NCS I and NCS II
The Past and the future at NOAA's Marine Chart Division

You got to be careful if you don't know where you're going, because you might not get there.
Yogi Berra

Current Nautical Products Situation

- Vessels must carry up to date Nautical Charts and publications produced by an appropriate authority (carriage requirements)
  - 33 CFR Part 164.33-35 (US regulations currently in place)
- IMO permits chart carriage to be accomplished in one of several methods
  - Traditional - Paper Nautical Charts, "currently corrected" with changes in all NM published by NGA or equivalent foreign government publication
  - ECDIS (Electronic Chart Display and Information System) installed and operated as per regulations, with ENC's "currently corrected".
- In 2012, ECDIS will be required equipment on specific vessel types, with a requirement on all SOLAS vessels by 2018.

What is NOAA's Nautical Chart System (NCS)?

- NOAA's Nautical Chart System (NCS) consists of hardware, software, processes and personnel needed to produce nautical charting products

- Includes major components:
  - Source Document Registration and management (DREG)
  - Job tracking and assignment (chart tracker, scheduler)
  - Raster and Vector Charting Production Lines
    - Continual Maintenance
    - Critical Updates
  - Distribution systems
  - Archiving and chart histories

Nautical Charting Products

- Paper and Raster Nautical Chart (RNC) and Updates
  - 1000+ product suite in maintenance
  - 300 new editions annually
  - 10400 Notice to Mariner Applications
- Electronic Nautical Chart (ENC) and Updates
  - 700+ product suite in maintenance
  - 350 new editions
  - 50 new builds/ yr (increasing)
  - 6300 Notice to Mariner Applications

NOAA ENC Coverage

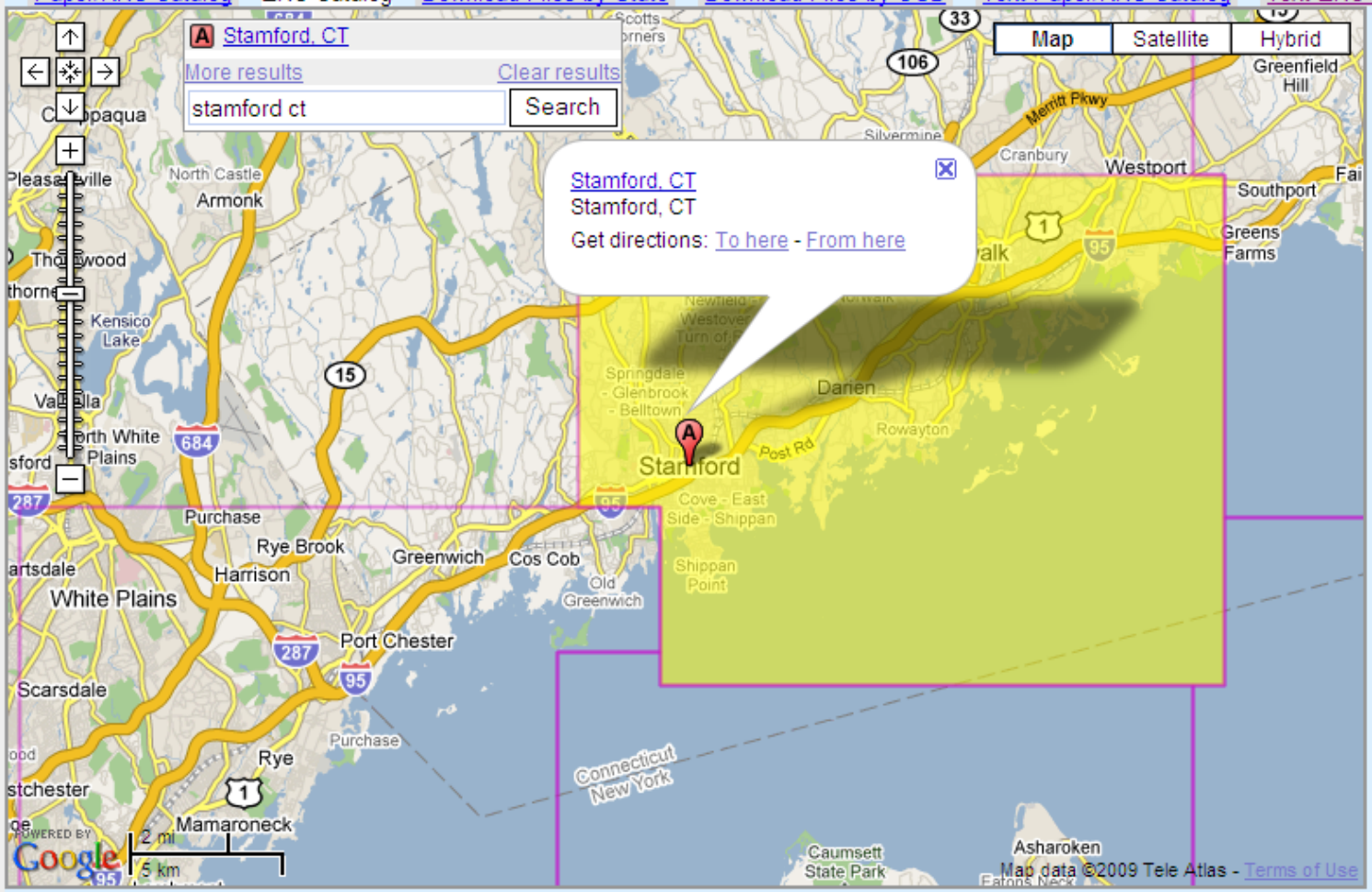
- As of 2009:
- 97% of the Marine Transportation Systems top 175 ports
  - Large Scale coverage
  - 700 chart equivalents posted
- By 2012
- 100% of the top 175 ports covered and transit between ports
- By 2014
- All ENCs (includes charts for non-SOLAS navigation)

Product Distribution

- Multiple avenue's to receive official NOAA products
  - Chart Agents (multiple products based on owner)
  - Print on Demand (direct from OceanGrafix)
  - Certified ENC and RNC Distributors
  - NOAA / OCS Website
    - New "Find a product "Google " interface
    - New xml Chart catalog for automated systems
      - Currently two distributors using system
        - » Coastal Explorer (ECS system)
        - » I NavX (for Iphones)

NOAA Chart Downloader (Web based Distribution)

- Used for ENC and RNC distribution
- Multiple User Interfaces
  - Graphical User Interface
  - By zip file packages
    - All
    - Coast Guard District
    - State
    - Individual
  - .xml Product Catalog for automated distribution



Help using this page

Show all ENCs

Selected Point:
41 03' 18.80" N
073 31' 51.64" W

ENC

US5CN11M

US3NY01M

US2EC03M

For ENC US5CN11M
Download ENC

Select by Coordinate, enter decimal degrees, DM or DMS. Just numbers and spaces, no fancy characters please.

Lat: N

Lon: W

Select Lat/Lon

US5CN11M
Harbor Chart

Panel Title: North Shore of Long Island Sound Sherwood Point to Stamford Harbor

Download Statistics for September 2009

- ENC Statistics
  - 70,600 Discrete downloads (click through)
  - 1,200,000 Total Cells Downloaded
  - 22,600 System downloads (via xml catalog)
- RNC Statistics
  - 45,000 Discrete downloads
  - 1,700,000 Total Charts Downloaded
  - 39,000 System downloads (via xml catalog)
-

The Future - Improved system and processes

- MCD is actively pursuing the next generation of GIS software as a potential to gain efficiencies in data handling and product generation and management, and improved products and services.
- Focus on Commercial Off the Shelf (COTS) software solutions for long term viability
- If mature technology available – central database from which charting products could be created or extracted

NCS I System

- Four versions of each product at one time

Source DREG

7 – 10 thousand Source Documents Per year

Raster

Maintenance Copy

New Edition (BSB, Paper)

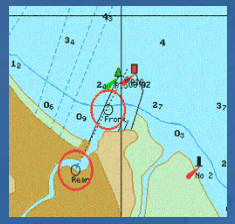
300 Per year

CRIT Copy

Weekly (BSB, POD)

75 Per week

Vector

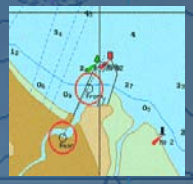


Maintenance Copy

New Edition (.000)

400 Per year

CRIT Copy

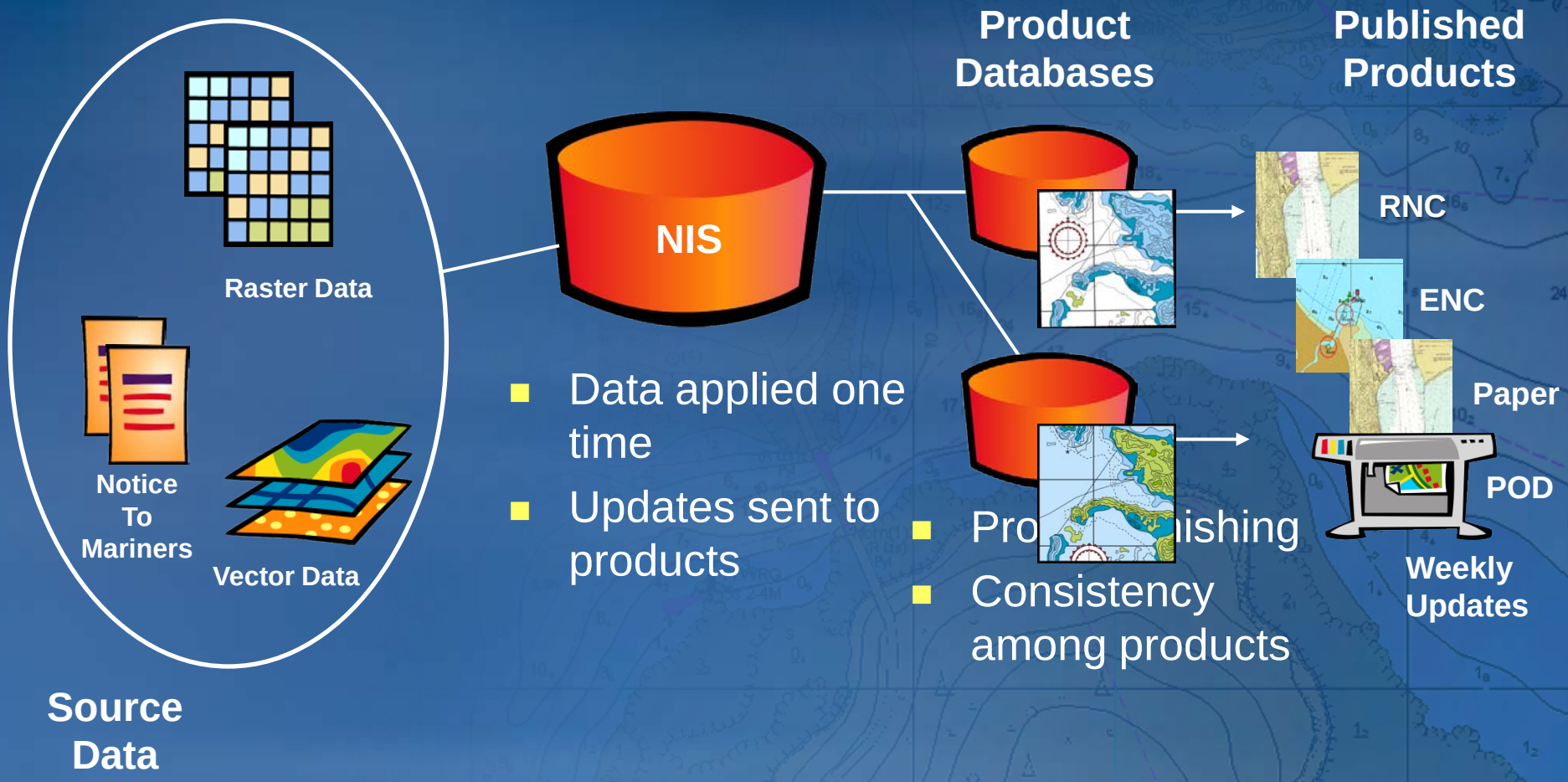


Weekly (.001, .002)

65 Per week

NCSII System

- Centrally managed database
- Products are extracted

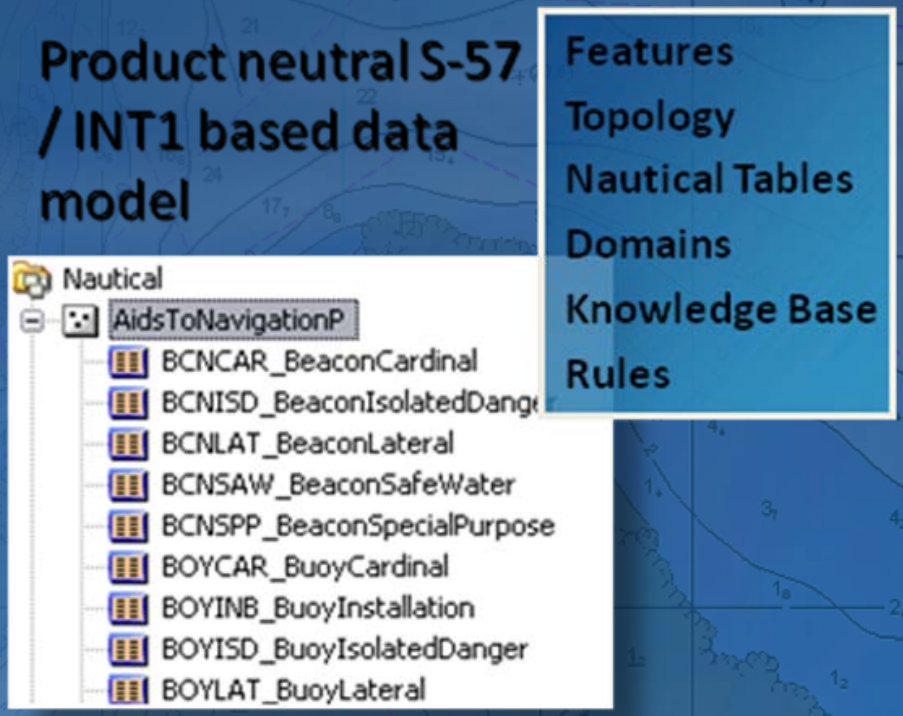


- Data applied one time
- Updates sent to products
- Pro ishing
- Consistency among products

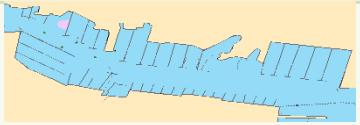
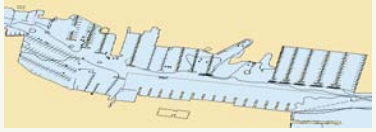
Nautical Information System – The Database

- Data centrally managed and edited in the NIS
- NOAA ENCs – initial data load into the NIS
- 22 scale bands – multiple representations of each feature
- Aids to navigation will exist one time
- Maintains spatial and spatial data
- Product neutral

Product neutral S-57 / INT1 based data model



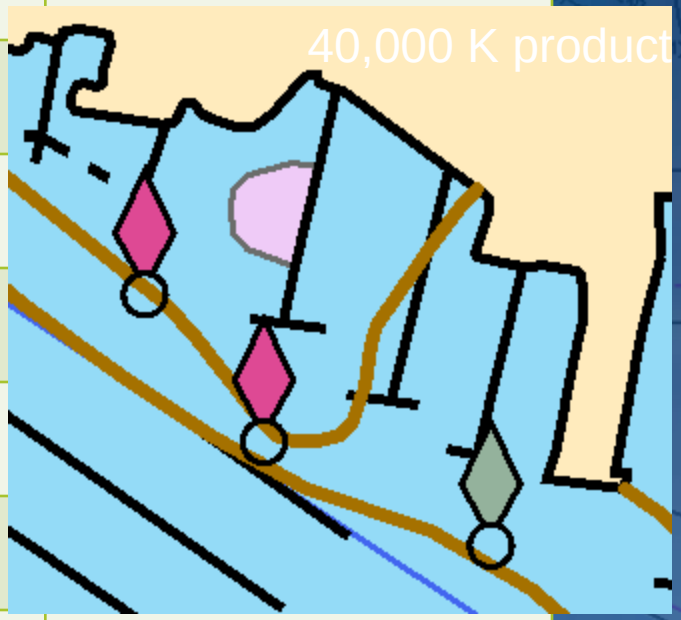
Data Storage in the NIS

1,000,000		
500,000		ENC, paper
120,000		
80,000		
40,000		Paper
20,000		
10,000		ENC, Paper
	Location X	

Aids to Navigation Conflation

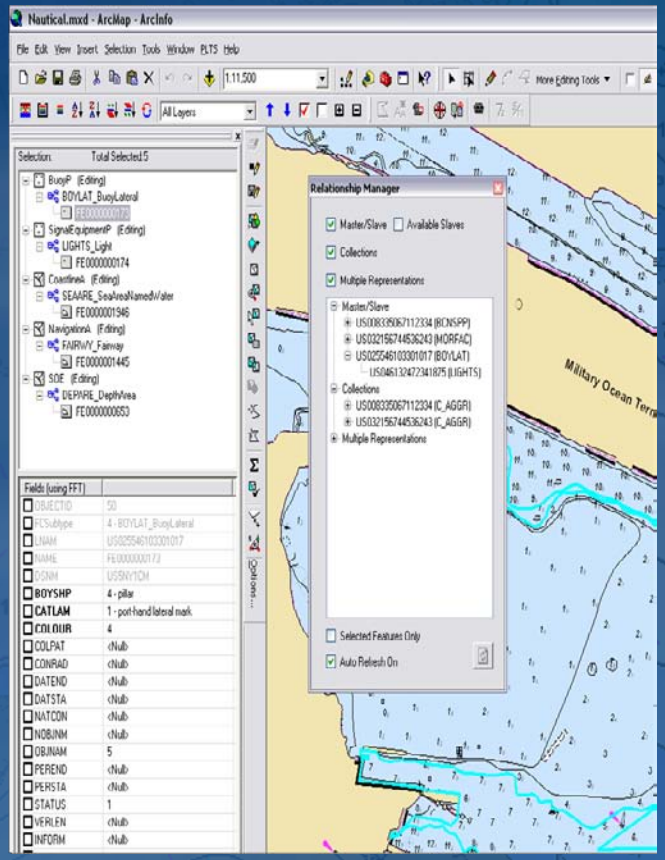
- Aids are stored only once in the NIS
- Best position is used
- Stored at smallest scale that the aid is located
- System knows that the aid must appear on every larger scale product in that location

1,000,000	
500,000	
120,000	
80,000	
40,000	
20,000	
10,000	
	Location X



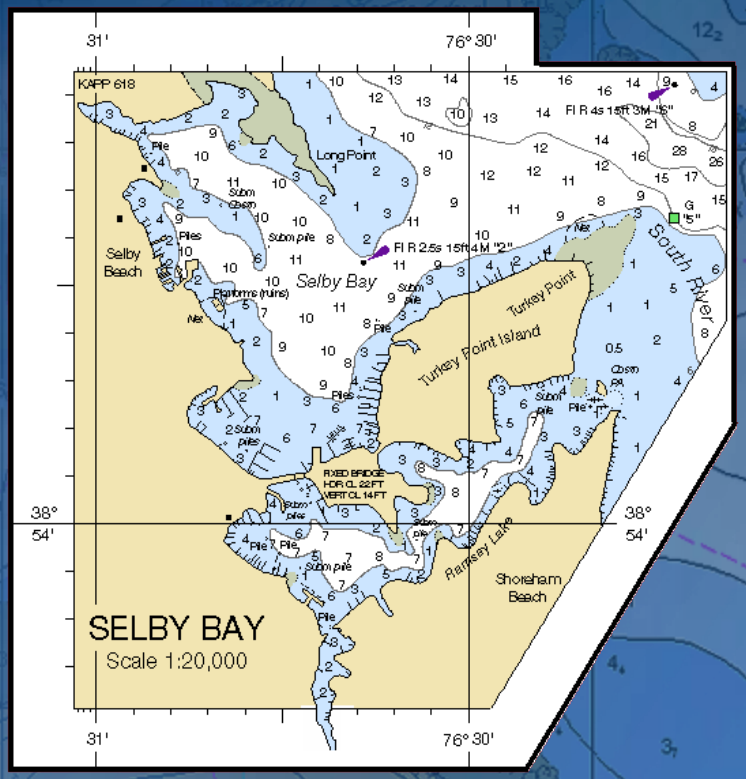
Output - ENC Products

- Filters control the flow of data from the NIS to the ENC
- ENC specific processes
  - Creation of S-57 topology
  - Setting of Scale Minimum for ENC consistency
- Supports – New Editions, Updates, or re-issues

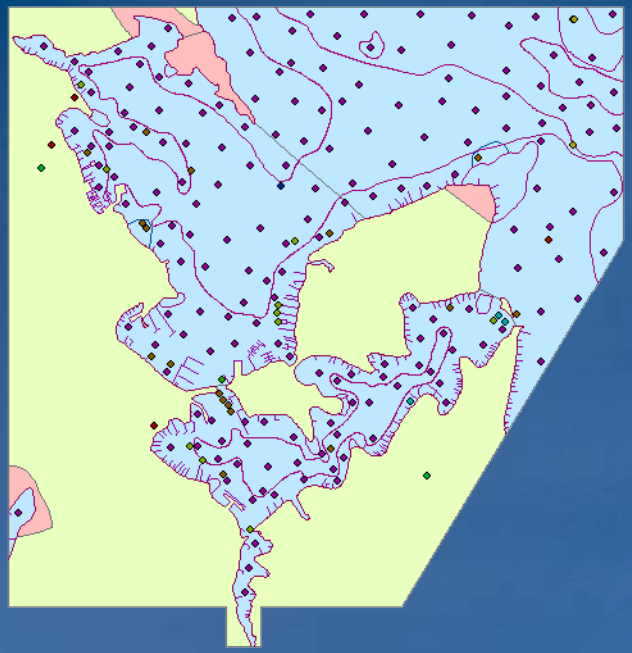


Output - RNC (Paper Chart) Products

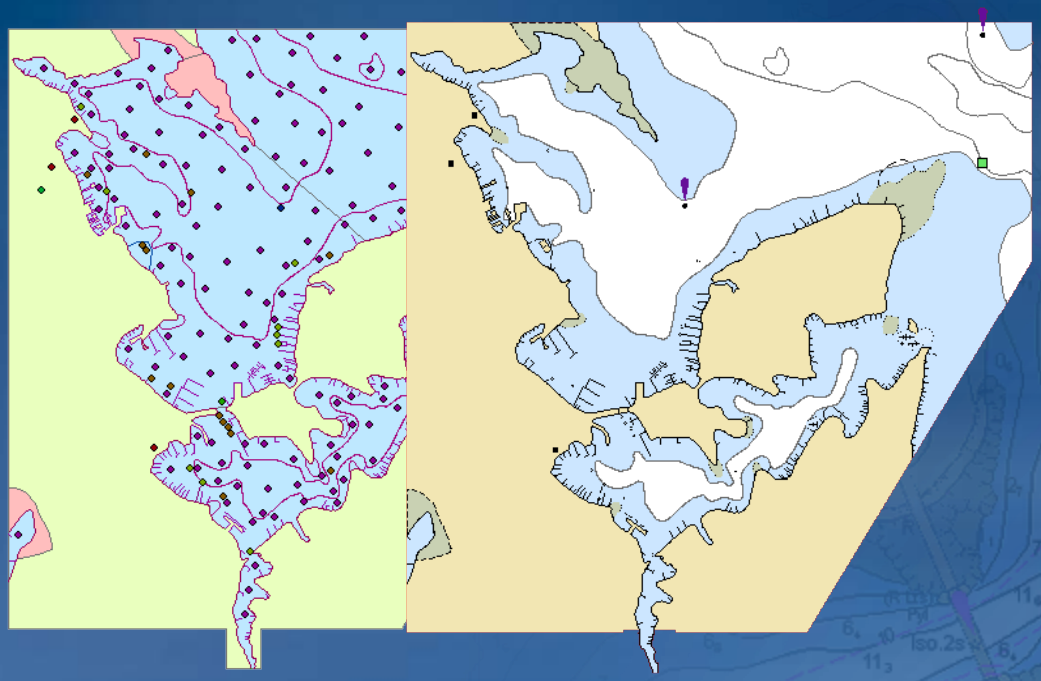
- Extract data from the NIS
- Visual Specification Tool (VST)
  - Database driven cartography
- Prepare chart specific information and features
  - Grids, compass, rotate and clean up overprinting information etc.
- Master version is exported as:
  - GEOTIFF for RNC and Print on Demand
  - Color separated PDF for lithographic operations



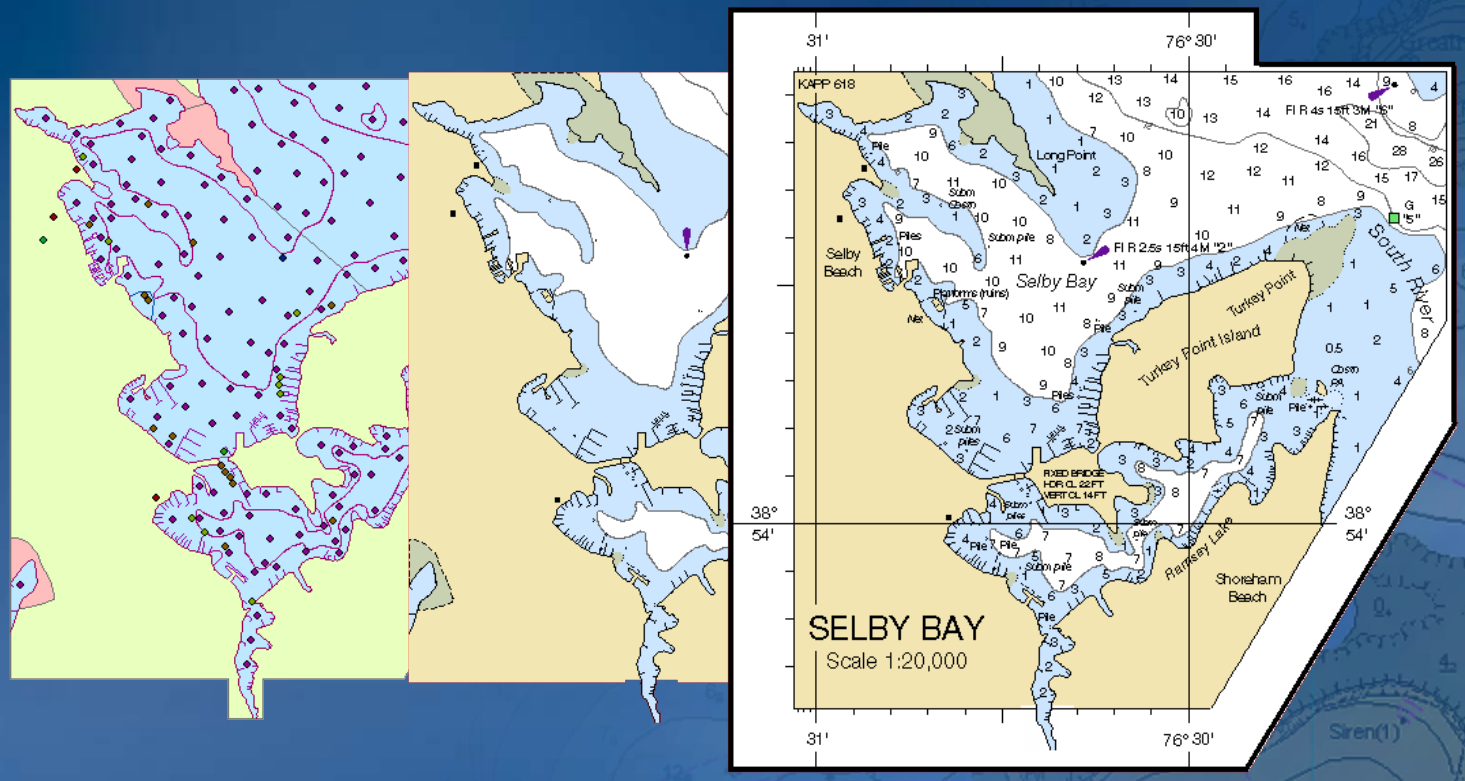
Product Finishing



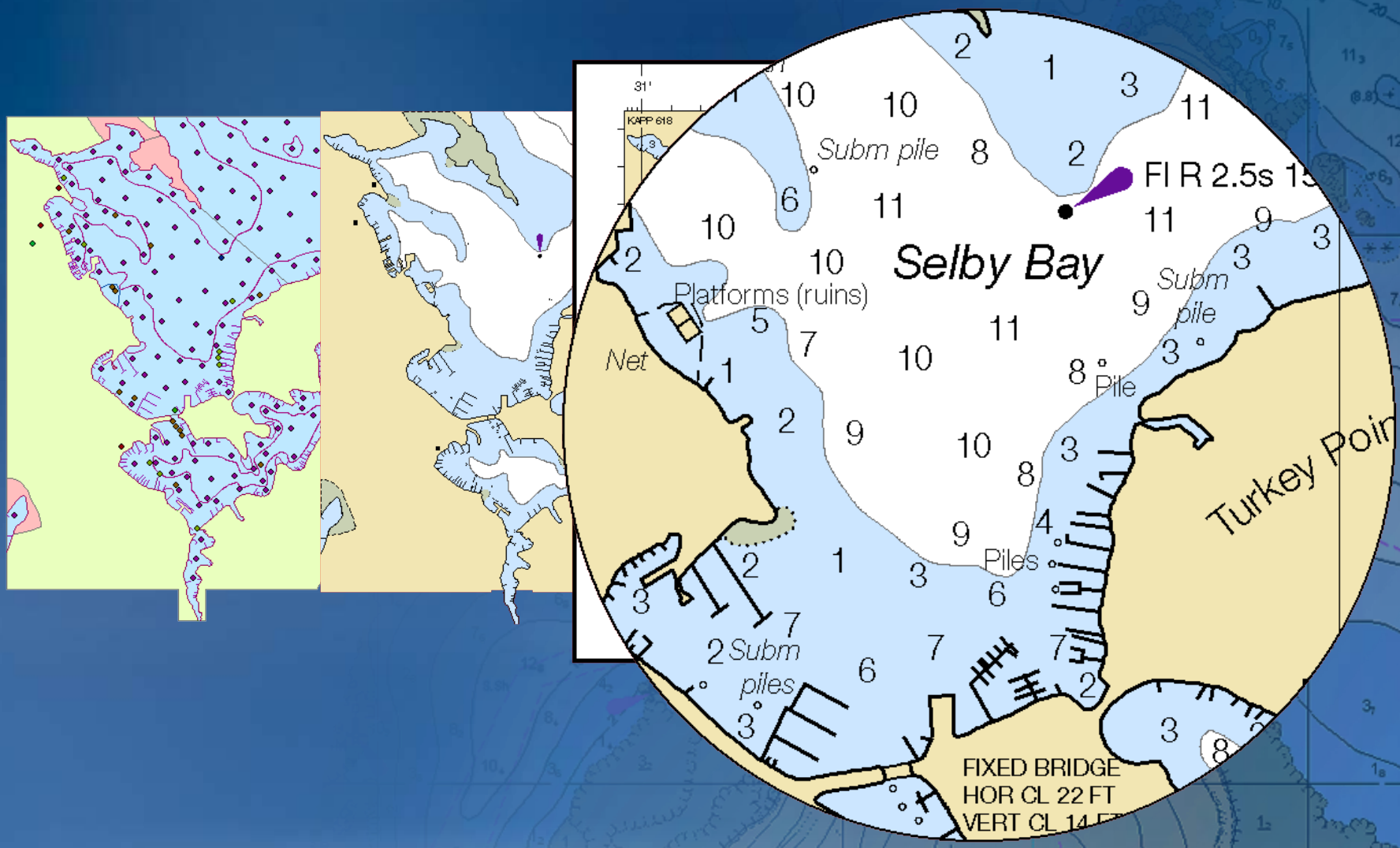
Product Finishing



Product Finishing

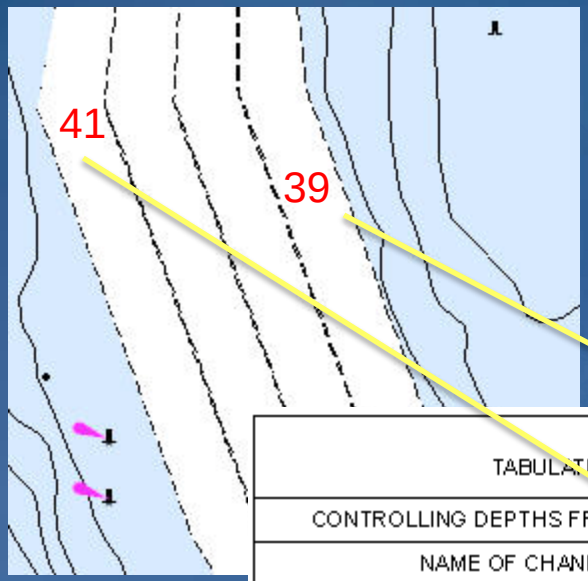


Product Finishing



Data Driven Surround Elements

- Improved data consistency
- Improved data delivery speed



When data is updated in the NIS it can be linked to surround elements on the product and automatically update them

ST. JOHNS RIVER CHANNEL DEPTHS
TABULATED FROM SURVEYS BY THE CORPS OF ENGINEERS - REPORT OF APR 2006

	CONTROLLING DEPTHS FROM SEAWARD IN FEET AT MEAN LOWER LOW WATER (MLLW)					PROJECT DIMENSIONS		
NAME OF CHANNEL	LOQ	LIQ	RIQ	ROQ	DATE OF SURVEY	WIDTH	LENGTH	DEPTH
CHASEVILLE TURN	41	42	37.9	39	2-07	500-800	0.6	38
LONG BRANCH RANGE	31.2	31.2	37	37	2-07	650-1325	0.6	38

Time Line for production line transition

- USCG Dist 5 ENC cells (90) loaded March 2010
  - Cells will be maintained in NCS II
  - 20 paper charts maintained in NCSII
- Software enhancements to allow scaling of paper products in place late 2010
- Data preparation ongoing (hole filling and data clean-up, template building etc.)
- Product improvement efforts and user outreach
- 5 years to complete transition

Wrap up

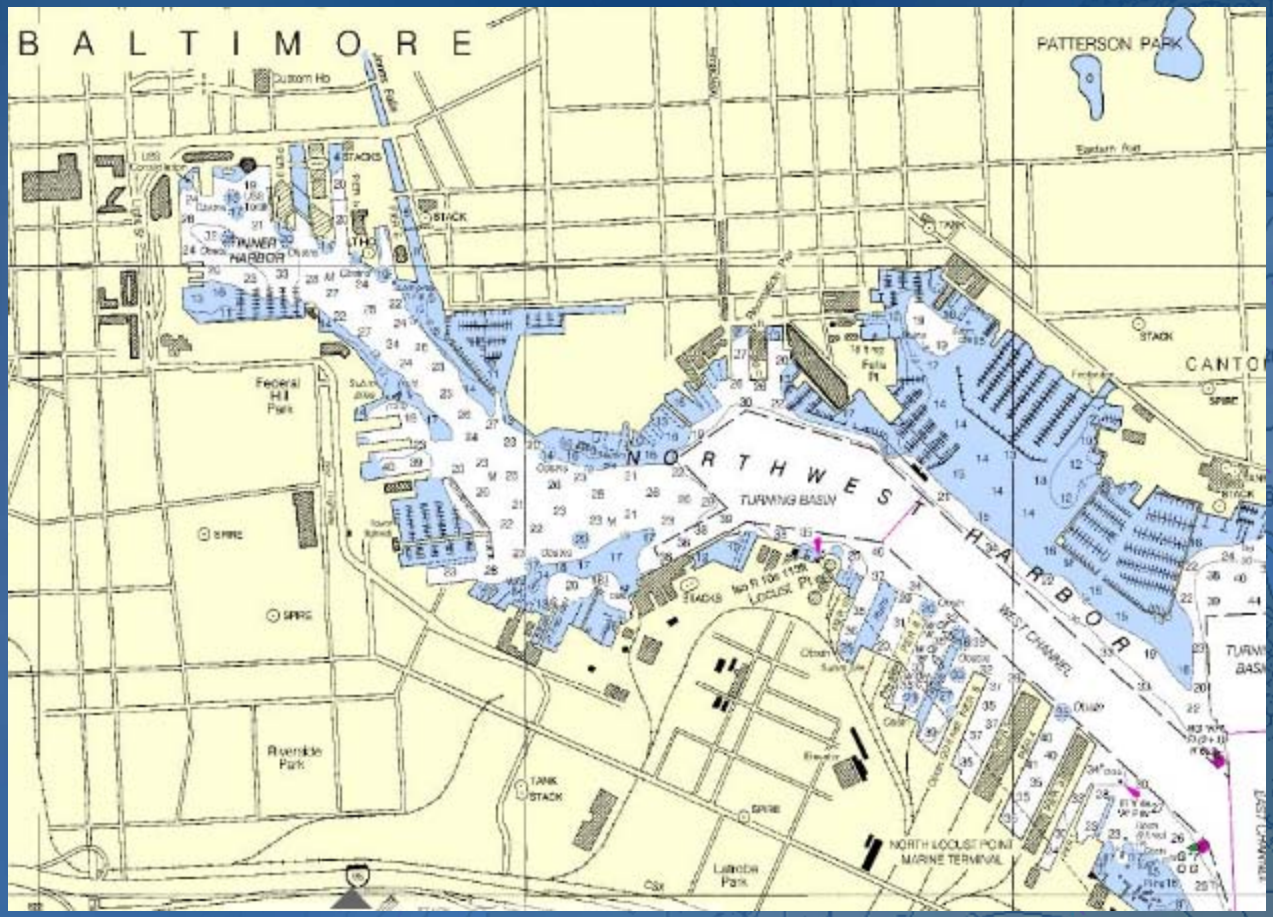
- NCS II will provide for improved product quality, consistency and timely delivery to the chart product user.

- NCS II is a Multi-year effort
- NCSII will improve production efficiencies
- Scalable for the next generation of navigational products
- increase the ability of the Office of Coast Survey to meet new demands:
  - Coastal and Marine Spatial Planning
  - New products
  - Supported platform for future data and technology advancements such as S-100, S-101 and S-10x

Historical Chart of Baltimore Harbor 1866

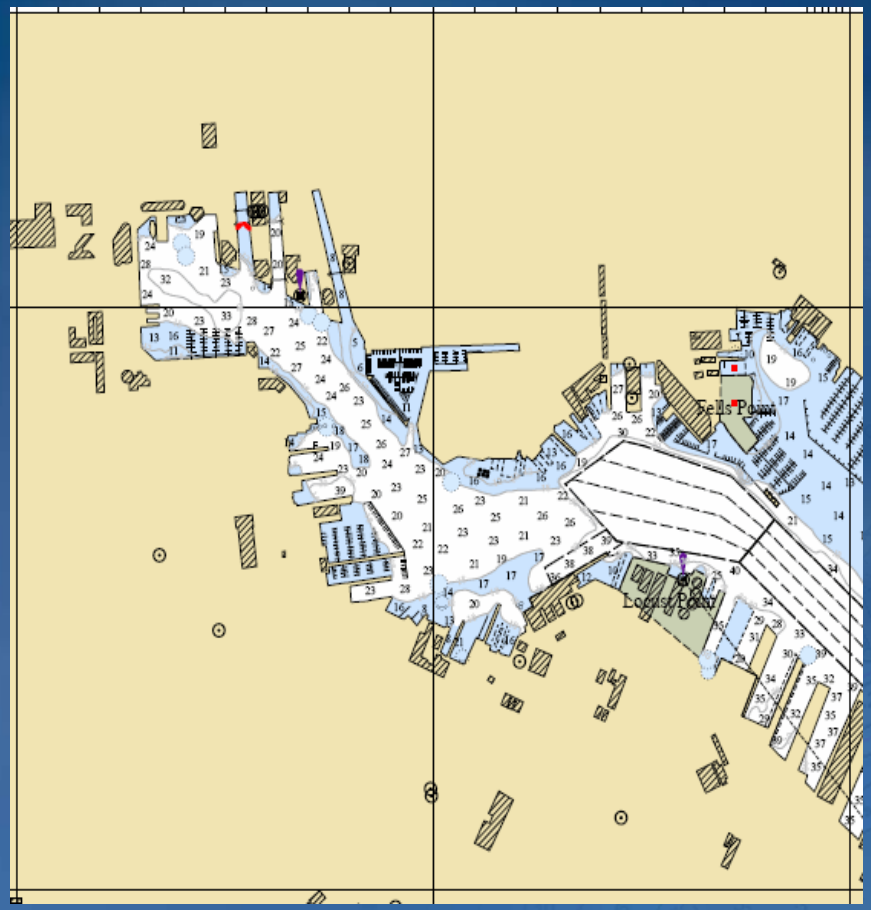
Lithographic Output (traditional Paper Chart)

12281 ed 52 – 8/1/2008



ENC Display

NCSII Paper Output



NCSI Lithogaphic output

Thank you.

QUESTIONS?