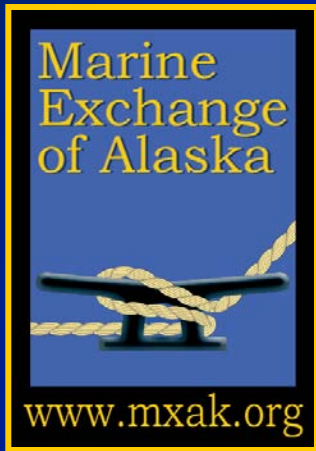


Marine Board Workshop: Safe Navigation in the Arctic

Shipping Operations / Traffic Regulation Schemes

**Vessel Traffic Monitoring & Management Options for
Reducing Risk of Arctic Maritime Operations**

Captain Ed Page, US Coast Guard (Ret)
Executive Director, Marine Exchange of Alaska



Marine Exchanges

Exchange Maritime Information



Telegraph Hill San Francisco
1850

Marine Exchanges Date Back to 1800's

- Honest Brokers of Maritime Information
- Initially used telescopes and semaphore
- Today radars, radios, AIS, e-mail, web, and satellites.



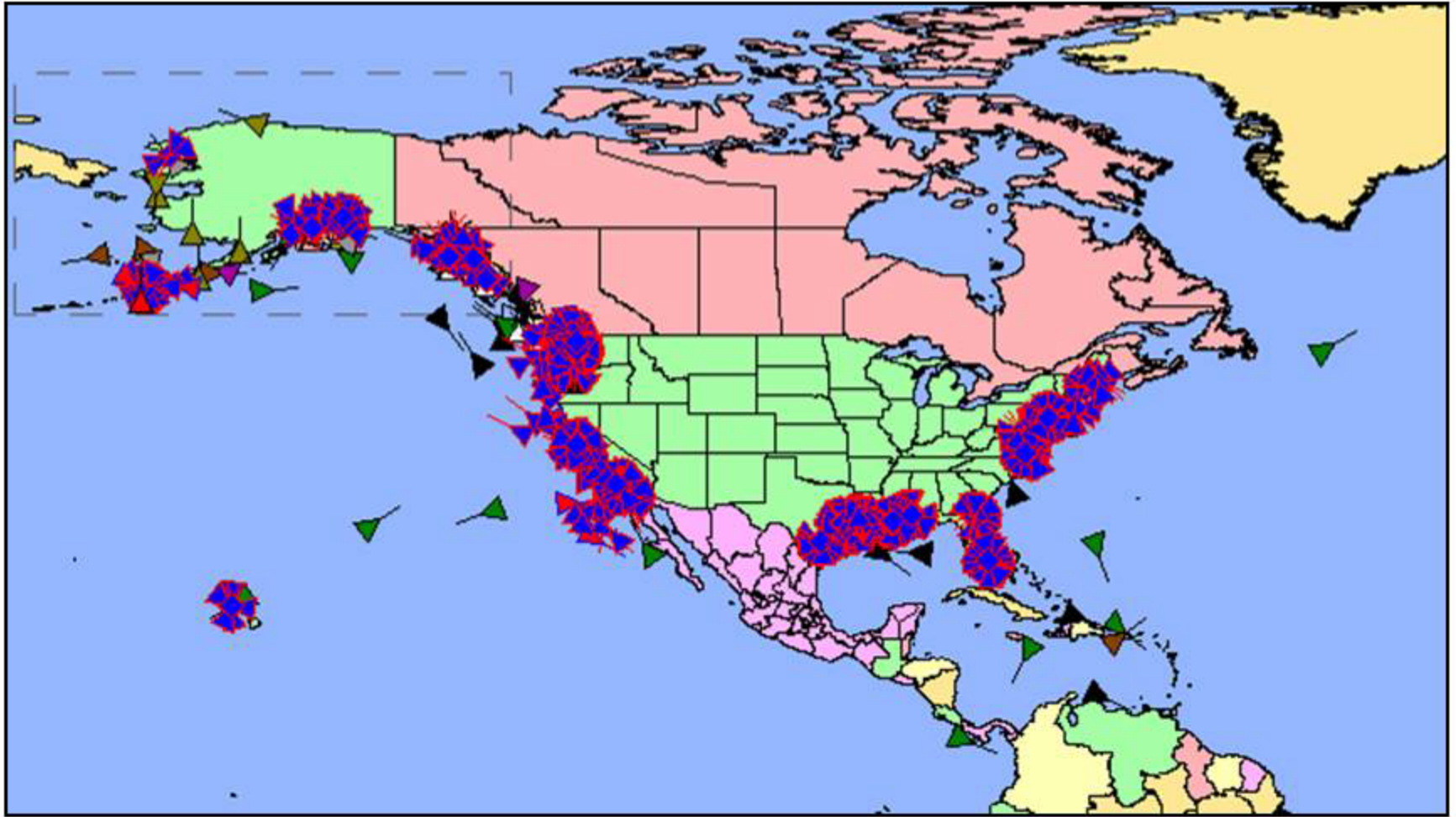
San Francisco Exchange 1857



MISNA Vessel Tracking

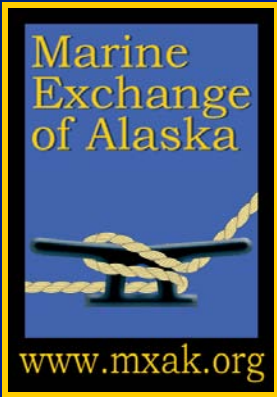
North America AIS and Satellite Tracking

150+ AIS Sites - 3,500+ vessels daily



MXAK 7x24 Operations Center



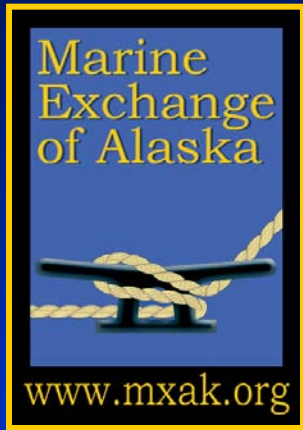


Members – Maritime Professionals

Puget Sound, Southeast Alaska,
Prince William Sound and Western Alaska

- Tanker Companies
- AMHS
- Cruise Industry
- Container Lines
- Passenger Vessel Operators
- Ports and Harbors
- Tug and Barge Companies
- Oil Spill Response Organizations
- Fishing Companies
- Pilot Associations





Why Track Vessels?

- Save Lives
- Environmental Protection
- Validate Compliance
- Emergency Response
- Improve Efficiency
- Maritime Security
- Risk Assessment



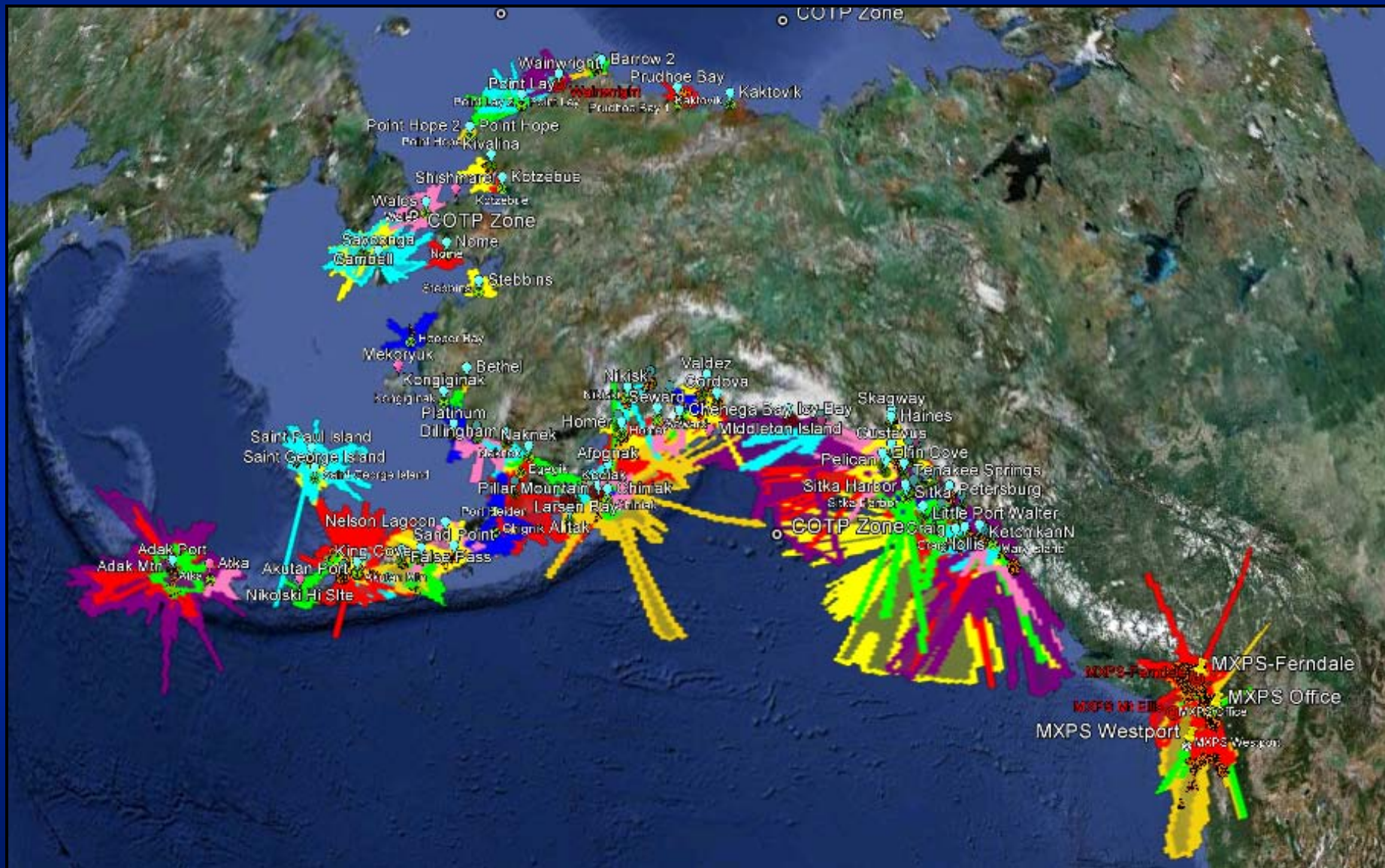
*Safe, Secure, Efficient and Environmentally
Sound Maritime Operations*

AIS

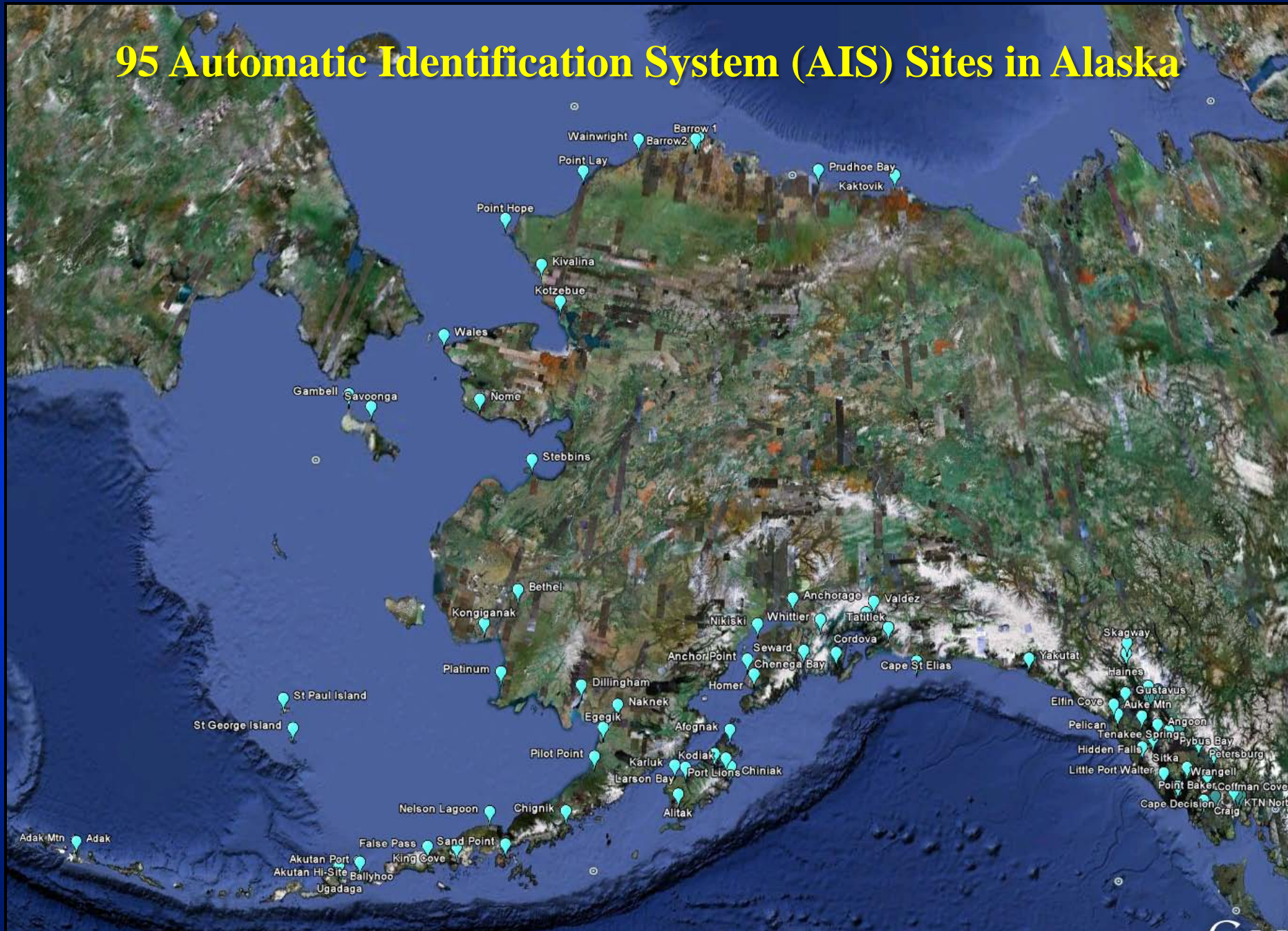
Cornerstone of Arctic Vessel Traffic Monitoring & Management System

- Biggest maritime technological advance since GPS
- Truth serum
- Compels and monitors compliance
- Aids emergency response
- Enhances efficiency
- Manage Fleet

Alaska AIS Network



95 Automatic Identification System (AIS) Sites in Alaska

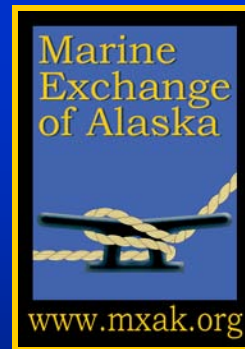


Vessel Tracking Support

Alaska Maritime Community Support of AIS Network

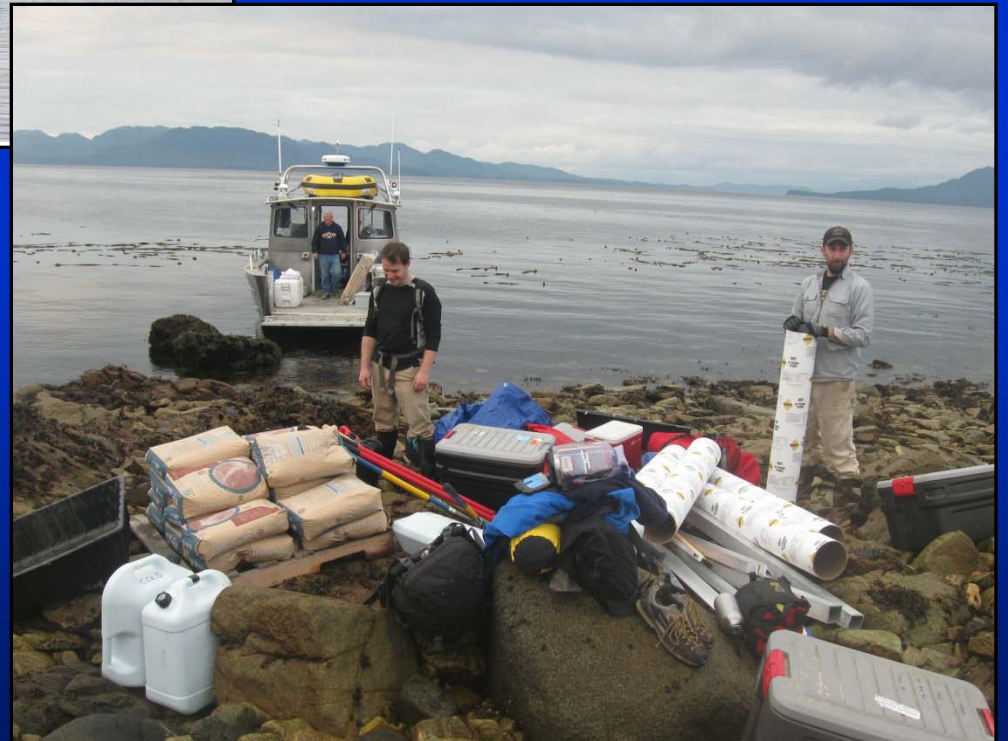


- Lighthouse Associations
- Pilot Stations
- Harbor Offices
- Fish Hatcheries
- Tug Offices
- Shipping Companies
- Fish Processing Plants
- Tribal Offices
- Oil Facilities
- Science Centers
- Oil Spill Response Organizations

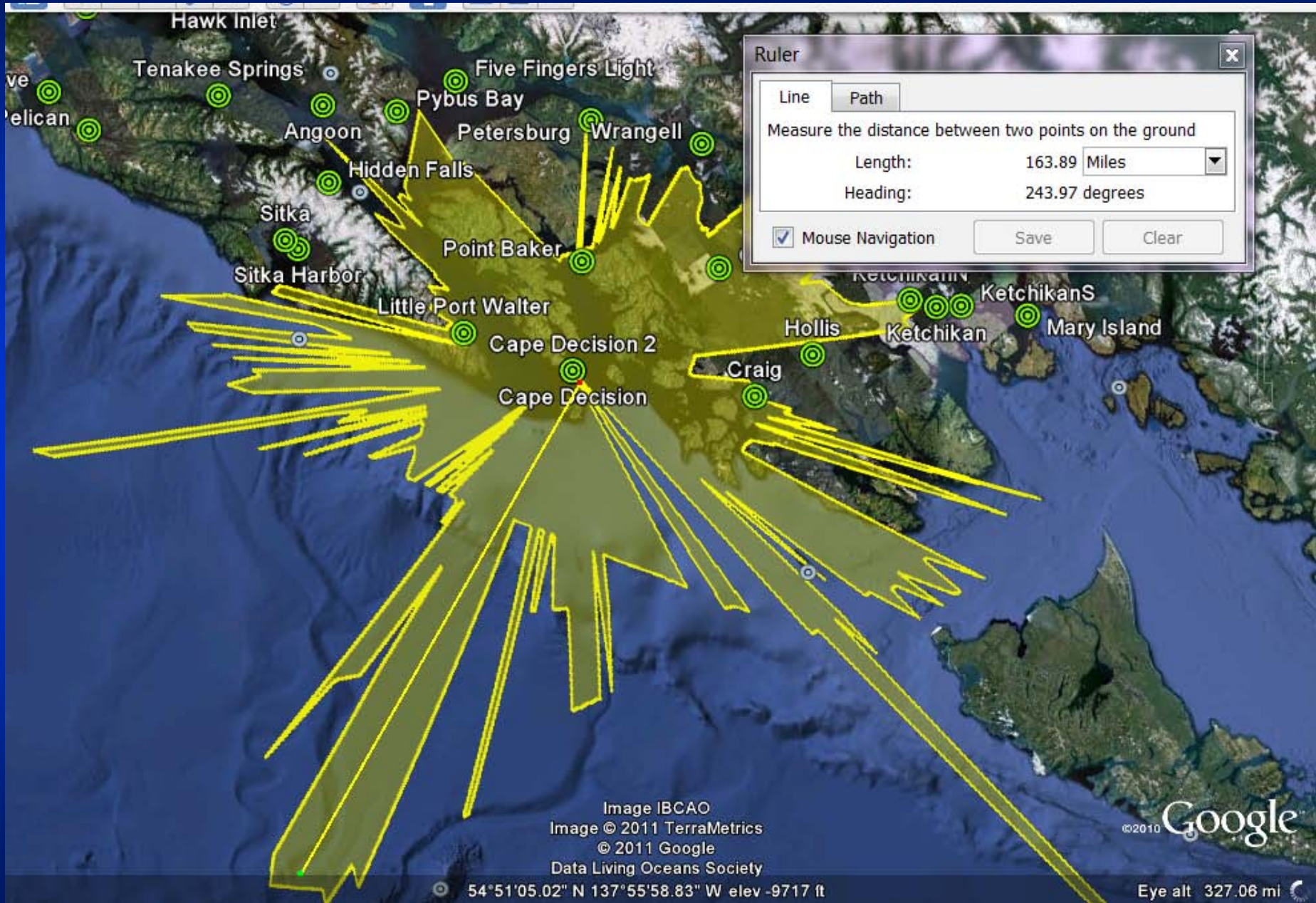




Remote – Self Supporting Sites







Ruler

Line Path

Measure the distance between two points on the ground

Length: 163.89 Miles

Heading: 243.97 degrees

Mouse Navigation

Save Clear

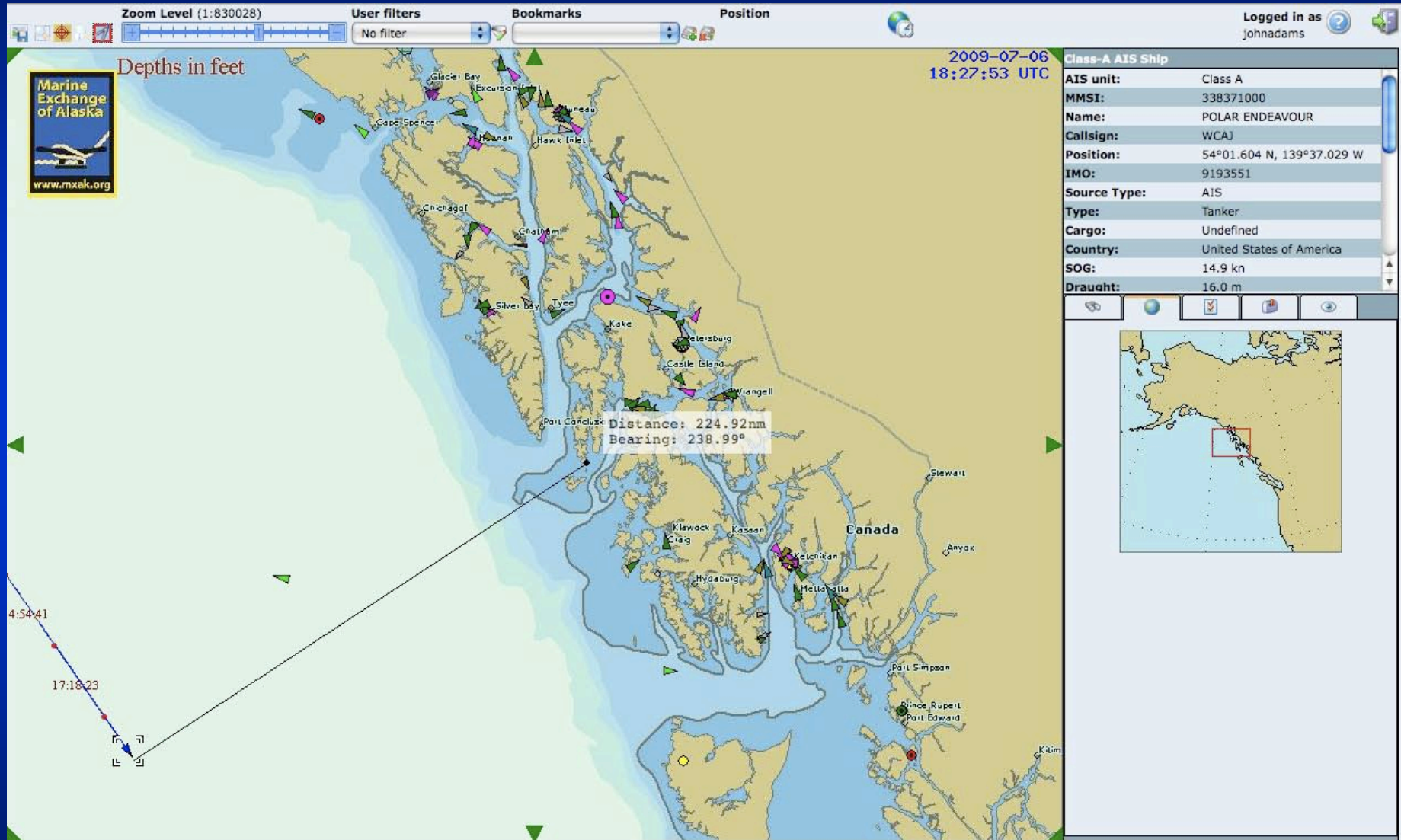
Image IBCAO
Image © 2011 TerraMetrics
© 2011 Google
Data Living Oceans Society

54°51'05.02" N 137°55'58.83" W elev -9717 ft

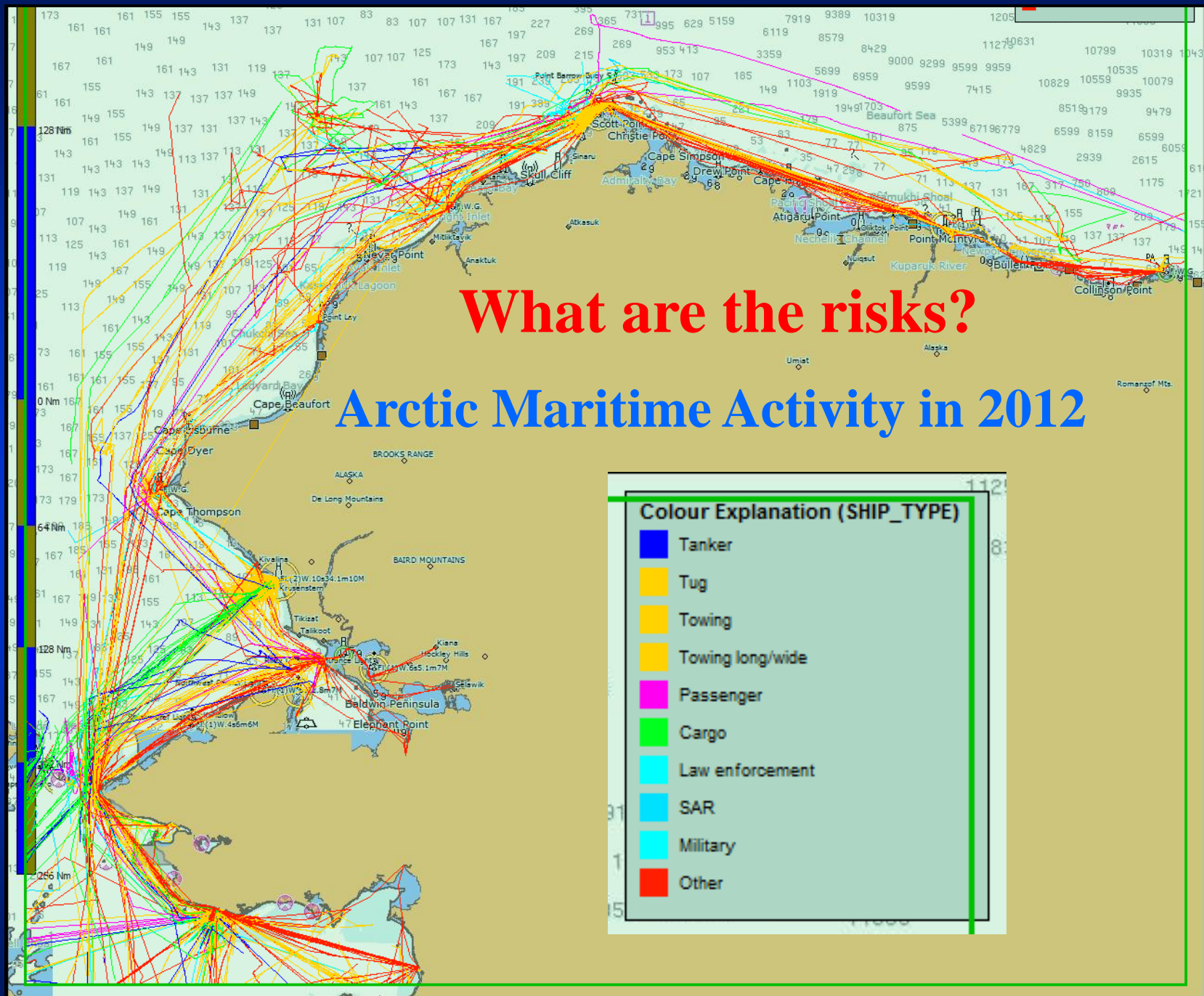
©2010 Google

Eye alt 327.06 mi

Cape Decision AIS



Polar Endeavour tracked 225 nm from Cape Decision

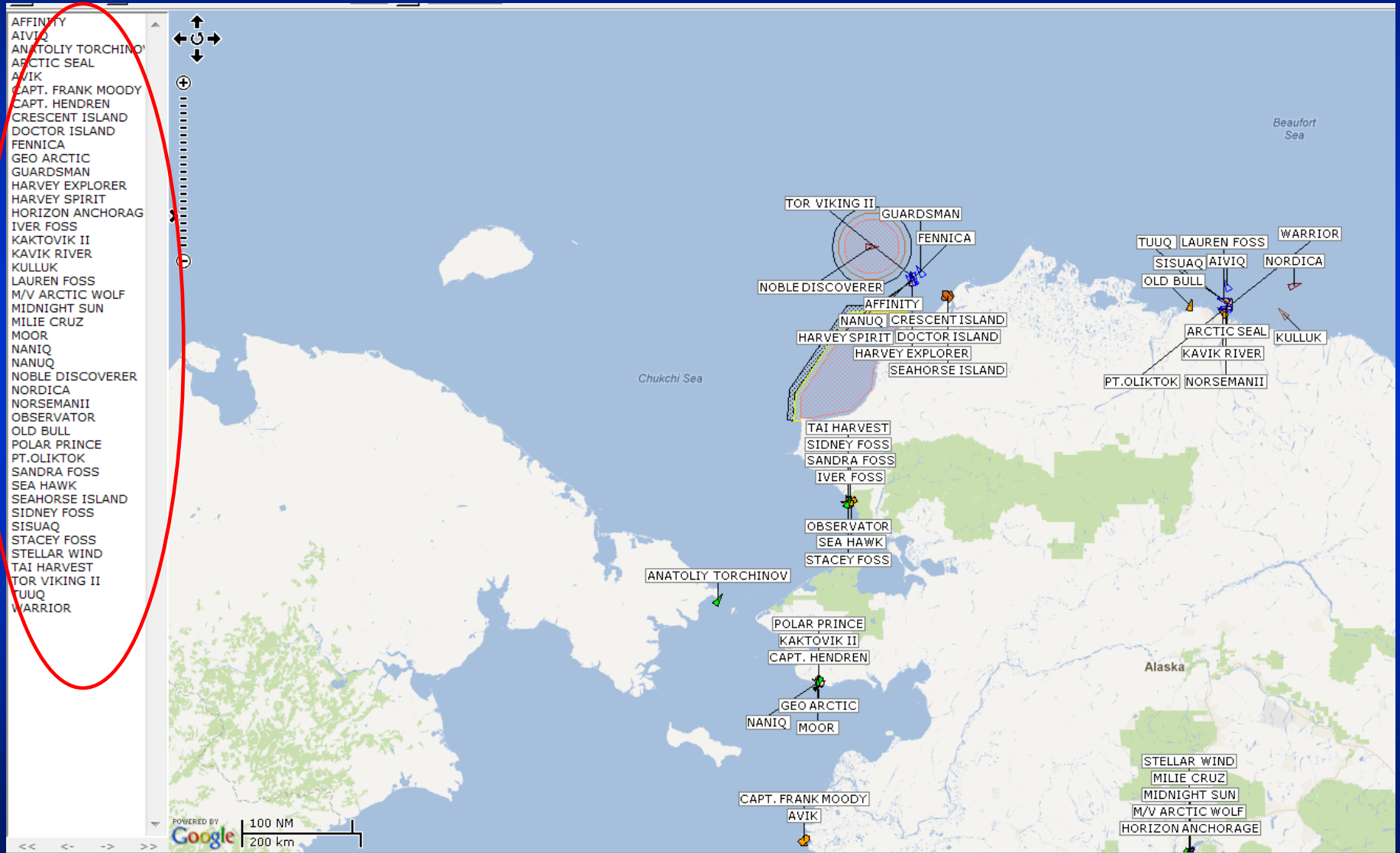


Arctic Maritime Activity from AIS Monitoring

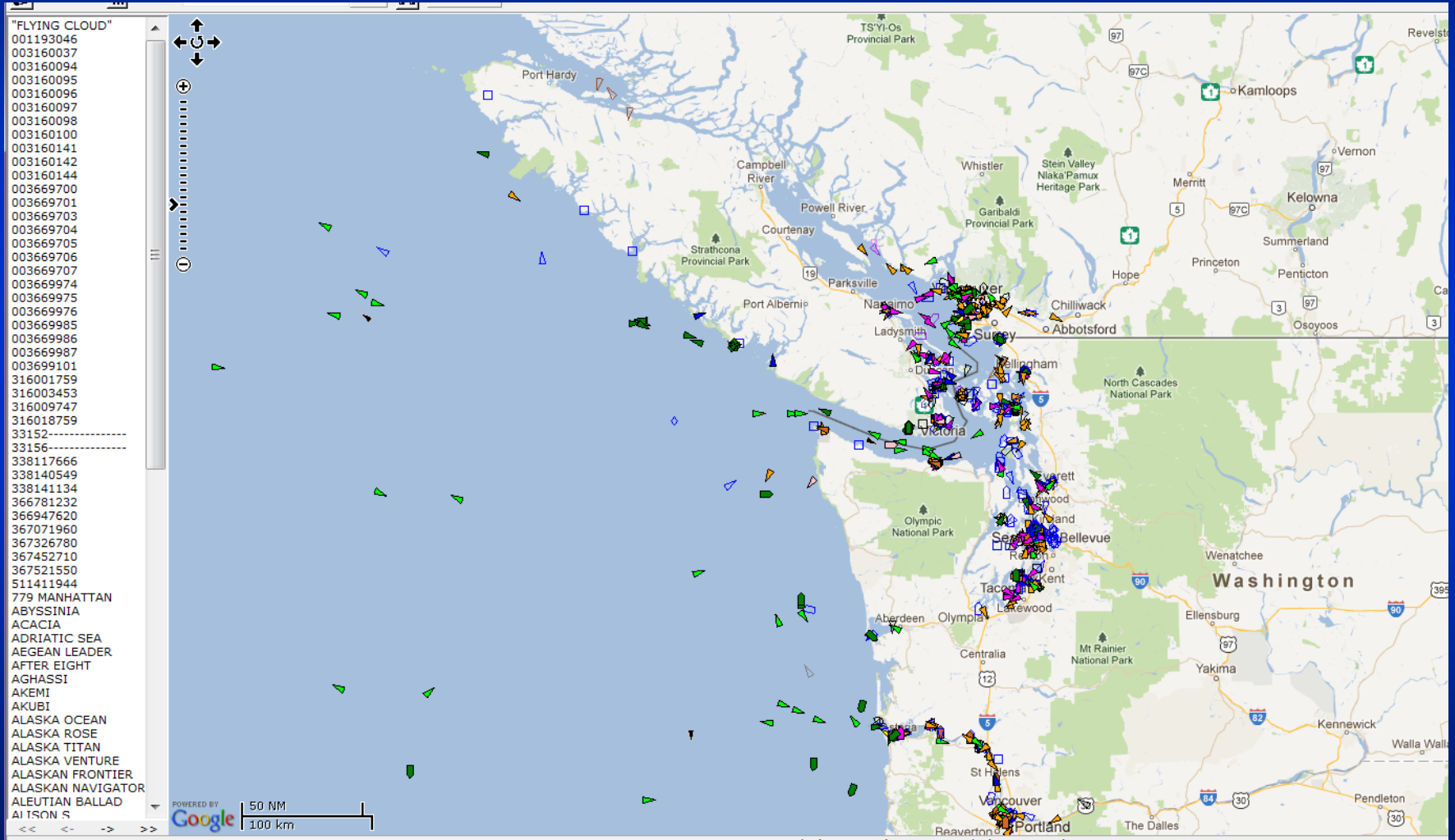


Towing	38
Bulk Carriers	19
Product Tanker	12
General Cargo	9
Oceanographic Research	8
Icebreaker (various types)	8
Anti Pollution	5
Fishing	5
Landing craft	4
Offshore Supply	4
US Coast Guard	4
Unidentified	4
Canadian Coast Guard Icebreaker	1
Chemical Tanker	2
Containership	1
Dredging (probably incorrect)	1
Drill Ship	1
Greenpeace Yacht	1
Integrated tug barge	2
MODU	1
Anchor Handling Tug Supply	2
Passenger	2
Reefer Cargo	1
RORO	1
Sailing Yachts	2
SAR	1

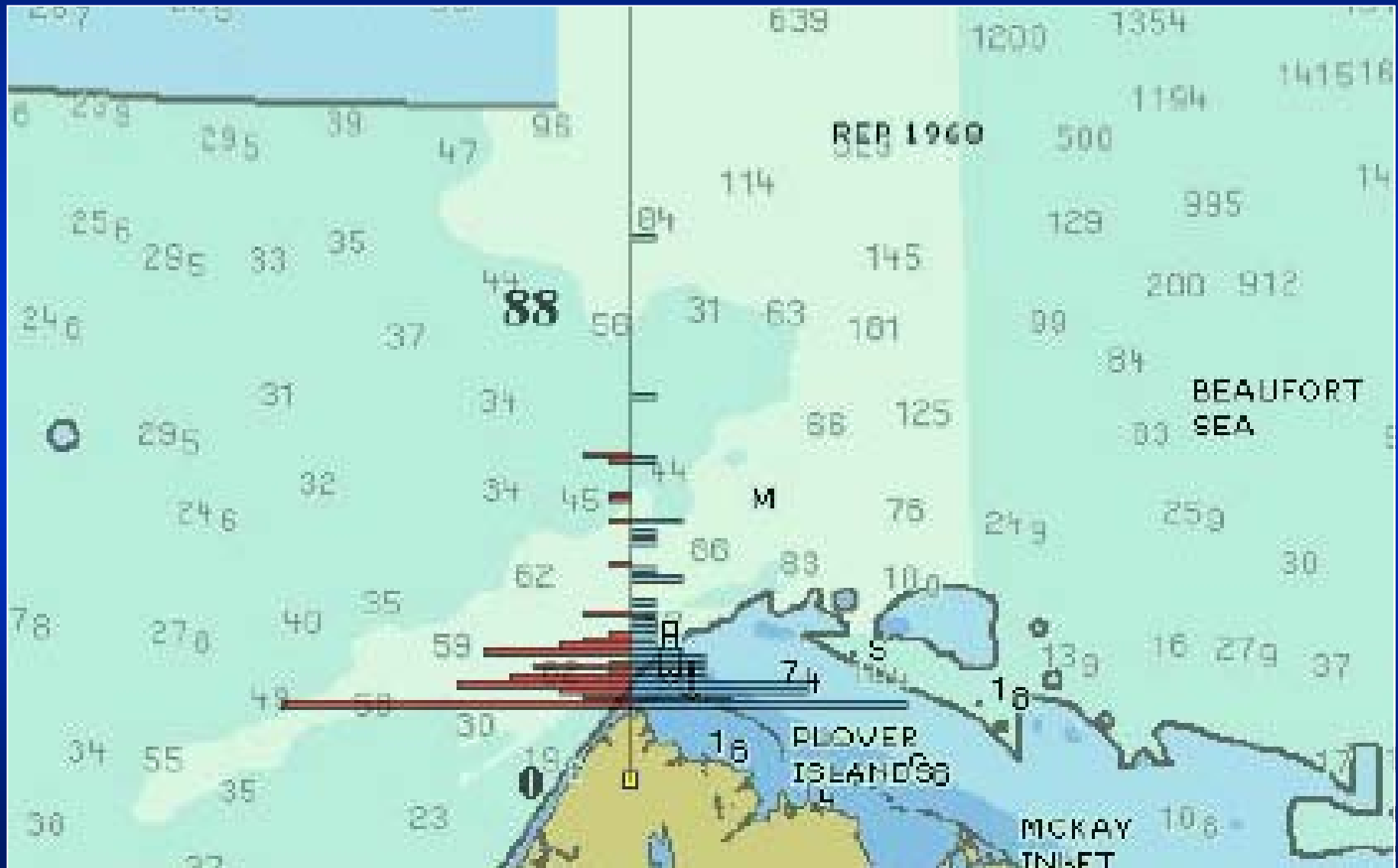
Arctic Maritime Activity



Puget Sound Maritime Activity

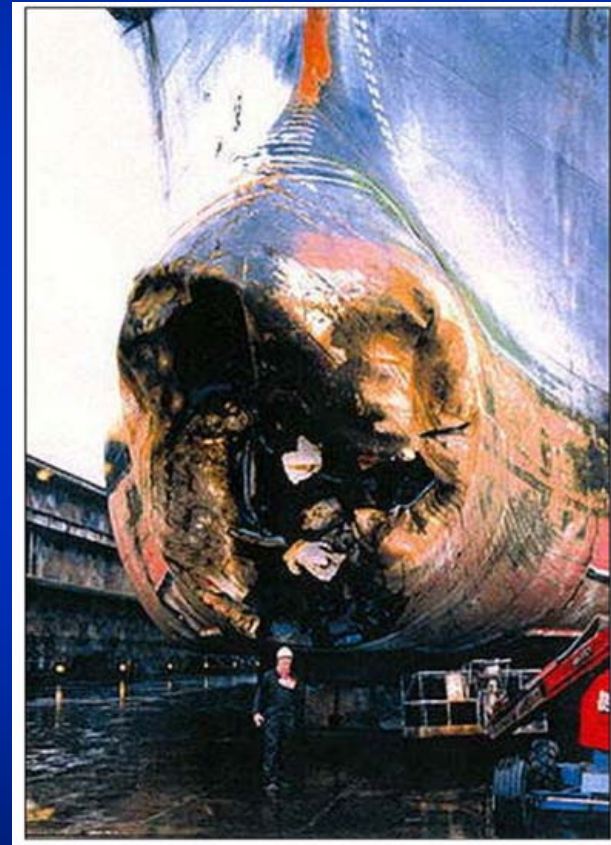


Barrow Passage Line



What are Issues of Concern?

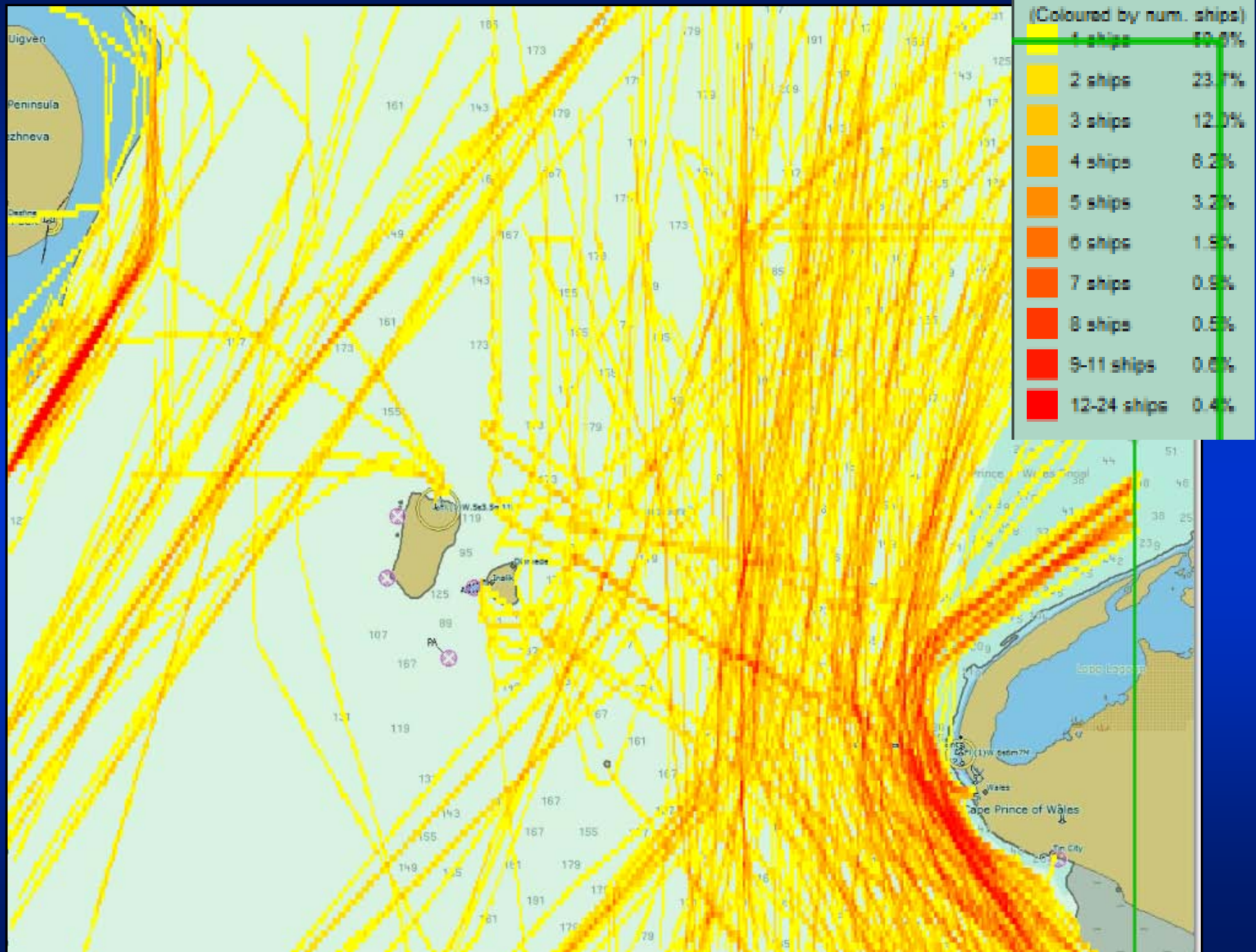
- Groundings
- Collisions
- Loss of Power
- Ice Encounters
- Sinking
- Oil Spills
- SAR/Medivacs

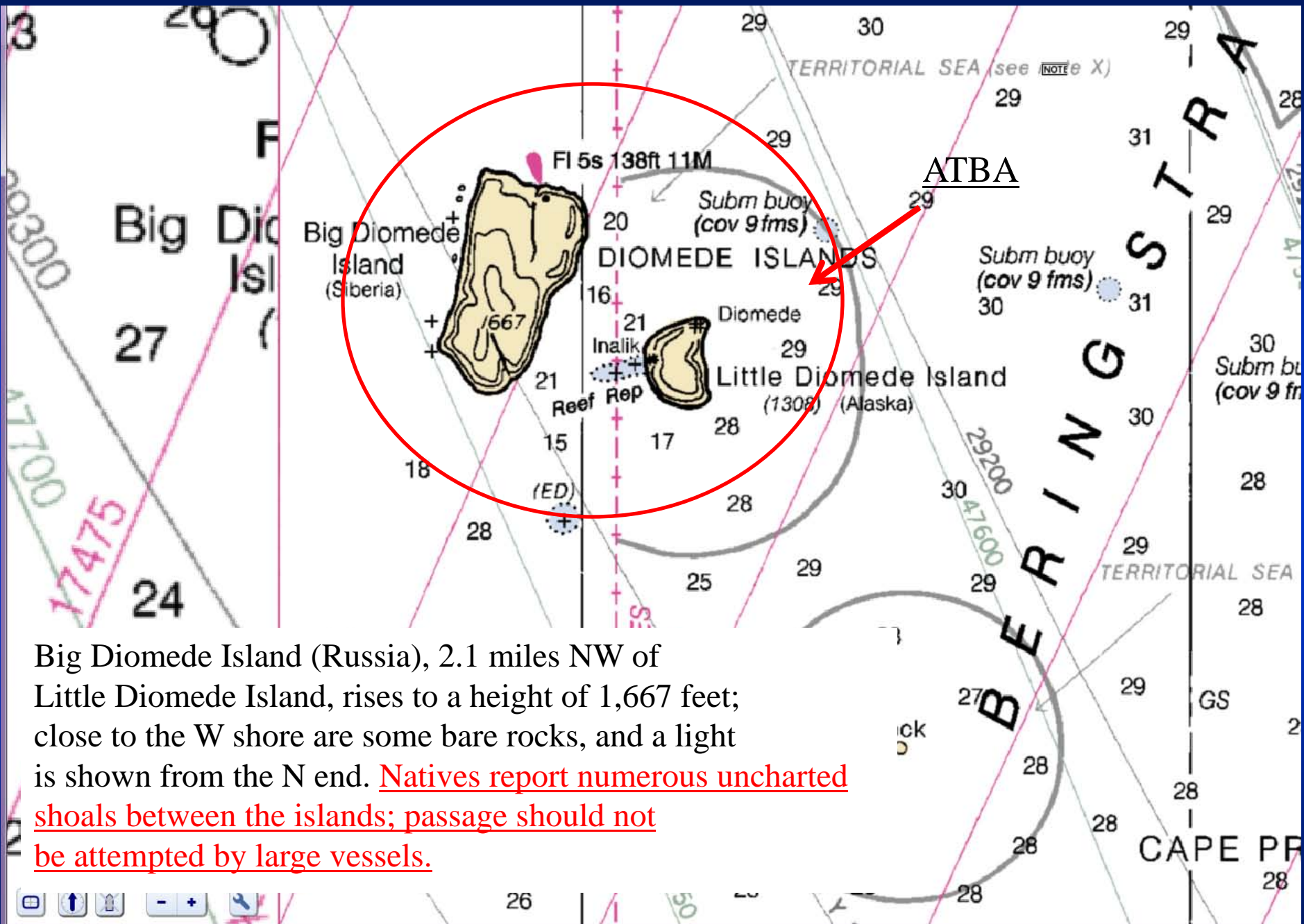


What are the Vessels of Concern?

- Tankers
- Cargo Ships
- Offshore Supply Vessels
- Drilling Vessels
- Tugs and Oil Barges
- Fishing Vessels
- Tugs and Deck Barges
- Landing Craft
- Oil Spill Response Vessels
- Yachts

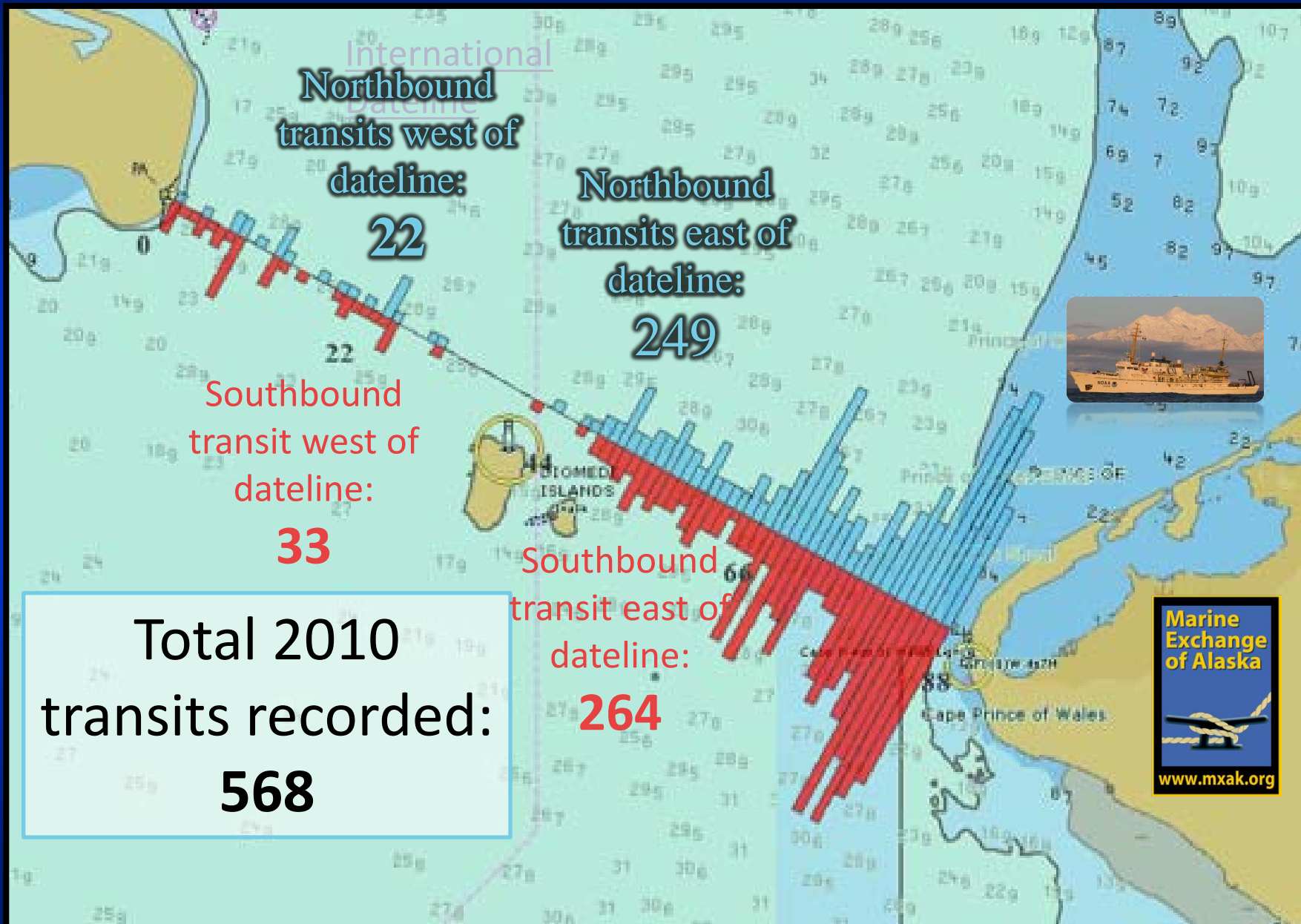


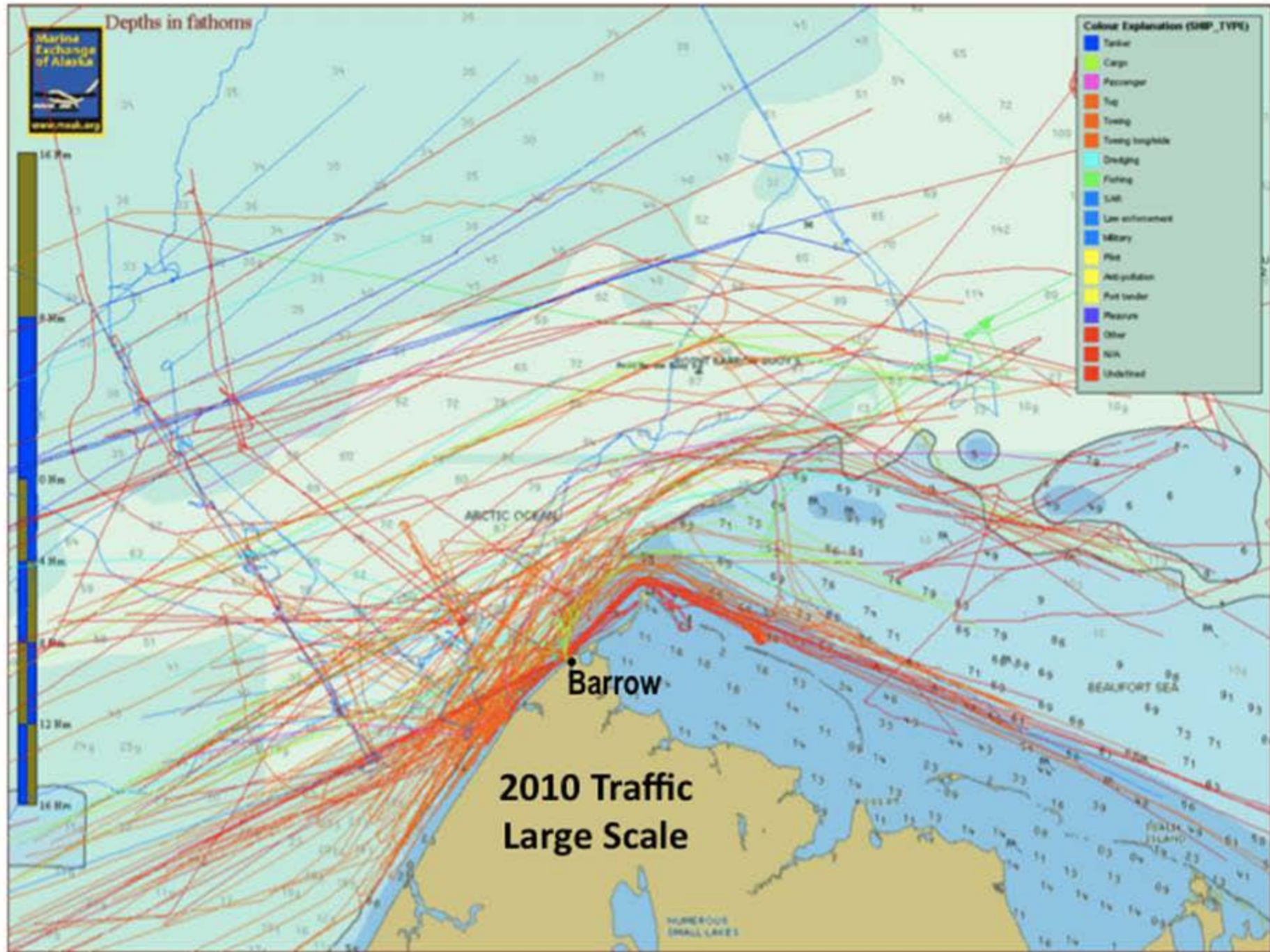




Big Diomedede Island (Russia), 2.1 miles NW of Little Diomedede Island, rises to a height of 1,667 feet; close to the W shore are some bare rocks, and a light is shown from the N end. Natives report numerous uncharted shoals between the islands; passage should not be attempted by large vessels.

Bering Strait Transits by Section – 2010





99.9% Success =

Public Outrage



Exxon Valdez



Costa Concordia



Rena

What are the Risk Mitigation Options?

- Compelling compliance with;
 - Areas to Be Avoided
 - Traffic Separation Schemes
 - Safe Distance Offshore
 - Reduced speed regions
- Providing information on;
 - Locations of Ice
 - Locations of native whalers/hunters
 - Locations of whales
 - Location of response vessels
- Caching Emergency Towing Systems

Means of Ensuring Compliance with Risk Reduction Measures

NOTIFY



REMIND



ENFORCE



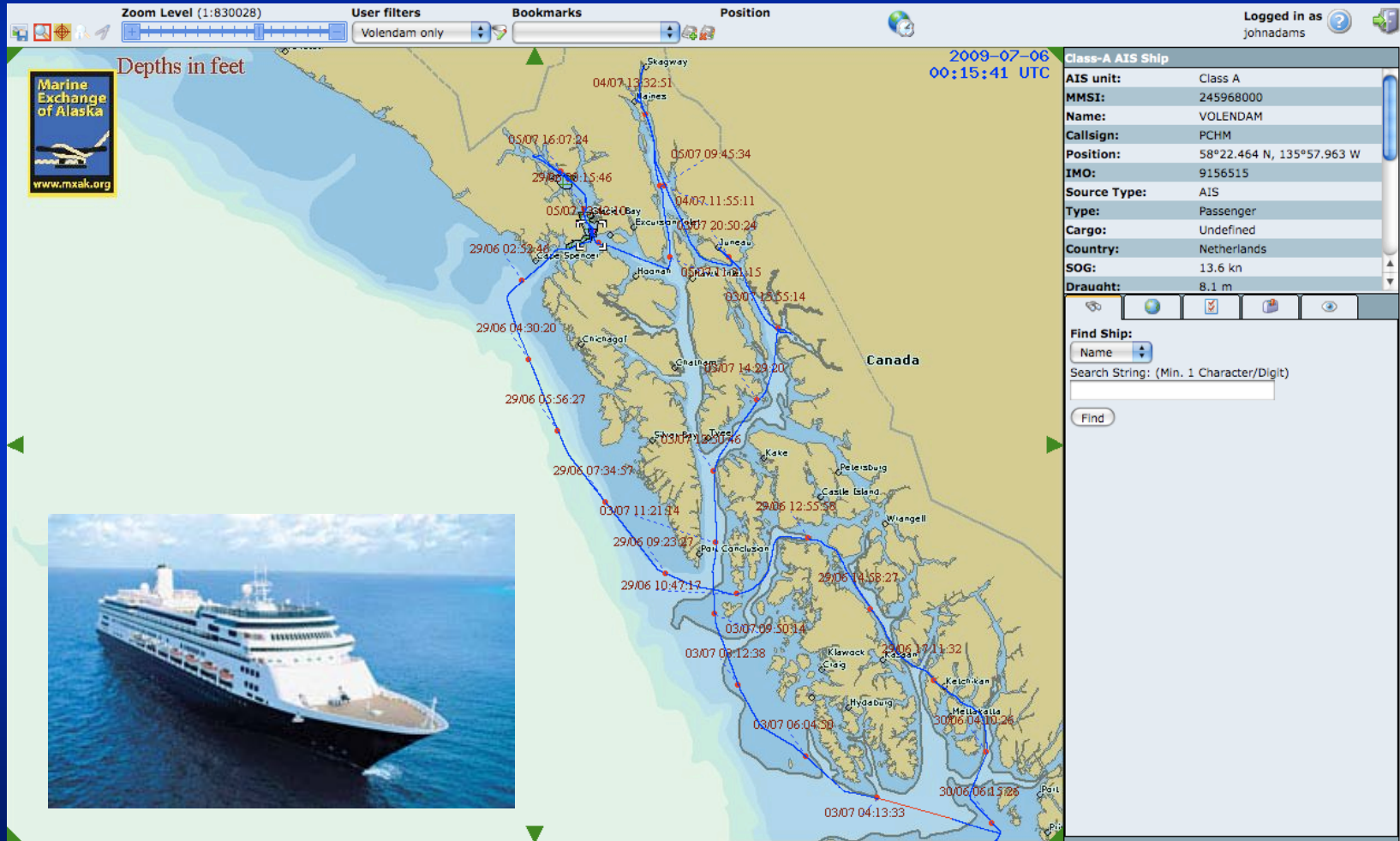
AIS

Detect, Deter, Enforce

Safety related acknowledgement	Acknowledgement of received addressed safety related message	
Safety related broadcast message	Safety related data for broadcast communication	
Interrogation	Request for a specific message type (can result in multiple responses from one or several stations) ⁽⁴⁾	

Application of AIS in Alaska Today

Environmental Protection

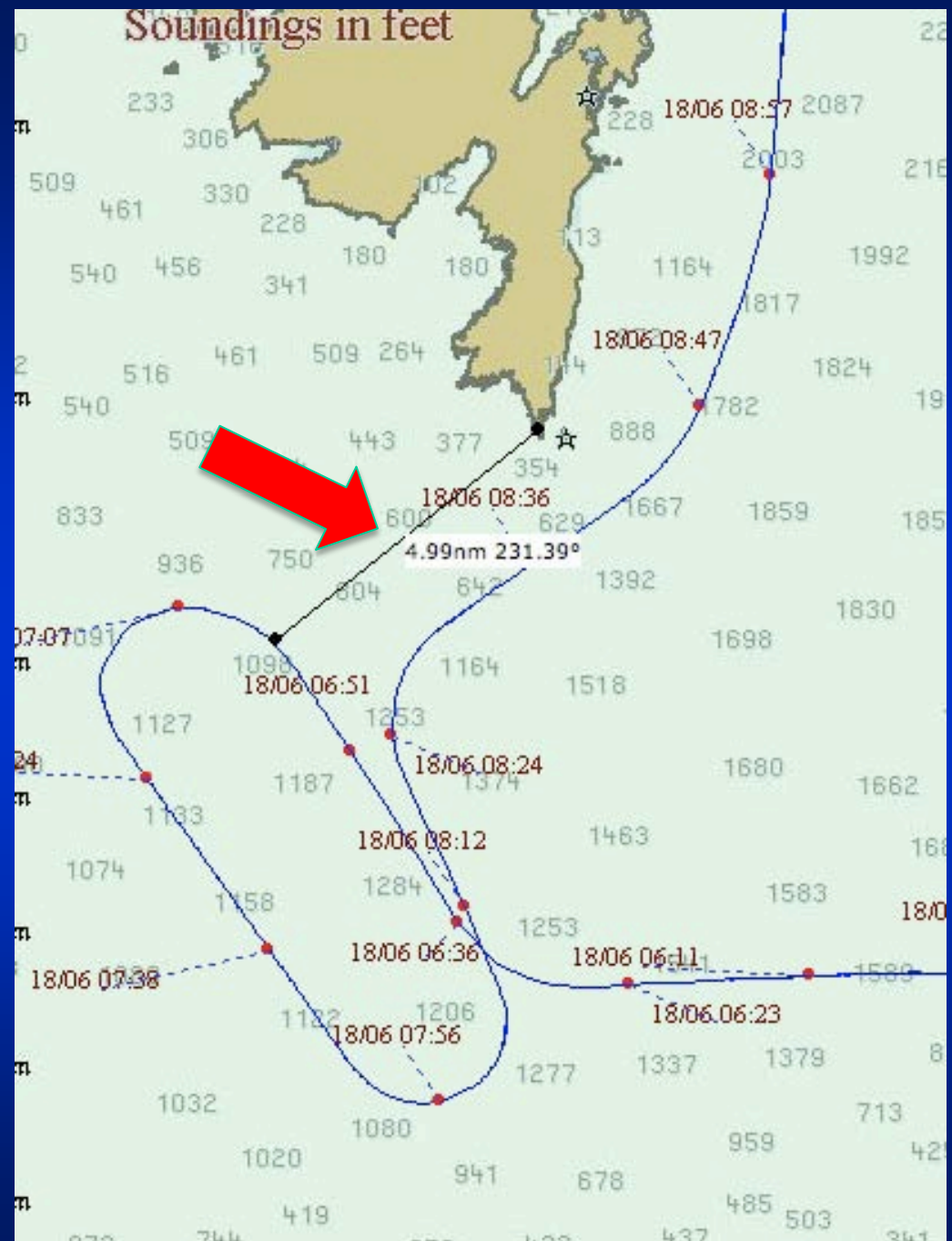


AIS vessel tracking of Cruise Ships provides:

- frequent position reports
- greater detail
- lower cost

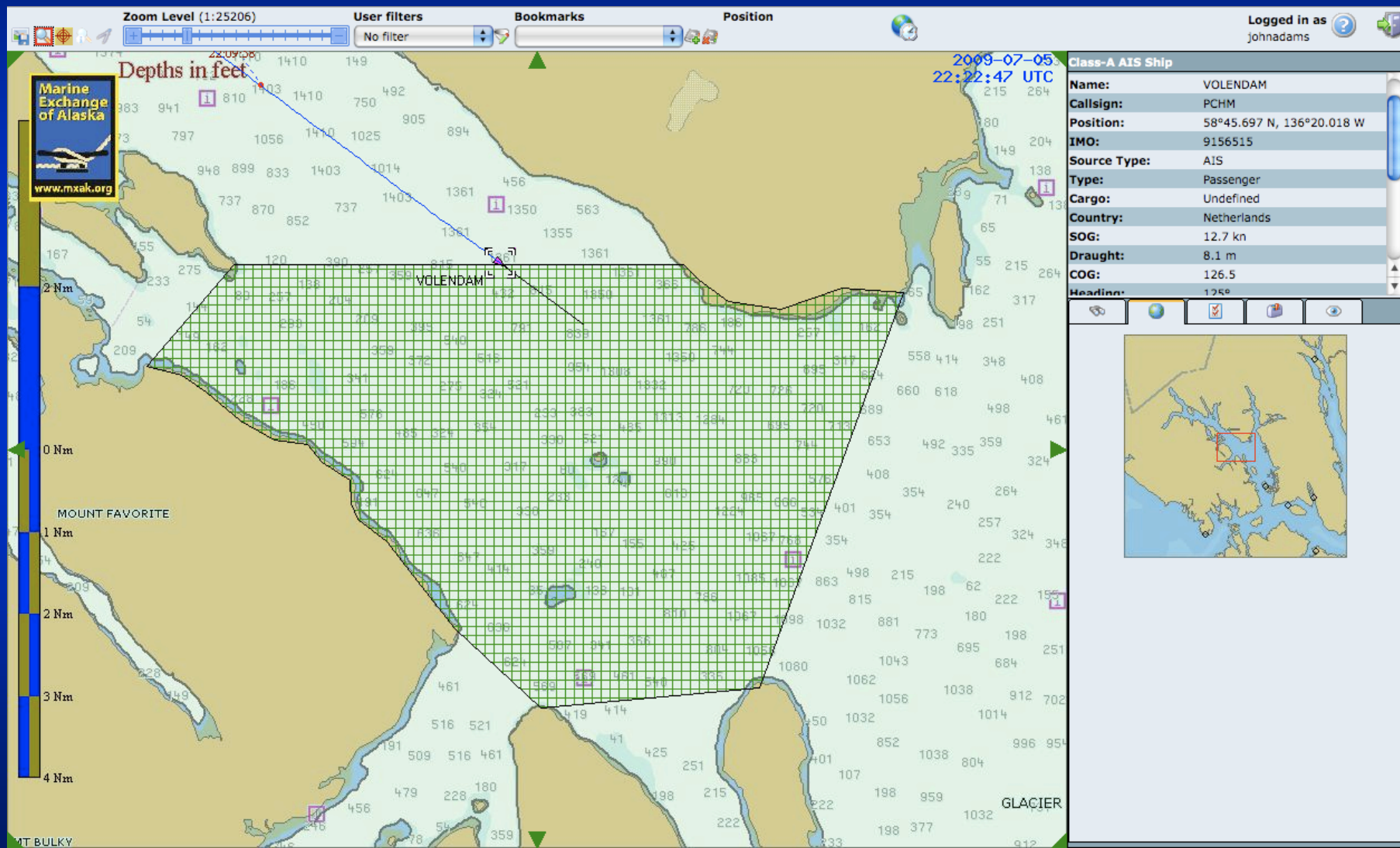
Verification of compliant maritime operations.

Environmental monitoring.

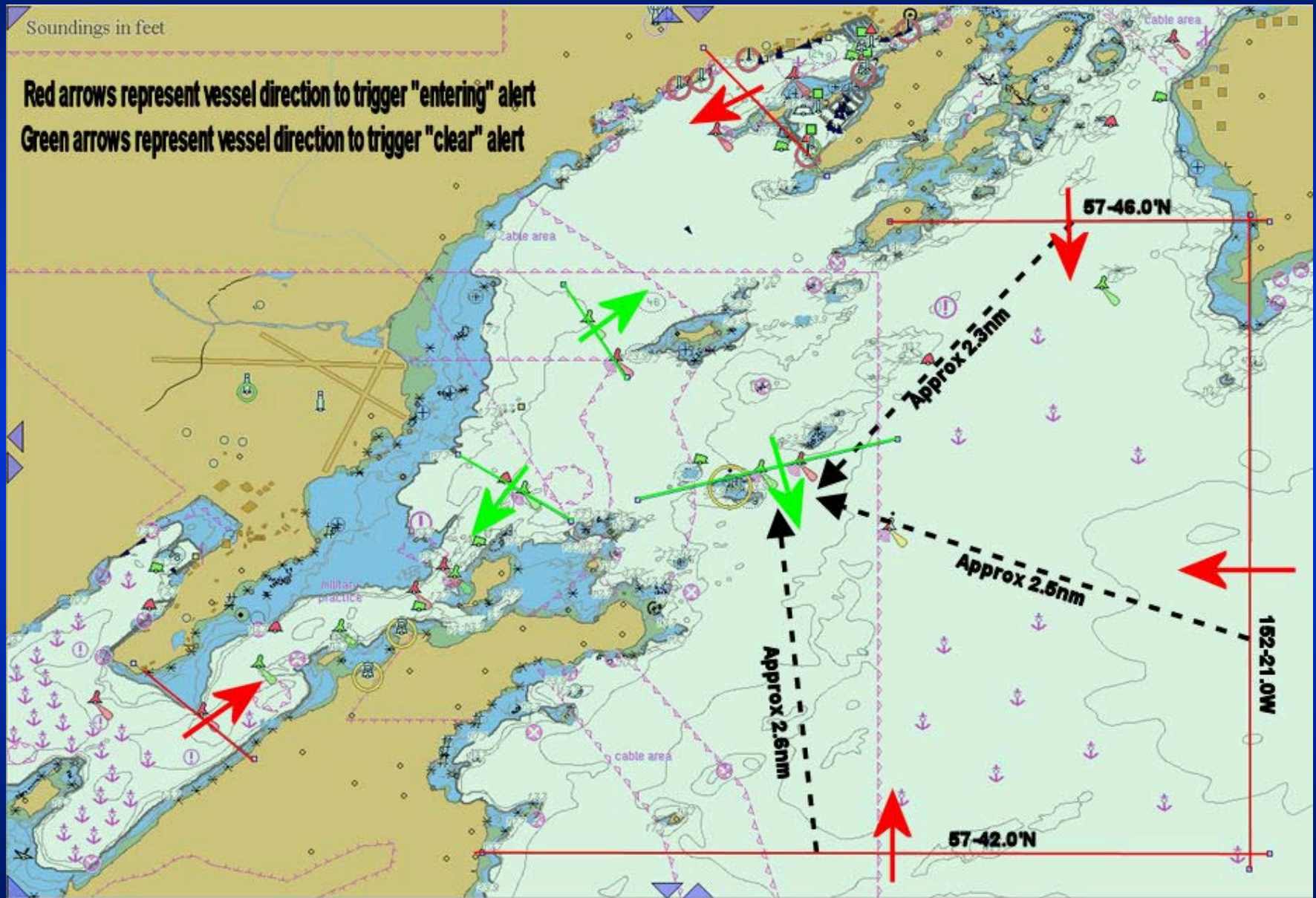


Cruise ship enters Whale Waters at less than 13 knots

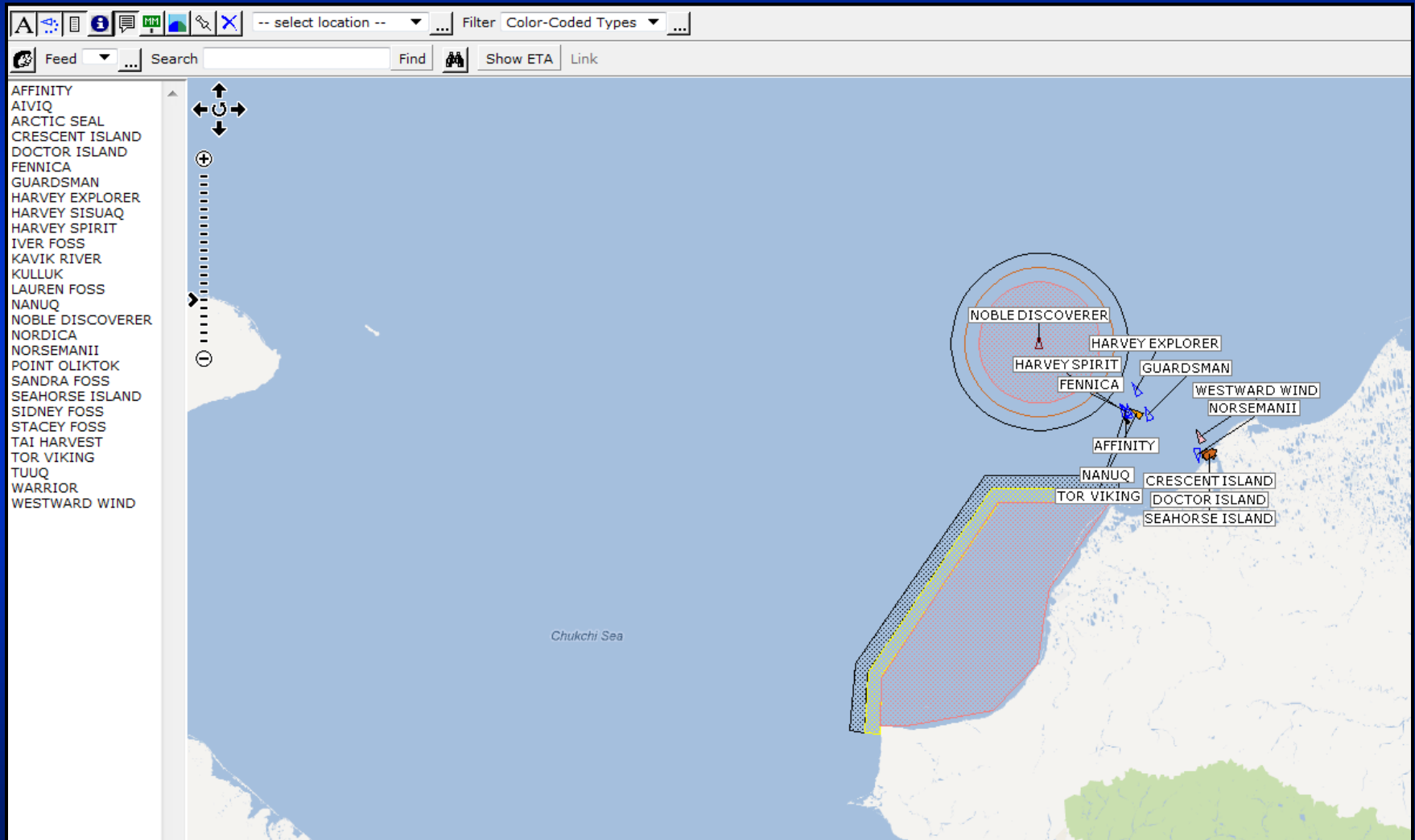
Automatic generation of e-mail and text msg alerts



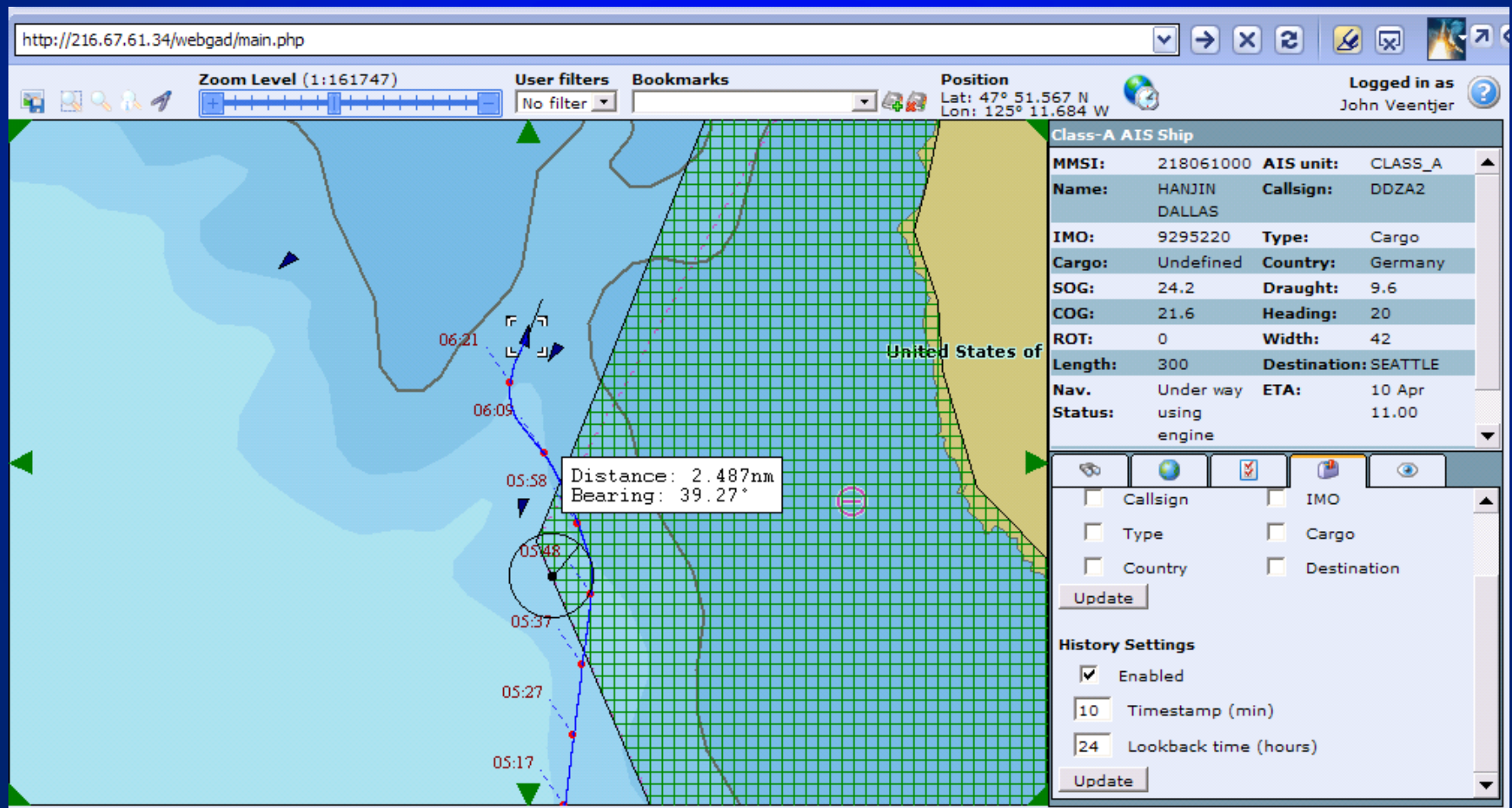
Preventing Vessel / Aircraft Collisions



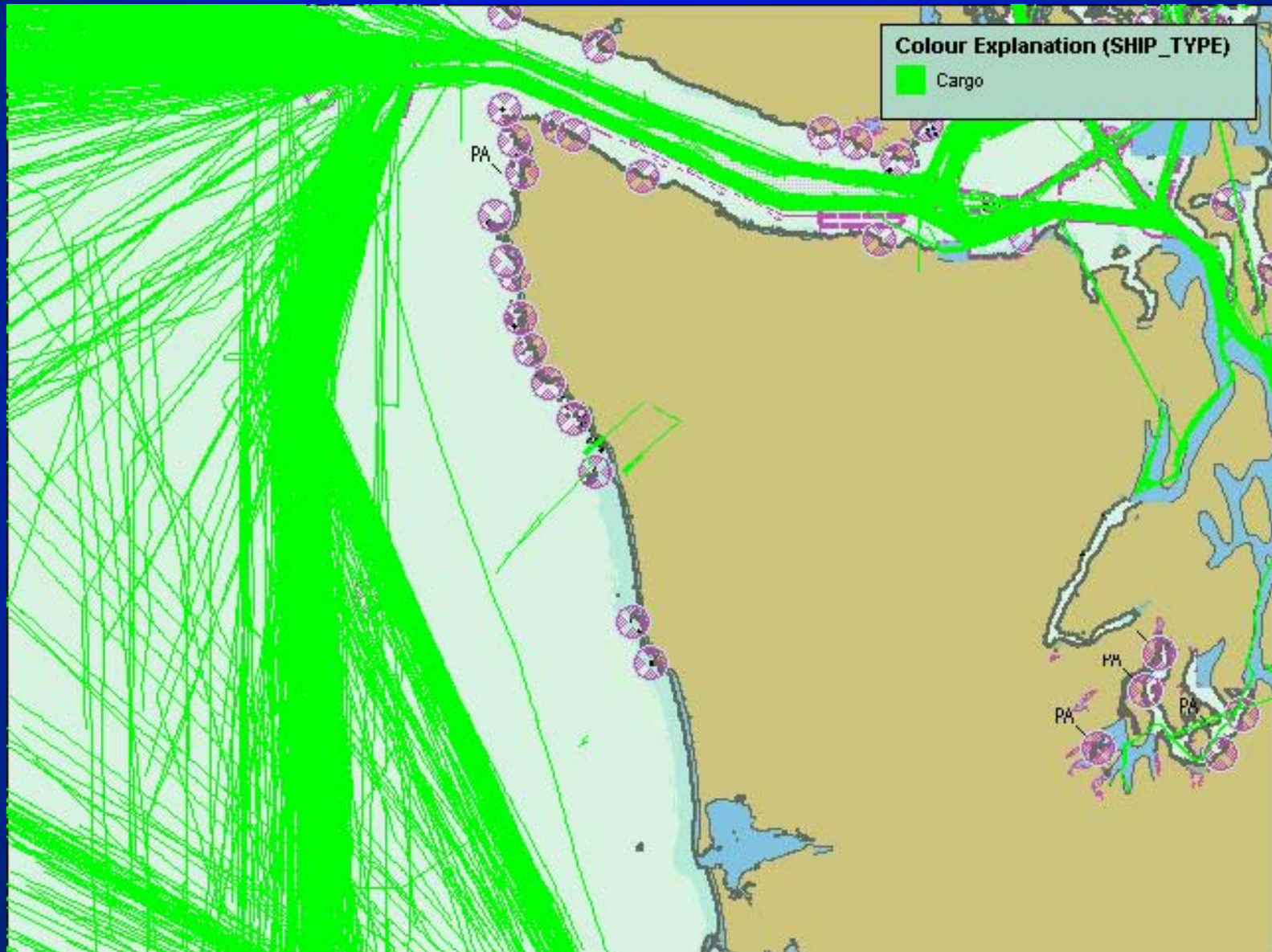
Shell Exploration Fleet Monitoring



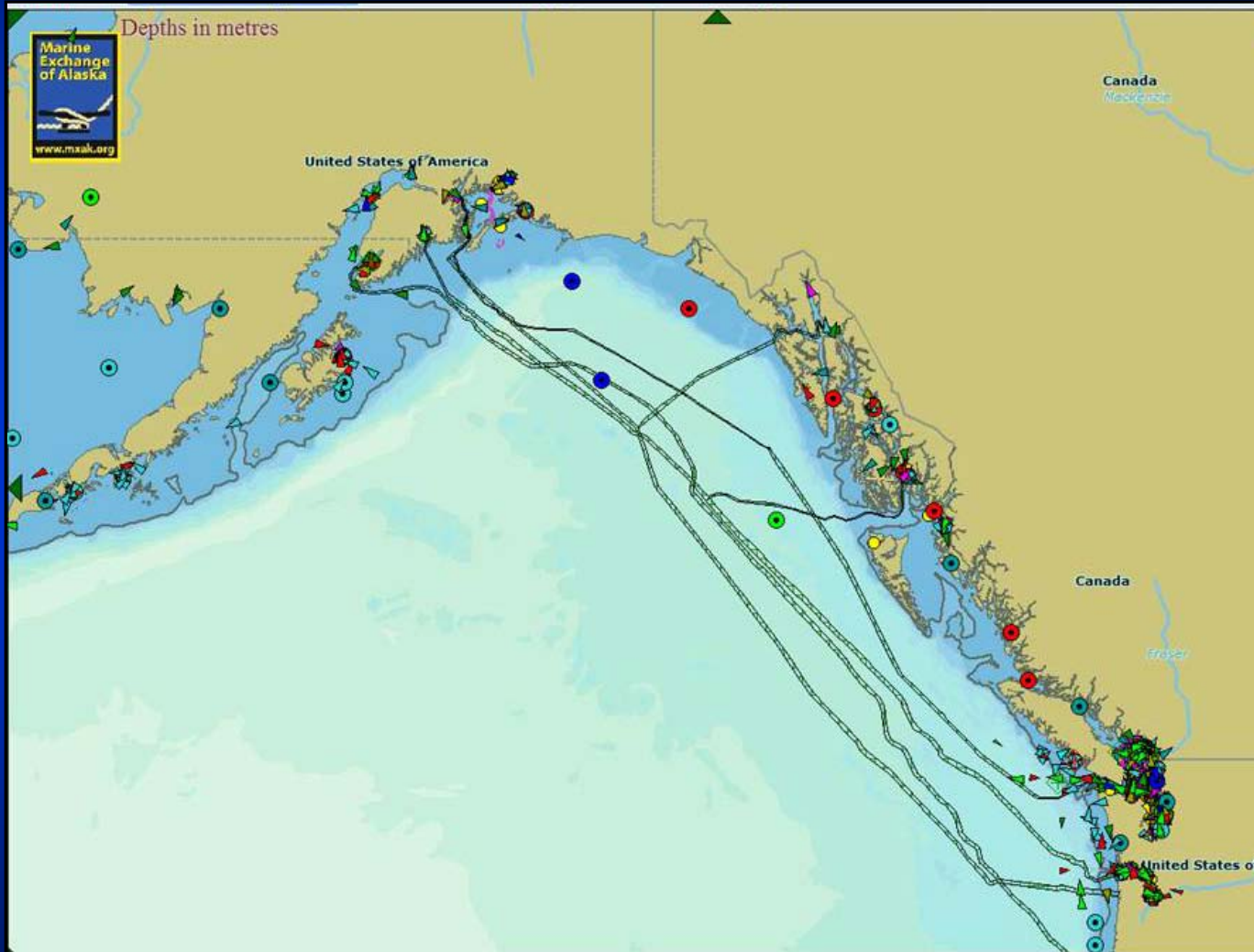
Area To Be Avoided (ATBA) Monitoring Olympic Coast Marine Sanctuary



Long Term Voluntary Compliance with ATBA



Fiber Cable Watchdogs



View Historical Watchdog Events
 Configure Watchdog Areas

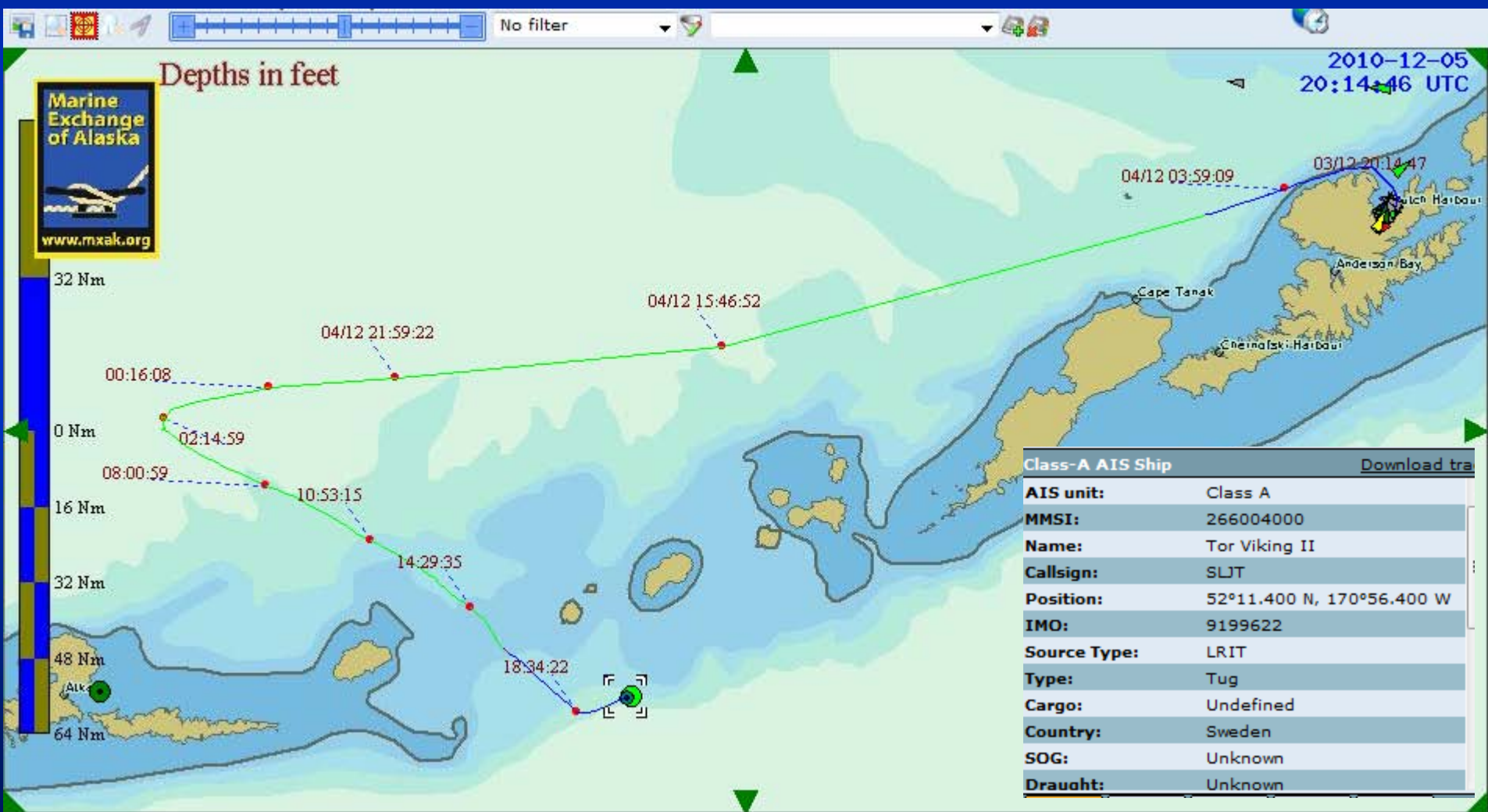
Name	Target Name	MMSI
GCI AUF-D	GUARDIAN	366887210
Dutch Harbor A...	HORIZON ANCHORAGE	366557000
IFA Terminal	LITUYA	366919560
IFA Terminal	LITUYA	366919560
IFA Terminal	LITUYA	366919560
IFA Terminal	LITUYA	366919560
IFA Terminal	LITUYA	366919560
IFA Terminal	LITUYA	366919560
IFA Terminal	LITUYA	366919560
IFA Terminal	LITUYA	366919560
PODutch Marina...	GYRFALCON	366978710
IFA Terminal	LITUYA	366919560
IFA Terminal	LITUYA	366919560

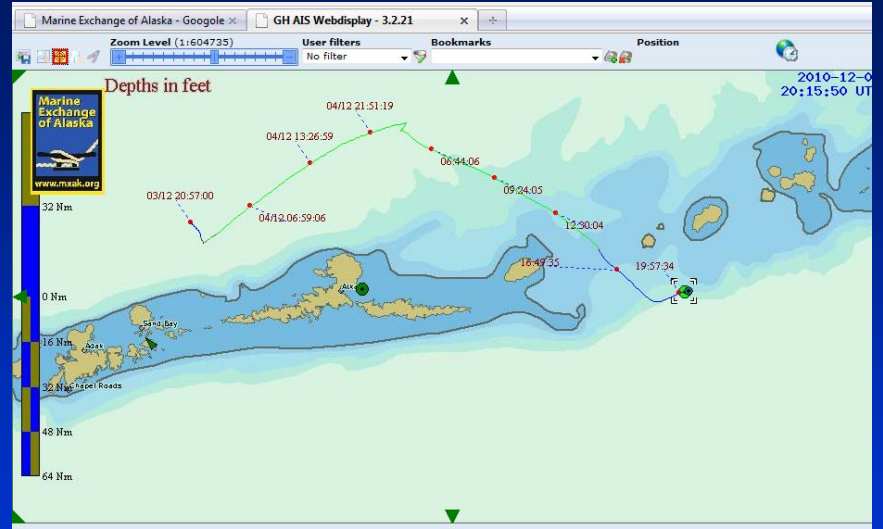
M/V Golden Seas Case Study





Tor Viking

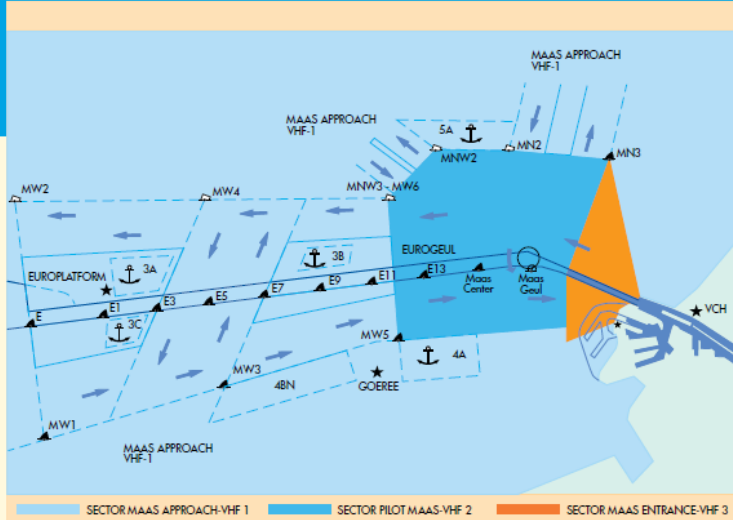




Traditional VTMS

Vessel Traffic Monitoring System

SAFETY THROUGH COMMUNICATION



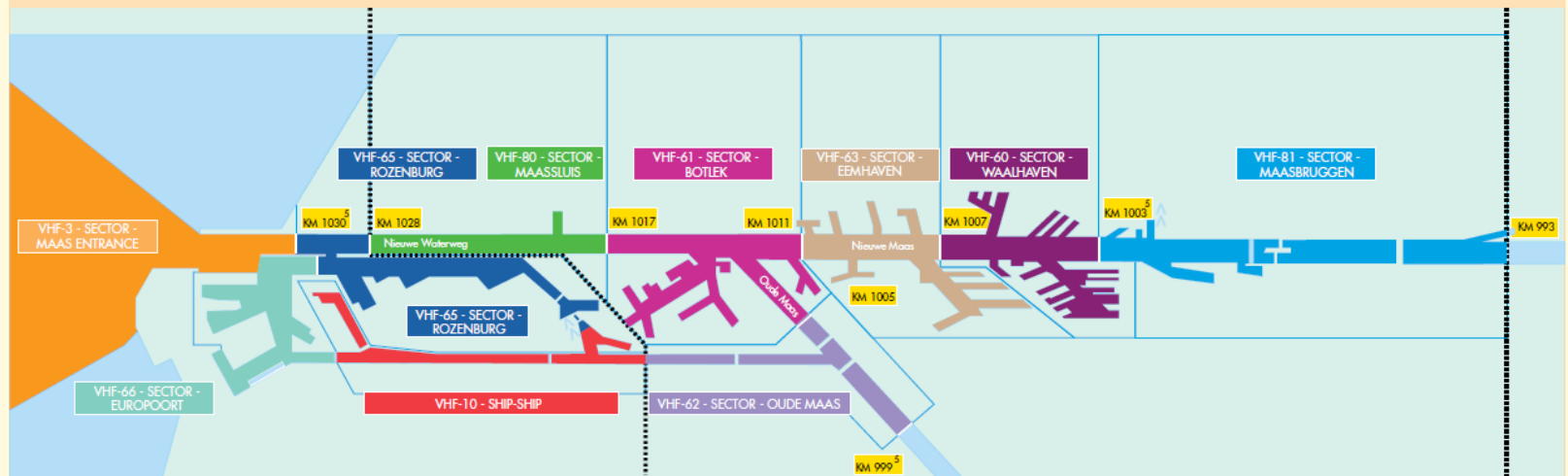
SHIPPING INFORMATION-VTMS

BASIC RULES

- 1 Responsibility as to safe navigation always remains with the master or skipper on board the vessel.
- 2 A continuous listening watch on the assigned VHF channels should be maintained to be kept well informed about the traffic situation.
- 3 Information should be given on request of the VTS-authority / VTS-operator.
- 4 The VTMS provides information, navigational assistance when deemed necessary and possibly traffic instructions on behalf of the Harbourmaster.
- 5 All communication should be brief and relevant.
- 6 Any particulars with regard to navigation or the vessels equipment should be reported..
- 7 The language to be used is primarily Dutch and secondly English with the exception of the sectors Maas Approach (VHF 1), Pilot Maas (VHF 2) and Maas Entrance (VHF 3), where the language to be used is English and secondly Dutch.

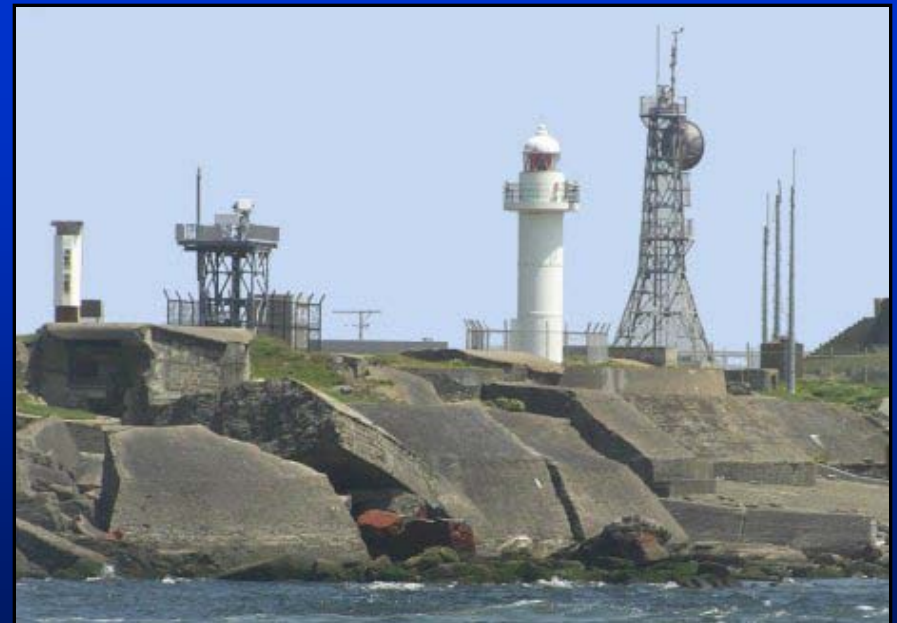
Traffic Centre Hook van Holland VHF-11

Traffic Centre Rotterdam VHF-11





Traditional Vessel Traffic Centers – Port Centric – Radar & Radios



Radars and Voice Communications



Arctic VTMS Tools

- Terrestrial AIS Transceivers
- Satellite AIS Receivers
- Satellite transponders
- Weather Sensors and Transmitters
- Digital Selective Calling Radios
- Electronic watchdogs
- Radars at choke points...AIS validation

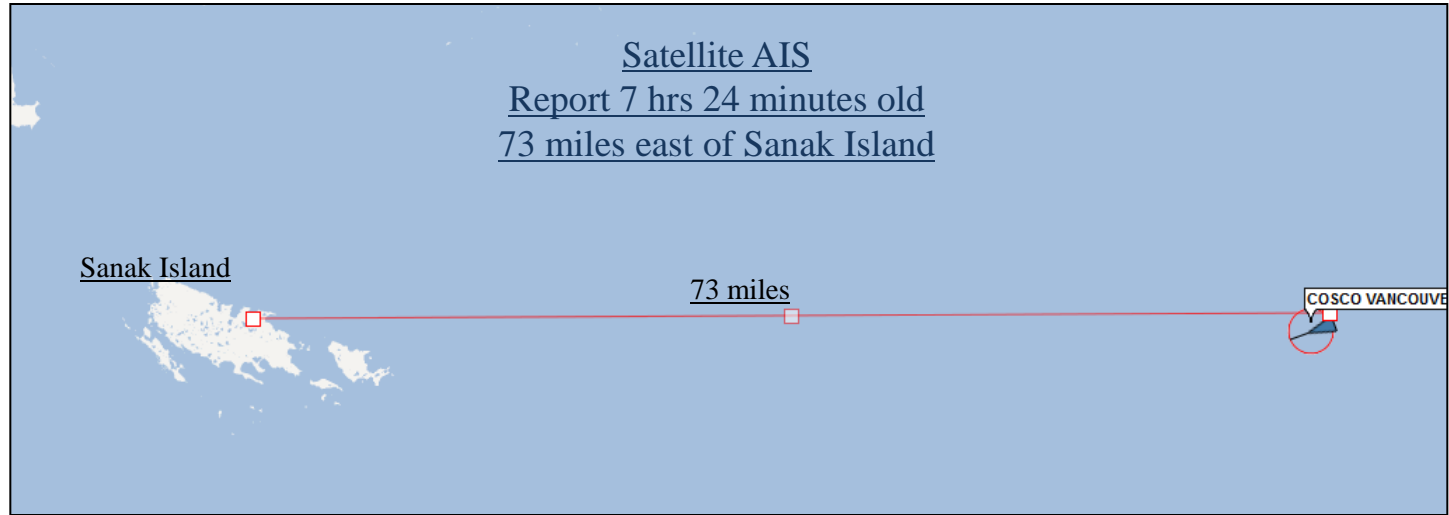


Comparison Terrestrial AIS (MXAK) and Satellite AIS

COSCO VANCOUVER

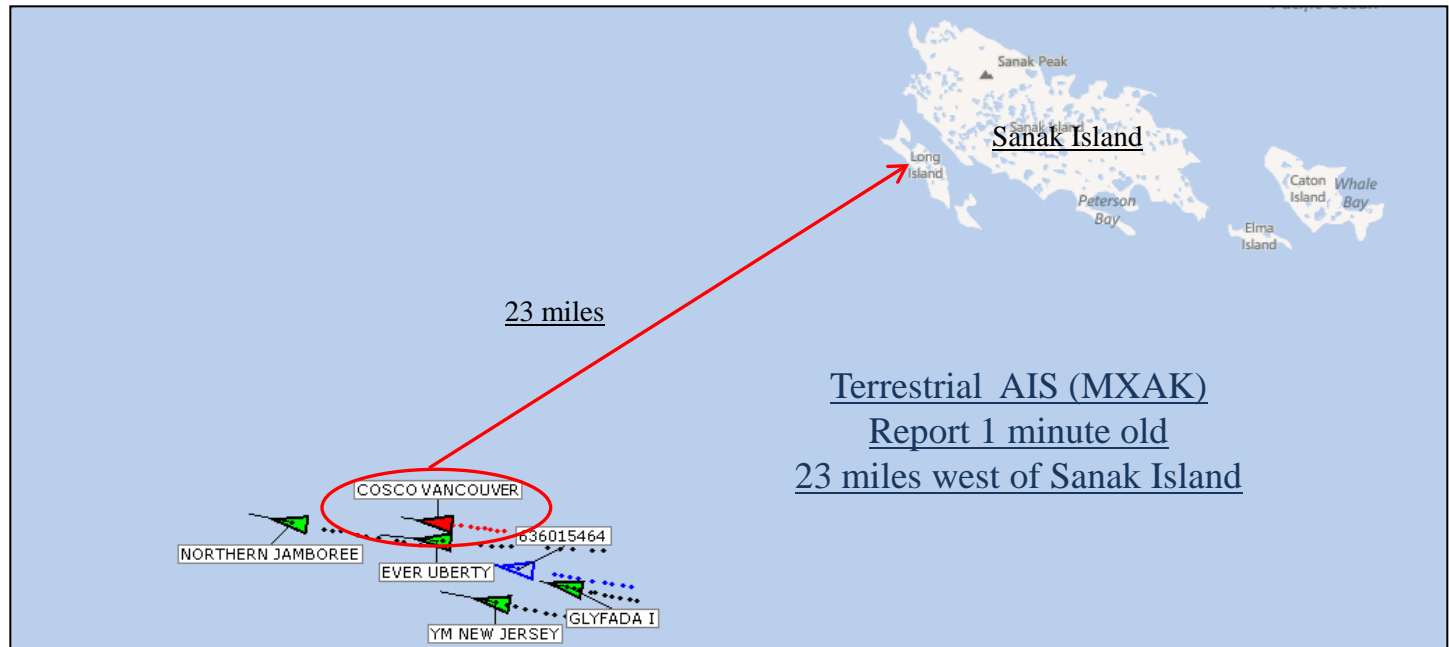
Details

Type:	Cargo
Call Sign:	A8E08
IMO#:	9285691
Flag:	Liberia
Last Report:	7 hours 24 minutes ago 2012-09-06 02:29 AKDT
Heading:	251 deg
Speed:	13.6 knots
Location:	161.9 miles E of Unimak Pass Lat: 54.43, Lng: -160.56
Data Source:	AIS:Satellite



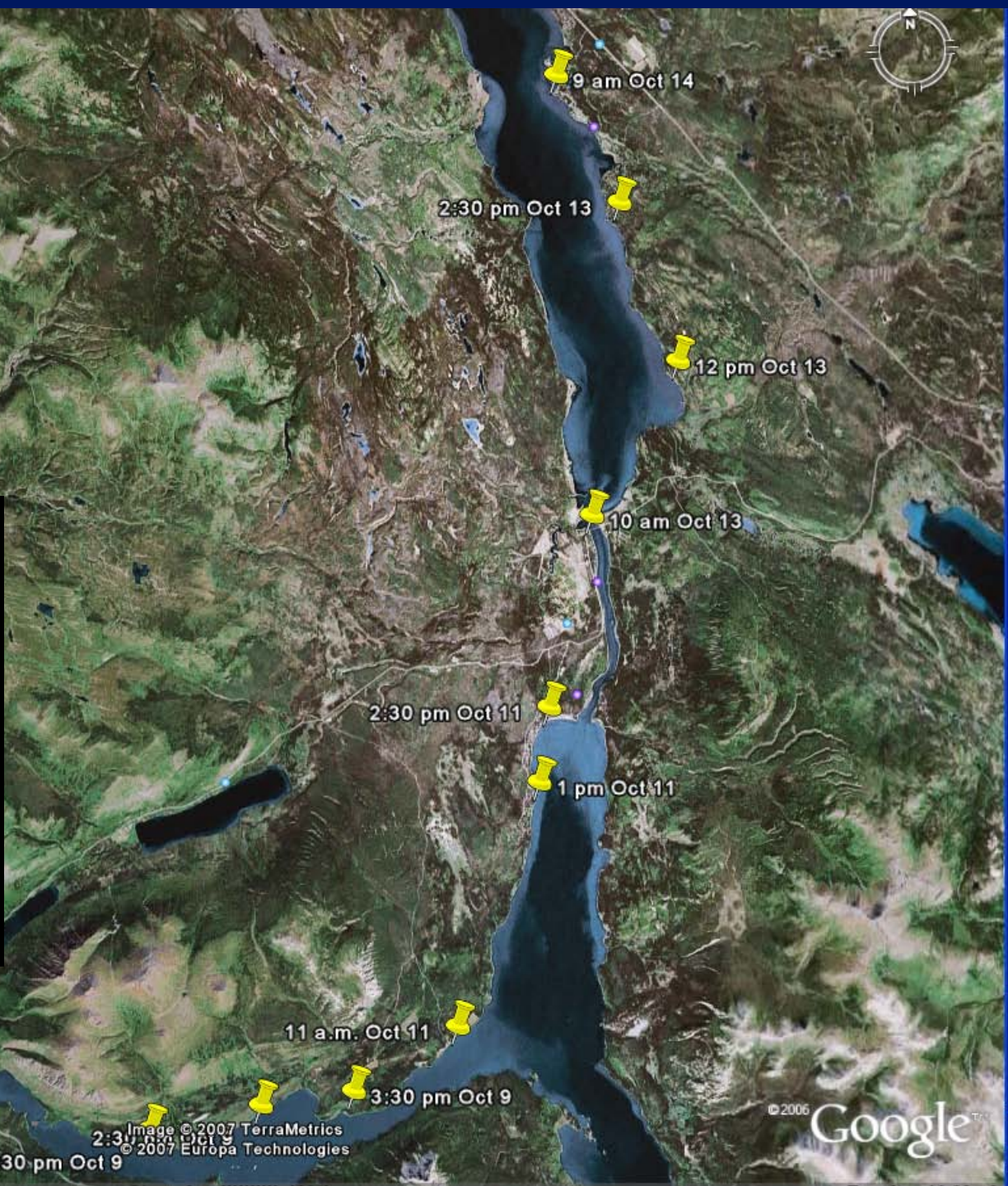
COSCO VANCOUVER

MMSI/IMO: 636090750 / 9285691
 Lat./Lng.: 54°12.092'N / 163°15.834'W
 Nearest MM: n/a
 Type: Cargo ship
 Nav.Stat.: Under way using engine
 Speed/Course: 13.5knt(15.5MPH) / 277.2°
 Length/Beam: 300m / 42m
 Dest.: JPYOK
 ETA: 9/15/2012 4:00 PM
 UTC: 9/6/2012 5:49 PM
 Received: 0 min ago

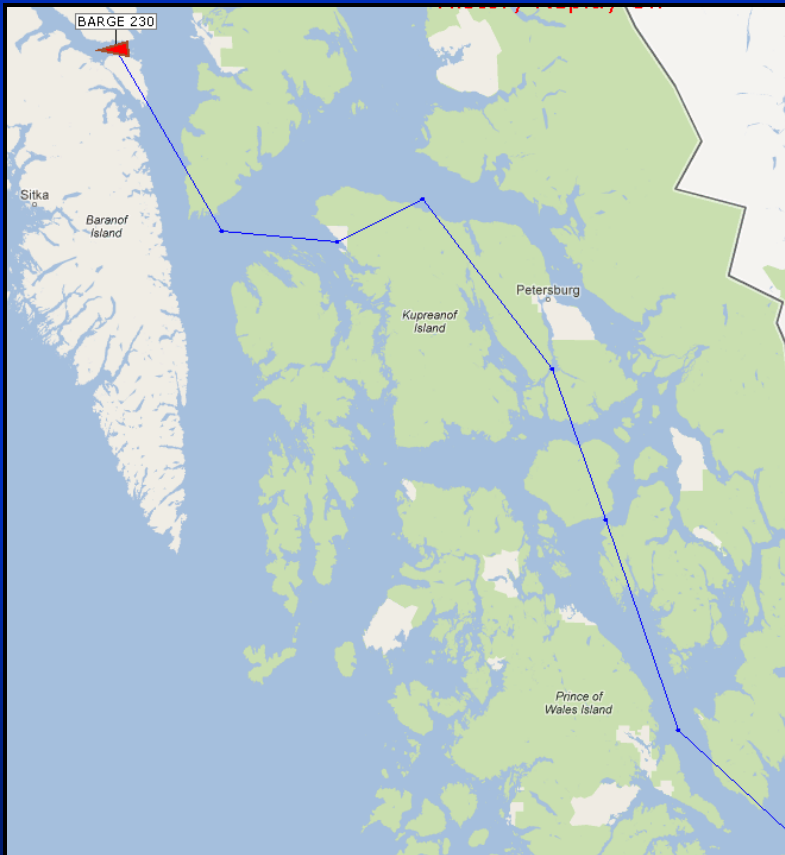




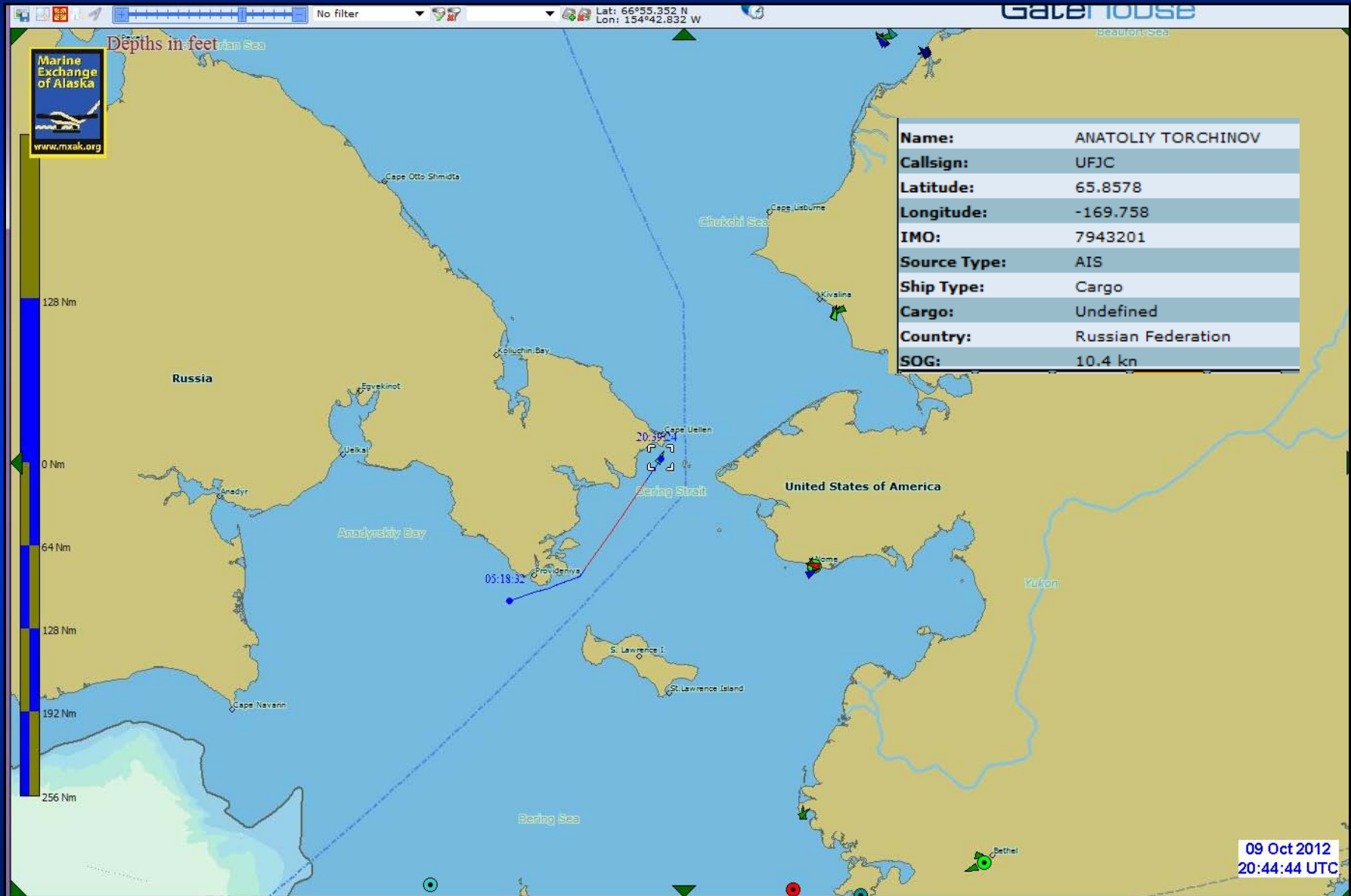
Yukon River Trip

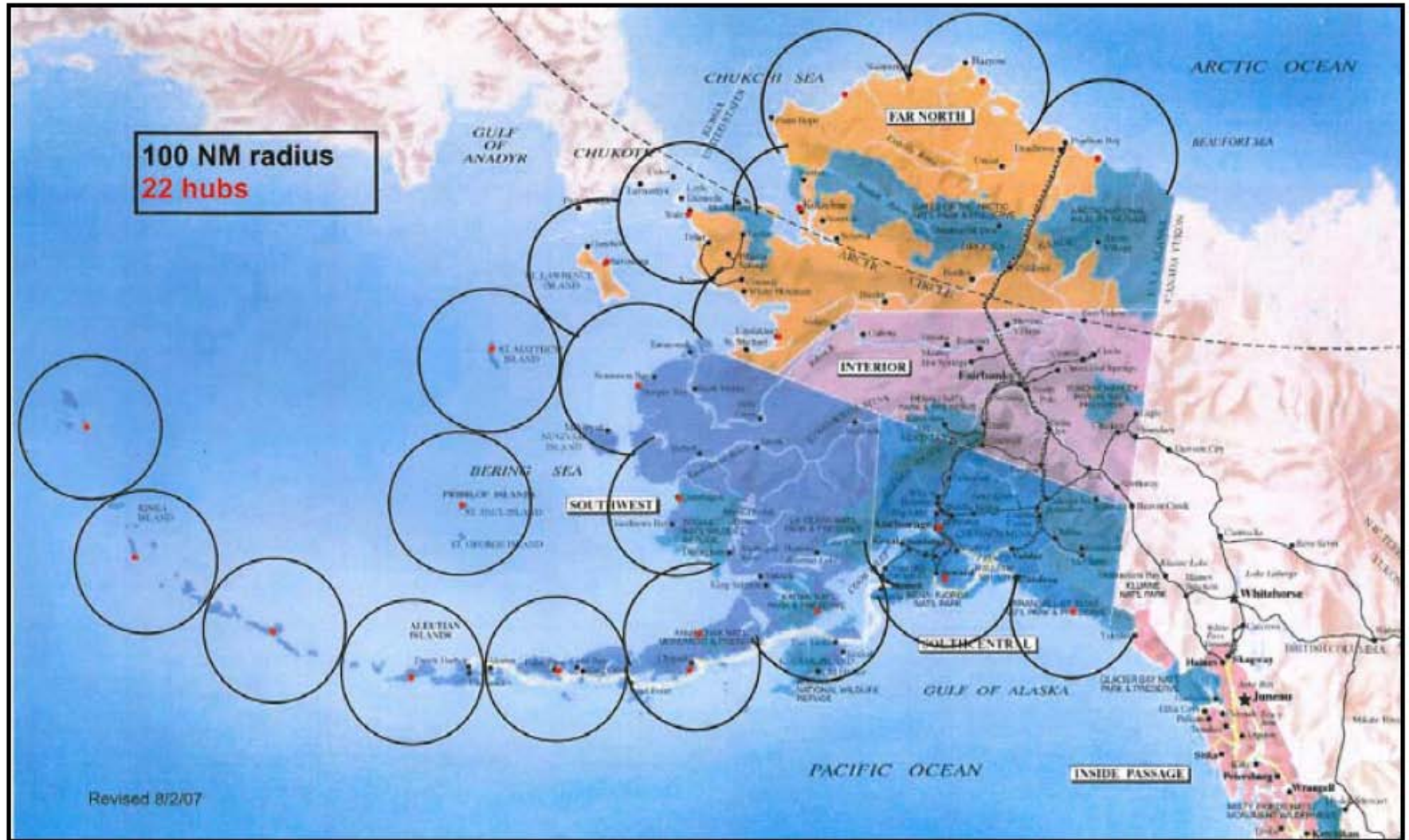


Satellite Tracking of Vessels



International Component – Russian use of Northern Sea Route





Western Alaska Response Hubs Needed for Full Compliance

Alaska Maritime Prevention and Response Network

www.ak-mprn.org



ALASKA MARITIME
Prevention & Response Network



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WA-APC-T

The Western Alaska Alternative Planning Criteria (WA-APC) is a prevention focused option for oil tankers and vessels transporting oil as a secondary cargo to meet the Coast Guard oil pollution prevention regulations in 33 CFR 155 when operating in Western Alaska waters.

The Alaska Maritime Prevention and Response Network is a non-profit organization established to provide the capabilities required to implement the WA-APC's prevention and response measures to protect Alaska waters from environmental harm.

As the present oil spill removal capabilities in Western Alaska do not fully meet the Coast Guard requirements, the only currently available compliance option for oil tankers and vessels transporting oil as a secondary cargo operating in Western Alaska waters subject to 33 CFR 155 Subpart D is through participation in the WA-APC approved by the Coast Guard as meeting the environmental protection objectives of OPA-90.

The Alaska Maritime Prevention and Response Network is a non-profit maritime organization established to implement alternative spill response and prevention measures that most cost effectively meet the environmental protection objectives of state and federal regulations.

Alaska Maritime Prevention & Response Network

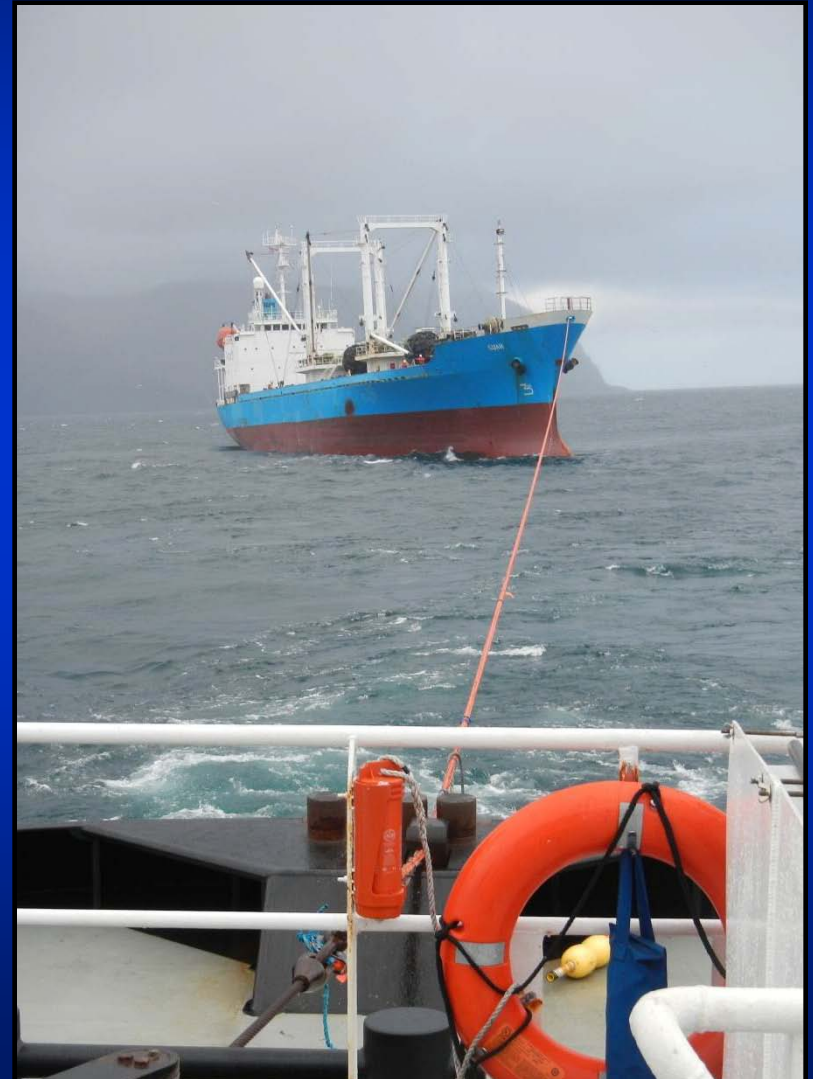
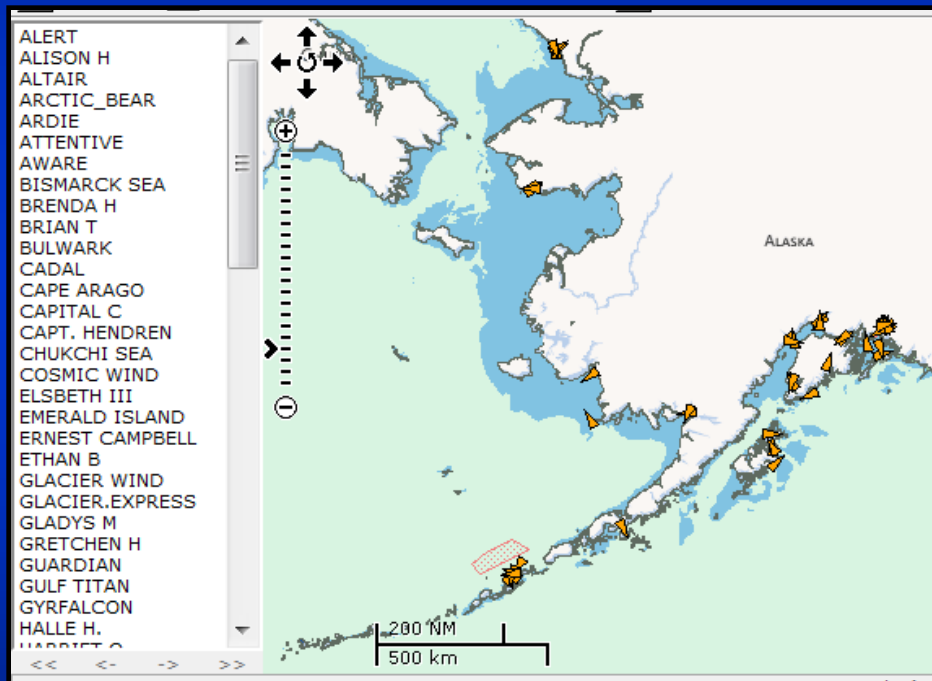
Phone: 907-463-3064

Fax: 800-783-0513

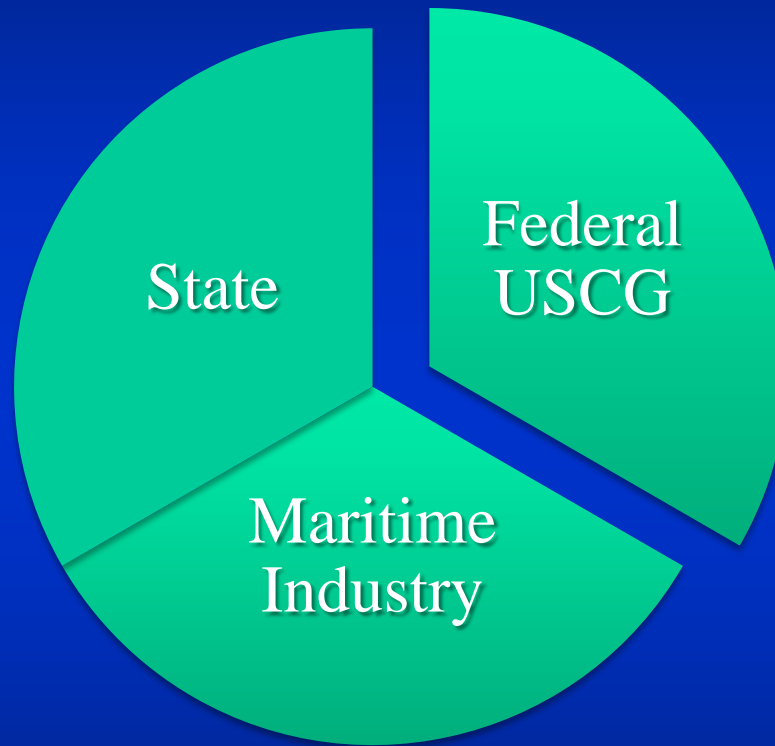
Email: operations@ak-mprn.org

Design By [Skunk Cabbage Designs](#)

Locating Vessels Able to Respond to Vessel in Distress



Funding and Support



Maritime Safety, Security, Efficiency Environmental Protection

