Status of Inland ENCs in the USA

Denise R. LaDue
US Army Corps of Engineers (USACE)

Inland ENC Harmonization Group

US Army Corps of Engineers

USACE Organizational Structure

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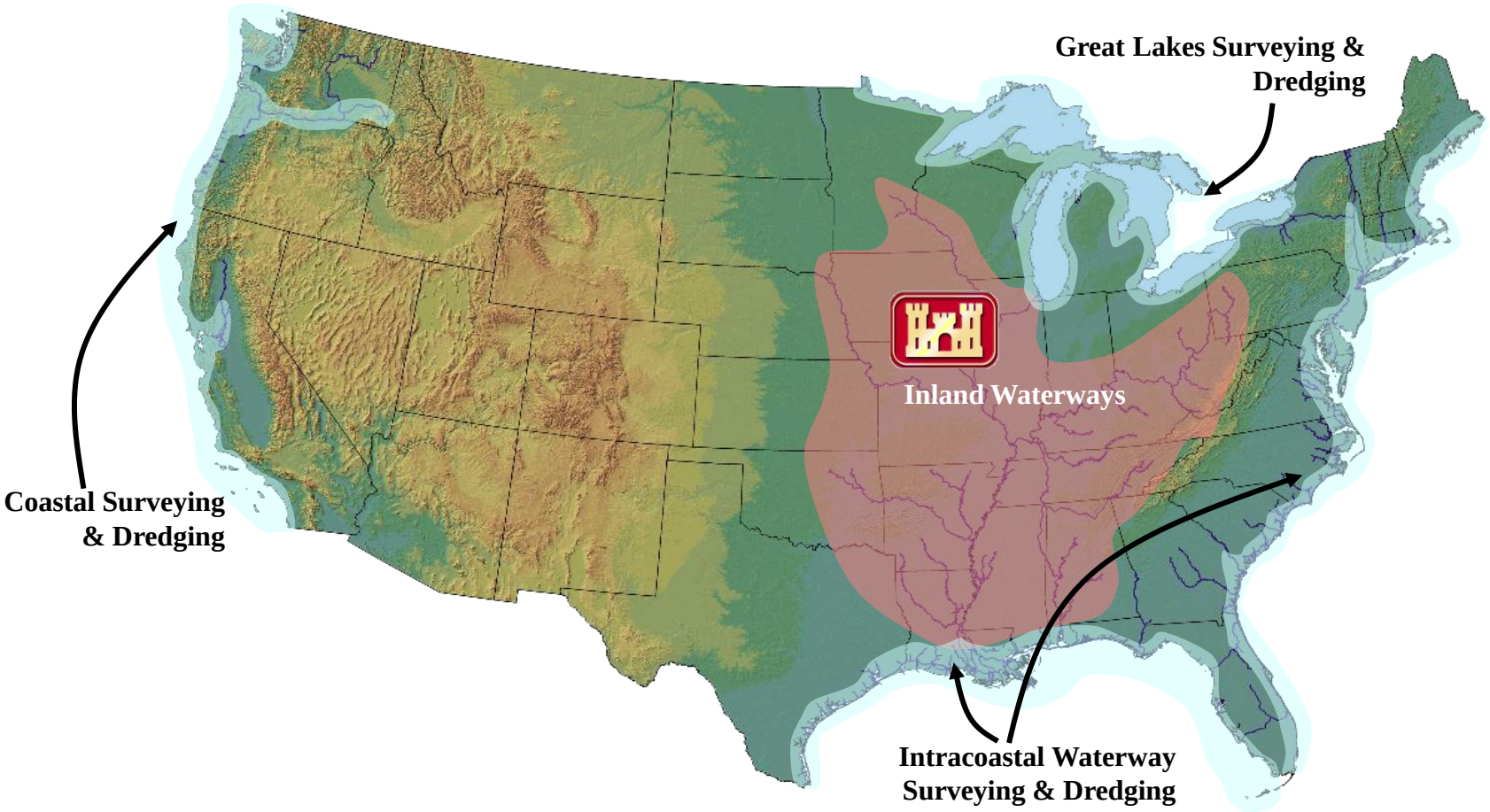
USACE Civil Works Missions

- **Dam Safety**
  - Own and operate more than 600 dams
- **Flood Control**
  - Provide a total water supply storage capacity of 329.2 million acre-feet in major Corps lakes.
- **Hydro Power**
  - Own and operate 24 percent of the U.S. hydropower capacity or 3 percent of the total U.S. electric capacity.
- **Recreation**
  - No. 1 Federal provider of outdoor recreation
- **Regulatory Permits**
  - Restore, create, enhance or preserve tens of thousands of acres of wetlands annual
- **Navigation**
  - Operate and maintain 12,000 miles of commercial inland navigation channels
  - Dredge more than 200 million cubic yards of materially annually
  - Maintain 926 coastal, Great Lakes and inland harbors

USACE Navigation Mission



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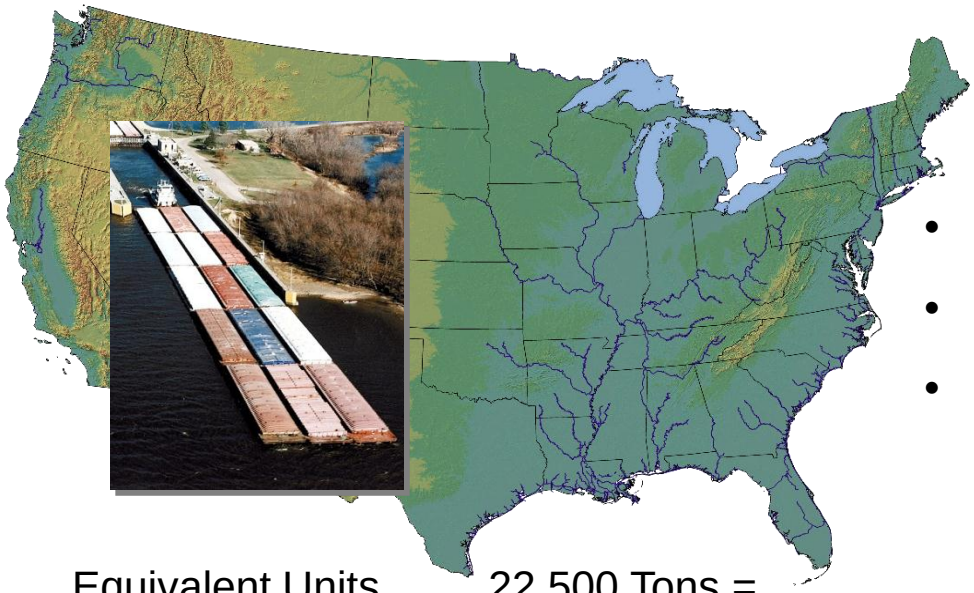
US Inland Navigation Statistics *



- 8,200 mi (13,197km) of inland waterways
- 158 lock chambers
- 589 million tons of commodities
  - 31% coal / coke
  - 25% petroleum
  - 18% other raw materials
  - 12% food & farm products
  - 8% chemicals
  - 6% manufactured products

Equivalent Units — 22,500 Tons =

One 15 Barge Tow

225 Railroad Cars

900 Large Semi Trucks

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* from the Navigation Data Center “TRANSPORTATION FACTS”, Dec. 2009

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History Behind US Inland ENCs

Disaster at Big Bayou Canot, 22 September 1993

- A towboat pushing six barges, lost in the fog, struck the Big Bayou Canot bridge near Mobile, AL causing the track to misalign by approximately 3 feet.
- Eight minutes later, AMTRAK *Sunset Limited* derailed on the railroad bridge and plunged into the waterway, killing 47 and injuring 103.

An electronic chart system on the towboat could have prevented the accident.

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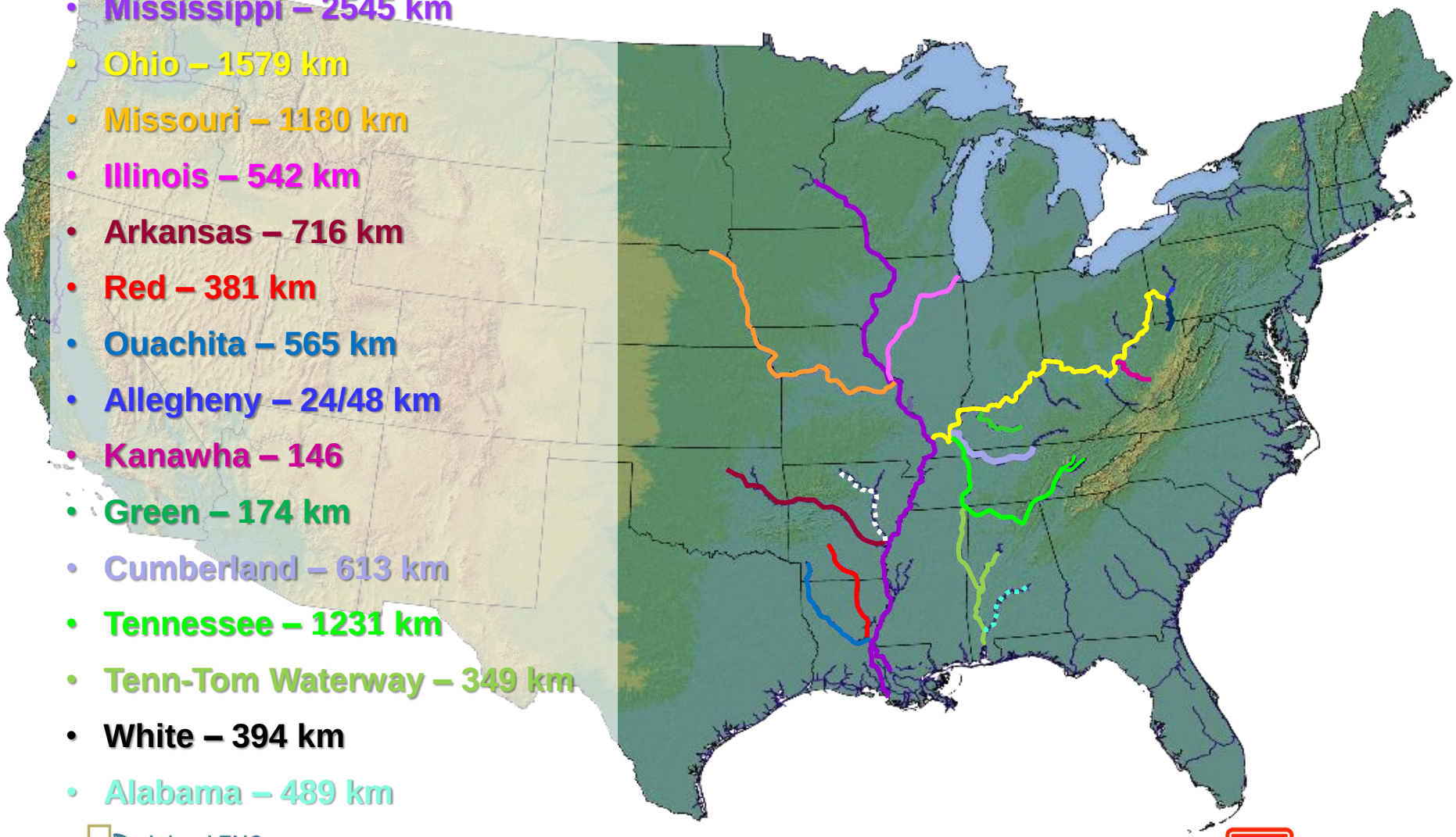
Inland Waterways in the USA

- Mississippi – 2545 km
- Ohio – 1579 km
- Missouri – 1180 km
- Illinois – 542 km
- Arkansas – 716 km
- Red – 381 km
- Ouachita – 565 km
- Allegheny – 24/48 km
- Kanawha – 146
- Green – 174 km
- Cumberland – 613 km
- Tennessee – 1231 km
- Tenn-Tom Waterway – 349 km
- White – 394 km
- Alabama – 489 km



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Status of Inland ENCs in the USA

S-57 Standard Edition 3.1 (USACE Encoding Guide 4.0)

- 2001 – US Congress tasks USACE to produce IENCs
- 2001 – present – USACE produced & maintains106 IENC cells, covering 19 waterways

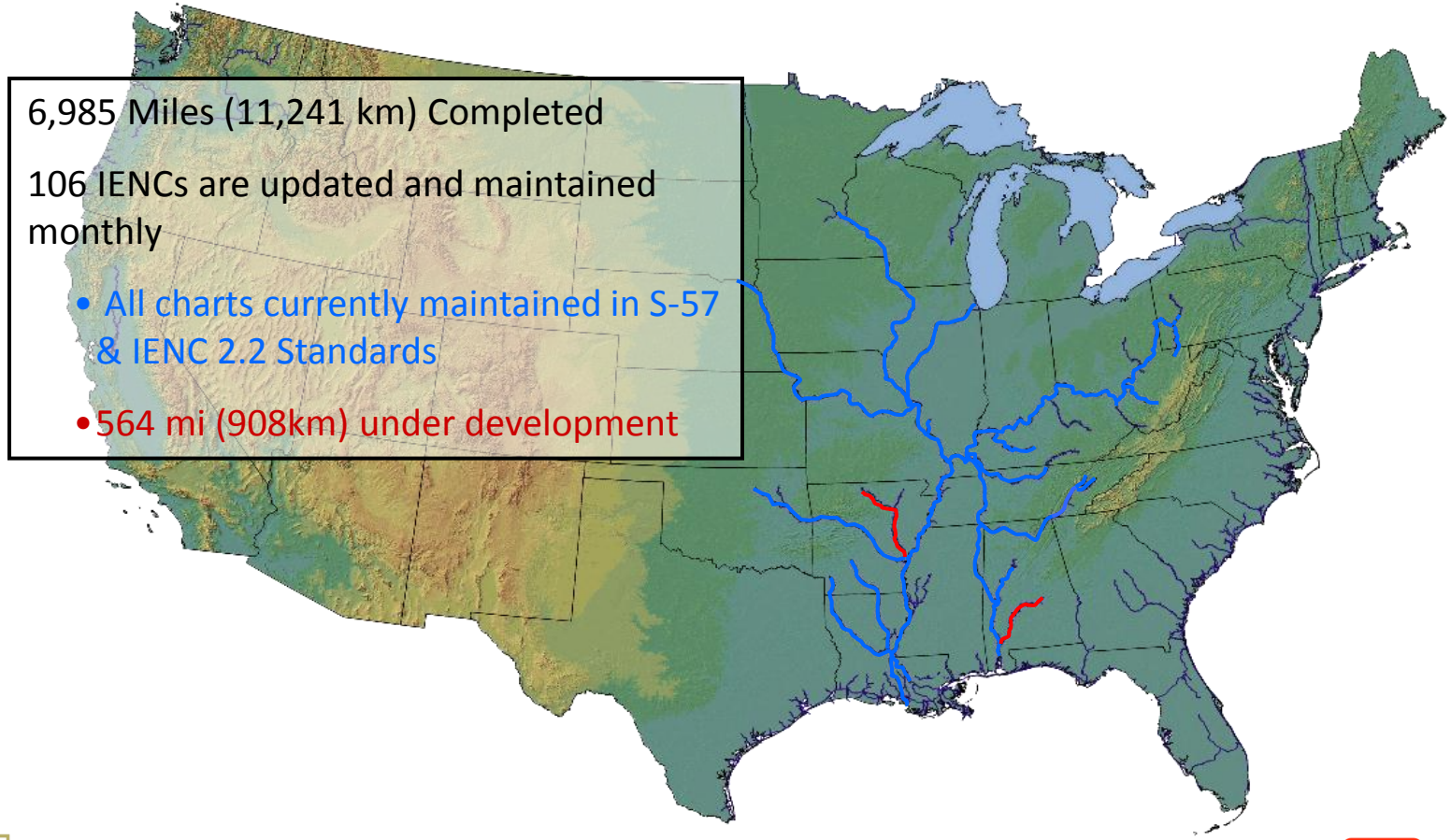
IENC Standard Edition 2.2 (Encoding Guide 2.2.0)

- 2010 – Decision made to produce new waterways to Inland ENC standards (3 rivers produced to IENC 2.1)
- 2011 - Conversion of charts from S-57 & IENC 2.1 to Inland ENC 2.2 started
- 2012 – Migration of all charts to IENC 2.2 Completed
- 2013 – IENC cells will only be maintained in IENC 2.2 standard

Status of IENC Production in the USA

http://www.agc.army.mil/echarts/

7,549 mi (12,149 km) of inland waterways are scheduled for Inland ENC coverage



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Implementation of Inland ENCs in the USA

River / Waterway	Miles	Kilometers	S-57 - ENC 3.1 (EG USACE 4.0)	Inland ENC 2.2 (EG IEHG 2.2.0)
Alabama River	304	489		Planned 20??
Allegheny River	15*	24	Published	Published
Arkansas River	445	716	Published	Published
Atchafalaya River	118	190	Published	Published
Black Warrior River	235	378	Published	Published
Cumberland River	381	613	Published	Published
Green River	108	174	Published	Published
Illinois Waterway	337	542	Published	Published
Kanawha River	91	146	Published	Published
Kaskaskia River	36	58	Published	Published
Lower Mississippi River	715	1,151	Published	Published
Missouri River	733	1,180	Published	Published
Mobile / Tombigbee Rivers	217	349	Published	Published
Monongahela River	129	208	Published	Published
Ohio River	981	1,579	Published	Published
Ouachita River	351	565	Published	Published
Red River	237	381	Published	Published
Tennessee River	765	1,231	Published	Published
Tenn-Tom Waterway	225	362	Published	Published
Upper Mississippi River	866	1,394	Published	Published
White River	245	394		Planned 2013
Total	**7,534**	**12,124**		

* An additional 15 mi (23 km) of the Allegheny will be produced in 2013

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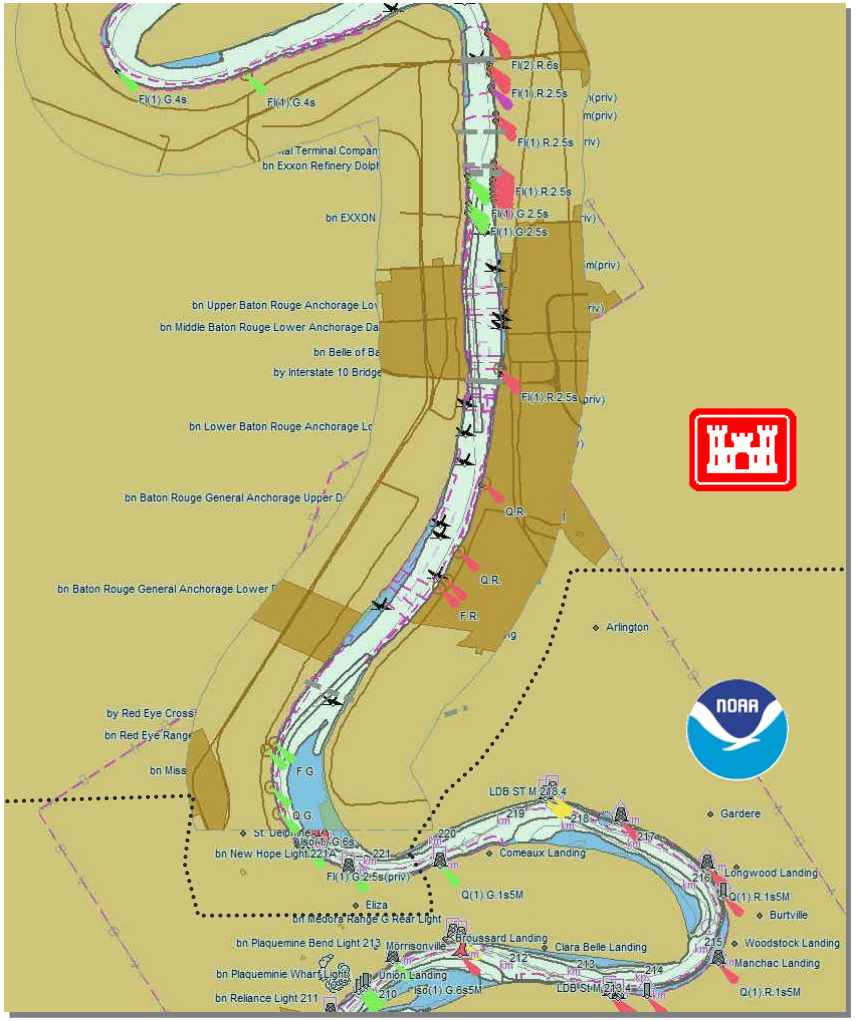
Updates & Maintenance of US IENCs

- One hundred-six (106) Inland ENCs, totaling 6,985 miles (11,241 km) covering 19 waterways have been produced
- All cells are updated and maintained on a monthly basis
  - 46 in-house, 60 by contractor
  - charts are checked and cleared through the USACE Chart Center prior to release
- IENCs are maintained in both S-57 and Inland ENC 2.2
- Dual maintenance will be discontinued on 31 March 2013, at which time only Inland ENC 2.2 standard charts will be maintained



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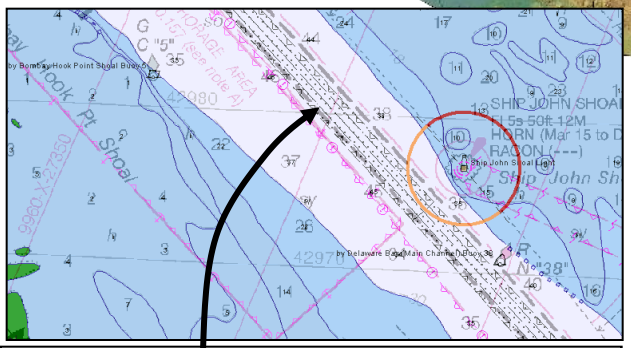
Partnering: NOAA (Coordination & Data Sharing)



More consistent and reliable channel data from Corps for NOAA charts

Corps of Engineers, Inland Waterways

NOAA, Coastal and Great Lakes

Coordination of adjoining charts for seamless use by chart systems

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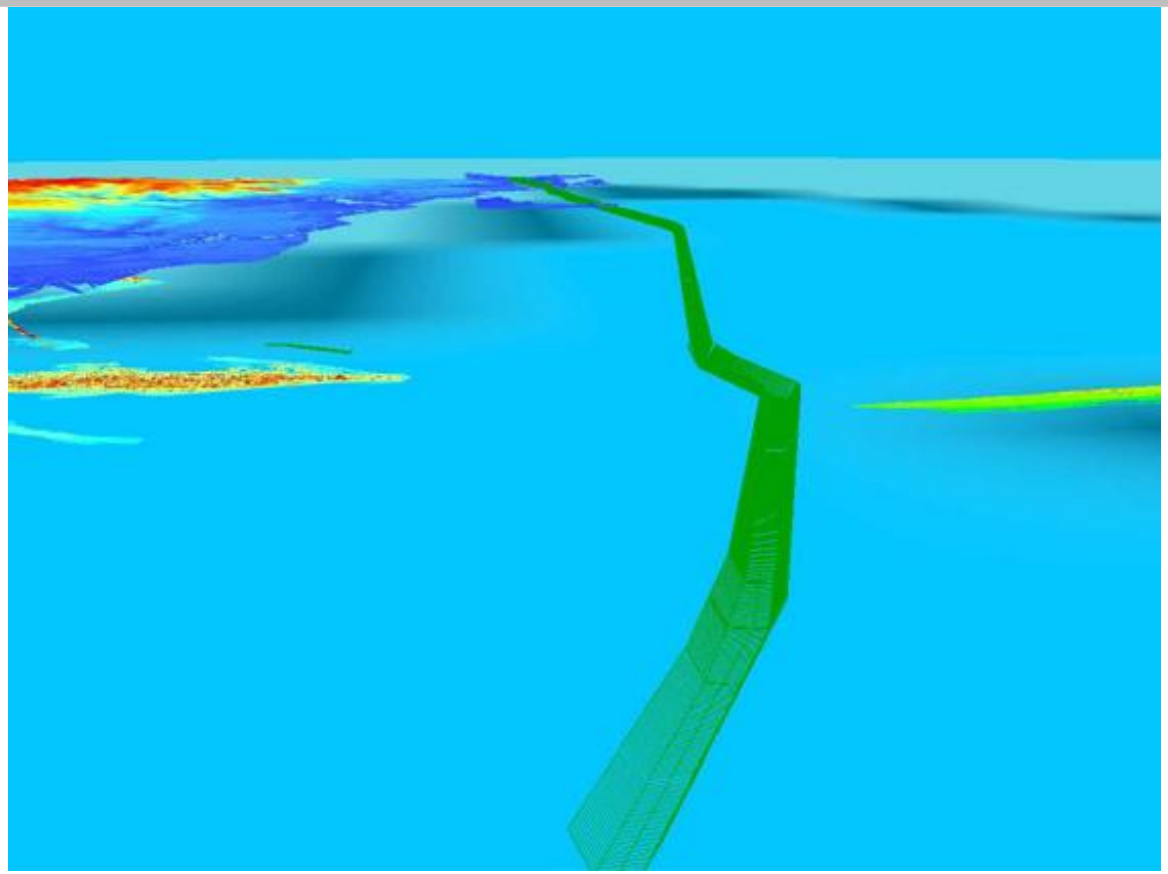
Channel Framework Data



- A coastal data project
- Contracted through mobile District
- Partnering Success with NOAA

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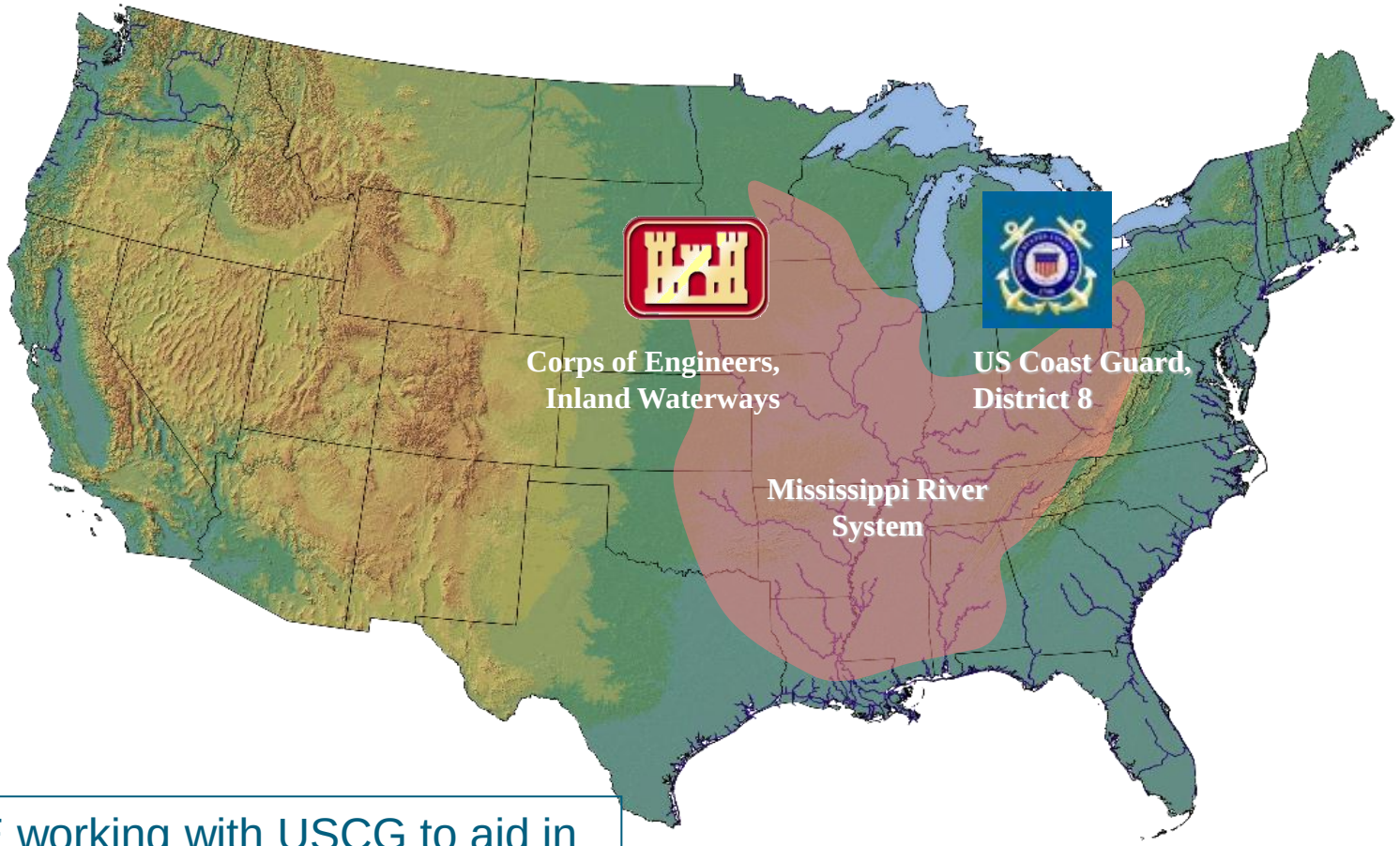
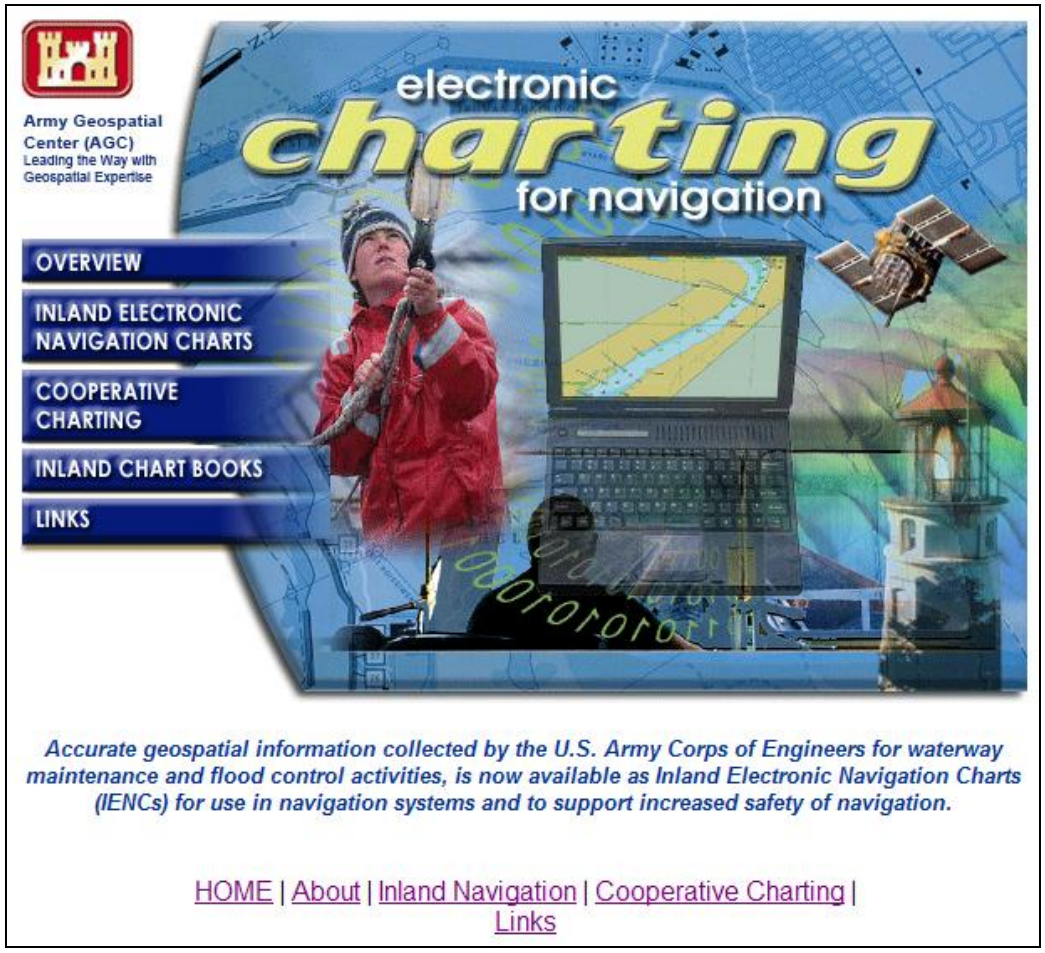
Partnering: US Coast Guard (Buoy Placement)



USACE working with USCG to aid in buoy placement by providing survey data for “problem” areas.

Inland ENC Data Download Services



http://www.agc.army.mil/echarts/

Inland ENC Data Download Services

- Products Catalog
  - XML based: universal and flexible
  - Incorporates NOAA structure and attributes
  - Allows automated data updates for software clients
  - Allows automated querying of available products
  - Expandable and scalable to accommodate future products and services

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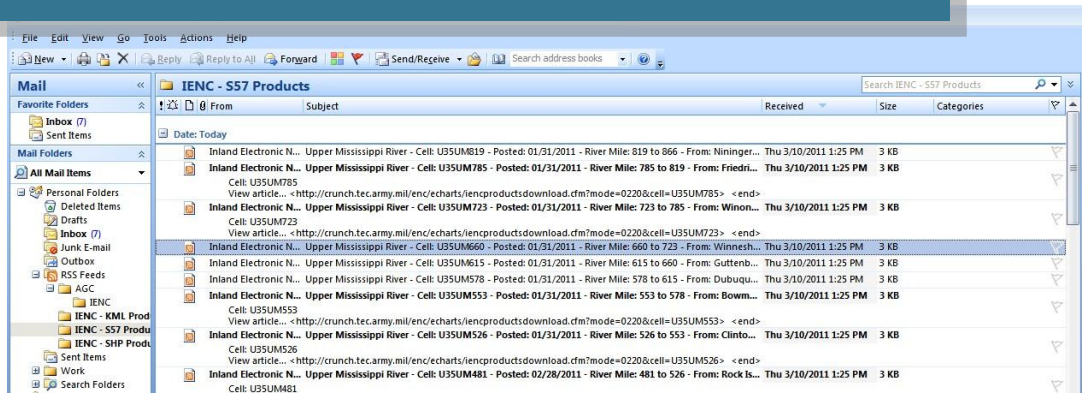
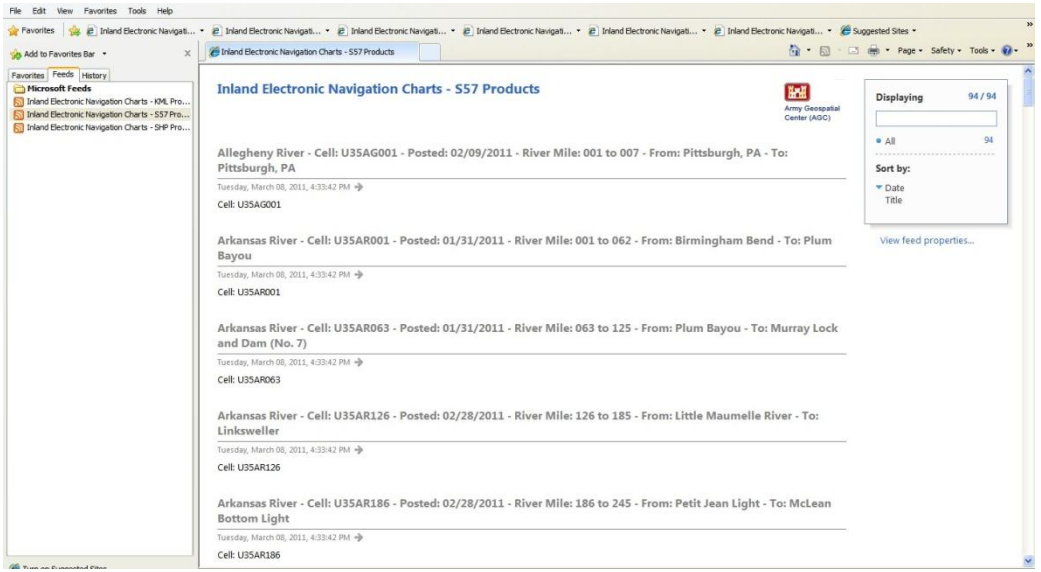
Inland ENC Data Download Services

- RSS feeds
  - RSS based: universal and flexible
  - Catalog service driven
  - Automatic data status updates to users PC
  - Allows data download from users' desktops
  - Supported on a wide range of clients: browsers, free and commercial RSS readers, Outlook, and other email clients.



Outlook Client



Browser Client

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Inland ENC Data Download Services

- Graphical Interfaces
  - Supports Multiple Clients
    - Public and Commercial (e.g. ArcExplorer, Google Map/Earth, ArcGIS, etc.)
  - All products available for download
    - S-57, KML, SHP
  - Accomodates real time navigation and data download concurrently
  - River system knowledge not required

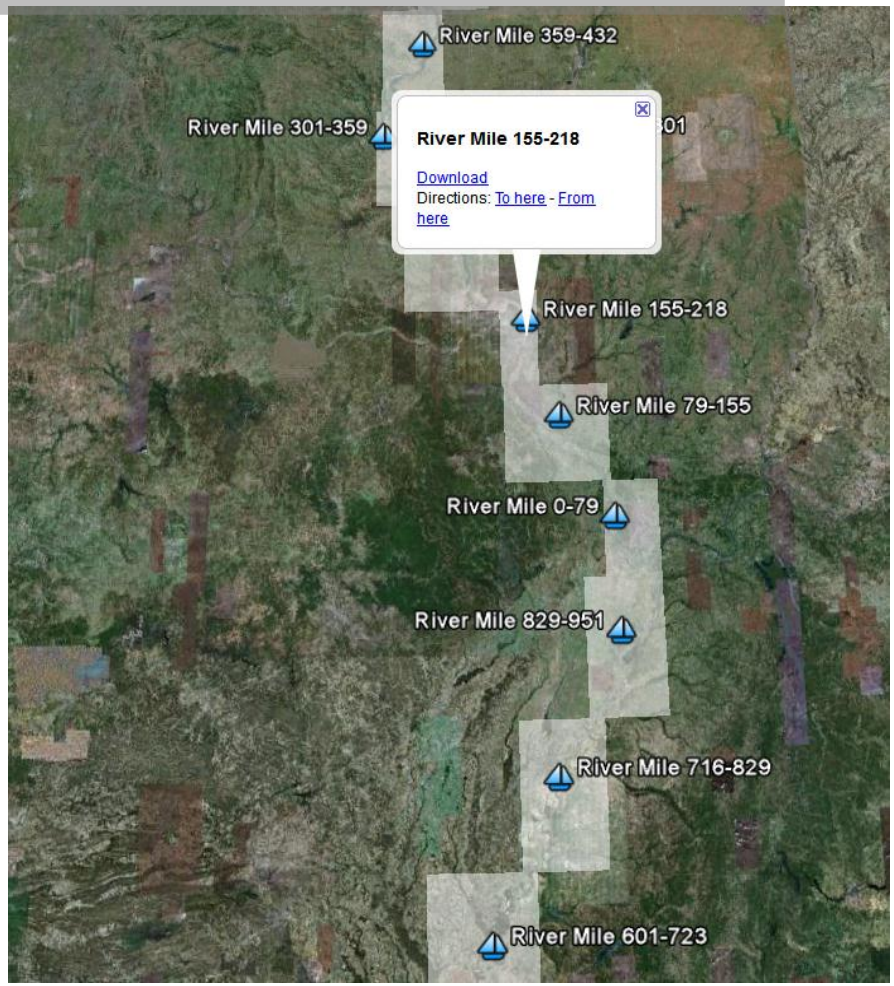

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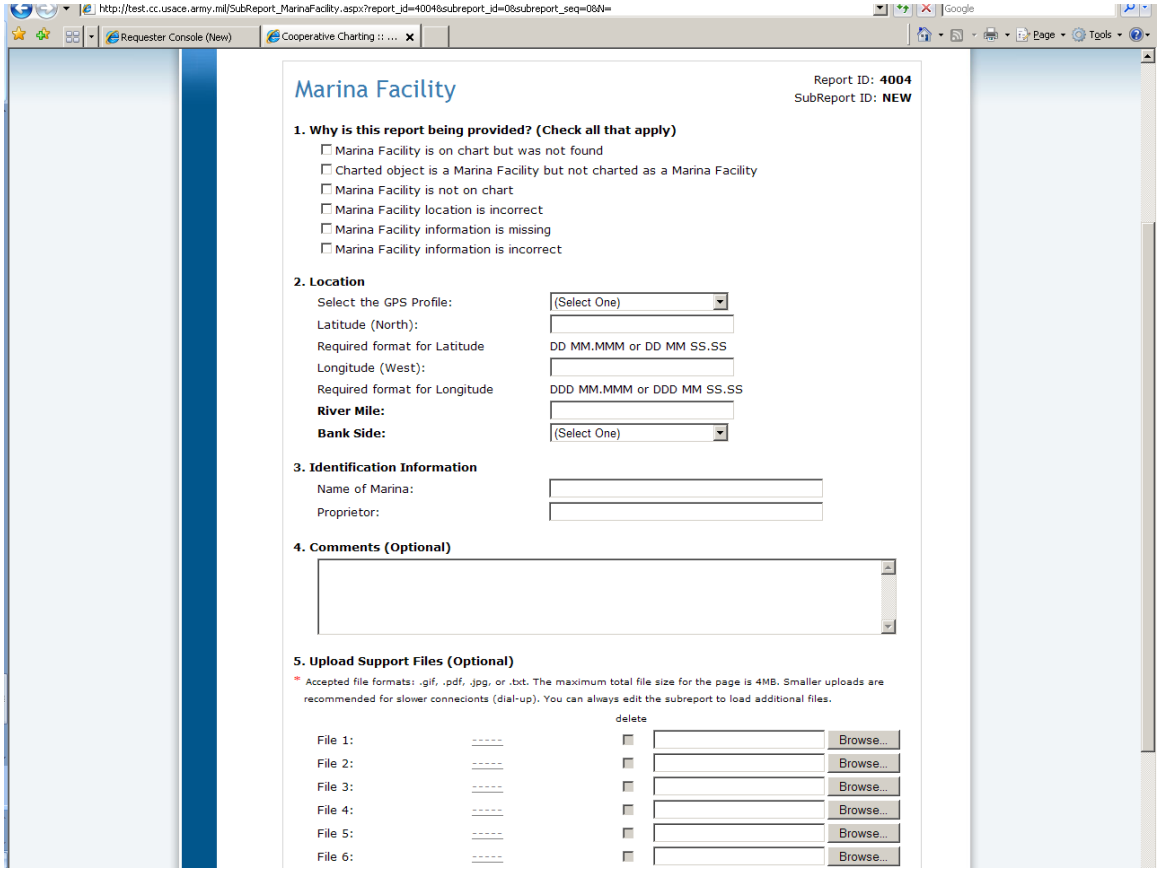
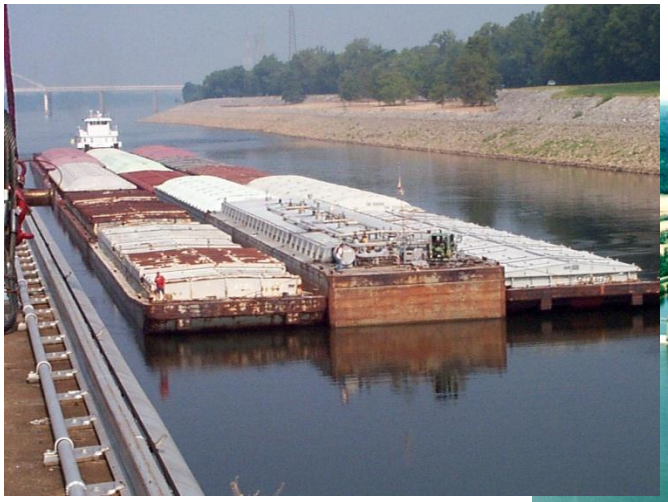
Chart Reports (Discrepancy / Error Reporting)



- All users can provide reports; formerly planned for USPS
- District POCs will receive alert to existing report; provide feedback

Implementation of Inland ENCs in the USA

Questions ?



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