

Tsunami Marine Debris in Alaska

Alaska Department of Environmental Conservation

Airborne Technologies, Inc

Gulf of Alaska Keeper

January 29, 2014



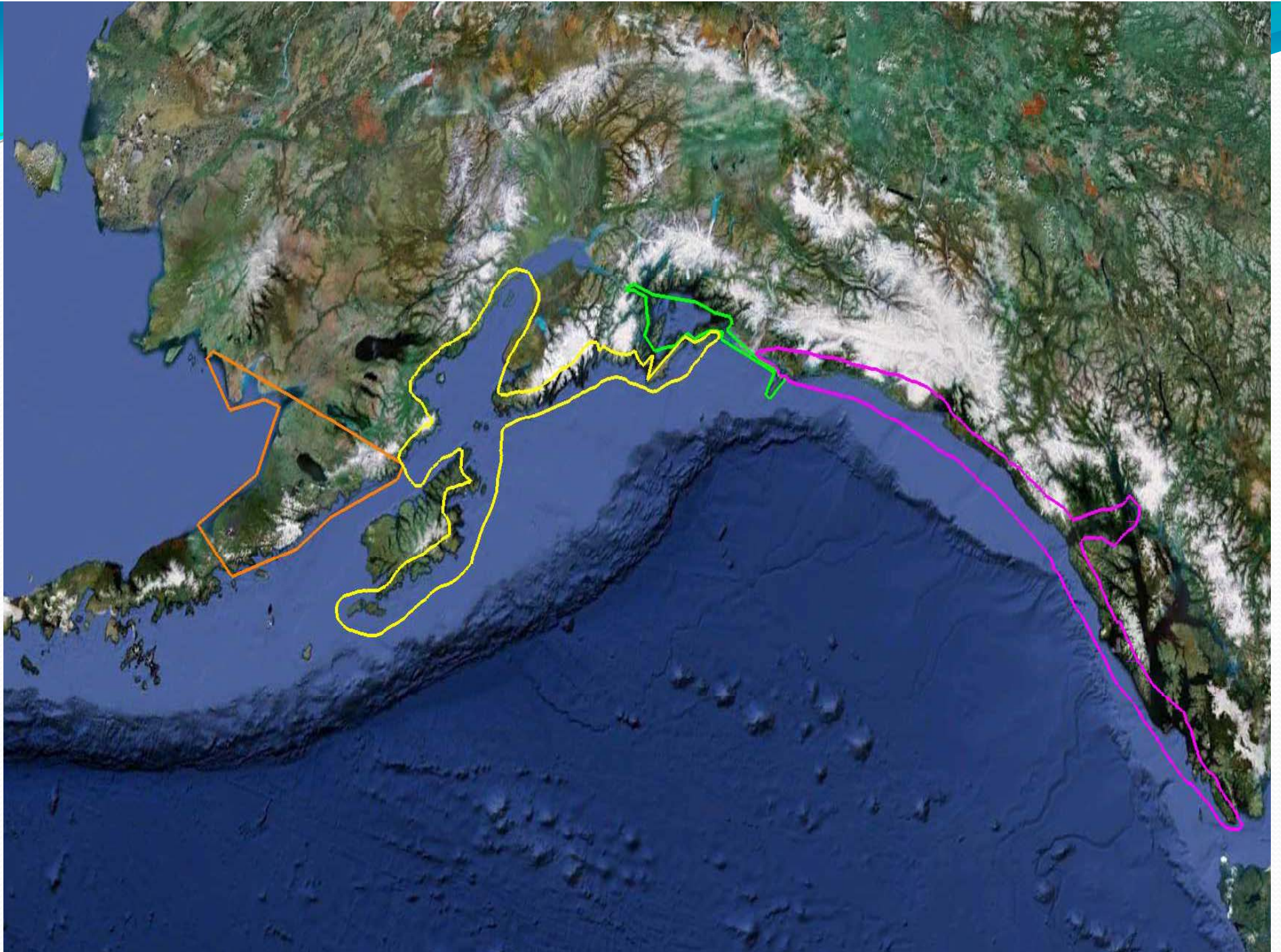
Tsunami-Generated Marine Debris Background

- Devastating March 2011 Earthquake and Tsunami in Japan
- Government of Japan estimates 5 million tons of debris swept into Pacific Ocean
 - Estimated 70% sank almost immediately
 - 1.5 million tons floating off coast of Japan, caught by wind and ocean currents
- Composition
 - Materials typically found in urban areas, homes, and fishing communities
 - Styrofoam, buoys, bottles, jugs, household items (refrigerators, freezers, etc)
 - Rigid urethane insulation and wood from destroyed buildings and homes
 - Fishing & boating docks, floats, bumpers, nets,
- NOAA models show debris will reach US and Canadian shores for next several years
 - High-windage (lighter) debris carried by wind; arrived much sooner than expected
 - Low-windage (heavier) debris carried by ocean current;



Detailed Aerial Survey Airborne Technologies, Inc (ATI)

- Approximately 2500 miles of coastline surveyed
- Over 8200 high resolution images
 - Southeast Alaska
 - Gulf of Alaska
 - Prince William Sound
 - Alaska Peninsula
 - Bristol Bay
- Every image individually ranked for density and debris type
- Data analysis and GIS mapping





Observations Relating to Amount, Location and Composition of Tsunami Marine Debris in Alaska

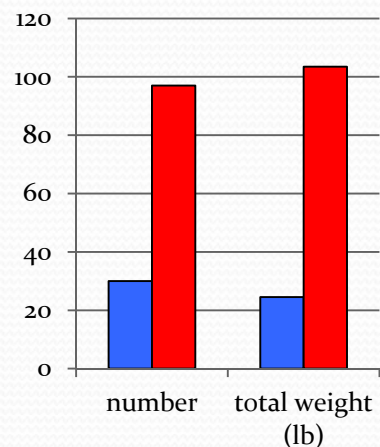
- Significant increase in volume
- Large volume of high windage items
- Evidence of March 2011 Tsunami-generated debris
 - Oyster Buoys
 - Rigid Urethane Insulation
 - Common Japanese household items
 - White Styrofoam

Gulf of Alaska Keeper Tsunami Debris - Summer 2012

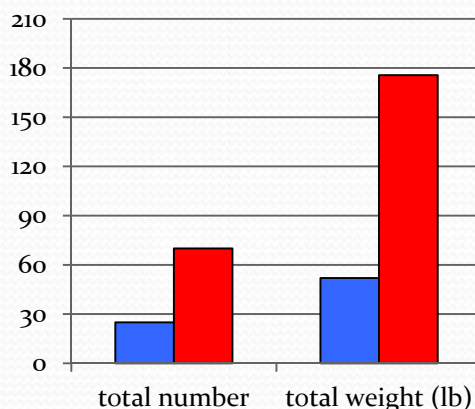


Combined changes in amount of high-windage MD 2011 to 2012, pre- and post-tsunami, on two Gore Point monitoring sites and two Prince William Sound sites. Pre-tsunami in blue, post-tsunami in red. (Debris collected and data analyzed by Gulf of Alaska Keeper, August 2012.)

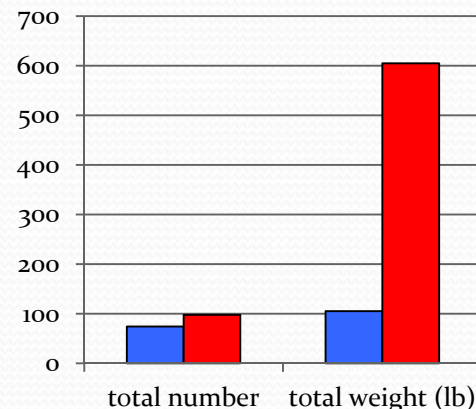
Buckets (≤ 7 gallon size)



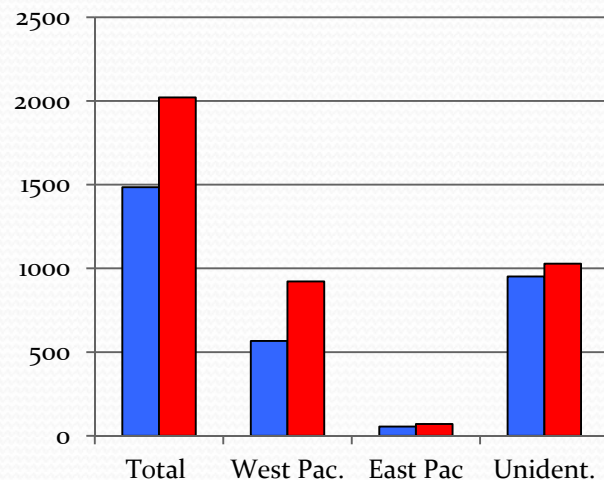
Plastic drums (≤ 6 gallon)



Hard plastic buoys

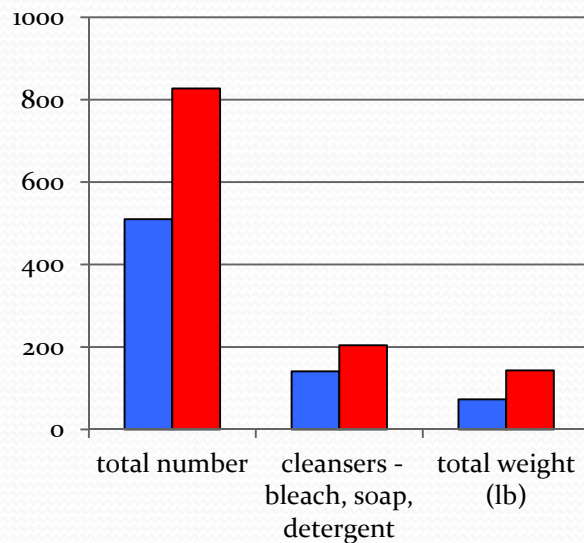


Beverage bottles (number)

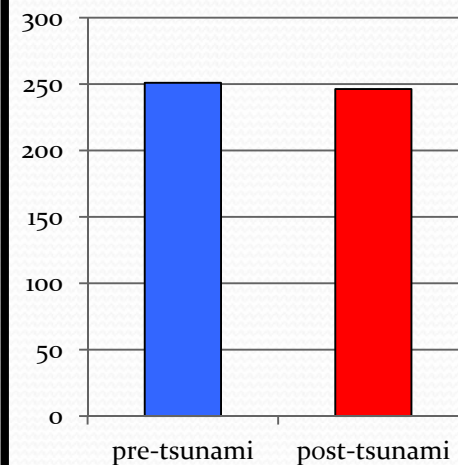


Pre-tsunami 2011
Post-tsunami 2012

Non-beverage bottles (number)



Combined rope and line fragments (lbs)



Control

Low-windage, current-driven debris



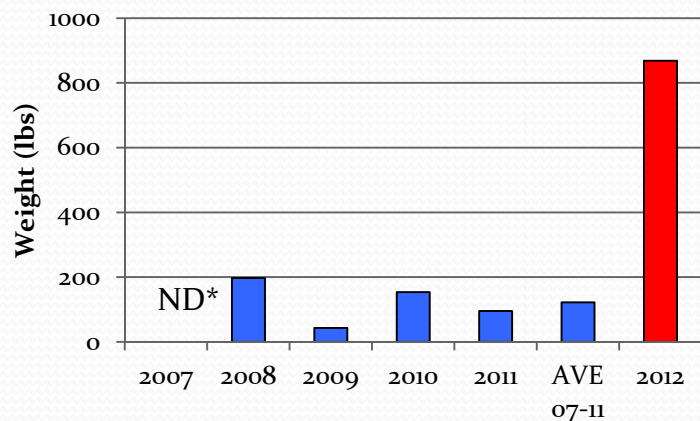
Gulf of Alaska Keeper Marine Debris Monitoring Program.

Styrofoam Data Summary as of August 20, 2012.

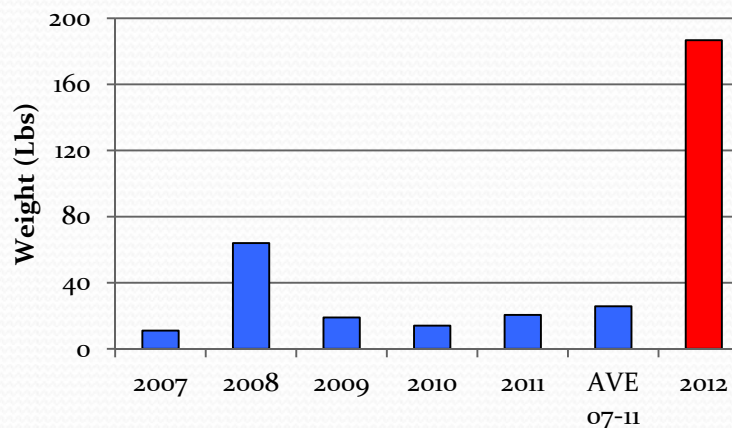
Effect Of The 2011 Japanese Tsunami On Marine Debris In PWS And Gore Point.

Styrofoam Weight

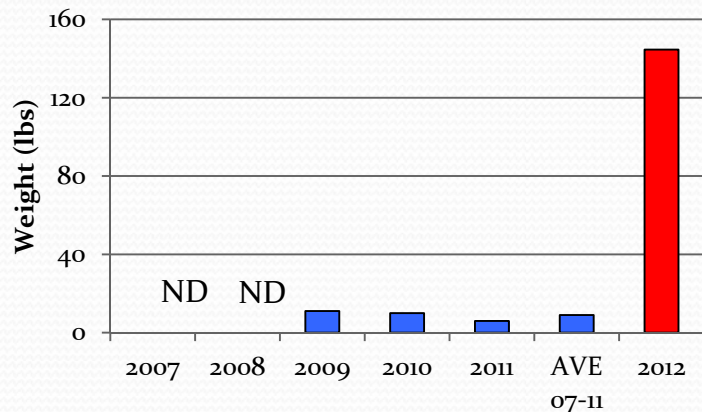
Gore Point East - Styrofoam



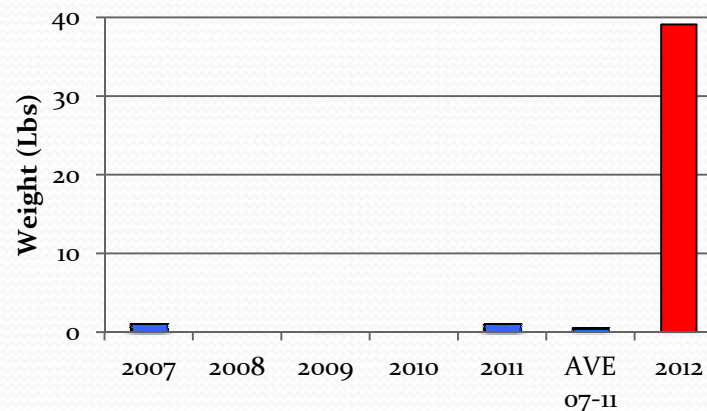
Mega Byte- Styrofoam



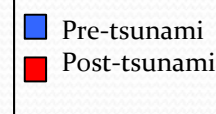
Gore Point North - Styrofoam



Block Island - Styrofoam

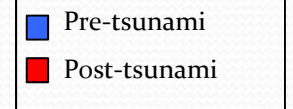
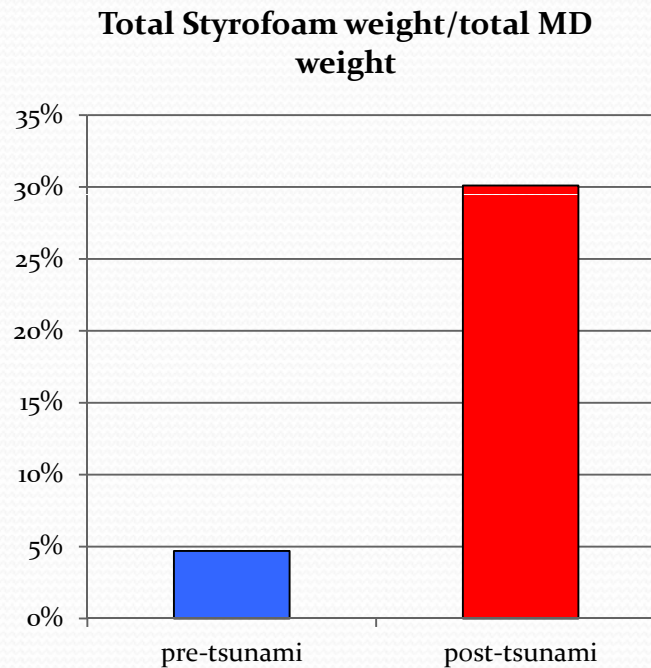
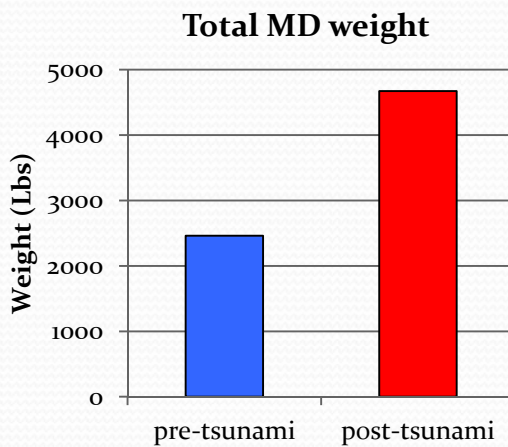
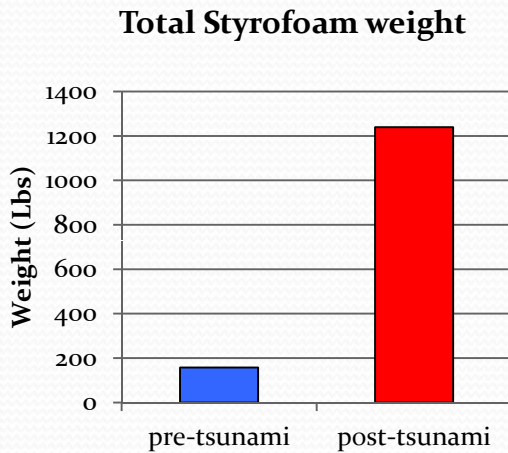


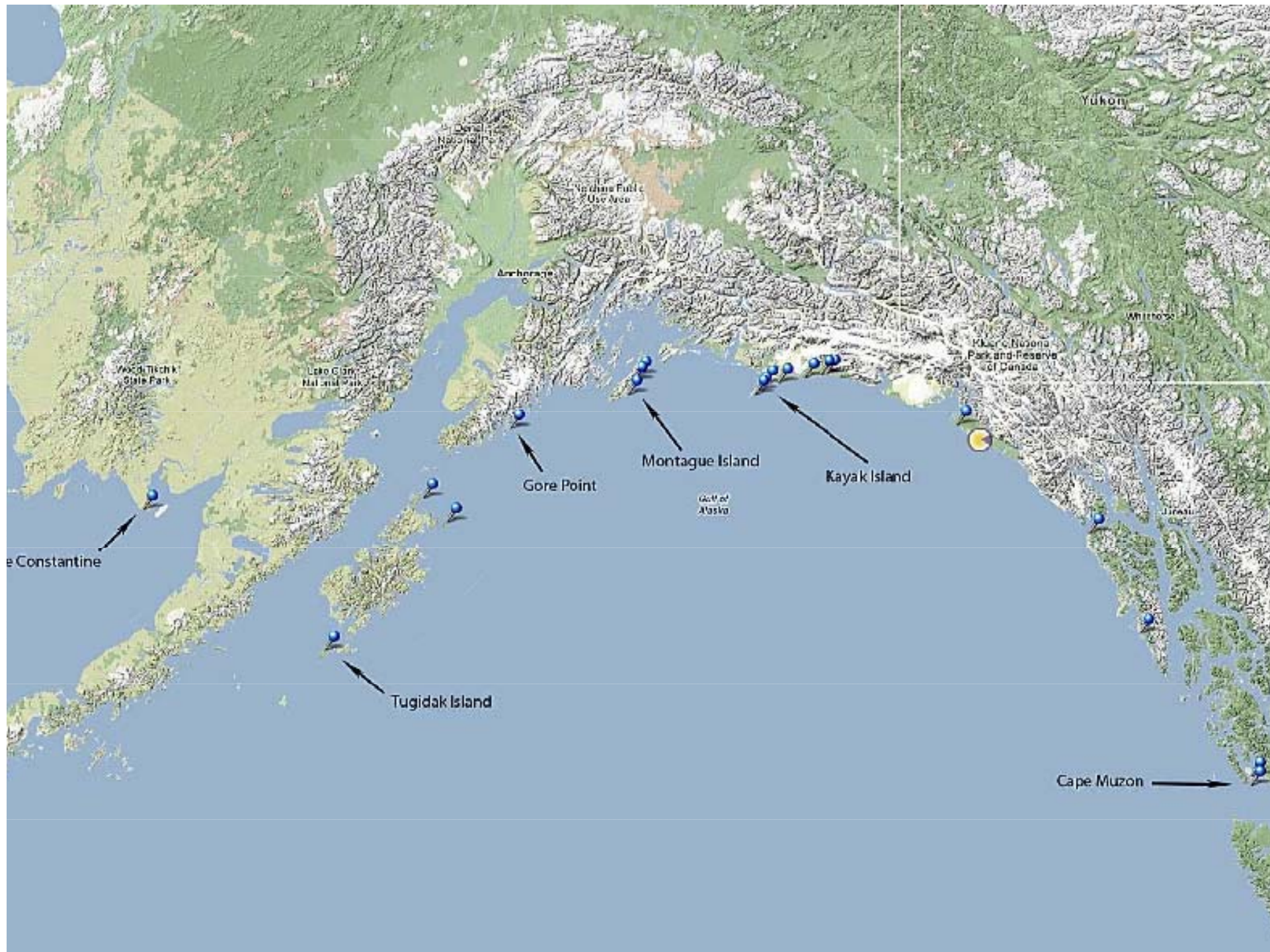
* ND, no data





***Gulf of Alaska Keeper Marine Debris Monitoring Program.
Styrofoam data summary as of August 20, 2012.
Average percentages, before and after tsunami.
Totals for the 4 sites.***







- Late Fall 2012 Pictures





More Tsunami Debris Observations

- New Debris Lines
- Storm Surges Move Debris Farther Up Beach
- Wind Carries Debris Inland
- Collector Beaches
- Heavier Debris Arriving Now





Concerns Related to Marine Debris

- Unknown Total Quantity or Composition
- Potential Toxicity of Components
- Breaking up and Disbursement
- Potential Impact of Small Styrofoam Pieces on Marine and Terrestrial Life
- Smothering of Sensitive Habitats
- Invasive Species
- Disposal
- Safety Risks (weather, remote sites, sea conditions, wildlife)
- Potential Navigation Risks Due to Large Debris



Radiation

- It is highly unlikely that tsunami debris has been affected by radiation from Japan's Fukushima Nuclear Reactor.
- By the time the radioactive water leak developed, the debris was already in the ocean, miles away from the reactor, and moving farther offshore.
- Recent inspections of Alaska beaches by DHSS's Radiological Health Physicist have turned up no marine debris with levels of radiation above background.
- For additional questions on radioactivity and radiation testing, visit: www.epa.gov/japan2011/index.html or contact EPA spokesperson Molly Hooven at 202-564-2313.



Cleanup Cost Considerations

- Re-Cleaning a Beach
- First Time Marine Debris Removal
- Landing Craft, Crew Vessel, Skiffs, Equipment, Supplies
- Crew Costs: Wages or Contractors
- Helicopters and Planes: Site Access or Debris Movement
- Disposal



Funding Tsunami Marine Debris Removal

- **Funding from Federal Government**
 - \$50,000 grant from NOAA that funded tsunami debris removal in Prince William Sound, late Fall of 2012.
- **Funding from State of Alaska**
 - \$200,000 for aerial survey and data analysis (SFY 2012)
- **\$5 Million goodwill gesture from Government of Japan**
 - Small equal allocation initially to 5 states, 2 territories
 - Transfer mechanism via MOA with NOAA and submission of Statement of Work
 - First allotment expected in April 2013
 - Subsequent allotments are need-based upon approval by NOAA review team



Recent and Upcoming Events

- Alaska effectively demonstrated significant debris arrival, treacherous, difficult to access, and extensive coastline.
- Therefore, it is possible for Alaska to receive a greater portion of the reserved funding that NOAA will release based on need. This approach benefits Alaska.
- Prioritization and planning meeting January 17, 2013 in preparation for the 2013 field season for debris removal; ongoing coordination with NOAA, State & Federal land and animal managers .
- Alaska Forum on the Environment February 4-8, 2013



