

North Atlantic Right Whale Vessel Strike Risk Reduction Technology Workshop



Homeland
Security

Jorge Arroyo | Navigation Systems SME

USCG HQ Office of Navigation Systems

Dissemination & Integration Session



The U.S. Coast Guard is... the Nation's oldest, continuous seagoing service (1790)

Multi-mission, Multi-authority

- ❑ Defense Readiness
- ❑ Migrant Interdiction
- ❑ Drug Interdiction
- ❑ Search & Rescue
- ❑ Ice Operations
- ❑ Ports, Waterways,
& Coastal Security
- ❑ Marine Safety
- ❑ Aids to Navigation
- ❑ Marine Environmental
Protection
- ❑ Living Marine Resources
Protection
- ❑ Other Law Enforcement

**Only agency with
authority to enforce
all U.S. laws @ sea**

**Agency which
mandates carriage
of marine navigation
equipment**

Member of the 6 Armed Forces & 8 Uniformed Services

- ❑ 44,500 active duty | 7,724 reservists
- ❑ 31,000 auxiliarists
- ❑ 8,577 civilians

**12th largest navy in the world,
yet about the size of the NYPD**

- ❑ 250 cutters (ships)
- ❑ 2,000 small boats
- ❑ 200 aircraft
- ❑ 65,000 AtoNs





U.S. Department
of Homeland Security
**United States
Coast Guard**

LOCAL NOTICE TO MARINERS

District: 1

Week: 08/24

COASTAL WATERS FROM EASTPORT, MAINE TO SHREWSBURY, NEW JERSEY

* Unless otherwise indicated, missing and destroyed structures are presumed to be in the immediate vicinity of assigned position. Mariners should proceed with caution.

* The Local Notice to Mariners is a weekly edition.

* Inquiries, published articles or Information: mail to: D01-SMB-LNM@uscg.mil.

* The U.S. Coast Pilot supplements the navigational information shown on nautical charts.

* The Coast Pilot, along with its corrections, are available online at <https://nauticalcharts.noaa.gov/publications/coast-pilot/index.html>.

* The Local Notice to Mariners is available online at <https://navcen.uscg.gov/local-notice-to-mariners-by-cg-district>

* Updated Light List is available online: <https://navcen.uscg.gov/light-lists>.

* Weekly updates to all Light Lists: <https://navcen.uscg.gov/weekly-light-lists>

* Information on Private Aids to Navigation is available at: <http://www.usharbormaster.com/>

* Reports of Channel conditions can be found at the Army Corps of Engineers website at: <http://www.nan.usace.army.mil/Missions/Navigation/ControllingDepthReports.aspx>.

* NOAA Chart Corrections and Chart Viewer: <https://www.nauticalcharts.noaa.gov>

* NOAA Tides and Currents can be found at: <http://www.tidesandcurrents.noaa.gov/>.

* Weather: <https://www.weather.gov/>

* The United States Coast Guard Navigation Information Service (NIS), operated by the USCG Navigation Center, is staffed 24 hours a day, 7 days a week. The NIS provides information on the current operational status, effective policies, and general information for GPS and DGPS. The NIS also disseminates Safety Broadcasts (BNM), Local Notice to Mariners (LNM), and the latest Notice Advisory to Navstar Users (NANU). NANU notices can be obtained via email subscription through the USCG Navigation Center website: <https://navcen.uscg.gov/nanu-information>. In addition, the NIS investigates all reports of degradation or loss of GPS, DGPS or AIS service. Users are encouraged to report all degradation or loss of radio navigation services to the NIS via any of the following: Phone: (703) 313-5900, mail to: tis-sg-nisws@uscg.mil, or on the internet at: <https://navcen.uscg.gov/>.

PLEASE IMMEDIATELY REPORT DISCREPANCIES IN AIDS TO NAVIGATION TO THE NEAREST COAST GUARD UNIT

COMMANDER, FIRST COAST GUARD DISTRICT (dpw)
408 Atlantic Avenue, Boston, Massachusetts 02110-3350
Telephone: (617) 223-8356
24 Hour FAX: (617) 223-8094
<http://www.uscg.mil/d1/prevention/Marineinfoeregulations.asp>

INFORMATION DISSEMINATION (PULL)

Notice to Mariners (pdf formatted)

- Local Notice to Mariners (LNM)*
 - Produced by USCG Districts
- USCG Navigation Center website
 - RSS Feeds for LNM
- USCG Homeport R. Whale Page
- USCG Marine Information Bulletins (MSIB)
- USCG Guidelines
- USCG Maritime Commons
- NGA Notice to Mariners (NTM)*
 - GMDSS NAVWARN Areas
- U.S. Coast Pilot*

* required carriage on most
commercial vessels



Salish
Sea, WA
USCG
Whale
Desk



Radio Broadcast Notice to Mariners Now available via email too

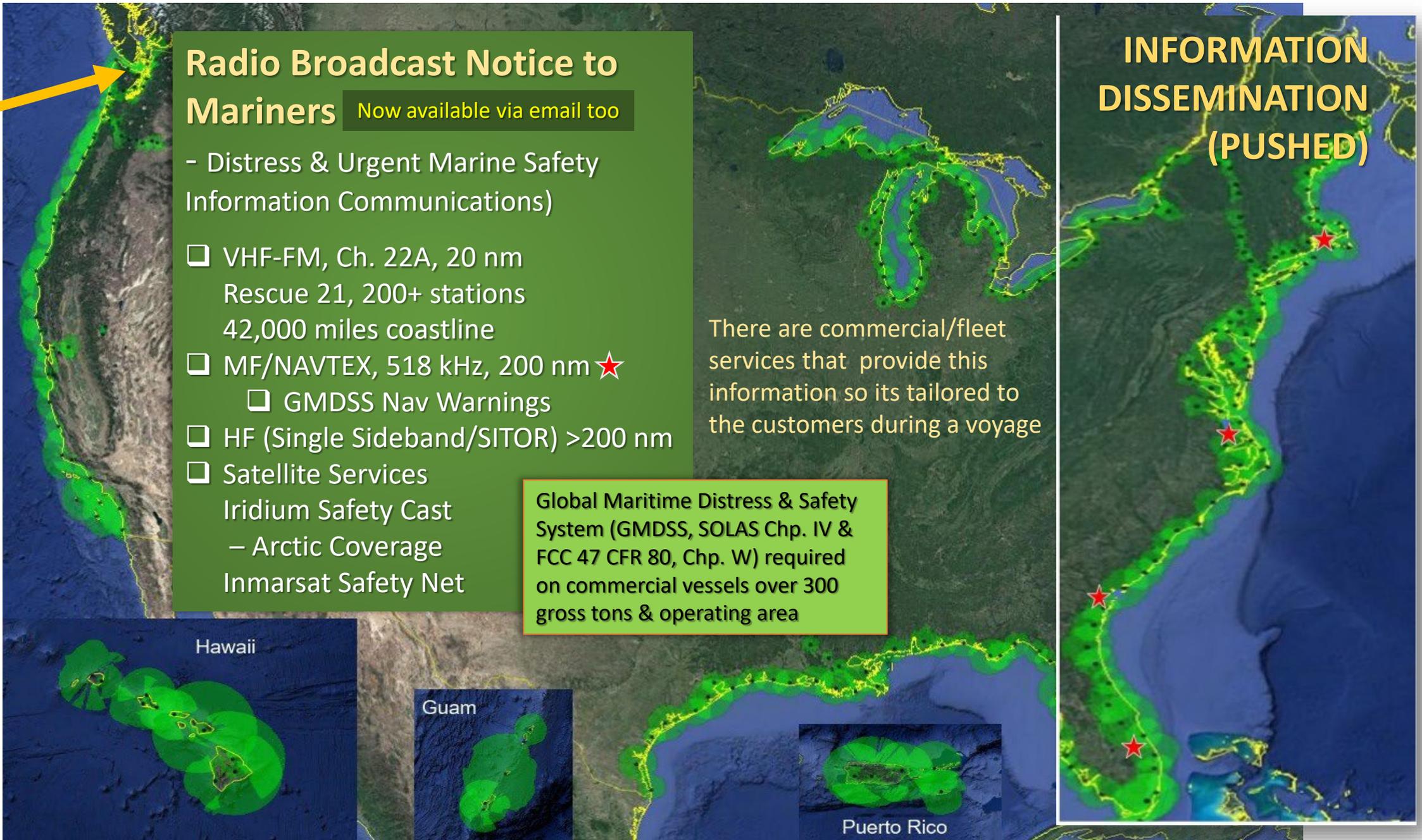
- Distress & Urgent Marine Safety Information Communications)

- VHF-FM, Ch. 22A, 20 nm
Rescue 21, 200+ stations
42,000 miles coastline
- MF/NAVTEX, 518 kHz, 200 nm ★
 - GMDSS Nav Warnings
- HF (Single Sideband/SITOR) >200 nm
- Satellite Services
 - Iridium Safety Cast
– Arctic Coverage
 - Inmarsat Safety Net

Global Maritime Distress & Safety System (GMDSS, SOLAS Chp. IV & FCC 47 CFR 80, Chp. W) required on commercial vessels over 300 gross tons & operating area

There are commercial/fleet services that provide this information so its tailored to the customers during a voyage

INFORMATION DISSEMINATION (PUSHED)



Hawaii

Guam

Puerto Rico

What is AIS?

It's an Autonomous, Continuous, Non-Proprietary, Open Broadcast, World-wide Navigation-Communication Protocol

What for?

- ❑ **Collision Avoidance**
- ❑ **VTS tool**
- ❑ **Coastal Surveillance**

How's it work?

- ❑ Autonomously & continuously reports near real-time position, identity & status
- ❑ 3 modes of operation: automatic/self-reporting, assigned, interrogation/polling
- ❑ Robust - 4500 reports per minute
- ❑ Versatile - multiple standard digital interfaces and display options (i.e., radar, ECS/EDCIS, INS, PPU, PC, etc.) **but not required on ECS/ECDIS or U.S. radars.**

Internationally Adopted & Required (IMO SOLAS Regulation V/19.2.4)

- ❑ Tankers, passenger vessels & other ships > 300 GT

Mandated by Congress

Marine Transportation & Security Act of 2002 (46 U.S.C. 7014, 33 CFR 164.46)

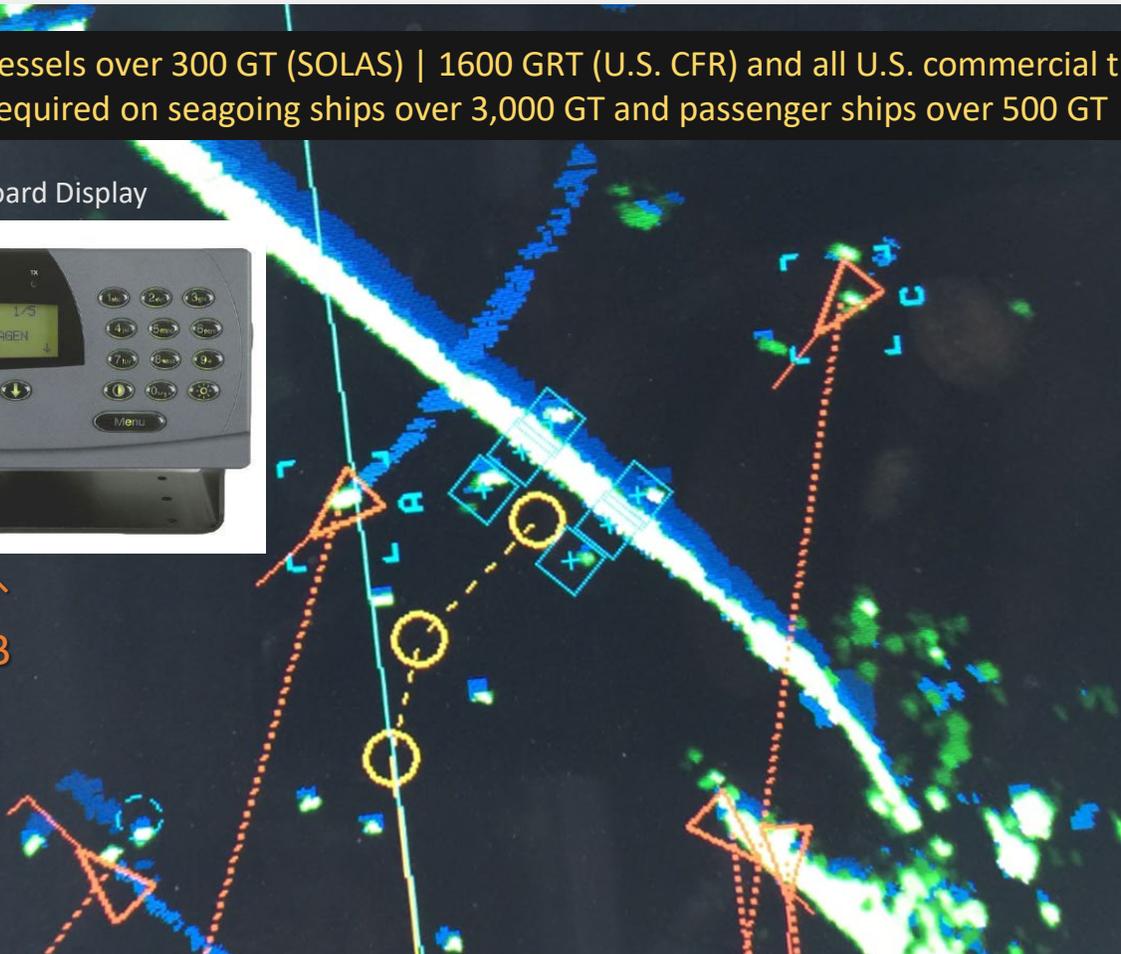
- ❑ Commercial self-propelled vessels > 65 feet
- ❑ Towing Vessels > 26 feet & 600 hp
- ❑ Passenger vessels as determined by USCG (i.e., self-propelled vessel certificated for 150+ passengers)
- ❑ those the USCG deems necessary for safety (i.e., dredges and vessels moving certain dangerous, flammable or combustible liquid cargo in bulk)

Radar is required on vessels over 300 GT (SOLAS) | 1600 GRT (U.S. CFR) and all U.S. commercial tugs
ECDIS (SOLAS) is required on seagoing ships over 3,000 GT and passenger ships over 500 GT

Minimal Keyboard Display



AIS Class A ↑
↓ AIS Class B



ID#	AIS Standard Messages (ITU-R M.1371-5)
1,2,3	Position Reports – autonomous (au), assigned (as), or interrogated (in) every 10 sec or less
4	Base Station Report – UTC/ & position every 10 sec
5	Class A static & voyage related data every 6 min or upon a status change
6,7,8	Binary Message – addressed, acknowledge or broadcast
9	SAR aircraft position report every 10 sec
10,11	UTC/Date - enquiry and response
12,13,14	Safety Text Message – addressed, acknowledge or broadcast as needed
15	Interrogation – request for specific messages
16	Assignment Mode Command
17	Binary Message – DGNSS Correction
18,19	Class B Reports – position & extended data every 15/30 sec
20	Data Link Management – reserve slots
21	ATON Report – position & status
22	Channel Management
23	Group Assignment
24	Class B-CS Static Data every 6 min
25	Binary Message - single-slot
26	Binary Message - multi-slot (STDMA)
27	Long Range Report every on Ch. 74/74

IMO Binary (Application) Specific Messages

- Clearance time to enter port
- Marine traffic signal
- Berthing data
- Weather observation report from ship
- Area notice – broadcast & addressed**
- Extended ship static and voyage-related data*
- Dangerous cargo indication*
- Environmental Data
- Route information – broadcast & addressed
- Text description – broadcast & addressed
- Meteorological and Hydrographic [sensor] data
- Tidal window

Some Area Descriptions->

- circle or point
- rectangle
- sector
- polyline
- polygon
- associated text

Caution Area: Marine mammals habitat

Caution Area: Marine mammals in area – reduce speed

Caution Area: Marine mammals in area – stay clear

Caution Area: Marine mammals in area – report sightings

Caution Area: Protected habitat – reduce speed

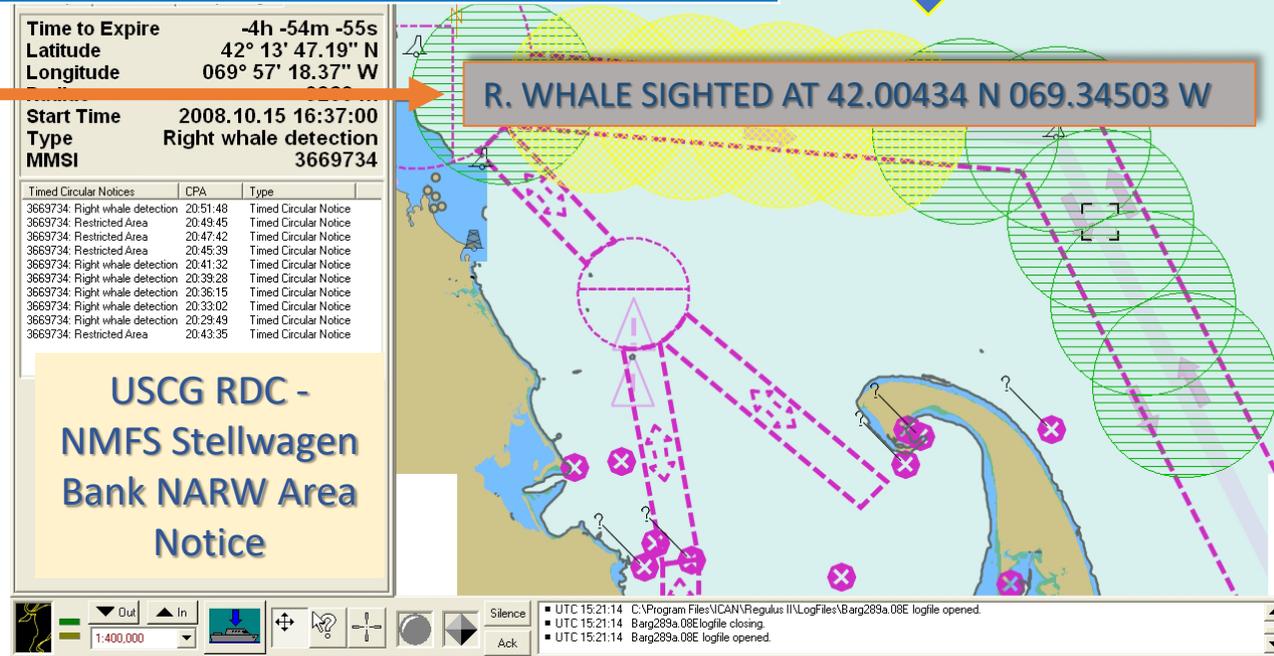
Displaying ASMs is optional except on post-2022 Integrated Navigation Systems (INS)

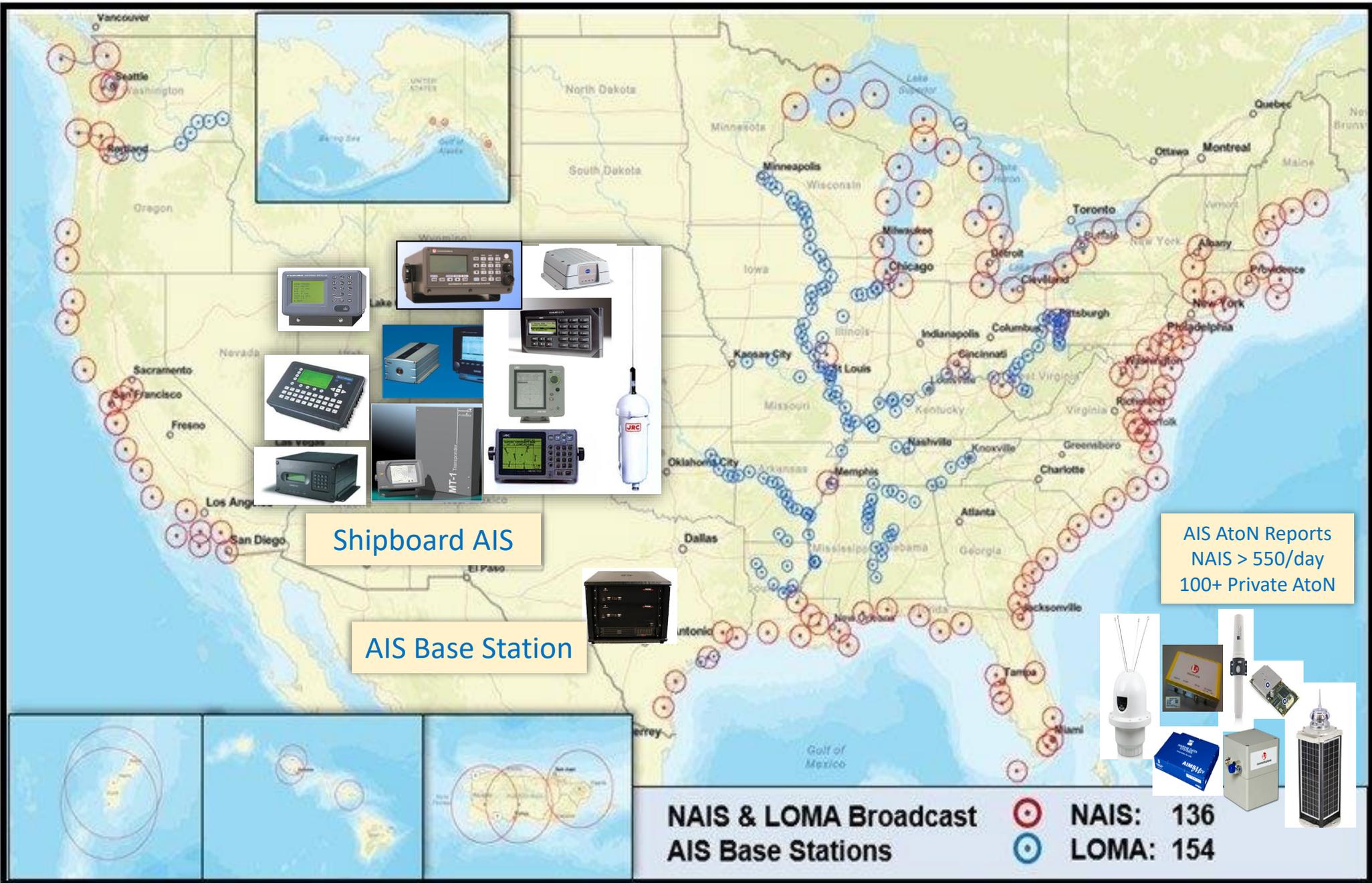
Time to Expire	-4h -54m -55s
Latitude	42° 13' 47.19" N
Longitude	069° 57' 18.37" W
Start Time	2008.10.15 16:37:00
Type	Right whale detection
MMSI	3669734

Timed Circular Notices	CPA	Type
3669734: Right whale detection	20:51:49	Timed Circular Notice
3669734: Restricted Area	20:49:45	Timed Circular Notice
3669734: Restricted Area	20:47:42	Timed Circular Notice
3669734: Restricted Area	20:45:39	Timed Circular Notice
3669734: Right whale detection	20:41:32	Timed Circular Notice
3669734: Right whale detection	20:39:28	Timed Circular Notice
3669734: Right whale detection	20:36:15	Timed Circular Notice
3669734: Right whale detection	20:33:02	Timed Circular Notice
3669734: Right whale detection	20:29:49	Timed Circular Notice
3669734: Restricted Area	20:43:35	Timed Circular Notice

USCG RDC - NMFS Stellwagen Bank NARW Area Notice

R. WHALE SIGHTED AT 42.00434 N 069.34503 W





NAIS Snapshot on Sun, 9/27/23
Boston-to-Jacksonville FL

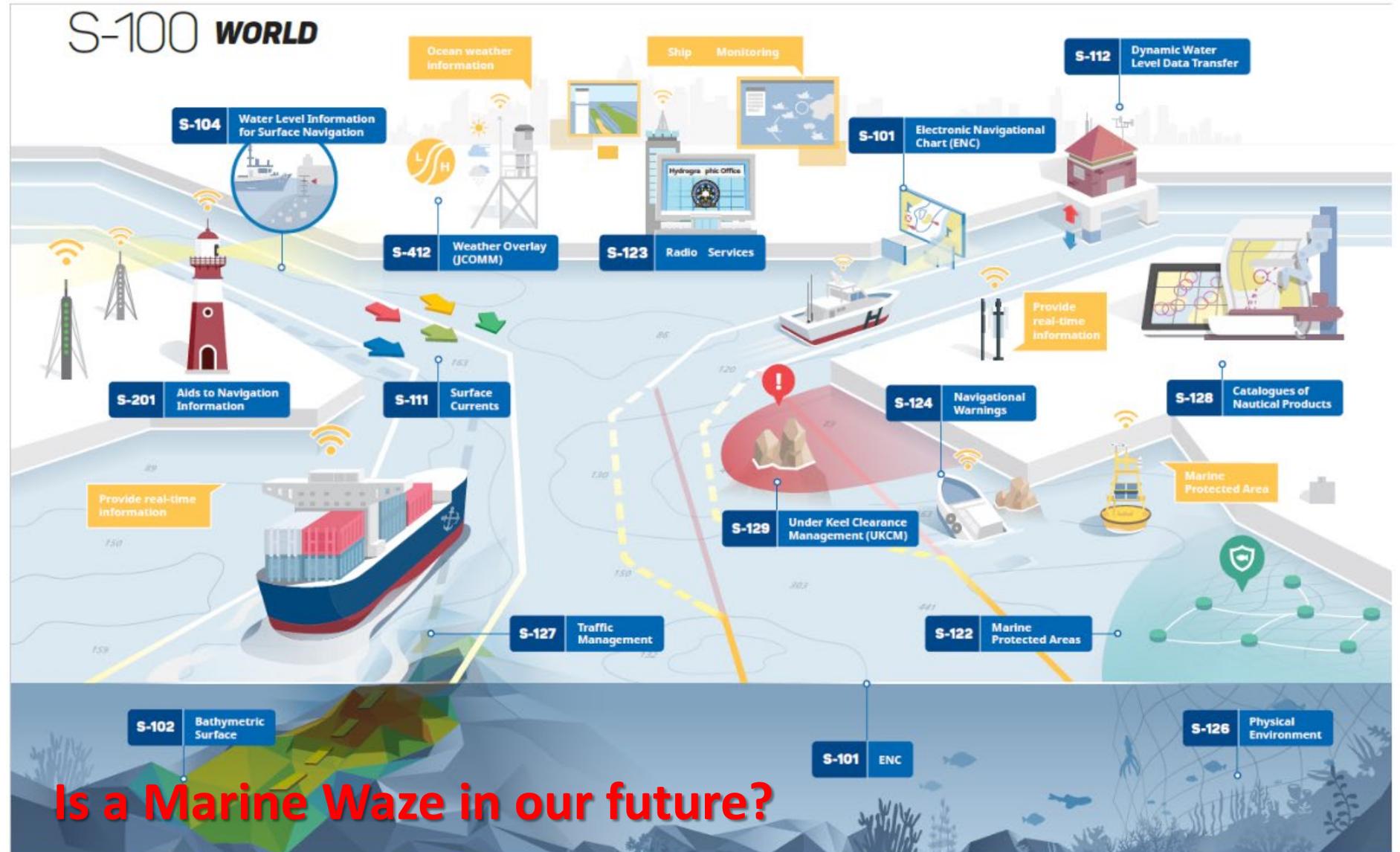
4540	Total Vessels Tracked by NAIS	
By AIS Class		
1687	39%	w/AIS Class A
2675	61%	w/AIS Class B
By Length		
2274	49%	<=20m
1762	44%	> 20m
209	5%	0m = default
962	7%	Length NULL
44m	144ft	AVG Length
37m	121ft	MEDIUM Length
By Ship Type		
1799	40%	Rec
535	12%	Sail
460	10%	Tow
360	8%	Fish
296	7%	Pax
266	6%	Cargo
260	6%	Tanker
548	12%	Specialty
16	0%	Local (Tug + Tow)
22	0%	Other, not defined
30	1%	Unknown = default
39	1%	Type NULL
Voluntary Users		
1270	28%	Rec
491	11%	Sail
108	2%	Fish
7	0%	Tow <8m
59	1%	Pax
8	0%	Other, not defined
18	0%	Unknown
1961	43%	Total

The Marine Milieu Is Being Digitized

Sunset of Paper Charts, S-100 based ENC's by 2026, required after 2029

USCG in process of amending its chart carriage requirements

ANPRM 3/28/2022
Docket
USCG-2021-0291



Is a Marine Waze in our future?

THE S-100 UNIVERSAL HYDROGRAPHIC DATA MODEL

AIS 2.0 – Next GEN AIS VHF Data Exchange System (VDES)

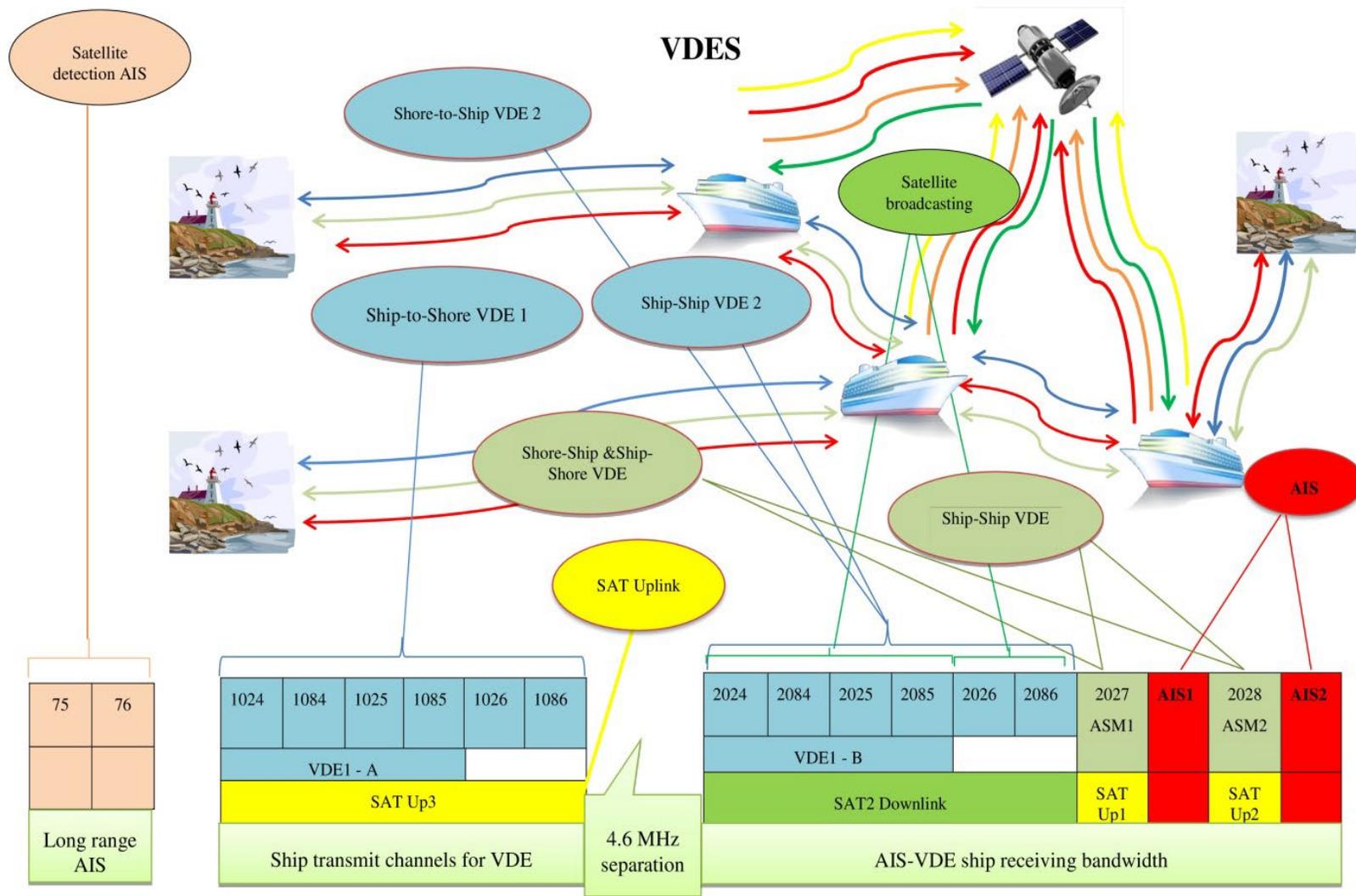
Repurposing of VHF Public
Correspondence Band
(analog-to-digital)

4 Components:

- ❑ AIS1+2, LR AIS 1+2
- ❑ ASM 1+2, ASM SAT 1+2 ↑
- ❑ VDE-TER: 4 ch. txmt , 4 ch. rcv
- ❑ VDE SAT: 6 ch. ↑ 6 ch. ↓

32x greater throughput

It's performance and
carriage requirements
currently under
discussion at IMO





**United States Coast Guard
Office of Navigation Systems**



"We Help Mariners Get There"

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