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Automatic Identification System (AIS) Data Integration and Quality Analysis for Commercial Vessel and Commodity Movements

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August 26, 2013

WEDA 33 & TAMU 44

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Introduction

Why: USACE Navigation mission- maintain federal navigable channels

What: manage infrastructure and capital investments

How: Monitor vessel & commodity movements



Data Elements

- Getting started: A Vessel Operation Report (VOR), filed monthly by vessel owners and operators (it's the law)
- What is reported? Number of trips, type of cargo, vessel origin and destination, commodity, tonnage
- Who gets the report? The USACE Waterborne Commerce Statistics Center in New Orleans
- Then what? After verification and validation, the data is published for waterborne commerce statistics



The Next Step

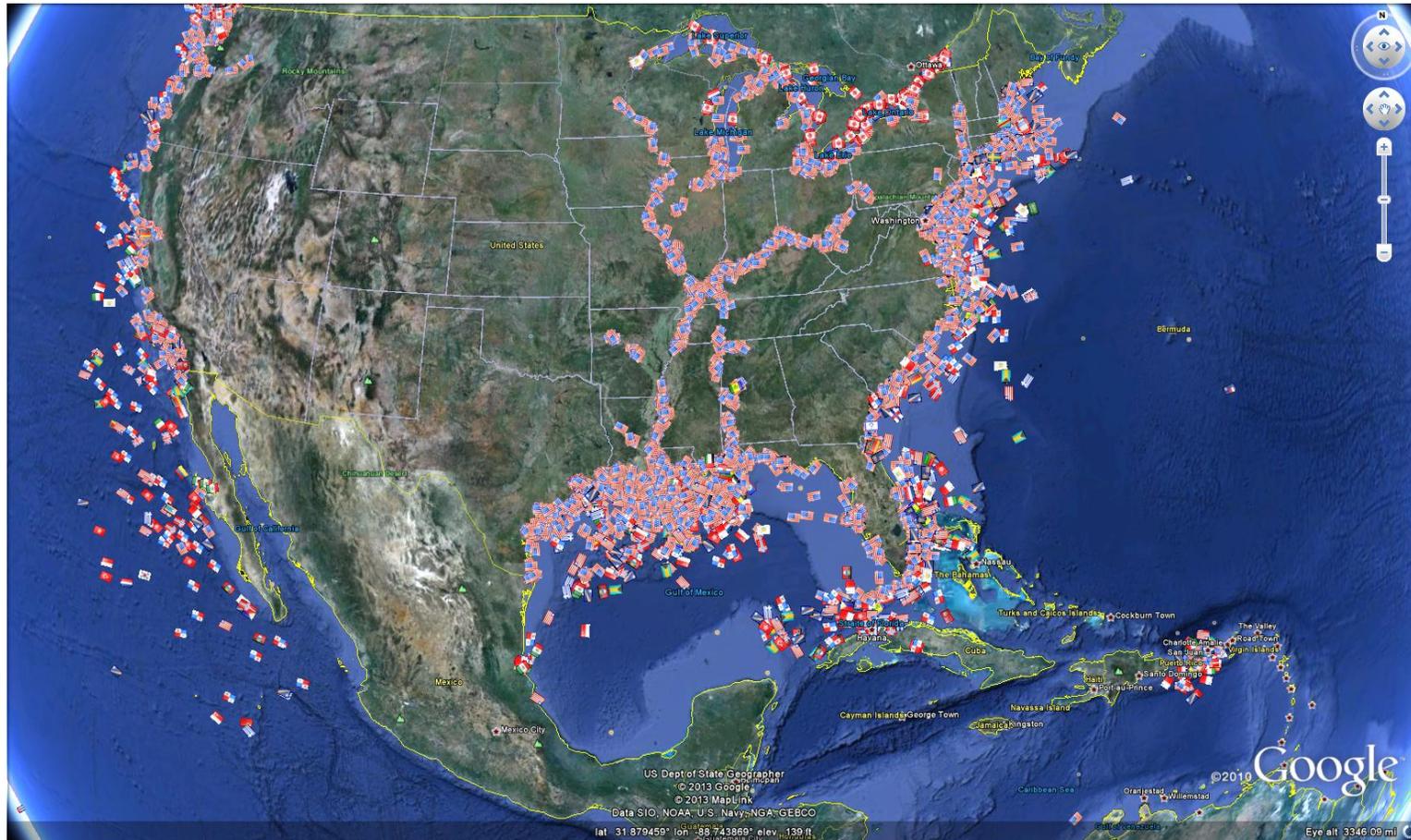
- Coordinate with the USCG
 - AIS tracks vessel ID, position, transit, history
 - Data display is a geographical representation
 - Vessel specific ID features imbedded in 'flag'
- Common data element = voyage history



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USCGC Real-Time AIS Vessels



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Data Validation

- AIS provides each vessel unique features identified through the Maritime Mobile Service Identity (MMSI)
- Unreported vessels identified by USACE
 - notification is sent out to require VOR
 - input MMSI
 - if a match: add date & time stamp, display using Google Earth viewer
- NPI displays vessel movement



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USCG Vessel Display Info

HUGH R SHARPE



VesselTrack: [1m](#) | [3m](#) | [6m](#)
[Show Voyage History](#)

	AIS	Verified
Name:	R/V SHARP	HUGH R SHARPE
MMSI:	367063060	367063060
IMO Number:	938844300	9388443
Official Number:		
MISLE Vessel ID:		803151
Call Sign:	WDC9608	WDC6908
Ship Type:	Reserved (regional use)	
Class Society:		ABS
Flag:	United States	
Year Built:		
Length:	40	45.00
Beam:	10	9.75
Draft:	3.3	
Discrepancies:	IMO/CL SN/NAME	
Report Time	2011-09-26T12:42:36-00:00	2010-02-17T16:44:20-00:00

Operator Information

[UNIVERSITY OF DELAWARE](#) | Research | Academic

Navigation Information

Destination:	
ETA:	00000000
Nav Status:	At anchor
Speed (knots):	0.0
Course:	48.0
Heading:	355

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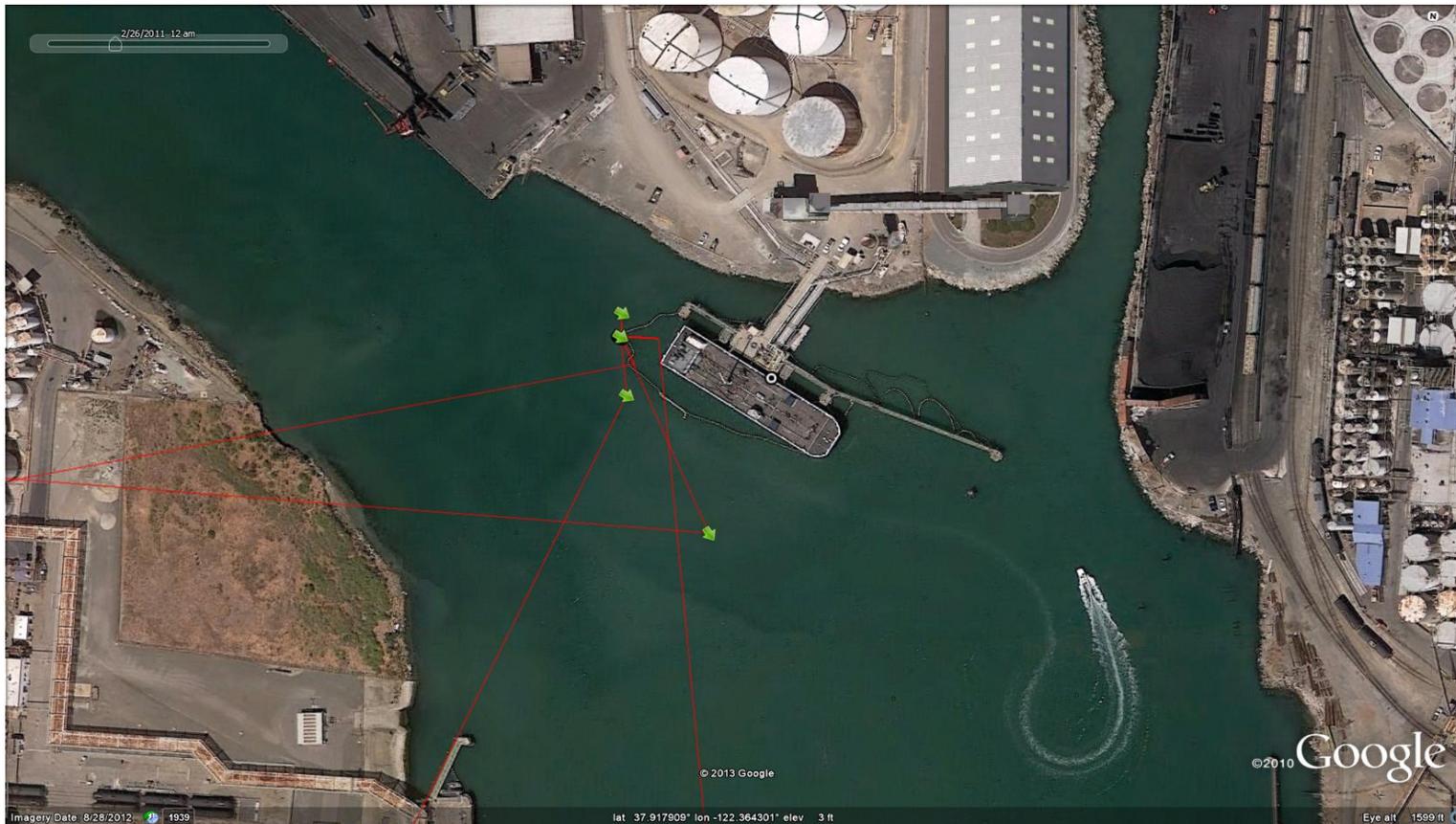


Data Verification

- Display vessel geographical area using Google Earth
- Identify NPI dock location → import into viewer
- Open AIS and display dock location & event



Navigation Points of Interest



Green arrow represents vessel at petroleum dock, Richmond, CA

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Now What? - Notification

Once USACE gathers info on specific unreported vessel movement

- Successful Outcome – notify owner to file VOR → report filed
- Not-so-successful Outcome – no report filed, AIS turned off or repaired, no vessel movement → \$5,000 fine, jail



So What?

In 2011 - 24 petroleum tankers were
identified without VORs
- 16/24 used AIS

Additional data added = 640,000 tons of
commodity at a value of \$745,000



Data Availability

(Where to Get the Information)

- The USACE Navigation Data Center exercises federal responsibility for maintaining water transportation information systems
- All public data are available through the NDC website:

<http://www.navigationdatacenter.us/>



Data Availability

(Where to Get the Information)

- Waterborne Commerce Statistics of the US are published by the USACE Waterborne Commerce Statistics Center, New Orleans
 - Domestic (annual): vessel trips, tonnage, commodity, etc.
 - Foreign (annual): US/foreign port, commodity, etc.
 - Internal Waterway (monthly): cargo movements, etc.



Conclusion

- USCG AIS used successfully to track & verify
- USACE enhances WCS with accurate vessel data
- Data supports budgets & priorities for capital improvements
- Justification for expenditures on navigation projects



Questions?

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