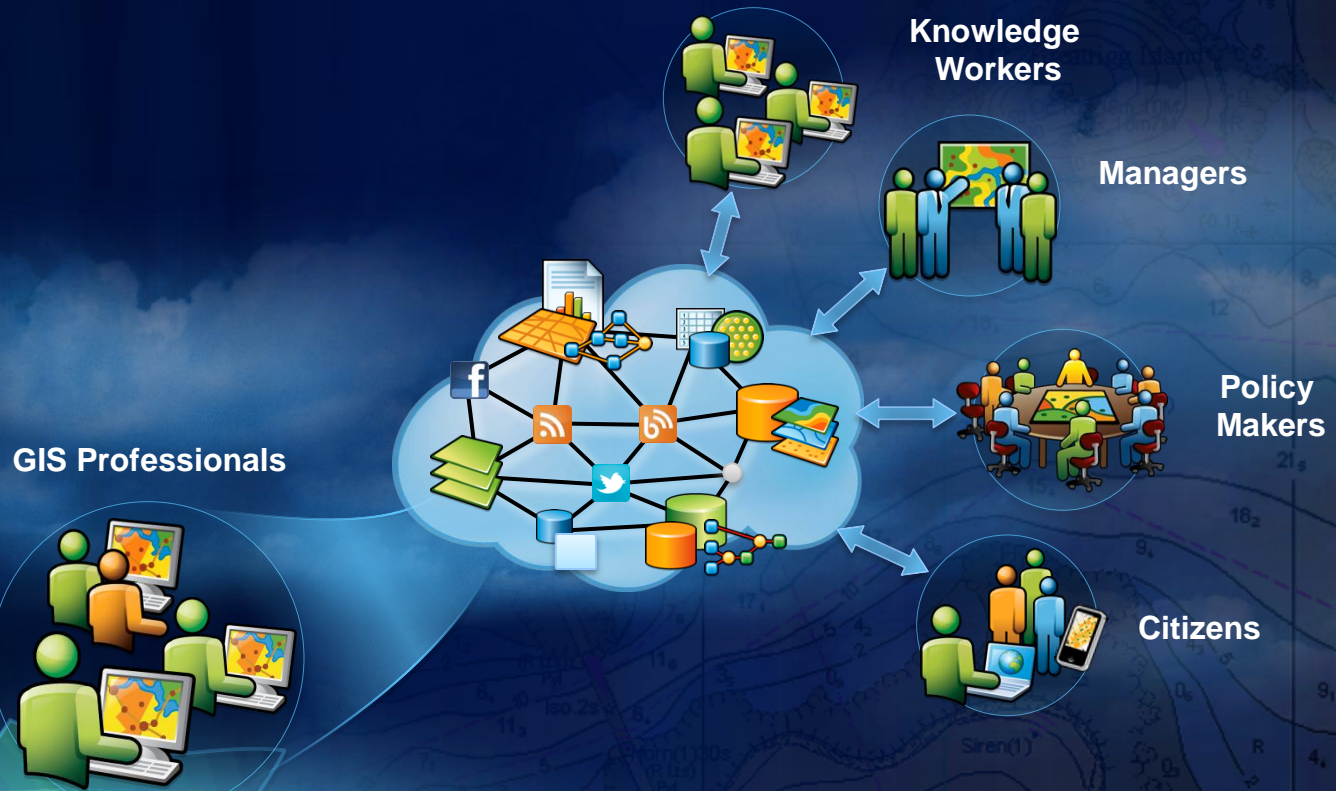


SDI key components



Marine SDI

Providing Access to a Vast Network of Marine Knowledge



*Extending the Reach of GIS . . .
Empowering Others to Participate . . .
. . . Providing Shared Understanding*

Marine SDI

Definition

- ***“MSDI is the component of an SDI that encompasses marine geographic and business information in its widest sense. This would typically include seabed topography (bathymetry), geology, marine infrastructure (e.g. wrecks, offshore installations, pipelines and cables), administrative and legal boundaries, and areas of conservation, marine habitats and oceanography.”***

(IHO Pub. C-17, Spatial Data Infrastructures “The Marine Dimension”. Guidance for Hydrographic Offices. Ed. 1.1 February 2011).

Building a MSDI

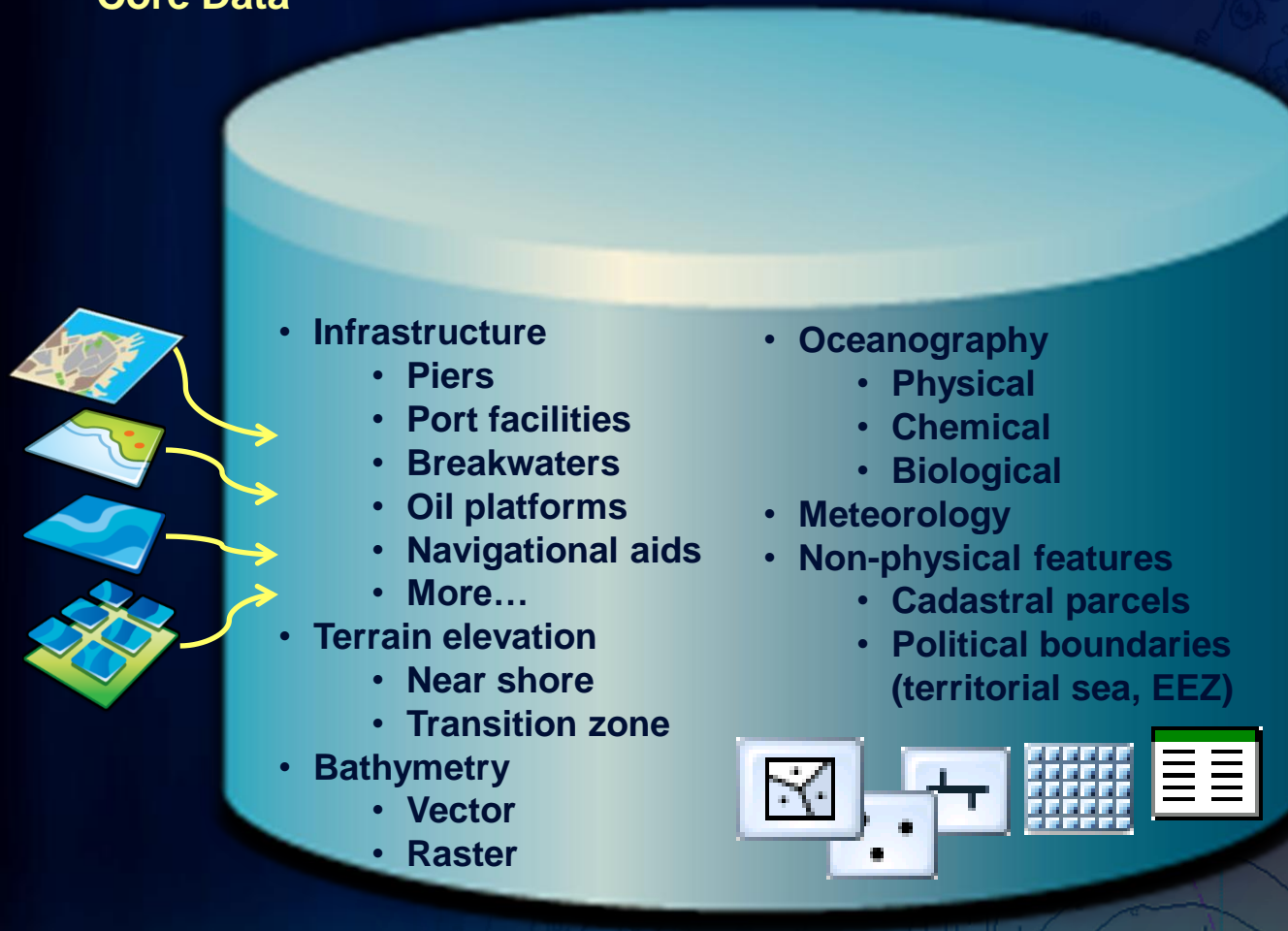
Basic elements

- Core Data
- Database
- Data models
- Geographic Information System
- Geoportal
- Web services



Building a MSDI

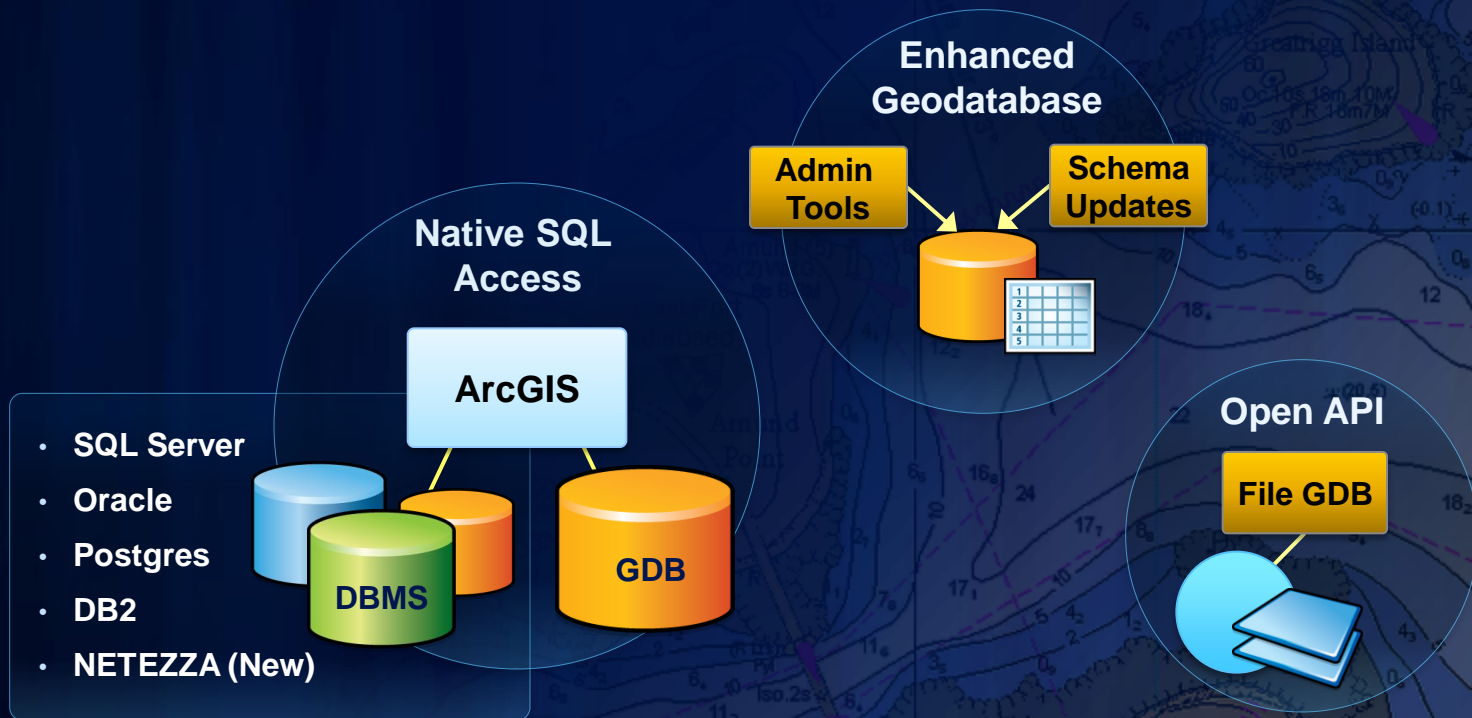
Core Data



Standardize data sets organized as Features, Rasters and Tables

Building a MSDI

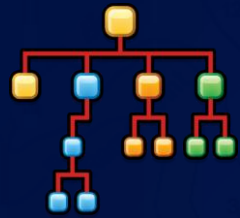
Standard Spatial Databases



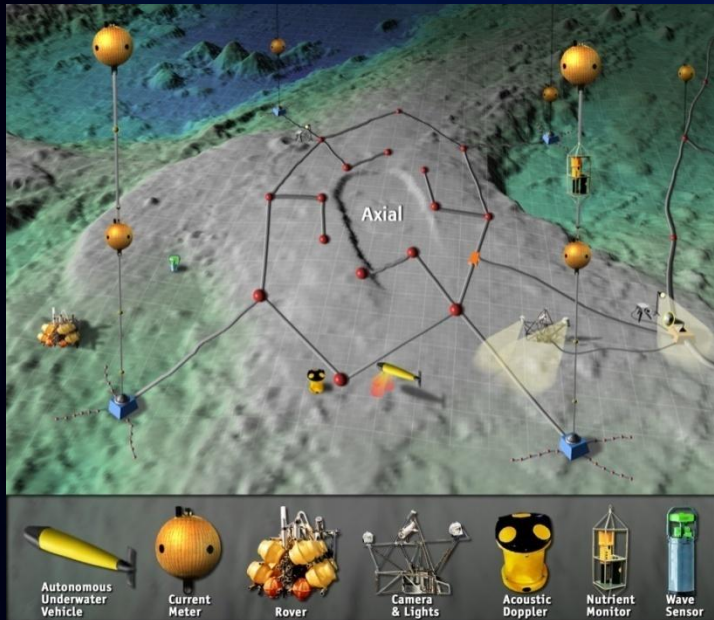
... Making Management and Access Simple

Data Models

ArcMarine, Nautical and Bathymetry



Marine data collection



Short-term
Mobile Observations

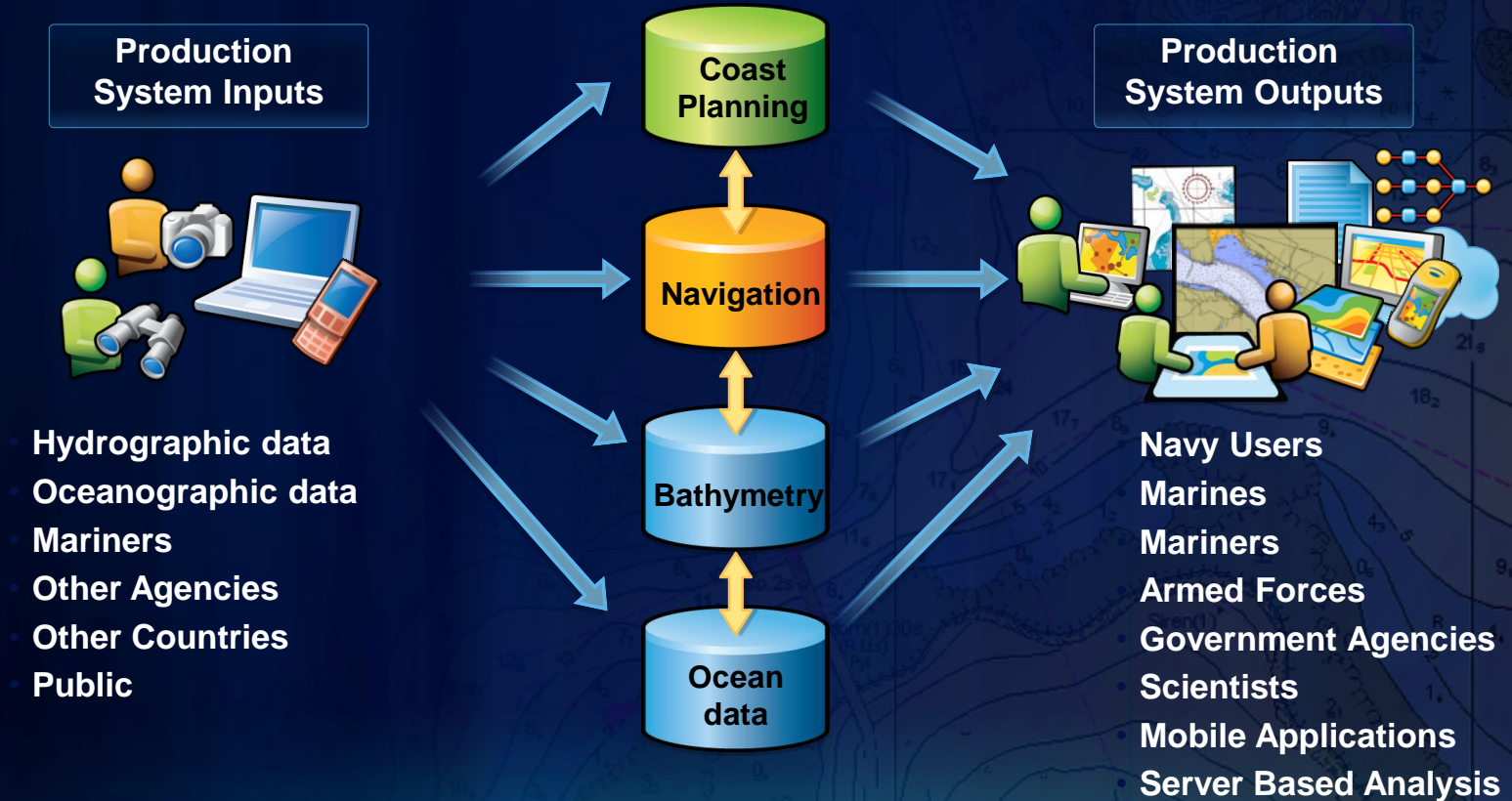
Long-term
Fixed Observations

Temporal and Spatial relationship

Image published in the ArcMarine book by permission of the Neptune Program, www.neptune.washington.edu, University of Washington Center for Environmental Visualization

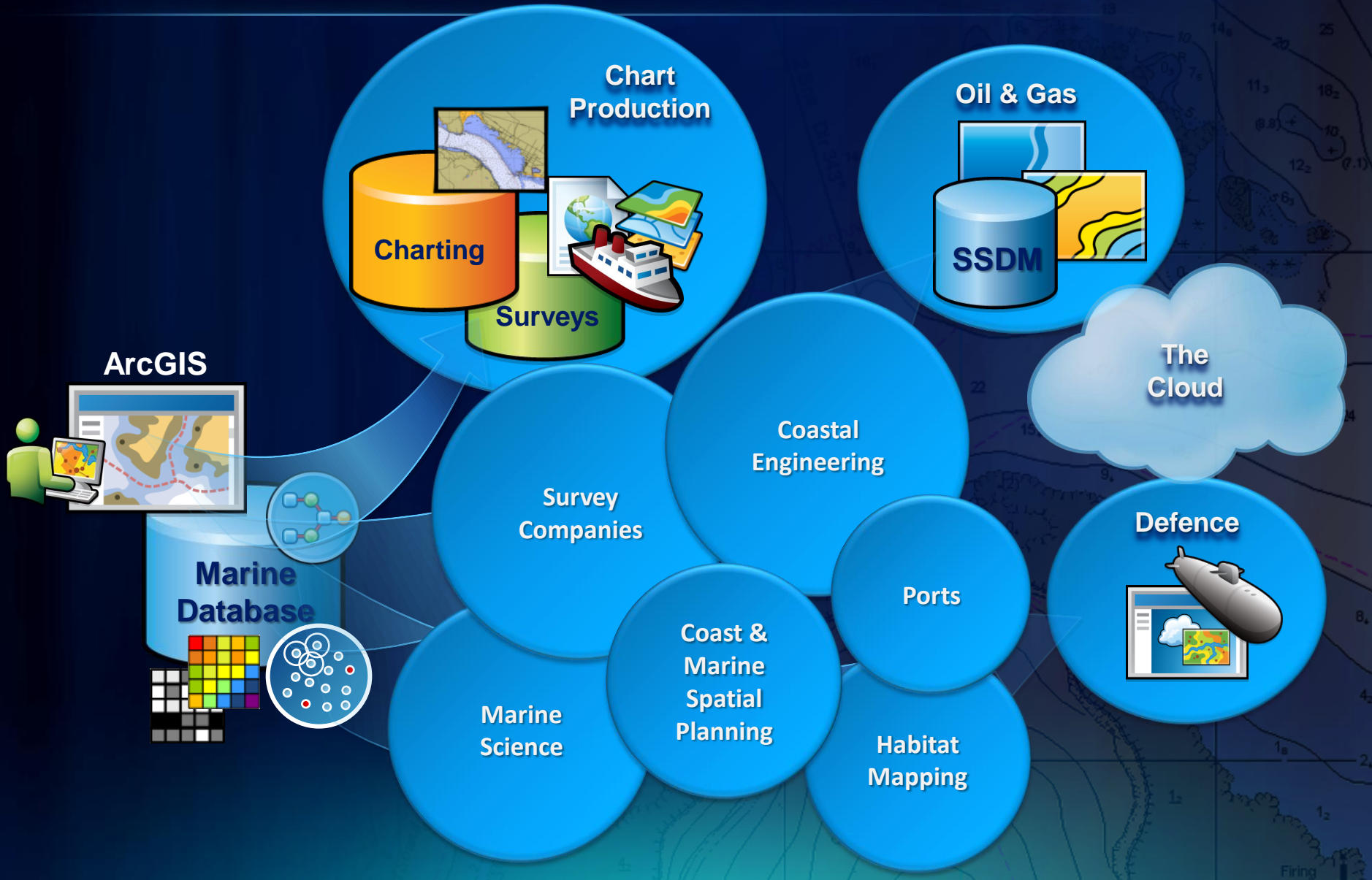
A Marine GIS as the Core of MSDI

Marine Data and Information System



...Interoperability, flexibility and scalability

From GIS to anywhere...




ArcGIS Online: Cloud computing (and Crowdsourcing)

ArcGIS Online



Maps and Apps for Everyone

Easy online discovery, access,
visualization, and dissemination of
geospatial information.

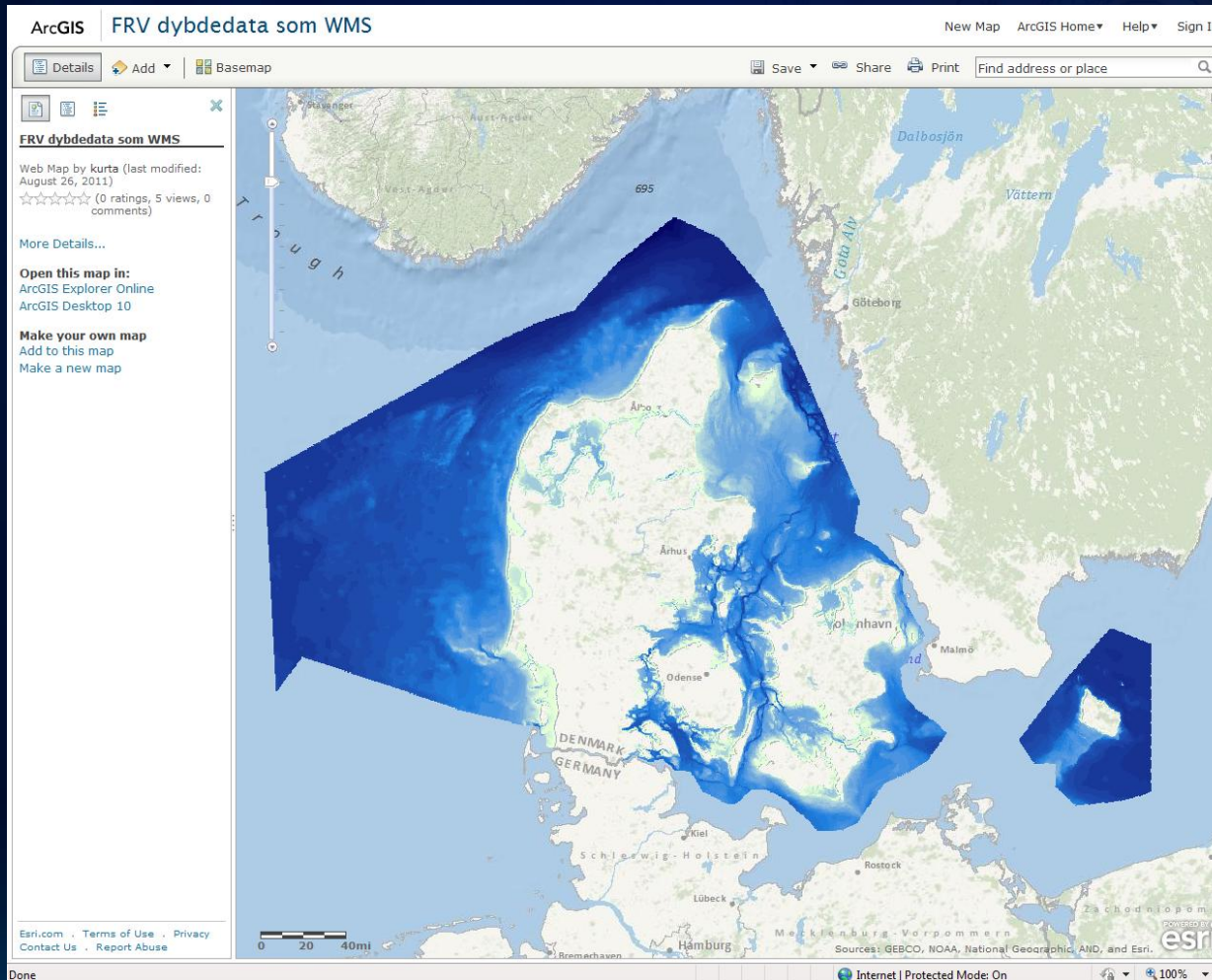
VIEW NOW 

- Map Products
- Web Apps
- Web Services
- Ocean Basemap



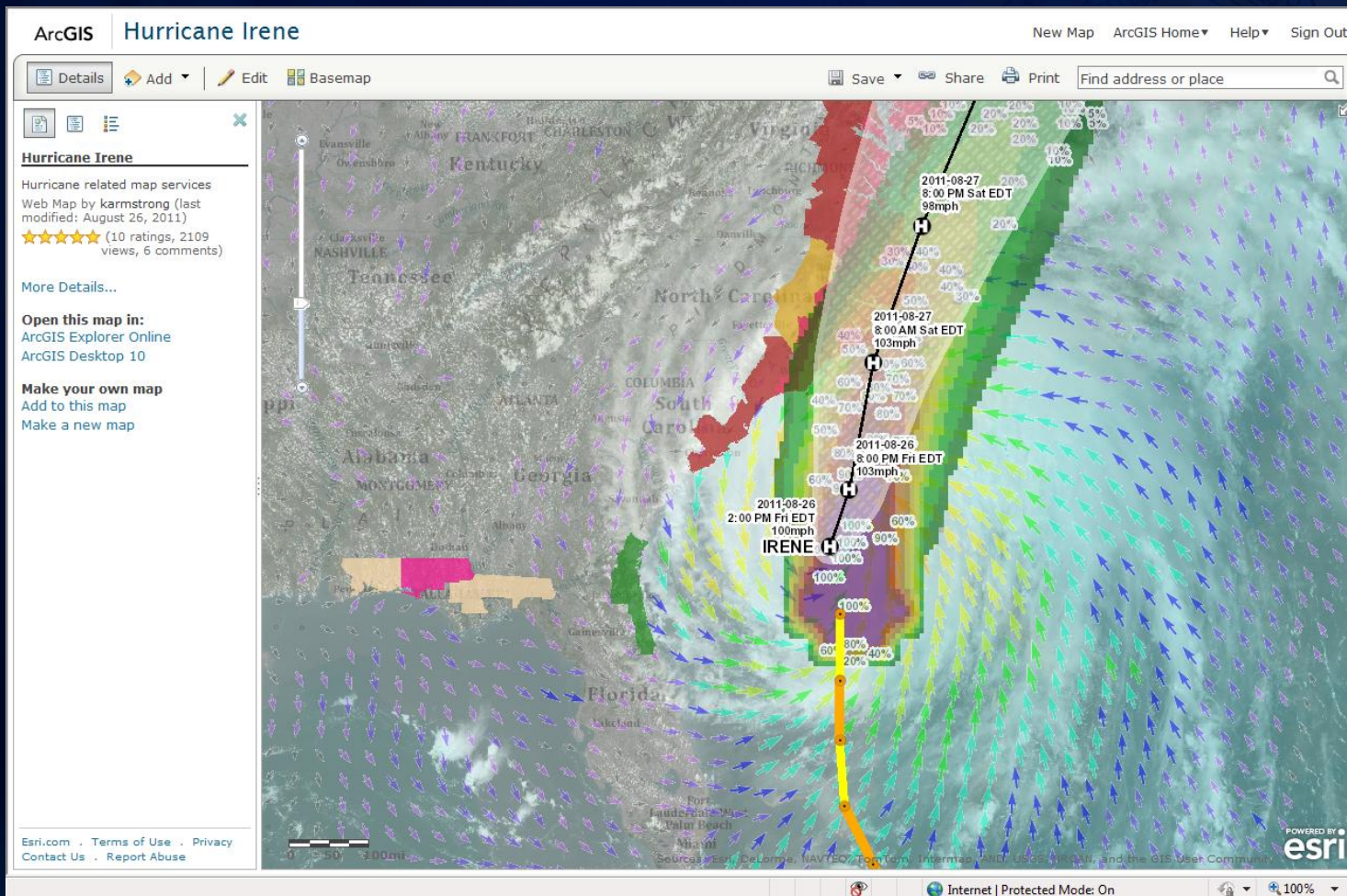
An Ocean Basemap

A Marine SDI product



Hurricane Irene (Aug-26-2011)

A Marine SDI Product



US NOAA and BOEMRE Multipurpose Marine Cadastre

A Marine SDI Web App

Multipurpose Marine Cadastre
BUREAU OF OCEAN ENERGY MANAGEMENT, REGULATION, AND ENFORCEMENT AND NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Latitude: 29.2562 Longitude: -82.5703 Scale: 1:4,622,324

Table of Contents

Layers Legend

Street Physical Satellite

Available Layers:

- ▶ Jurisdictional Boundaries and Limits
- ▶ Federal Georegulations
- ▼ **Navigation and Marine Infrastructure**
 - Shipping
 - Collision Regulations Boundary
 - Oil and Natural Gas Wells
 - Drilling Platforms
 - Liquefied Natural Gas Sites
 - Selected Pipelines
 - Submarine Cables
 - Wrecks and Obstructions
 - Anchorage Areas
 - Military Danger Zones
 - Navy Aviation Warning Areas
 - Aids to Navigation
- ▶ Federal Agency Regions
- ▼ Physical and Oceanographic
 - Undersea Feature Placenames
 - Sediment Type
 - Seafloor Geology
 - Outer Continental Shelf Sand and Gravel

Identify

Active Layer: Navigation and Marine Infrastructure

Attribute	Value
description	telephone
description	

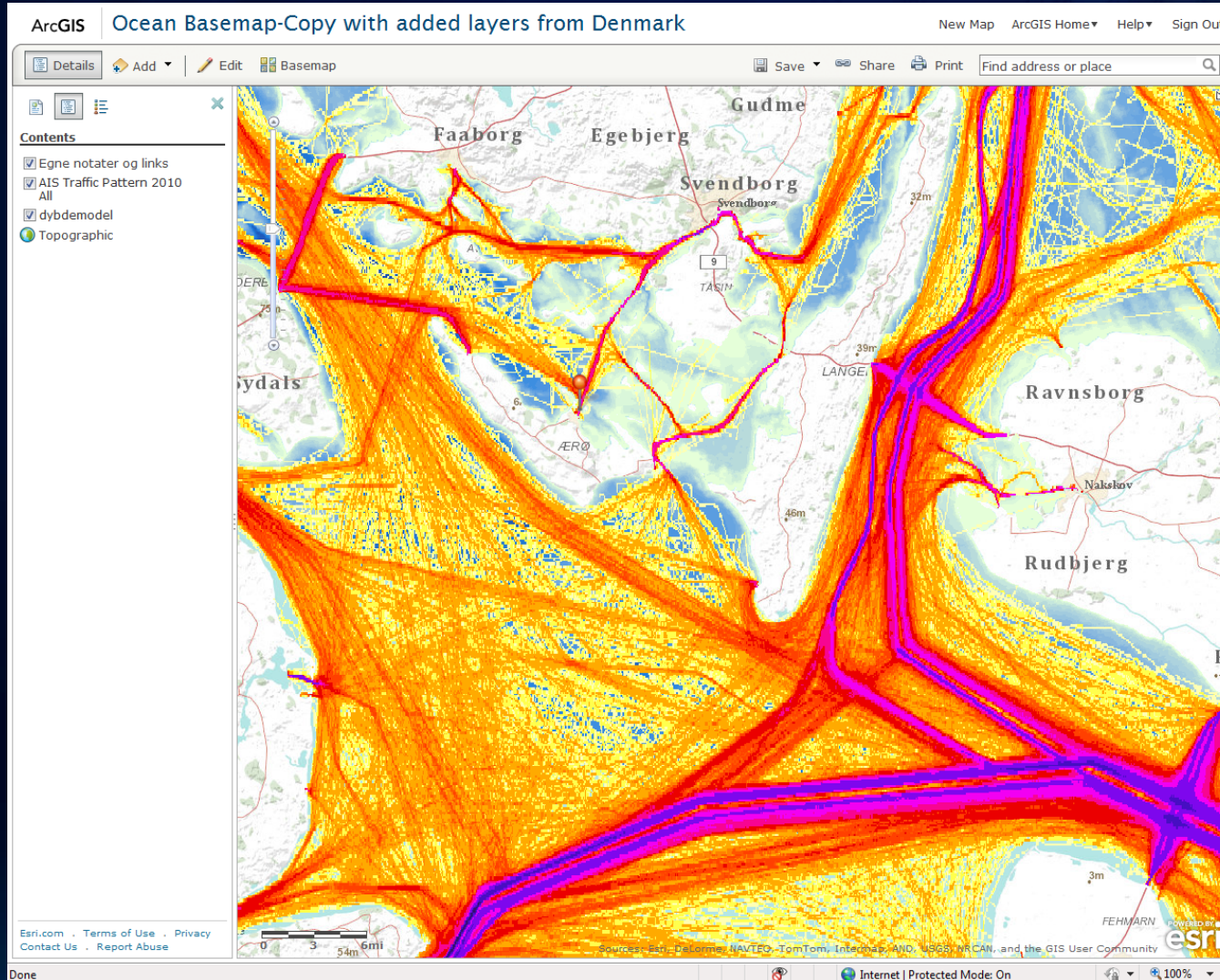
United States Department of Commerce | National Oceanic and Atmospheric Administration | National Ocean Service

Contact Us | Privacy Policy | Link Disclaimer | USA.gov

Done Internet | Protected Mode: On 100%

Ocean Basemap with AIS Traffic Patterns

A Marine SDI Web Service



Maritime Online— Esri Ocean Basemap



ARCTIC OCEAN

ARCTIC OCEAN

NORTH PACIFIC OCEAN

NORTH ATLANTIC OCEAN

SOUTH PACIFIC OCEAN

SOUTH ATLANTIC OCEAN

INDIAN OCEAN

PACIFIC OCEAN

NORTH AMERICA

EUROPE

ASIA

AFRICA

SOUTH AMERICA

AUSTRALIA

POWERED BY
esri

http://obcache/ArcGIS/rest/services/Combined/MapServer?f=jsapi

ArcGIS JavaScript API: Com...

ArcGIS JavaScript API Co... Suggested Sites Maritime - Site Content a... Adobe ArcZone Bathy-DMS Bathy TFS CCP EPDS ETC GIS Wksp MarDMS - Site Admin

Next OBM release (December 2011)

The screenshot shows a web browser window displaying an ArcGIS web map. The browser's address bar shows the URL: http://www.arcgis.com/home/webmap/viewer.html?url=http%3a%2f%2f184.108.163.100%2farcgis/rest/services/monterey_bay/MapServer/0. The page title is "New OBM US waters".

The map interface includes a search bar with the text "Find address or place" and a search icon. Below the search bar are navigation and utility icons: Details, Add, Basemap, Save, Share, Print, Measure, and Bookmarks. The map itself shows a bathymetric view of the Monterey Bay region, with depth contours and labels for various seamounts and points of interest, including Point Arena, Sonoma Mountains, Security, Obstin, Pioneer Seamount, Gypsy Seamount, Monterey Bay, Point Pinos, Lopez Point, David's Seamount, and San Juan Seamount. A purple circle highlights a specific area near the coast, and a scale bar is visible at the bottom left.

The left sidebar contains a "Contents" panel with the following layers checked:

- A16_Grouped
- Ocean_Basemap_Proxy
- Topographic

At the bottom of the page, there is a footer with the text: "Esri.com · Terms of Use · Privacy Contact Us · Report Abuse" and "POWERED BY esri".

Maritime Online – St. John BIOMapper

Biogeography Integrated Online Mapper



Benthic Habitat Mapping off St. John, U.S. Virgin Islands National Park and Virgin Islands Reef National Monument

ArcGIS World Elevation Image Services

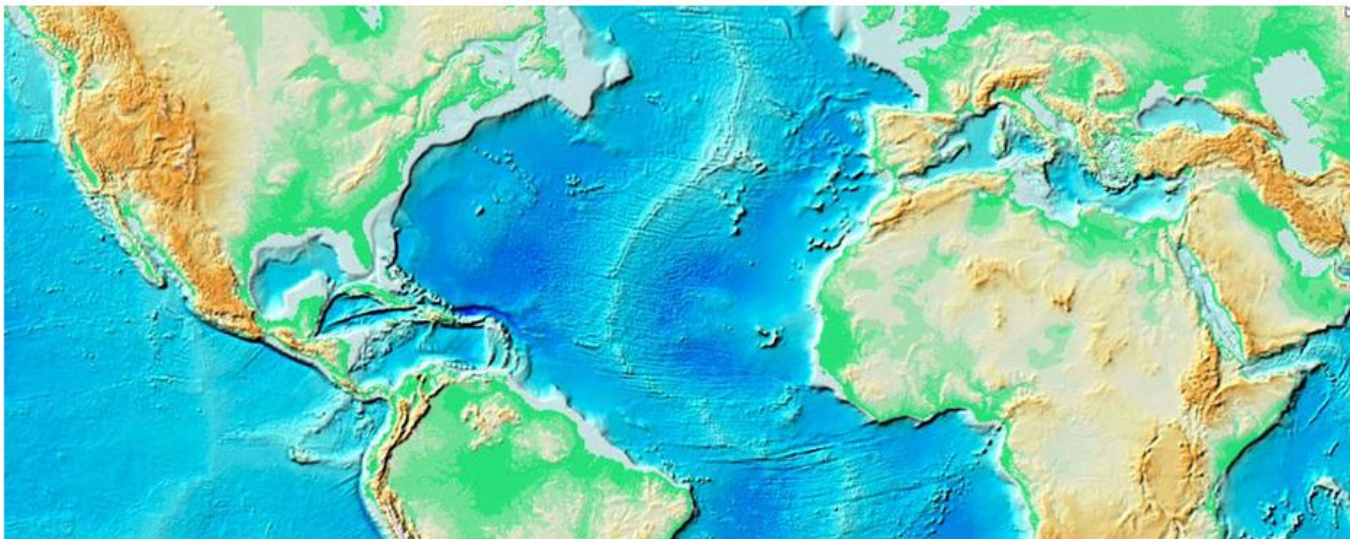
Dynamic elevation image services provide simple, online access to large collections of multi-resolution, multi-source elevation data covering the globe. They provide:

- Simple, direct access to global elevation data
- Easy-to-interpret, visual symbologies (such as hillshade, slope, and aspect) and associated metadata
- Direct access for web and desktop applications that require height, slope, or aspect
- The ability to export small sections for local use

There are a variety of elevation surface representations available. The earth's surface is represented as a terrain (without features like trees and buildings), as a surface (with trees and buildings), and as a combined topographic and bathymetric surface (to represent land and under water). The data sources include multiple sources of elevation data, ranging from 230m Global GMTED, to the USGS NED coverage, to submeter Lidar data for small areas.

The ArcGIS World Elevation services are currently available as a public beta. Please begin by clicking the **'Join This Group'** button in the upper right hand corner for the [World Elevation group](#) on ArcGIS Online, and from there you can proceed to the beta site. [Learn more](#) about the ArcGIS World Elevation services before joining the beta.

Please [contact us](#) for more information on these services.



Maritime Online – Nautical Chart Service (coming soon)



ArcGIS | Gulf Coast Electronic Navigational Charts

Details | Add | Basemap | Save | Share

Gulf Coast Electronic Navigational Charts

This map service presents a nautical chart basemap derived from NOAA Electronic Navigational Charts (ENC) data for the Gulf of Mexico region and symbolized with U.S. Chart 1 symbols.

Map Service by esri_event (last modified: May 22, 2010)

★★★★☆ (2 ratings, 1770 views, 0 comments)

[More Details...](#)

Open this service in:
ArcGIS Explorer Online
ArcGIS Desktop

Make your own map
Add to this map
Make a new map

0 15 30mi

Source: Esri, DeLorme, NAVTEQ, TomTom, Intermap, AND, USGS, NRCAN, Kadaster NL, and the GIS User Community

POWERED BY **esri**

Inset Map Details:

- Multiple obstructions found in the area with this least depth
- South Mud Lumps
- Uncharted platforms, gas and oil well structures, pipes, piles and stakes can exist in this area.

ArcGIS Online is the new GIS platform

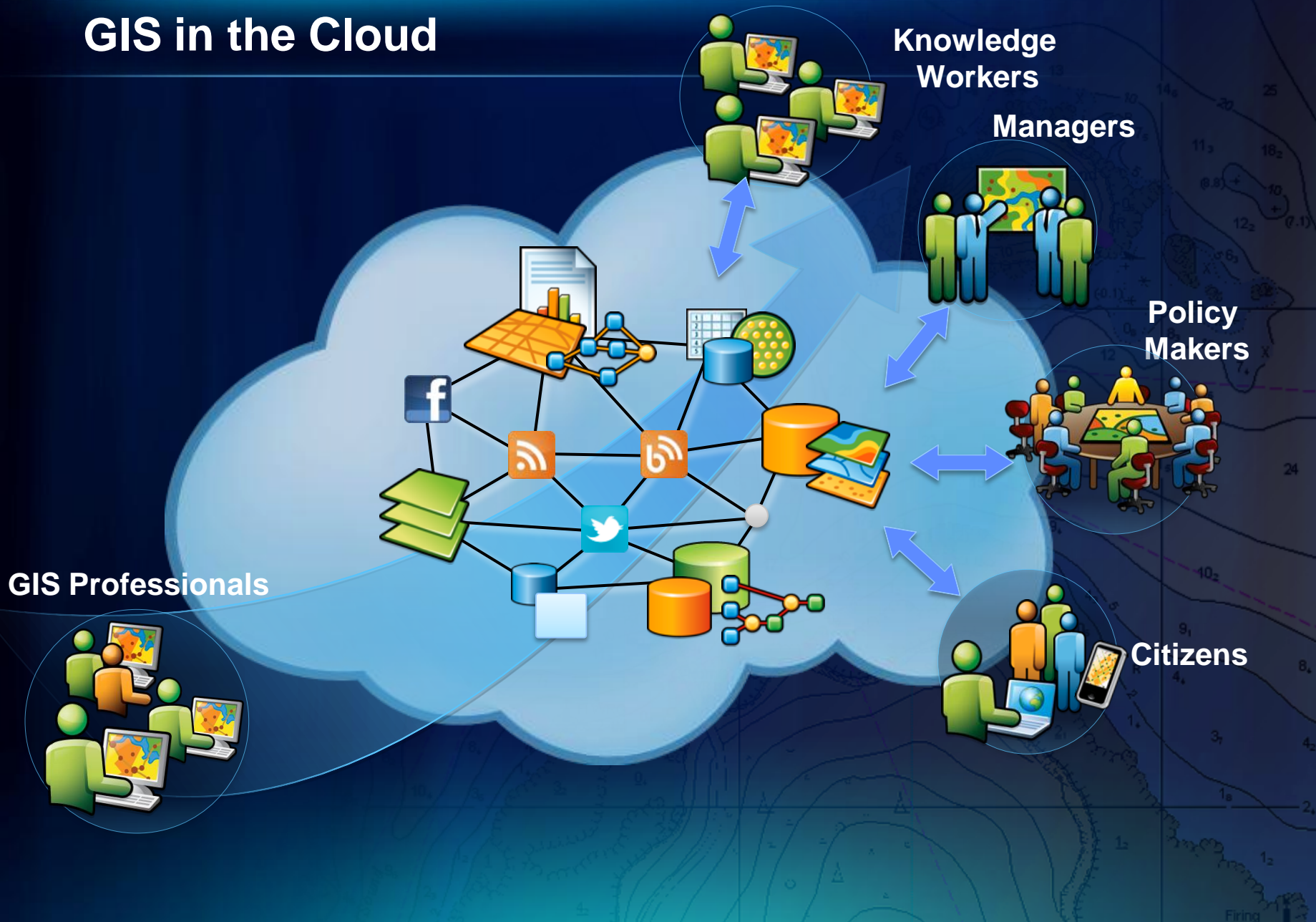


- ArcGIS Online is Cloud based
 - Geospatial content management
 - Esri & GIS User authored
 - Wide variety of platforms



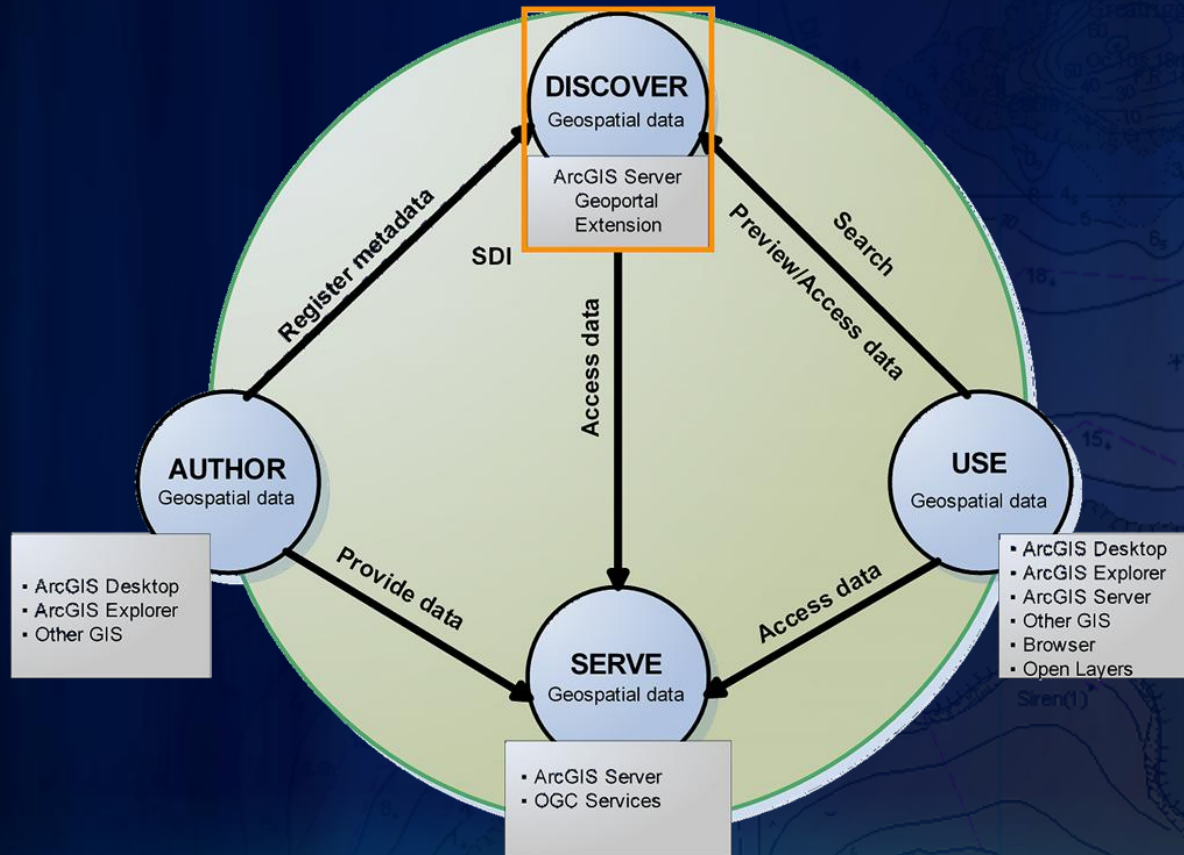
- Create & Share maps/data
- Access & Discover
 - Maps, services, tools, data
- Share Content
 - Public, Private, Groups

GIS in the Cloud



A Geoportals

For searching and accessing data



Esri's free, open source geoportals server

www.esri.com/geoportals

INSPIRE (Authoritative content)

Marine SDI as one of its main components

The screenshot shows the INSPIRE Geoportal website. At the top left is the European Commission logo and the text "European Commission INSPIRE Geoportal". A navigation bar contains "EUROPEAN COMMISSION > INSPIRE GEOPORTAL >". On the right, there are links for "Contact" and "Legal notice" and a circular logo for "INSPIRE Infrastructure for Spatial Information in Europe".

Home
[Discovery](#)
[Viewer](#)
[Metadata Editor](#)
[Metadata Validator](#)

Legislation
[Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community \(INSPIRE\)](#)
[Regulation on INSPIRE Network Services](#)
[INSPIRE Metadata Regulation](#)

INSPIRE Website
INSPIRE FORUM
INSPIRE

Welcome to INSPIRE geoportal

The INSPIRE geoportal provide the means to search for spatial data sets and spatial data services, and subject to access restrictions, view and download spatial data sets from the EU Member States within the framework of the [Infrastructure for Spatial Information in the European Community \(INSPIRE\) Directive](#). INSPIRE aims at making available relevant, harmonised and quality geographic information to support formulation, implementation, monitoring and evaluation of policies and activities which have a direct or indirect impact on the environment.

What does it include

This version is a prototype INSPIRE geoportal and allows for [discovery](#) and [viewing](#) of spatial data sets and services. It's aim is to identify issues related to its implementation and accessing distributed INSPIRE services, to help towards the development of the operational geoportal.

The prototype INSPIRE geoportal currently accesses a limited number of discovery and view services and therefore only a few metadata for spatial data sets and services may be found and viewed. These will increase as more services become available from the EU Member States.

To ensure that the INSPIRE geoportal has a full functional access to the Discovery and View services testing is done in close cooperation with the Member States. This allows performing any necessary modifications or adjustments to improve interoperability and the overall architecture performance and in general facilitate the way towards the full operating capability.

We depend on your feedback to help us make the geoportal better. If you have questions or comments about the site, please [contact us](#).

What's inside

Discovery
Search, discover and access geographic information provided by European governmental, commercial, and non-commercial organizations.

Viewer
Search, view, edit online maps, and create your personalised map using distributed data.

Metadata Editor
Create metadata according to the INSPIRE implementing rules.

Aug 2011

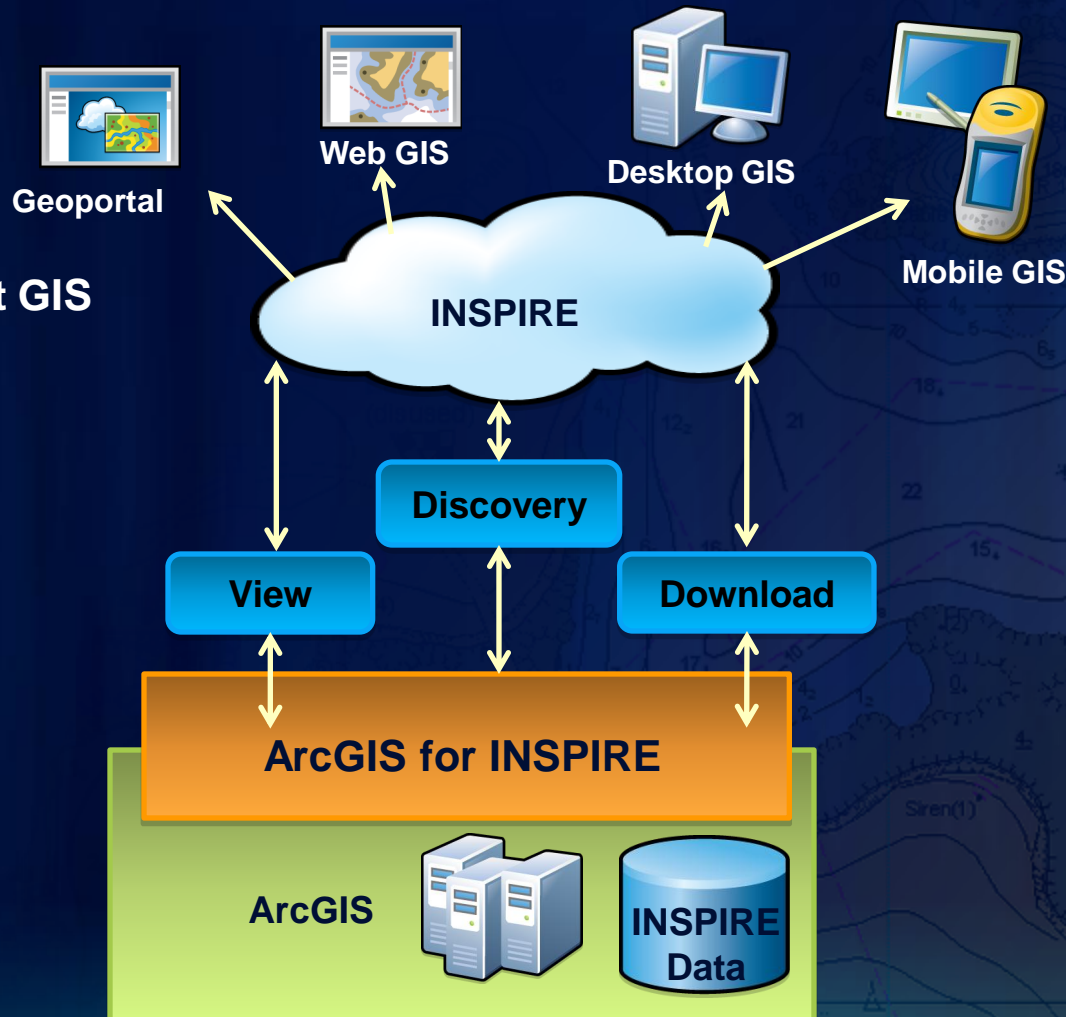
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

NEWS **EVENTS**

- 22-Jul-11 Call for Facilitators and Editor for Thematic Working Groups:
- 22-Jun-11 Consultation on the draft legal act on the harmonization and interoperability of environmental information (as defined in Annexes II and III of the INSPIRE Directive (2/2007))
- 09-Jun-11 Review of Data and Service Sharing documents
- 20-May-11 Registration for INSPIRE ANNEX II and III data specifications testing is still open
- 14-Apr-11 INSPIRE Spatial Data Services Recommendations Survey

Internet | Protected Mode: On | 100%

INSPIRE



- **INSPIRE compliant GIS**
- **Rules & Technical Guidance for**
 - **View**
 - **Discovery**
 - **Download**
 - **Metadata**

Eye on Earth (Crowdsourcing)

The screenshot shows a web browser window displaying the Eye on Earth website. The browser's address bar shows the URL <http://www.eyearth.org/>. The website header features the Eye on Earth logo and the slogan "Sharing is everything". The main content area is set against a satellite map of the world. On the left, a text box welcomes visitors and describes the service as a global public information platform for sharing data. In the center, there are social media icons for YouTube, Twitter, and Facebook, along with a "forum" link. On the right, there are sections for "Eye on Earth Watches" with a video player, a "Preview Version" announcement, and a logo for the COP17/CMP7 climate conference. The footer contains links for "Terms of use", "Privacy", and "Contact us".

http://www.eyearth.org/

Eye on Earth - Sharing is ev... x

Google Search More >>

hidrog... x

EYEonEARTH Sharing is everything

Welcome to Eye on Earth
Eye on Earth is a global public information service for sharing data and information from diverse sources.
Eye on Earth allows you to manipulate the data for collective discovery.
Eye on Earth is the result of a public-private partnership joining expertise from industry and public organisations.

Eye on Earth Watches

Eye on Earth
Preview Version
NEW WORK

forum

eye on earth
COP17/CMP7
CLIMATE CHANGE
CONFERENCE OF THE PARTIES
DOHA, QATAR

Terms of use Privacy Contact us

Esri supported SDIs in Europe

Portugal National System for Geographic Information (SING)
British Geological Survey Science Portal

The screenshot displays the ISPRA Geologic Portal website. At the top, there is a header with the ISPRA logo (Istituto Superiore per la Protezione e la Ricerca Ambientale) and the text "SERVIZIO GEOLOGICO D'ITALIA". A navigation bar includes links for "HOME", "METADATA SEARCH", "GEOLOGIC CARTOGRAPHY", and "GEOMAPVIEWER". A search bar is visible in the top right corner with links for "Login", "Help", "About", "Registration", and "Feedback".

The main content area is divided into several sections:

- Home**: A sidebar with buttons for "Home", "Thematic area", "Applications", "Project", "OGC Standard", "Publications", and "News".
- Overview**: A central text block stating: "The Geographic Portal allows to access to all metadata and data services stored in the Land Protection and Nature Map Department s, in accordance with the ISO19139 and INSPIRE standard and with the standard CNIPA published in the near future. The services in this portal are not the whole archives available, while the metadata form the information heritage of the Geological Survey of Italy."
- Quick Searcher**: A section with a search input field and a "Search" button. Below it, text reads: "Search in the metadata catalog of ISPRA or in another CS-W 2.02 metadata catalog the available metadata."
- Highlight Projects**: A section featuring three project cards: "Landslides (IFFI)", "ITHACA", and "CARG", each with a small red 'X' icon.
- News**: A sidebar on the right with a "News" header and two news items: "Vicenza landslides" and "Massa landslides", each with a corresponding image. Below these is a "News" section titled "Premiazione del portale alla 14° Conferenza ASITA - 9-12 novembre 2010".

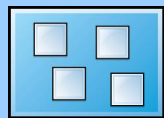
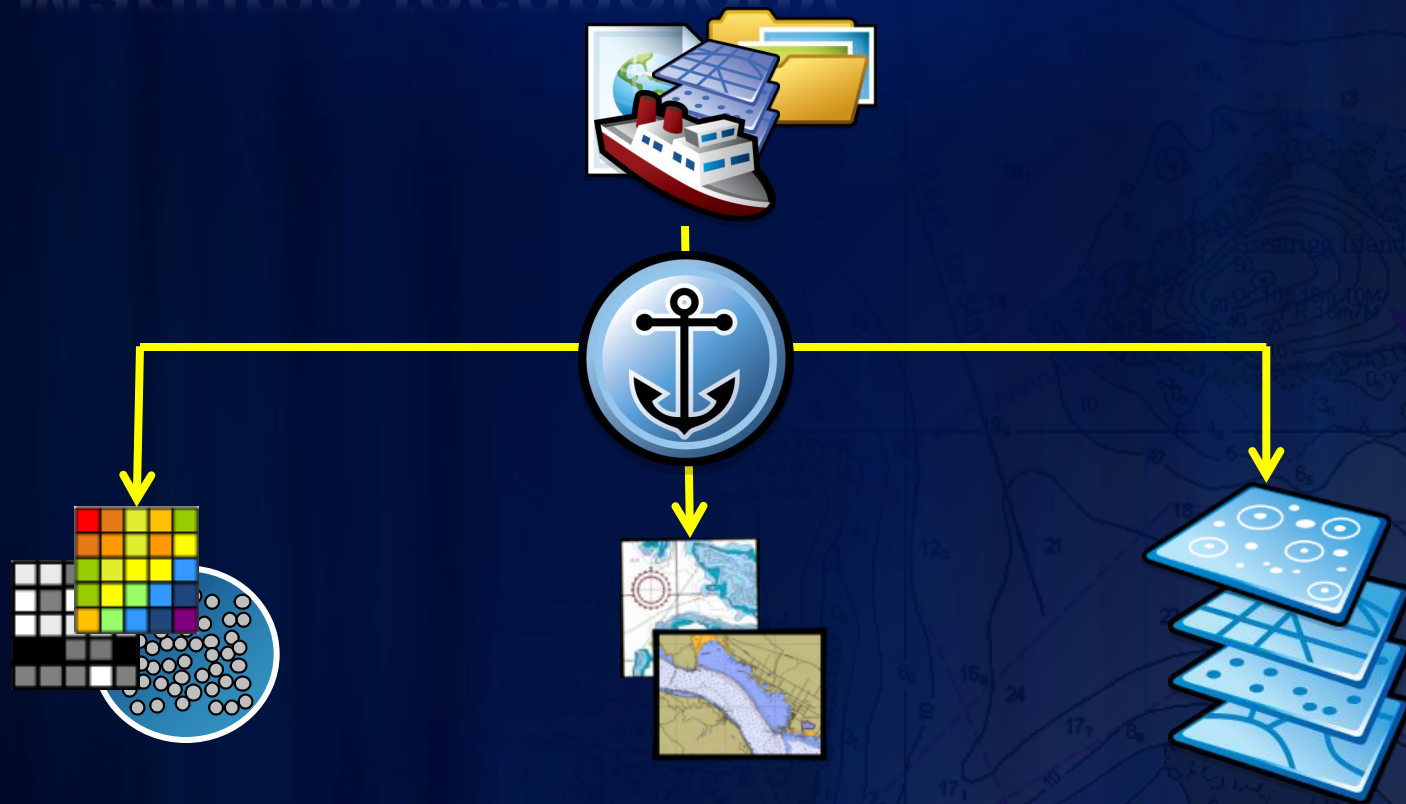
The bottom of the browser window shows the status bar with "Done", "Internet | Protected Mode: On", and a zoom level of "100%".



Esri Maritime Technology



Esri Maritime technology



Data Models



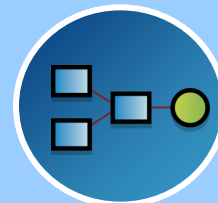
Data Bases



Tools



QC/QA



Workflows



Server

A complete platform

The Modern Hydrographic Workflow



esri



The Modern Hydrographic Workflow

*QINSy
Survey*

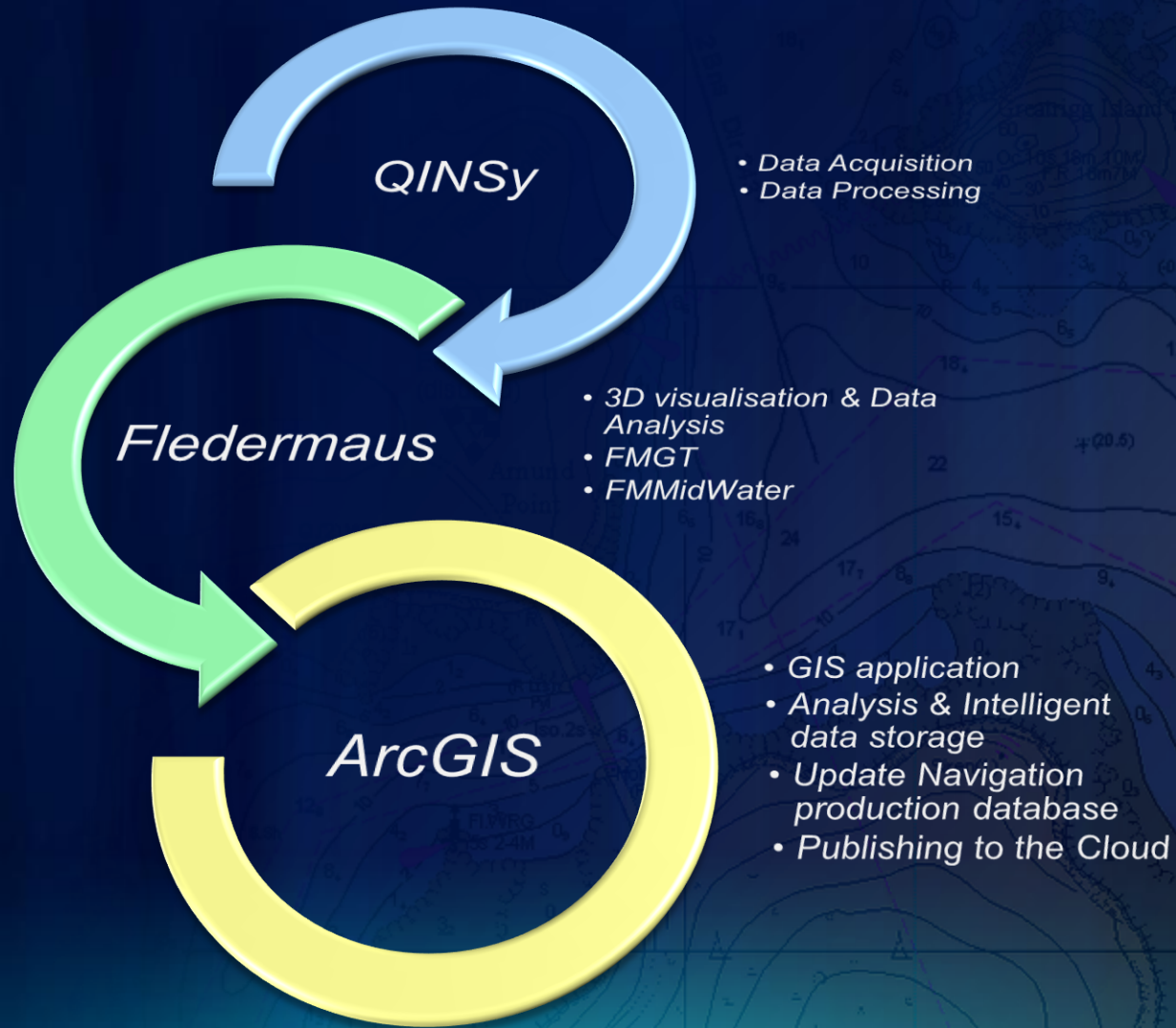
QINSy
Office

Fledermaus

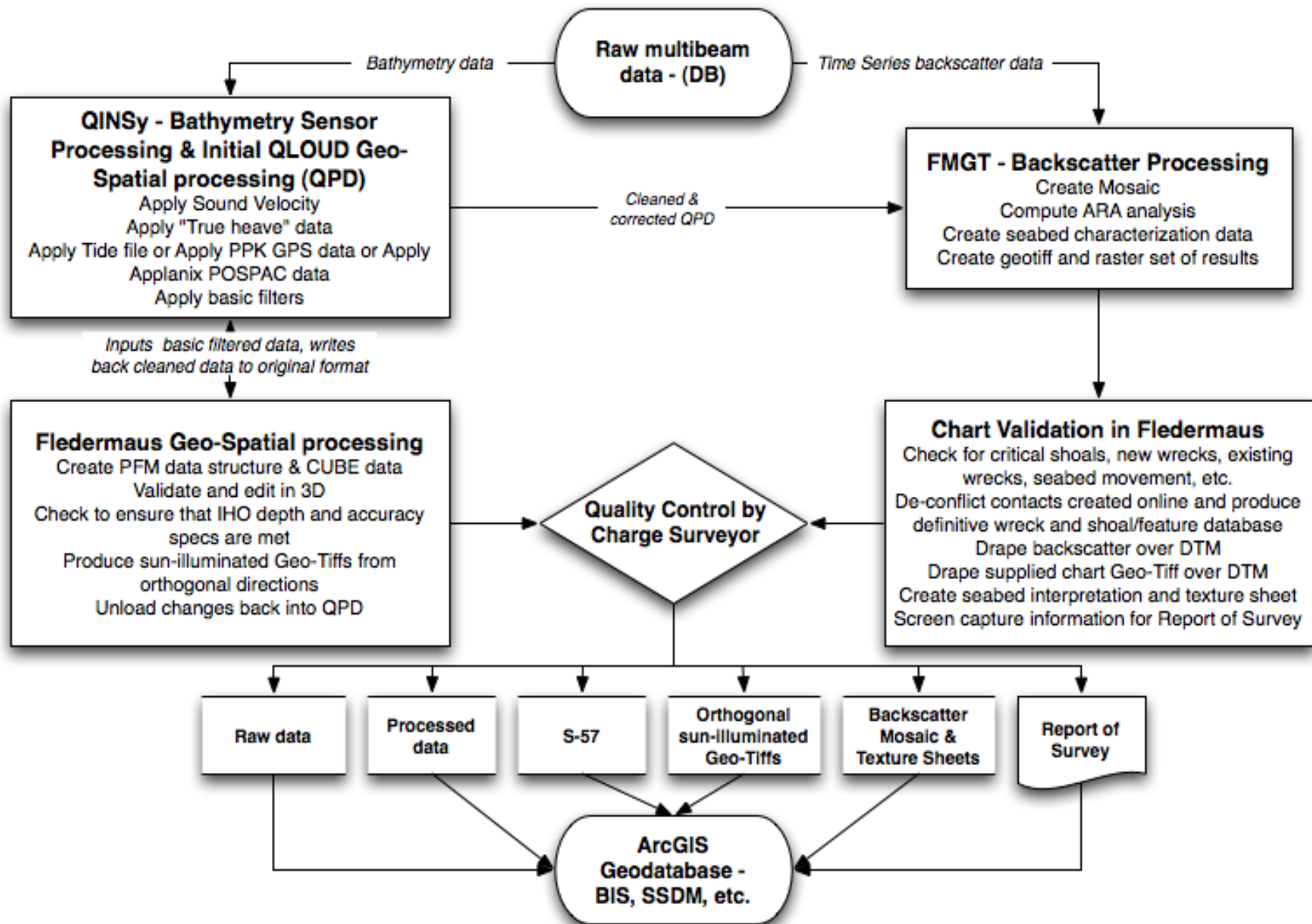
ArcGIS
Qonnection

Esri ArcGIS

QINSy PREMIUM



THE MODERN HYDROGRAPHIC WORKFLOW



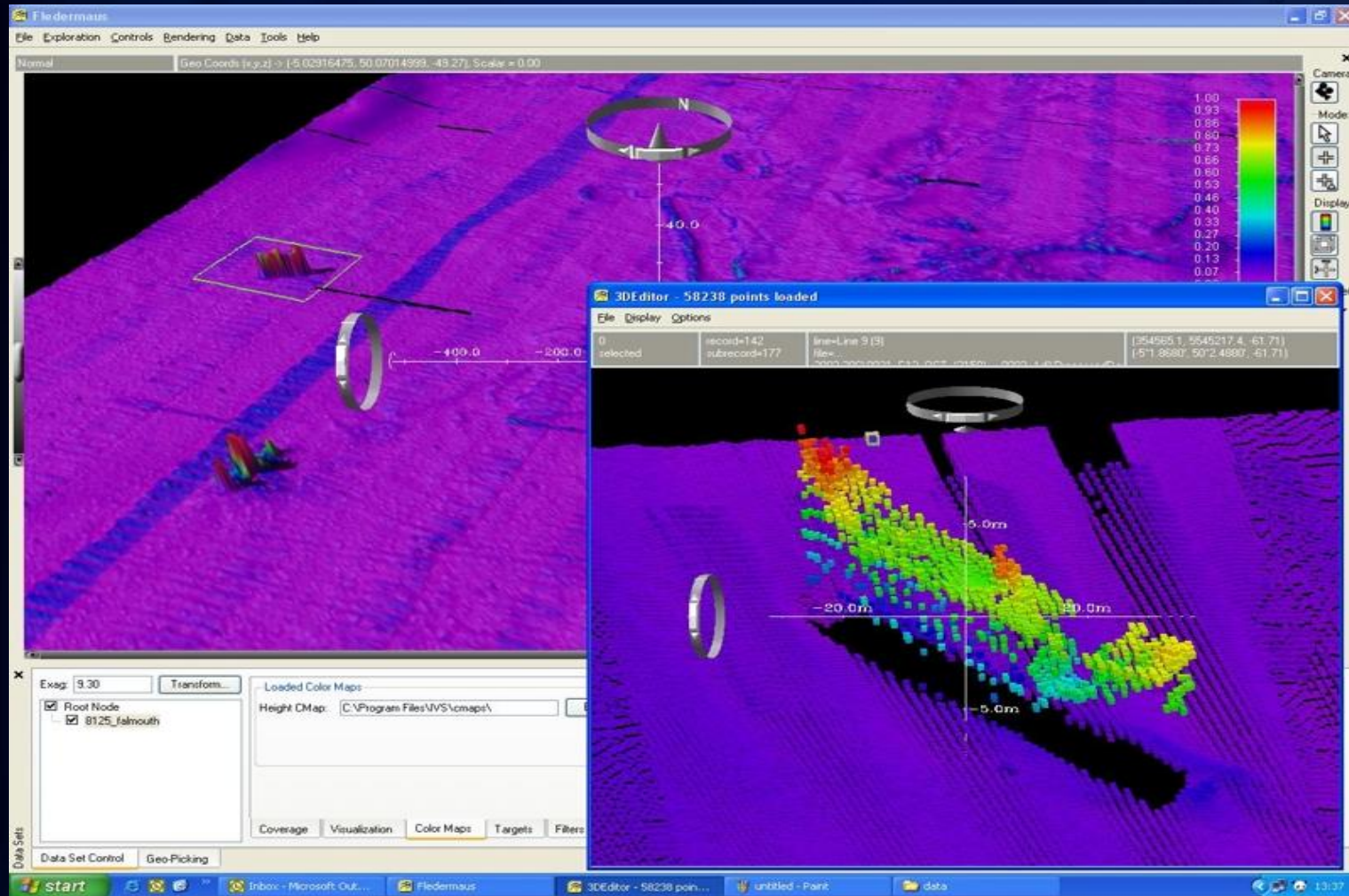
FM Bundles and Modules

- **FM Hydro – CUBE, data validation and QC**
- **FMGT – Geocoder Toolbox**
- **FMMidwater – water column processing**
- **FMGIS – ArcGIS connection**





FM Hydro – CUBE and validation





FM Hydro – filter soundings

The screenshot shows the QPS software interface with a 3D bathymetric plot. A dialog box titled "Cube Filter Soundings" is open, allowing the user to select a filtering method. The "Based on distance from the Cube surface" method is selected, with "Distance based on" set to "standard deviations" and "Distance Amount" set to 2.0. The "Based on IHO Depth Uncertainty" method is also visible, with "Order 1" selected and "a" set to 0.5 and "b" set to 0.013. The "Filter Action" section has "Set Rejected Flag" selected. The "Targets/Contacts" section has "Don't Filter Soundings Near Targets/Contacts" checked and "Target Radius (meters)" set to 10. The "Check/Uncheck Area" section has "Show Checked Areas" checked and "Scope" set to "Selection". The "Coverage" section shows a red area on a map. The "Data Set Control" section shows "Falmouth_CUBE" selected.

This screenshot shows the same QPS software interface as the first, but with a different view of the 3D bathymetric plot. The "Cube Filter Soundings" dialog box is still open, showing the same settings as in the first screenshot. The "Coverage" section shows a red area on a map. The "Data Set Control" section shows "Falmouth_CUBE" selected. The "Surface Display Options" section has "Surface" set to "Shallow Edited", "Colored By" set to "Std. Deviation", "Show Flags" set to "None", and "Highlight By" set to "None". The "Edit Control" section has "Launch 3D Editor..." selected.

FM Hydro – cross check



CrossCheck

File Object Import Help

Selected Data Sets for Analysis

File Name

- ALL_DATA_SUMMARY
 - D:\Project Scratch Folder\1336crosscheck\0000_20100614_17
 - D:\Project Scratch Folder\1336crosscheck\0000_20100614_18
 - D:\Project Scratch Folder\1336crosscheck\0000_20100615_00

Add Vertical Bias (m) 0.0

Difference Range

-1.471158 0.402740 Force Diff Range

Difference Statistics Information

Custom Factor a 0.000000 Factor b 0.000000

	Statistic	Value
13	Order 1 # Rejected	1
14	Order 1 P-Statistic	0.000000
15	Order 1 Test	ACCEPTED
16	Order 2 Error Limit	1.005301
17	Order 2 # Rejected	1
18	Order 2 P-Statistic	0.000000
19	Order 2 Test	ACCEPTED

Multi-Thread Setup Auto Manual 16

Point Size 2.8

Difference Histogram Analysis

Highlight Given Data Percentage 95 Cursor: 0.07



FMGT - Geocoder Toolbox

FMGeocoder Toolbox: C:\Users\mdoucet\FMDData\Projects\ss081.fmprj

File View Settings Processing Tools Help

Source Files

- Source
 - Portsmouth
 - 0000_20070918_181123_ShipName.all
 - 0000_20070919_144727_ShipName.all
 - 0000_20070919_164356_ShipName.all
 - 0000_20070920_152550_ShipName.all
 - 0001_20070918_184123_ShipName.all
 - 0001_20070919_150445_ShipName.all
 - 0001_20070919_165901_ShipName.all
 - 0001_20070920_154155_ShipName.all
 - 0002_20070918_190747_ShipName.all
 - 0002_20070919_151926_ShipName.all
 - 0002_20070919_171623_ShipName.all
 - 0002_20070920_155906_ShipName.all
 - 0003_20070918_193444_ShipName.all

Source Files Visual Objects

Mosaic Info

Pixel Size (m) Mosaic Area

Compute

Meters	Width	Height
Mosaic: 0.4	2270.88	4454.45
Statistic: 8.00	Pixels: 5678	11137
	Mosaic Memory: 603.064 Mb	

Navigation Nadir Lines

Processing

Automatic Processing Manual Processing Messages

Backscatter Source: Beam Time Series

Build

All Mosaic ARA Statistics

Mosaic ARA Statistics

Visual Options

Mosaic Opacity

Statistics Opacity

ARA Opacity

Information not available. Directory=OFF 0000000000 382.6 MB



FM Midwater

The screenshot displays the 'FM Midwater' software interface. At the top, there is a menu bar with 'File', 'Exploration', 'View', 'Tools', 'Filter', and 'Help'. Below the menu is a tree view on the left containing a 'Sensor' folder with several ping files (e.g., '0016_20040617_162519_Pingline.all') and a 'Midwater' folder with '0005_20040617_145627_Pingline...'. Below the tree view are 'Beam View Options' and 'Signal Options' panels. The 'Beam View Options' panel includes radio buttons for 'Fan', 'Polar', 'Stacked', and 'Beam', with 'Beam' selected. It also has sliders for 'Beam' (75 to 150), 'Range' (13.8 to 50.6), and 'Depth' (0.0 to 96.0). The 'Signal Options' panel includes radio buttons for 'Amplitude', 'Power', 'Sv', and 'Tn', with 'Amplitude' selected. It features a color scale bar and a 'Clip' checkbox. The main display area is split into two panes: the left pane shows a 3D sonar scan of a seabed with a blue highlighted area, and the right pane shows a 2D depth profile with a pink line. A toolbar on the right side of the 2D profile pane contains various navigation and zoom controls. At the bottom, there is a time display showing 'Time: 06/17/2004 14:58:03.2' and a 'Rate' of '48 1s'. A status bar at the very bottom indicates 'Information not available.'



FM Midwater

FM Midwater: C:\Users\mduocet\FMData\Projects\chevron1.fmproj

File View Tools Filter Help

- Source Files
 - Source Files
 - Visual Objects
- Map View
- Display Control

Sensor

- 0000_20110805_021934_Quest4.wcd
- 0001_20110805_022940_Quest4.wcd
- 0000_20110805_021934_Quest4.all
- 0001_20110805_022940_Quest4.all

Navigation

- 0001_20110805_022940_Quest4_R2_CH1.gwc
- 0000_20110805_021934_Quest4_R2_CH1.gwc

Midwater

30m 30s 31m 30s 32m 30s Time: 08/05/2011 2:30:13.9 Rate: 1s

Beam View Options Messages

Fan Polar Stacked Beam 1 Use

Beam: 1 256

Range: 0.0 28.0

Depth: 0.0 14.2

Signal Options Picking

Amplitude Power Sv Ts Custom dB

Clip -127.00 -72.21 15.73

Geo Coords (x,y) (time) -> (0°0'0.00" 0°0'0.00") (08/05/2011 2:29:40.2) Packet 0 Depth 0.1 105.7 MB

Fledermaus
Interoperability
Management

Bathymetry
Formats
MSX

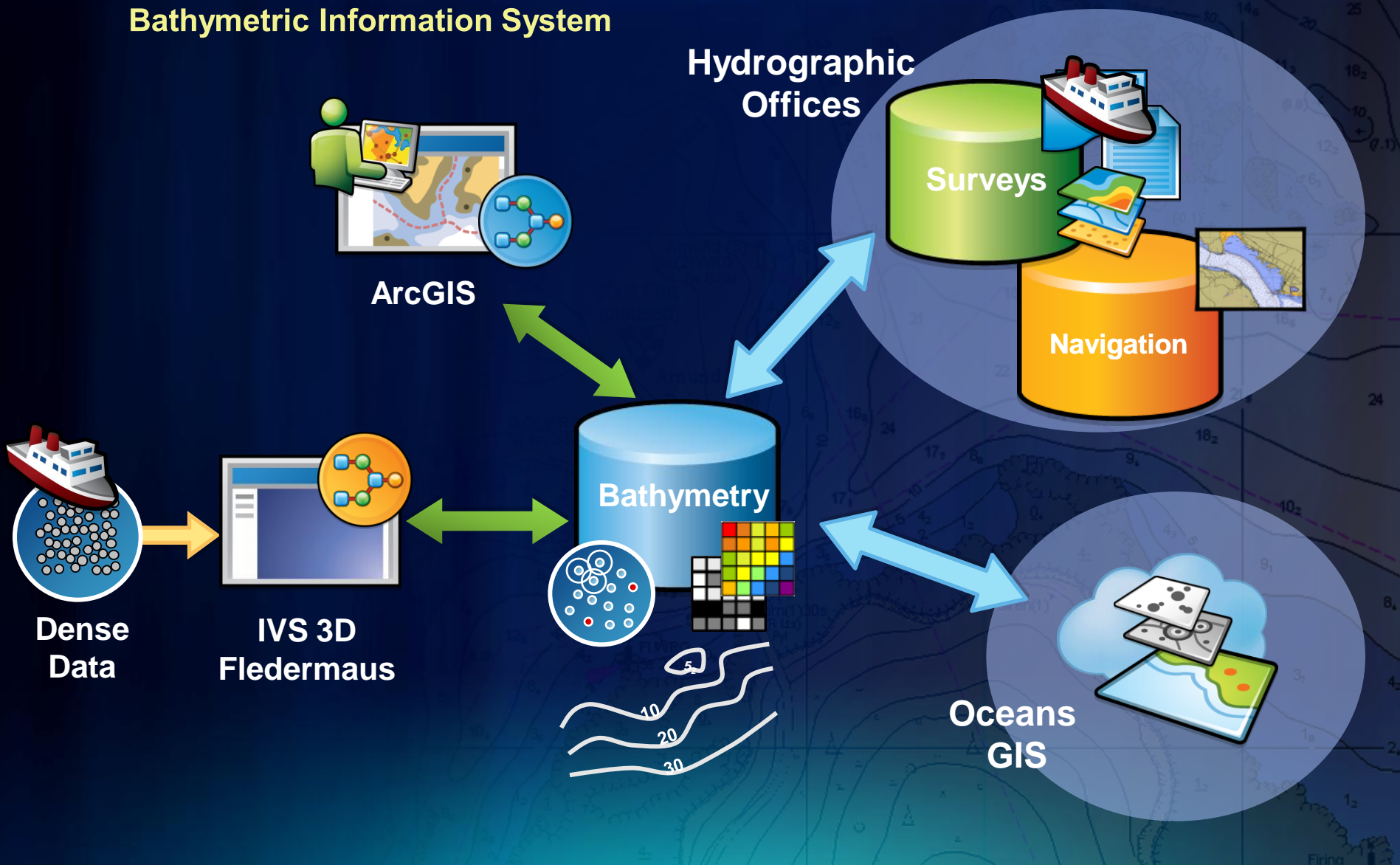
Processing
Contouring
Dissemination
Algorithms

ES
CUBE
Sounding

ES

Nautical Solution - Bathymetry

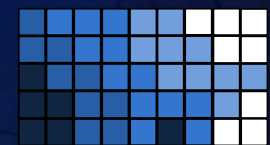
Bathymetric Information System



A Bathymetric Vision for Esri

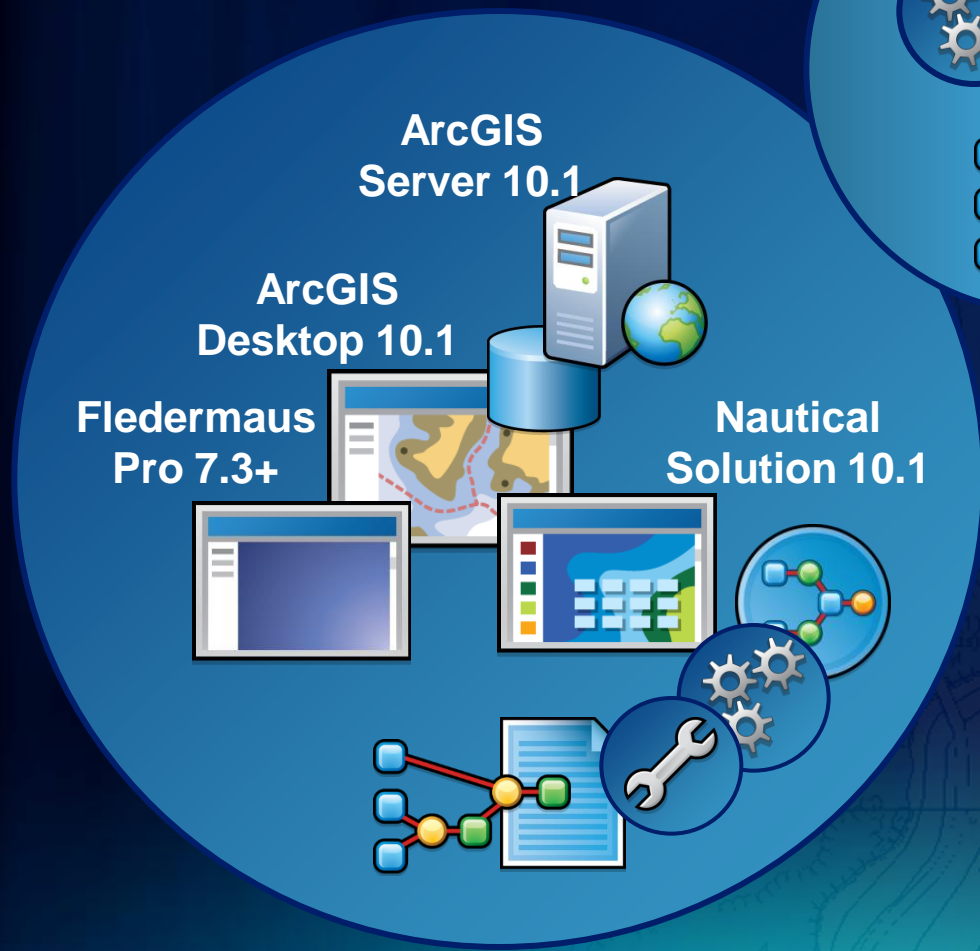
- *An Enterprise GIS system for the management and deployment of bathymetric data, metadata and products that is commercially available.*
- **Comprised of:**
 - ArcGIS Nautical Solution
 - Server, Desktop
 - Fledermaus by IVS 3D/QPS





Nautical Solution – Bathymetry @ 10.1

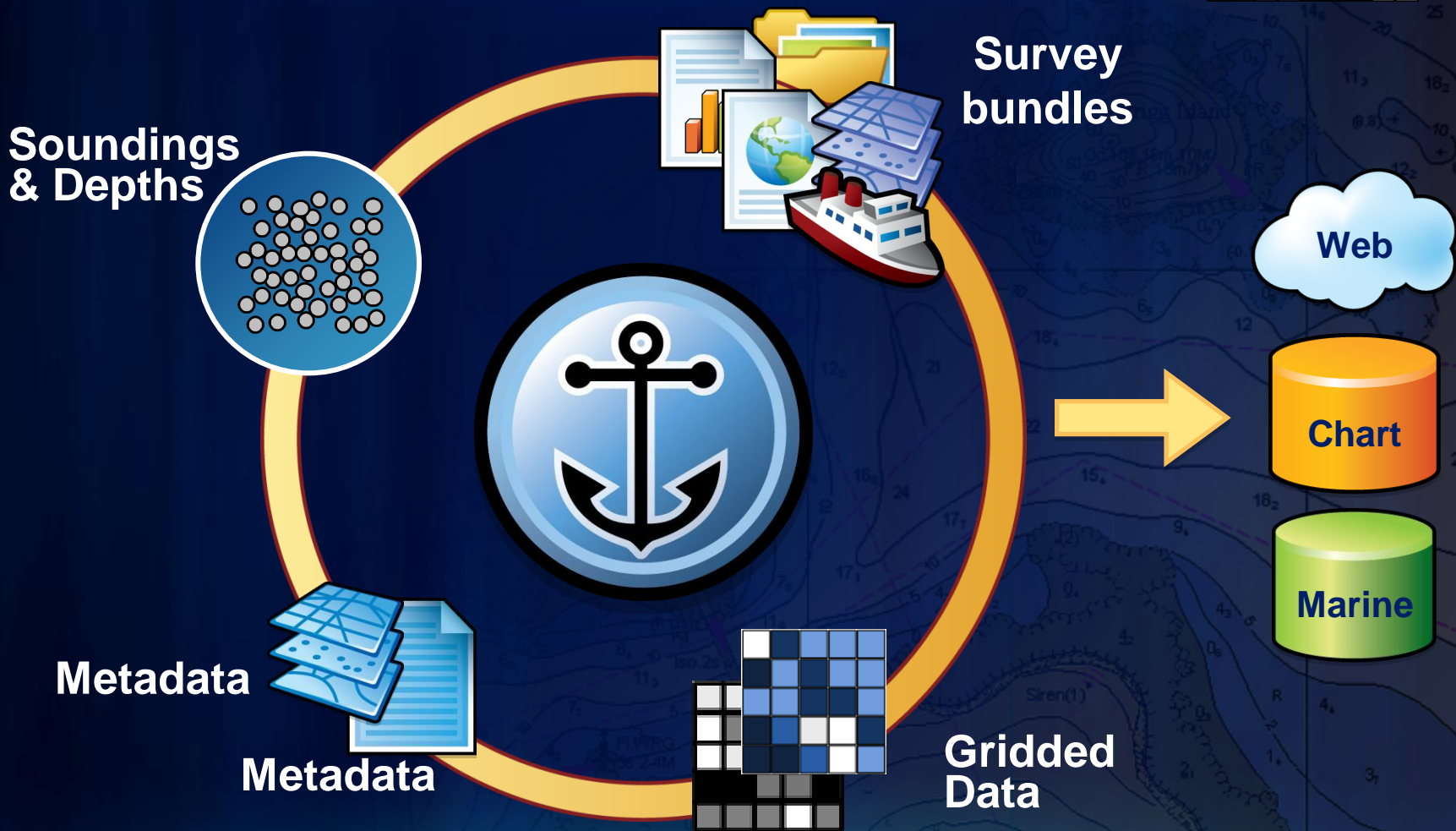
COTS Software



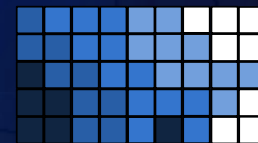
Adaptation & Configuration

- Model Builder
 - Python
 - Data Interoperability
 - ArcObjects
 - ArcEngine
-
- Workflows
 - Data model
 - Geoprocessing tools
 - Analysis Models
 - Documentation
 - **...plus...**
 - Metadata Engine
 - BIS Explorer
 - Surface Builder
 - Survey Management
 - Fledermaus Integration

Nautical Solution - Bathymetry

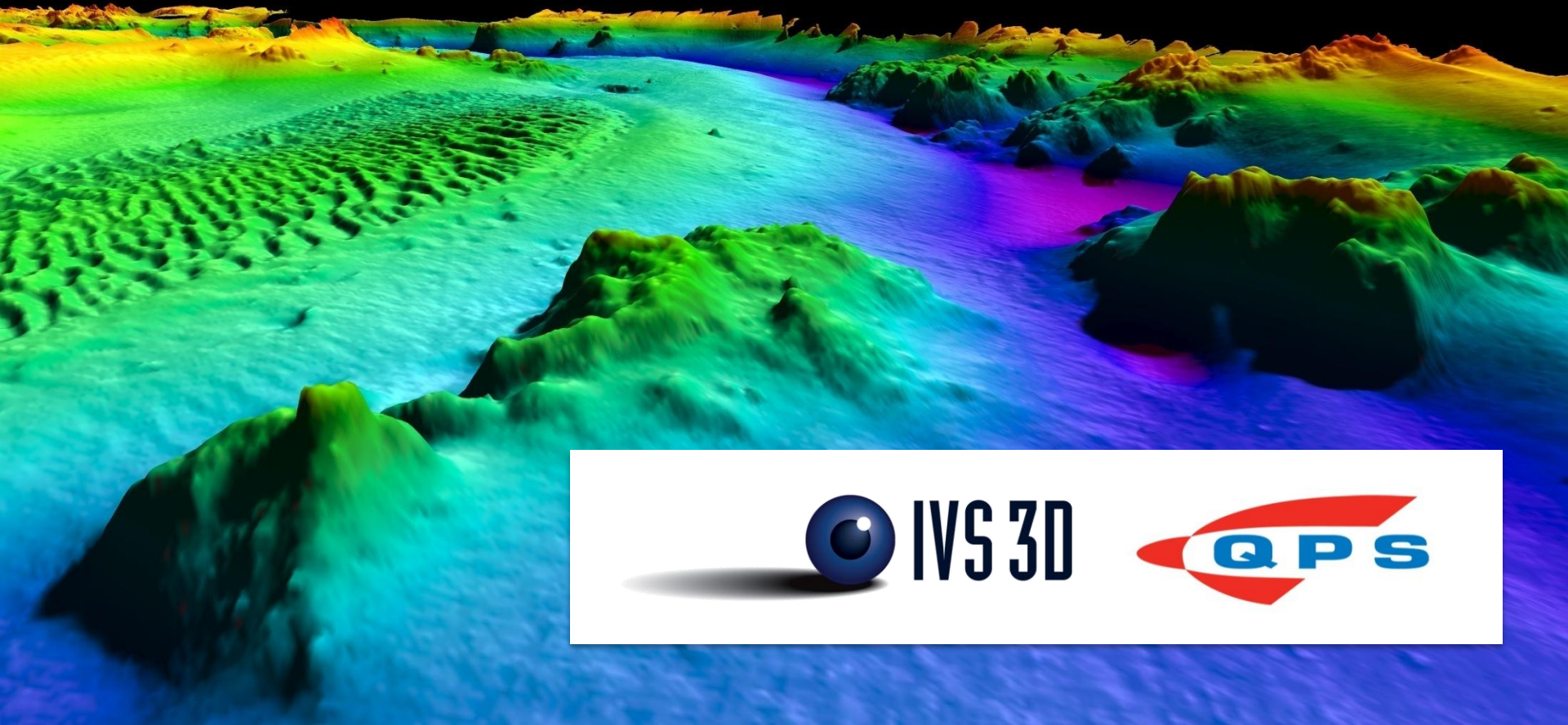
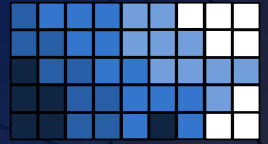


Nautical Solution - Bathymetry



A Partnership in Bathymetry

- A single solution built from 2 application platforms
 - Seamless integration between Fledermaus and ArcGIS
 - Quality Control and persistence through metadata
 - End to end workflow utilizing a common GIS platform



Ocean GIS

Three tiers

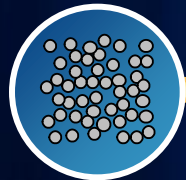
Web Tier

Thin Clients



Rich Clients

Application Tier



Survey Data



Fledermaus



ArcMap

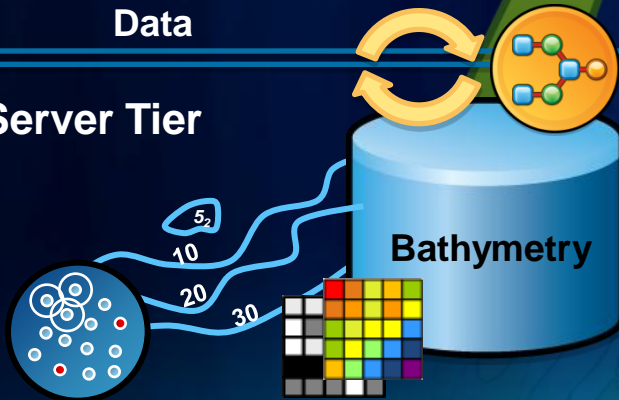


ArcMap

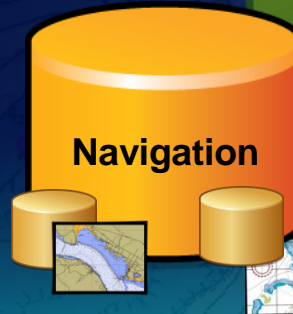


Other Applications

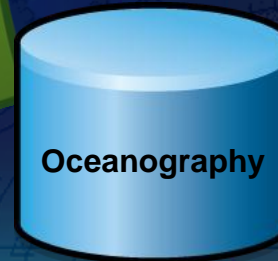
Server Tier



Bathymetry



Navigation

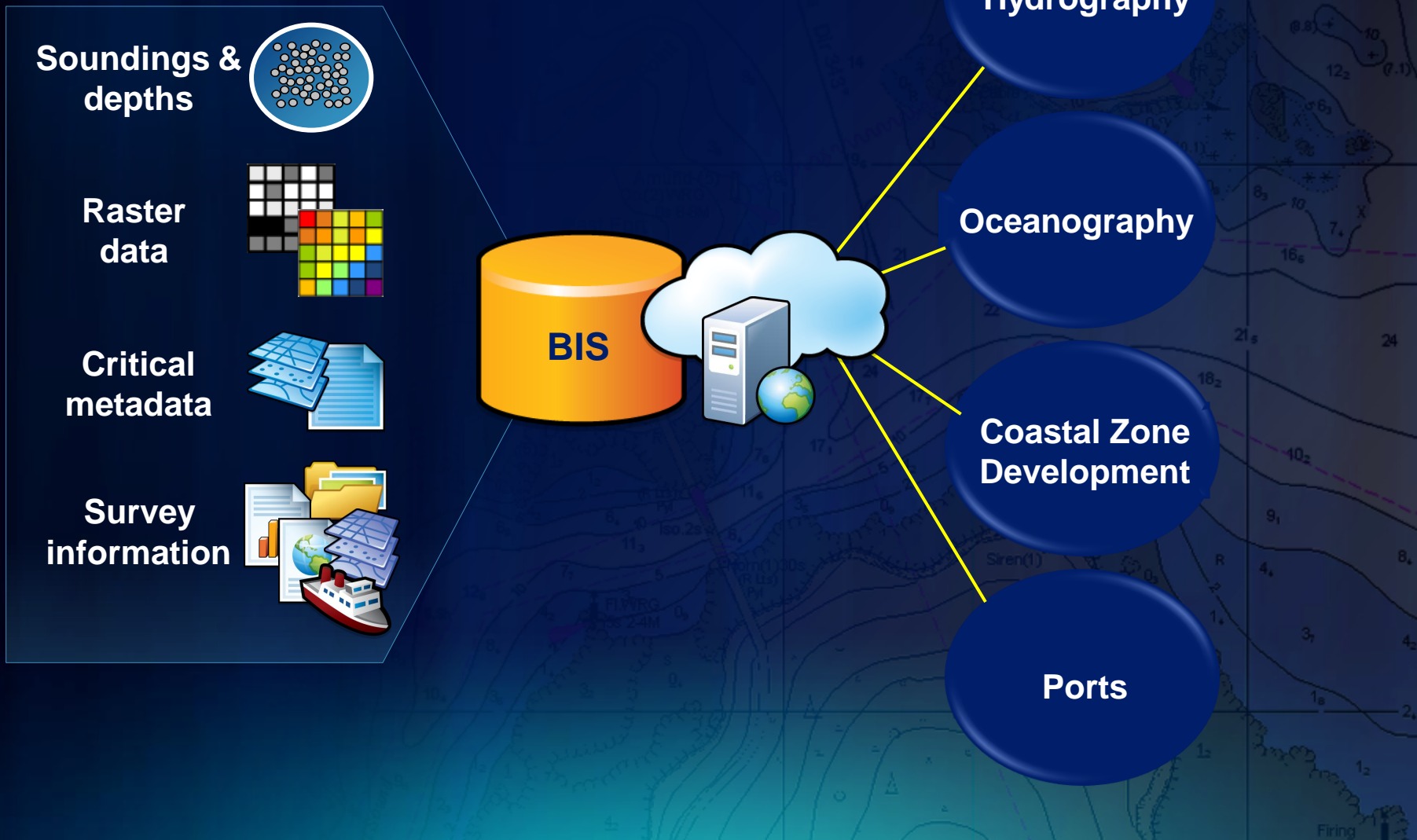


Oceanography



Survey Management

Bathymetry Management for...

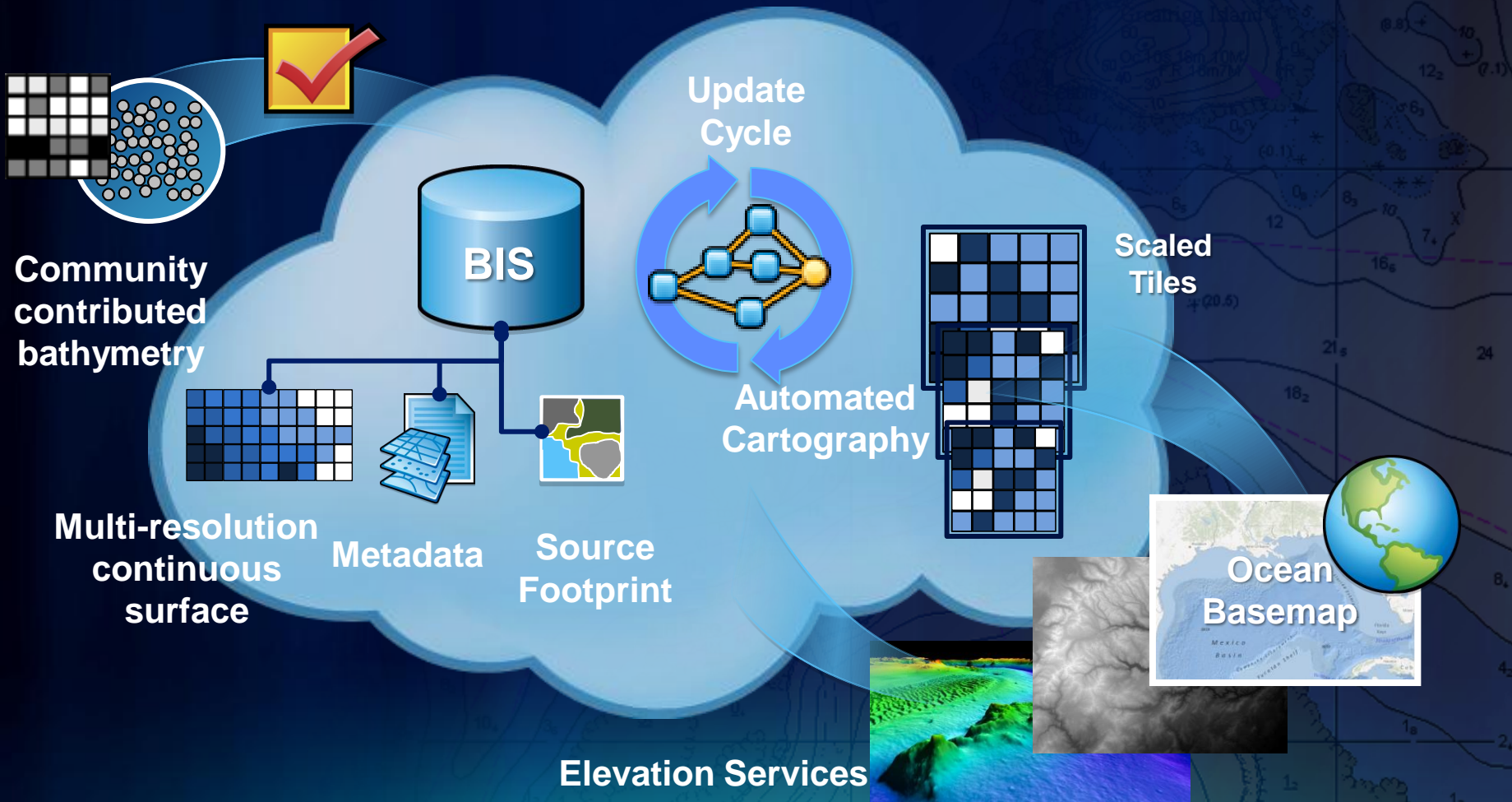


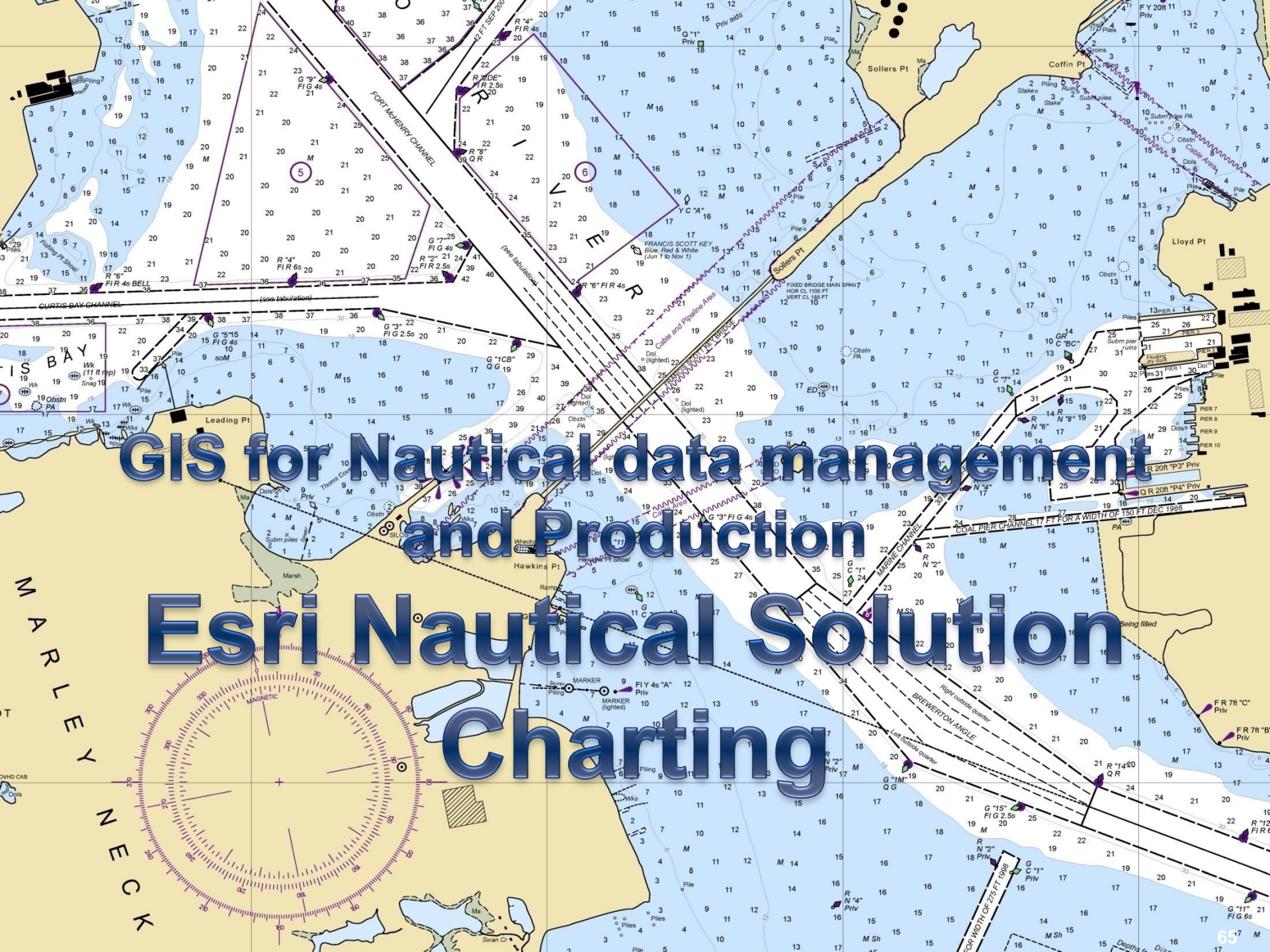
Bathymetry in the Cloud

- A new generation of ArcGIS Server
- Easier to publish web content to:
 - Portals | Cloud | Web Services
- Easier to use, accessible by many



Bathymetry in the Cloud and Ocean GIS

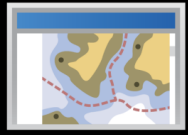




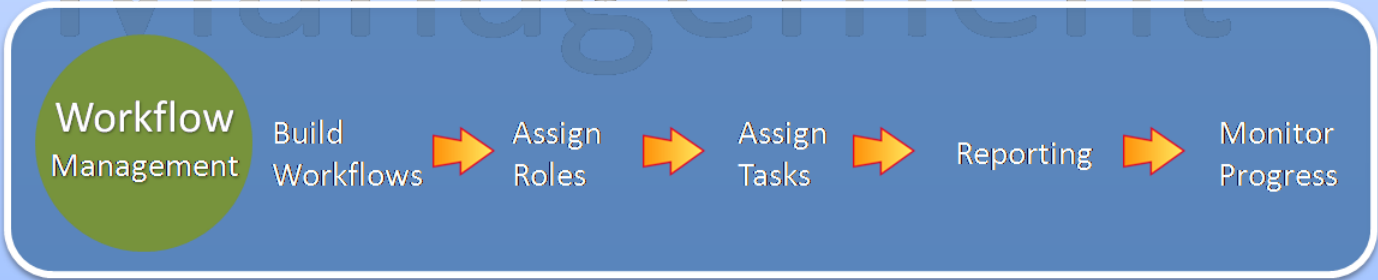
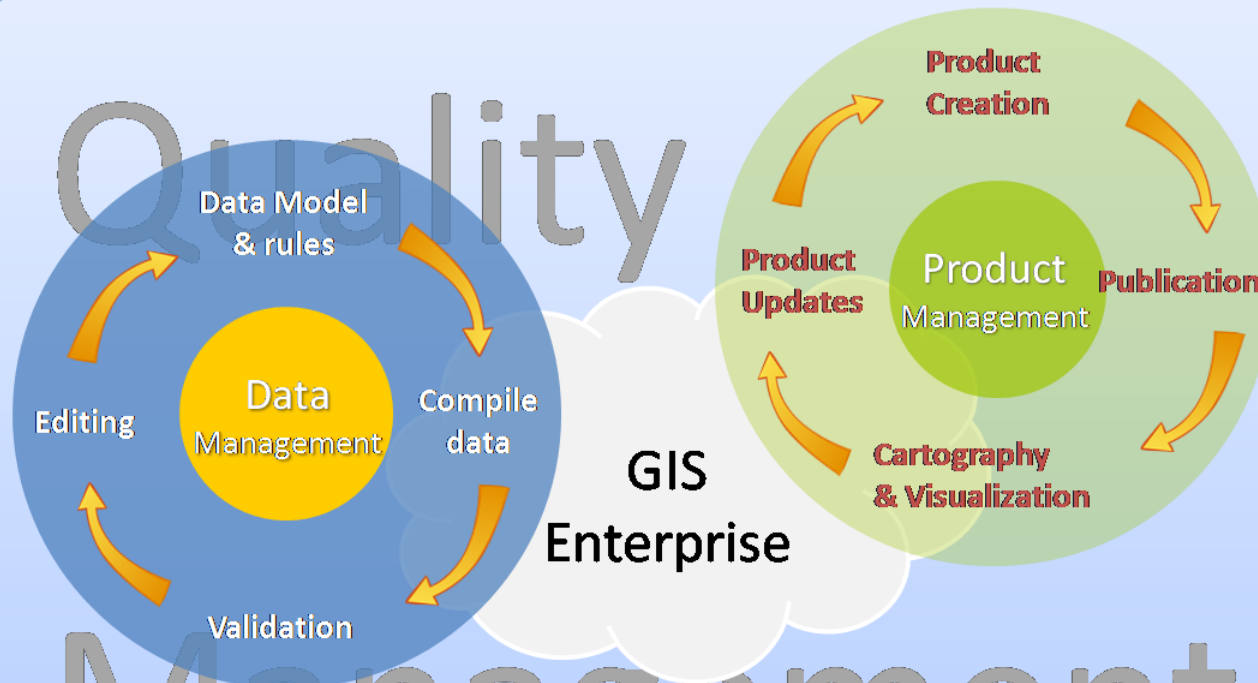
GIS for Nautical data management and Production

Esri Nautical Solution

Charting



Esri Nautical Solution Philosophy



Esri Nautical Solution

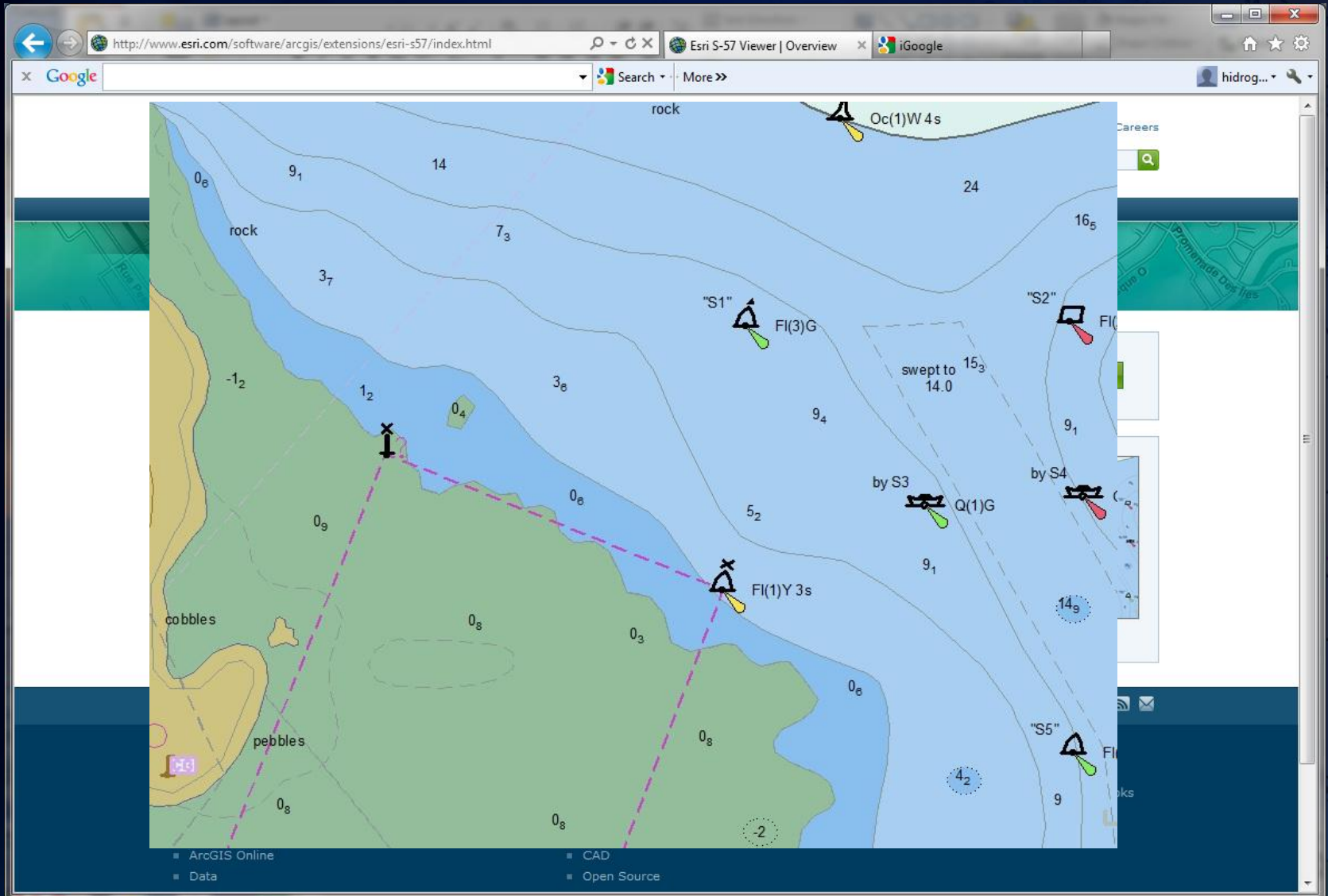
A complete Nautical Information System

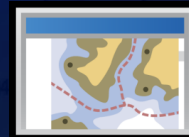


Nautical Solution successes this year

- This year NOAA OCS went live with the NCSII system
- 800+ cells produced with the Nautical Solution
- YRWA producing S-57 and CJ-57 products
- HNHS moving into real production early next year
- KMS building a NIS from scratch for Greenland

Esri S-57 Viewer

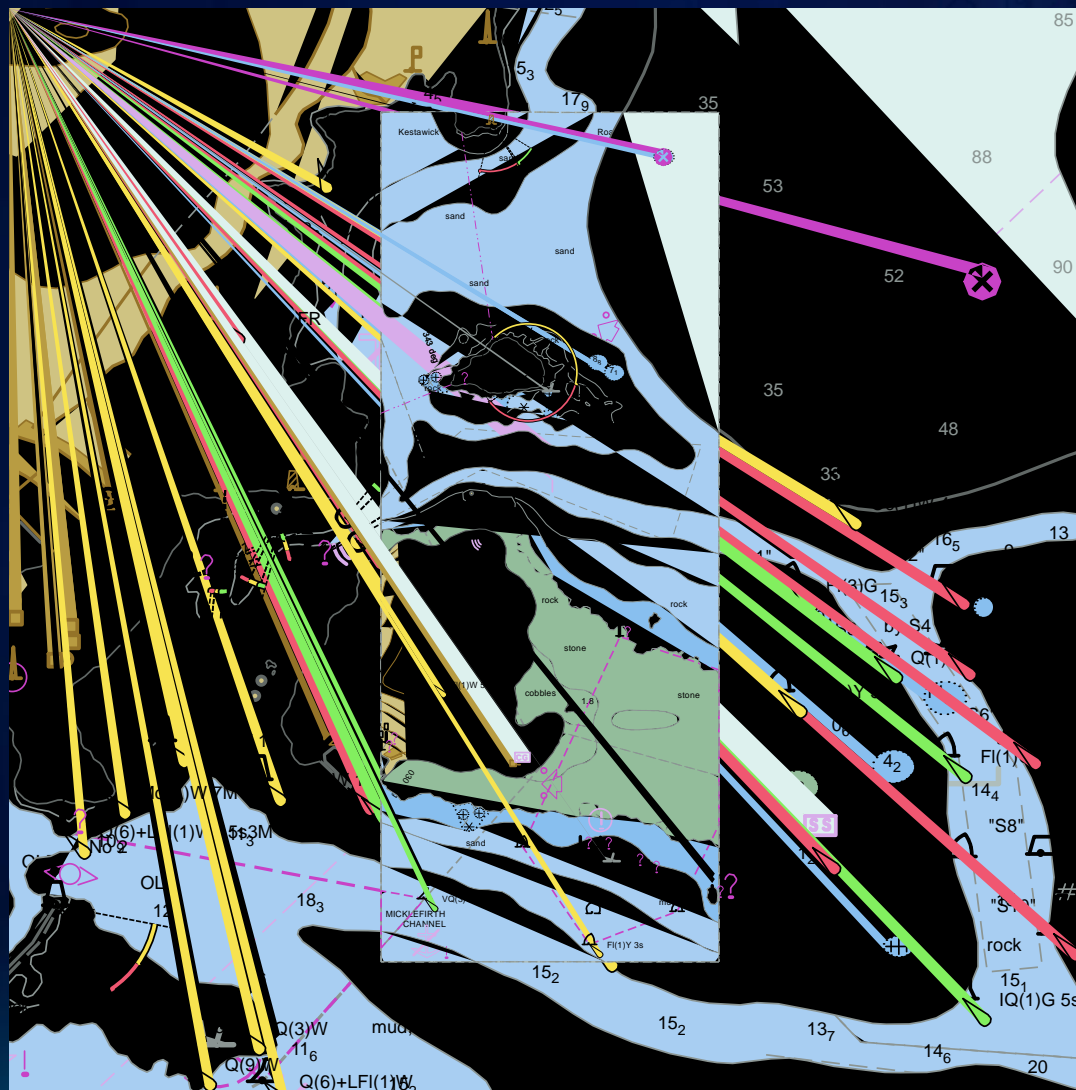




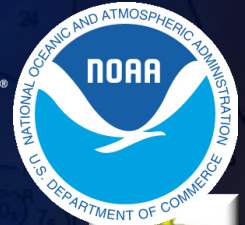
Maritime technology – S-57 Viewer

- **Viewing S-57 data is key for nautical users**
- **Lightweight application extension to ArcMap**
 - Works with 9.x and 10.x platform
 - Works with Engine and Server
- **Used in Command & Control systems**
- **Used by people with a need to view S-57 data in ArcGIS**

New Esri Converter from S-57 to S-101



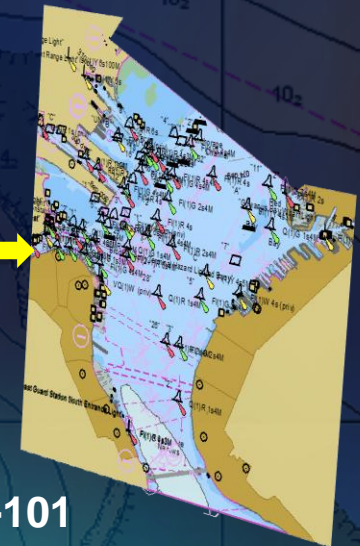
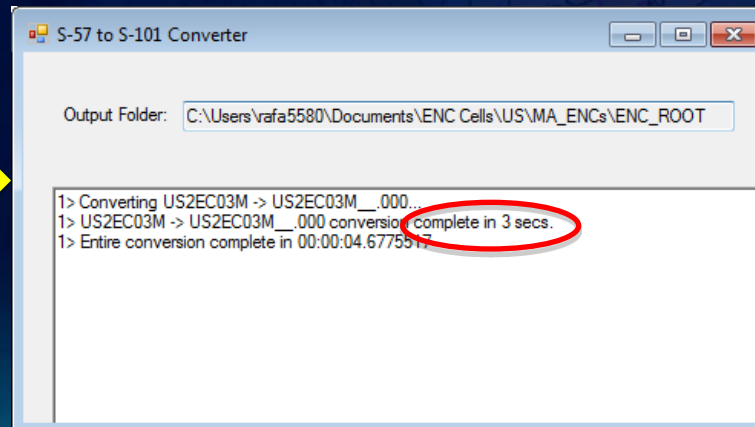
S-57 to S-101 Converter



- In line with IHO S-100 Universal Hydrographic Data Model
- Co-funded with NOAA
- To be released to the public through the IHO web site
- Esri is the first in creating the next generation of ENC in the S-101 standard
- Easy and crystal clear conversion from S-57 to S-101
- Big impact in the hydrographic community



S-57



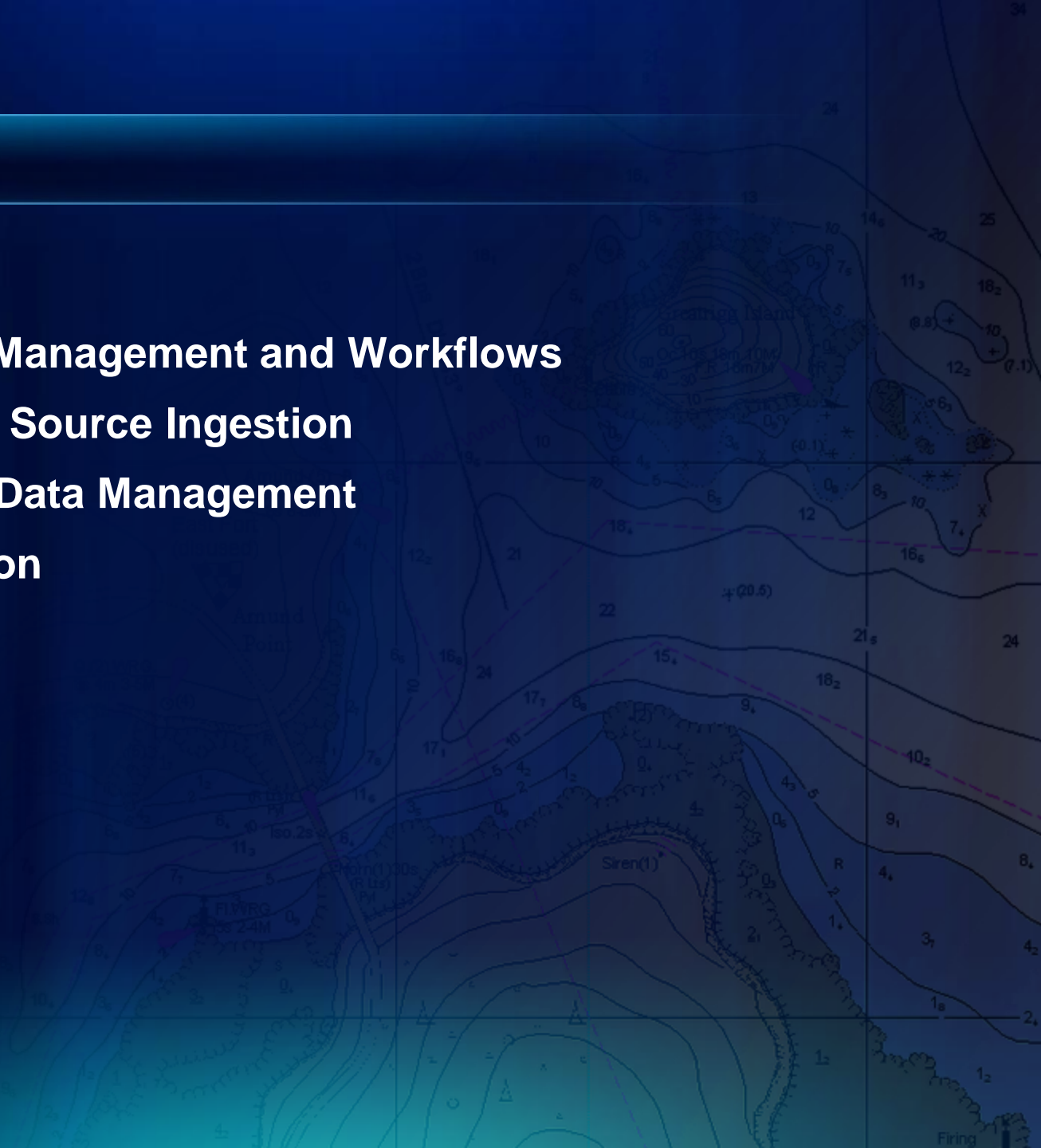
S-101



Enterprise Maritime Data Management (MDM)

Challenges

- **Production Management and Workflows**
- **Bathymetric Source Ingestion**
- **Centralized Data Management**
- **Dissemination**



Production Management

Challenge:

- Tracking complex maritime production tasks with aggressive time constraints
- Accessing detailed job status and production metrics to manage resources and priorities

Concept:

- A web-based production management dashboard that provides status, metrics, and on-the-fly resource assignment to help meet production deadlines and mitigate risk.

Workflows

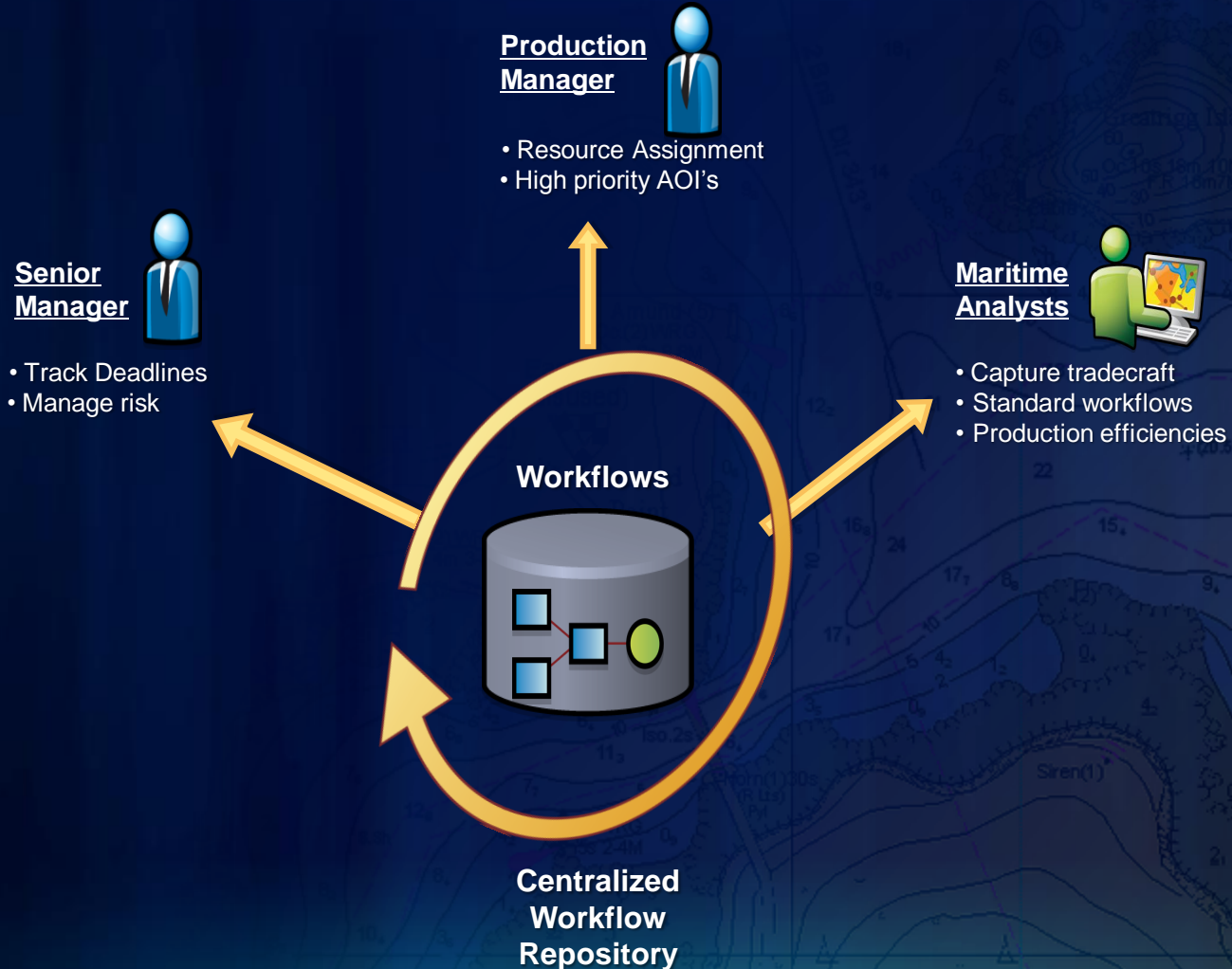
Challenge:

- Capturing tradecraft from SME's, standardizing best practices, and sharing them across the enterprise

Concept:

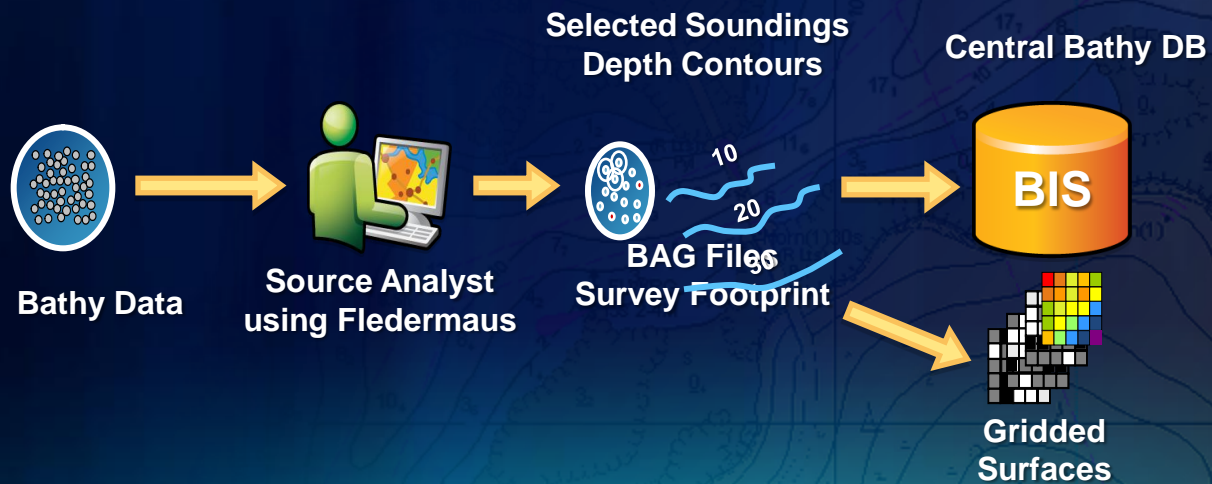
- Workflow tools to capture tradecraft, store jobs in a central repository, and provide step by step procedures with email alerts to gain efficiencies and shorten production cycles.

Production Management and Workflow Interaction



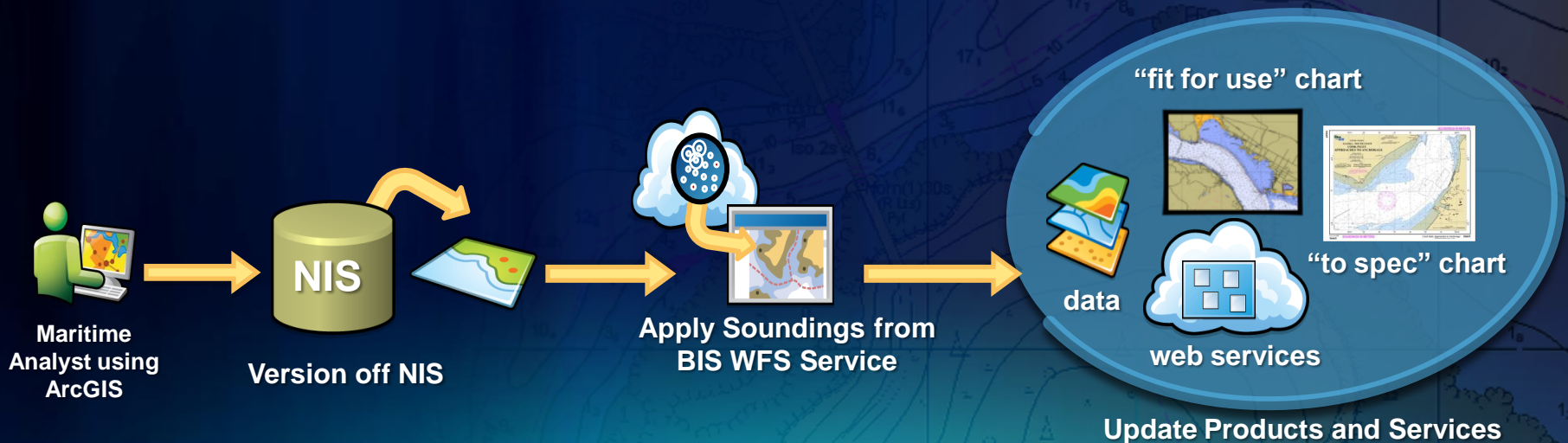
Bathymetric Source Ingestion

- **Challenge:** Managing the import of various bathymetric sources to leverage in the production processes.
- **Concept:** An integrated suite of tools to ingest, process, and manage disparate sources into a centralized geodatabase of bathymetric information available for production use.



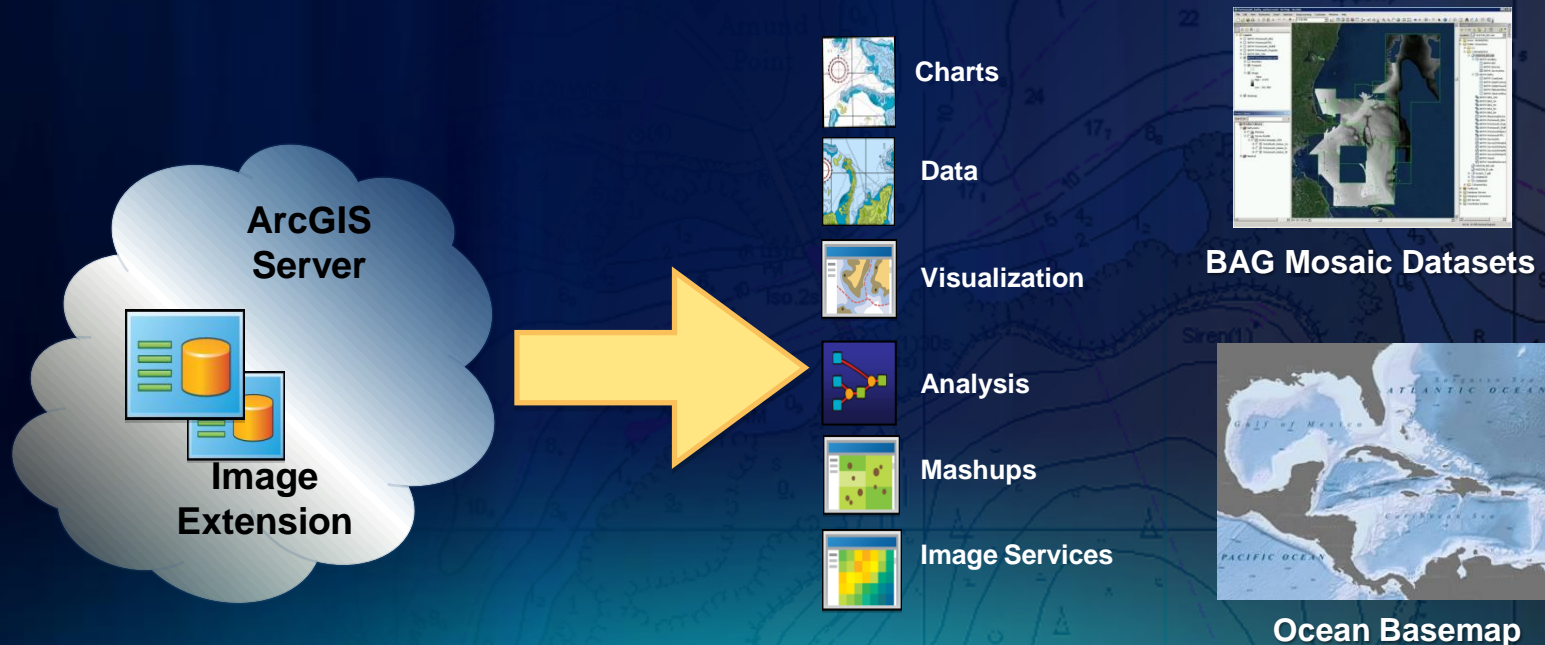
Centralized Data Management

- **Challenge:** Meeting time sensitive production demands with best available data which is currently stored and maintained within multiple locations in multiple formats.
- **Concept:** An authoritative central database for all production and operational needs that eliminates duplication of effort. Outputs may include web services, spec products, proof plots and planning tools.



Dissemination

- **Challenge:** Providing authoritative content to the user community in a time dominant and efficient manner.
- **Concept:** Leverage an authoritative centralized database to facilitate dissemination of multiple data products and services to meet mission needs.



A topographic map with contour lines and various labels, serving as a background for the slide. The map shows elevation contours and some specific points of interest.

Esri opportunities for Capacity Building

FLWRG
2.3M

Shim(1)
R 100

Siren(1)

Firing

Why we could be considered?

- Esri is a founder member of the OGC and has Principal member status (voting level)
- Active participation at key IHO technical working groups (TSMAD and CSPCWG)
- Active member of RTCM
- Contribution to Hydrographic training courses (STET Maritime, Singapore)
- Close collaboration with the United Nations University
- Several Capacity Building activities around the world:
 - Mapping and GIS Capacity Building in American Samoa
 - Capacity Building Initiative on GIS-Based Hazard Risk Information Systems
- A complete Education Infrastructure

A complete Education infrastructure

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- Free mapping tools like ArcGIS Explorer [PC Desktop](#) or [Online](#)
- Complete mapping with [ArcGIS](#)
- Learn with [ArcLessons](#)
- Connect: [Facebook](#) & [Twitter](#)

Welcome to the Esri GIS Education Community - an ecosystem for the exchange of ideas and experiences, curriculum, software, and data between GIS educators and learners around the globe.

New at the Community Blog

[Curiosity Headed to Mars, Needed on Earth Too](#)
Published: 11/30/2011
On November 26 NASA launched our next expedition to the Red Planet—the Mars Science Laboratory (MSL) with its car-sized rover ...

[Fun with GIS #99: Chaos Cave](#)
Published: 11/29/2011
GIS has hit literature! "Chaos Cave: A Revolutionary Adventure" by Lesley Downie takes young readers into a time-travel and ...

[T3G 2012: Advance your GIS Professional Development for Educators](#)
Published: 11/22/2011
- Are you passionate about GIS and its potential benefits for students of all ages? - Do you love sharing GIS with other ...

[New GIS Career Video: GIS Analyst-Forester](#)
Published: 11/22/2011
The growth of GIS and other geospatial careers is more visible each day. Recently Esri, with the help of Career Corner Digital, ...

[Fun with GIS #98: Tree Planters](#)
Published: 11/21/2011

What's New

- [Discover ArcGIS.com](#)
- [Explore Careers in GIS](#)
- [GIS + STEM = Success](#)

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“ I always pick up new information to work smarter not harder. ”

Judith Needham, Arizona
Making Better Map Layouts with ArcGIS

Overview

One hour of real-time, expert GIS training streamed directly to your desktop. Seminars are interactive, free and require no registration — attendance is on a first-come, first-served basis.

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Next Seminar


[Introduction to ArcGIS Viewer for Silverlight](#)

Learn how to create custom web applications that support map visualization, editing, and analysis using this intuitive viewer.




Thursday, December 8, 2011


9:00 a.m. PST (U.S. & Canada)

 [Add to calendar](#)

11:00 a.m. PST (U.S. & Canada)

 [Add to calendar](#)

3:00 p.m. PST (U.S. & Canada)

 [Add to calendar](#)

[Attend Seminar](#)

This button will be active about 30 minutes before the seminar's scheduled start time.

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- [Getting Started with GIS \(for ArcGIS 10\)](#)
- [Esri Production Mapping Cartography Recordings](#)
- [Introduction to ArcGIS Data Reviewer](#)
- [Using ArcGIS Data Reviewer to Assess Data Quality](#)
- [ArcGIS Data Reviewer Recordings](#)
- [Esri Nautical Solution Recordings](#)
- [Versioning 101 – ArcUser Article](#)
- [Versioned Editing Workflows for the Multiuser Geodatabase](#)
- [Getting Started with ArcGIS Workflow Manager](#)

What opportunities Esri offers to the MACHC Member States?

- **Support in creation of GIS capabilities**
- **Support in the creation of Charting capabilities**
- **Support in the creation of Hydrographic training courses according to IHO S-2:**
 - Essential 5 Hydrographic Data Management
 - Essential 6 Environmental Science
 - Optional Unit 1 Nautical Charting Hydrography
 - Optional Unit 2 Hydrography to Support Port Management and Coastal Engineering
 - Optional Unit 3 Offshore Geophysical Surveying
 - Optional Unit 4 Offshore Construction Hydrography
 - Optional Unit 5 Remote Sensing
- **Educational licensing agreements**
- **Class support: remote (webcast) and on-site**

Maritime Directions





Conclusions

Esri is growing fast in Oceans GIS technology

Nautical Solution for Charting significantly better at 10.1

Bathymetric capabilities at 10.1

Maritime Online is a new direction for Esri

Cloud Computing and Crowd sourcing at the
forefront of our development

Partnerships are key for success

More Capacity Building opportunities



Thank you!

Rafael Ponce
Maritime Team Program Manager
rponce@esri.com

www.esri.com/maritime



esri