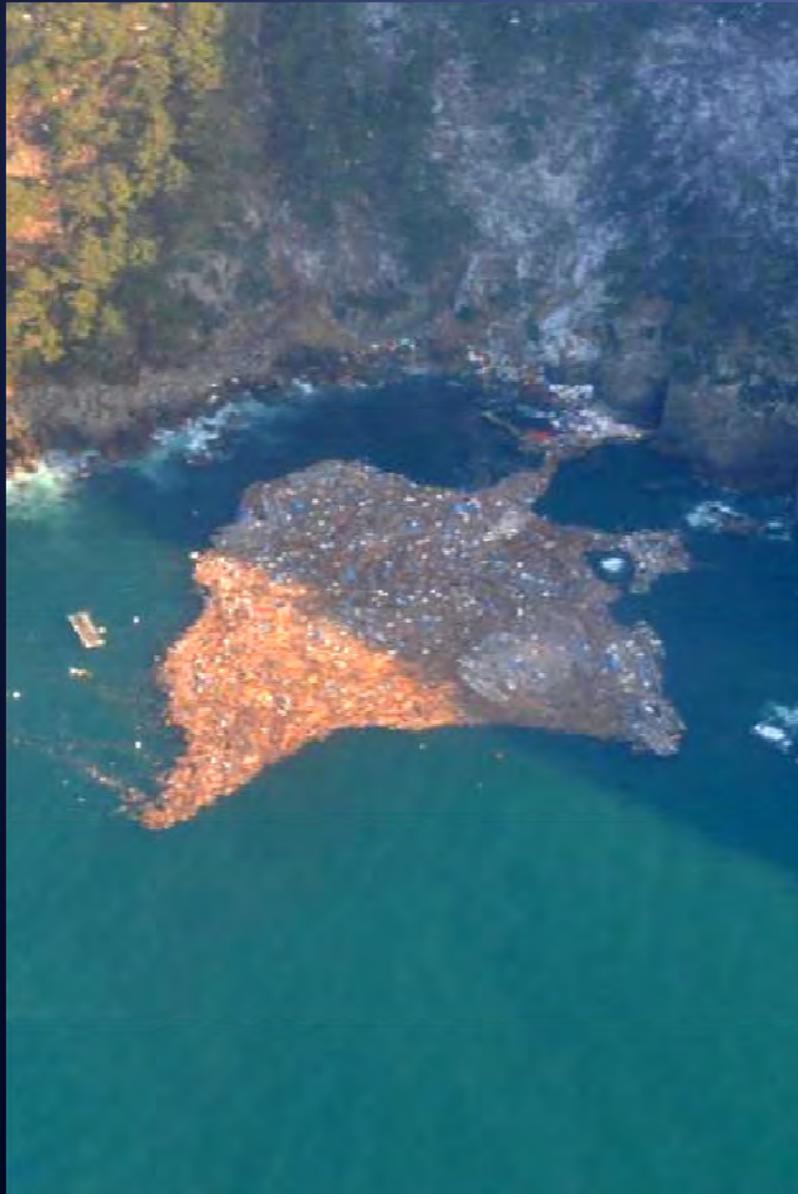


Marine Debris

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Japan Tsunami Marine Debris: Information and action

Alaska
**Climate, Ecosystem &
Health Working Group**
April 16, 2012

Peter Murphy
Alaska Coordinator
NOAA Marine Debris Program



Outline

- Background
- What we know
- What we are doing
- What you can do
- Questions?



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NOAA Marine Debris Program

- Established in 2005
- Mandated by the Marine Debris Research, Prevention, and Reduction Act, Dec. 2006
- Dedicated to leading and promoting research, prevention, and reduction activities nationwide
- Regional Structure
- Website:

<http://marinedebris.noaa.gov/>

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Home

About the Program
Marine Debris Info/101
Projects & Partners
Funding Opportunities
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In the News & Media
Photo Galleries

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This Site
NOAA

Search

Marine debris threatens oceans and coasts, marine life, our economy, safe navigation, and human health and safety.

NOAA Marine Debris Program

UPDATES & NEWS

3 of 9

How should we begin monitoring our shoreline debris?
...and more!

FAQs:
Japan Tsunami
Marine Debris

Annual Art Contest NOW OPEN - Closes Oct. 21
Marine Debris Grant NOW OPEN - Closes Nov. 1
FAQs: 2011 Japan Tsunami Marine Debris
Marine Debris Tracker App
What We Know About: Garbage Patches

Special Features

MARINE DEBRIS TRACKER
Download the app now!
Click here

FAQs
2011 Japan
Tsunami
Marine Debris

INTERNATIONAL MARINE DEBRIS CONFERENCE
440 Participants
38 Countries
Click here

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Marine Debris - Impacts



Photos: Gulf of Alaska Keeper



Photos: NOAA



Photos: NWSI



Photos: NOAA

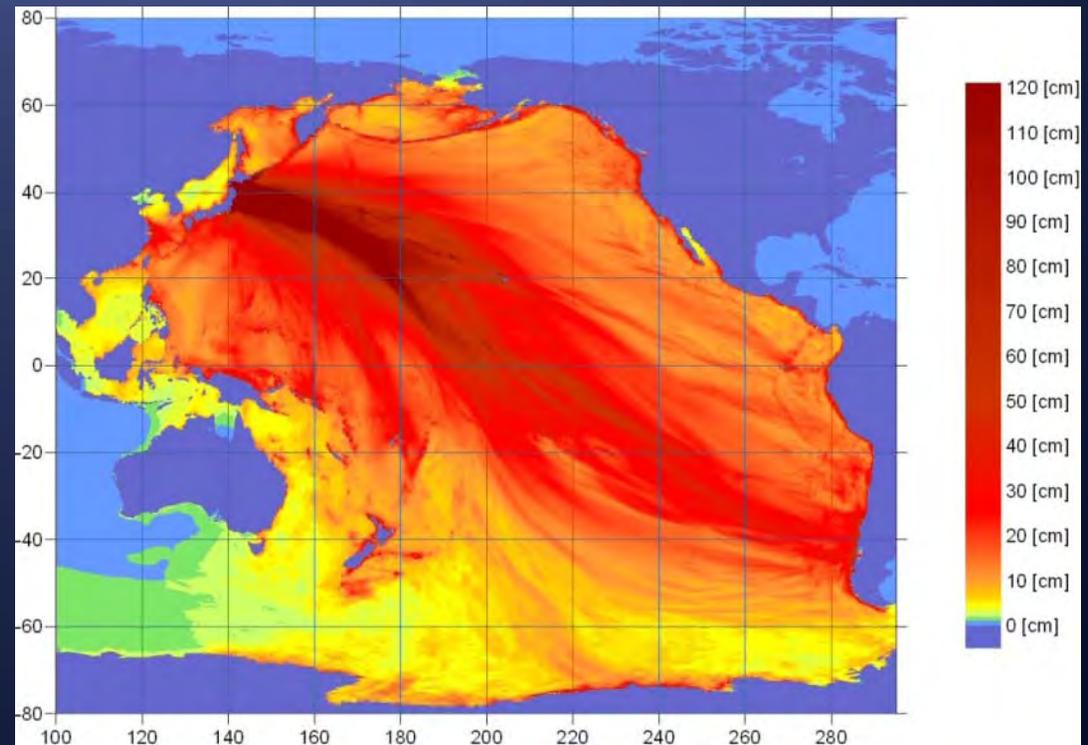


Photos: NOAA



Tsunami Event

- 9.0 magnitude earthquake
- 120 ft max wave height
- 217 square miles inundation
- 15,844 people confirmed dead, 3,451 missing



NOAA's ocean energy distribution forecast map of the 2011 Japan tsunami



The Damage

- Total debris on land: ~22 million tons
- Quantity and composition of floating debris: unknown at this time



Photo: US Navy

Ofunato, March 15

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Tsunami Marine Debris – What is it?



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At-sea Sightings: Japan, Oct., Nov. 2011



Fishing boat



Capsized boat



Gas cylinder



Fishing gear

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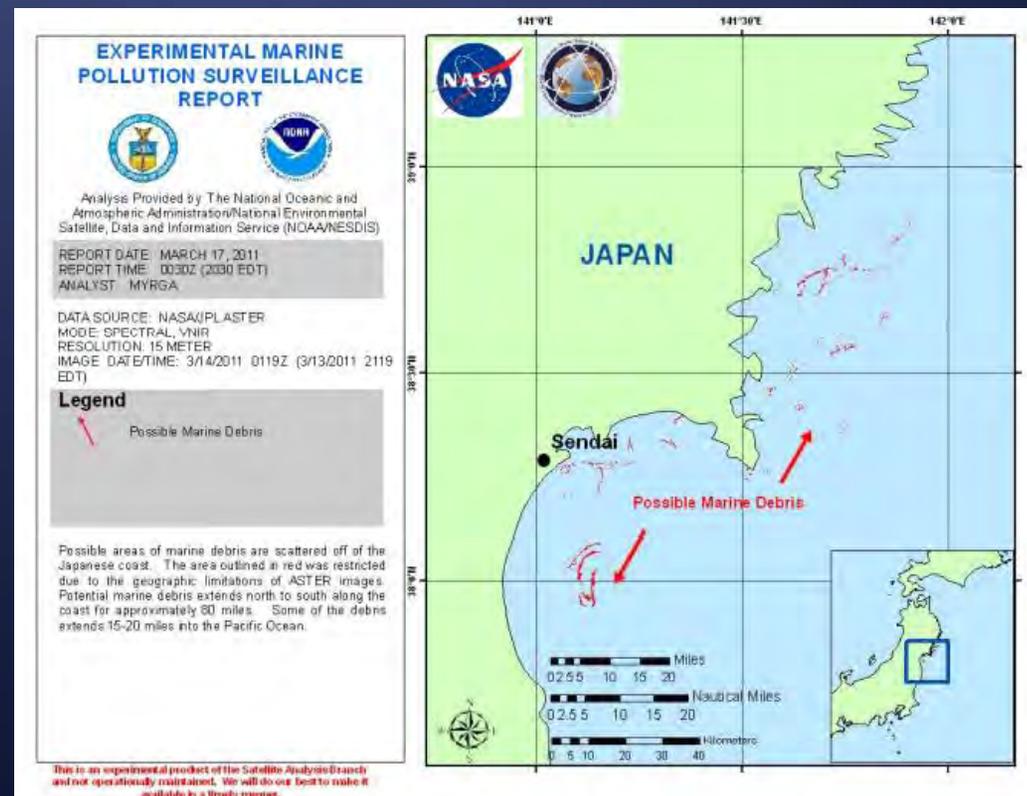
Marine Debris – Early Sightings



Photos: US Navy Pacific Fleet

Aerial Imagery – March 13

- Patches and fields
- Wood, construction materials abundant



Satellite Imagery – March

- Patches and fields – By April 14, debris no longer visible

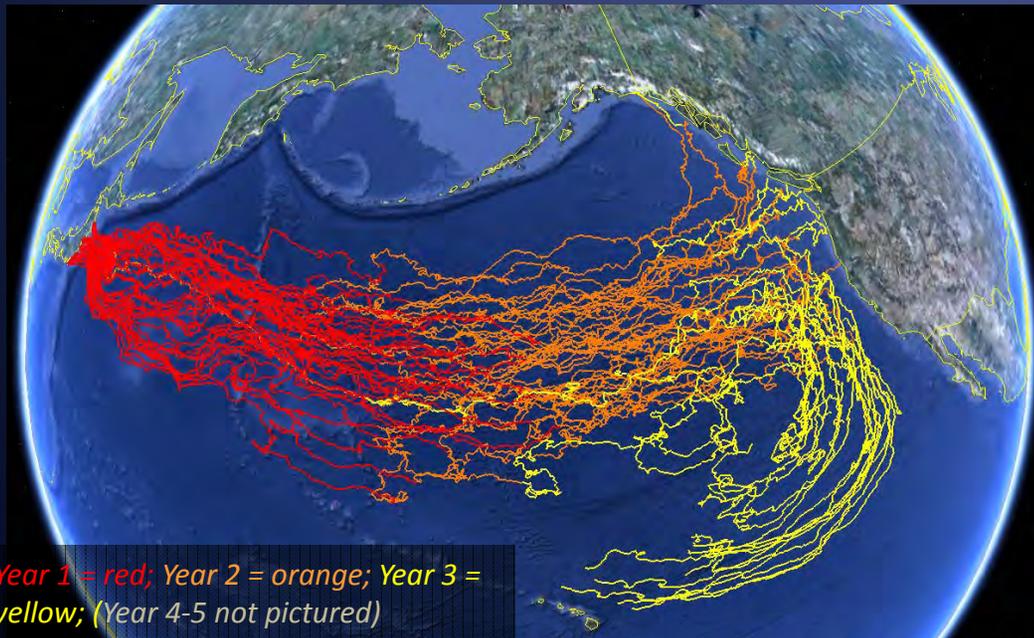
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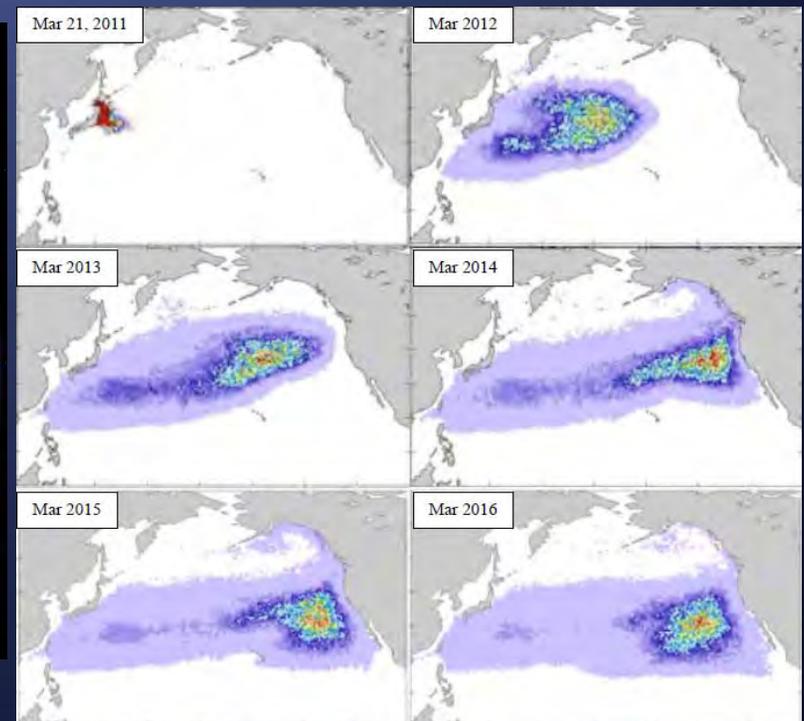
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Modeling – Initial Efforts



NOAA OSCURS Model outputs



UH SCUD model outputs

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Windage



Wind Direction



Windage is combination of sail area and drag.



Lower windage



Higher windage

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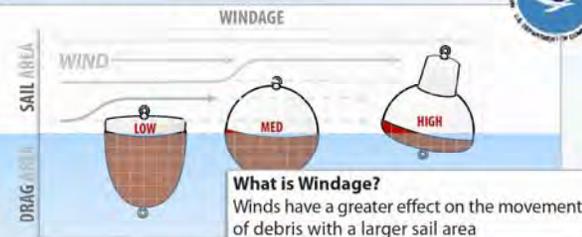
Modeling – Updated Efforts

Modeled Movement of the Marine Debris Generated by the March 2011 Japan Tsunami

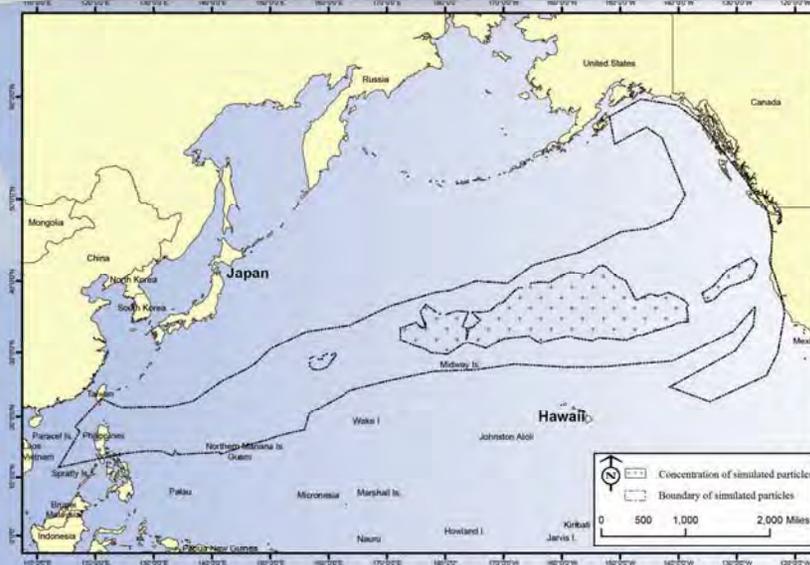
On March 11, 2011, an estimated 5 million tons of debris washed out by the tsunami

Estimated 30% floated away and dispersed

Estimated 70% sank near Japan



Expected Distribution of Computer Simulated Particles Through Saturday, 4/07/12



- Japan Ministry of the Environment estimates that 5 million tons of debris washed into the ocean.
- They further estimated that 70% of that debris sank near the coast of Japan soon after the event.
- Model Results: High windage items may have reached the Pacific Northwest coast as early as winter 2011-2012.
- Majority of modeled particles are still dispersed north and east of the Hawaiian Archipelago.
- NOAA expects widely scattered debris may show up intermittently along shorelines for a long period of time, over the next year, or longer.

NOAA used a computer model to simulate the movement of tsunami debris from March 11, 2011, to the present day. This GNOME model (General NOAA Operational Modeling Environment) simulation is based on ocean surface currents from the US Navy (the Hybrid Coordinate Ocean Model) and winds from NOAA (the NOAA blended wind product). The computer model simulated the release of 1,000 particles from each of 8 locations on the Japan coastline where tsunami wave heights were 3.5 meters or greater. Particles were randomly assigned windage values from 1-5%, meaning that they were moved not only by ocean currents, but were also moved by 1-5% of wind speed in the downwind direction. The shaded area indicates the region of the highest concentration of simulated debris with 1% windage at the end of the simulation. For more details on this model, please visit marinedebris.noaa.gov

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Tsunami Marine Debris - Sightings

ERMA | Environmental Response Management Application
Pacific Islands

Information Help Recent Data Find

The screenshot displays the ERMA Pacific Islands interface. At the top, it shows the application name and a search bar. Below is a map of the North Pacific Ocean region, with various geographical features and state abbreviations labeled. A series of yellow circular markers indicates debris sightings along the West Coast of North America. Four blue arrows originate from specific markers on the map and point to inset images: 1) A white fishing boat on the water. 2) A dark, spherical object with 'RY-22' written on it. 3) A dark, spherical object with 'V-230' written on it. 4) A red inflatable boat. 5) A large, rusted shipwreck.



Tsunami Marine Debris – Actions

1. Detection
 - *Satellite, Aerial, Vessel*
2. Modeling
3. Monitoring
 - *Baseline data*
4. Planning / Preparedness
 - *Regional*
5. Communication



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Japan Tsunami Debris: Information and FAQs

TSUNAMI AFTERMATH MARINE DEBRIS

Debris from the tsunami that devastated Japan could reach the United States as early as this winter, according to predictions by NOAA scientists. However, there is still a large amount of uncertainty over exactly what is still floating, where it's located, where it will go, and when it will arrive.

Have You Seen Tsunami Debris?
Report to: DisasterDebris@noaa.gov

What's Happening?
As the tsunami that hit Japan in March 2011 receded from land, it pushed much of what was in the inundation zone into the ocean. Washed materials sank close to shore, while buoyant materials went on to make up the debris fields we care to monitor. Inspire and aerial photos of the waters surrounding Japan.

Months later, debris fields are no longer visible, winds and ocean currents

Have You Seen Tsunami Debris?
1. [Tsunami Debris Page](#)
2. [DisasterDebris.com](#)
3. [Twitter](#)
4. [Facebook](#)
5. [YouTube](#)
6. [LinkedIn](#)
7. [Google+](#)
8. [RSS](#)
9. [Email](#)
10. [Print](#)

Report to: DisasterDebris@noaa.gov
Press inquiries contact: Science.Debris@noaa.gov



Tsunami Marine Debris – What we know

- Tsunami debris **added to an existing problem**
- Likely much of the **debris sank near shore off Japan coast.**
- **Debris is dispersed** and not in large concentrations or fields.
- **Radioactive debris?**
 - Consensus that contamination of debris is highly unlikely
- **Sightings**
 - **Three** sightings of confirmed JTMD (as of 04/10/12), many more unconfirmed

Marine Debris

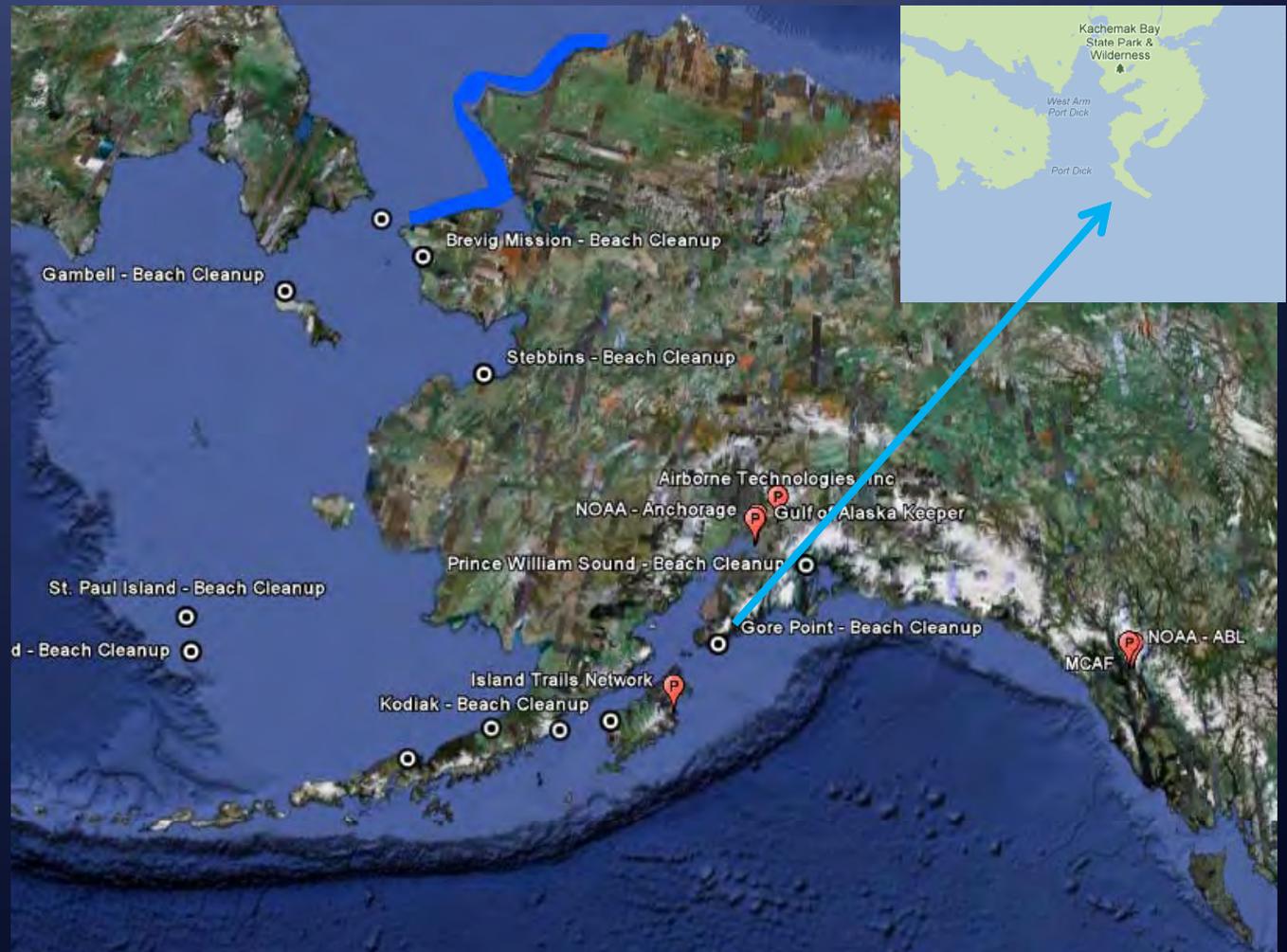
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Marine Debris – Already in Alaska

- MD in AK
 - 23 projects
 - Research
 - Outreach
 - **Removal**



Marine Debris

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Marine Debris in AK – Example



*Photos:
Gulf of
Alaska
Keeper*



Marine Debris What YOU can do!

- Report JTMD sightings
 - disasterdebris@noaa.gov
- Volunteer
 - Cleanup
 - **Monitoring Programs**
- Stay Informed
 - <http://marinedebris.noaa.gov>



Photo: Gulf of Alaska Keeper



Thank You

Peter Murphy

peter.murphy@noaa.gov

marinedebris.noaa.gov

Report JTMD Sightings to:

disasterdebris@noaa.gov