



# ArcGIS for Maritime

Inland ENC Harmonization Group 13

Tom De Puyt

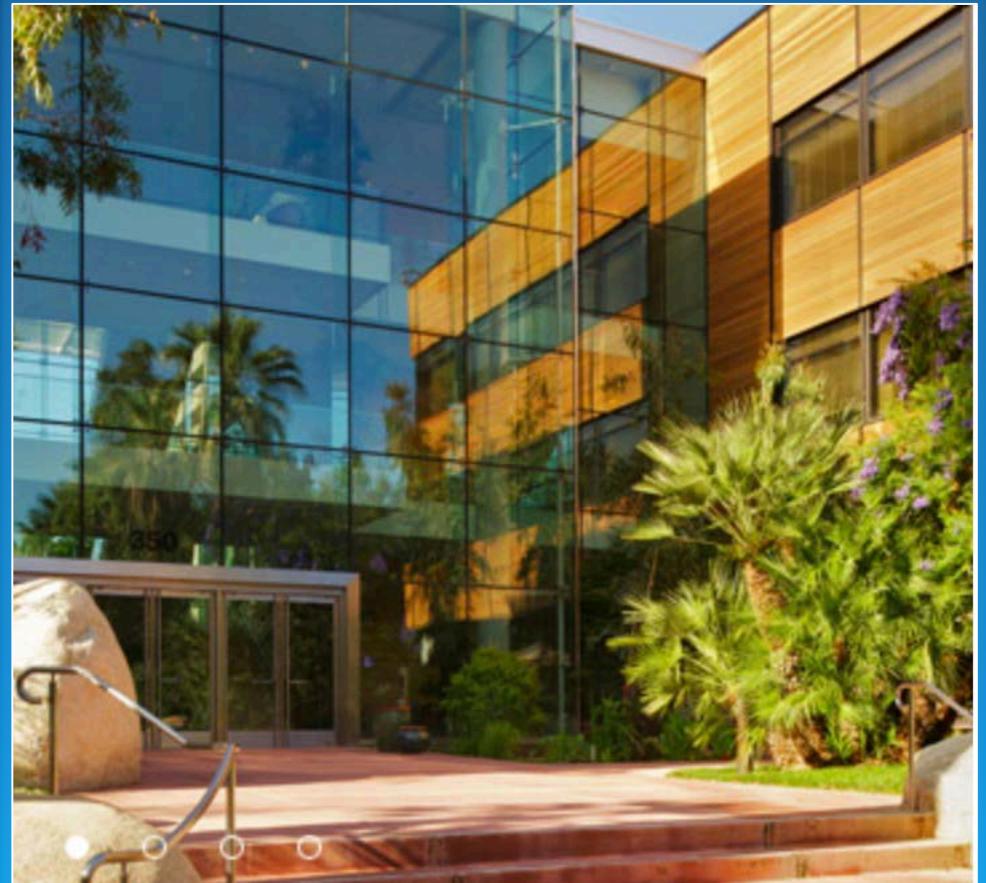
October 12-14, 2015

# Agenda

- ArcGIS Platform Overview
- Chart Management and Production System
- Emerging Patterns

# Esri

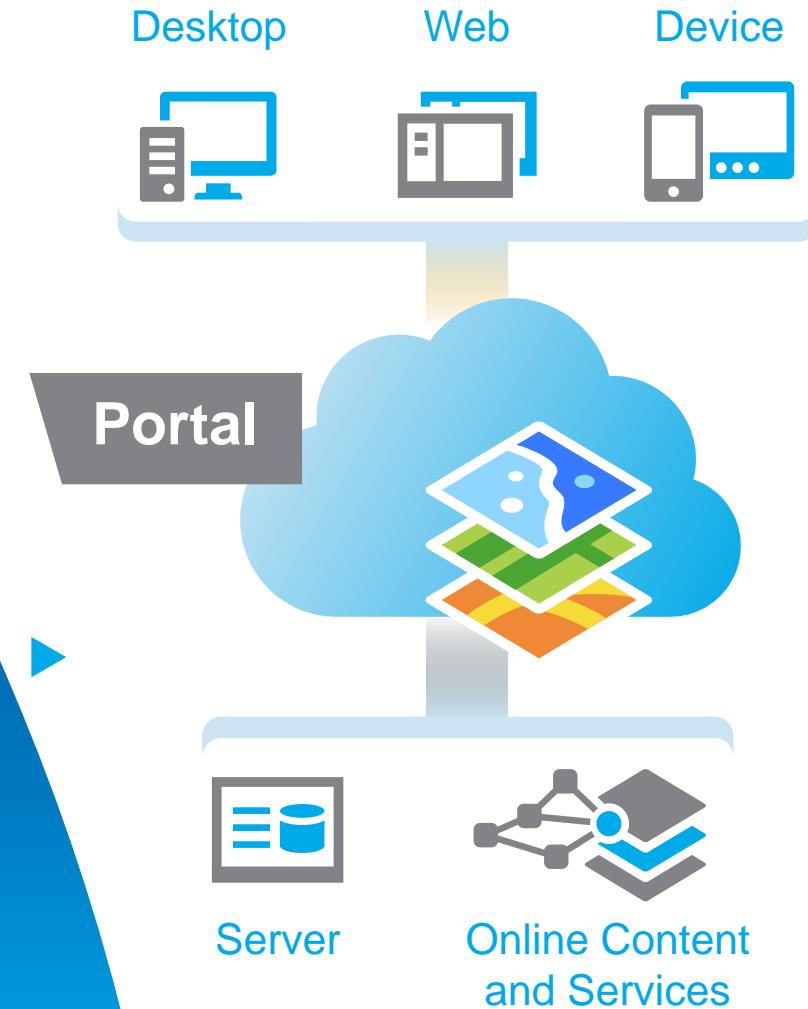
- **Founded in 1969**
- **350,000 clients**
- **3,100 employees**
- **10 US offices**
- **80 Distributors worldwide**
  - Esri China
- **1,800+ partners**
- **25+% of revenue invested in R&D**
- **Zero debt**



# ArcGIS

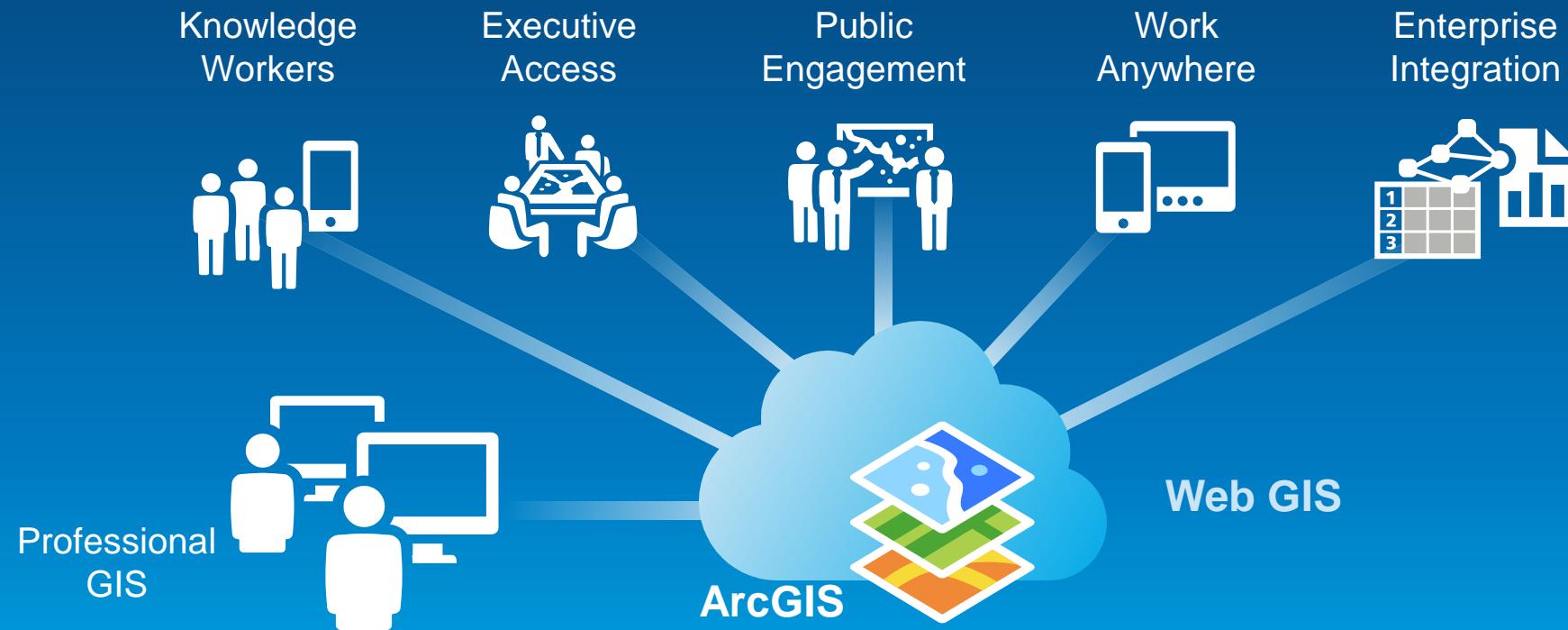
An Integrated  
Web GIS Platform

**Providing mapping, analysis, data  
management, and collaboration**

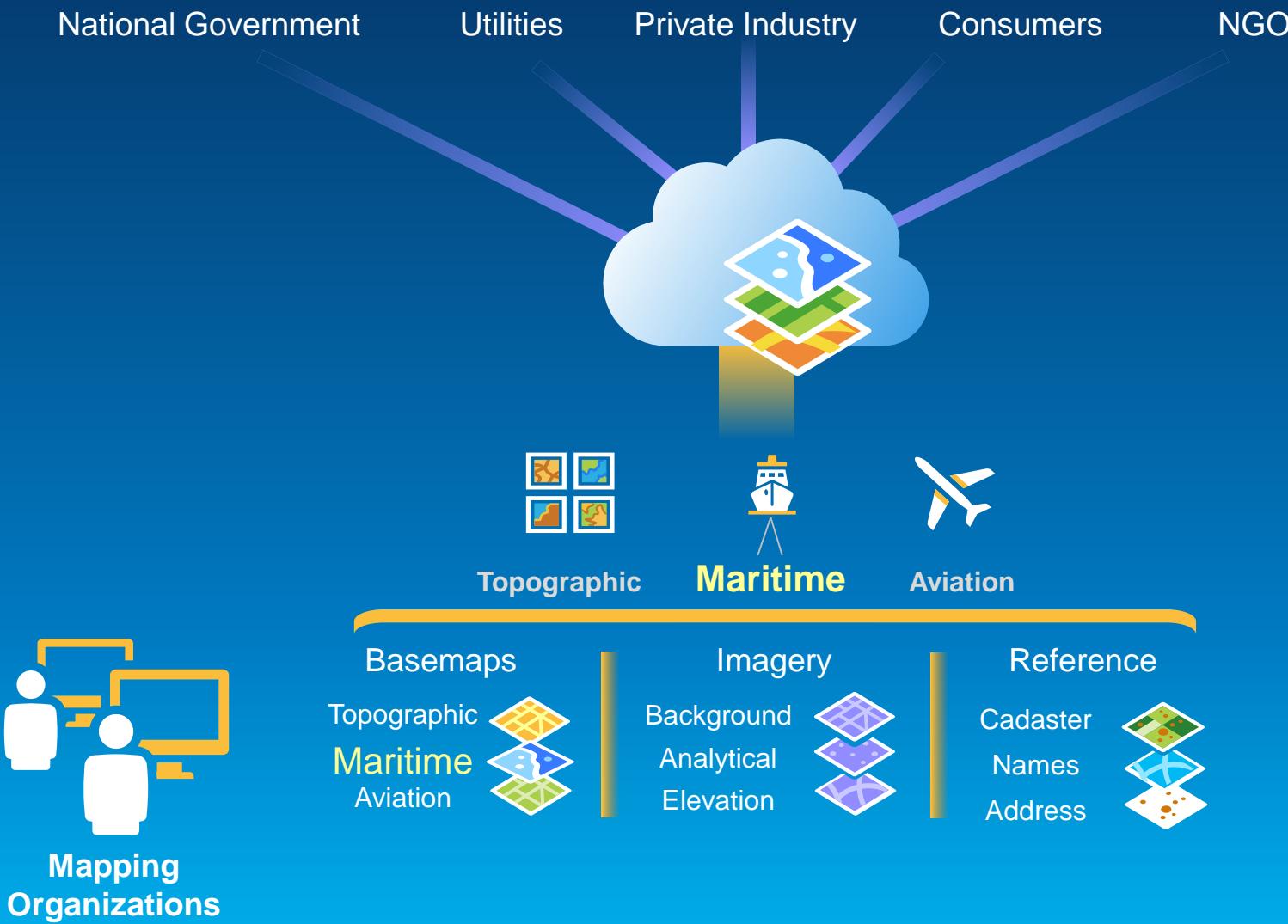


# ArcGIS is a Platform

Making mapping and location aware apps available across your organization



# Base Geospatial Information for the Nation



# Chart Management and Production System

# ArcGIS for Maritime

Collect



Produce



Workflows



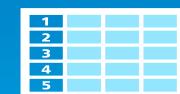
Features



Products



Share



Specifications



Data Models

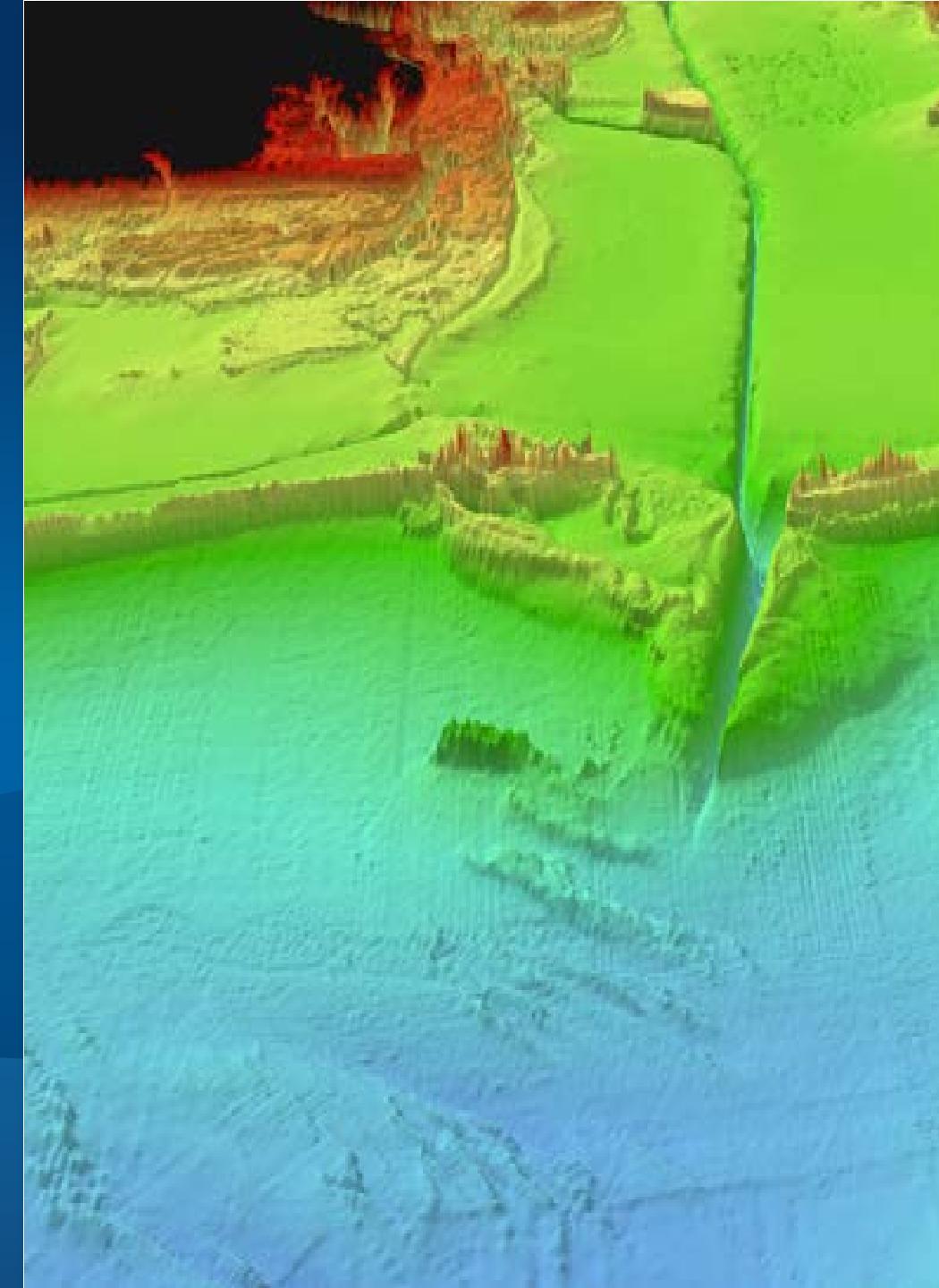


Workflows

Manage

*A Platform for Streamlining Production*

# Bathymetry



# ArcGIS for Maritime: Bathymetry (BIS)

Manage and model seafloor data



Unlock data from stovepipes



Store once, reuse many times



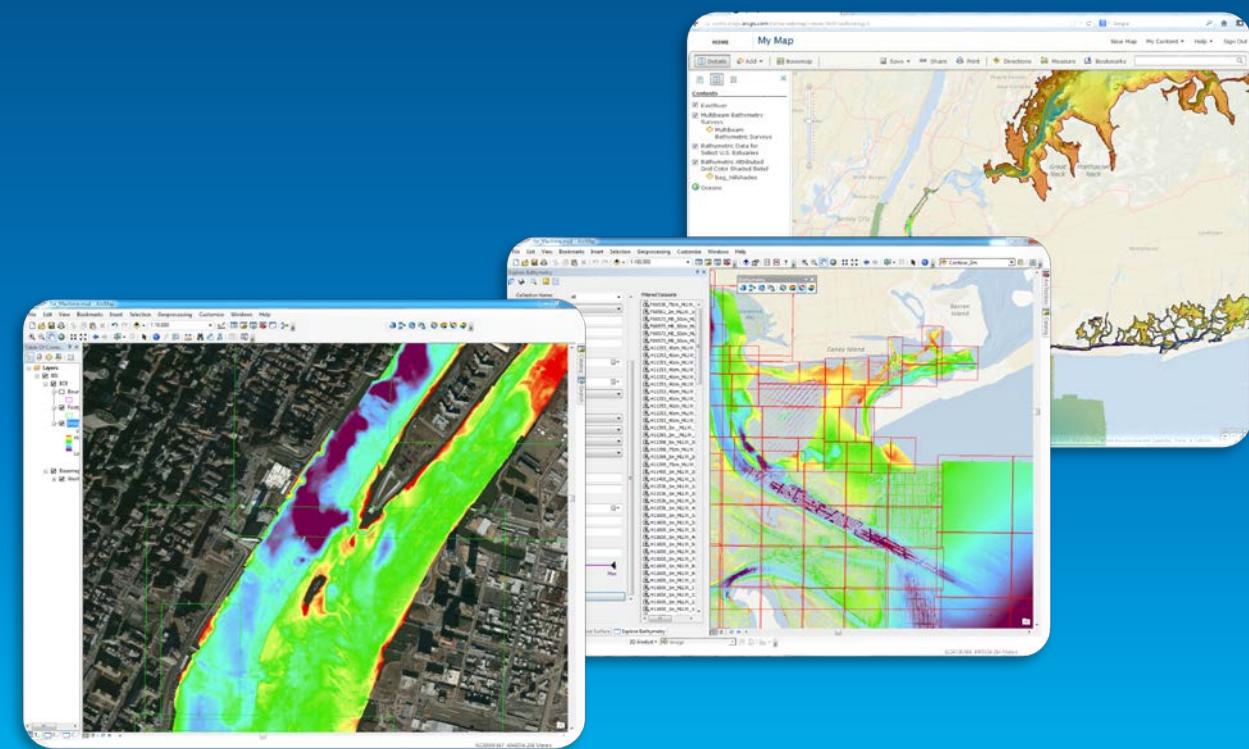
Traceability



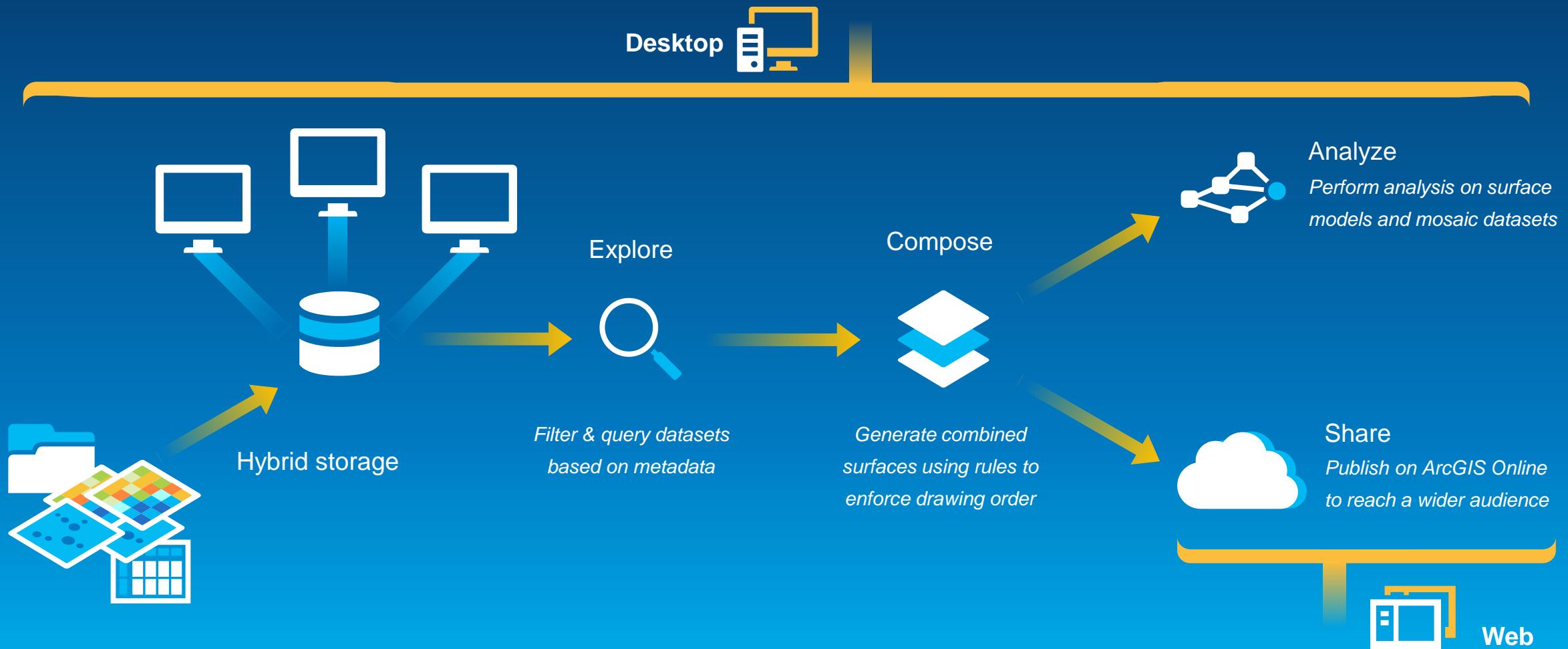
Scale



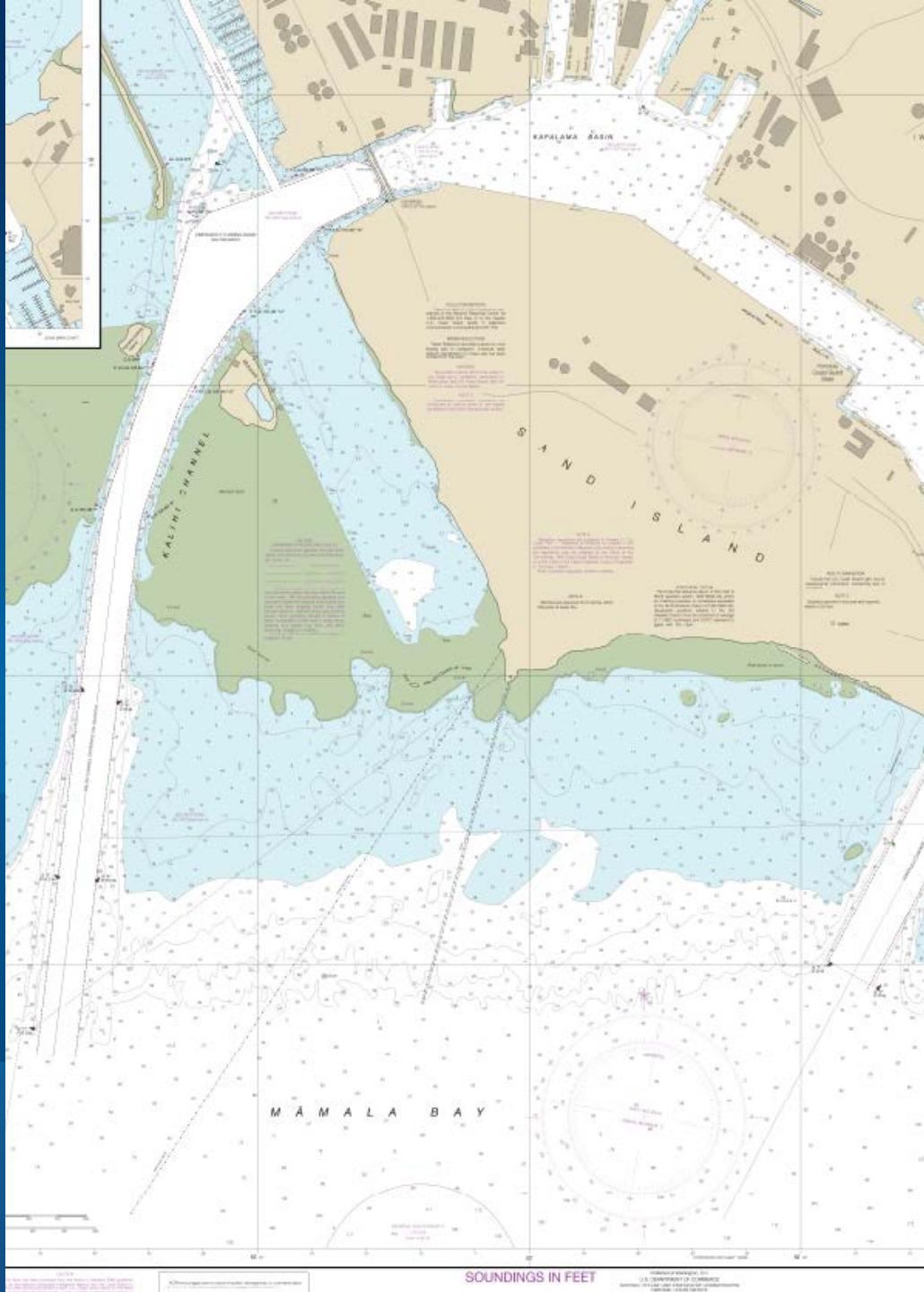
Querying and modeling



# ArcGIS for Maritime: Bathymetry Solution Architecture

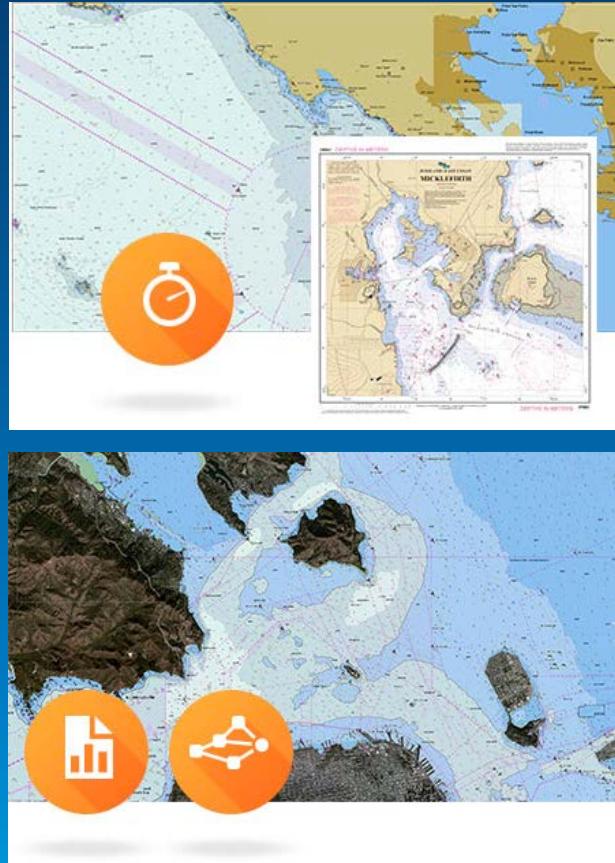
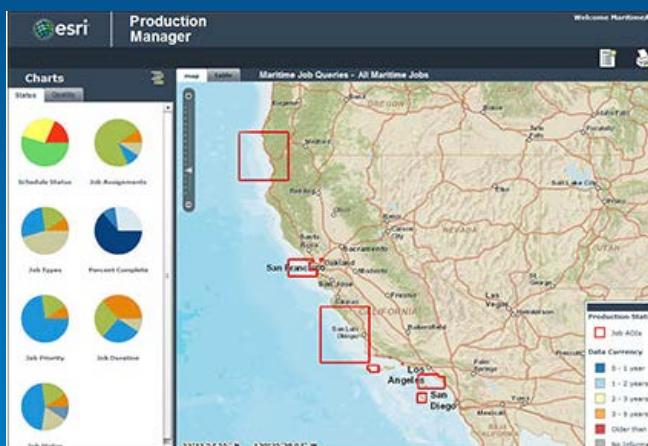


# Charting



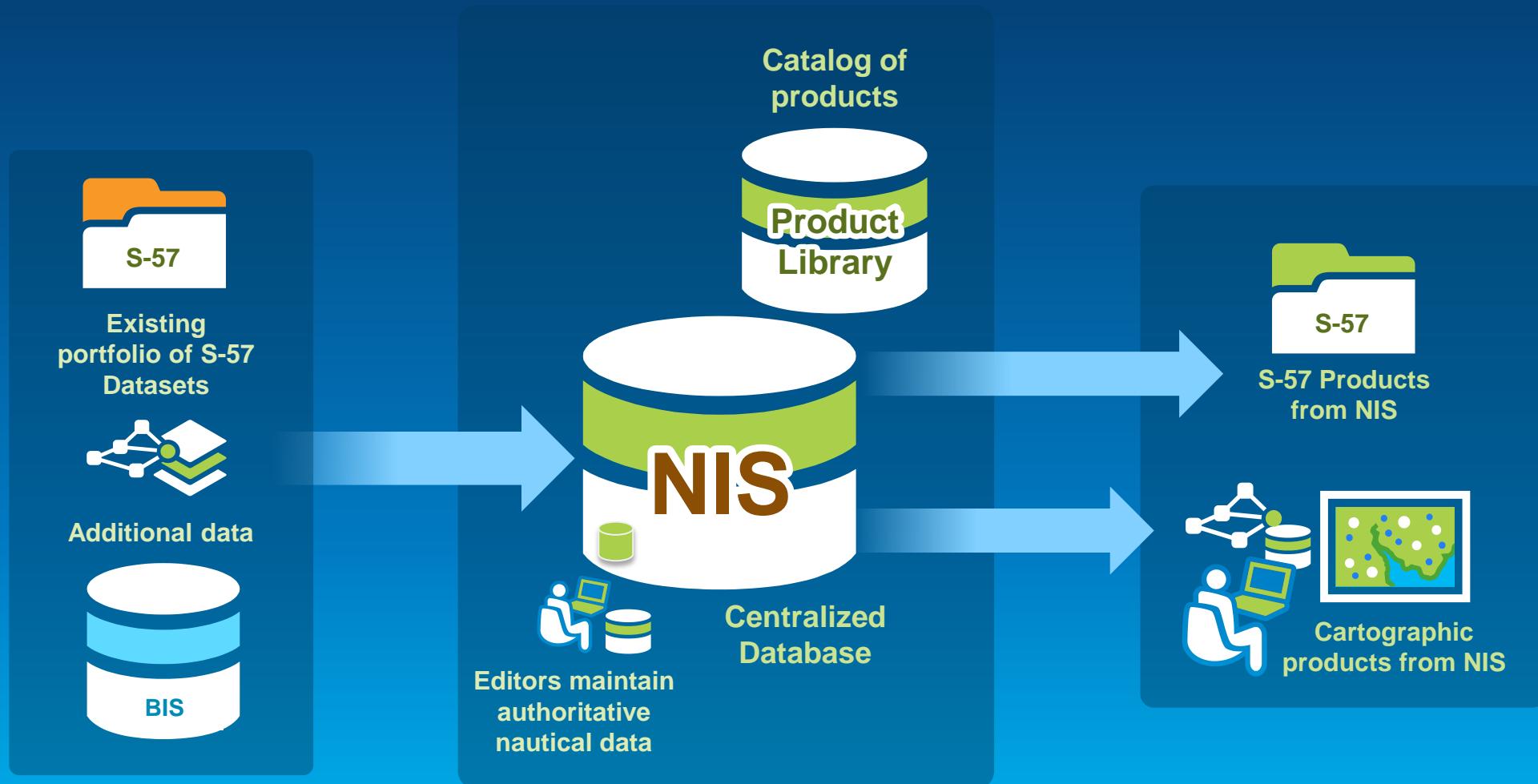
# ArcGIS for Maritime: Charting

## Produce and Maintain



- **S-57 ENCs**
- **CJ-57 ENCs**
- **Inland ENC (IENC)**
- **Official and custom Paper Charts**
- **Raster Nautical Charts (RNC)**
- **Digital Nautical Charts (DNC)**
- **Additional Military Layers (AML)**
- **Other special purpose chart products**
- **Foundation for a Marine SDI**

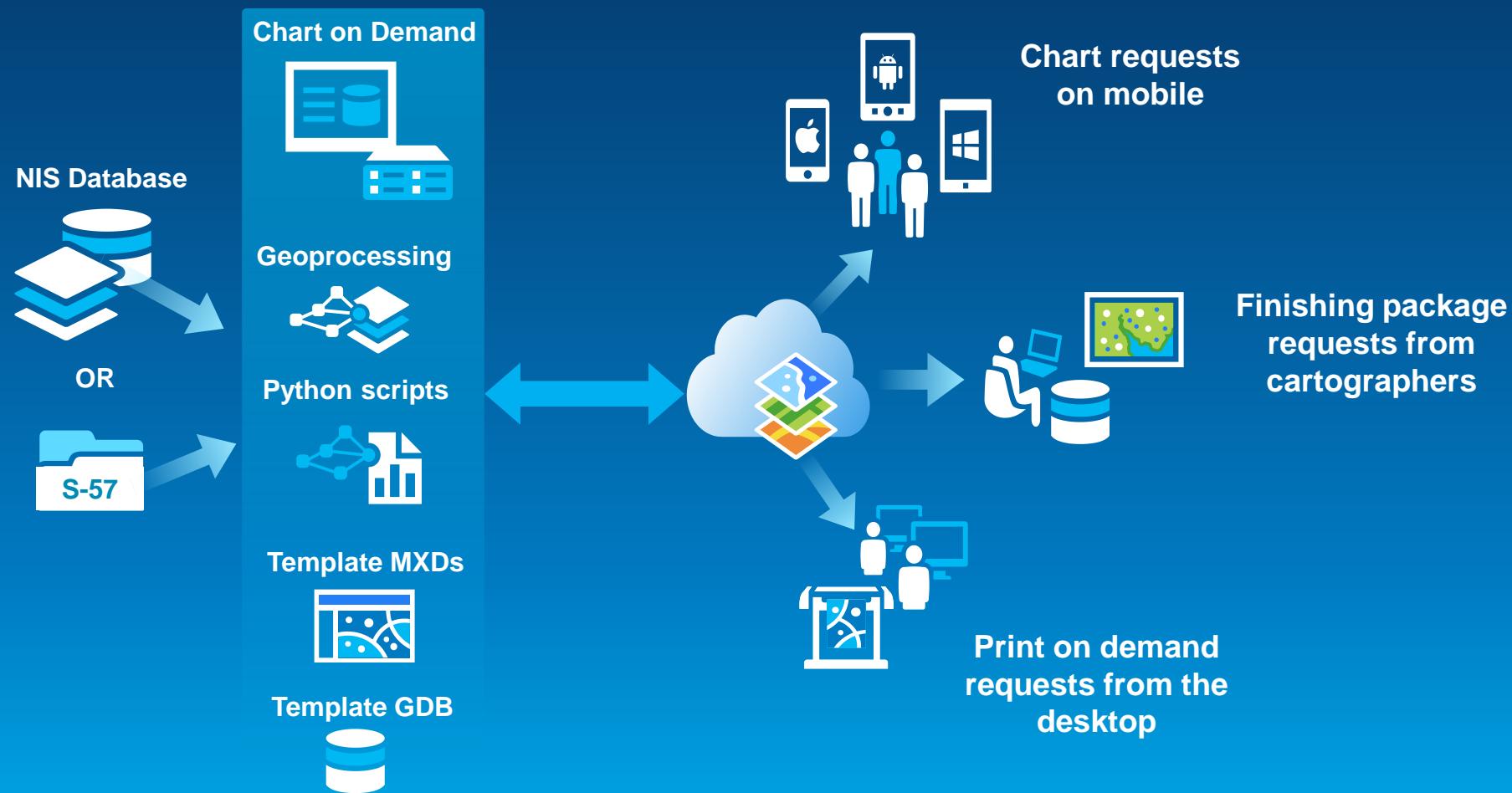
## 10.3 Architecture



# Server



# Product On Demand



# ArcGIS for Maritime: Server

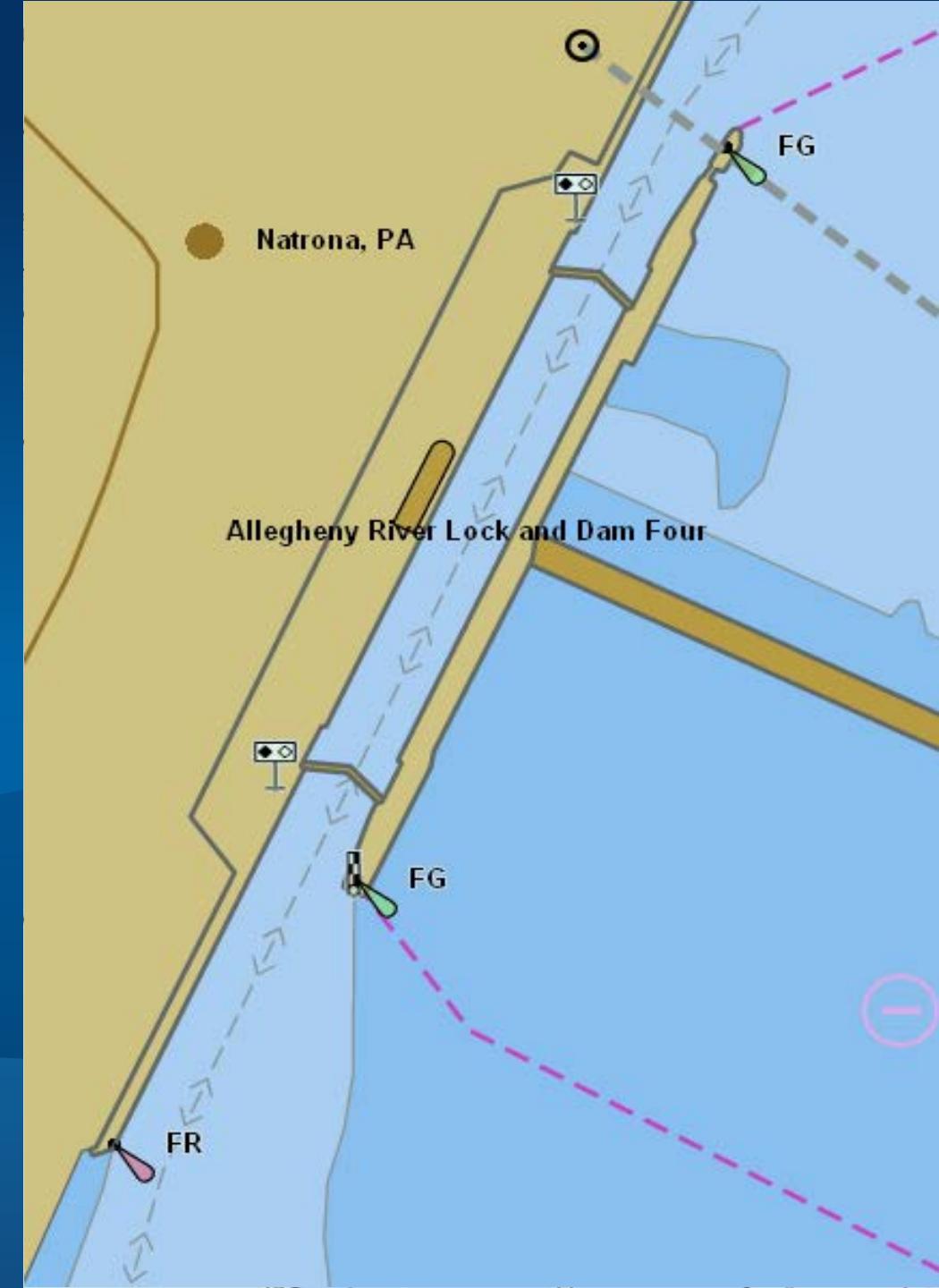
## Maritime Chart Service

- All your charts in one seamless view
- Unlock the value of Maritime data
- Using IENC beyond the bridge: ArcGIS for Maritime: Server
- Using JavaScript to create web applications
- Esri REST and OGS WMS support



Demo

# Maritime Chart Service



# Pick Report

Search for attribute information and external files

**Search**

francis scott

Object name search

Search Results /

Details:

**US5MD11M**  
DATASET  
**BOYSPP**  
FEATURE  
**Buoy, special purpose/general**  
DESCRIPTION  
**Point**  
GEOMETRY  
**Harbour**  
USAGE  
**15000**  
COMPILATION SCALE  
**US001934088200...**  
LNAME  
**conical (nun, ogival)**  
BOYSPP  
**general warning mark**  
CATSPM  
**blue,red,white,blue**  
COLOUR  
**horizontal stripes,vertical stripes**  
COLPAT  
**Francis Scott Key Memorial Buoy**  
OBJNAM  
**--1101**  
PEREND  
**--0601**  
PERSTA  
**119999**  
SCAMIN  
**20050516**  
SORDAT  
**US,US,reprt,5thCG...**

**Identify Results (1 of 6)**

**US5MD11M** Less Info Zoom To

Feature: BOYSPP Description: Buoy, special purpose/general Point Geometry: Harbour Usage: Compilations Scale: 15000

BOYSPP: conical (nun, ogival) CATSPM: general warning mark COLPAT: blue,red,white,blue COLPAT: horizontal stripes,vertical stripes OBJNAM: Francis Scott Key Memorial Buoy

**Maritime Chart Server**

**Contents**

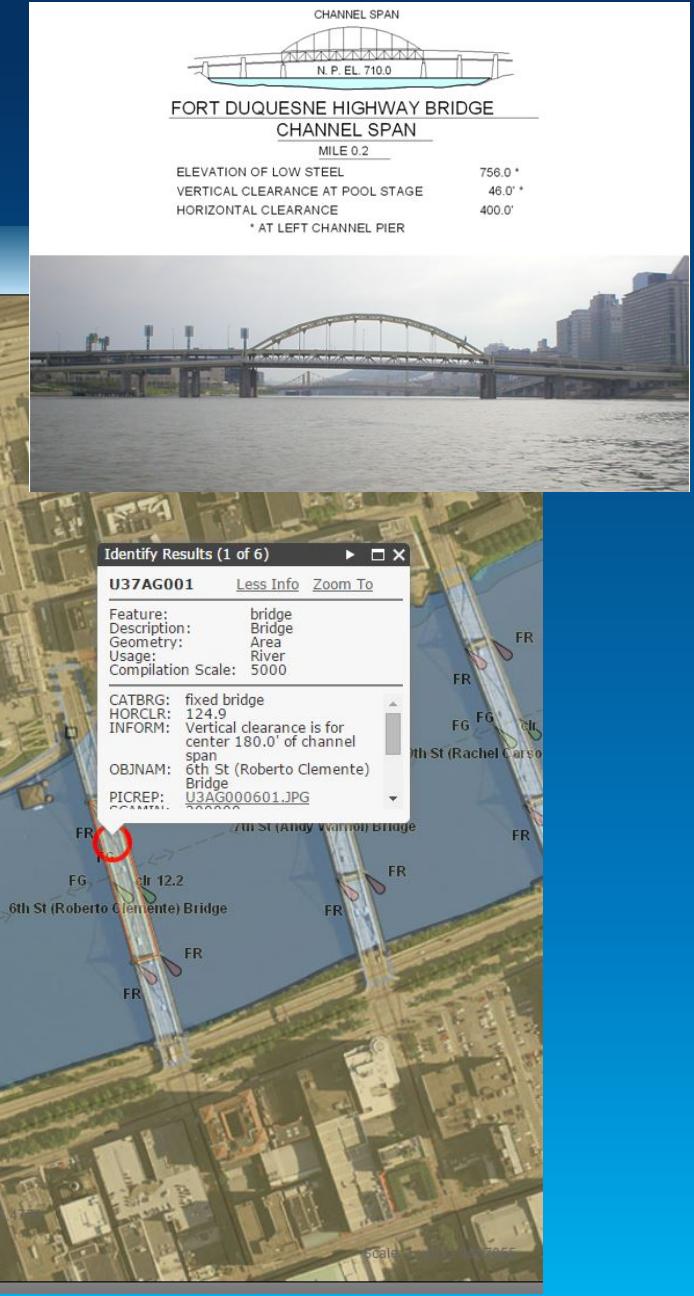
- Base Map
  - World Imagery
  - Low Resolution 15m Imagery
  - High Resolution 60cm Imagery
  - High Resolution 30cm Imagery
  - Citations
- S57 Service
  - Information about the chart display
  - Natural and man-made features, port features
  - Depths, currents, etc
  - Seabed, obstructions, pipelines
  - Traffic routes
  - Special areas
  - Buoys, beacons, lights, fog signals, radar
  - Services and small craft facilities
  - AIS Service
  - AIS Data (recorded playback)

**Identify Results (1 of 6)**

**U37AG001** Less Info Zoom To

Feature: bridge Description: Bridge Geometry: Area Usage: River Compilation Scale: 5000

CATBRG: fixed bridge HORCLR: 124.9 INFORM: Vertical clearance is for center 180.0' of channel span OBJNAM: 6th St (Roberto Clemente) Bridge PICREP: U3AG000601.JPG

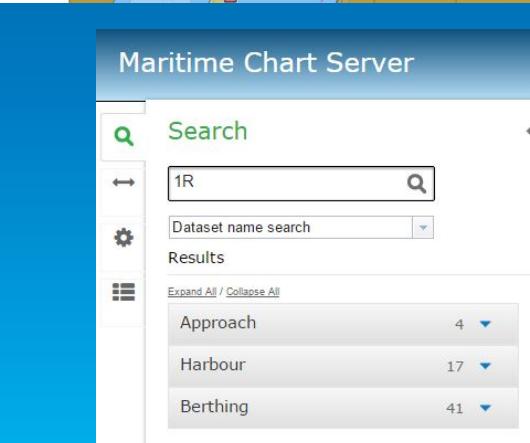
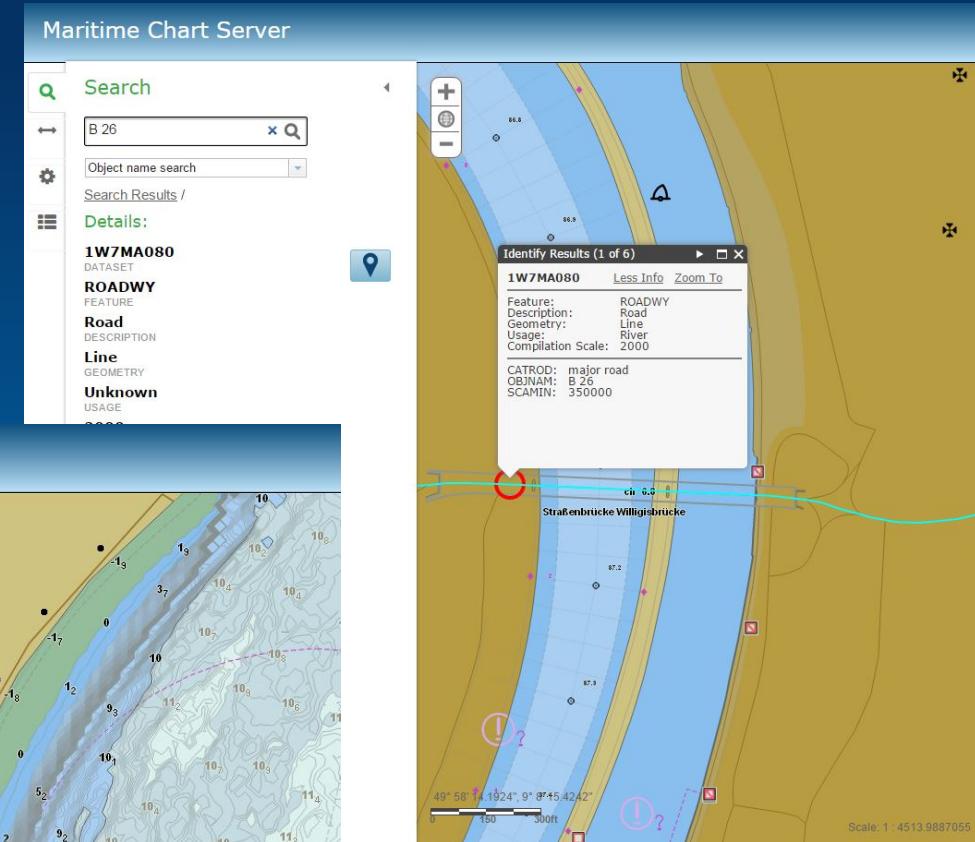
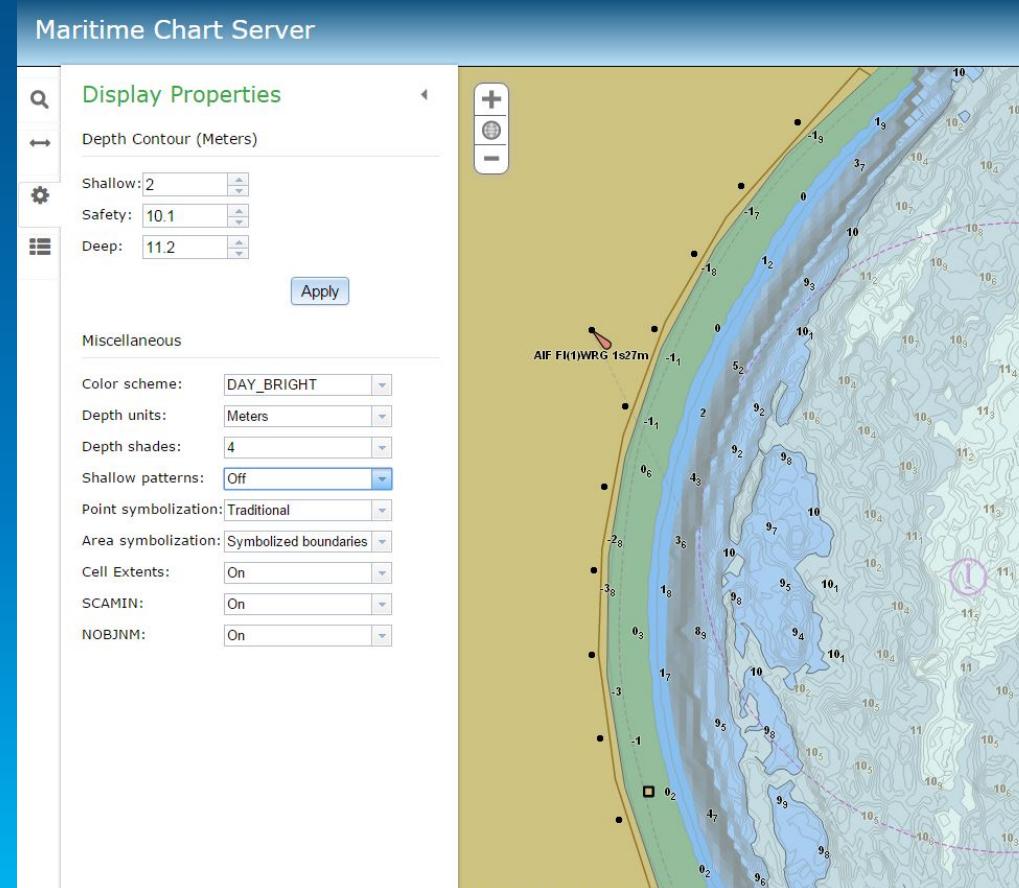


# Service Properties

## Client side configuration

## Web and Mobile Applications

- Zoom to selected features
- Adjust transparency
- Switch S-52 display parameters
- Query OBJNAM
- Query Dataset name
- Toggle S-52 Viewing Groups





# NMEA 2015 Presentation



Access through [REST](#) or [OGC WMS](#)

- <http://gis.charttools.noaa.gov/arcgis/rest/services/MCS/ENConline/MapServer/exts/Maritime%20Chart%20Server/MapServer>
- <http://gis.charttools.noaa.gov/arcgis/rest/services/MCS/ENConline/MapServer/exts/Maritime%20Chart%20Server/WMServer>

<http://www.nauticalcharts.noaa.gov/ENConline/enconline.html>

Contact: [leland.snyder@noaa.gov](mailto:leland.snyder@noaa.gov)

For more information about Esri technology: [maritime@esri.com](mailto:maritime@esri.com)



# Esri Hosted Services

## ArcGIS Online Federal Content

ArcGIS Features Plans Gallery Map Scene Help  Sign In

### USDOD USACE Inland Electronic Navigational Charts (IENC)



This WMS utilizes the U.S. Army Corps of Engineers (USACE) Inland Electronic Navigational Charts (IENCs) and overlay datasets

 [WMS by Federal\\_User\\_Community](#)

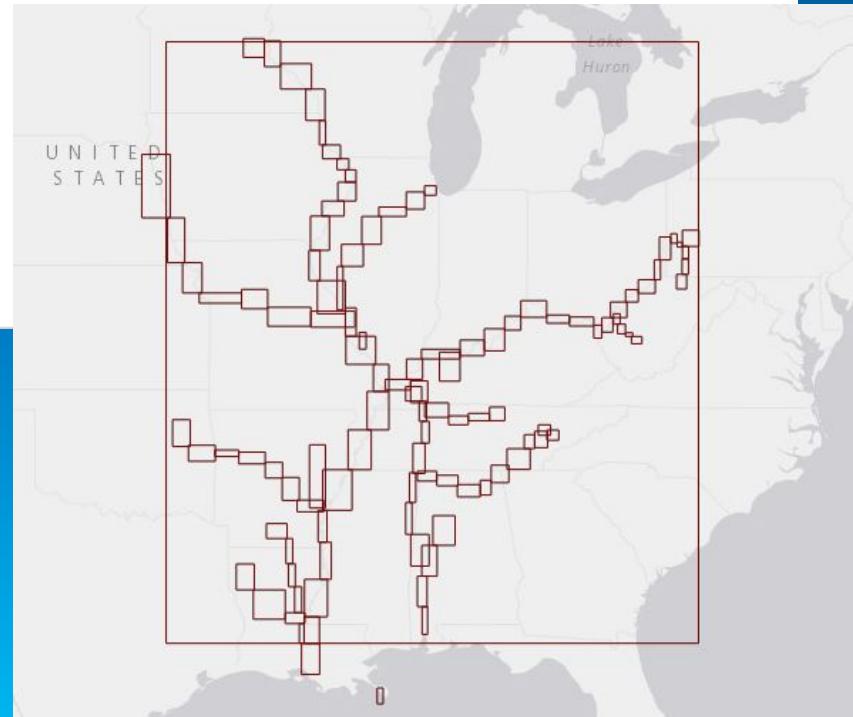
Last Modified: June 16, 2015

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[REST Link](#)

[WMS Link](#)

[Sample Application Link](#)

# Emerging Patterns

Inland Waterway Implementations



# PortMaps

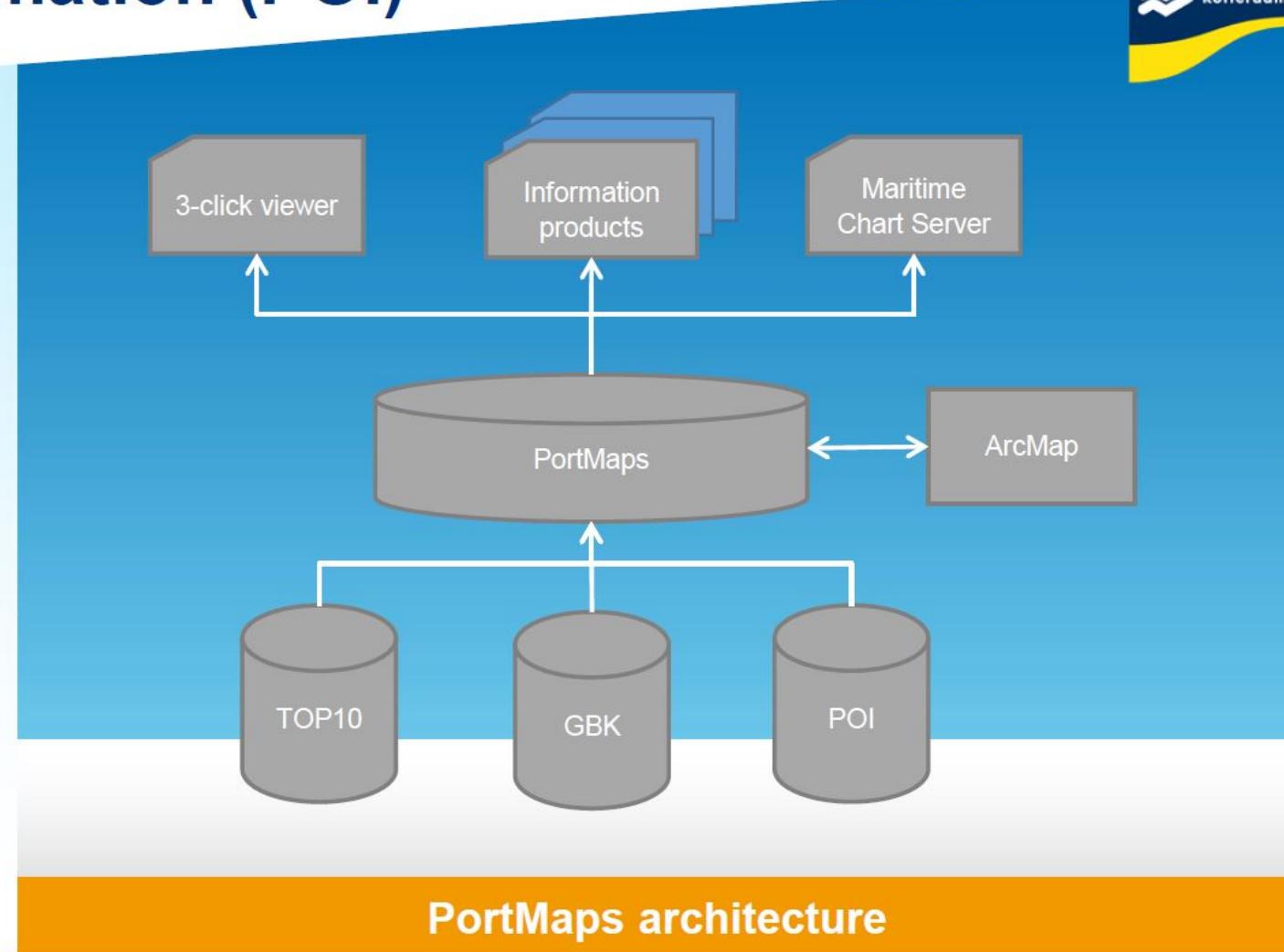
- 2013 Partnership Port of Rotterdam – Esri
- Port GIS system based on ArcGIS
- All port assets accessible within 3 mouse clicks
- Links with SAP, Sharepoint and DMS

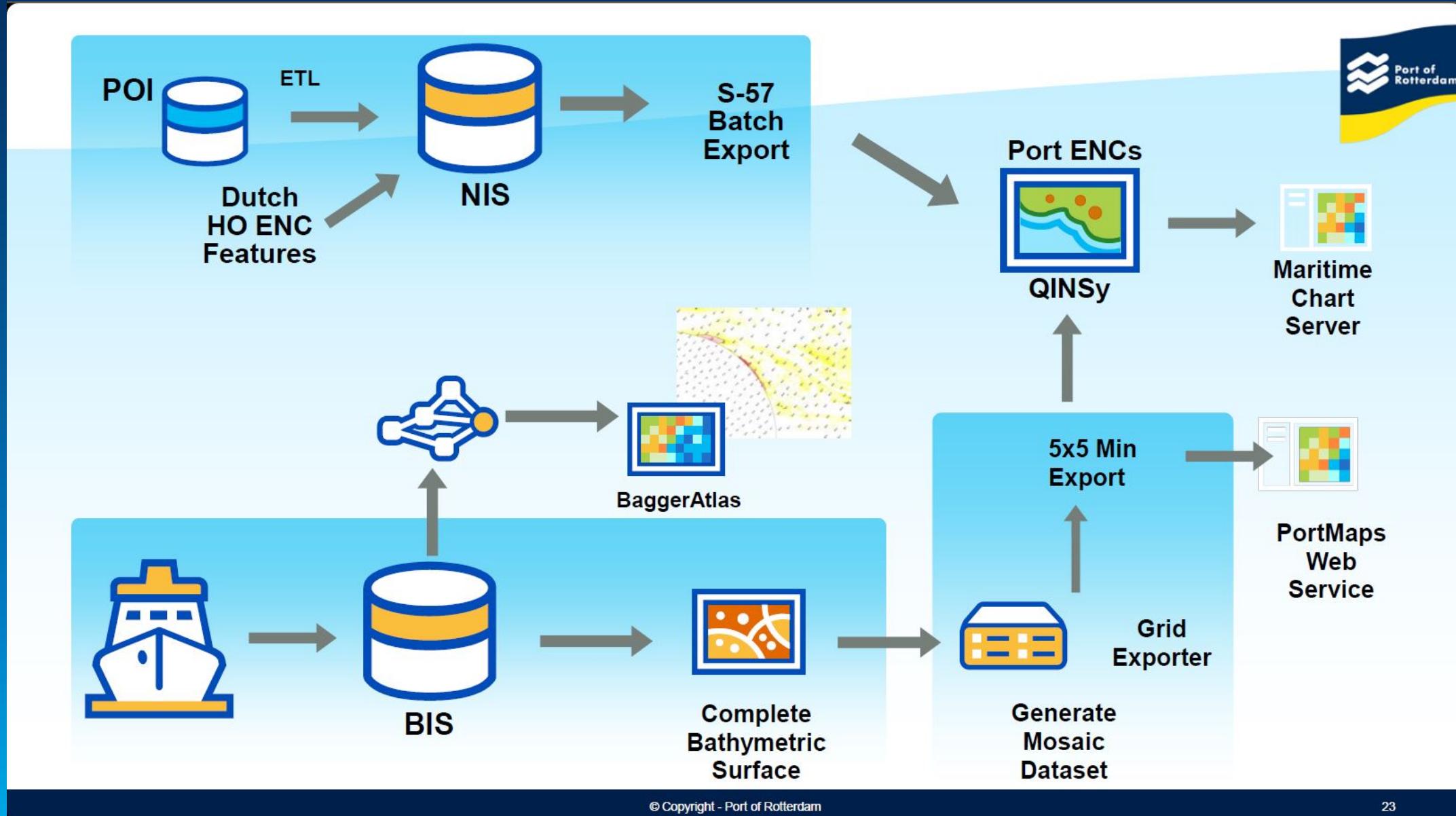
The screenshot shows a detailed map of the Port of Rotterdam's industrial areas. The map is color-coded to represent different land uses, with brown and orange tones indicating industrial zones. Numerous water bodies, represented by blue and teal colors, are scattered throughout the area. A network of roads and highways is shown in red and grey, with labels for 'N15' and 'A15'. A scale bar at the bottom left indicates distances of '2500ft' and '1km'. At the top of the map, there are several interface elements: a logo for 'Port of Rotterdam', the text 'PORTMAPS', a search bar with the placeholder 'Zoeken op de kaart...', and a link labeled 'Asset Management - Data management'. A yellow banner at the bottom of the map area reads 'PortMaps 3-click viewer'.

# Port Object Information (POI)



- New data model for Port Asset/Object Information
- Database connections to national data sources
- Output to information products





## ***Conclusions***

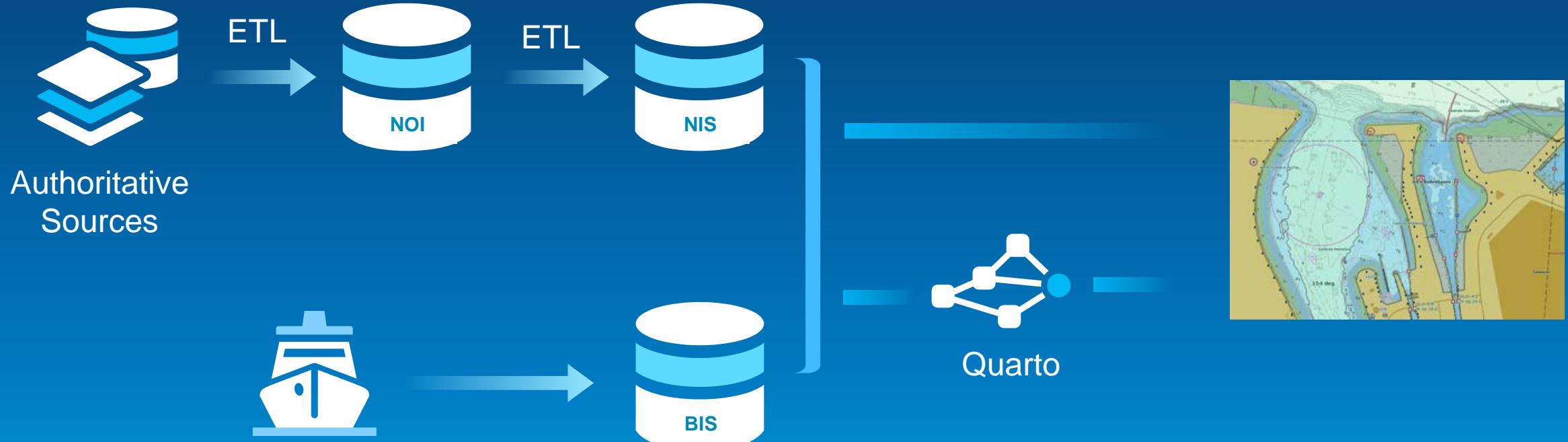
- Introduction of PortMaps leads to efficient data management due to one data source for multiple information products
- All nautical users are looking at the same data
- ENC production and Dredging Atlas process automated by ArcGIS tools

## ***Developments***

- Real “on-the-fly” ENC production
- EU Inland ENC production (V2.3)
- Web services for Port ENC to reduce turn-around-times

# Rijkswaterstaat

Repeatable Pattern for automated production



# S-100 Road Map

► Advancing Next Generation Standards

## IHO S-101 Development and Test-bed Timeline



## S-100 Working Group

S-101 Converter  
Real-time Tides  
e-Navigation

Exchangeable Catalogues

## ISO 19100 Complex Attributes

S-100 Based Products  
Navigational Decision Making  
Better Portrayal

... Advancing the ArcGIS Platform to support Maritime Standards

# GIS

Is the Platform for Applying  
Hydrography Everywhere

