



Gulf of Alaska Keeper

Marine Debris

Supported by:

Exxon Valdez Oil Spill Trustee Council

Alaska Department of Environmental Conservation

Government of Japan

Alaska Legislature

NOAA, Community Based Restoration Program

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Northern Gulf of Alaska

Gulf of Alaska Keeper's marine-debris cleanup area

Anchorage

Valdez

Whittier

Cordova

Prince William Sound

Seward

Montague Island

Kayak Island

Homer

Gore Point



GoAK is a 501c3 non-profit organization dedicated to combating marine debris. We are a diverse group of Alaskans devoted to removing this menace from Alaska's magnificent coast.



For years, in an ongoing effort, GoAK crews and volunteers have cleaned mountains of marine debris from public beaches in Prince William Sound and the northern Gulf of Alaska.



Together we have removed over **three million pounds** of plastic marine debris from **1500 miles** of northern Gulf of Alaska shoreline. Sadly, thousands of tons of marine debris must still be cleaned from Alaska's coast.



Tied by Tide



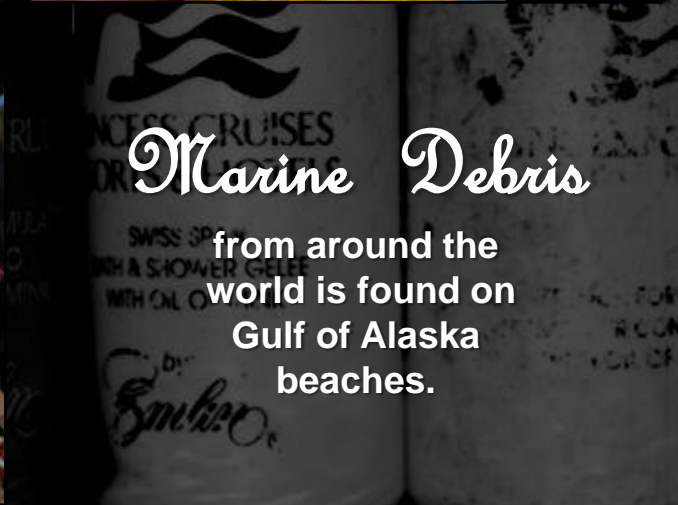
Plastic marine debris may look harmless, even beautiful, but it is not!

Marine Debris smothers many Gulf of Alaska beaches and adjacent forest floors



Montague Island has extreme debris densities and very difficult working conditions





Toxic Debris



Pharmaceuticals



Cleansers/Bleach



Biocides



Medical Waste



Coolants



Immense quantities of toxic debris are deposited on northern Gulf of Alaska beaches.



Industrial Chemicals

Spill Swill - The Exxon Valdez Oil Spill Marine-Debris Legacy

Debris from the 1989 Exxon Valdez oil spill still contaminates area beaches.



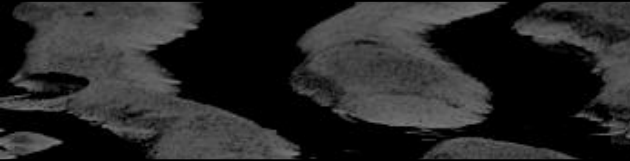
Pom Poms



Rope Mop



Rope Mop



Absorbent Boom



Pom Poms

Petroleum Products



Creosote



Fuel

Refined petroleum products from a variety of sources inundate Alaska's Gulf Coast. Lost commercial cargo, vessel accidents, intentional dumping, and stockpiling contribute to the

problem.

Many of these products poison coastal habitat.



Engine Oil



Lubricants



Propane

Container Spills & Ship Wrecks



UHMW Plastic Sheets

Container spills and other shipping accidents, including fishing-vessel sinkings, annually dump thousands of tons of plastic and other marine debris into the Gulf of Alaska.



Foam Balls



Shipping container on Gulf of Alaska beach



Aluminum Beverage Bottles

Thousands of miles of sensitive and critical Alaskan coastal habitat are routinely contaminated and harmed by container spills and shipping accidents.

Nobody Is Held Accountable



Walkers

Marine Debris comes in nearly every conceivable form. Here, a deeply embedded fabric bundle is pulled from a Prince William Sound beach in Zaikof Bay on Montague Island.



Commercial Fishing Debris

from all over the North Pacific is the greatest contributor by both weight and volume to Alaska's plastic marine-debris problem.



Trawl Gear



Seine Net



Line



Trawl Net



High Seas Drift Net

Derelict commercial fishing lines, nets, and packing bands are deadly to marine life and are the most difficult and expensive to remove of all the plastic marine debris. They become entangled in logs and rock and buried in the beach substrate making extraction extremely challenging.



Packing Band Bundle

Net and Line Nightmares



Trawl Net



Salmon Seine Net



Hawser, line and net bundle



New line from sunk vessel

Net and Line removal is difficult and time consuming



Commercial Fishing Gear litters the Gulf of Alaska coast



Styrofoam Buoys



Fish Totes



Hard Plastic Buoys



High Seas Driftnet Floats



Derelict Vessels



Crates, Baskets, Drums, Bait Containers



Pallets

Foam Debris

An extraordinary amount of Styrofoam debris layers Gulf of Alaska beaches. The 2011 Great Japanese Tohoku earthquake and tsunami increased the Styrofoam and urethane debris volumes on northern Gulf of Alaska beaches many times. Foam debris cleanup is difficult, time consuming, and labor intensive.



Bears and other animals love to chew and shred Styrofoam. In the process, small pieces become scattered throughout the intertidal zone and adjacent forest. Many animals ingest Styrofoam and other plastics.

Storms and surf along Alaska's high-energy coast also grind the foam debris into countless small bits which are easily ingested by fish, birds and smaller marine organisms.



Cleanup work can be dangerous



Brown bears patrol the shoreline



Dangerous surf awaits the unwary



Loading marine debris at Tonsina Bay, Kachemak Bay State Wilderness Park, Kenai Peninsula



Marine Debris removal is neither easy nor cheap.



Logistics and Transport

Because of the immense amount of marine debris fouling northern Gulf of Alaska beaches, and the distance between remote projects and ports, transport, labor, fuel, and disposal costs are high. To maximize efficiency and reduce costs, Gulf of Alaska Keeper carefully plans each project and utilizes the most efficient resources available to conduct specific cleanup projects.



Above: A helicopter and large landing craft used to remove 40 tons of plastic marine-debris from Gore Point in 2007.

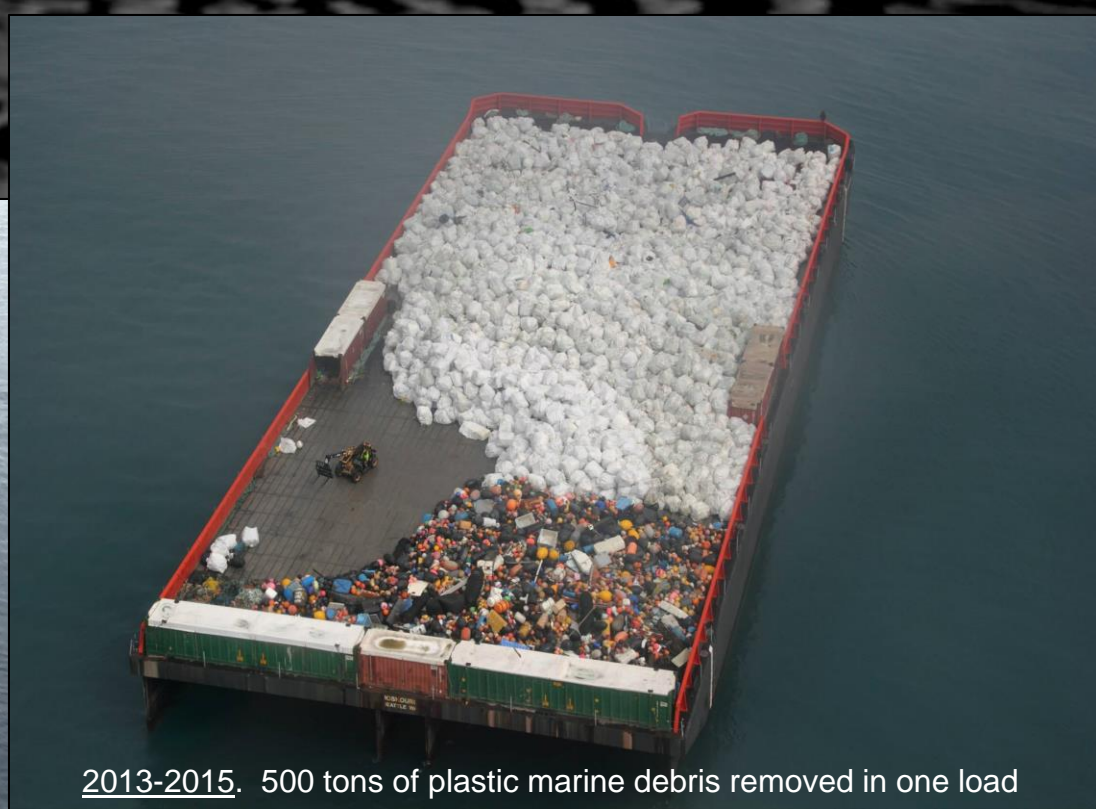


Left: One of five loads of marine debris removed from Zaikof Bay on Montague Island, Prince William Sound in 2008. In 2013, after being overwhelmed by a flood of Japanese tsunami debris, GoAK transported 17 similar loads to port for disposal by mid-summer. Cost and safety considerations demanded a change in removal methodology.

Logistics and Transport



2016. 300 tons of plastic marine debris collected by 10 workers over 40 days on Montague and Kayak islands were removed by helicopters and a barge.



2013-2015. 500 tons of plastic marine debris removed in one load

The 2011 Japanese tsunami doubled debris volume on the Northern Gulf of Alaska shoreline. The outer coast holds 20 to 30 tons of plastic debris per mile. Helicopters, used in conjunction with massive barges and ocean-going tugs, are now necessary to efficiently and safely remove and transport all the collected plastic debris to recycling or disposal facilities

Before and After: A bear-scattered Styrofoam cleanup



Before and After:

Net and line removal



Before and After:

A 2009 marine-debris cleanup in Chugach Bay, Kachemak Bay State Wilderness Park, Kenai Peninsula.



Dense pockets of marine debris are common along the northern Gulf of Alaska coast. On many beaches, tons of debris per mile blanket sensitive coastal habitat, smothering vegetation, choking spawning streams, killing wildlife, and threatening fisheries.

Ingestion: Many mammals, from small rodents to bears, eat plastic debris.



Indigestion — Plastic bits in animal scat.



Black Bear



Coyote



River Otter

Micro Plastics and the chemicals that leach from them harm wildlife



Marine debris derived chemical sheen on Elizabeth Island Lake



Crushed Styrofoam and micro plastic in salmon stream



Micro plastic debris from Elizabeth Island Lake



Micro plastic covering shore of Montague Island salmon habitat

Research has established that phthalates and other chemicals leached from plastic marine debris threaten marine wildlife.

Juvenile salmon have dysregulated immune systems from plastic marine-debris derived phthalates.



Preparing Elizabeth Island salmon fry for scientific analysis

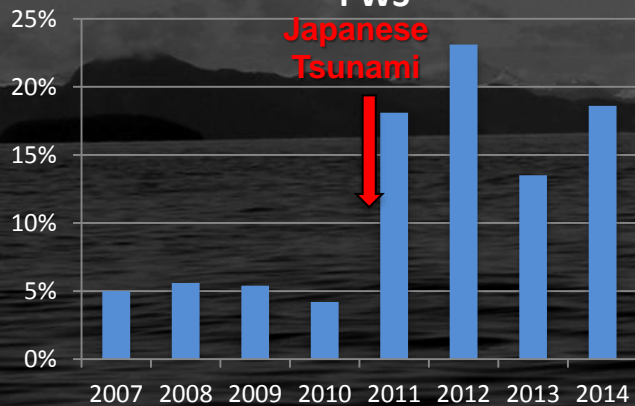
Marine Debris Monitoring

Gulf of Alaska Keeper annually re-cleans 17 selected beaches. Newly accumulated debris is sorted into 150 categories, quantified by weight and item numbers, recorded and removed in an ongoing baseline data-collection effort. Each year, thousands of tons of new debris wash up on our coast.

Left: One season's accumulation of beverage bottles on Gore Point's 1/3-mile long East Beach.



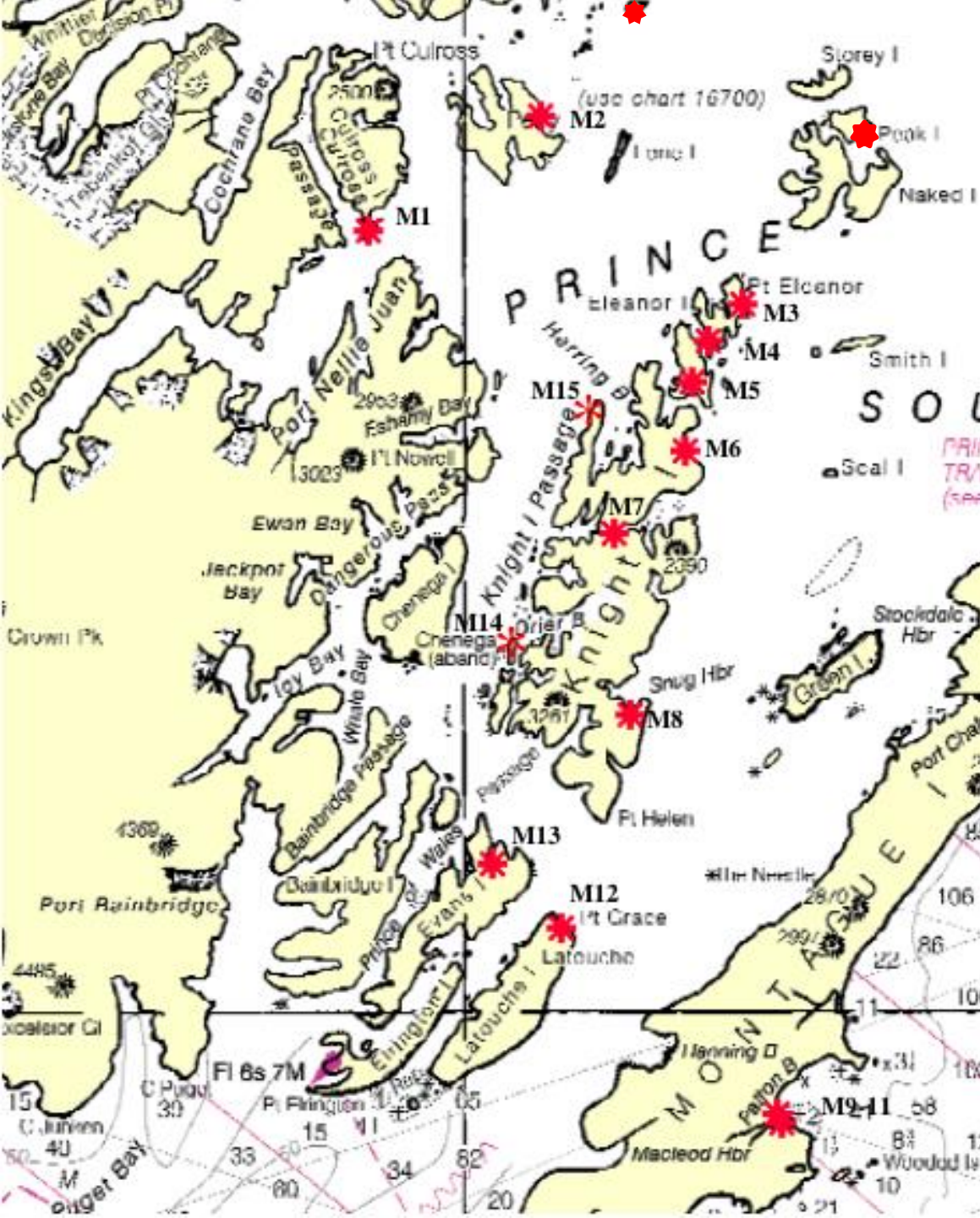
Styrofoam % of Total Weight - PWS



Right: GoAK's crew sorts marine debris on a Gore Point debris monitoring plot.

Marine Debris Monitoring

Sites established in 2006



Volunteers sorting marine debris





Recycling

Most of the debris that GoAK collects is shipped to landfills for proper disposal. Recycling in Alaska is generally unavailable, limited, or too expensive. GoAK donates recovered commercial-fishing gear and other items back to the fishing industry or to local communities for arts and crafts.



Recycling

In 2016, Parley for the Oceans partnered with GoAK to sort through 300 tons of the plastic debris collected in 2016 for recycling. One hundred volunteers over five days sorted fourteen shipping containers full of recyclable plastic from the debris. PET, HDPE, lines and nets, and all hard plastic including fishing buoys were recycled.



GoAK workers and volunteers sort marine debris in Anchorage for recycling

Recycling is very difficult in Alaska because of the small population, distance to markets, and transportation costs. Without committed partners like Parley for the Oceans, recycling marine debris in Alaska would be impractical. The 2016 sorting effort recycled 60-70% of the 300 tons of marine debris removed from shorelines that summer.



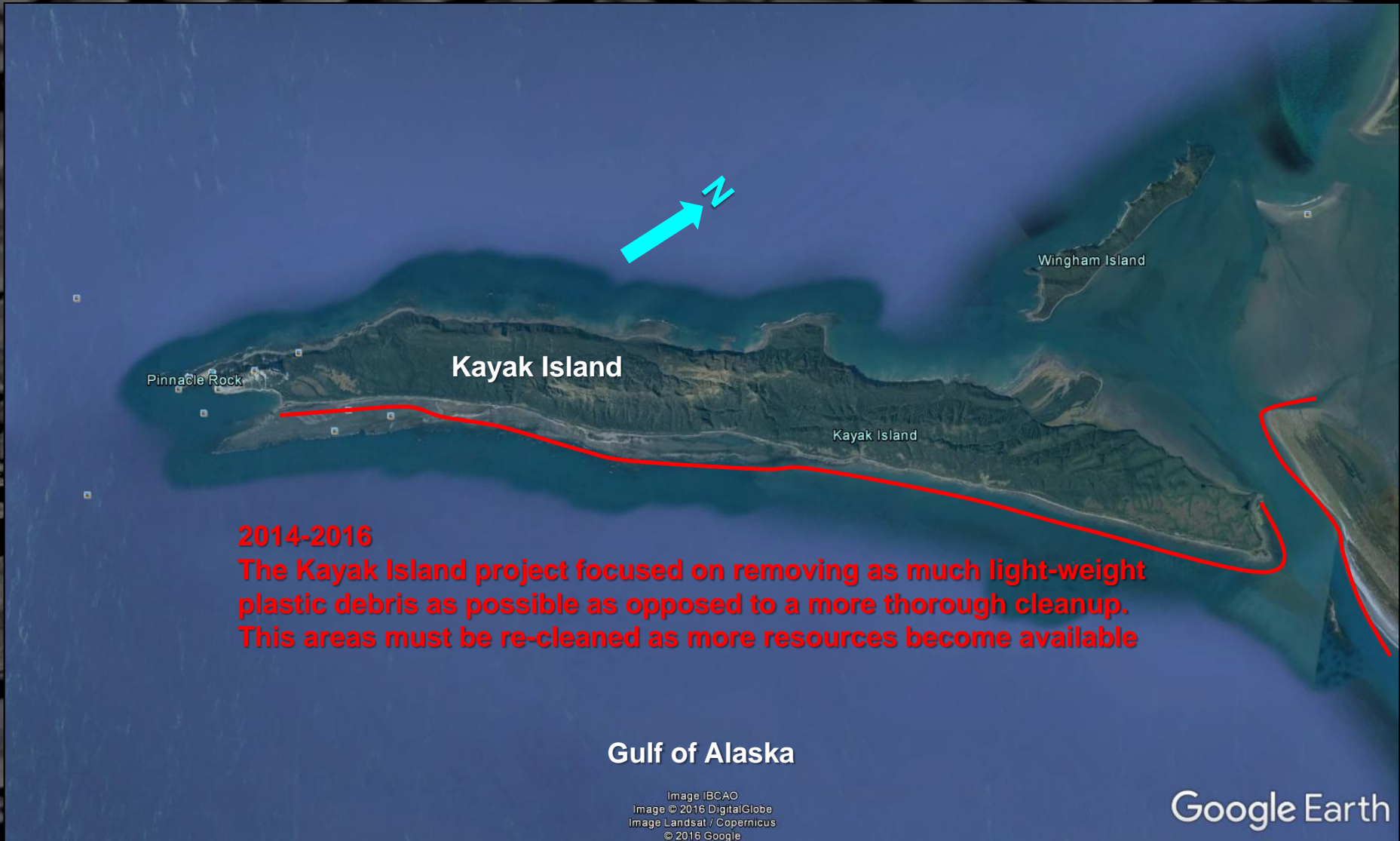
Lines and nets sorted by volunteers await placement in shipping containers.

Gore Point region of the Southwest Kenai Peninsula ongoing cleanup work 2007-2015



Hundreds of miles of shoreline have been cleaned on the Kenai Peninsula but hundreds more remain to be done particularly along the Kenai Fjords National Park shoreline.

Kayak Island ongoing marine-debris cleanup project



2014-2016

The Kayak Island project focused on removing as much light-weight plastic debris as possible as opposed to a more thorough cleanup. This areas must be re-cleaned as more resources become available

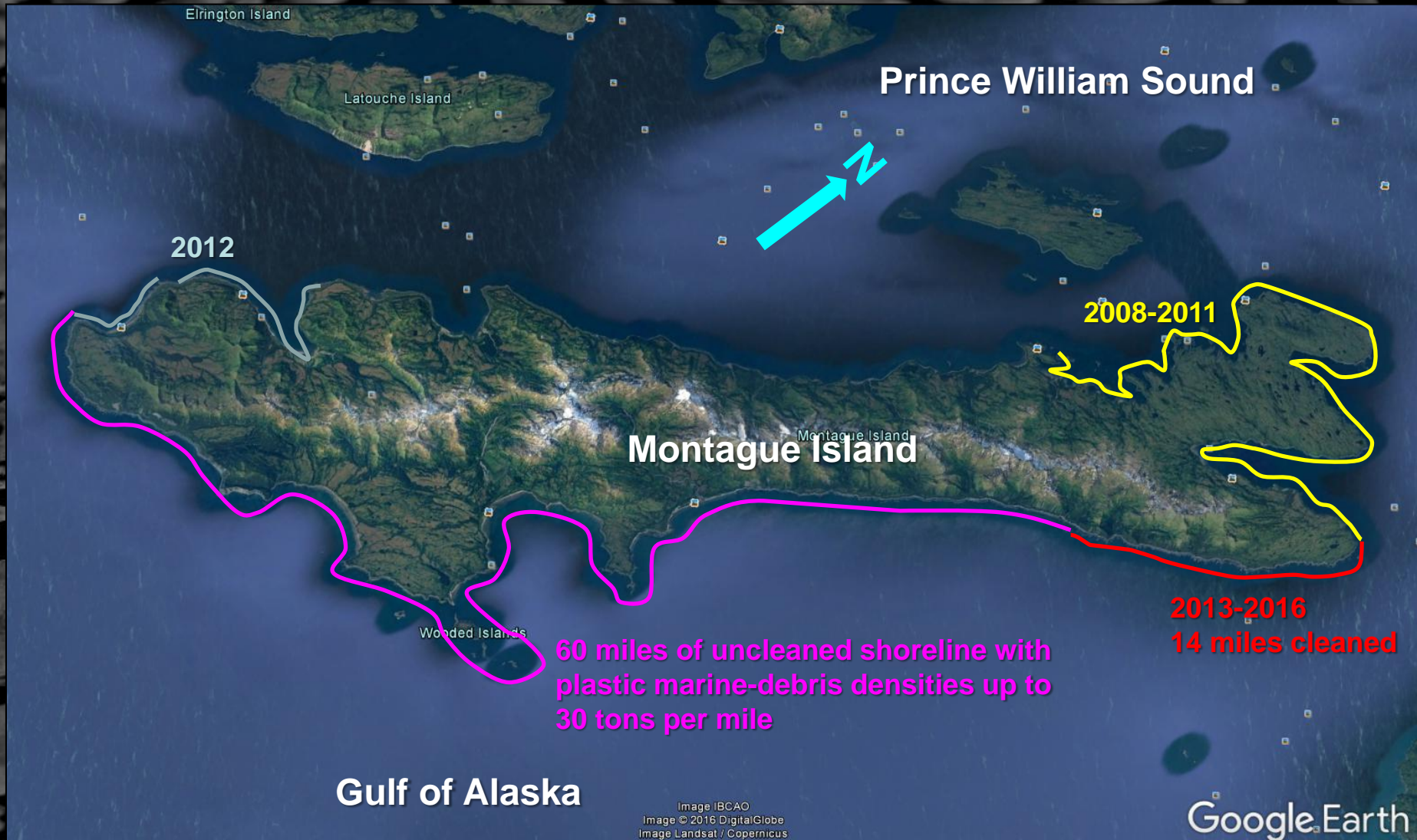
Gulf of Alaska

Image IBCAO
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Google Earth

Naturalist Georg Steller was with the first group of Western explorers to land on Alaska when members of the Vitus Bering expedition visited Kayak Island in 1741. Kayak Island has changed little in the interim other than a light house at Cape St. Elias and the hundreds of tons of plastic debris that cover its coast.

Montague Island ongoing marine debris cleanup project



At 50-miles long, remote Montague Island is the largest uninhabited island in the United States. In addition to the estimated 1500-2000 tons of plastic debris remaining on its shore, thousands of tons of wrecked vessels, toxic creosote-impregnated logs and timbers, and chemically-treated dimensional lumber litter its beaches.

Past and Present Valued Partners:

NOAA, Community-based
Restoration Program; College
of William and Mary Zwollo
Lab;

University of Alaska
Anchorage; Chugach Alaska
Native Corporation; Port
Graham Native Corporation;
USFS, Glacier Ranger District;
National Outdoor Leadership
School; Alaska Center for
Coastal Studies; Alaskans for
Litter Prevention & Recycling;
BP; Princess Tours; Alyeska
Pipeline Company; REI;
Johnson Tires; Insulfoam;
Nordic Viking LLC; American
Seafoods; Cities and Harbors
of Whittier, Seward, and
Homer; Kenai Peninsula
Borough; Honey Charters;
PWS Sound Eco-Charters;
Sound Eco-Adventures;
Alaska Walkabouts Charters;
Lazy Otter Charters; Dozens
of private vessels; **Hundreds
of volunteers.**



We all have a part to do

Critical Habitat and *Wildlife* depend upon our work



Helicopter utilized to shuttle cleanup workers daily to and from project beaches.

Habitat and wildlife don't need us. We depend on them for our existence. We'd be wise to remember that and treat them accordingly.

Life's a Clean Beach!

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<https://www.facebook.com/GulfOfAlaskaKeeper>

Gulf of Alaska Keeper, 4040 Twilight Lane, Anchorage, AK 99516

YouTube:

Gulf of Alaska Keeper: Cleaning the Final Frontier, <https://www.youtube.com/watch?v=sx7fZEKwIMo>

Cleaning Marine Debris from Alaska's Beaches, <https://www.youtube.com/watch?v=XScR5Khp8MU>

