

FROM THE ARCTIC TO SOUTHEAST: PRESENT AND FUTURE ALASKA MARITIME OPERATIONS

**Marine
Exchange
of Alaska**



www.mxak.org

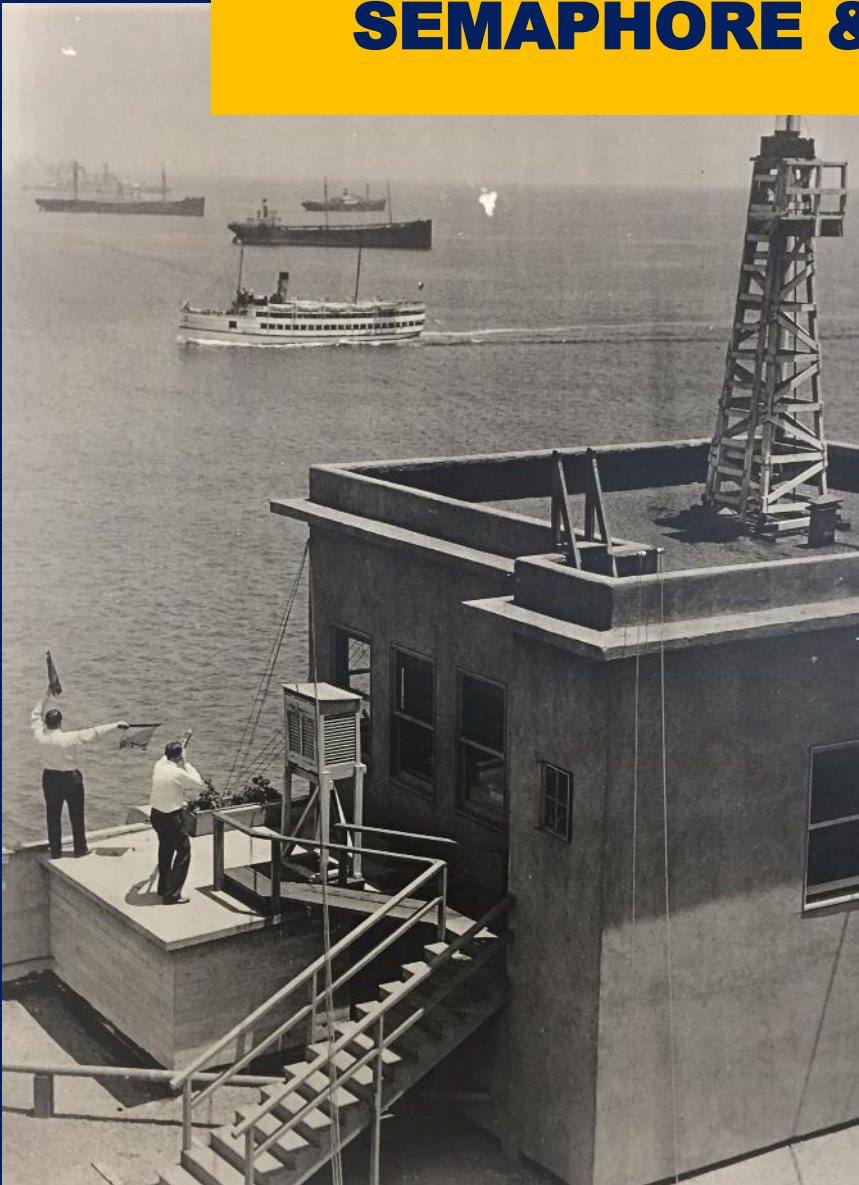
A non-profit maritime organization established to provide the Alaska maritime community information, communications and services to ensure safe, secure, efficient and environmentally responsible maritime operations.



MARINE EXCHANGE SHIP SPOTTING



SEMAPHORE & MEGAPHONE



MARINE EXCHANGE OF ALASKA:

A 21st CENTURY OPERATION



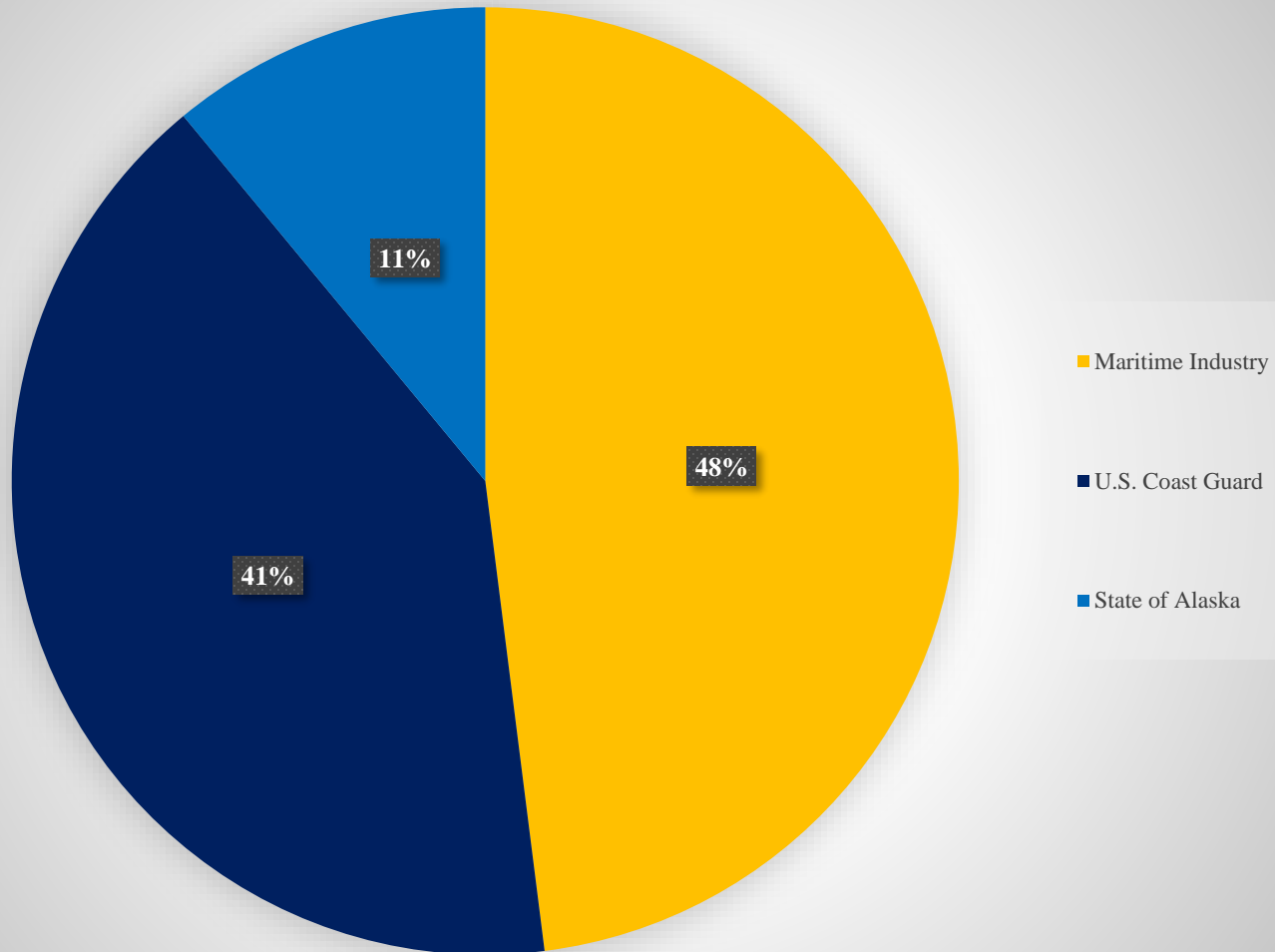
MARINE EXCHANGE OF ALASKA:

A 21st CENTURY OPERATION

- Vessel Traffic Management
 - 24/7 Operations Center
- Brokers of maritime information
- Advocacy
- Regulatory compliance
- Port Planning
- Environmental Sensors
 - Weather, Wind, Current

MARINE EXCHANGE OF ALASKA

MXAK'S FUNDING: PUBLIC - PRIVATE PARTNERSHIP



BOARD OF DIRECTORS

Captain Michael O'Hara

Vice President

Southwest Alaska Pilots Association

Captain Hans Antonsen

President

Southeast Alaska Pilots Association

Captain Carl Uchytel

Secretary/Treasurer

Juneau Port Director

Captain Bill Gillespie

Alaska Marine Pilots

Mr. Don Reid

Alaska Marine Lines

Judge Peter Froelich

Member at Large

Harold Whittlesy

Satellite Technical Services

Captain Jim McManus

Trident Seafoods

Captain Lawson Brigham

University of Alaska Polar Policy

Captain Ed Page

Executive Director

Marine Exchange of Alaska

Brett Farrell

Assistant Director

Marine Exchange of Alaska



THE COMMUNITY WE SERVE

CONTAINER

CARGO
VESSELS

SMALL
PASSENGER
VESSELS

FISHING

FERRIES

CRUISE SHIPS

OIL SPILL
RESPONSE

TUGS AND
BARGES

TANKERS

COAST
GUARD





MARITIME INFORMATION SERVICES OF NORTH AMERICA (MISNA)

Alaska

Seattle

Portland

San Francisco

LA/LB

New York/New
Jersey



Philadelphia

Baltimore

Hampton

Roads Virginia

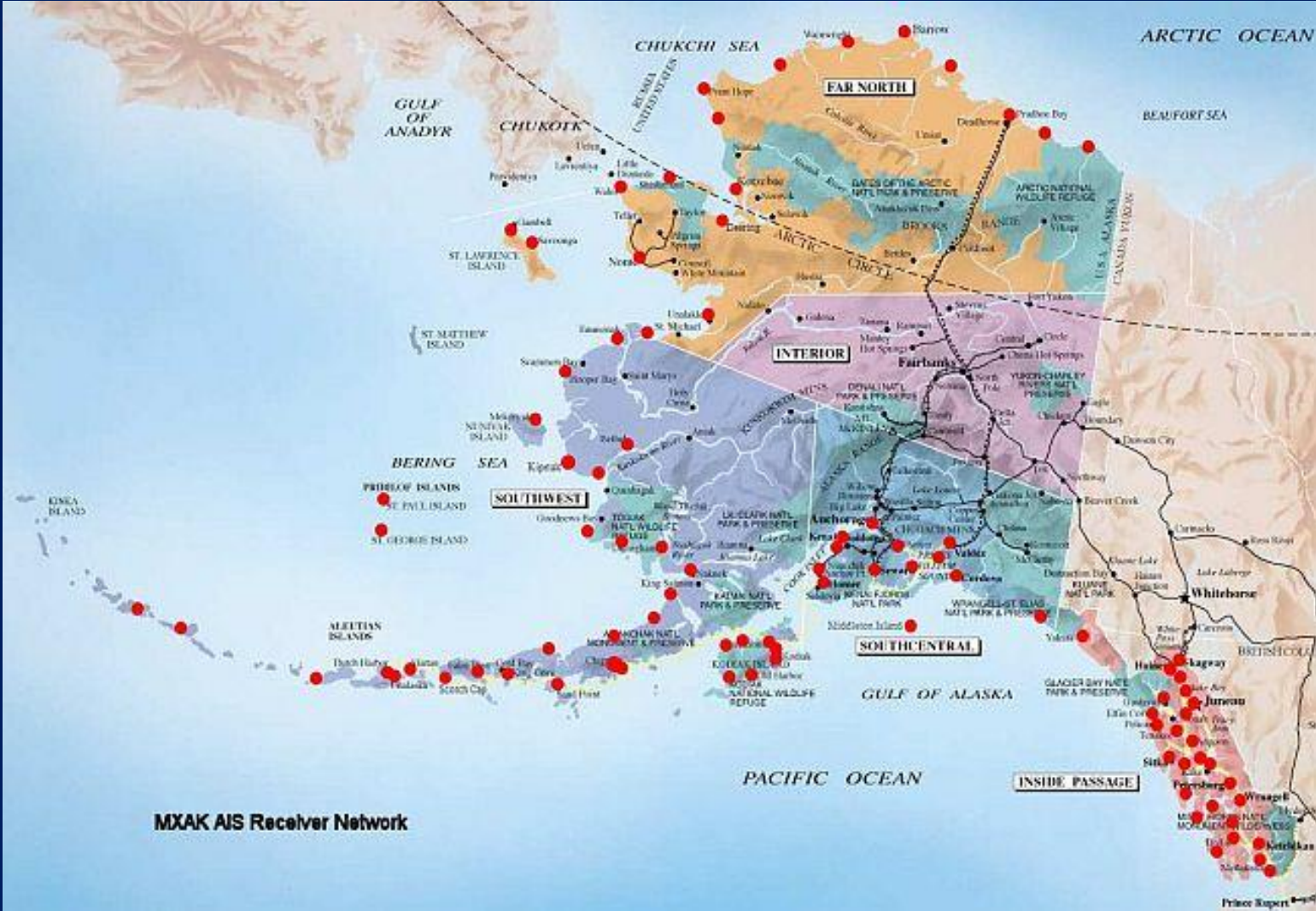
Jacksonville

Tampa

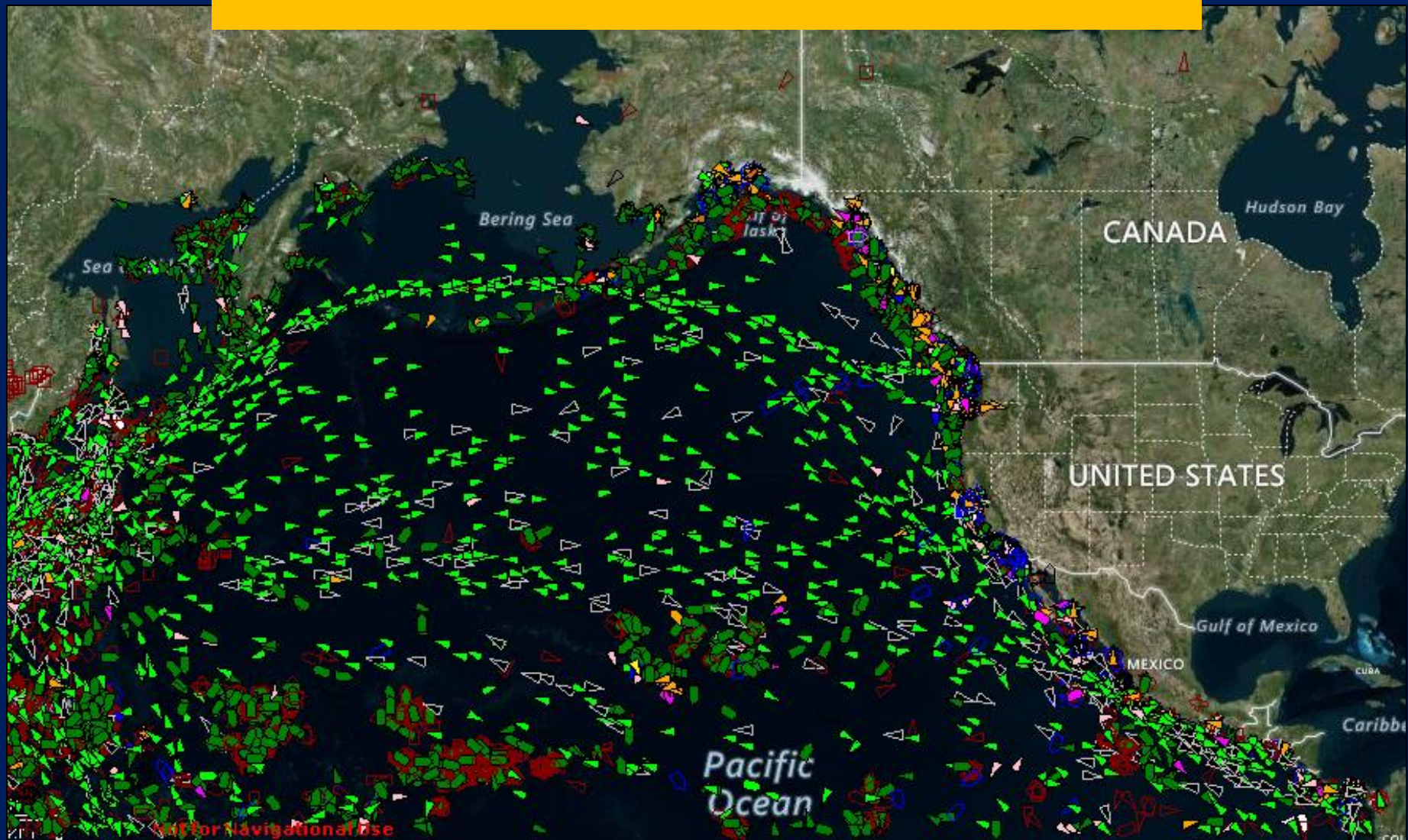
New Orleans

Houston

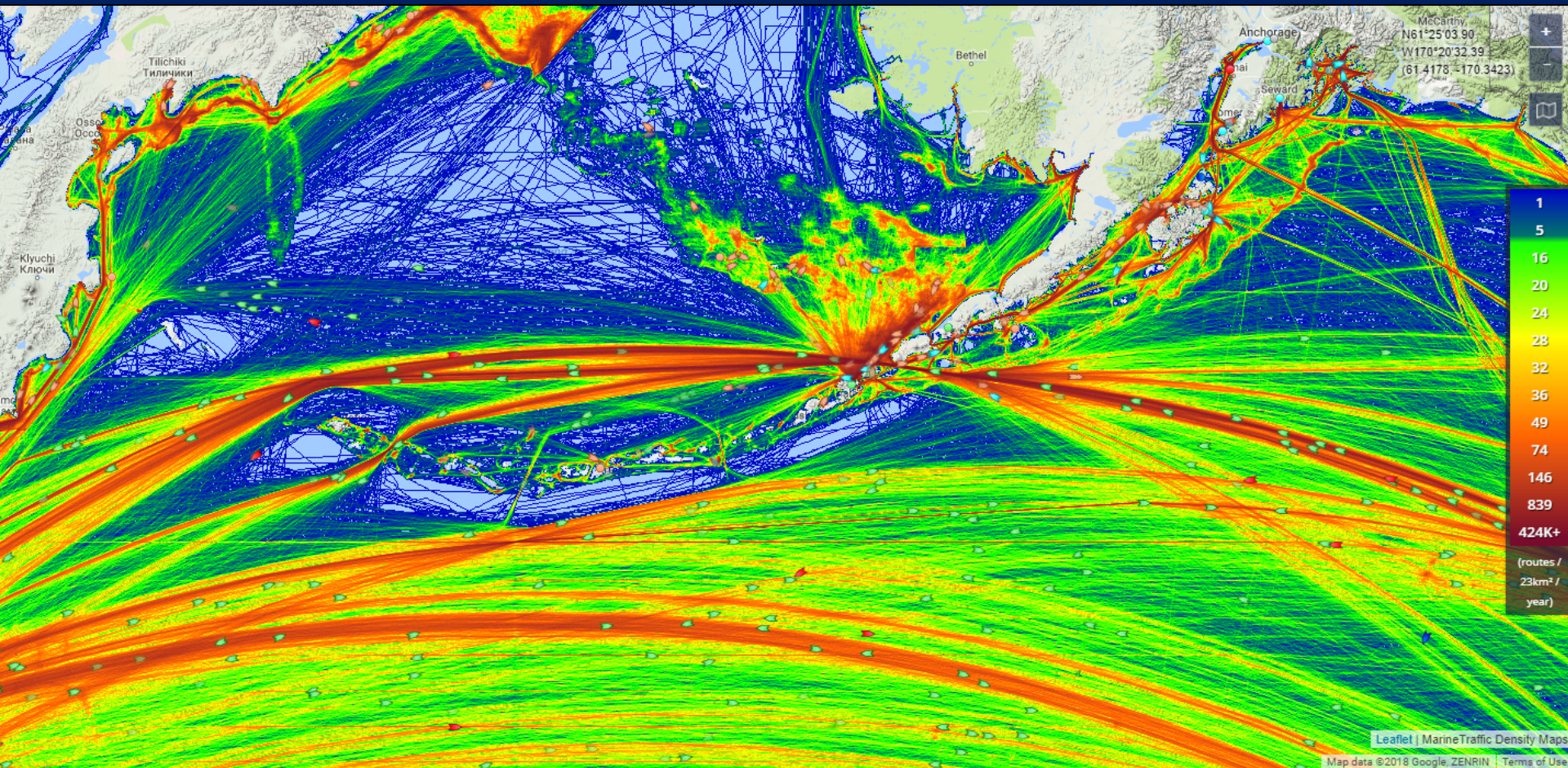
MXAK AUTOMATIC IDENTIFICATION SYSTEM (AIS) NETWORK



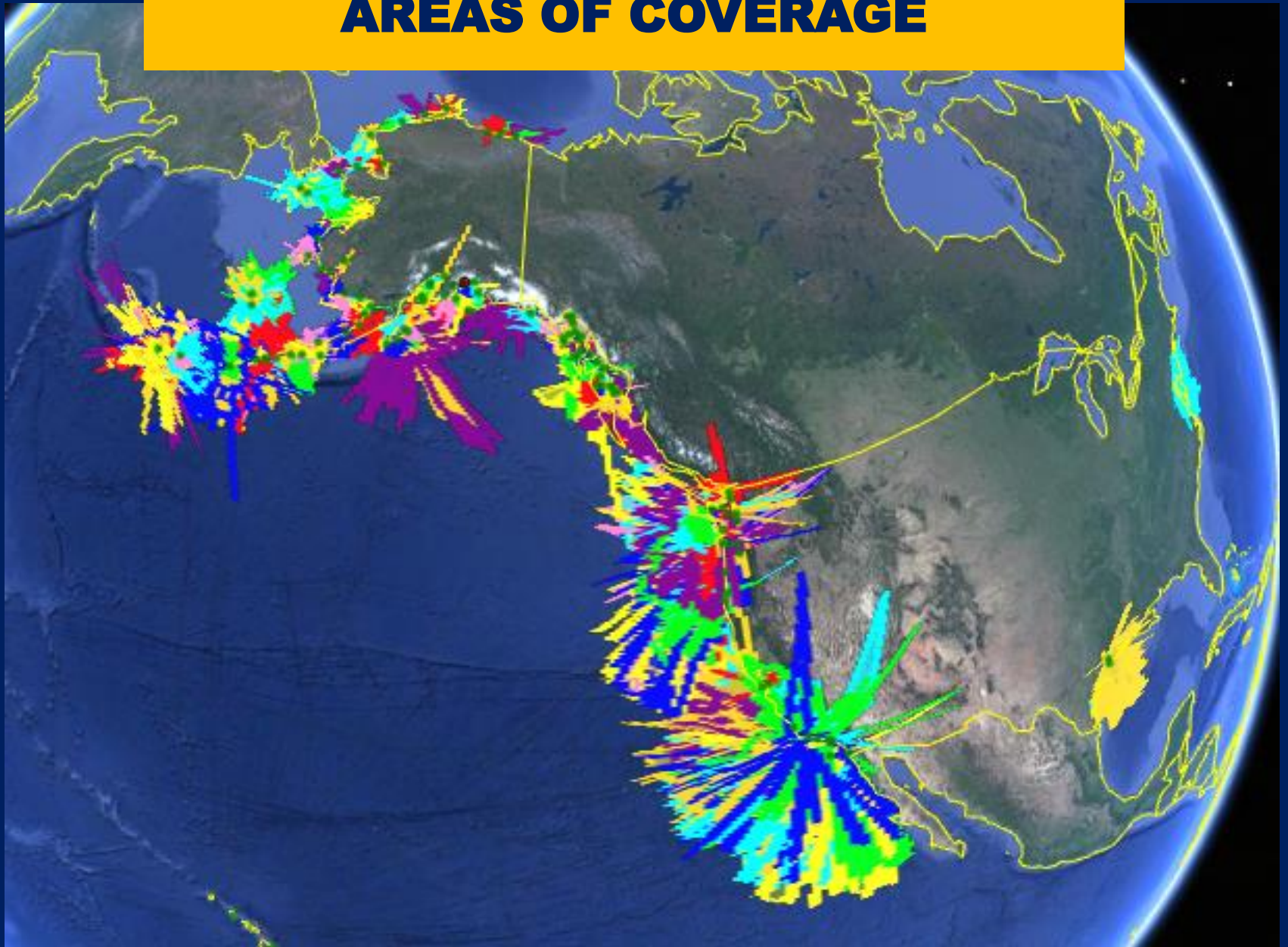
PACIFIC VESSEL TRAFFIC TODAY



ALASKA VESSEL TRAFFIC



AREAS OF COVERAGE



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-SUPPORTED AIS SITES



CAPE ST. ELIAS MARINE SAFETY SITE



UNIMAK PASS







Trenching for power:
Wire from wind
turbine



MXAK Marine
Safety Site



Wind Turbine

MARITIME SAFETY:

99.99% Success

Can still

=

PUBLIC OUTRAGE



SELENDANG AYU: DECEMBER 2004



No Maritime Domain Awareness
No Maritime Domain Management



Vessel Operating Dangerously Close to Shore in Remote Area

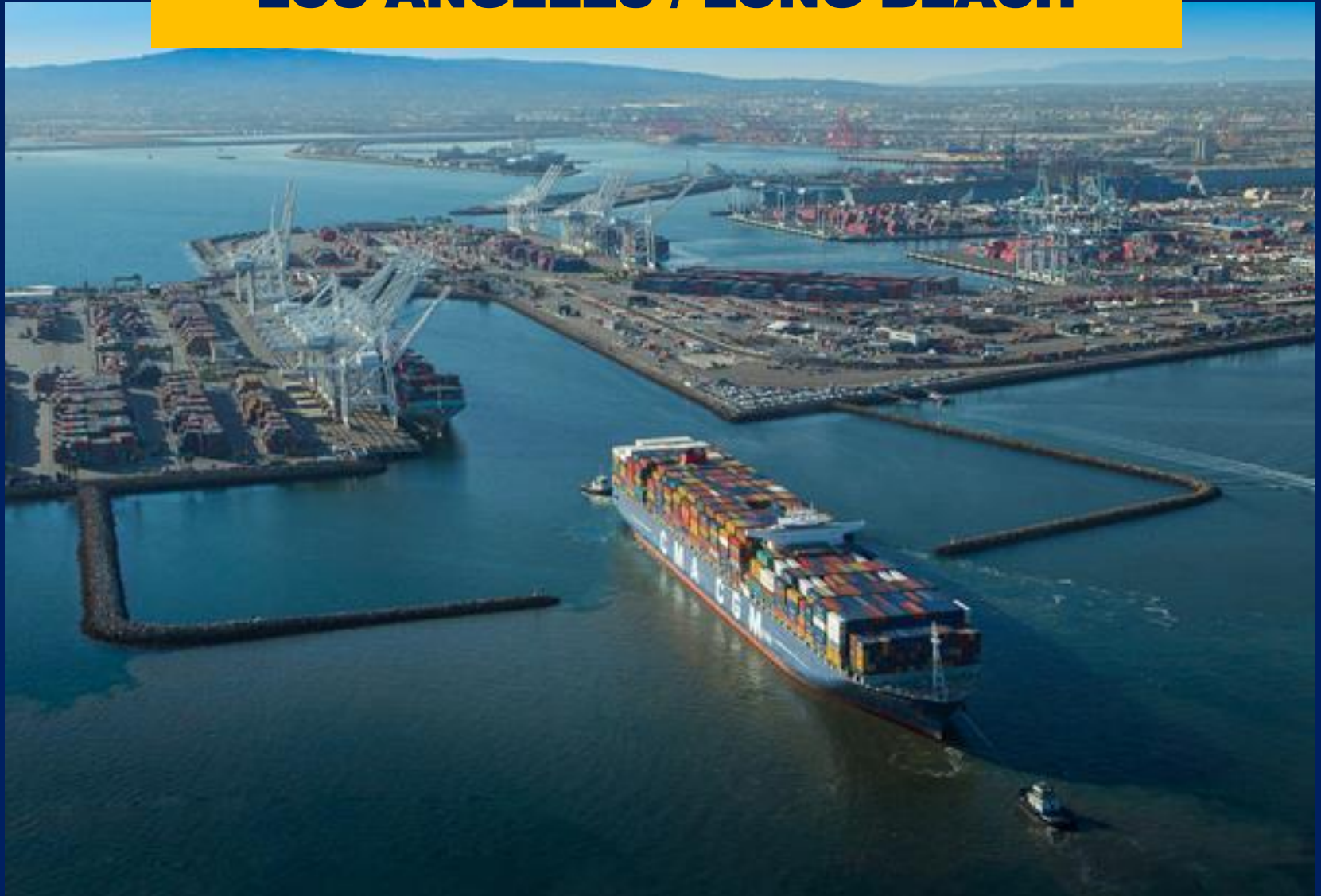
Maritime Domain Awareness
No Maritime Domain Management

IMPROVING PREVENTION & RESPONSE



Applying Internet of Things (IoT)
Machine to Machine (M2M) Technology
Artificial Intelligence (AI)

LOS ANGELES / LONG BEACH



ALASKA MARITIME PREVENTION & RESPONSE NETWORK

Network Tanker and Nontank Vessel Alternative Planning Criteria (APC's) for Alaska

The Alaska Maritime Prevention and Response Network is a non-profit 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 WATERS



456 Shipping Companies
3,500 Different Vessels

LAURA MAERSK

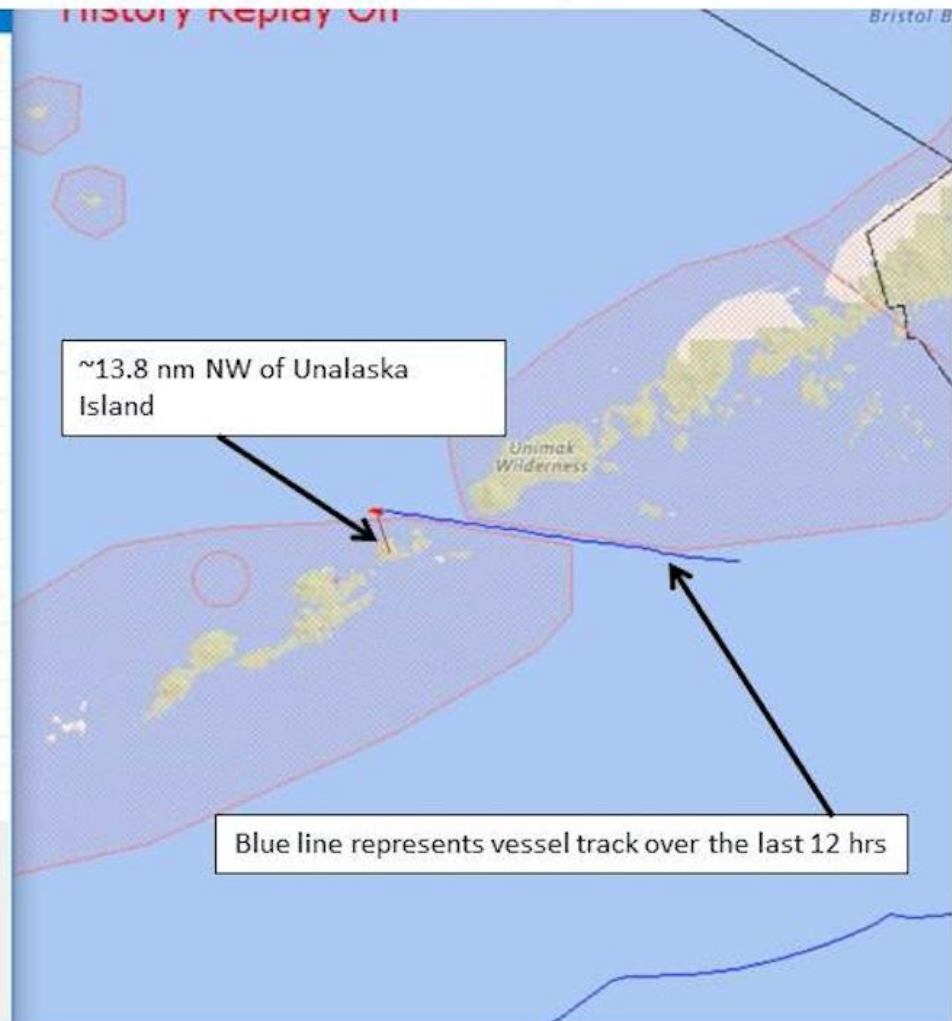
Origin: Vancouver, BC

Destination: Busan, Korea

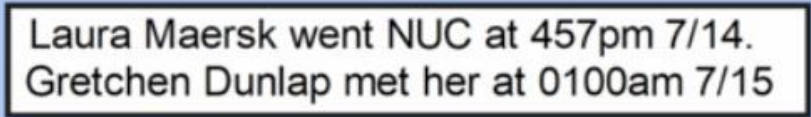
Type: Fully Cellular Containership

Status: Non Network NTV Not Under Command **Speed:** 0.4kts

Information	
Name	LAURA MAERSK
MMSI	219947000
IMO	9190731
Call Sign	0WKI2
Type/Cargo	Cargo ship:DG,HS,MP(A)
Length x Beam	266m x 37m
Draught	11.1m
Nav. Status	Not under command
Last Seen UTC	7/15/2017 1:35 AM
Last Seen Loc	7/14/2017 5:35 PM
Latitude	54°25.690'N
Longitude	166°08.778'W
Nearest MM	
Speed	0.4knt(0.5MPH)
Course	137.4°
Heading	275°
Rate of Turn	0°/min
Destination	CAVNR TO KRPUS
ETA	7/23/2017 4:00 PM
Last AIS UTC	7/15/2017 1:35 AM
Last Sat UTC	7/15/2017 12:58 AM
Last AIS Lat	54°25.690'N
Last AIS Long	166°08.778'W
Last Sat Lat	54°25.804'N
Last Sat Long	166°07.356'W
Pos. Accuracy	High (<10m)
Pos. Fix. Dev.	GPS
IP	216.67.61.34:10067c



LAURA MAERSK



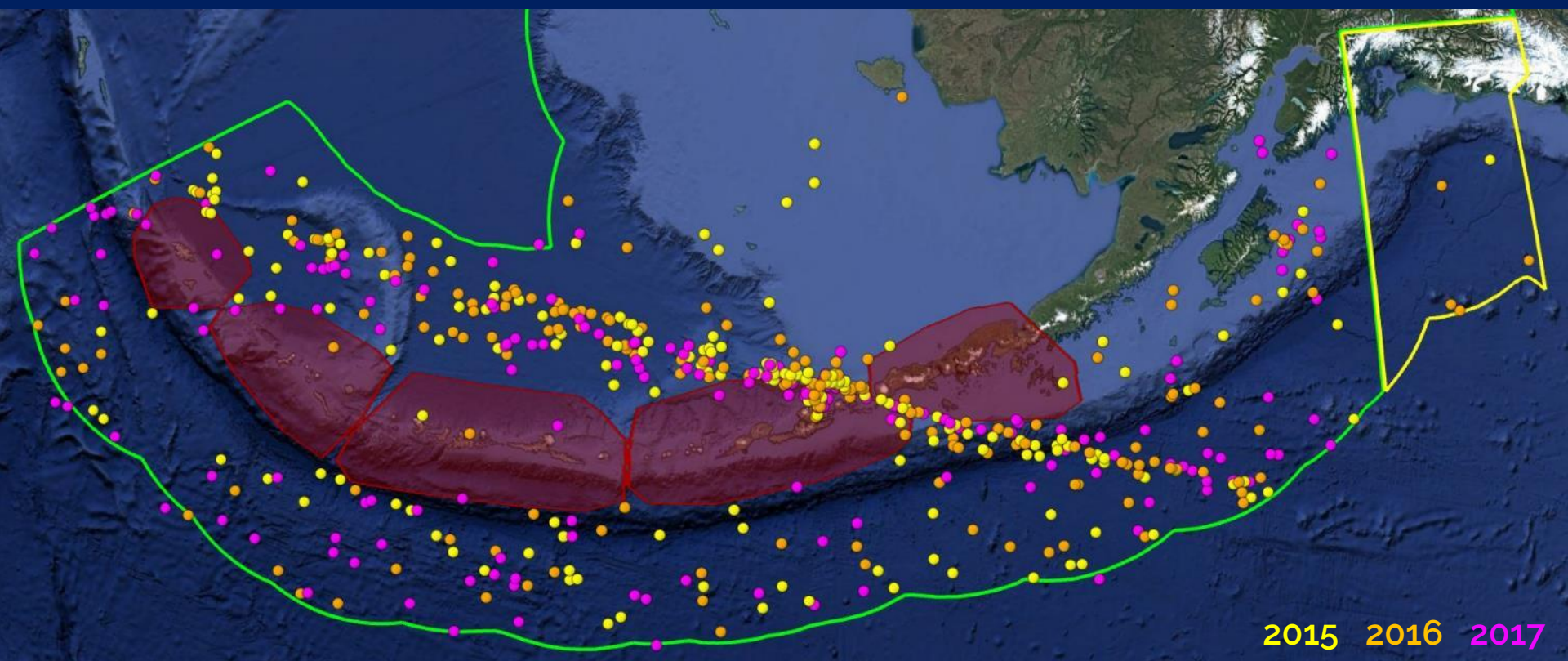
Container Ship – Crankcase explosion 13 miles offshore

- Coast Guard opened the “Fund” and contracted two tugs to rescue the vessel

- Vessel drifted at speed of 2 knots – approached to 5 miles offshore before tugs arrived

VESSELS OF CONCERN

- Reduced speed
- Erratic maneuver
- Transit through unauthorized pass
- Too close to shore
- Loss of propulsion
- Loss of steering
- Loss of stability
- Cargo broken free

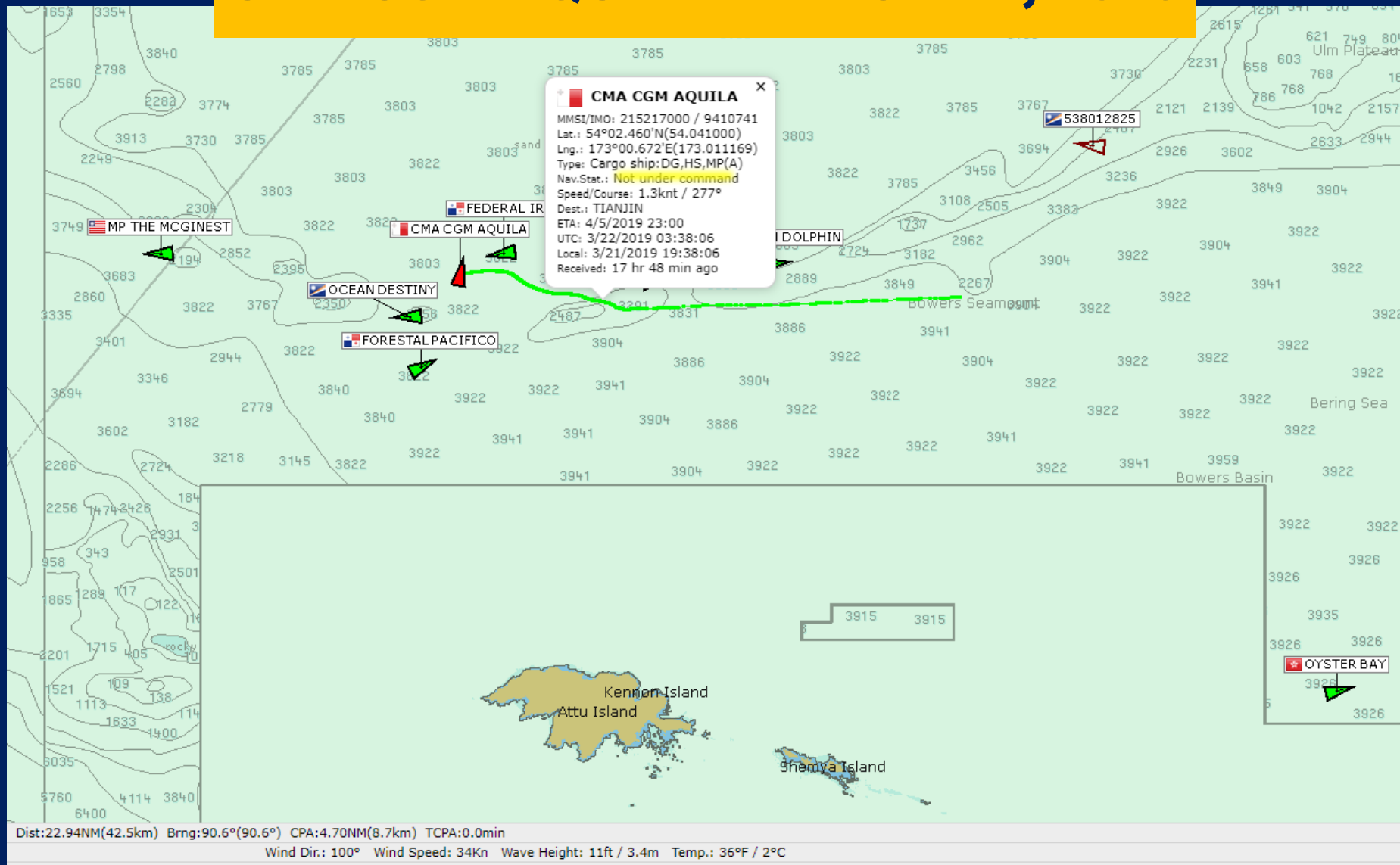


EXAMPLE: CMA CGM AQUILA



- Appx. **3-4 million gallons** of oil
- Over **3 football fields in length** (1190 feet)
- **43 miles** of containers

CMA CGM AQUILA: MARCH 21, 2019



MONITORING COMPELS COMPLIANCE WITH RISK MITIGATING MEASURES



Arctic Council
**Arctic Marine Shipping
Assessment 2009 Report**



**CONSIDERING A ROADMAP FORWARD:
THE ARCTIC MARINE
SHIPPING ASSESSMENT**

WORKSHOP REPORT

University of Alaska Fairbanks
October 22-24, 2009



University of the Arctic – Institute for Applied Circumpolar Policy

Editors: Lauren W. Brigham and Michael R. Briggs
University of Alaska Geography Program
School of Natural Resources & Agricultural Sciences



ARCTIC COUNCIL
ARCTIC MARINE SHIPPING ASSESSMENT
2009-2010

PAME
Partnership for the Arctic Marine Environment

“... take appropriate action to expand the AIS tracking network ...”

SPECIAL REPORT 283

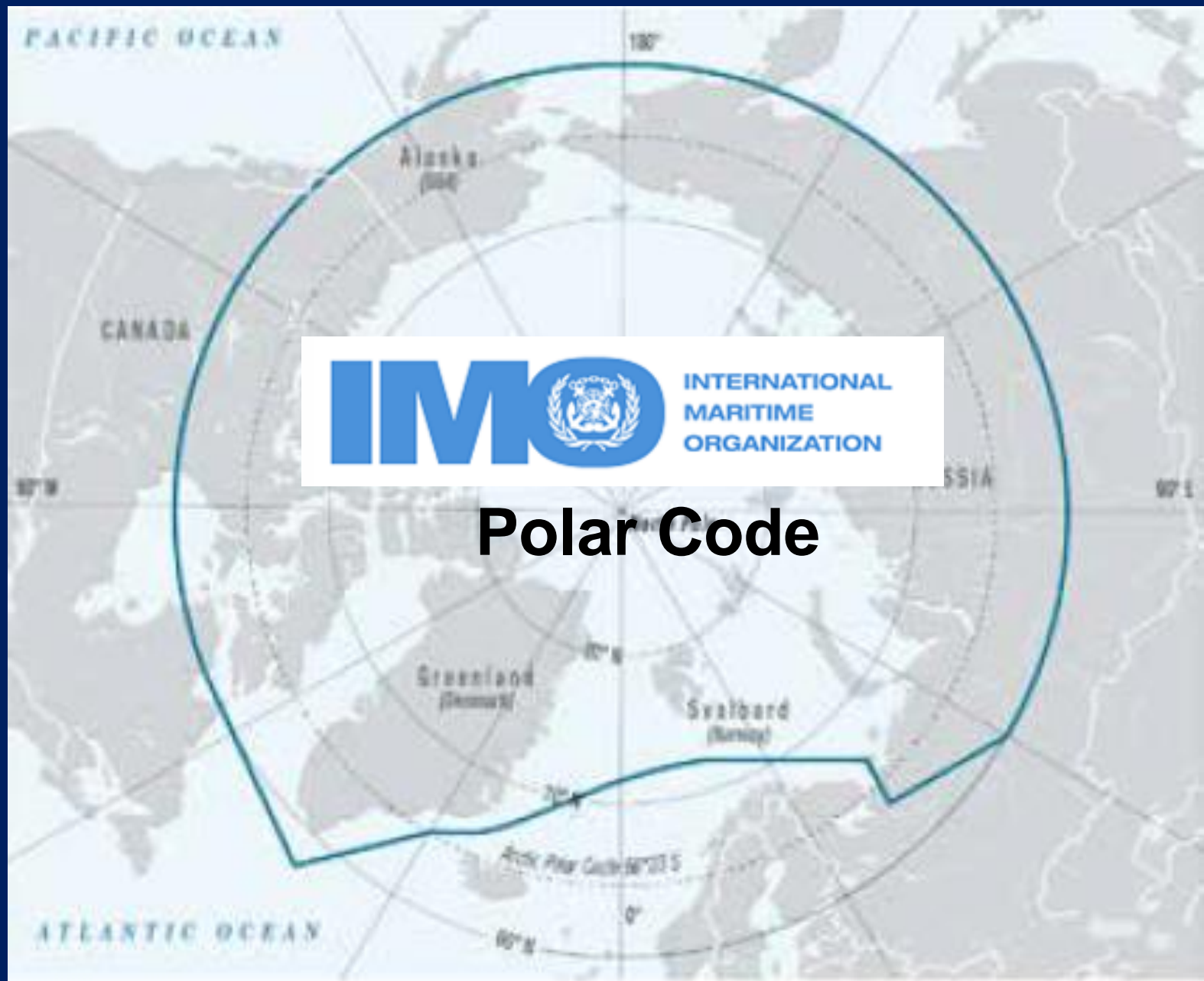
**Risk of Vessel
Accidents and Spills
in the Aleutian Islands**

**DESIGNING A COMPREHENSIVE
RISK ASSESSMENT**

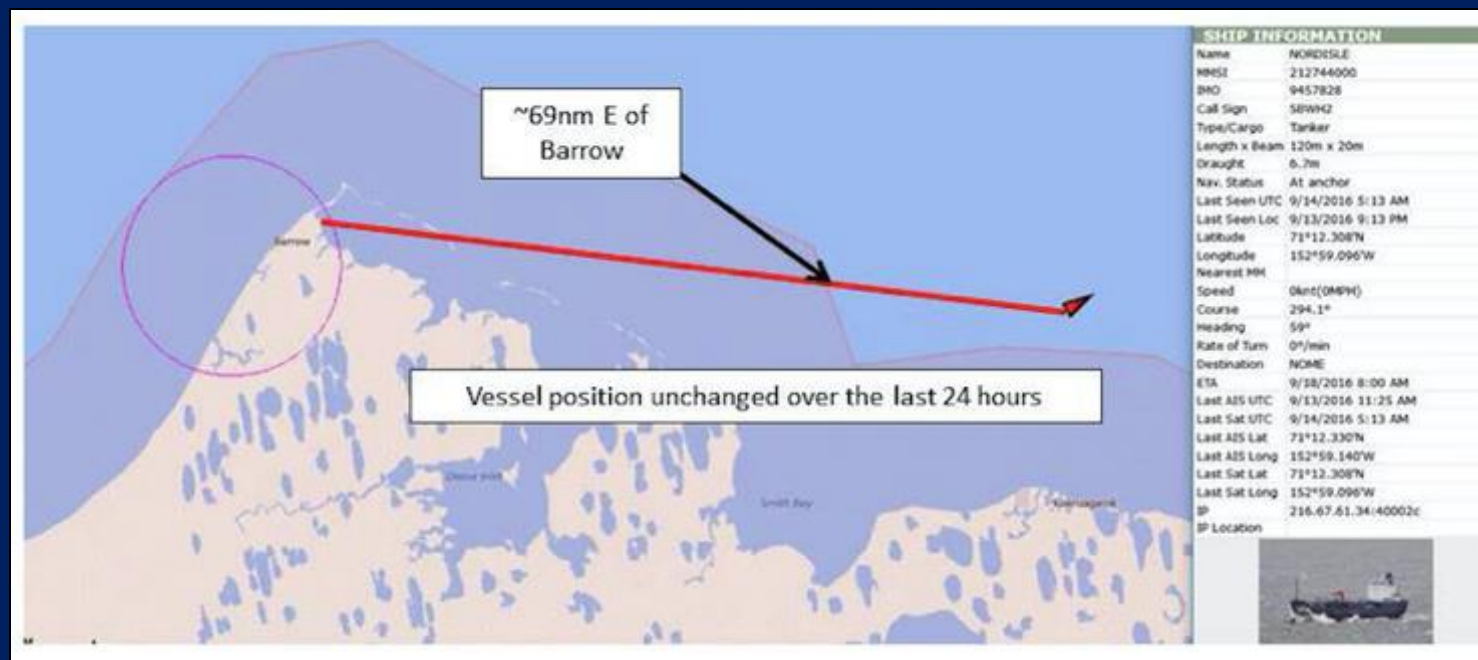


TRANSPORTATION RESEARCH BOARD
OF THE NATIONAL ACADEMIES

“Completion of an AIS receiver network in the Arctic is high priority; linkages between AIS and marine mammal awareness need to be developed.”



- Commercial ships voyaging and operating in remote polar waters place a premium on ship monitoring and tracking. Sharing Arctic marine traffic data among the flag and port states may require a new binding agreement among the Arctic states. This information could provide new data on the effectiveness of the IMO Polar Code and how the marine industry is adjusting to these new rules and regulations.



Arctic Maritime Activity 2018 Bering Strait



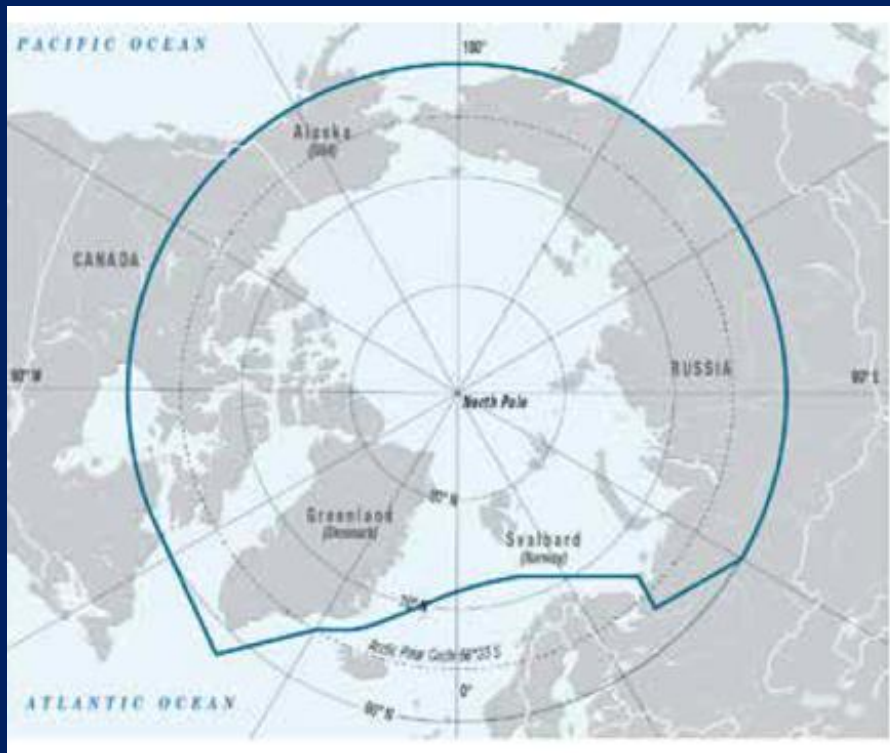
Orange Tug
Yellow Towing
Blue Military

Pink Passenger
Green Cargo Vessel
Black Tanker

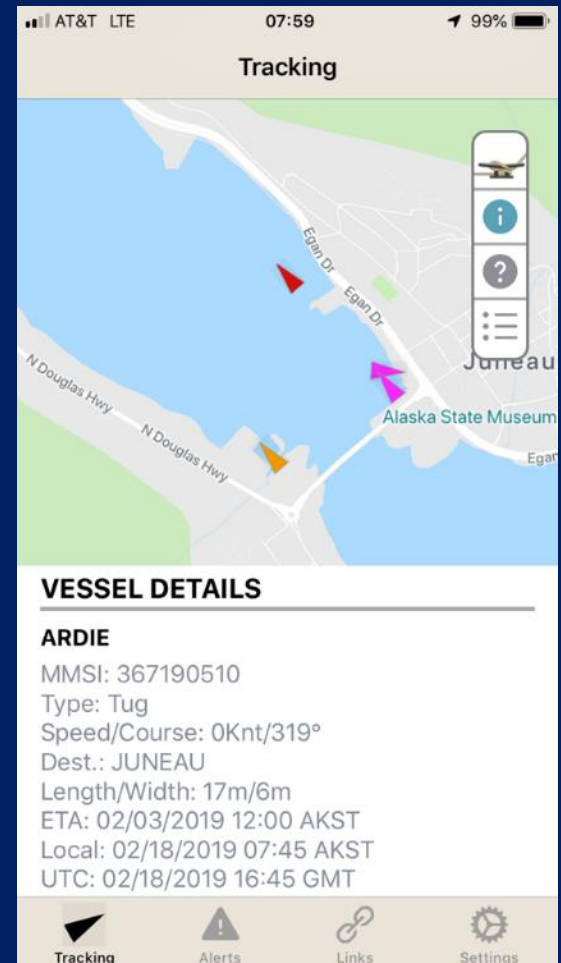
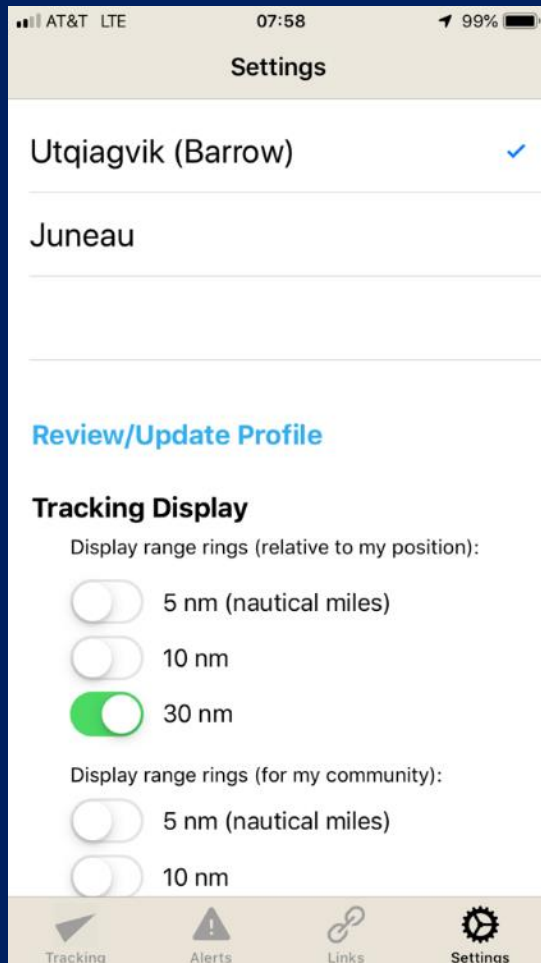


ARCTIC MARITIME SAFETY NET PROJECT

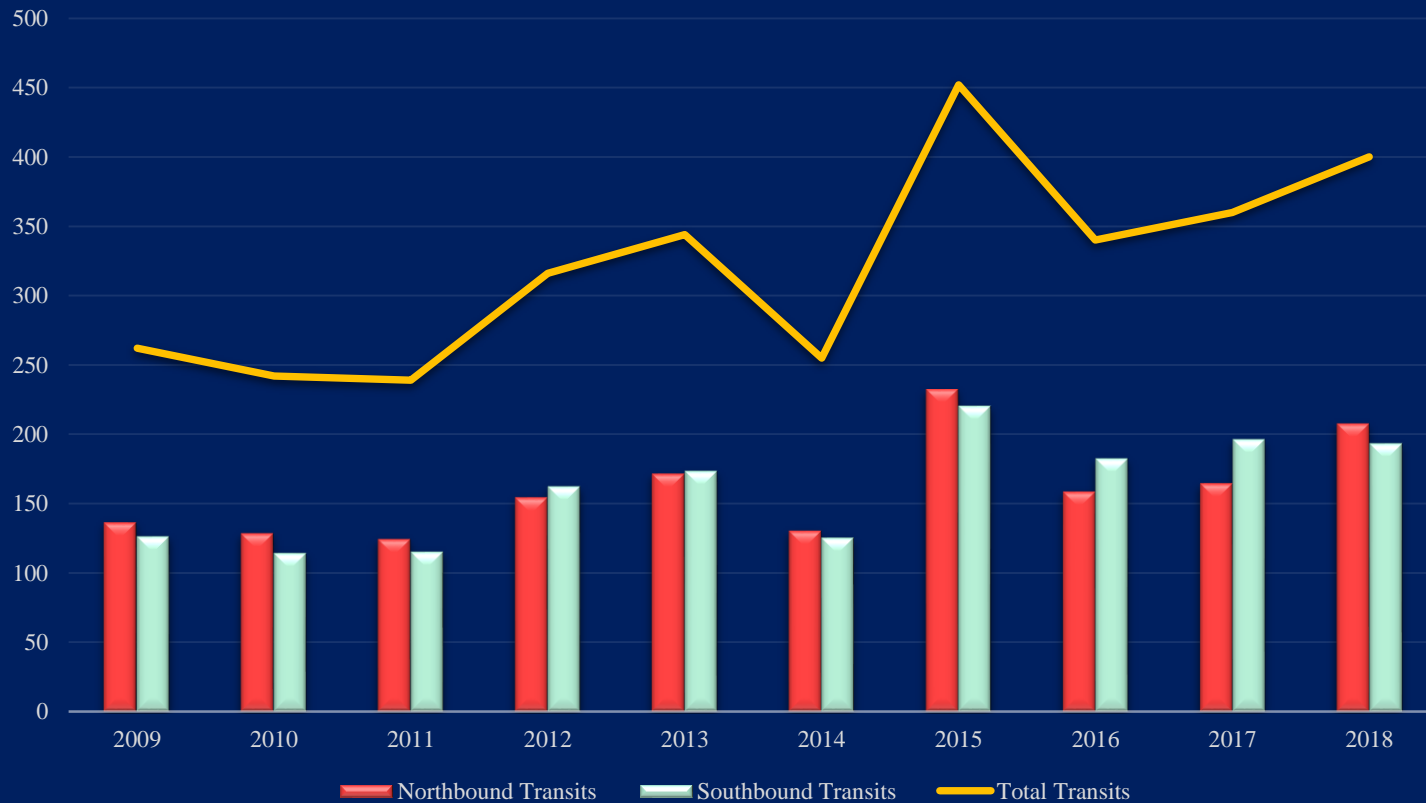
related to the future protection of Arctic people, especially those in Arctic coastal communities and their traditional lifestyles. The IMO is



ARCTIC APP

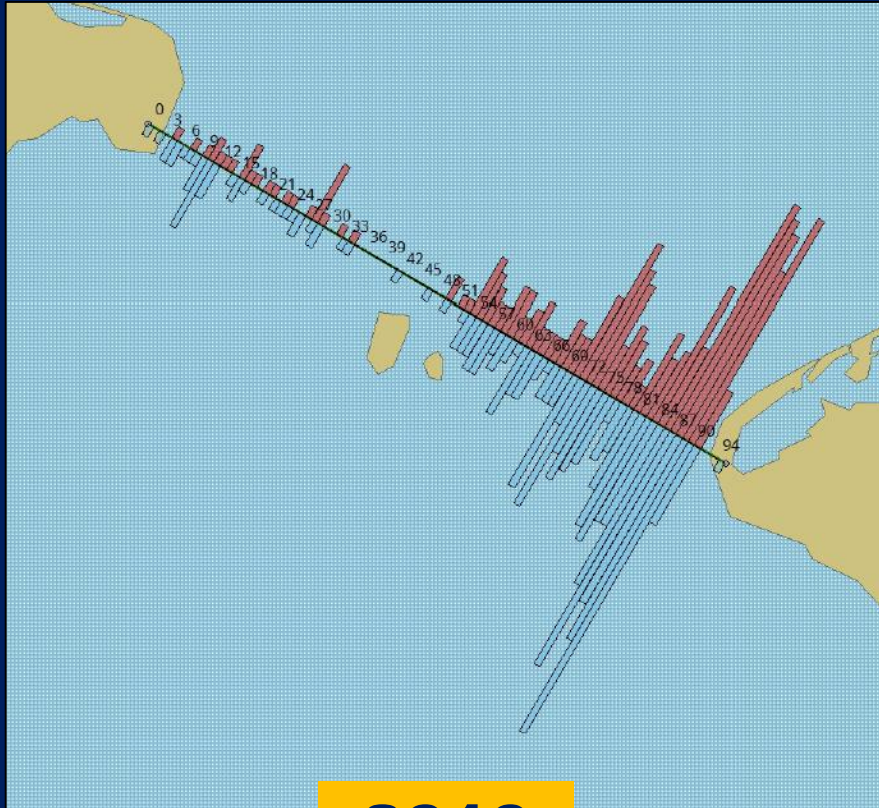


BERING STRAIT TRANSITS 2009-2019

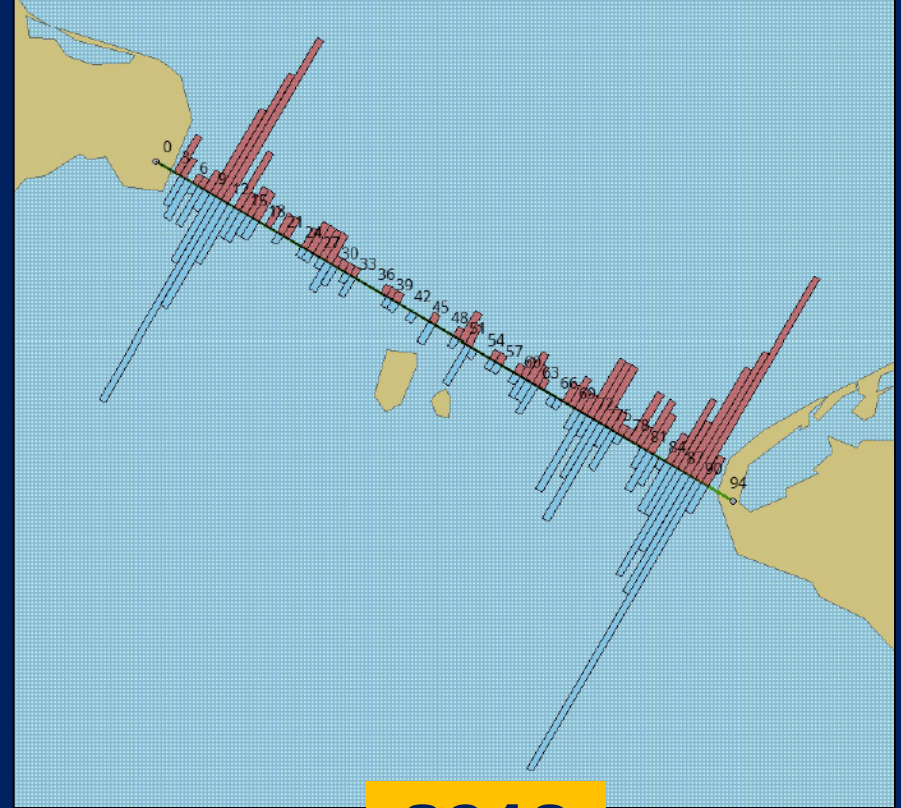


YEAR	NORTHBOUND TRANSITS	SOUTHBOUND TRANSITS	TOTAL TRANSITS
2009	136	126	262
2018	207	193	400

BERING STRAIT TRANSITS



2010



2018

The New York Times

"Even relatively simple monitoring of ships can reduce the potential for disaster. Ed Page, a former Coast Guard captain, runs a private-public partnership, the Marine Exchange of Alaska, that uses a network of radio receivers to watch over ships around Alaska. Exchange operators can contact vessels that are getting too close to shore — a ship should usually be far from land, so that in the event of a mechanical problem, it has time for repairs without running aground — and have them change course.

With More Ships in the Arctic, Fears of Disaster Rise

By HENRY FOUNTAIN JULY 23, 2017



Crystal Serenity, a 1,000-passenger luxury liner, at a stop in Ulukuktook in Canada's Northwest Territories during a Northwest Passage cruise in August. Kate Orloff

"Captain Page acknowledged that if something went disastrously wrong with a ship within the 1.5 million square miles of ocean his network covers, "it would be ugly."

"But we should stop worrying about what we're going to do when things go wrong," he said. **"We should prevent things from going wrong."**

– July 23, 2017



USCG – MXAK CRADA

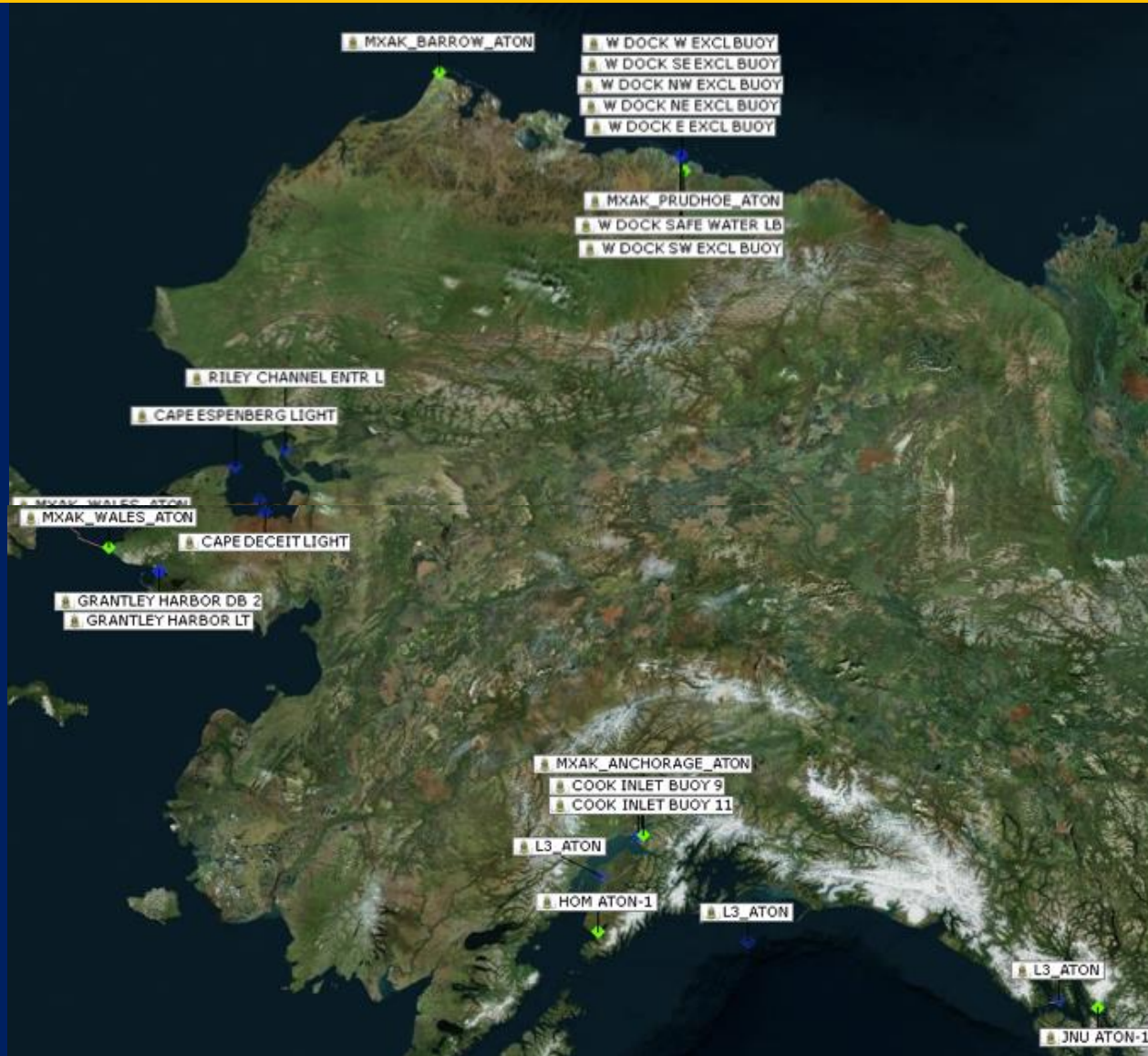
*(Cooperative Research &
Development Agreement)*

Builds upon AOOS AIS/WX project to
communicate information to vessels via AIS

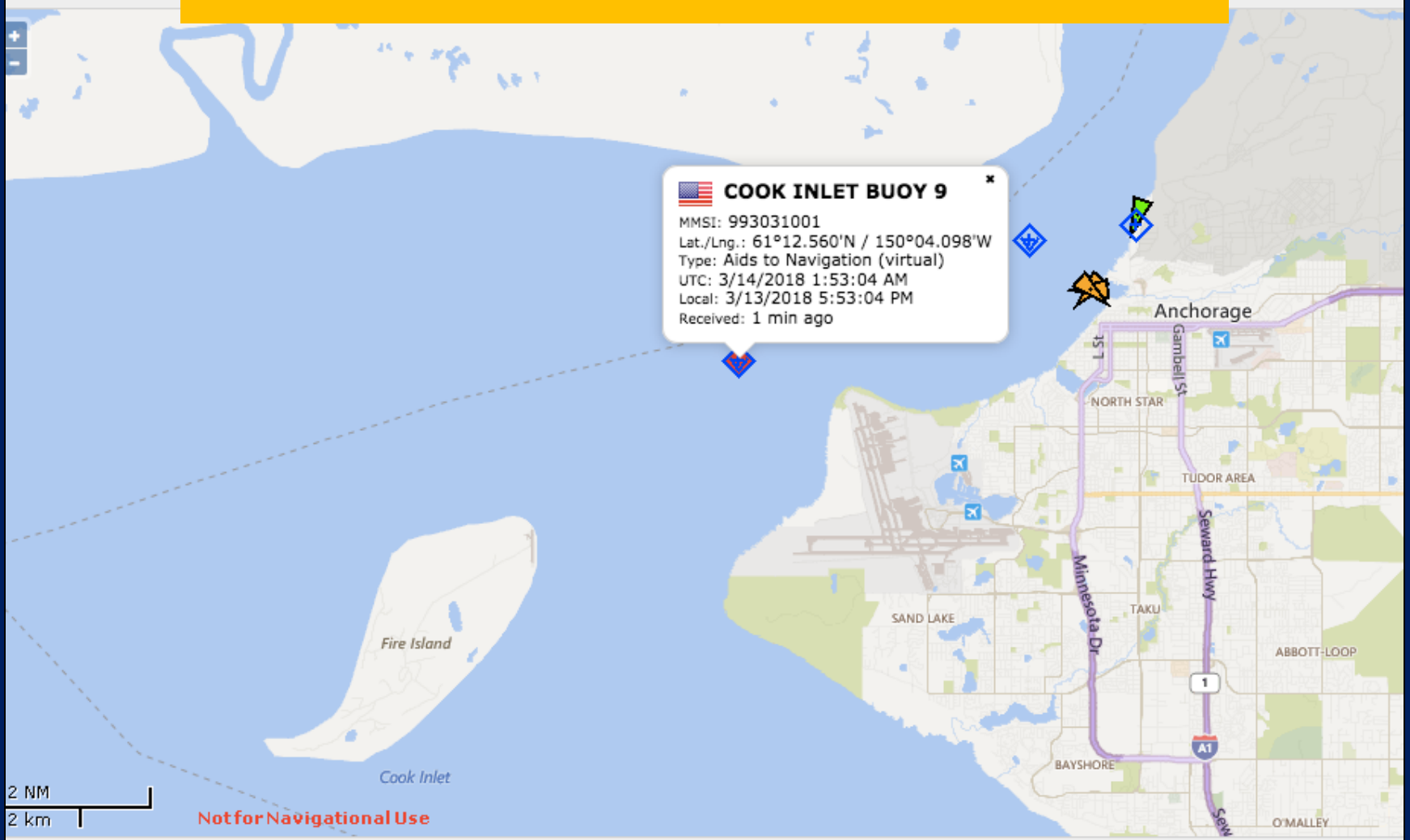
- Virtual aids to Navigation (i.e. buoys)
- Locations of whalers
- Environmental Data (i.e. weather and ice)
- Locations of whales
- Vessels in distress, etc.
- Notify vessels in “Areas to be Avoided” or exceeding speed restrictions
- AIS transmission tests conducted with Coast Guard cutter Healy

**ARCTIC NEXT
GENERATION
NAVIGATIONAL
SAFETY
INFORMATION
SYSTEM**

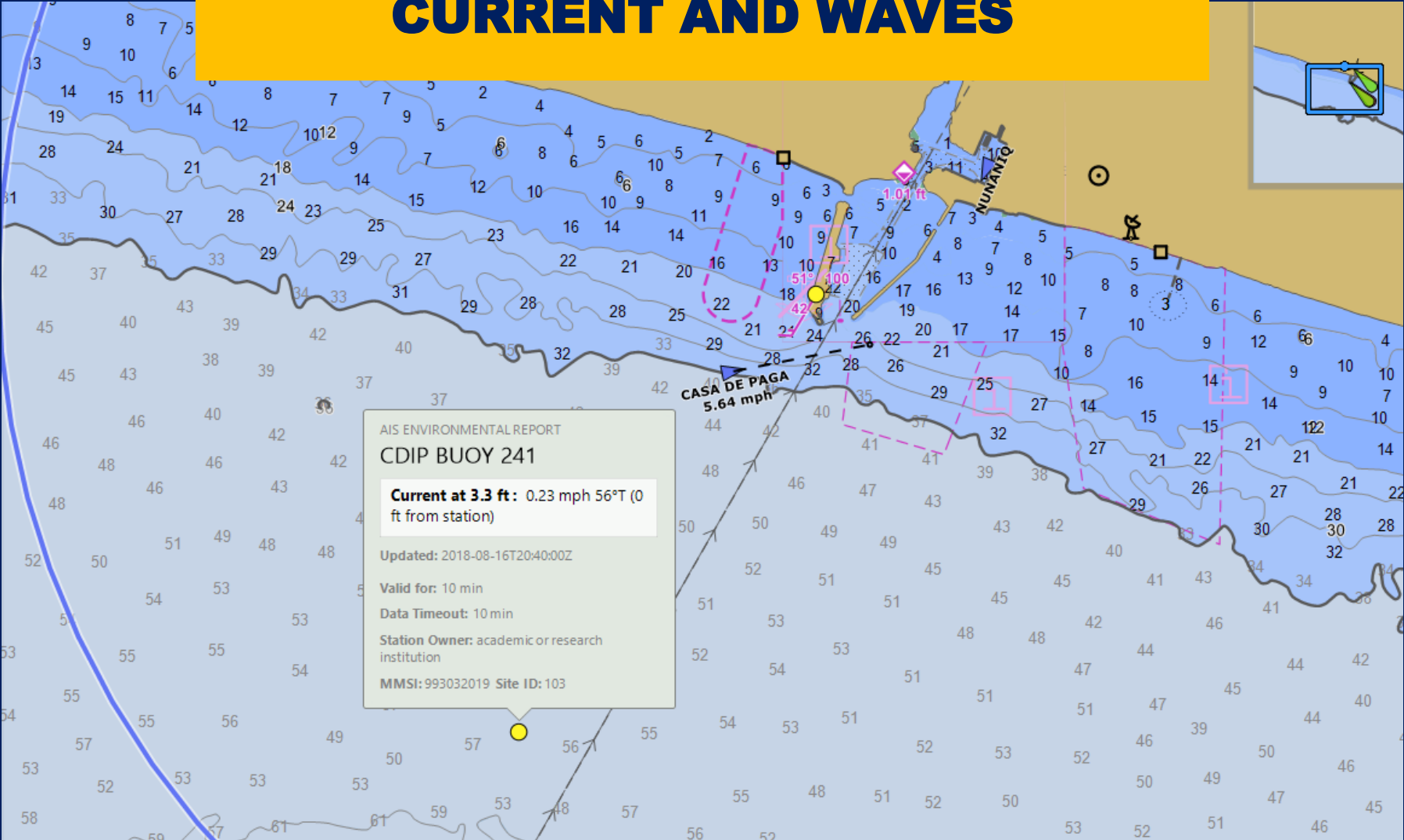
AIS ATONS IN ALASKA



VIRTUAL AIS BUOYS



NOME ENVIRONMENTAL DATA: CURRENT AND WAVES



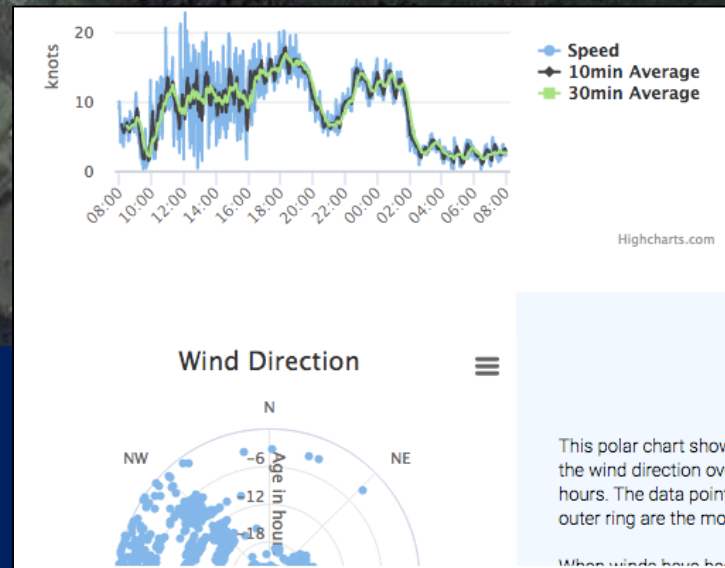
CITY OF JUNEAU PROPOSED DOCK EXPANSION ALTERNATIVES NAVIGATION STUDY



CORAL PRINCESS APPROACH



PORT OF JUNEAU CRUISE FACILITIES AND ENVIRONMENTAL SENSORS

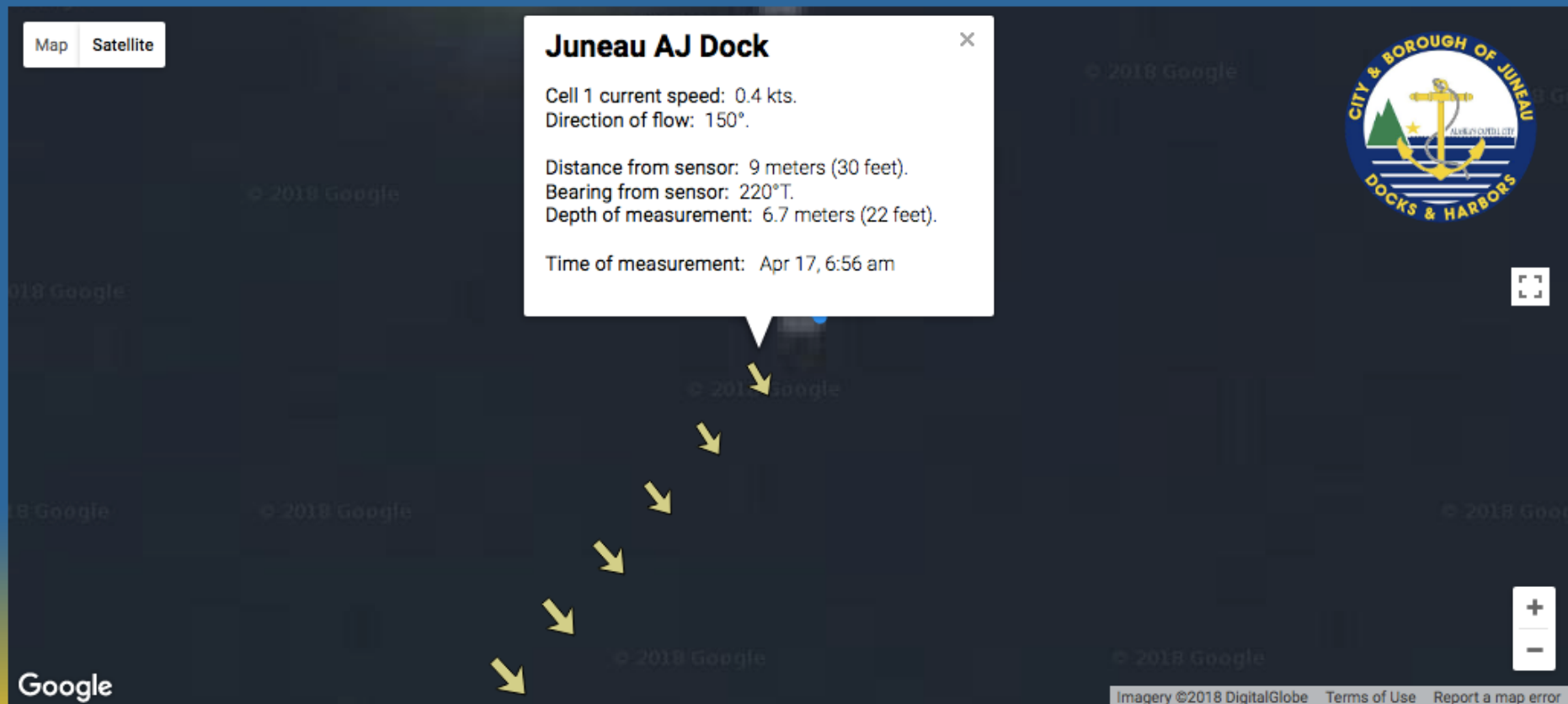


This polar chart shows the wind direction over hours. The data points outer ring are the most recent.



Marine Exchange of Alaska

Port of Juneau — Environmental sensors for wind, weather and tidal currents.



JUNEAU ALASKA AIS WEATHER DATA DISTRIBUTION PROJECT



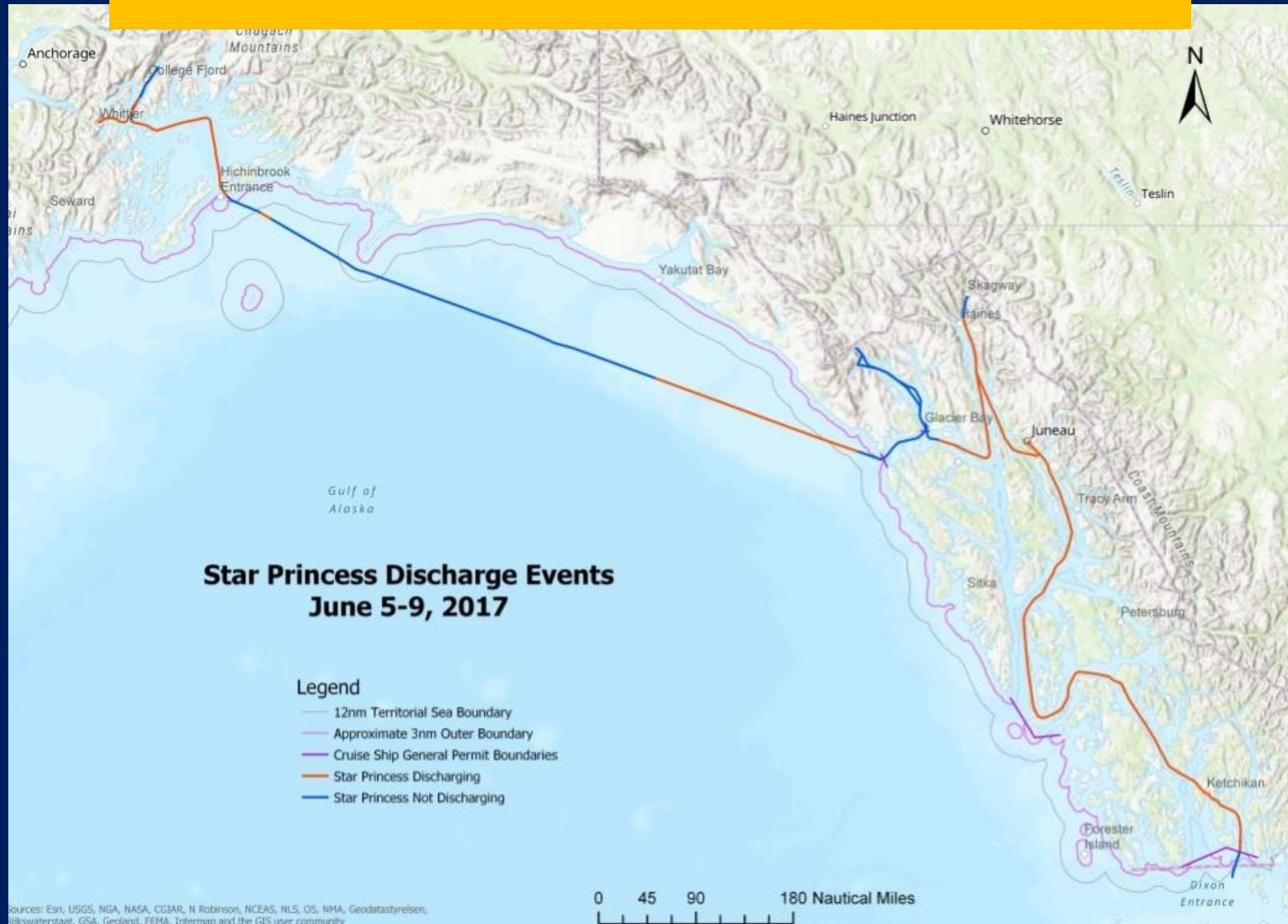
Portland Island
Weather Sensor

MXAK HQ AIS
Weather Server
Juneau, AK

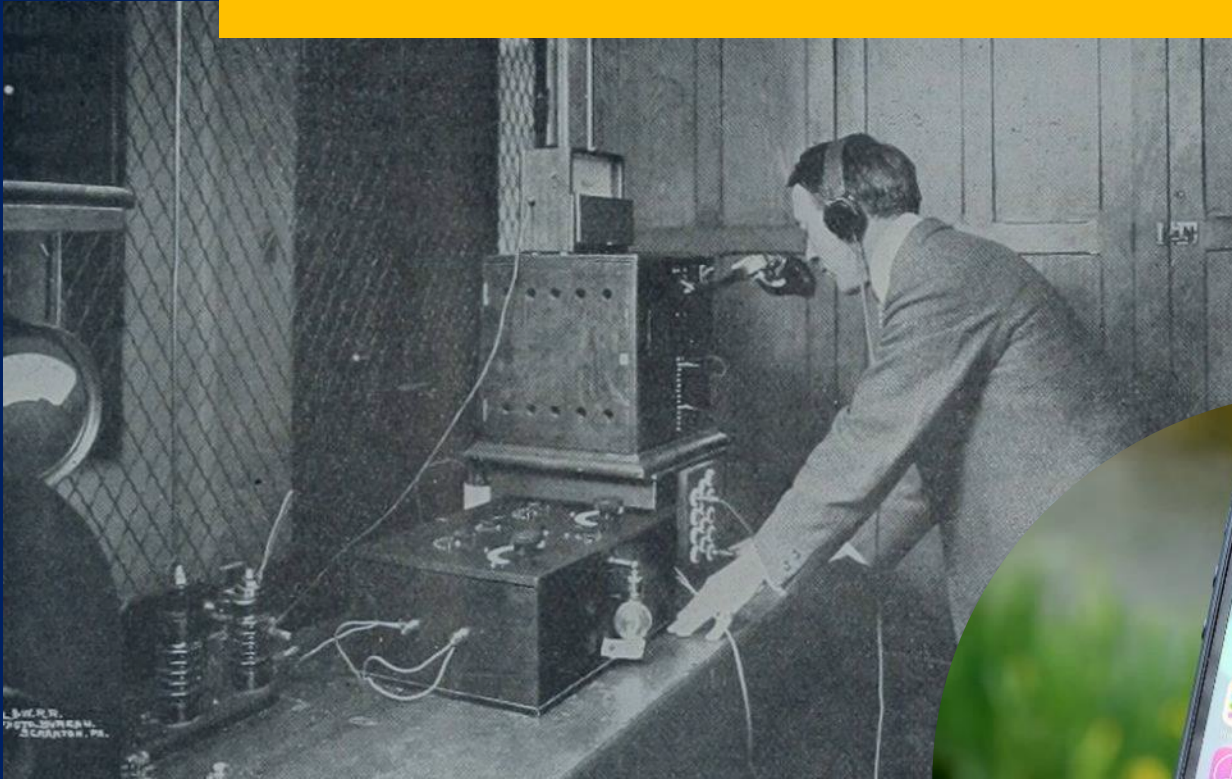
Juneau
Weather Sensor and
collocated ATON
Transceiver

Marmion Island
Weather Sensor

CURRENT ROLE OF MONITORING OF CRUISE SHIP DISCHARGES



CHANGING TECHNOLOGY



THE FUTURE:

Safe, efficient, environmentally
responsible maritime operations

