The Japan Tsunami Marine Debris: Current Status and Lessons Learned

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OCNMS SAC Meeting
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Overview

- Background
- Actions taken/current status
- Lessons learned

Photo: OPRD

The tsunami crashes over a seawall in Miyako City, Iwate Prefecture

Tsunami Damage

- 15,889 deaths, 2,598 missing, 6,152 injured
- 217 square miles inundated
- Massive damage

A train near Onagawa

Devastation at Natori, Miyagi Prefecture

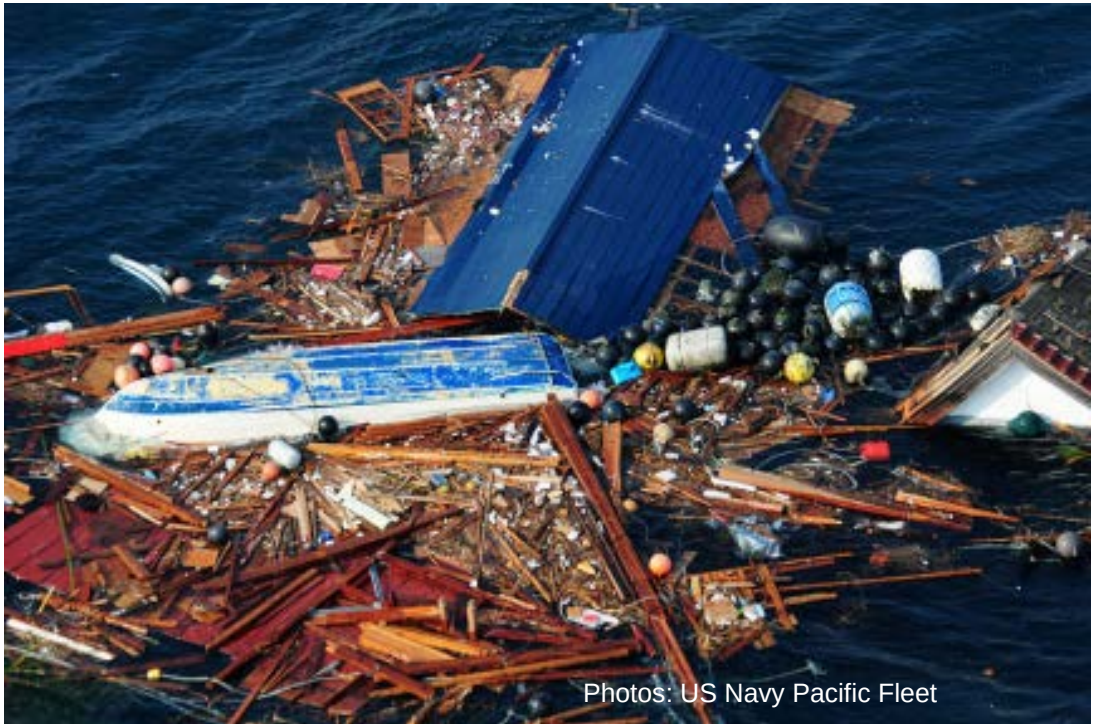
Minato after the tsunami

JTMD Questions

- How much?
- Where and when?
- Fate?
- Short and long term impacts?
- Action?

How Much?

- GoJ: 5M tons washed out, 1.5M tons remained afloat
- GoJ: 70-80% construction lumber
- Current quantities unknown



Floating Debris: Japan, Nov. 2011

Fishing boat

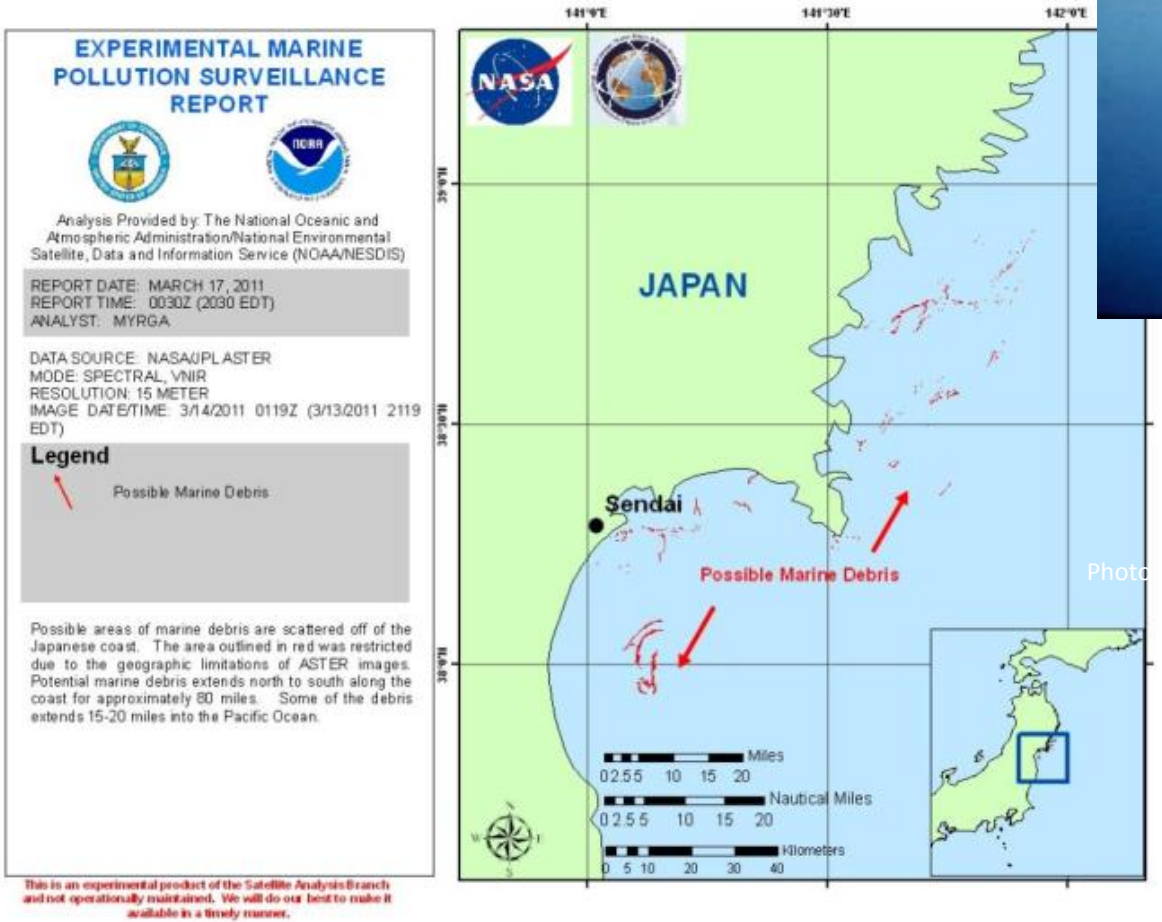
Capsized skiff

Gas cylinder

Fishing gear

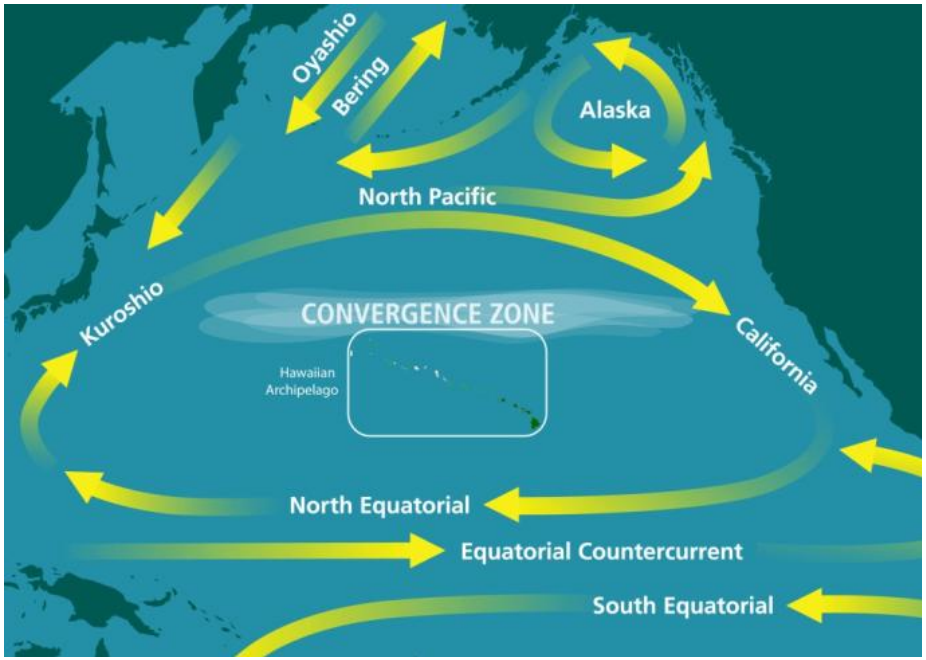
Where? At Sea Detection

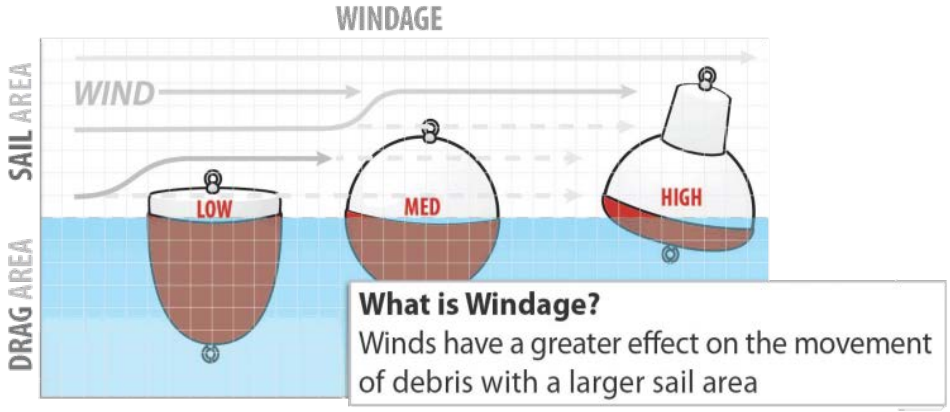
- Widely dispersed
- Mixed with other marine debris
- Current status: Reports are rare



Where and When? Modeling

Ocean currents + **Winds**

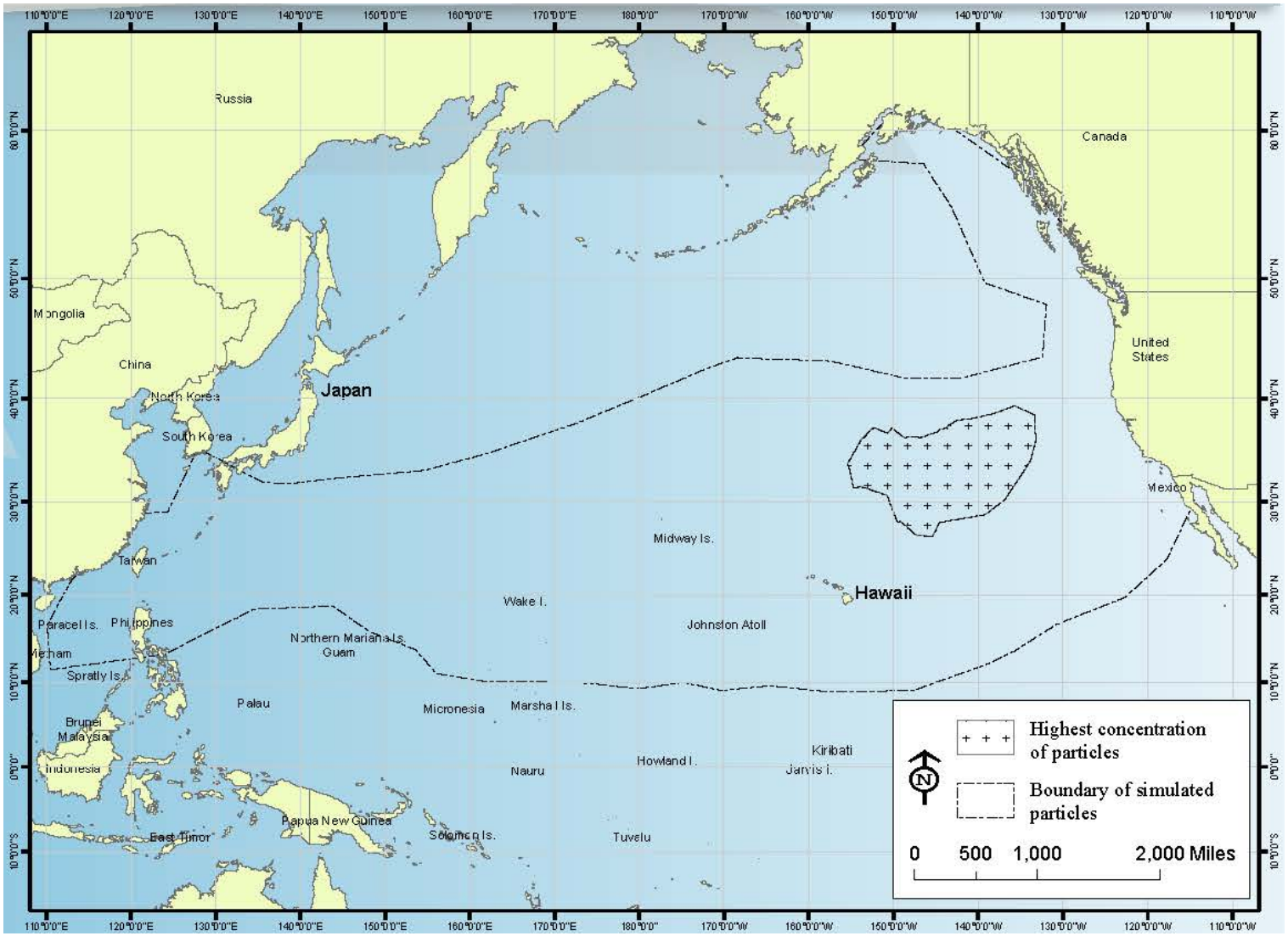




- **Combination of sail area and drag**
- Low = slow (e.g., wood, nets)
- Medium = moderate (e.g., fishing vessel)
- High = fast (e.g., unoccupied inflatable life raft, Styrofoam, floats)

Modeling Output

http://marinedebris.noaa.gov/tsunamidebris/debris_model.html



Impact: JTMD at Sea

disasterdebris@noaa.gov

Small fishing boat

Skiff

Royu Un Maru

Floating dock

Impact: JTMD on Shore

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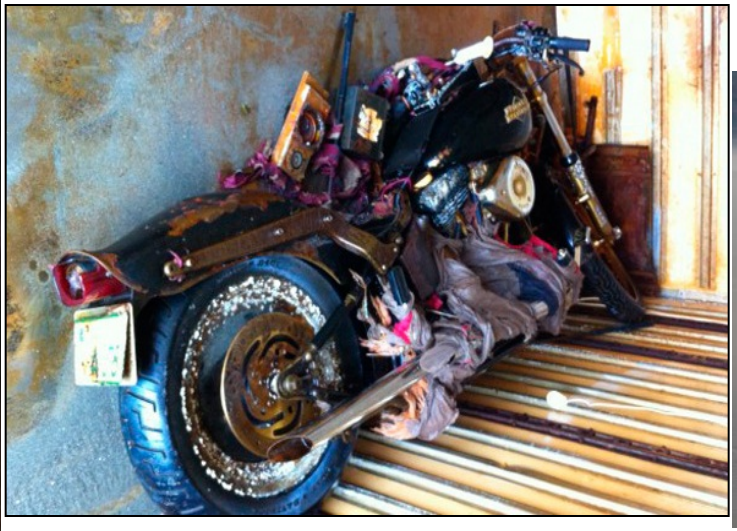
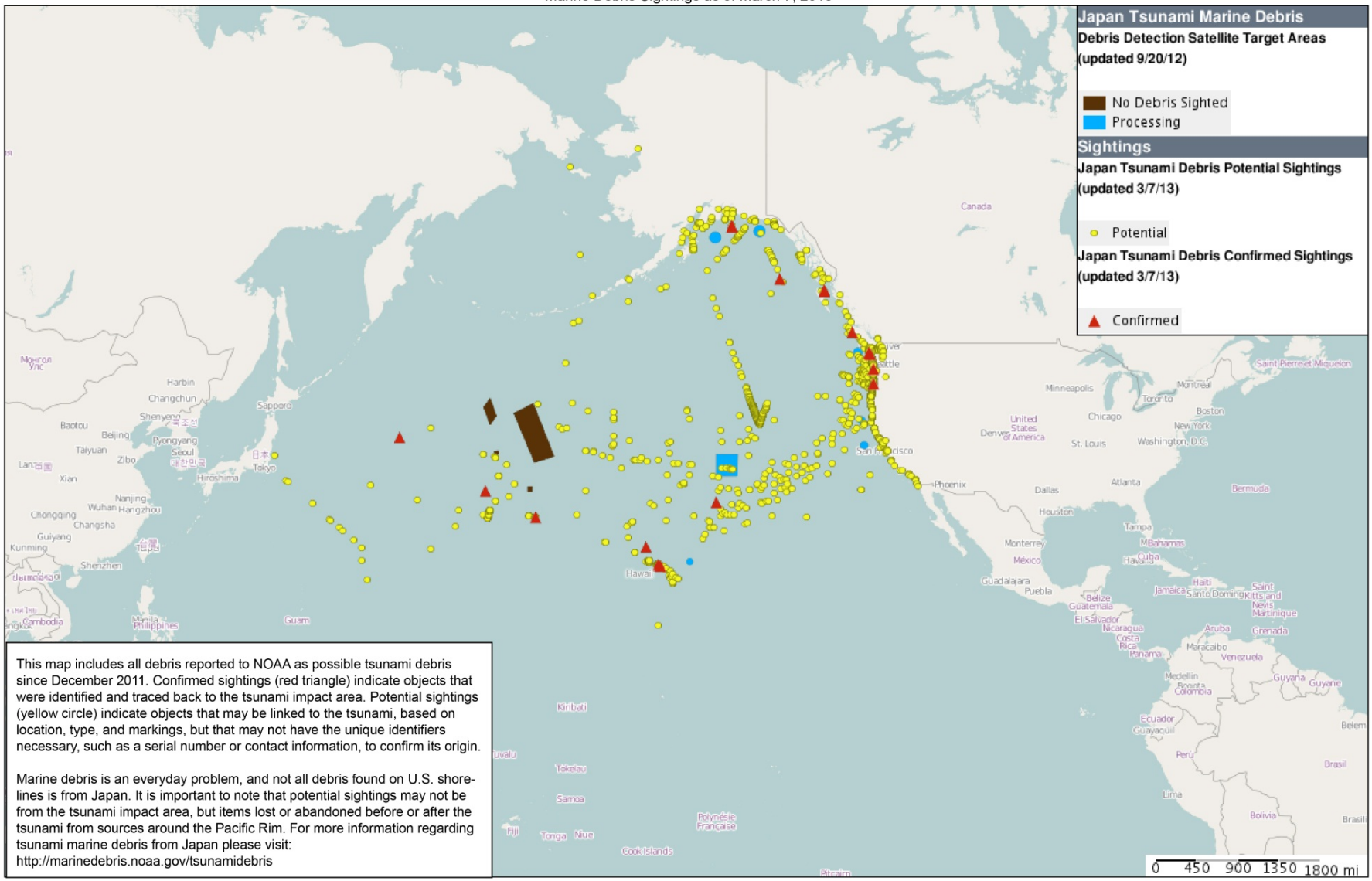


Marine Debris Sightings as of March 7, 2013



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Coastal Response Research Center
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ERMA | Environmental Response Management Application Pacific Islands

http://marinedebris.noaa.gov/tsunamidebris/debris_sightings.html

Impact: Hazardous Debris

- A serious concern
- Assistance from the Government of Japan
- Current status: Less items, but more weathered and corroded

Drums and gas cylinders

Kerosene containers

Medical waste

Impact: Invasive Species

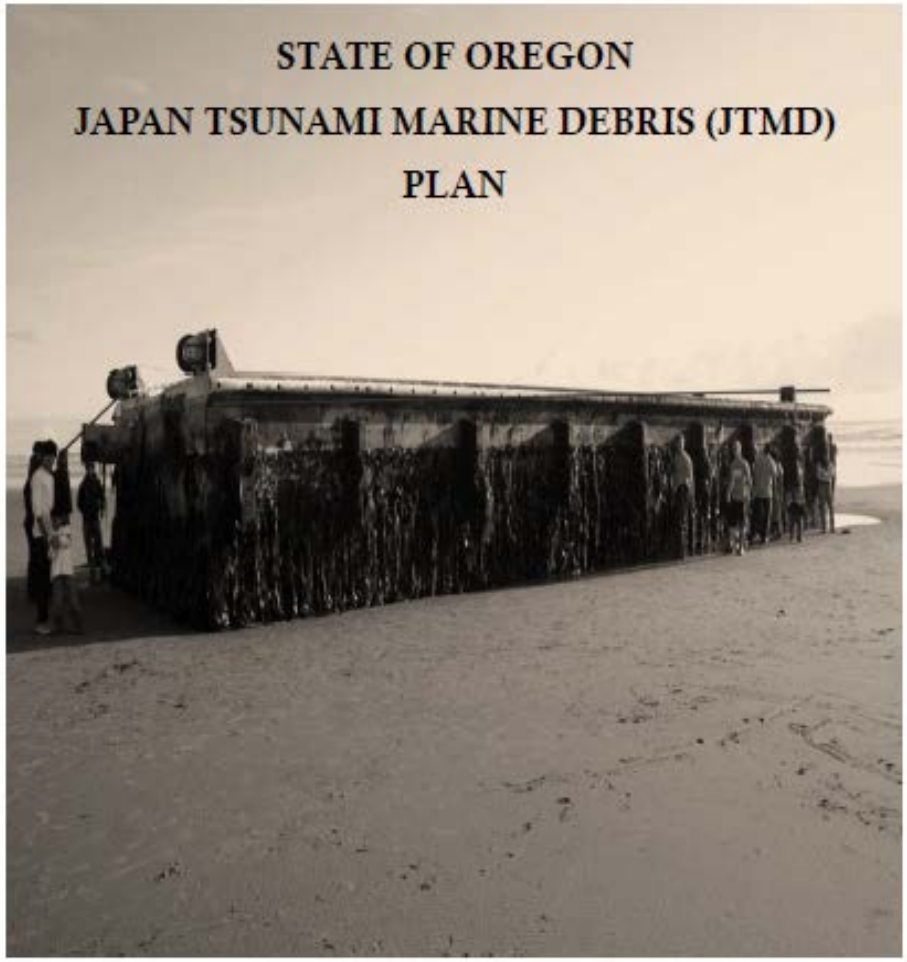
- MD is a vector for AIS
- AIS issue magnified by JTMD
- On-going concern

Outreach and Communication

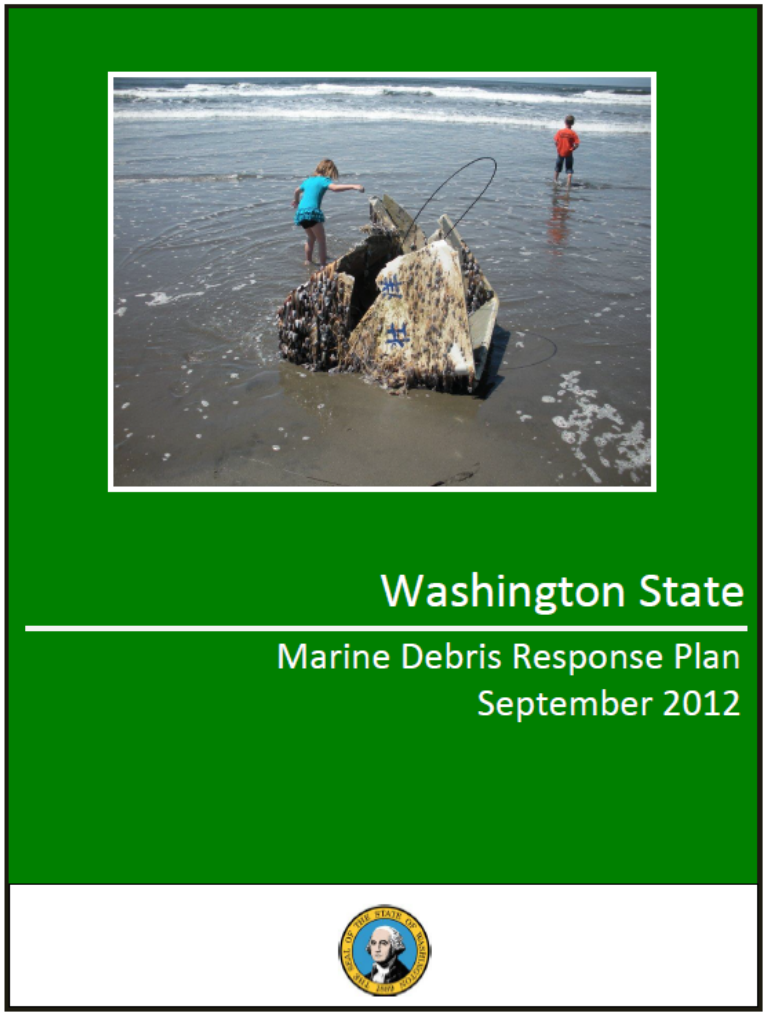
- Over 70 outreach events along the West Coast in 2012-2013
- Provide information, address perception
- Federal, states, and local entities

http://marinedebris.noaa.gov/tsunamidebris/faqs.htm
http://marinedebris.wa.gov/
http://www.oregon.gov/OPRD/PARKS/Pages/tsunami_debris.aspx

Planning

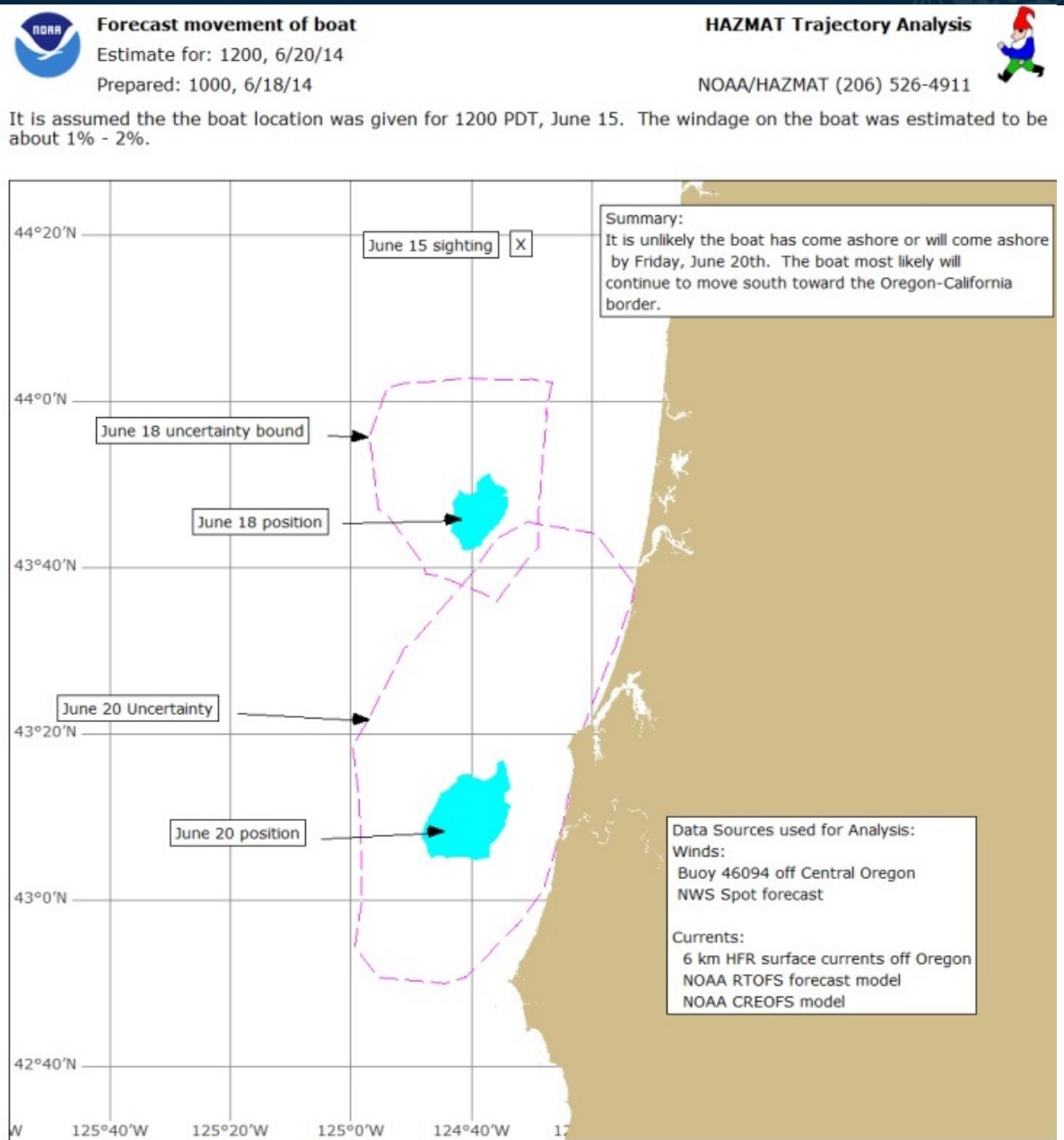


http://www.oregon.gov/OMD/OEM/public_information/jtmd_plan.pdf

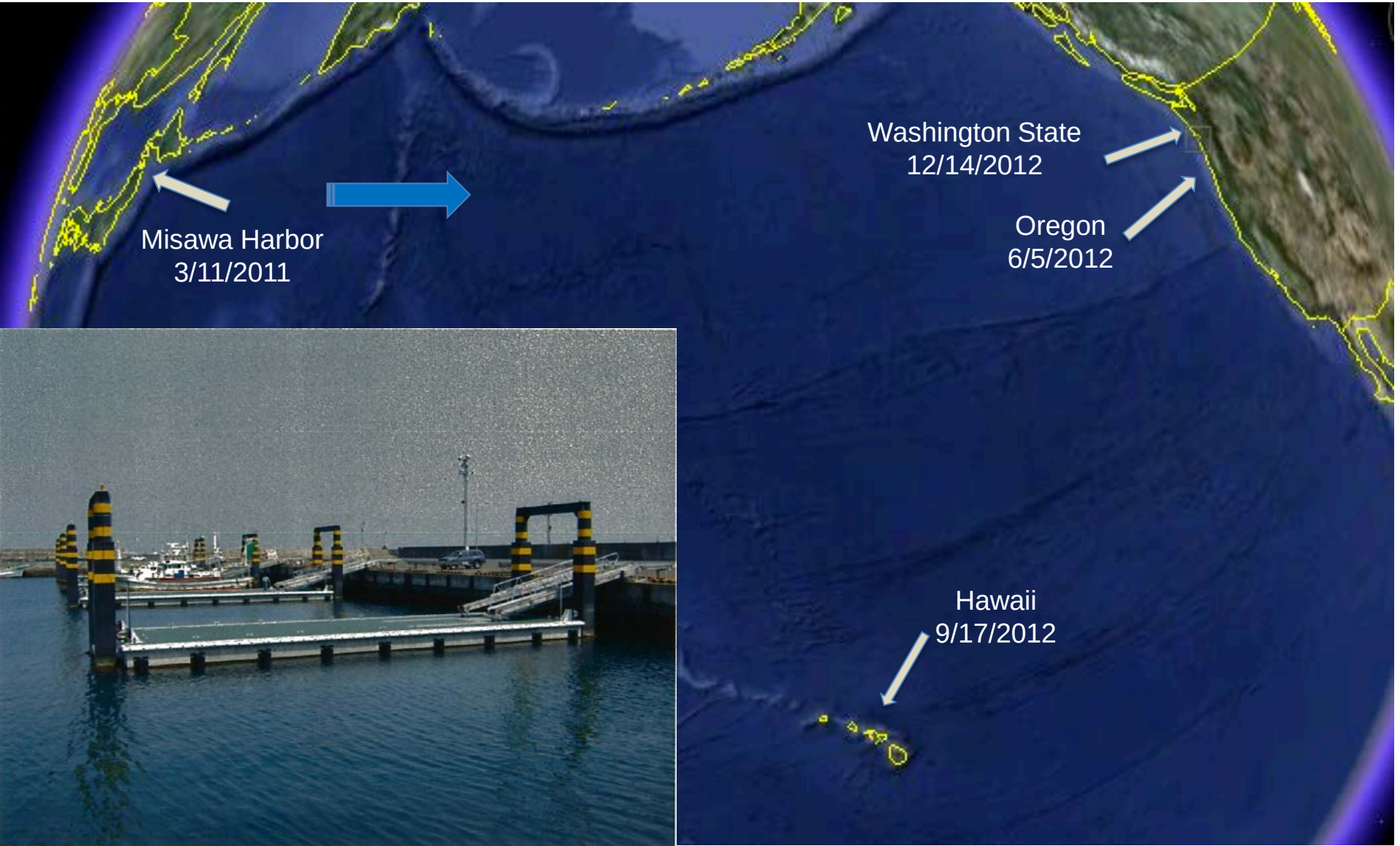


http://marinedebris.wa.gov/

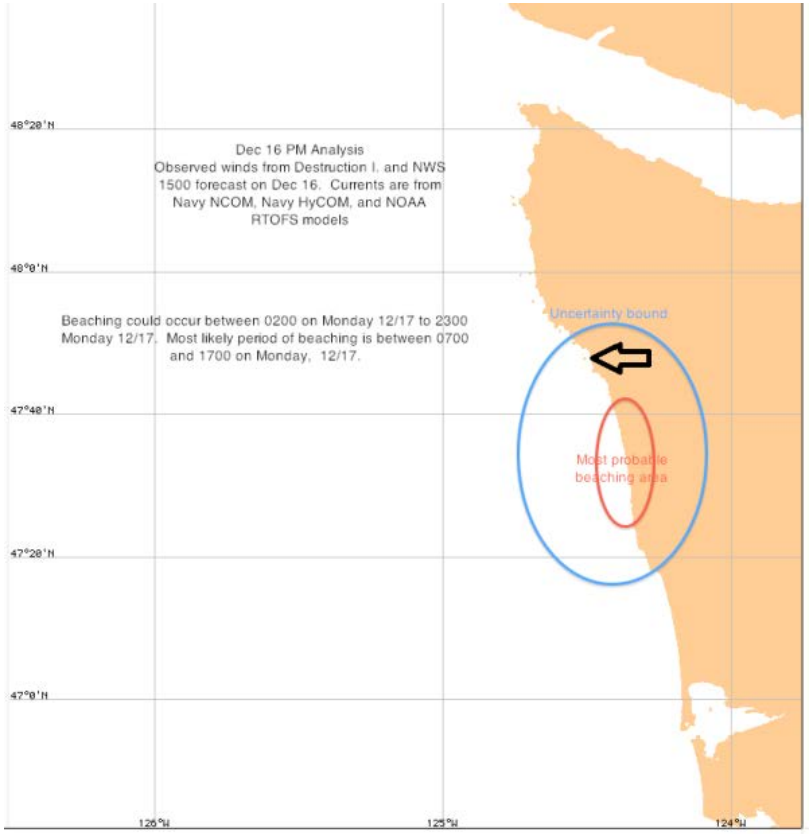
Trajectory Modeling



Misawa Floating Docks



Trajectory and Sighting



NOAA Trajectory Map

Dock Sighting by USCG

Cleanup and Removal

AIS cleanup, Jan 2013

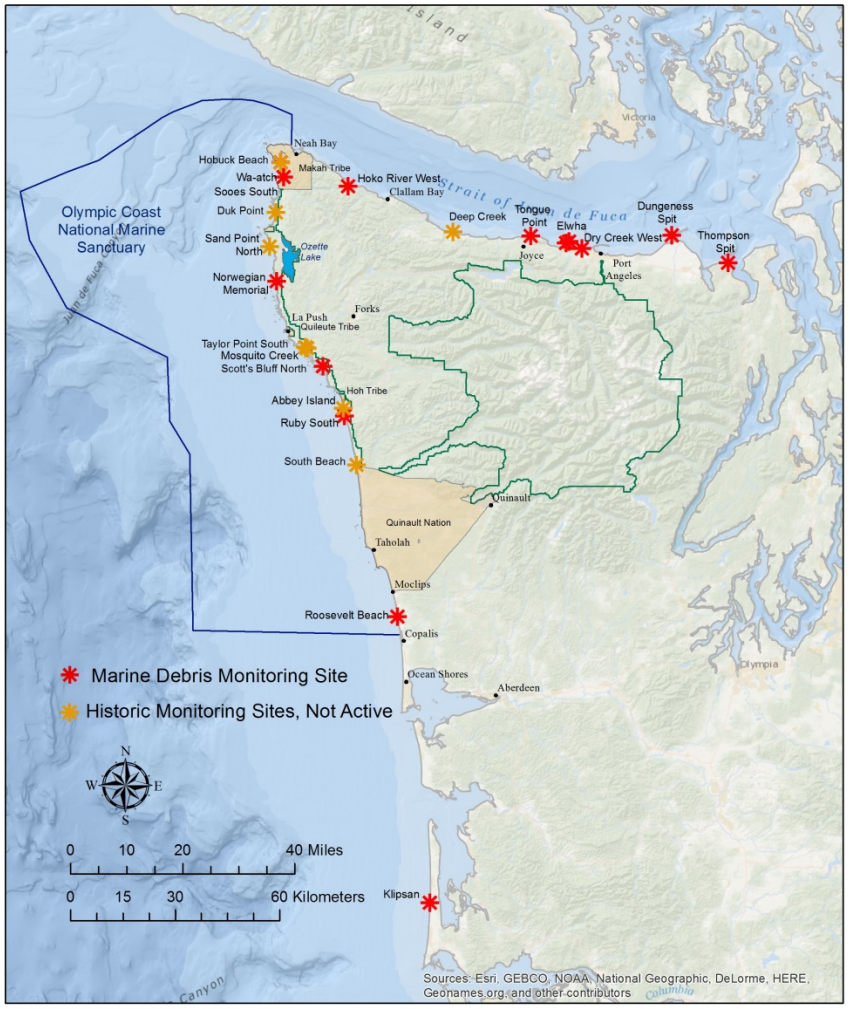
Dock removal, March 2013

2015 Monitoring Sites

6 sites:
Strait of Juan de Fuca

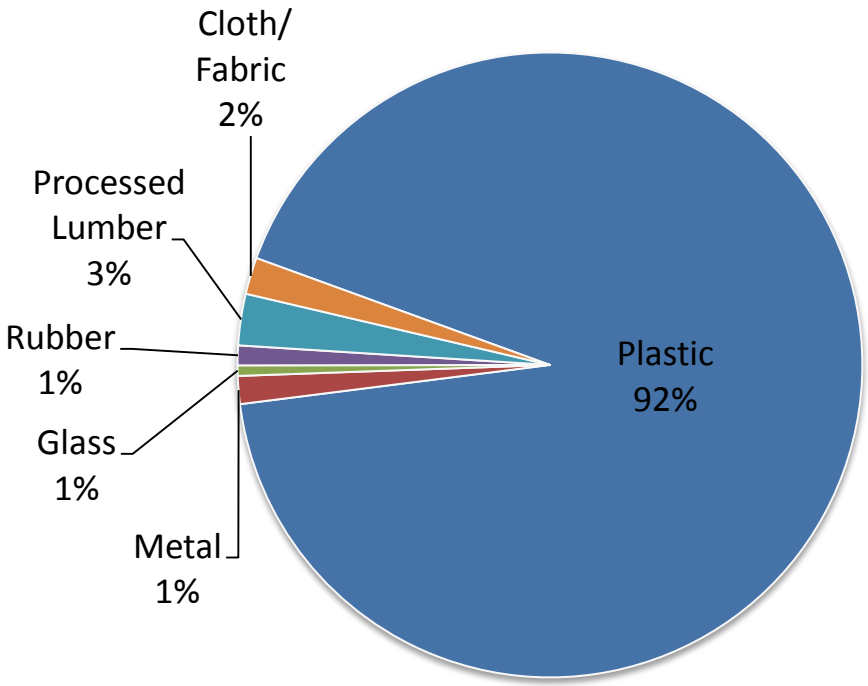
7 sites:
Washington coast

OCNMS Marine Debris Monitoring Sites

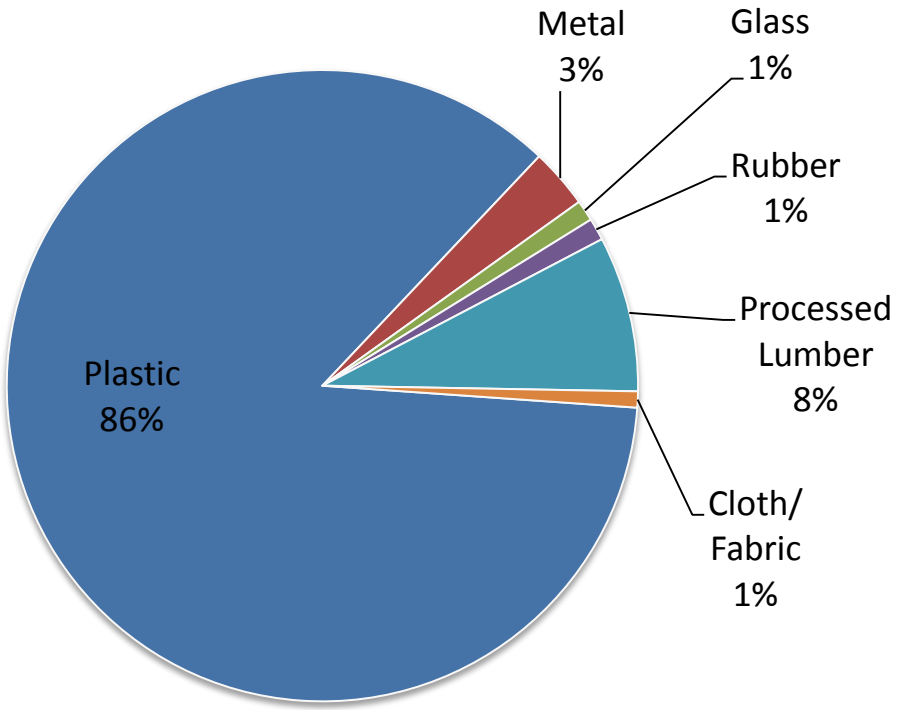


Overall Debris

Shoreline Debris on Ocean-Facing Beaches



Shoreline Debris on Strait-Facing Beaches



Short Yellow Ropes

- 6% of total debris collected on Ocean-facing beaches
- From longline oyster aquaculture in Washington
- Thrown into the water
- Mitigation in progress

Lessons Learned

- JTMD arrival was intermittent and widely scattered
- Quantities were significant, but usually manageable
- Large JTMD items posed a hazard to navigation
- JTMD hazardous items arrived, and were usually handled well
- JTMD composition was 70-80% wood, likely sank
- JTMD detection in the open ocean was challenging

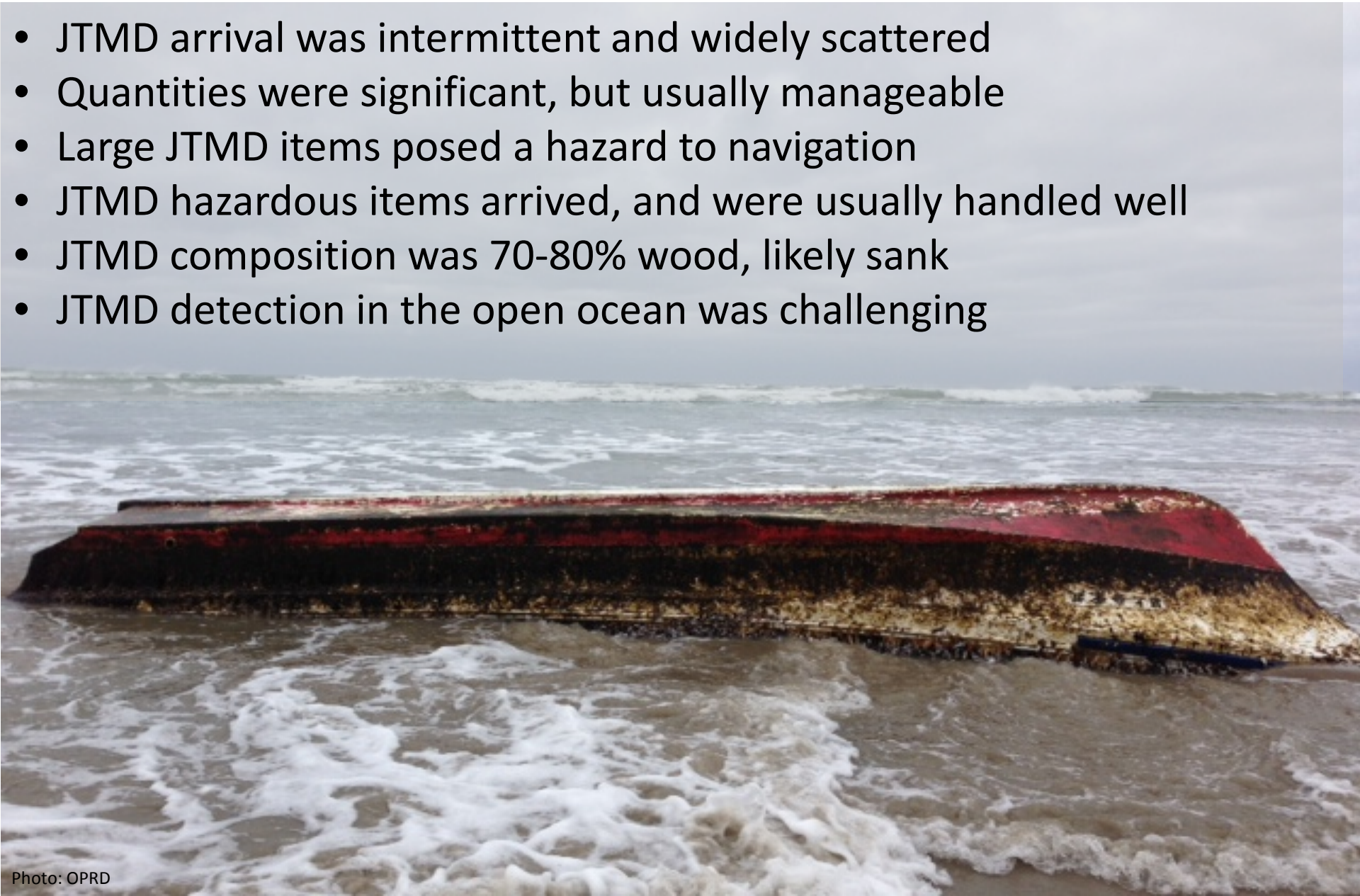
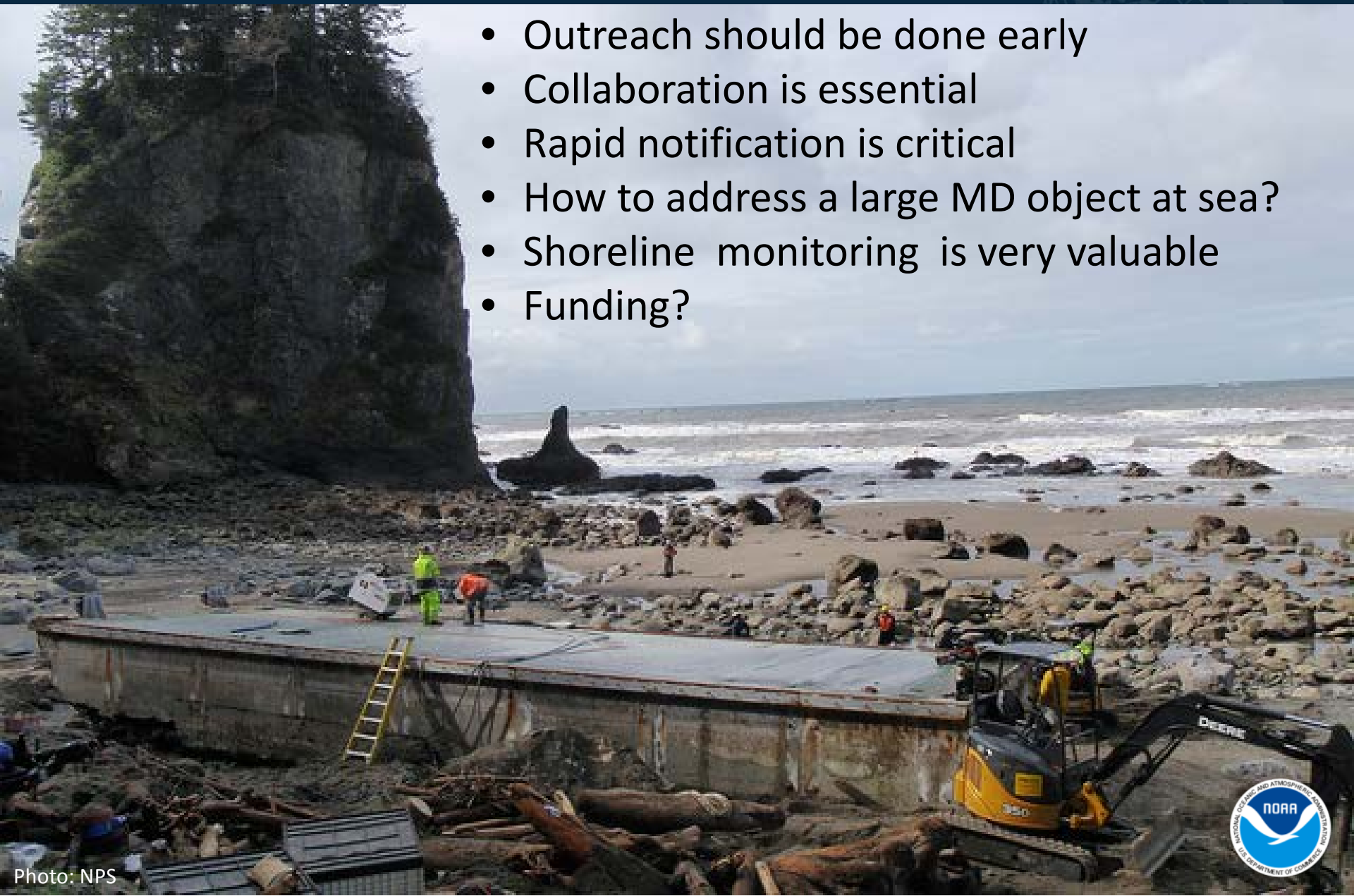


Photo: OPRD

Lessons Learned



- Outreach should be done early
- Collaboration is essential
- Rapid notification is critical
- How to address a large MD object at sea?
- Shoreline monitoring is very valuable
- Funding?

Photo: NPS

OCNMS Critical Contribution

- JTMD outreach
- Shoreline monitoring lead in Washington
- Dock removal funding, contracting, removal, and documentation
- Support of CoastSavers
- Marine debris projects and initiatives over the years

Thank You!

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http://marinedebris.noaa.gov/