

Gulf of Alaska Keeper

EVOSTC

Harbor Protection and Marine Restoration

Marine Debris Removal Grant

Prince William Sound

Tsunami Debris Amendment

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Background Information

In early 2012, Gulf of Alaska Keeper (GoAK) commenced work on a multi-year marine debris cleanup, EVOSTC Project #12120116, Contract # IHP-12-057. During the summer of 2012, the EVOSTC-funded cleanup work focused on removing decades of built up deposits of marine debris from southwest Prince William Sound (PWS) beaches. While not the focus of the 2012 EVOSTC project, by late April of 2012, it became clear that massive quantities of marine debris emanating from the Japanese tsunami of March 2011 had made its way across the northern Pacific to the shores of Montague Island, Kayak Island, and other Gulf of Alaska beaches. By June 2012, the tsunami debris had penetrated Hinchinbrook Entrance and had begun to disperse throughout portions of PWS. By mid-summer large quantities of Styrofoam, urethane insulation and other foamed-plastic debris had washed ashore on many islands within PWS. In late June 2012, GoAK re-cleaned 14 PWS beaches during an annual marine debris monitoring project. Data collected during the monitoring project established that tsunami debris had already heavily impacted central PWS beaches in the Naked Island group in central PWS, as far west as beaches on Applegate Island to south of Main Bay, and beaches along the northeastern half of the Knight Island archipelago.

2012 marine debris monitoring data shows that both the amount and composition of annual marine debris deposition in PWS increased remarkably from previous years. The annual deposition of Styrofoam and other foamed plastic debris shot up by an average of 7-fold by weight. *See* figures 1 and 2. Japanese plastic bottles and containers holding a wide array of chemicals washed into PWS. Fuel tanks and chemical drums were found on many beaches. Many varieties of Japanese oyster-culture and commercial fishing floats and buoys have lodged on beaches throughout PWS. Many of these floats are made of Styrofoam that quickly shreds along rugged PWS beaches and the bits are then scattered throughout the inter-tidal ecosystem.



Japanese tsunami debris Styrofoam and hard plastic floats recovered from PWS beaches.

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

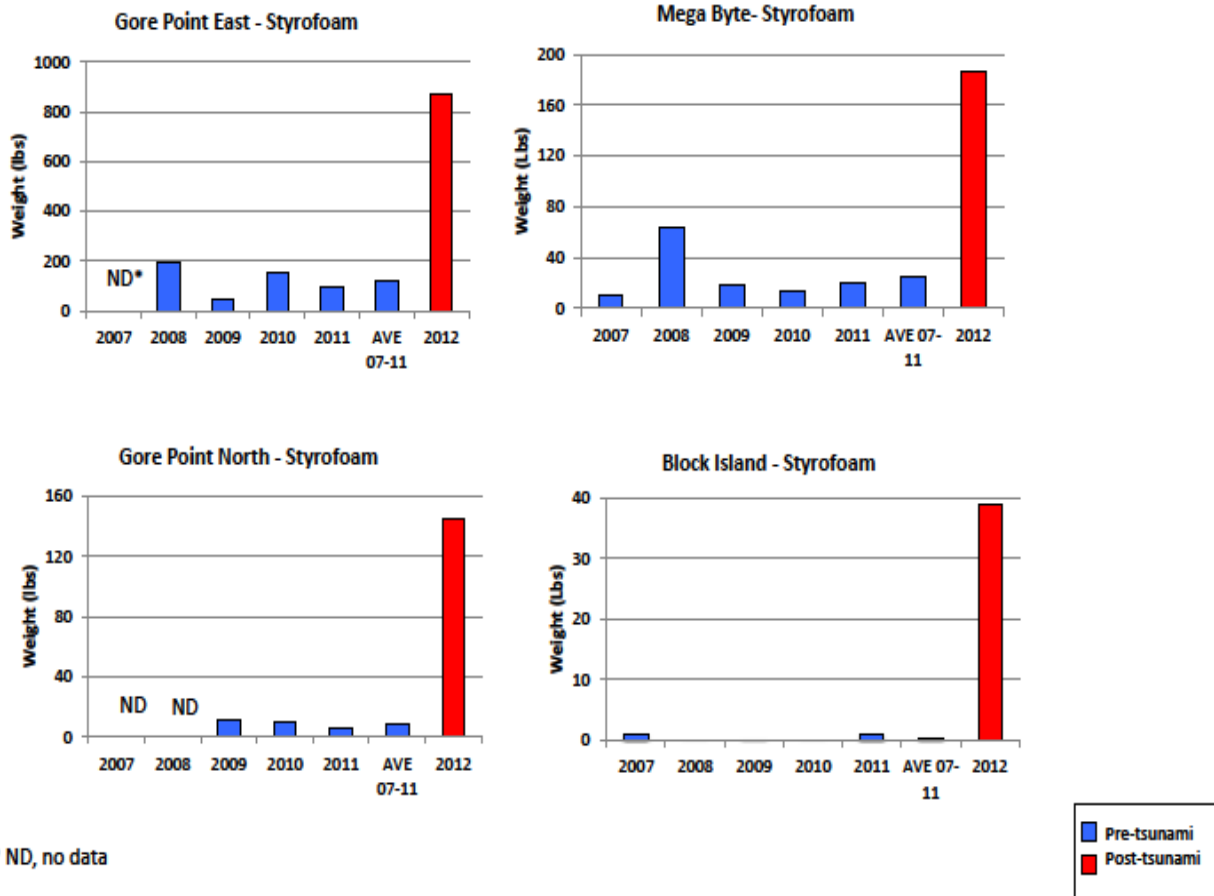


Figure 1. Increase in Styrofoam marine debris in 2012 compared to previous 5 years.

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.

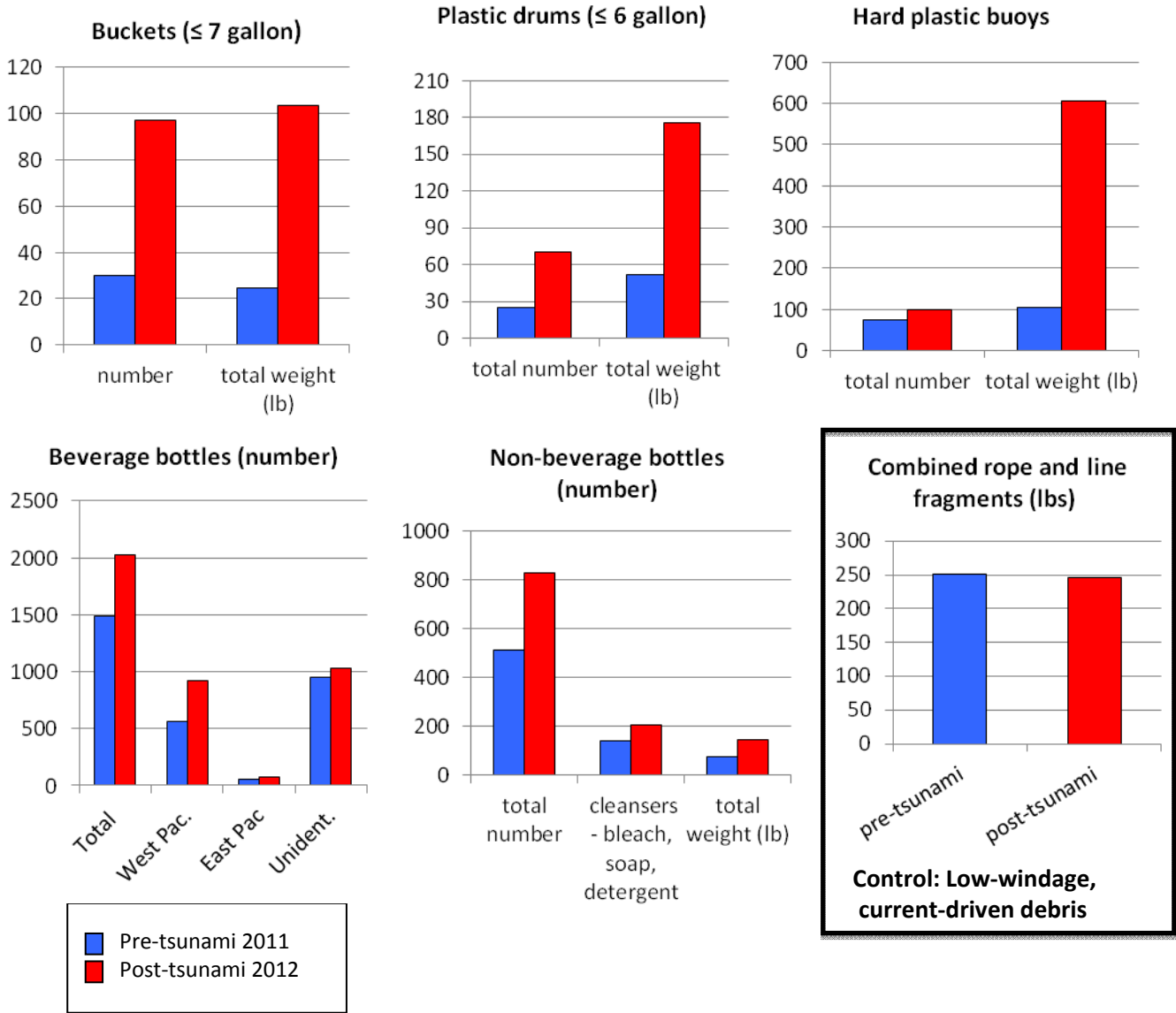


Figure 2. Wind driven tsunami debris compared to low-windage rope and line control, 2011-2012.

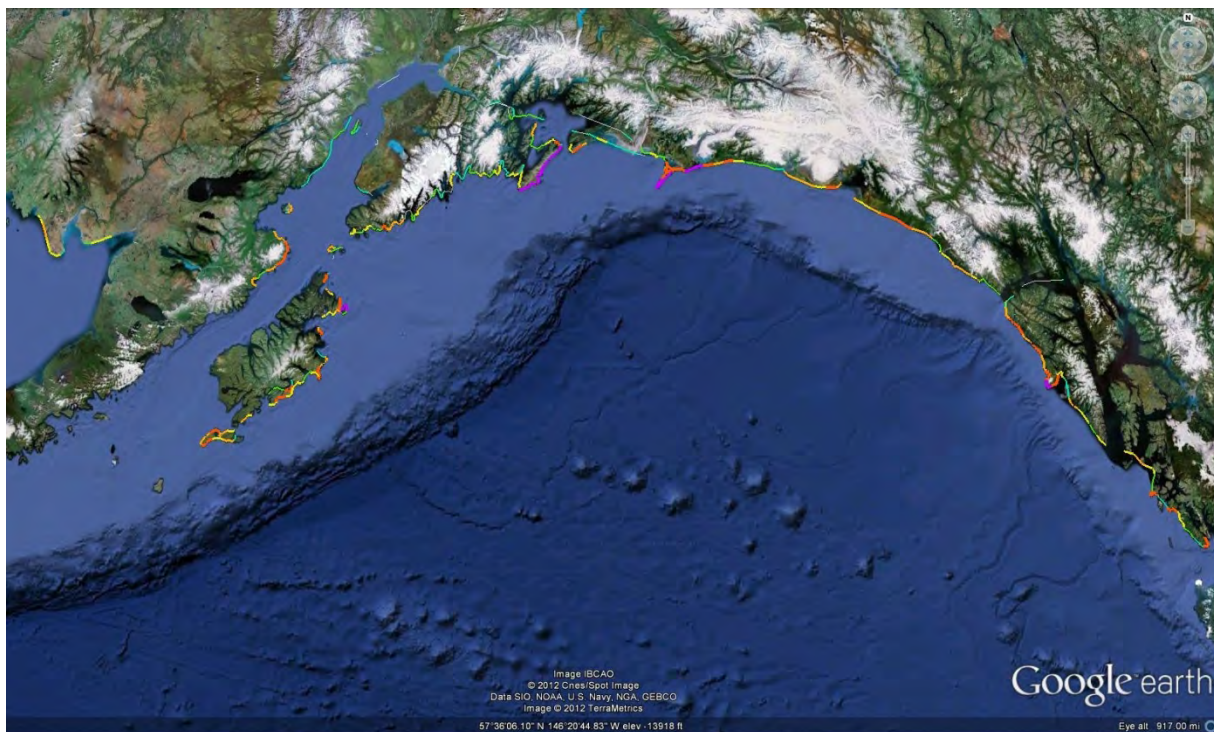


Styrofoam tsunami debris on Sphinx Island, PWS, ADEC Cleanup, September 2012.



Japanese tsunami Styrofoam, bottles, fishing floats and chemical drum, Eleanor Island, ADEC cleanup, September 2012.

To ascertain the extent of the tsunami debris problem, during July and August of 2012, Airborne Technology Inc. (ATI) conducted an aerial survey of Alaska's coast. ATI's survey documented extensive deposits of tsunami debris from the southernmost tip of Southeast Alaska to the Alaska Peninsula. ATI's survey determined that the shores of Montague and Kayak islands contain the heaviest deposits of tsunami debris. The extensive fields of tsunami debris on Montague Island include the beaches on the three northernmost points of Montague Island. ATI also documented tsunami debris throughout PWS including on Knight, Eleanor, Ingot, Entrance, and Sphinx islands.



Tsunami Debris Deposits Along Gulf of Alaska Coast, Airborne Technology Inc., ADEC

In September of 2012, the Alaska Department of Environmental Conservation (ADEC) submitted a Request for Proposals to remove tsunami debris from PWS pursuant to a small National Oceanic Atmospheric Administration grant. GoAK submitted a proposal, with 3 alternative project sites, prioritized by the amount of debris present but each dependent on weather conditions for access. GoAK's proposal was accepted and the cleanup work started September 22 and ended October 2. The first priority cleanup site included the three northern Montague Island points but weather prevented cleanup work in that area. The cleanup then focused on the second priority site on the east side of Knight Island from the Bay of Isles to the northern tip of Eleanor Island, including, Ingot, Entrance and Sphinx islands. *See Chart 1.* Although ATI's survey had documented a considerable amount of tsunami debris along the second priority shoreline, the realities on the ground were much worse than the survey indicated. *See photos page 6.* Information gathered during the ADEC tsunami debris cleanup reinforced the aerial survey data which had already clearly demonstrated that a massive influx of tsunami debris had flooded PWS.

ADEC 2012 Cleanup Priority Tsunami Debris Collector Beaches

The beaches in the northern Knight Island vicinity are second priority beaches and the beaches in the Naked Island vicinity are third priority beaches.

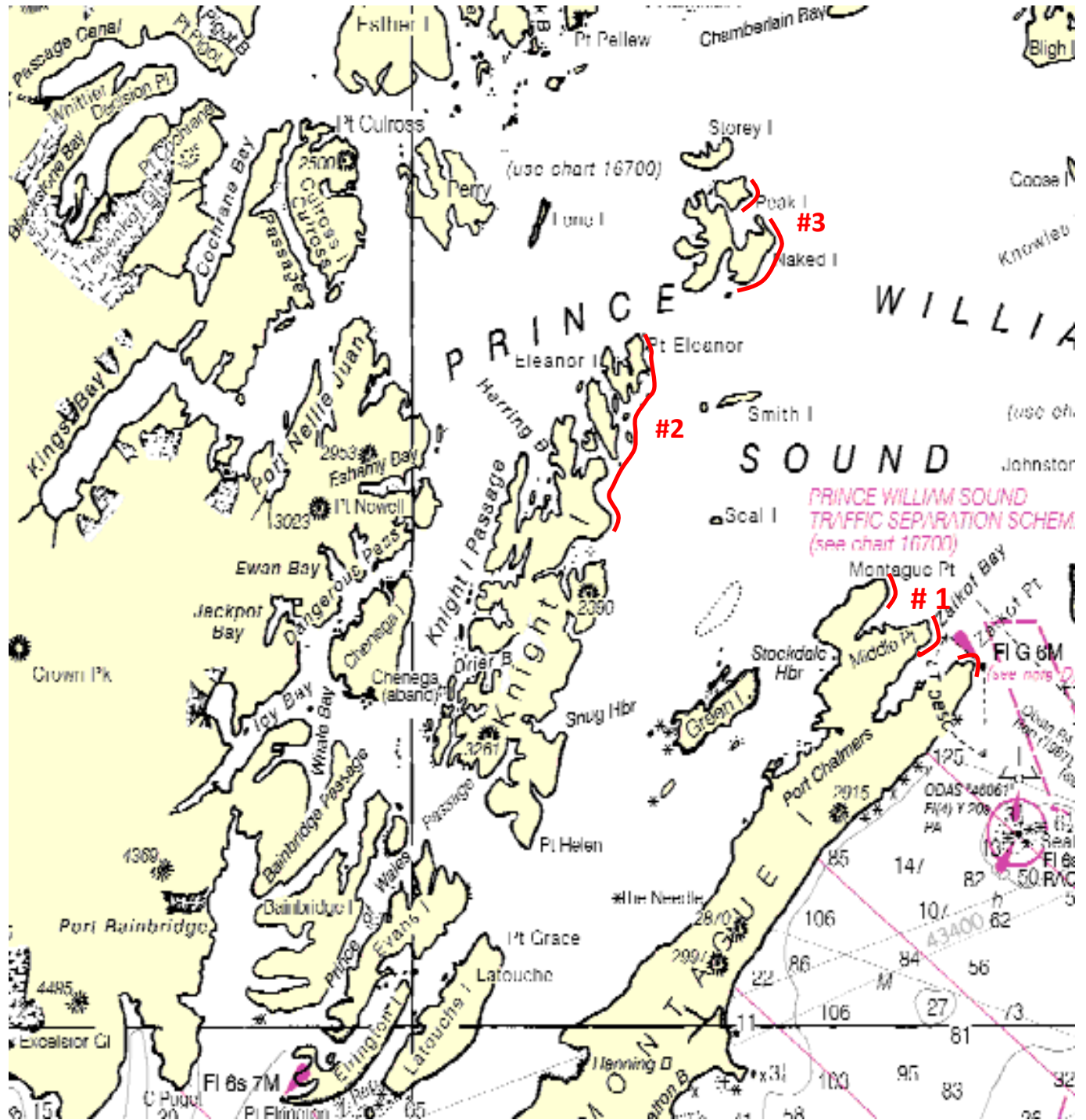


Chart 1, ADEC September 2012 tsunami debris cleanup priority beaches. Priority 1 and 3 beaches were not cleaned.

Much of the debris encountered during the ADEC tsunami cleanup was hidden from the ATI aerial survey by shoreline topography which included boulders as large as houses, crevices, sea caves, overhanging cliffs, trees, and brush. A considerable amount of the tsunami debris was in fact funneled and concentrated into dense pockets of debris concealed by the overhanging shoreline structure. However, there were Styrofoam, urethane and other foamed plastic pieces scattered along nearly all of the shoreline cleaned during this project.

Severe weather hampered the ADEC project, but during this short cleanup, 67 cubic yards of tsunami debris were picked up. Approximately 70% of the debris was comprised of Styrofoam, urethane or other foamed plastic products. Given the short period of time available for this project, and the near impossibility of doing so, countless numbers of beads from shredded chunks of Styrofoam and degraded urethane were not removed. However, by removing the larger pieces of Styrofoam, other foamed plastic, and all the other debris, a significant amount of further degradation and environmental damage was prevented. Drums and containers of products ranging from shampoos to industrial chemicals were removed from the shoreline. Hundreds of fishing floats and dozens of large oyster-culture buoys were recovered. This astounding amount of tsunami debris had accumulated in just a few months. All of the beaches cleaned during the ADEC project had been thoroughly cleaned in the summer of 2011, and a few of them again in June 2012. However, by late September of 2012 they were all covered with tsunami debris.



Degraded Styrofoam, urethane and other Japanese tsunami debris on a PWS beaches.

Birds and land mammals are eating the foam tsunami debris and other plastic with unknown consequences. It is likely that fish consume the Styrofoam beads and other plastic particles that wash off beaches. Furthermore, given the amount of tsunami debris that has inundated PWS, and the fact that Styrofoam and other foamed plastic is susceptible to shredding and then being disbursed throughout the shoreline environment, GoAK believes that an intense effort to remove as much as the PWS tsunami debris as possible should be made in the summer of 2013. For these reasons, we submit the following proposed amendment to our EVOSTC marine debris removal grant.

Proposed PWS Tsunami Debris Cleanup Amendment

GoAK's current EVOSTC marine debris cleanup grant includes two additional seasons of cleanup work following the 2012 season's work in southwest PWS and along the Gulf of Alaska Coast from Port Bainbridge to Resurrection Bay. The cleanup work previously approved for the summer of 2013 was to occur in the Barren Islands and for the summer of 2014 on the Gulf of Alaska side of Montague Island in the Patton Bay/Jeannie Cove area. This multi-year grant and proposed cleanup work were conceived and awarded before the Japanese tsunami occurred, long before anybody considered the consequences of such a disaster to PWS. **Because of the overwhelming tsunami debris damage in PWS, GoAK proposes that the EVOSTC grant be modified to provide an additional season of cleanup work so that the marine debris cleanup team can focus on removing tsunami debris from the greater PWS area during the summer of 2013. We further propose that the two seasons of previously approved work be each delayed one year so that the Barren Island project would now occur in 2014 and the Patton Bay/Jeannie Cove project occur in 2015.**

GoAK anticipates that there may be funding available from the Japanese government and the U.S. federal government to help address the tsunami debris problem. Nonetheless, at this time there is no clear idea of how much funding will be available or when it will be available. In addition, indications are that the Governor of Alaska will not request a state appropriation to help address a problem he considers a federal issue. However, if any of the above mentioned funding sources become available, GoAK believes that that funding should be used to address the massive tsunami debris deposits along the Gulf of Alaska shorelines of Montague and Kayak islands. They will require an industrial-scale cleanup approach. Those remote and inaccessible shorelines will be incredibly difficult and very expensive to adequately clean, the cost of which would require substantial federal and/or state funding to adequately address.

Extrapolating from the short ADEC tsunami debris cleanup in September 2012, and from GoAK's 11 seasons of marine debris work in PWS, we estimate that to clean the entire interior PWS shoreline directly exposed to tsunami debris will take our cleanup crew 75 days. *See Chart 2* for shorelines needing cleaning. Over two hundred miles of shoreline within PWS are now known to have significant amounts of tsunami debris on them. Many of these shorelines face the east or southeast, such as those on the Knight Island archipelago, the direction from which the prevailing wind blows and the currents from Hinchinbrook Entrance flush into PWS. However, once debris is swept into PWS through Hinchinbrook entrance, currents and storms then disperse it as far west as beaches on southern Culross Island and along the mainland north and south of Main Bay. Debris has also swept south down Montague Straits, impacting Green Island and the north and east side of Latouche Island. The Fox Farm Harbor area at the southern extreme of PWS on Elrington Island has also captured a significant amount of tsunami debris.

Because of GoAK’s intimate familiarity with the proposed PWS cleanup area, we are confident that we can thoroughly clean it without resorting to specialized and expensive equipment such as large landing craft or helicopters. GoAK has received a grant from the Chugach National Forest RAC that will help pay fuel and debris disposal costs for marine debris cleanup work in PWS in 2013. In addition, GoAK’s 12th Annual Volunteer Cleanup will occur May 17-19 on the eastern side of the Knight Island archipelago. A dozen donated vessels with up to 100 volunteers will spend several days picking up tsunami debris and caching it for GoAK’s cleanup crew to retrieve. Volunteers will also help clean the 14 PWS marine debris monitoring beaches as they do each summer. With the Chugach National Forest’s grant and ongoing volunteer assistance, EVOSTC’s contribution will be highly leveraged.

GoAK’s crew will remove all accumulated tsunami debris from interior PWS beaches with the exception of large items such as boats or portions of buildings, or hazardous material. However, hazardous material will be identified by our Hazmat-trained crew, secured, and if safely possible, removed from the active surf zone for later recovery by proper authorities. GoAK will not transport or dispose of hazardous material. All plastic debris, including foamed plastic such as Styrofoam, will be shipped to Central Alaska Recyclers for recycling and disposal. All intact hard fishing floats will be given to commercial fishermen, oyster farmers, or anybody that might have use for them. All other usable items such as drums, fuel tanks and buckets are similarly disposed of.

Removal of the tsunami debris is generally a simple matter of picking it up by hand, stuffing it into a garbage bag if small enough, and then eventually transferring it to a landing craft for shipment back to Whittier. However, some debris is entangled in branches and brush or partly buried by sand and gravel. Then it becomes a greater problem to remove. Gas-powered vacuums (reverse leaf blowers) may at times be used to vacuum up large quantities of crushed Styrofoam. Once the landing-craft loads of debris reach Whittier, the debris will be transferred to 40-yard dumpsters for shipment to Central Alaska Recyclers in Anchorage. During this project, we anticipate shipping a landing craft load of debris...about 45-cubic yards...to Whittier every 5 to 6 days. We estimate that twelve to fifteen loads of tsunami debris, or as much as 650-cubic yards, will be removed from PWS beaches during this project.

PWS Tsunami Debris Removal Budget FY 2013

Budget Category (e.g. personnel, supplies, contractual, etc.)	EVOSTC Funds	Matching Contributions	Total Expense	Nature (cash or in-kind) And Source of Match
Personnel				
-CACS (public outreach)	25,500.00	0.00		Cash-EVOSTC
-CCF (public outreach)	4,000.00	0.00		Cash-EVOSTC
-Volunteer Cleanup	0.00	82,000.00		In-kind-Volunteer labor
-Management/Logistics	0.00	32,800.00	144,300.00	In-kind-GoAK Board
Travel				
-Volunteer transport	0.00	1,300.00		Cash-Volunteers
-CACS (public outreach)	2,500.00	0.00		Cash-EVOSTC
-Vessel Charter	8,800.00	0.00		Cash-EVOSTC
-CCF Instructor	1,500.00	0.00	14,100.00	Cash-EVOSTC
Equipment				
-Vol. cleanup vessels	0.00	80,000.00	80,000.00	In-kind- Donated vessel owners
Supplies				
-Fuel, Research Project	2,000.00	0.00		Cash-EVOSTC

-Fuel, PWS Cleanup	0.00	20,000.00		Cash-Chugach Nat. Forest/Private
-Watermaker filters	0.00	500.00		Cash-GoAK
-Garbage bags	0.00	900.00	23,400.00	In-kind- ALPAR
Contractual				
-Contract Crew	180,000.00	0.00		Cash-EVOSTC
-Work Vessels	195,000.00	0.00		Cash-EVOSTC
-Debris Disposal	0.00	15,000.00		Cash-Chugach Nat. Forest/Private
-Liability Insurance	0.00	7,000.00		Cash-GoAK
-CCF (public outreach)	1,500.00	0.00		Cash-EVOSTC
-MCAF (documentary film)	1,000.00	0.00		Cash-EVOSTC
-MCAF (MD Tide Book)	11,400.00	0.00		Cash-EVOSTC
-UAA/W&M research	10,000.00	0.00	420,900.00	Cash-EVOSTC
Accounting/Bookkeeping	0.00	2,000.00	2,000.00	Cash-GoAK
Total	443,200.00	241,500.00	684,700	

PWS Tsunami Debris Removal Budget Narrative

While this amendment at first seemed to be a simple swap with the approved 2013 Barren Island cleanup project, there are several EVOSTC-funded components of the Barren Island project that, while related, are not directly involved with the actual marine debris cleanup activities. Those components of the 2013 project are already contracted. They include the Center for Alaskan Coastal Studies' public outreach and marine debris curriculum development, the Chugach Children's Forest Service PWS Expedition, the Marine Conservation Alliance Foundation's production of a marine-debris documentary film and marine-debris-prevention themed tide books. All of these related contractual activities have been included in this amended budget, but are not be described in detail in the budget narrative because they are the identical activities funded in the pre-existing approved 2013 budget.

Personnel

Personnel costs for the Center for Alaskan Coastal Studies' marine-debris prevention public outreach and curriculum development will be **\$25,500**. The Chugach Children's Forest Service PWS Expedition personnel costs are **\$4,000**. Over 4000 hours of volunteer time will be donated to PWS tsunami debris cleanup projects in 2013, an in-kind donation of **\$82,000**. GoAK's board will donate 1600 hours in 2013 to organize, manage, and provide logistic for the 2013 cleanup work, and in-kind donation of **\$32,800**.

Travel

Volunteers for the 2013 cleanup projects will pay for their own travel, tunnel and parking costs, a matching cash donation valued at **\$1,300**. A charter vessel for the Chugach Forest PWS Expedition is **\$8,800**. Travel for the Center for Alaskan Coastal Studies Staff will cost **\$2,500**. Travel for the Chugach Children's Forest Service instructor is **\$1,500**.

Equipment

Twelve vessels will be donated for 3 days for the 2013 PWS Volunteer Cleanup and two vessels for 8 days for the PWS marine debris monitoring project, an in-kind donation of **\$80,000**.

Supplies

Fuel for the UAA/College of William and Mary marine debris plastic toxicity study will cost **\$2,000**. **\$20,000** of fuel for the PWS tsunami debris cleanup will be purchased with matching Chugach Forest Service RAC and private cash grants. GoAK will purchase filters and other reverse osmosis supplies necessary to make fresh water for the cleanup crew, a matching cash expenditure of **\$500**. ALPAR will donate 3000 heavy duty debris collection bags, an in-kind donation of **\$900**.

Contractual

An 8-man tsunami debris cleanup crew will for 75 days clean over two hundred miles of PWS shoreline in the summer of 2013. At \$2,400 per day for 75 days, the cleanup crew will cost **\$180,000**. Three work vessels including a 54-foot crew vessel, a 32-foot landing craft, a 24-foot aluminum work boat, and 4 rigid-hull inflatables with outboards will be used to support the cleanup project. At \$2,600 per day for 75 days, the cleanup vessels will cost **\$195,000**. Debris transport by truck to Anchorage and tipping fees for this cleanup project are projected to be **\$15,000** which will be paid with a Chugach National Forest RAC grant and private donations. GoAK will purchase a general liability insurance policy for **\$7,000**. The Chugach Children's Forest Service outreach instructor contract is **\$1,500**. The Marine Conservation Alliance Foundation's contract for the marine debris documentary film is **\$1,000** and their contract for the design and production of tide books is **\$11,400**. The 2013 University of Alaska/College of William and Mary marine debris plastic toxicity researcher contracts are **\$10,000**.

The total cash cost of the 2013 amended project **\$489,000**. **We request that EVOSTC fund \$443,200** of the total project costs. Matching cash contributions from other donors will total **\$45,800**.

In addition to the cash necessary for this project, volunteers will contribute at least 4000 hours to remove tsunami debris from PWS during the summer of 2013. That is an in-kind donation of \$82,000. Volunteers will also donate the cost of their travel to and from the point of departure for the volunteer cleanup, including fuel, tunnel and parking fees. This is a cash contribution of \$1,300. During the 3-day volunteer cleanup 12 vessels will be donated to support the cleanup work. This is an in-kind donation of \$52,000. Two vessels will be donated to the 8-day monitoring cleanup which will also be removing tsunami debris from 14 beaches throughout PWS. That is an in-kind donation of \$28,000. ALPAR will donate 3000 large heavy-duty debris-collection bags, an in-kind donation valued at \$900. Total in-kind contributions to support the 2013 PWS tsunami debris cleanup will total at least **\$195,700**.