

# Local Research Report on

## Japan's Earthquake and Tsunami Debris in the

### State of Alaska

#### **Objective:**

Regarding the issue of the 2011 earthquake and tsunami debris washing up on the western coastal areas of the United States, the objective of this research is to strengthen collaborative ties between Japan and the U.S. and explore the possibilities for working collaboratively on handling this issue.

Since the amount of debris found in the state of Alaska is greater than in other states, five researchers will be dispatched to Alaska for the research. This research has been funded by the Sasakawa Peace Foundation and JEAN's organizational funds.

#### **Research participants:**

1. *Azusa Kojima, Director of JEAN:* In charge of beach debris status investigation.
2. *Shigeru Fujieda, Professor at Faculty of Fisheries at Kagoshima University:* In charge of beach debris status investigation.
3. *Akio Matsumoto, Secretary General of The Sea Beautification Society:* In charge of handling of drifted buoys.
4. *Katsuyuki Sugimori, Ocean photographer at Non-Profit Organization, The Oceanic Wildlife Society):* In charge of photography.
5. *Hiromi Okamoto of ELCOM Co., Ltd.:* In charge of providing technical information on styrofoam volume reduction.

#### **Research schedule:**

<b>Date</b>	<b>Schedule</b>
June 25th	<b>Depart Japan</b> Arrive in Anchorage shortly after 2:00 pm local time
June 26th	<b>Visit Consular Office of Japan Anchorage</b> Meeting with Consul Funayama Meeting and scheduling with Representative Director, Chris Pallister of Gulf of Alaska Keeper (GoAK)
June 27th	<b>Coast inspection tour: Montague Island</b> <ul style="list-style-type: none"><li>• Inspection of debris on the coasts from helicopter.</li><li>• Observed the GoAK crew collecting debris. Landed on the rocky coast and found debris washed up in between the</li></ul>

	<p>large amounts of driftwood.</p> <ul style="list-style-type: none"> <li>• Collected plastic bottles and sorted the caps and labels. according to country of origin. Searched for pipes used for oyster farming and plastic lighters. Landed at sandy coast and found debris that had washed up in between the driftwood.</li> <li>• Found broken, minute pieces of plastic.</li> </ul>
June 28th	<b>Visit Japan-US earthquake and tsunami debris workshop / Alaska State University Anchorage and Dr. Kennish's office</b>
June 29th	<p><b>Coast inspection tour 2: Prince William Sound</b></p> <ul style="list-style-type: none"> <li>• After visiting GoAK's boat in Whittier, headed to Prince William Sound on "Chugach" boat.</li> <li>• Inspected the convoluted coastline from the boat.</li> <li>• Assisted with the transfer of debris collected by the GoAK crew at Montague Island from the boat to a container.</li> </ul>
June 30th	<b>Return to Japan</b>

**Japan-U.S. earthquake and tsunami debris workshop:**

A workshop for sharing information on the debris from the earthquake and tsunami was held at Phillips Integrated Science Building at the University of Alaska Anchorage. See below for minutes:

**Opening speech by Chairman Chris Pallister of GoAK**

**Speech by Consul Koichi Funayama (Consular Office of Japan Anchorage):**

Thank you for having me here, and I would like to extend my gratitude to the members that have come from Japan.

Immediately after the Japanese government announced that as a result of the 3.11 earthquake and tsunami, debris would be washing up on the coastal areas of the U.S, Japanese experts presented the speculated date of arrival of the debris. Since then, the Consular Office of Japan in Anchorage has been sharing information with the Japanese and the US governments, specifying the debris that has come from Japan, and translating documents pertaining to this issue.

Ocean waste is a huge problem in Alaska. Beach clean up is arduous work, however, there are many people here that are working to tackle this problem and our office is doing its best to support these people and to help protect the natural environment.

**Presentation 1 by Azusa Kojima (Chairman of Japan Environment Action Network) on the status of Japan's ocean waste and the efforts of JEAN.**

**Presentation 2 by Akio Sakamoto (Secretary General of The Sea Beautification Society) on the collection of earthquake and tsunami debris and supporting local fishermen as well as returning fishing equipment.**

**Presentation 3 by Shigeru Fujieda (Professor at Kagoshima University, Faculty of Fisheries Director of JEAN) on the collection and recycling of styrofoam floating devices used by the fishing industry.**

**Presentation 4 by Hiromi Okamoto (ELCOM Co., Ltd.). Introduction of technique used at the Japan Fisheries Agency to reduce the volume of styrofoam floating devices.**

**Presentation 5 by Mary Fisher (Secretary General of Alaskans for Litter Prevention and Recycling (ALPR):**

ALPR is an NGO established 30 years ago with many business organizations participating in its efforts. It has been working with GoAK for many years and has been providing waste bags for the collected debris.

The new green colored bags have been made larger for carrying the styrofoam floats that are not heavy but bulky. In Anchorage, there are not many problems with landfill sites, however, space is a problem on Kodiak and Yakutat islands. The most essential point here is securing a source of funds so that recycling can be implemented.

Research is currently being conducted on styrofoam volume reduction equipment so we are very interested in the techniques of Japan.

**Presentation 6 by Elaine Buss Floyd (Acting Director of Alaska Department of Environmental Conservation):**

Alaska and Japan are actively engaged in tourism, trade and investments as well as importing and exporting seafood and minerals with each other. Many Alaskans visit Japan, hence the relationship between the Alaskans and Japanese people is most important. We thank the Japanese government for the compensation money that they gave to our country after the earthquake and tsunami.

We are working together with other departments of the Alaska state government on the topic at hand, and have been dealing with the earthquake and tsunami debris issue along with the federal government through the National Oceanic Atmospheric Administration (NOAA). We have been taking aerial photos of the coasts and have been determining where to start tackling this problem on the long coast.

We have submitted a proposal to the NOAA on how to use the compensation money from Japan. Initially, we requested \$250,000 to be given to Alaska, and that was approved. We are now in the process of having our second request for \$750,000 be approved.

We would like to analyze the data collected and make use of this fund sent to NOAA from Japan. Soon we will be sending a report along with photos so that people in Japan can see how the funds are being used to deal with the debris issue.

**Presentation 7 by Tim Veenstra (Owner of Airborne Technologies, Inc.):**

Last summer, we were commissioned by the Alaska Department of Environmental Conservation and conducted investigative research of tsunami debris by taking aerial photos of the coasts. The photos were taken as high-resolution images. While editing, the images were categorized into five levels and assigned keywords such as "bonten" (a type of buoy), facilitating searches on our website.

Even for the same location, when the image is enlarged, it may be categorized into a higher level category (i.e., greater amount of debris). These high-resolution aerial photos are available to the public on the websites of Airborne Technologies, the Alaskan state government and NOAA. The largest amount of debris washed ashore was found on parts of the coasts of Montague, Kayak and Kodiak islands. The Alaskan current flows into these coastal areas. If the images are enlarged, debris the size of a golf ball can be viewed. Minute debris cannot be seen with these aerial photos.

The actual state of the coasts can be understood from the photos and from the work of Chris and his crew, but the debris has washed up throughout Alaska, and there are places where helicopters cannot land. In one 20 - 35 mile section, the entire area is in the same state (with

much debris washed ashore). In even just one area, there is such a large amount of debris washed ashore, and although it is possible to view the debris from the air, collection will be very difficult.

**Comments by Chris Pallister of GoAK:**

Since mid-May, we have been on a 70-day clean-up mission with eight crewmembers on Prince William Sound (PWS) under the Exxon Valdez Oil Spill Trustee Council. So far, the collected debris has been brought to Whittier, and then transported to Anchorage using the containers of the Central Recycling Service (CRS). Most of the collected debris is plastic.

The debris is then sorted at CRS. Materials that can be used are reused, but the rest is sent to landfill sites. Flotsam from the tsunami has washed ashore in the U.S. and British Columbia, Canada, but we must not forget that the items once belonged to those who perished in Japan due to the tsunami.

Every time I pick up flotsam items, I bear in mind that they were once part of the lives of the tsunami victims.

Approximately 12-transfer vessels filled with debris have been collected since May. One vessel filled with debris is equivalent to about 42 m<sup>3</sup> (11095 gal.). Currently, debris collection is taking place on the Gulf of Alaska side of Montague Island. It is assumed that if all of the debris from the Gulf of Alaska side of Montague Island is collected, about 600 vessels will be filled.

Compared to last fall, the amount of large EPS floats has decreased, and currently, there is much driftwood and broken pieces of EPS. Similar to Hawaii's plastic beach, the area is littered with plastics. It is important to collect the large pieces now before they break down into small pieces.

**Presentation by John Kennish, Ph.D. (Professor of Chemistry at the University of Alaska Anchorage):**

I am researching how plastic ocean waste is polluting the environment. This research started from the plastic debris collected by Chris and his crew. The amount of plastic waste found in the ocean since the 1950s is on the increase. There are many advantages of using plastic, one of which is convenience, but it also destroys the environment. Since plastic is durable and floats on water, it has drifted and washed ashore in various locations.

This research is on the concentration level of phthalic acid esters in Alaskan marine organisms.

Regarding toxicity from plastic, abnormal reproduction occurred the most frequently.

Plastic waste absorbs the toxins from insecticides and other substances and has been causing environmental problems. Please note in particular the high levels of phthalic acid esters in tufted puffins.

**Presentation by Patty Zwollo, Ph.D. (Professor at College of William and Mary):**

I will discuss how ocean waste is affecting salmonidae. The immune system of fish is located in the kidneys and not in the bone marrow, hence the system is operated by the kidneys and spleen. Since the immune system works in the kidneys of the fish, when we consume fish, we are protected from bacteria entering our bodies.

In order for the immune cells to properly function, it is vital for them to develop through the different developmental stages. Our research results show that exposure to phthalic acid esters interferes with the development of the immune system in the fish.

By researching natural young salmon, we are studying the degree of decrease in antibodies, and have also been comparing young silver salmon in Lake Elizabeth to ones in the control area about 100 feet upstream. So far, results show that the phthalic acid ester level of the fish in the lake is five times higher than that of the fish upstream.

From these findings, it is thought that fish in the lake have fewer antibodies to fight bacteria as a result of the ocean debris that is inhibiting the proper development of the immune system of the fish.

**Q&A and sharing of information****On reduction of styrofoam volume**

- Many questions were asked about the techniques for reducing the volume of styrofoam, and pelletizing the styrofoam for use as fuel.

**On returning the collected buoys to Japan**

- Mr. Sakamoto has been continuing holding public hearings for local fisheries of the earthquake and tsunami affected areas on the reuse of hard plastic type buoys and the method of their distribution.
- Smaller buoys that can be used for oyster farming in Alaska are being sorted after collection for people to take home freely. The larger ones have no use.
- The condition of the buoys on the coast was checked. Those that have not degraded can be returned to Japan, but since some can be reused in Alaska, Japan and the U.S. will stay in contact to determine the needs of both countries.

**Researching the state of debris washed ashore on Montague Island:**

- From a distance, man-made objects were not noticeable since there were large amounts of driftwood on the beach that blocked our view. From nearby, however, we found that plastic debris equivalent to the amount of the driftwood had washed ashore and scattered.
- Since time on the beach was limited, we could not explore the whole area or conduct an investigation using the method of International Coastal Cleanup (ICC). Instead, at location A, we collected plastic bottles and determined the country origin of these bottles from the labels and caps.
- Debris from Japan included plastic kerosene containers, beverage containers, volleyballs, oyster farming pipes, etc.
- Large amount of polyurethane foam pieces that may have been insulating materials from houses had washed ashore.
- Many fishing buoys and floating devices as well as ropes were found, including ones made in Japan with trade names inscribed.

**Beach investigation of Prince William Sound (from onboard boat):**

- The gulf is in a scenic location with a view of the mountains and glaciers. Tourist excursion boats cruise the area.
- Driftwood could be seen since the beach is an enclosed bay, but there were almost no manmade materials (waste).
- Since the Gulf of Alaska side, on which large amounts of manmade materials has washed ashore, cannot be seen even if tourists (from the US and from abroad) board excursion boats, it is considered that the tourists will not become aware of the issue of ocean waste and debris from the tsunami.