

Canadian Hydrographic Conference

Quebec, QC, Canada

22 June 2010



Recent Developments in US Army Corps of Engineers Inland Electronic Navigational Charts (IENC) Program

Robert G. Mann

IENC Program Manager

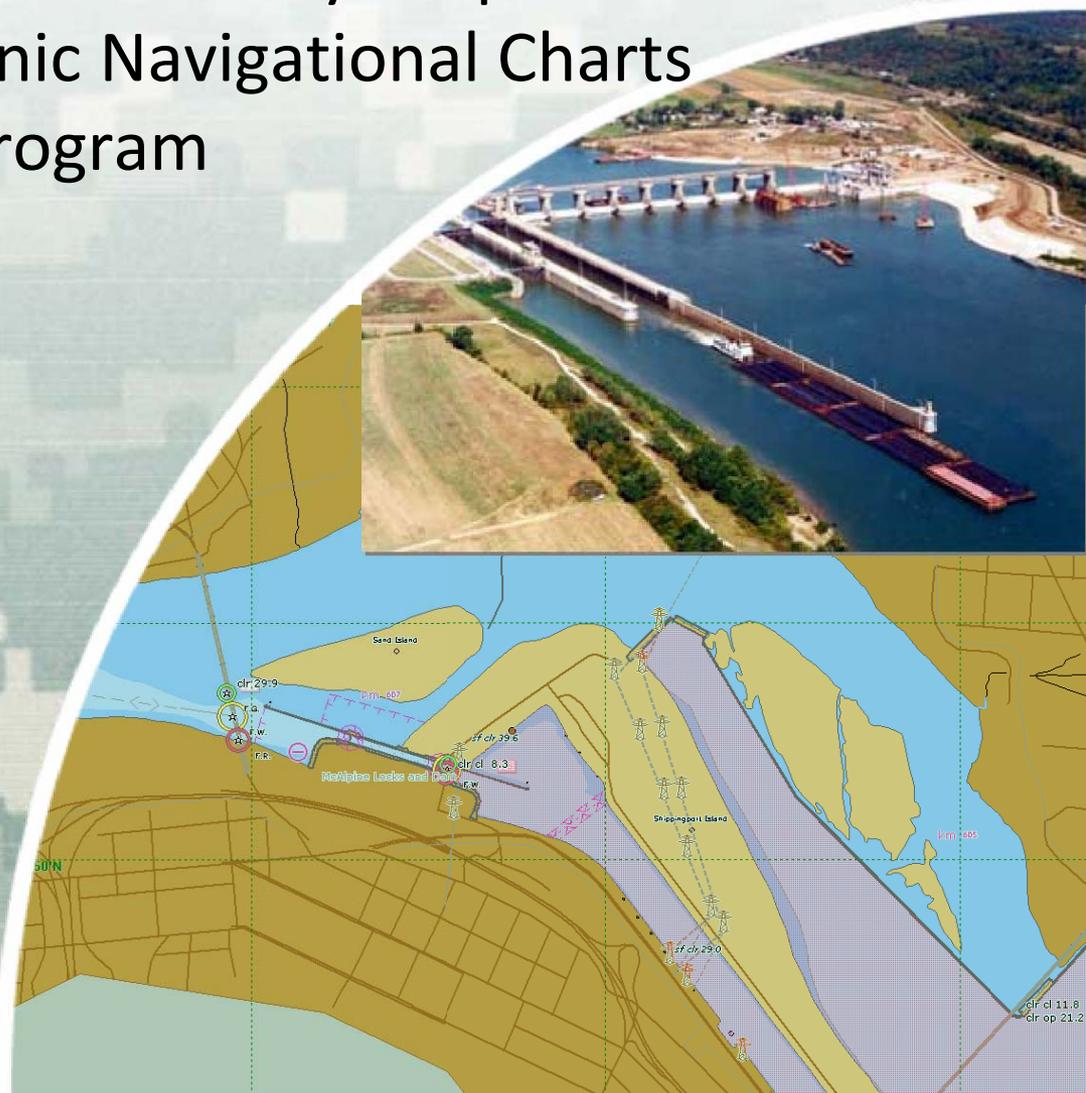
Army Geospatial Center

Alexandria, VA



®

US Army Corps of Engineers
BUILDING STRONG®



dfr cl 11.8
dfr op 21.2

Recent Developments in IENC Data Distribution

2D and 3D Services to Clients

Keyhole Markup Language (KML) files

Survey overlays for buoy placement

Automatic Identification System (AIS)

Navigational Channel Framework



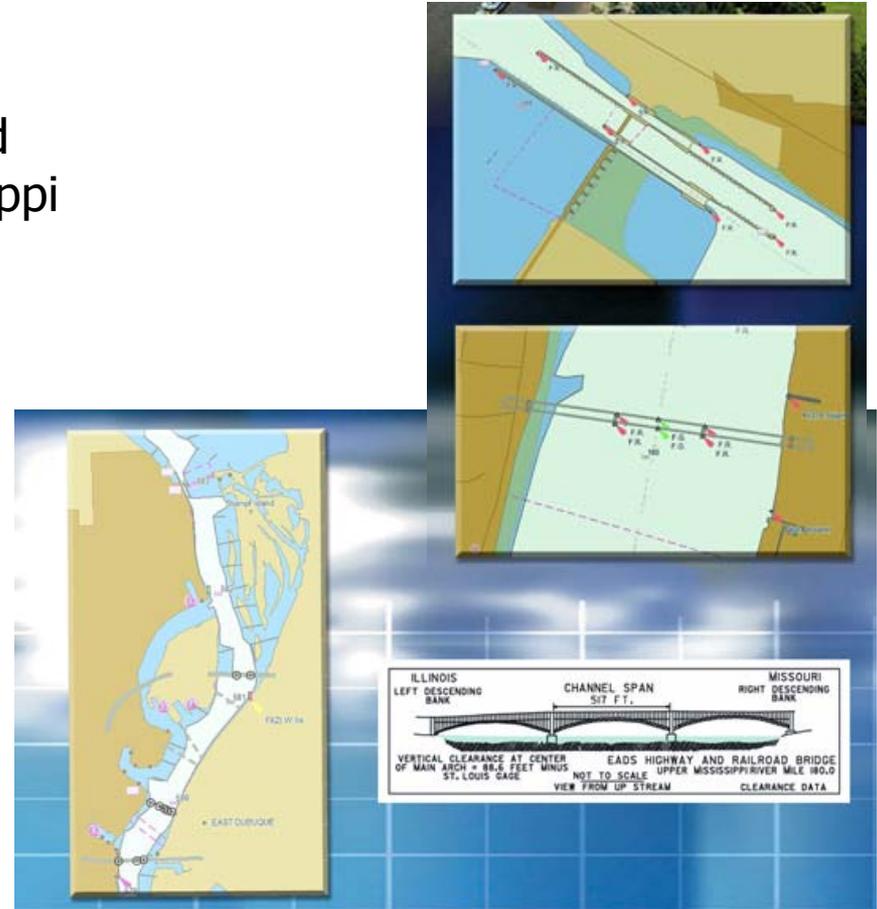
IENC Status

GOAL

Increase safety and efficiency of inland navigation; provide accurate, reliable, and updated navigation charts for the Mississippi River and its tributaries (7,297 miles).

STATUS

- Ninety-three (93) IENCs, totaling 5,793 miles available as of June 2010.
- Five IENCs, totaling 499 miles scheduled for release by Sep 2010.
- Remaining 1005 miles scheduled for completion in FY10.
- Paper charts updated with IENC



Primary Benefit of IENCs

Accurate, Up-to-Date Information on Inland Waterways

The screenshot displays a navigation software interface with several key components:

- Chart Panel (Top Left):** Lists chart identifiers: U350H001.000, U350H012.000, U350H032.000, and U350H087.000.
- Main Map:** Shows a river with depth soundings (e.g., 1m 1.15, 1m 1.00, 1m 0.95, 1m 0.85, 1m 0.75, 1m 0.65, 1m 0.55, 1m 0.45) and a bridge structure. A 'Pick Report' window is overlaid on the map.
- Pick Report Window (Bottom Left):**

Pick report at position: 40 26.80 N 080 01.61 W

[BRIDGE] - Bridge Group: 2
 FOID : (553, 1, 762395)
 Primitive : Area
 [CATBRG] : suspension bridge (12)
 [HORCLR] : 230.1
 [INFORM] : Vertical Clearance Based On Pool Gauge
 Reading Of 12'

[OBJNAM] : West End-North Side Highway Bridge
 [PICREP] : U38000_8.tif
 [SCAMIN] : 50000
 [SORDAT] : 20021028
 [SORIND] : US_U3.graph.USACE_Pittsburgh_SDS
 [VERCLR] : 20.2

[DEPARE] - Depth area Group: 1
 FOID : (553, 1, 714840)
 Primitive : Area
 [DRVAL1] : 2.7
 [DRVAL2] : 10
 [ICNDAT] : 20021028
- Technical Diagram (Top Right):**

CHANNEL SPAN

R.P. EL. 730.0

ELEVATION OF LOW STEEL: 776.3'
 VERTICAL CLEARANCE AT POOL STAGE: 46.3'
 HORIZONTAL CLEARANCE: 755.0'
- Photograph (Middle Right):**

WEST END - NORTH SIDE HIGHWAY BRIDGE (Ohio River Mile 0.8) Downstream View
- Photograph (Bottom Right):**

PARTIALLY EXPOSED WRECK OHIO RIVER MILE 0.8 RIGHT BANK (DESCENDING)
- Status Bar (Bottom):**

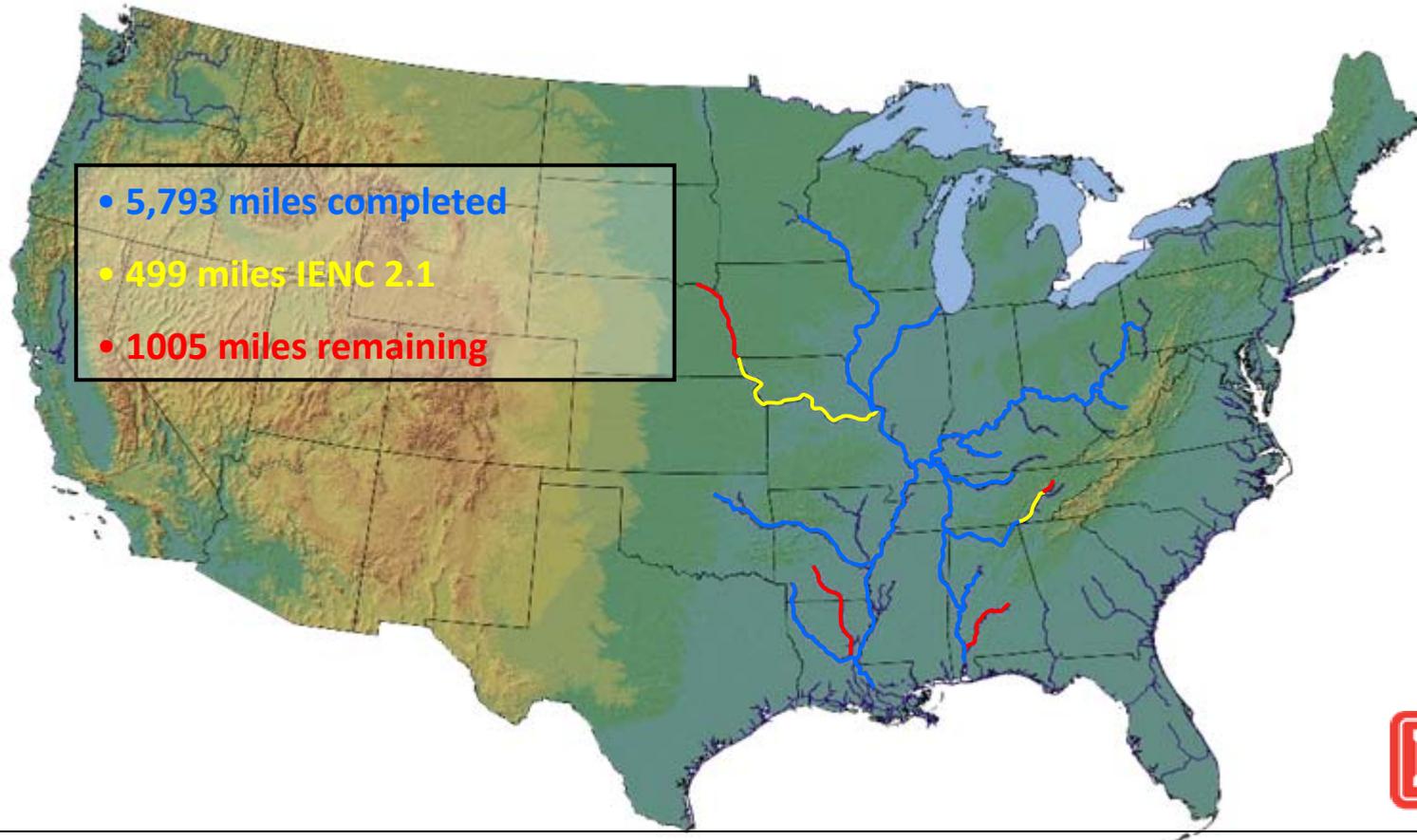
1:5296 40 27.033 N 080 01.609 W S-57/SENC



BUILDING STRONG.

Inland ENC Coverage in USA

7297 mi. of inland waterways/rivers are scheduled for IENC Coverage



Service to Clients

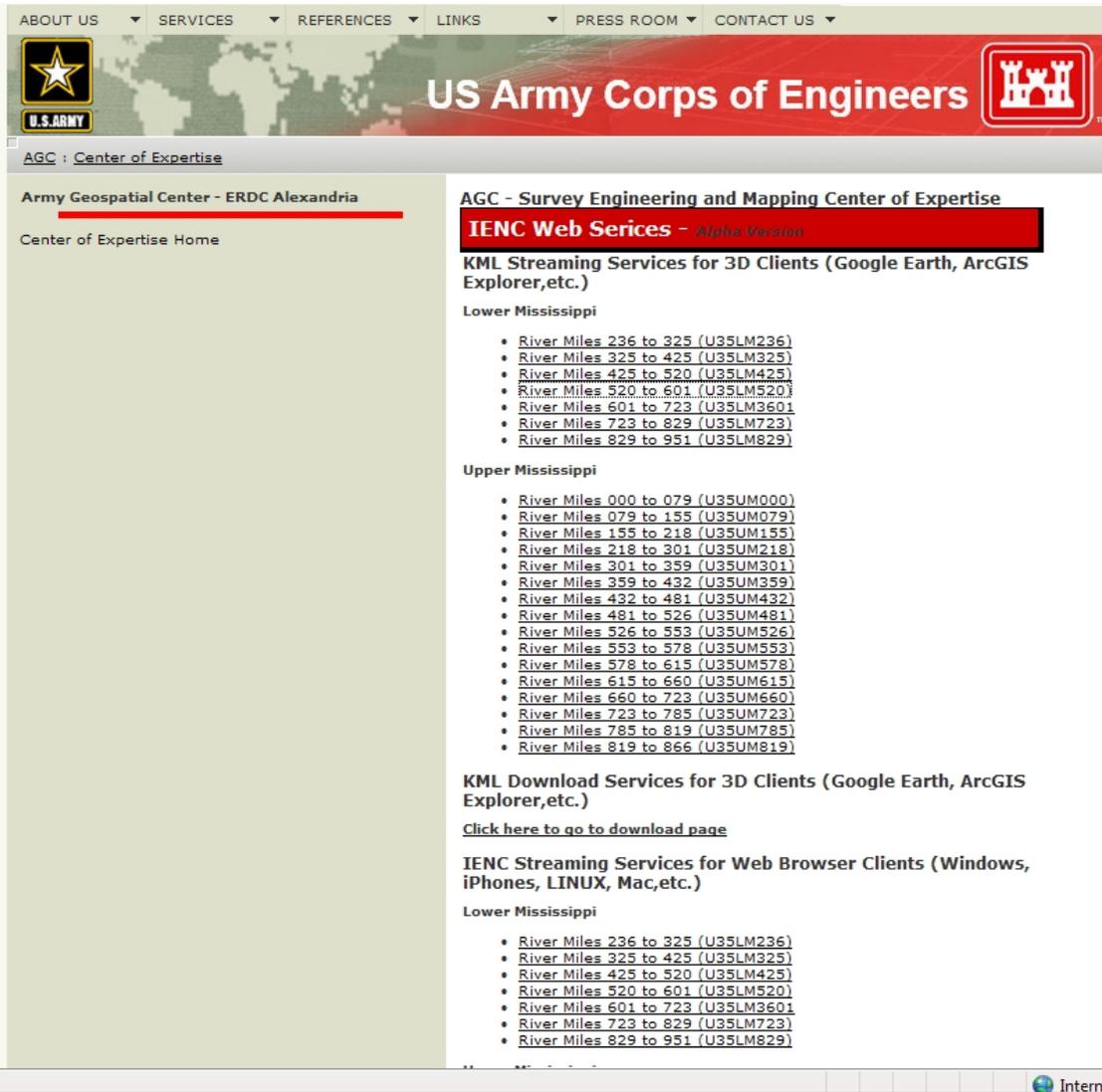
- 2D clients
 - ▶ Google Maps
 - ▶ ArcGIS Viewer
 - ▶ OpenSource GIS Viewers
 - ▶ Web Browsers
 - ▶ Flash Viewers/Silver Light Viewer
 - ▶ User developed

- 3D clients
 - ▶ ArcGIS Explorer
 - ▶ Google Earth
 - ▶ Terra Explorer
 - ▶ MS Virtual Earth
 - ▶ User developed

...not an exhaustive list



IENC Web Services Site



The screenshot shows the IENC Web Services Site. At the top, there is a navigation menu with links for ABOUT US, SERVICES, REFERENCES, LINKS, PRESS ROOM, and CONTACT US. Below the menu is a red banner with the US Army Corps of Engineers logo and the text "US Army Corps of Engineers". The main content area is divided into two columns. The left column contains the text "AGC : Center of Expertise" and "Army Geospatial Center - ERDC Alexandria". The right column contains the text "AGC - Survey Engineering and Mapping Center of Expertise" and "IENC Web Services - Alpha Version". Below this, there are sections for "KML Streaming Services for 3D Clients (Google Earth, ArcGIS Explorer, etc.)" and "KML Download Services for 3D Clients (Google Earth, ArcGIS Explorer, etc.)". Each section lists river miles for Lower Mississippi and Upper Mississippi. The bottom of the page shows a taskbar with the Internet Explorer logo and a 100% zoom level.

ABOUT US SERVICES REFERENCES LINKS PRESS ROOM CONTACT US

 **US Army Corps of Engineers** 

AGC : Center of Expertise

Army Geospatial Center - ERDC Alexandria

Center of Expertise Home

AGC - Survey Engineering and Mapping Center of Expertise

IENC Web Services - Alpha Version

KML Streaming Services for 3D Clients (Google Earth, ArcGIS Explorer, etc.)

Lower Mississippi

- [River Miles 236 to 325 \(U35LM236\)](#)
- [River Miles 325 to 425 \(U35LM325\)](#)
- [River Miles 425 to 520 \(U35LM425\)](#)
- [River Miles 520 to 601 \(U35LM520\)](#)
- [River Miles 601 to 723 \(U35LM3601\)](#)
- [River Miles 723 to 829 \(U35LM723\)](#)
- [River Miles 829 to 951 \(U35LM829\)](#)

Upper Mississippi

- [River Miles 000 to 079 \(U35UM000\)](#)
- [River Miles 079 to 155 \(U35UM079\)](#)
- [River Miles 155 to 218 \(U35UM155\)](#)
- [River Miles 218 to 301 \(U35UM218\)](#)
- [River Miles 301 to 359 \(U35UM301\)](#)
- [River Miles 359 to 432 \(U35UM359\)](#)
- [River Miles 432 to 481 \(U35UM432\)](#)
- [River Miles 481 to 526 \(U35UM481\)](#)
- [River Miles 526 to 553 \(U35UM526\)](#)
- [River Miles 553 to 578 \(U35UM553\)](#)
- [River Miles 578 to 615 \(U35UM578\)](#)
- [River Miles 615 to 660 \(U35UM615\)](#)
- [River Miles 660 to 723 \(U35UM660\)](#)
- [River Miles 723 to 785 \(U35UM723\)](#)
- [River Miles 785 to 819 \(U35UM785\)](#)
- [River Miles 819 to 866 \(U35UM819\)](#)

KML Download Services for 3D Clients (Google Earth, ArcGIS Explorer, etc.)

[Click here to go to download page](#)

IENC Streaming Services for Web Browser Clients (Windows, iPhones, LINUX, Mac, etc.)

Lower Mississippi

- [River Miles 236 to 325 \(U35LM236\)](#)
- [River Miles 325 to 425 \(U35LM325\)](#)
- [River Miles 425 to 520 \(U35LM425\)](#)
- [River Miles 520 to 601 \(U35LM520\)](#)
- [River Miles 601 to 723 \(U35LM3601\)](#)
- [River Miles 723 to 829 \(U35LM723\)](#)
- [River Miles 829 to 951 \(U35LM829\)](#)

Internet 100%

IENC KML Data Download Site



Inland Electronic Navigation Charts - Download KML Data

RIVER SYSTEM	RIVER MILES	FROM PLACE	TO PLACE	CELL NAME	ED	DATE POSTED	KML Links
Allegheny	001 to 007	Pittsburgh, PA	Pittsburgh, PA	U35AG001	4	01/29/2009	
Arkansas	001 to 062	Birmingham Bend	Plum Bayou	U35AR001	14	11/13/2008	
Arkansas	063 to 125	Plum Bayou	Murray Lock and Dam (No. 7)	U35AR063	15	12/09/2008	
Arkansas	126 to 185	Little Maumelle River	Linksweller	U35AR126	10	12/09/2008	
Arkansas	186 to 245	Petit Jean Light	McLean Bottom Light	U35AR186	10	11/13/2008	
Arkansas	246 to 307	Kalamazoo	US Hwy 64 Garrison St. Bridge	U35AR246	12	11/13/2008	
Arkansas	308.6 to 375	Poteau River	Spaniard Creek	U35AR308	12	11/13/2008	
Arkansas	376 to 444	US Hwy 64 Garrison St. Bridge	U.S. Hwy 66 Twin Bridge	U35AR376	6	11/13/2008	
Atchafalaya	000 to 046	Red River	Bayou Big Graw	U35AT000	9	11/13/2008	
Atchafalaya	046 to 117	Bayou Big Graw	Morgan City	U35AT046	9	09/16/2008	
Black Warrior	311 to head	McPherson Landing	Head of Navigation	U35BW311	8	11/13/2008	
Cumberland	003 to 075	Smithland, KY	Tobaccoport, TN	U35CR003	4	01/29/2009	
Cumberland	075 to 149	Tobaccoport, TN	Cheatham Lock and Dam	U35CR075	3	10/28/2008	
Cumberland	149 to 221	Cheatham Lock and Dam	Old Hickory, TN	U35CR149	3	01/08/2009	
Cumberland	221 to 307	Old Hickory, TN	Carthage, TN	U35CR221	3	01/08/2009	
Cumberland	307 to 381	Carthage, TN	Celina, TN	U35CR307	3	06/23/2008	
Green	001 to 108	Spottsville, KY	Rochester, KY	U35GR001	4	01/08/2009	
Illinois	005 to 080	Grafton	La Grange	U35IL005	15	12/09/2008	
Illinois	082 to 137	LaGrange	Copperas Creek	U35IL082	7	11/13/2008	
Illinois	137 to 199	Copperas Creek	Senachwine Lake	U35IL137	8	01/08/2009	
Illinois	199 to 257	Senachwine Lake	Barry Island	U35IL199	7	01/08/2009	
Illinois	257 to 302	Barry Island	Downstream of Junction with Cal-Sag	U35IL257	9	12/09/2008	
Illinois	302 to 322	Junction with Cal-Sag S. Pulaski Bridge	Upper Acme Bend	U35IL302	6	06/10/2008	
Kanawha	001 to 024	Point Pleasant, WV	Handleys Landing Light and Daymark	U35KA001	3	11/20/2008	
Kanawha	024 to 050	Handleys Landing Light and Daymark	Jefferson, WV	U35KA024	3	01/29/2009	
Kanawha	050 to 065	Jefferson, WV	Charleston, WV	U35KA050	3	10/28/2008	
Kanawha	065 to 091	Charleston, WV	Boomer, WV	U35KA065	3	01/08/2009	
Lower Mississippi	236 to 325	Wilkinson Pt	Palmetto	U35LM236	20	01/08/2009	U35LM236
Lower Mississippi	325 to 425	Palmetto	Diamond cut-off (Oak Bend)	U35LM325	11	01/08/2009	U35LM325
Lower Mississippi	425 to 520	Diamond cut-off (Oak Bend)	Kentucky Bend	U35LM425	11	01/08/2009	U35LM425
Lower Mississippi	520 to 601	Kentucky Bend	Scrubgrass Bend	U35LM520	15	01/08/2009	U35LM520
Lower Mississippi	601 to 716	Scrubgrass Bend	Cow Island Bend (Memphis)	U35LM601	11	01/08/2009	U35LM601
Lower Mississippi	716 to 829	Cow Island Bend (Memphis)	Huffman Landing	U35LM716	11	01/08/2009	U35LM723
Lower Mississippi	829 to 951	Huffman Landing	Cairo	U35LM829	13	01/08/2009	U35LM829
Monongahela	001 to 042	Pittsburgh	North Charleroi, PA	U35MN001	4	10/28/2008	
Monongahela	042 to 086	North Charleroi	Greensboro	U35MN042	4	01/08/2009	
Monongahela	086 to 128	Greensboro	Whitehall	U35MN086	4	11/20/2008	
Ohio	000 to 012	3 Rivers merge	Pittsburgh Area	U35OH001	5	11/20/2008	



IENC Overlay on Google Earth

The screenshot displays the Google Earth Pro interface with a map overlay of the IENC (Intrusion and Encroachment Notification) system. The map shows a bayou area with various features like Island Number 14, Island Number 13, Lee Towhead, and Blaker Towhead. A data popup window is open for a specific location, 'Robinson Bayou Lt. (850.7)', which is marked with a green square on the map.

Robinson Bayou Lt. (850.7)

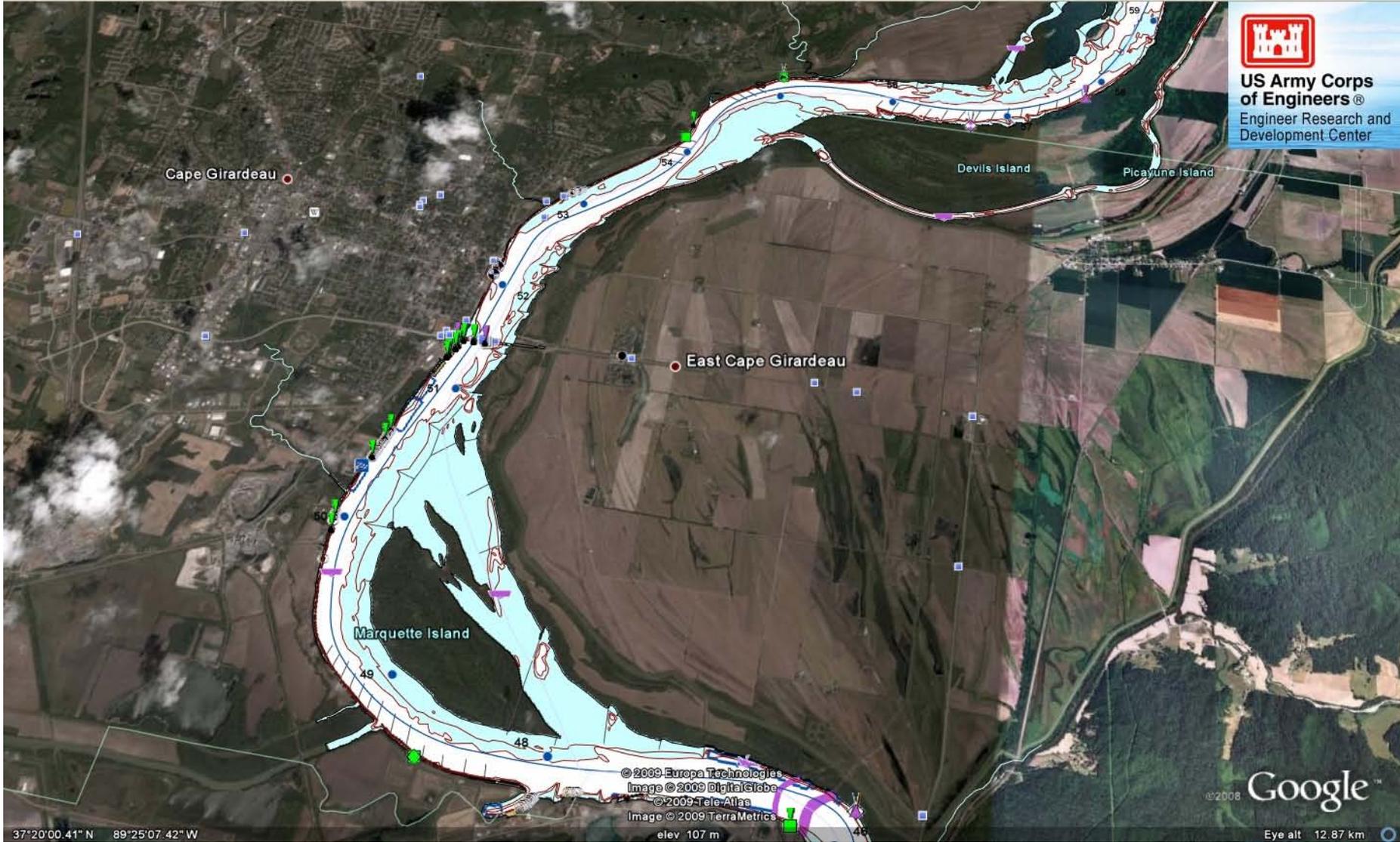
Field Name	Field Value
OBJECTID	64
SHAPE	Point
Object_Name	Robinson Bayou Lt. (850.7)
Color	Green
Top_Shape	Square
Color_Pattern	UNKNOWN
Information	SG(U), SG(D)
Scale_Minimum	60000
Source_Date	20050701
Source_Indication	US,U3,M8_LL, Edition_2004_No.9860

Directions: [To here](#) - [From here](#)

The interface includes a search bar, a places list on the left, and a layers panel. The map shows a bayou area with various features like Island Number 14, Island Number 13, Lee Towhead, and Blaker Towhead. The popup window provides detailed information about the selected location, including its object ID, shape, name, color, top shape, color pattern, information, scale, source date, and source indication.

IENC Overlay on Google Earth

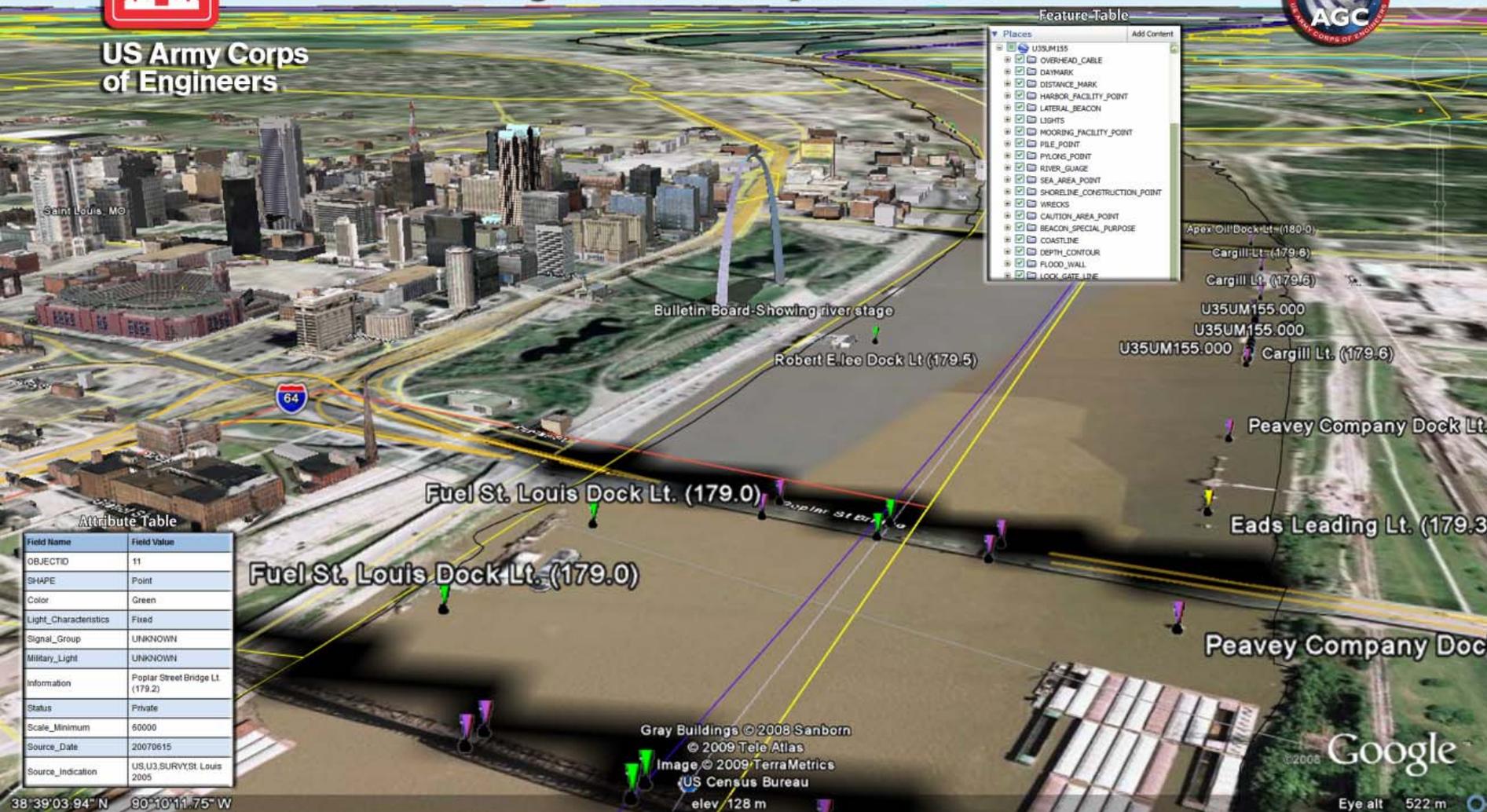
File Edit View Tools Add Help



Inland Electronic Navigational Chart Using ArcGIS Enterprise Server



US Army Corps
of Engineers



Feature-Table

Places	Add Content
<input type="checkbox"/>	U35UM155
<input checked="" type="checkbox"/>	OVERHEAD_CABLE
<input checked="" type="checkbox"/>	DAYMARK
<input checked="" type="checkbox"/>	DISTANCE_MARK
<input checked="" type="checkbox"/>	HARBOR_FACILITY_POINT
<input checked="" type="checkbox"/>	LATERAL_BEACON
<input checked="" type="checkbox"/>	LSPTS
<input checked="" type="checkbox"/>	MOORING_FACILITY_POINT
<input checked="" type="checkbox"/>	PILE_POINT
<input checked="" type="checkbox"/>	PYLONE_POBIT
<input checked="" type="checkbox"/>	RIVER_GUAUGE
<input checked="" type="checkbox"/>	SEA_AREA_POINT
<input checked="" type="checkbox"/>	SHORELINE_CONSTRUCTION_POINT
<input checked="" type="checkbox"/>	WRECKS
<input checked="" type="checkbox"/>	CAUTION_AREA_POINT
<input checked="" type="checkbox"/>	BEACON_SPECIAL_PURPOSE
<input checked="" type="checkbox"/>	COASTLINE
<input checked="" type="checkbox"/>	DEPTH_CONTOUR
<input checked="" type="checkbox"/>	FLOOD_WALL
<input checked="" type="checkbox"/>	LOCK_GATE_LINE

Attribute Table

Field Name	Field Value
OBJECTID	11
SHAPE	Point
Color	Green
Light_Characteristics	Fixed
Signal_Group	UNKNOWN
Military_Light	UNKNOWN
Information	Poplar Street Bridge Lt. (179.2)
Status	Private
Scale_Minimum	60000
Source_Date	20070615
Source_Indication	US.U3.SURVY.St.Louis 2005

IENC overlay on image (CORPSMAP)

The screenshot displays the CorpsMap web application interface. The browser address bar shows the URL: <http://maps.crrel.usace.army.mil:7778/apex/cm2.cm2.map>. The application title is "CorpsMap2".

Legend:

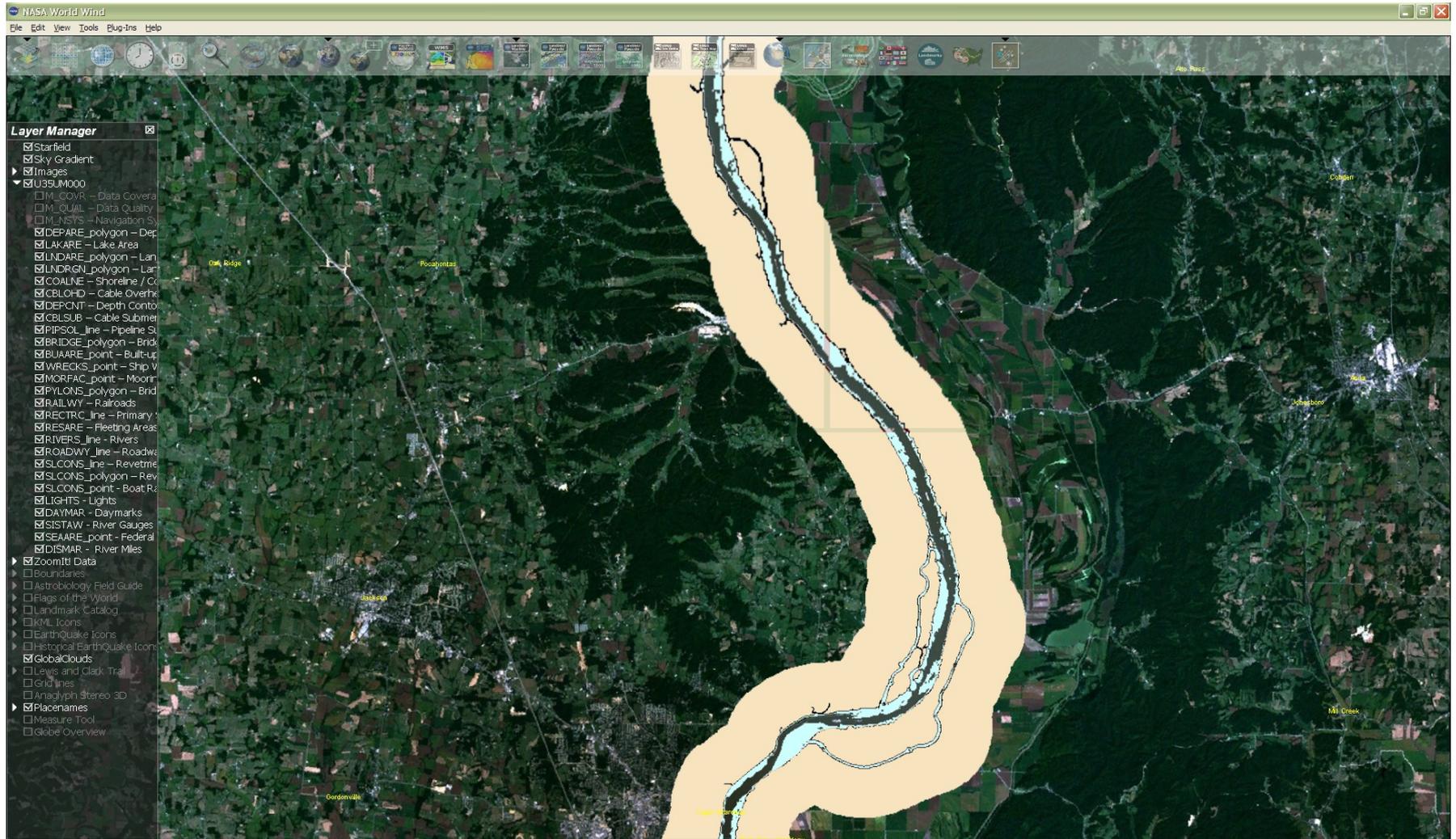
- Buoy, starboard-hand lateral mark
- Buoy, special purpose/general
- Beacon, lateral
- Beacon, lateral
- Wreck
- White Light
- Red Light
- Green Light
- Yellow Light
- Orange Light
- Pile
- Recommended track
- Obstruction
- Silo in general
- Dolphin
- Bollard
- Post or Pile
- Mooring Buoy
- Cable, submarine
- Powerline
- Transmission Line
- Telephone
- Telegraph
- Depth contour
- Railroad
- Roadway
- Bridge
- Conveyor
- Shoreline Construction
- Floating Dock
- Dam
- Dredged Area
- Restricted Area
- Built-up area

Map: An aerial satellite-style image of a river bend. A red hatched area, representing a "Restricted Area" according to the legend, follows the outer curve of the river. A green hatched area, representing a "Dredged Area", is located in the inner curve of the river. A small blue circle with a white 'E' is visible on the riverbank.

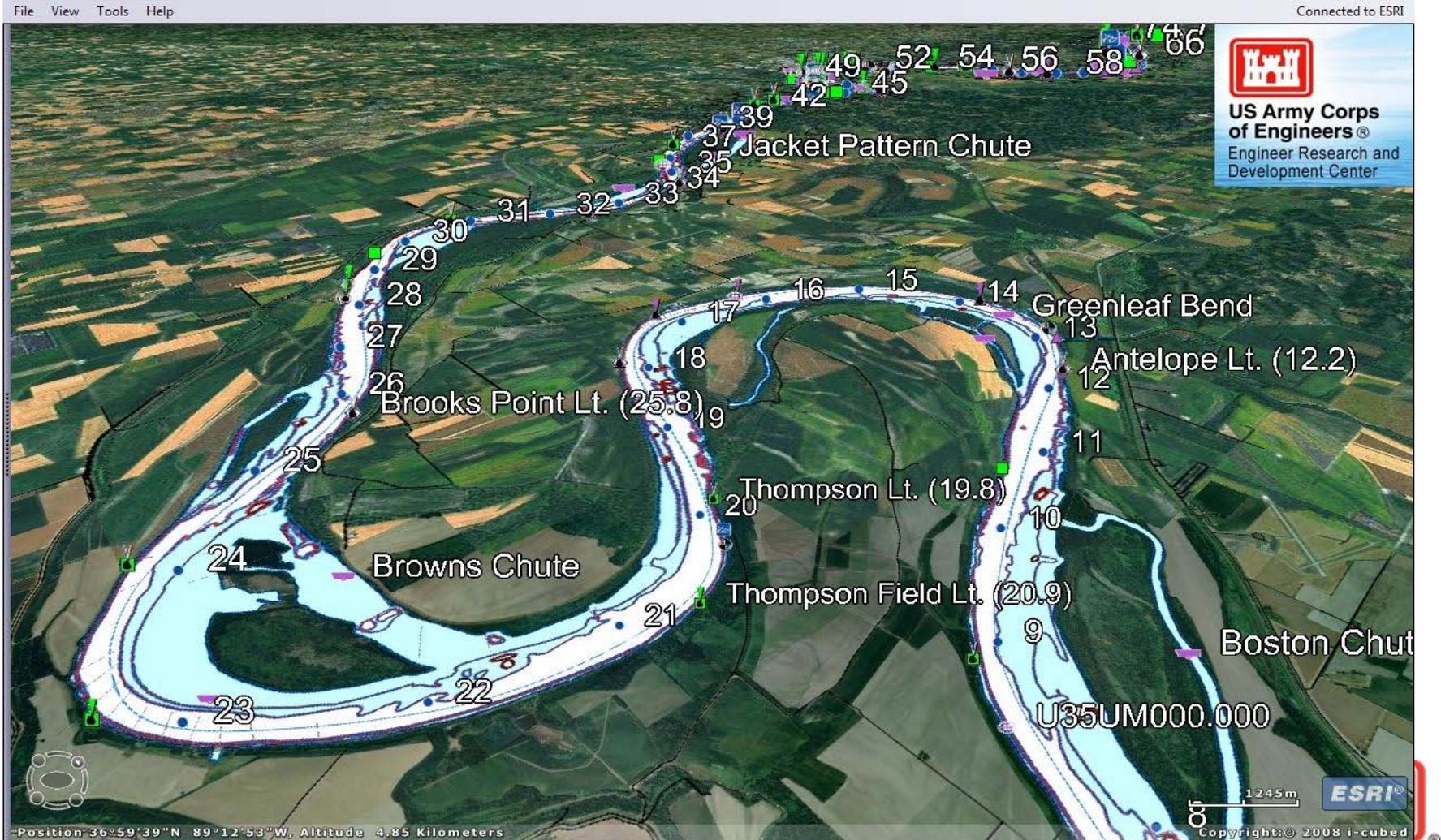
Status Bar: Map Ready Radar Off Interval Refresh Off Area Units: Acres Dist Units: Miles USACE Civil Works → Navigation → IENC → Dam -91.07563, 33.95653 LL / NAD

Footer: Imagery ©2009 DigitalGlobe, GeoEye, State of Arkansas, USDA Farm Service Agency - Terms of Use

WMS Service (NASA World Wind Client)



ArcGIS Explorer Showing KML Service



ArcGIS Explorer Showing WFS Service



IENC for Mobile Applications

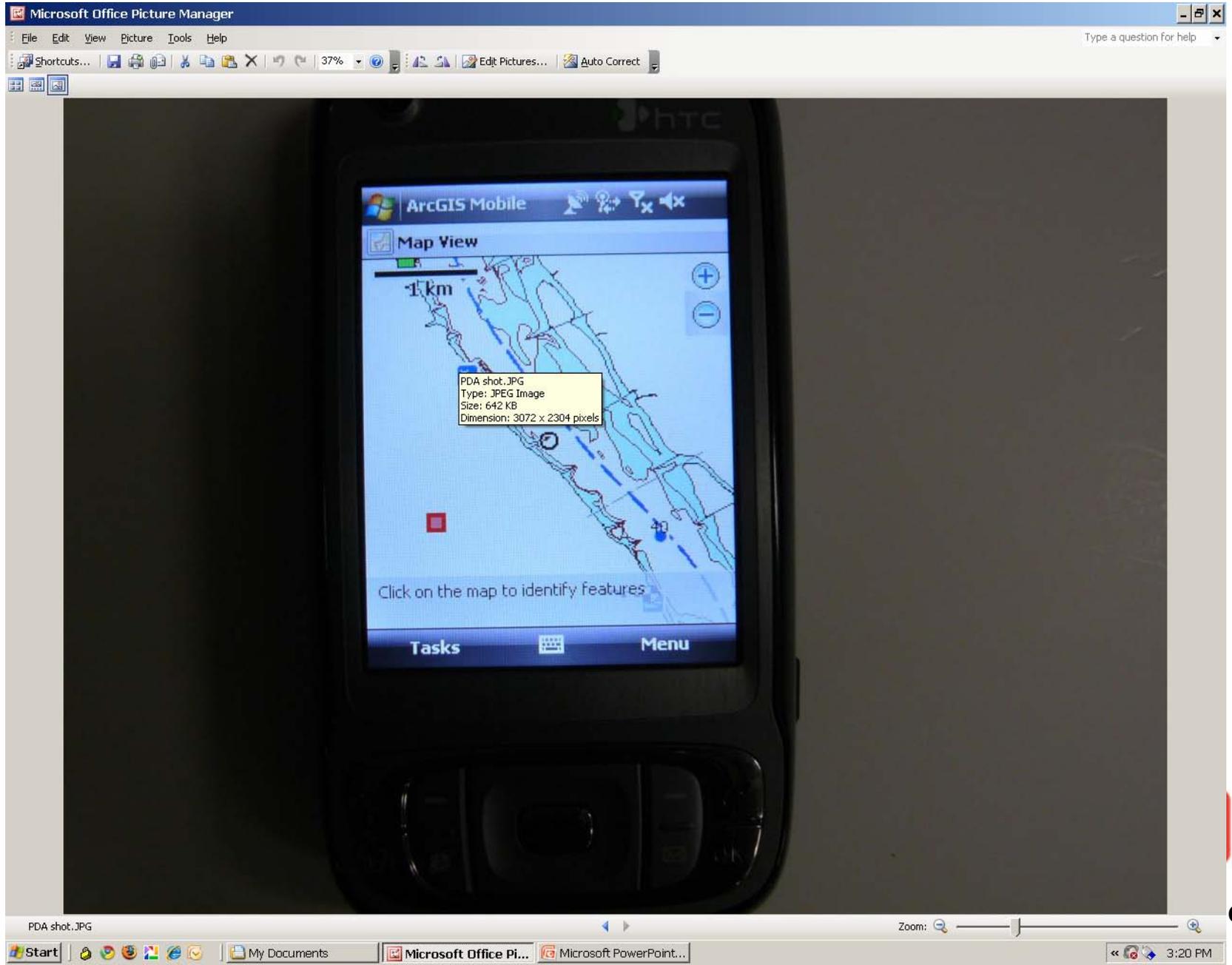
IENC data on PDA

Can be
displayed on
various
platforms



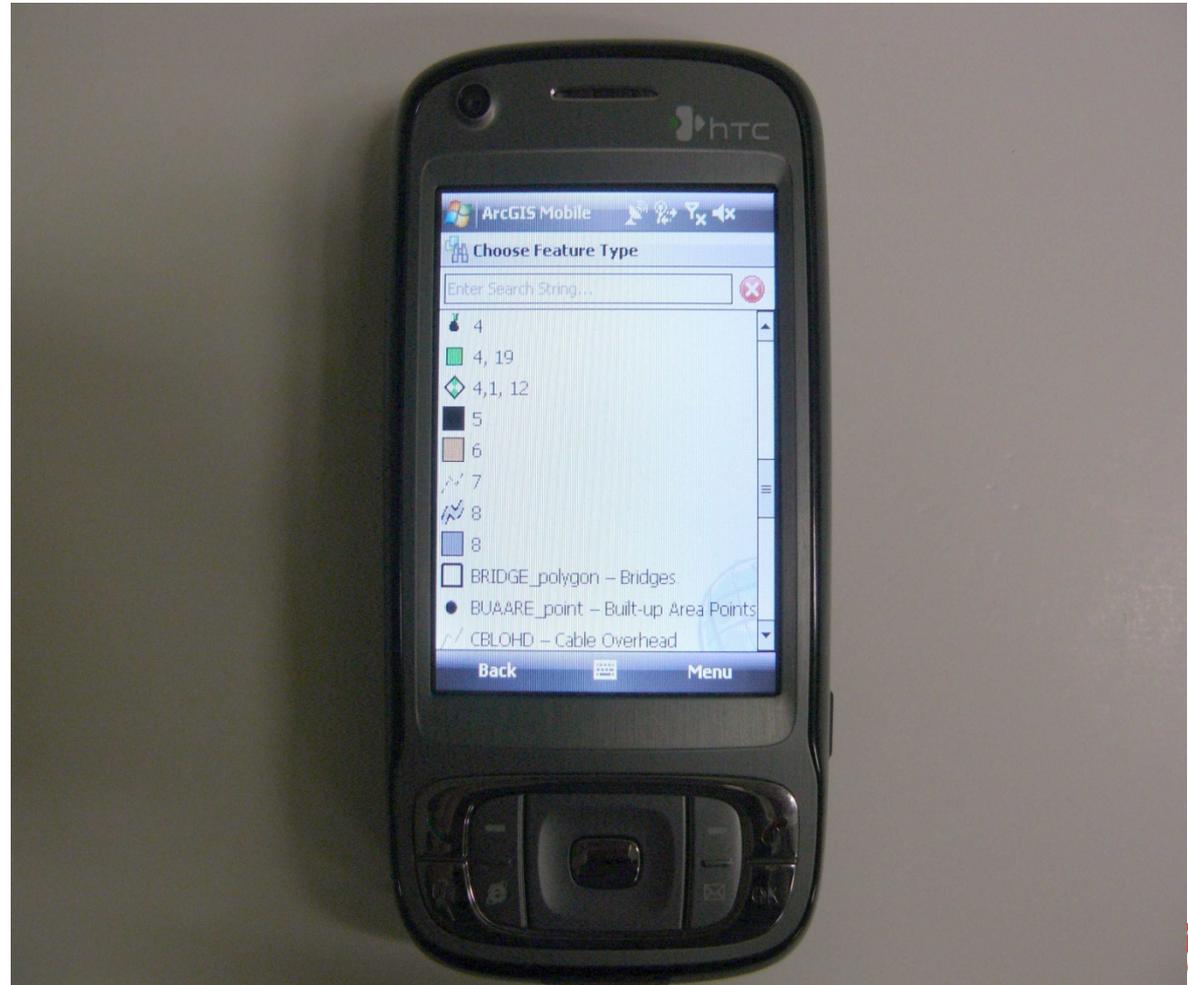
IENC data using ArcGIC Mobile

Windows Mobile Services



IENC for Mobile Applications

- Legends and symbologies



Future Developments

- Custom development on different platforms for users.
- Performance and capacity improvements to meet demand of increased user 'hits' on services.
- Deliver services dynamically per user's request – geographic extent of map served to user on demand.



Buoy Database as Overlay for IENC

Microsoft Office Picture Manager

File Edit View Picture Tools Help

Shortcuts... 88% Edit Pictures... Auto Correct

NavAids Data Management System - Plotter - Microsoft Internet Explorer provided by ICAN

http://localhost/NADMS/Plotter.aspx?show=19

Google

Google

Search + Bookmarks Find Check Sign In

NavAids Data Management System - Plotter

Home Buoy Surveys System Tools Logout

Marine Navigation & Surveillance Solutions
NavAids Data Management System

ICAN

NADMS_004.jpg
Type: JPEG Image
Size: 164 KB
Dimension: 1025 x 983 pixels
Download

3U5OH_9670_9750_10082008.000
Min: 37° 03' 24.99" N, 089° 11' 13.99" W
Max: 37° 09' 29.99" N, 089° 04' 21" W
Download

9590_10152008.000
N, 089° 00' 54" W
N, 088° 53' 58.99" W

Local intranet | Protected Mode: Off

Zoom: 100%

Start | Inbox - Micros... | RE: USACE Su... | IENC 09-10 | My Documents | Microsoft Offic... | Microsoft Off... | Microsoft Pow... | 12:31 PM

Aldebaran display of USCG buoy placement

Microsoft Office Picture Manager

File Edit View Picture Tools Help

Shortcuts... 76% Edit Pictures... Auto Correct

Aldebaran - [Info (1:3,000) U35OH736 SS7 1:5,000 DU=METRES OVERZOOMED Base Display North Up]

Main Chart Survey Route Nav Aids SAR Nav Elements Markers Tow Boat AIS Light Level Voyage Event! DRI Man Overboard! View Window Help

Charts

All Charts	Scale	Title
<input checked="" type="checkbox"/> U35OH736	5000	U35oh736
<input checked="" type="checkbox"/> U35OH736	5000	U35oh736

Survey Data Manager

Load Goto Survey Unload

Name	Description
<input checked="" type="checkbox"/> 3U0OR_8480_8500_03182009	<input type="checkbox"/> Contours (Green: 80ft - 81ft)
<input type="checkbox"/> 3USBW_3172_3183_02022009	<input checked="" type="checkbox"/> Contours (Red 316ft)
<input type="checkbox"/> 3USOH_9550_9590_10152008	<input checked="" type="checkbox"/> Contours (Yellow 315ft)
<input type="checkbox"/> 3USOH_9670_9750_10082008	<input type="checkbox"/> Soundings (Red: 2ft - 5ft)
	<input checked="" type="checkbox"/> Soundings Blue: 10ft - 15ft)
	<input type="checkbox"/> Testing Calc Values (10m)

Delete Edit Add

Close

Aldebaran_013.jpg

Zoom: [Slider]

Start | [Icons] | Inbox - Microsoft Out... | RE: USACE Survey - ... | IENC 09-10 | My Documents | Microsoft Office Pi... | 12:29 PM

AIS on Lower Mississippi River

USACE IWR/NDC Layer Legend

Locks, Dams and Structures - Shreveport

- Location
- Joe D. Waggoner Jr Lock
- Russell B. Long
- Columbia Lock And Dam
- Jonesville Lock And Dam
- Lindy Claiborne Boggs Lock
- John H. Overton
- Old River Lock
- Morganza Control Structure
- Port Allen Lock
- Calcasieu Salt Water Barrier
- Calcasieu Lock
- Catfish Point Control Structure
- Leland Bowman Lock
- Schooner Bayou Control Structure
- Freshwater Bayou Lock
- Keystone Lock
- Bayou Sorrel Lock
- you Boeuf Lock
- Berwick Lock

LPMS Lock Areas

- Arrival Area
- Approach Area
- Chamber Area

Real Time AIS Vessel Traffic
Refresh Rate: 15 secs

- US Non Hazardous
- US Hazardous
- Foreign Non Hazardous
- Foreign Hazardous

Search

Fly To: Find Businesses | Directions

Fly to e.g., San Francisco

Places

- My Places
- Sightseeing
- U35LM829
- Big Bayou Canot Train Disa...
- U35UM155
- ge[1].kml
- Locks, Dams and Struct...
- Locations
- Stoppages over Last ...
- Delays over Last 24 H...
- LPMS Lock Areas
- Real Time AIS Vessel Loc...
- Legend
- A J BOURG (WDE2901)

Layers

- Primary Database
- Borders and Labels
- Places of Interest
- Panoramio Photos
- Roads
- 3D Buildings
- Ocean
- Street View
- Weather
- Gallery
- Global Awareness
- More
- Terrain

© 2010 Google
Image USDA Farm Service Agency
© 2010 Europa Technologies
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

29°43'42.81" N 89°13'07.16" W elev -1 ft

Eye alt 311.38 mi

Google
Chandeur Val

10:54 AM

Search

Fly To Find Businesses Directions

Fly to e.g., San Francisco

Search input field with magnifying glass icon

Search results area with 'x' close button

Places Add Content

- My Places
- Sightseeing
- Select this folder and click on the 'Play' button below, to
- U35LM829
- Big Bayou Canot Train Disa...
- U35UM155
- ge[1].kml
- Locks, Dams and Struct...
- Locations
- Stoppages over Last ...
- Delays over Last 24 H...
- LPMS Lock Areas
- Real Time AIS Vessel Loc...
- Legend
- AARON CHARLES MCKIN
- As Of: 07-JUN-10 15:01:30

Layers

- Primary Database
- Borders and Labels
- Places of Interest
- Panoramio Photos
- Roads
- 3D Buildings
- Ocean
- Street View
- Weather
- Gallery
- Global Awareness
- More
- Terrain

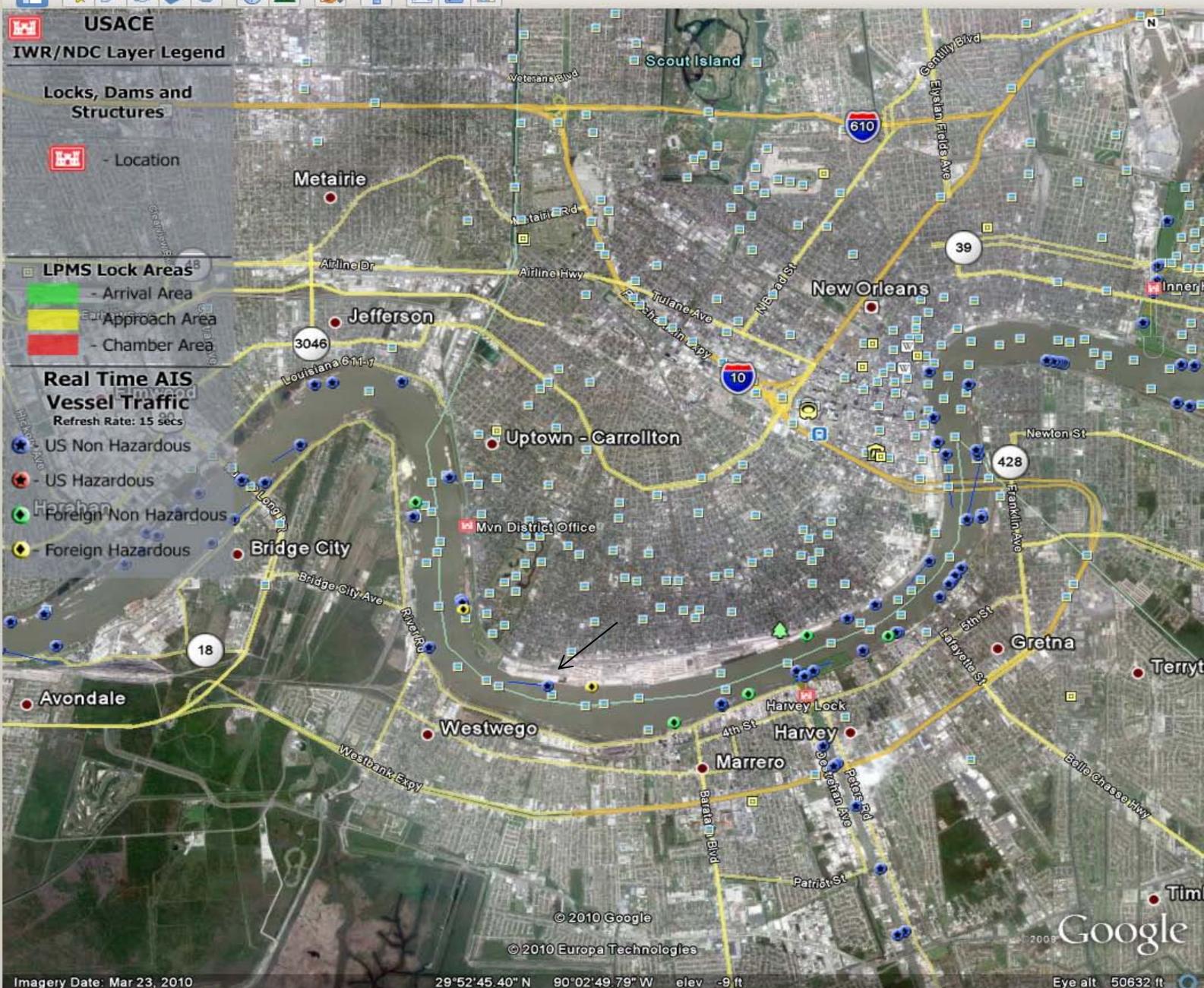


USACE IWR/NDC Layer Legend

- Location
- Arrival Area
- Approach Area
- Chamber Area

Real Time AIS Vessel Traffic Refresh Rate: 15 secs

- US Non Hazardous
- US Hazardous
- Foreign Non Hazardous
- Foreign Hazardous



Imagery Date: Mar 23, 2010

29°52'45.40" N 90°02'49.79" W elev -9 ft

Eye alt 50632 ft

Search

Fly To Find Businesses Directions

Fly to e.g., San Francisco

Places

- AVON 2 (WDA9768)
As Of: 07-JUN-10 15:01:30
- BELLATRIX (NHLL)
As Of: 07-JUN-10 15:02:56
- BILL O'DONLEY (WSF928)
As Of: 07-JUN-10 15:03:53
- BOLD EAGLE (WDF3325)
As Of: 07-JUN-10 15:03:53
- BOOTISIE B (WDA4508)
As Of: 07-JUN-10 15:03:53
- BOW PANTHER (QVMU3)
As Of: 07-JUN-10 15:02:01
- CAPT BUD BISSO (WCW-...)
As Of: 07-JUN-10 15:03:53

Layers

- Primary Database
- Borders and Labels
- Places of Interest
- Panoramo Photos
- Roads
- 3D Buildings
- Ocean
- Street View
- Weather
- Gallery
- Global Awareness
- More
- Terrain

USACE IWR/NDC Layer Legend

Locks, Dams and Structures

Location

LPMS Lock Areas

- - Arrival Area
- - Approach Area
- - Chamber Area

Real Time AIS Vessel Traffic

Refresh Rate: 15 secs

- - US Non Hazardous
- - US Hazardous
- - Foreign Non Hazardous
- - Foreign Hazardous

DOTTIE D (WDC2685)

As Of: 07-JUN-10 15:03:53 UTC
 MMSI: 366996390
 IMO: 0
 Type: Vessel towg
 Country: USA
 Speed: 5.2 Knots
 Course: 277.8
 Heading: Unknown
 Destination: CHEV PASC
 ETA: Jul 10 18:00
 Position: 29.912767 Lat, -90.126602 Lon
 Length: 55.77 ft Width: 22.97 ft
 Draft: 7 ft
 Data Source: B2GI99

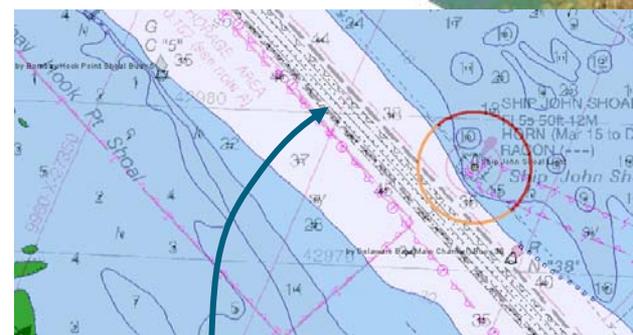
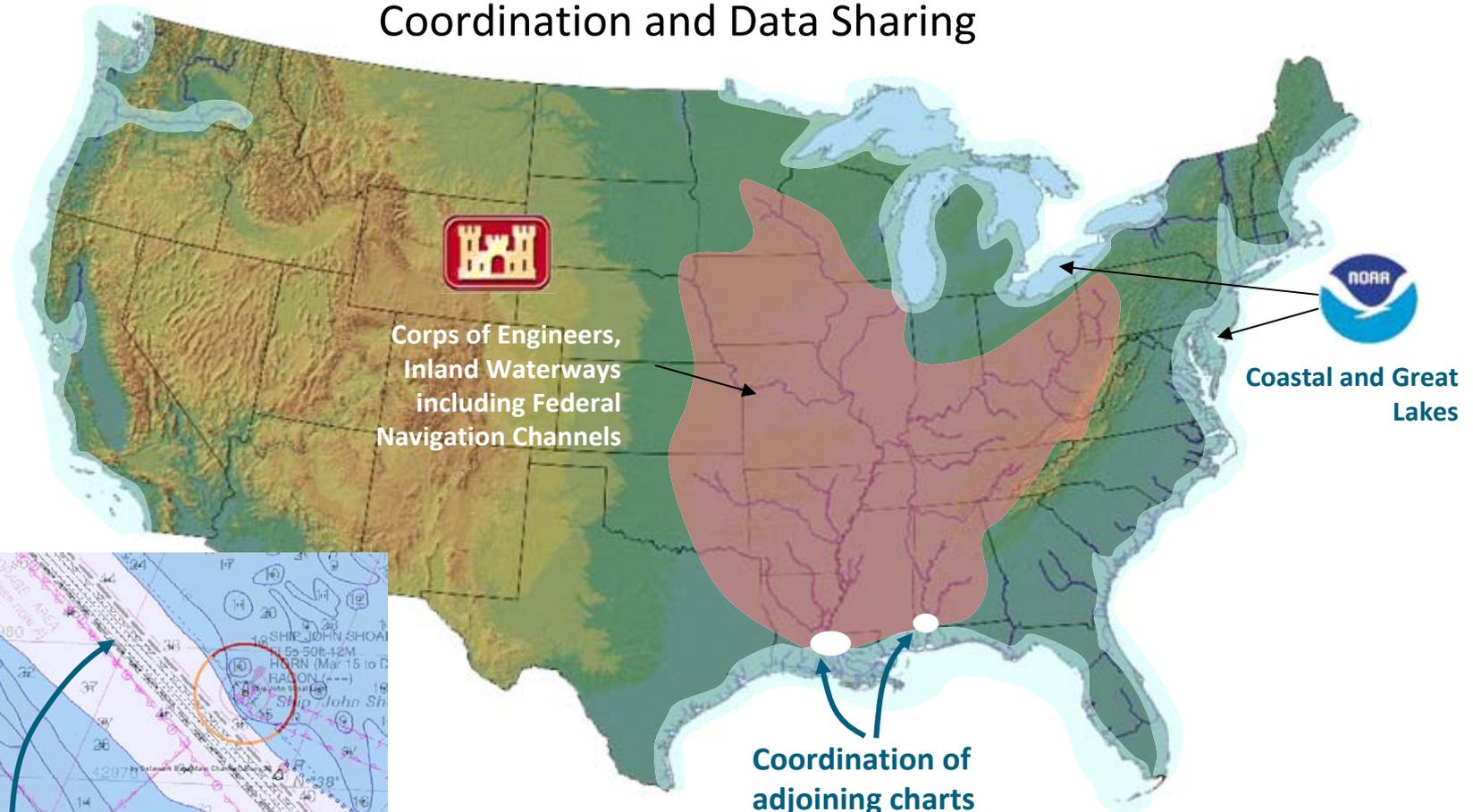
What is Navigational Channel Framework?

- Waterway road map
- Beginning point for moving USACE into an enterprise GIS program for managing the navigation business line
- Foundation for organization of navigation and dredging data across USACE.
- Basis for USACE data to update NOAA ENC
- Tracks channel history through authorized, maintained, and any changes in channel dimensions



Partnering with NOAA

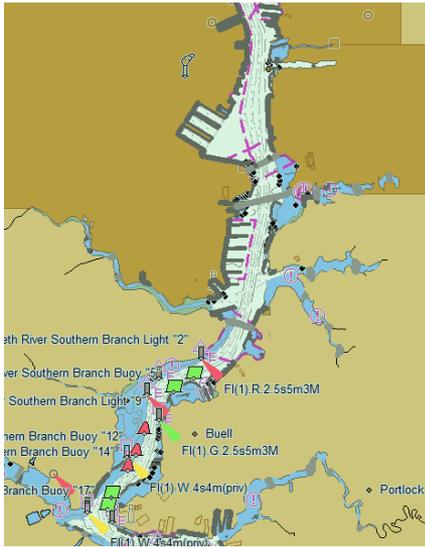
Coordination and Data Sharing



**More consistent and reliable channel data from Corps for NOAA charts.
Automatic upload from USACE to NOAA**

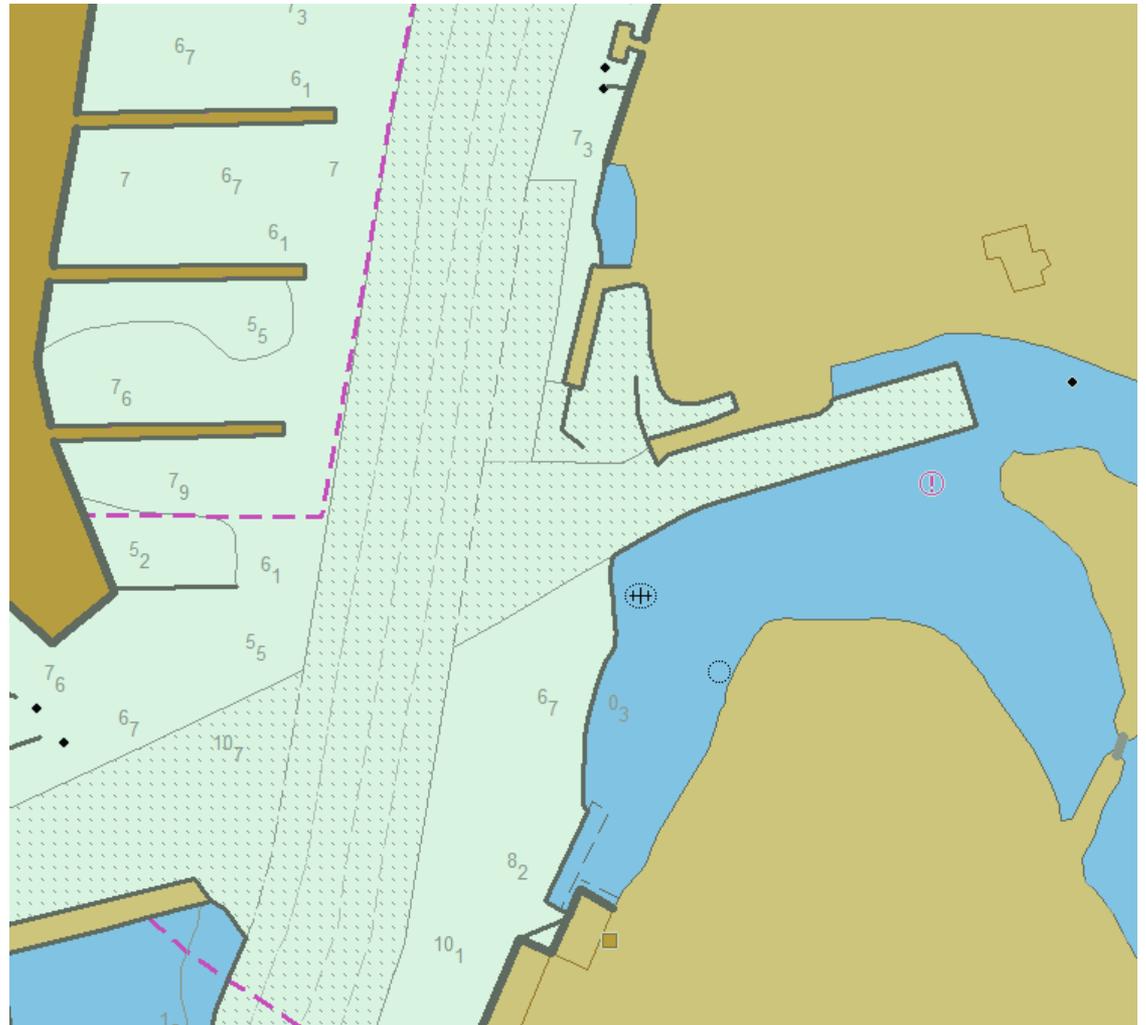


BUILDING STRONG.



NOAA chart with
channel embedded

NOAA's outside data
consists of 80% USACE
data



BUILDING STRONG.

Summary

IENC data can be delivered in several formats and be several methods

Both 2D and 3D clients are available for various mobile devices

Buoys, AIS and navigational channel framework data are being developed for more efficient customer use



Contacts:

Robert Mann

Robert.g.mann@usace.army.mil

Denise LaDue

Denise.r.ladue@usace.army.mil

IENC web site:

www.agc.army.mil/echarts



BUILDING STRONG®