

Project Report

2012 Projects on Tsunami Generated Marine Debris and its Management;
Japan – US NGO Collaboration Advancement, the Site Investigation Results
and Follow-Up Activities for Debris Problem Awareness Raising

March,2013

Preface

The sea floating man-made-objects whose potential cause was the Tsunami of Great East Japan Earthquake, hereafter referred to as "marine debris", has been adrift to the coasts of the U.S. and become the serious environmental threats. It is important to approach this problem from a variety of angles; not only through the inter governmental collaborations, but also through the cross-border projects by the private entities in both countries. The major debris driftage to the US coasts is prospected to reach around October 2012. Quick action is now essential.

The followings were implemented for this government-sponsored project. Besides the projects already started both in governmental and academic fields, the below is to accelerate the necessary investigations, data collections, and analysis of the whole debris problems as well as to establish the mutual communication basis among the related organizations.

(1) Project Committee Establishment

The project committee was established to examine the whole procedures of the on-site investigation, data collection and the information disclosure. The members were those energetically tackling the marine debris and the sea environmental issues from the different fields; the staff members from Non Government Organizations, the researchers, and those from Non Profit Organizations striving for rebuilding from the earthquake. The committee meeting was held for three times. The 1st meeting was to overview the whole projects; the procedures both for the investigation and the informative activities. The 2nd featured the data analysis after the investigation, while the 3rd was for the review of the whole project, including two Japan forums and some future plans.

(2) Field Investigation and Data Collections

The field investigation and data collections were conducted at the coastal areas of Hawaii and Ohio. This was aimed to make preparation for the major stranding of the disaster debris. Also the team looked into their countermeasures and comments from the local community.

The delegation consisted of the NGO members and the researchers from the above committee in (1); 8 for Hawaii and 6 for Oregon.

(3) Raising Awareness

Two forums were held in Sendai and Tokyo to officially report the outcomes of the investigations and related activities. It was held for the Japanese NGOs, the private organizations, and other groups involved in marine environment conservation and the debris management. The outcomes should be fully taken advantage of by these attendees.

Especially, the following is why it had to be in Sendai, the major disaster stricken area of the Great East Japan Earthquake; media reported that some objects drifted, such as Japanese soccer balls or fishery buoys, and were tracked down of their sources and then returned to the original owners in Japan. For the Tsunami victims and their families, these objects are so precious because they are the life memories themselves. Holding the forum in this particular city, Sendai, draws the attention of the citizens and may give the deep knowledge of the marine debris from the disaster.

In the forums, the original DVDs were shown for the demonstration of the on-site investigations, aimed to provide background knowledge about the whole marine litter issues, especially those in Okinawa and Japan Sea coastal lines. The efforts to control ocean litter were also introduced.

Also, to these Japan forums, members of the US NGO and the related people were invited. They already had participated in the Japan-US NGO forum of disaster debris early in the last August. (Here, the gratitude should be given to Sassagawa Peace Foundation for the invitation support.) These foreign participants visited the Tsunami-hit coastlines, deepening their understanding about the disaster marine debris and its future management.

(4) The Project Operation Outlines

This project involved both Japanese and the US NGOs/ NPOs that are interested /already involved in general marine litter issues, Tsunami oriented marine debris, and the reconstruction of disaster hit areas.

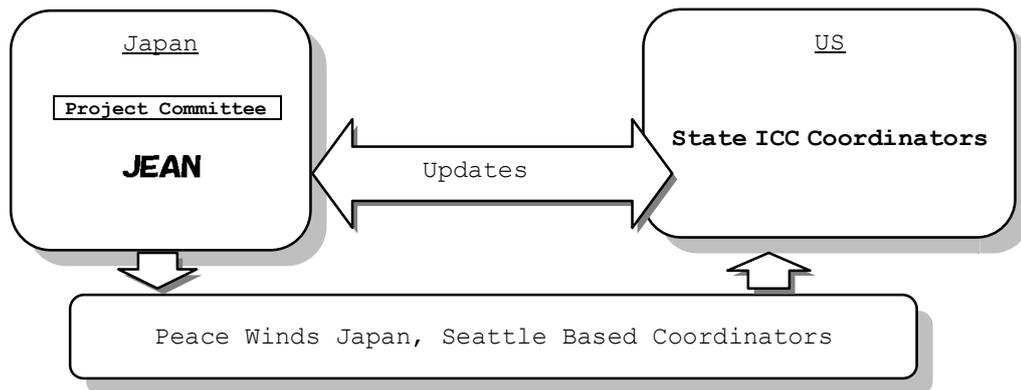
Organizations	Roles
Ocean Conservancy	• Supports for the Hawaii and Oregon investigations, including coordinating with the local related groups.
Peace Winds Japan, Certified Non Profit Organization	• Supports for the Oregon investigators, including coordinating with the local groups and collecting debris data.
Partnership Office, Non Profit Organization	• Supports for Material development and inter Japan forum preparation / operation
KIDS NOW, Non Profit Organization Miyagi Disaster Relief Volunteer Center, Non Profit Organization	• Supports for preparation and operation for the Sendai Forum.

(5) Coordination Prior to the Investigation

In carrying out this project, JEAN and Ocean Conservancy, the Washington D.C. based Non Governmental Organization, worked together. These two organizations have been tied over

20 years through "International Coastal Cleanup". The coordinators in each state helped the investigations. Ocean Conservancy provided updates of the marine debris at coastal lines both in Hawaii islands and US mainland.

Also, the Seattle field coordinators worked hard between OC and the Oregon based ICC coordinators for the smooth operation of the investigation. The below shows the communication flow of the group participated.



Networking with the US NGOs and NPOs

One of the goals of this project was to strengthen the ties between US-Japan NGO/ NPOs. So far it has been attained. Moreover, this brought the advanced networking among the domestic organizations, deepening the understanding of such international collaborations as well as relating each organization.

※The ministry of Environment released the mid term prospects for Tsunami marine debris' driftage to the remote shores from Japan, November 9, 2012.

The 1st Committee Meeting

- ① Tackling the disaster debris ~ the efforts so far
 - US-Japan NGO meeting on August 12
 - Marine debris issues before the disaster
 - Marine Debris Research Projects
- ② The objective of the whole project
- ③ The procedures for the project
 - Prospective arrivals of ocean debris from The Ministry of Environment
 - Marine Debris Overview on North American West Coasts
- ④ On Site Investigations / Questions and Answers

The 2nd Committee Meeting

- ① Updates of Disaster Ocean debris driftage
- ② The review of the field investigation and the findings
 - Regarding the press release from The Ministry of Environment
 - Reports from the Investigators

- The overview; investigation results and data collected
- Additional comments from the investigation team members
- ③ Promotional campaign in Japan
- ④ Inter-Japan Forum preparation and operational arrangement
- ⑤ Other necessary updates

The 3rd Committee Meeting

- ① The review of the inter Japan forums
- ② The review of the whole project
- ③ NGO/NPO The future plans for marine debris management
- ④ Other necessary updates

Project Committee Establishment

The project committee was established to examine the whole procedures of the on-site investigation, data collection and the information disclosure.

I-1. The Members of the Committee

The members were those tackling the marine debris and the sea environmental issues from the different fields; the staff members from Non Government Organizations, the researchers, and those from Non Profit Organizations striving for the disaster area rebuilding as seen in Figure 1.

Figure 1. The members of the committee

	Name	Positions / Organizations
Members	Minoru Ito	Chair, Clean Up Gamo
	Akio Sakamoto	Chief Secretary, Umi O Tuskurukai
	Kazumichi Sato	Chair of the Board, Partnership Office, NPO
	Junko Chano	Executive Director, Sasagawa Peace Foundation, NPO
	Tetsuhiro Nagayama	Chair of the Board, Miyagai Disaster Relief Center, NPO / Chair, KIDS NOW
	Rika Yamamoto	Chair of the Board, Peace Winds Japan, Certified Specified NPO
	Kosaku Yokoyama	Chair, OWS, NPO
Advisors	Atsuhiko Isobe	Professor, Center of Marine Environmental Studies, Ehime University
	Haruyuki Kanehiro	Professor, Otsuma Women's University
	Satoko Kiyono	Assistant Professor, Faculty of Engineering, Kyusyu University
	Hirofumi Hyuga	National Institute for Land and Infrastructure Management
	Shigeru Fujieda	Professor, Faculty of Fisheries, Kagoshima University

I-2. Agendas for the Committee Meetings

The project committee meetings were held on the following dates;

The 1st November 21, 2013

The 2nd March 4, 2013

The 3rd March 25, 2013

The followings are the agenda for each committee meeting. For the detailed minutes, refer to the appendix 1.

The 1st Committee Meeting

- ① Tackling the disaster debris ~ the efforts so far
 - US-Japan NGO meeting on August 12
 - Marine debris issues before the disaster
 - Marine Debris Research Projects
- ② The objective of the whole project
- ③ The procedures for the project
 - Prospective arrivals of ocean debris from The Ministry of Environment
 - Marine Debris Overview on North American West Coasts
- ④ On Site Investigations / Questions and Answers

The 2nd Committee Meeting

- ① Updates of Disaster Ocean debris driftage
- ② The review of the field investigation and the findings
 - Regarding the press release from The Ministry of Environment
 - Reports from the Investigators
 - The overview; investigation results and data collected
 - Additional comments from the investigation team members
- ③ Promotional campaign in Japan
- ④ Inter-Japan Forum preparation and operational arrangement
- ⑤ Other necessary updates

The 3rd Committee Meeting

- ① The review of the inter Japan forums
- ② The review of the whole project
- ③ NGO/NPO The future plans for marine debris management
- ④ Other necessary updates

II Field Investigation and Information Collection On Site

II-1 Field investigations Objectives

In the field investigation project, to sample the debris derived from the disaster or other origins, the following four types were conducted;

- Disaster Origin Marine Debris Investigation
- Japanese Origin Marine Debris Investigation
- Coastal Driftage Investigation
- Marine Debris Treatment Investigation

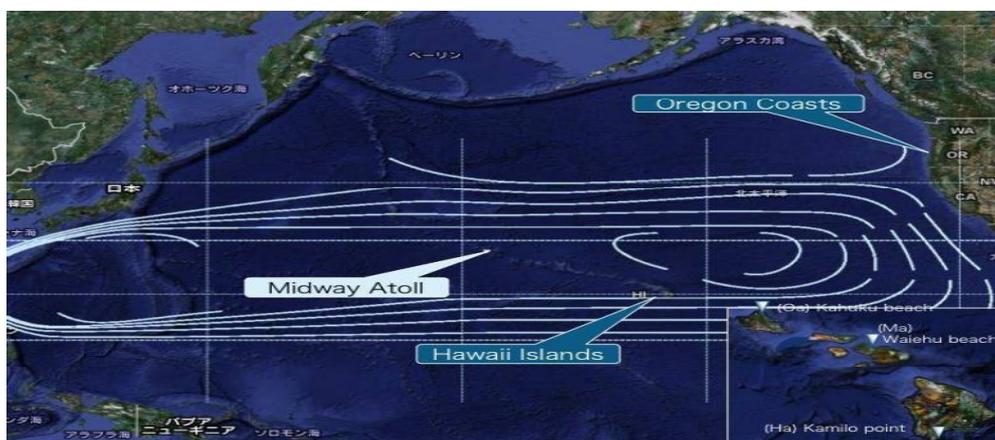
In "Disaster Origin Marine Debris Investigation", mainly the drifted items thought from the disaster for checking their amount and condition.

Besides the above, there have been ocean litters from Eastern Asian countries including Japan. In "Japanese Origin Marine Debris Investigation", the focus was on those objects potentially from Japan but non TSUNAMI origin, by classifying them same as above. Plus, in "Coastal Driftage Investigation", the focus was mainly on the shore circumstances. Recording the items of their numbers and conditions in the sample spot may promise the quick response in accordance with the changing coastal environment once the major debris driftage occurs. In "Marine Debris Treatment Investigation", to set forth the preparation against future major stranding, the target regions were examined of their work force, regional accessibility, and the treatments of the collected debris. In addition, future supports from Japan was discussed.

II-2. Field Investigation Procedures

The 7 subject coasts were Kafuku beach, Oahu Islands, Hawaii, Kamilo Point, Hawaii Island, Hawaii, Waiehu Beach, Maui Islands, Hawaii, Chinook Winds Beach, Lincoln City, Oregon, Gleneden Beach, Lincoln City, Oregon and Nye Beach, New Port, Oregon

Map1 Location of the Investigation Beaches



(with ocean currents indicated as white lines)

Map 1 indicates location of the beaches. For the investigation trip details of Hawaii delegation are in Appendix 2, as well as in the 3 for the Oregon delegation.

The investigation details are indicated in Figure 1 followed by the procedures.

Figure 1 Subject Beaches and Types of Investigations

State	Island/ City	Beach	Date	Disaster Origin Marine Debris Investigation	Japanese Origin Marine Debris Investigation	Coastal Driftage Investi- gation	Marine Debris Treatment Investi- gation
Hawaii	Oahu	Kahuku beach	Jan.10 2013	○	○	◎	○
	Hawaii	Kamilo point	Jan.12 2013	○	○	◎	○
	Maui	Waiehu beach	Jan.14 2013	○	○	○	○
Oregon	Lincoln City	Chinook winds beach	Feb.15 2013	○	○	◎	○
	Lincoln City	Gleneden beach	Feb.15 2013	○	○		○
	New Port	Nye beach	Feb.152 013	○	○		○

◎Including the plastic fragments

II-2-1. Disaster Origin Marine Debris Investigation

In "Disaster Origin Marine Debris Investigation", mainly the drifted items thought from the disaster were collected for checking their amount and condition.

II-2-2. Japanese Origin Debris Investigation

In "Japanese Origin Marine Debris Investigation", the focus was on those objects potentially from Japan but non TSUNAMI origin, by classifying them same as above. The subjects were;

- Disposable lighters, identifiable of their sources
- Oyster farm instruments or part of instruments ; oyster pipes, baby tubes, and the washers
- Pet bottles identifiable of their countries
- Other debris with some Japanese written on

Also, the followings were collected for the comparison;

- Chinese orange buoys
- Chinese blue buoys

- Korean conger traps
- Korean Sea-squirt farm wires

If the driftage were too much, debris were collected in "Coastal Driftage Investigation".

II-2-3. Coastal Driftage Investigation

To understand the density of driftage and proportional ratio of the items, 5 cm × 5cm quadrats were set on the beach vertically across from the shoreline to the closest greens. The oyster farm baby tubes, as large as 1.5 square meters, and objects larger were collected from the quadrats. The features of the debris were recorded on the International Coastal Cleanup Data Card, Japanese version, for the breakdown and calculation.

For the plastic fragments smaller than the "Baby Pipes", 40 cm × 40 cm × 5cm quadrats, were placed inside the above coastal driftage investigation quadrats. Every 8Ls of sand were collected and put in the watered bucket for the floating objects to be collected.

The collected objects were screened by the laboratory sieves after dried. The sieve sizes of the mesh were 0.5mm, 1.0mm, 1.4mm, 2.0mm, 2.8mm, 4.0mm, and 8.0mm, with which 2 minutes of screenings were conducted. The objects were then classified into 8 types according to their sizes as 0.5-1.0mm, 1.0-1.4mm, 1.4-2.0mm, 2.0-2.8mm, 2.8-4.0mm, 4.0-8.0mm, 8.0-16mm, and 16mm or greater.

II-2-4. Marine Debris Treatment Investigation

To calculate the whole amount of objects, "Ashore Litter Calculations Standardized Method" was applied. At the same time, the accessibility to the beach (time and distance) was checked to see the potentiality of sample collection. Also, the interviews were conducted to grasp the sorting out /disposal procedure.

II-3. Field Investigation Analysis

II-3-1. Disaster Origin Marine Debris Investigation

In the Hawaii coastlines, some refrigerators or lighters with Japanese words written on were found. Although some fish luring lights with Japanese words on were found in Oregon. However, the keys to determine their origins were not found. Thus, it was hardly possible to judge if they were the disaster origins. For many of the US citizens, it was too difficult to distinguish languages other than English (Korean, Chinese, Taiwanese, Russian, and Japanese). Many inquiry calls about drifted objects with foreign languages were over generalizing that every item was of Tsunami origin regardless of the language written. In Oregon beaches, despite their unknown origins, broken roofing applications made of rigid polyurethane or fishery buoys of Styrofoam were found.

II-3-2. Japanese Origin Marine Debris Investigation

At Hawaii coastal areas, 237 disposable lighters have been collected, including those found for the past one year period. Among them, 84 were US origin to form the largest group as 35.4 %, then 54 Japanese, 22.8%, and then 15 Taiwanese lighters were found to be 6.3%. (figure 2). Further among these, the followings are found their origin; ; 12 from Maui Island ,1 from Hualien County, Taiwan, 1 from Xinzhuang City, Taiwan, and 1 from Yamagata, Japan. From 3 beaches in Oregon, only 1 lighter were found and its home is yet identified.

The popular oyster farm utensils in Japan, baby tubes, and the oyster pipes and washers, particularly used in Hiroshima oyster farms, were found at all the sampling beaches (see Coastal Driftage Figure2 for details). As Figure 3 indicates, these pipes exceeded 70/m density at Kamilo Point, Hawaii. Among them, over 17 % were the pipes used in Hiroshima that indicates the driftage source can be the Seto Inland Sea to the outer ocean.

On the other hand, to be described in Coastal Driftage Investigation, very few pet bottles were found with clear origins; only 10 throughout the 4 beaches.

Thus, the origin trace was omitted. Also, Korean EEL sieves, sea squirt farm wires, large ball buoys, Japanese seaweed farm rings, Chinese orange buoys, and blue buoys were not found in Hawaii whereas not in Oregon beaches.

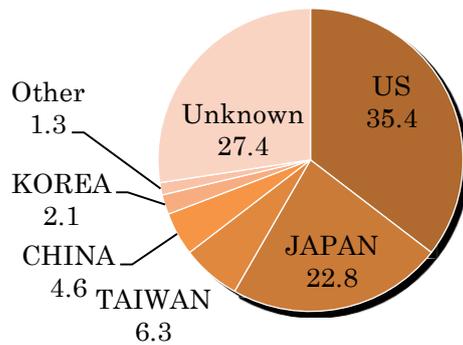


Figure 2. The origins of the disposable lighters found on Hawaii Beaches

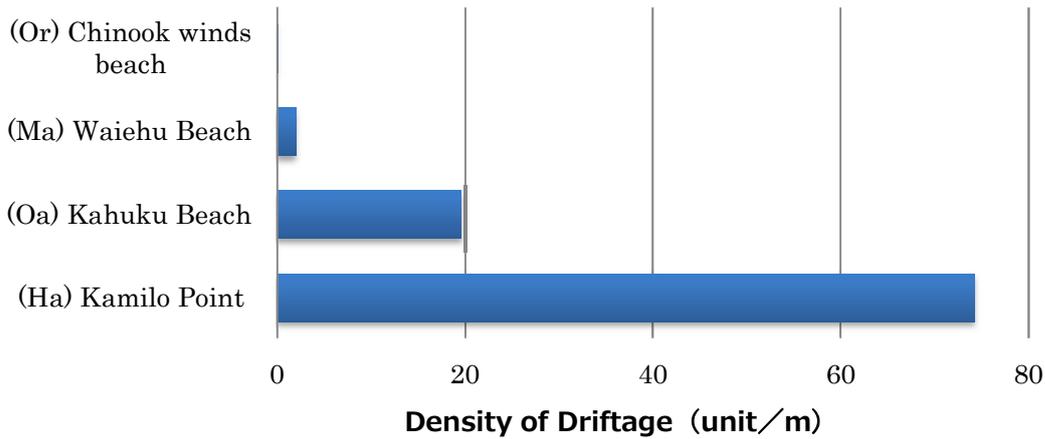


Figure 3. Driftage Density of oyster pipes found on Hawaii Beaches

II-3-3. Coastal Driftage Investigation

The drifted debris breakdown is as in Figure 2. The debris such as Styrofoam pieces and resin pellets smaller than the standard subject size were omitted from recording on the ICC Japanese Data Card. Details are in the micro plastic analysis section.

For the reference and comparison, the attached are the coastal debris breakdown on the Japan Pacific side by ICC, Sept. – Oct, 2012 as well as the 2011 ICC debris breakdown conducted by JEAN at Midway Atoll.

Figure 4 indicates the proportion of the coastal drifted objects. Regarding the results, the findings were similar to those at Pacific side of Japan done by ICC, there scattered some beverage related items, tobacco filters, fire works and so forth. Those were mainly disposed by the beach goers.

However, at Midway Atoll or Hawaii Islands, the largest debris was hard plastics posing over 90%, especially on Hawaii or Oahu Islands, showing a strong deviation to one from the others.

The oyster pipes were ranked as "Worst 10" items both in Midway and in U.S. coastal areas, also counted as worst 2 especially on Hawaii Islands and Oahu Islands. Bottle caps, ropes, and strings were ranked within the worst 10. As described, a lot of Styrofoam and urethane foam debris were found at Chinook Winds Beach, Oregon.

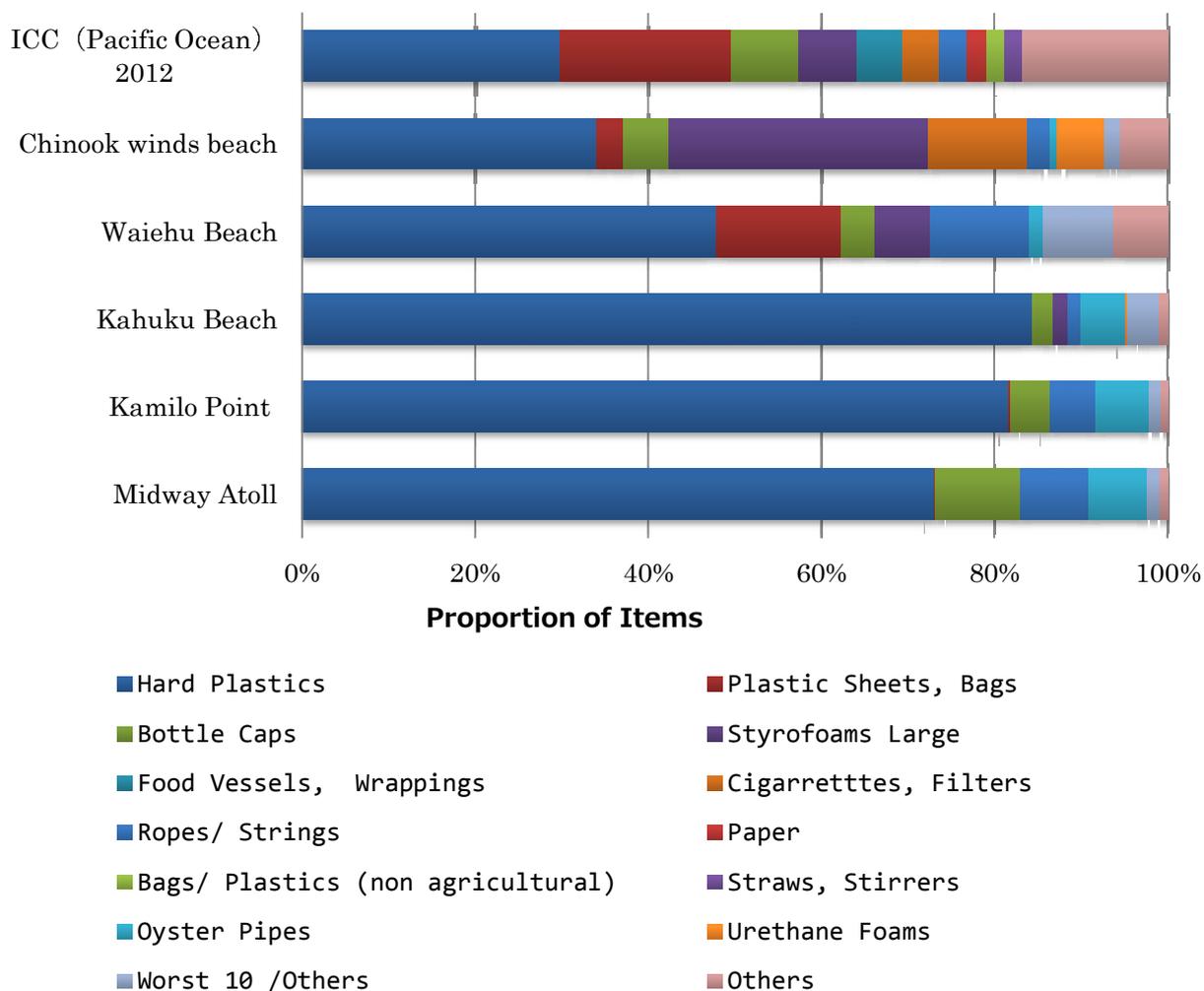


Figure 4. Breakdown of Drifted Items

The density of drifted objects are shown in Figure 5. The highest density was found in Kamilo point, Hawaii Island at 1119 unit/m. On the other hand, the density at Chinook Beach Oregon was as little as 1/m, and its weight was smaller than 0.1kg/m, 100 times less than that of Hawaii Islands; 1.4-2.1kg/m.

From the above, on Hawaii Islands, the hard plastic fragments occupies largely while on the Oregon coastlines, usually only little drifted litters are expected. Micro plastics' proportion is in Graph 6, Figure 3.

On those islands as Hawaii and Oahu, further, on their beaches as Kamilo Point and Kahuku Beach, the hard micro plastic fragments occupied over 80 % of the whole micro plastics. Also, in Oregon, where Styrofoam debris took 30 % of the whole drifted objects through Ocean Driftage Investigation, even in the micro plastic category, Styrofoam debris took more than 20 %. Resin pellets found in these beaches accounted over 5 %.

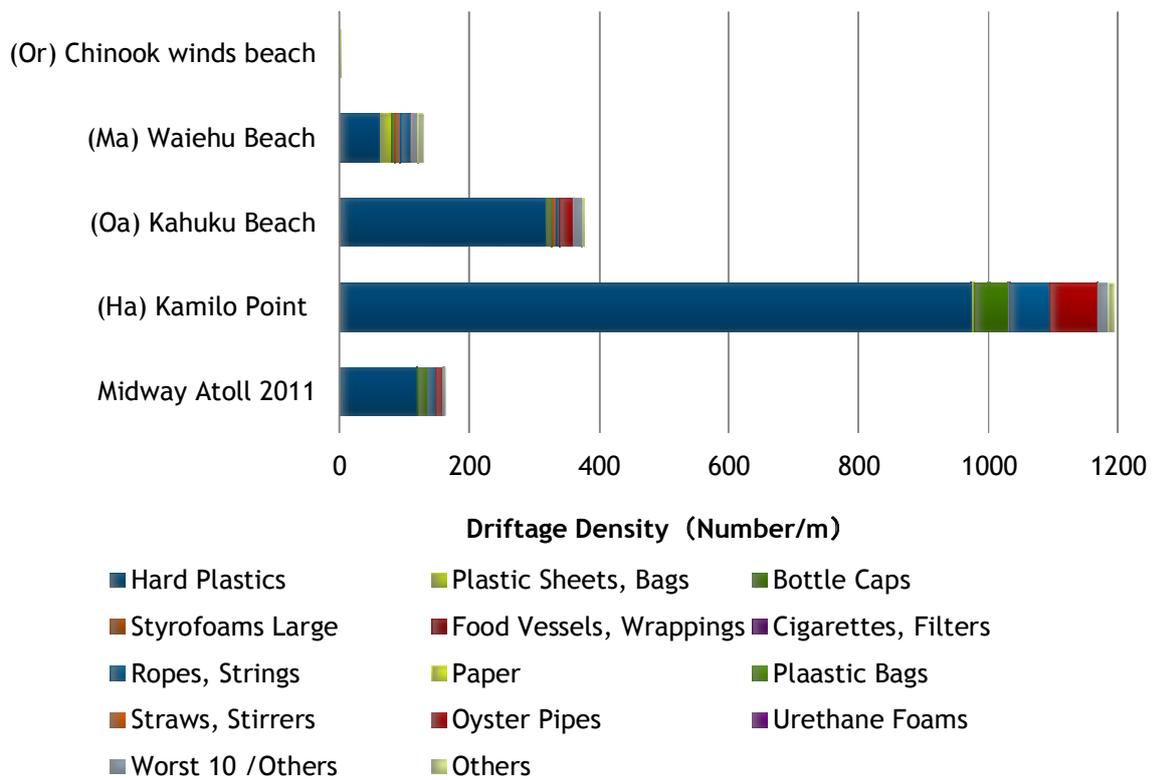


Figure 5 The density of the drifted objects

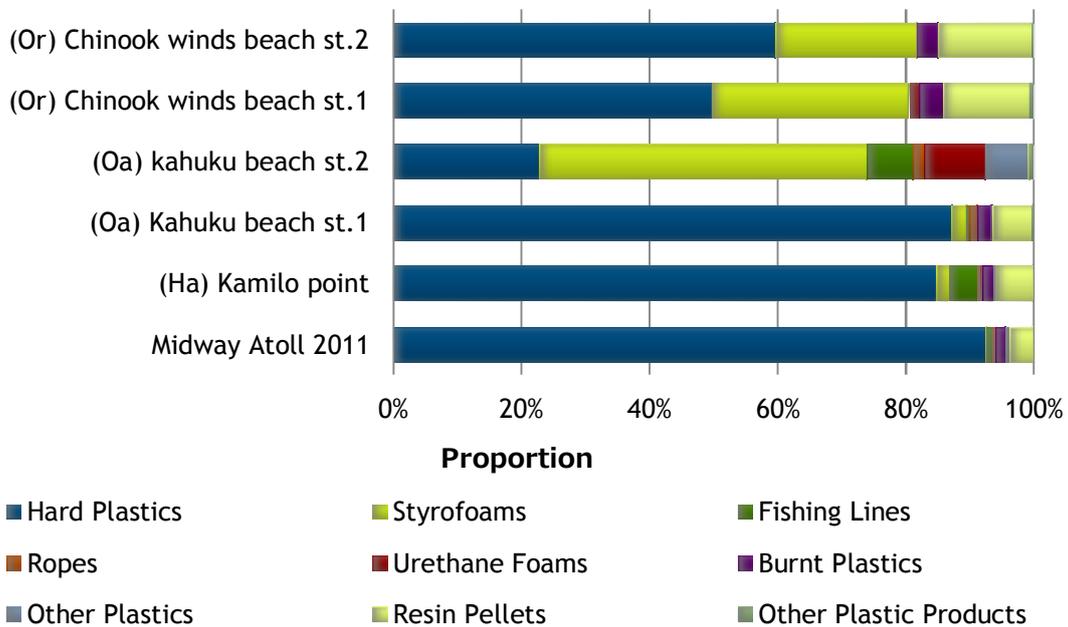
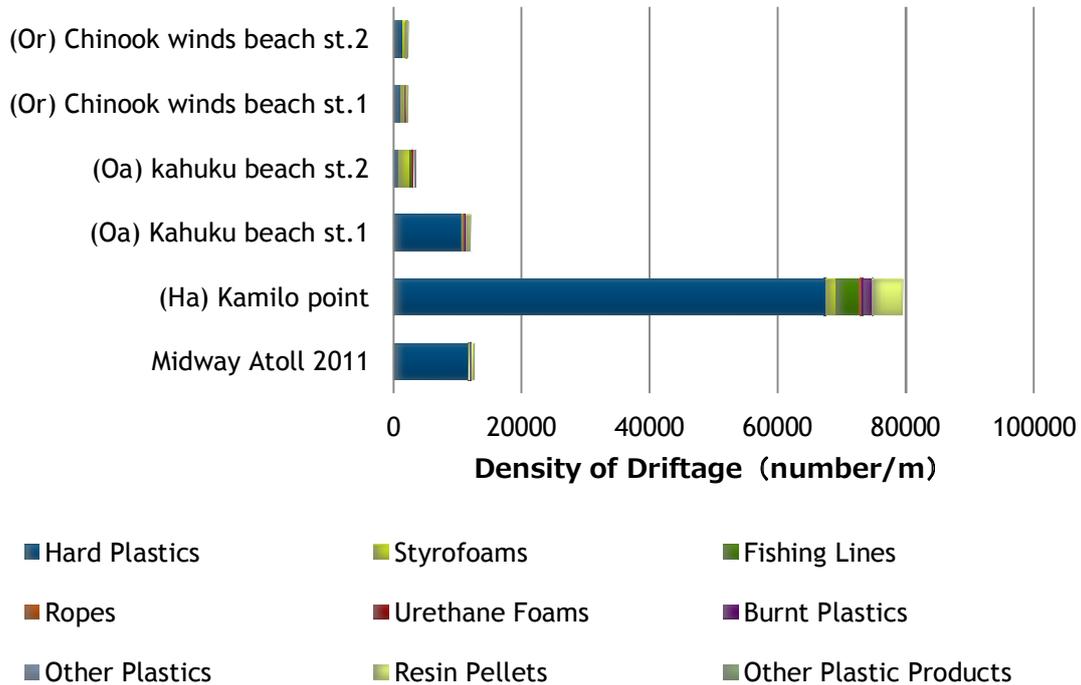


Figure 6 Proportion of Micro Plastics (over 0.5m)

Figure 3 Microplastic Drifted Objects Collected size 0.5mm>; Density (1m²) and Propotional Ratio

Category	Type	Objects	Sampling points											
			Oahu Island, kahuku beach st.1		Oahu Island, kahuku beach st.2		Hawaii Island, Kamiro point		Chinook winds St.1		Chinook winds St.2		Midway Atoll, Sand Island, Old seaplane Beach	
Platstics	Pieces	Styrofoam Pieces	281	2.3%	1,788	51.3%	1,606	2.0%	694	30.4%	538	22.1%	13	0.1%
		Hard Plastics	10,638	87.2%	794	22.8%	67,494	84.7%	1,131	49.6%	1,450	59.6%	11,744	92.6%
		Artificial Grass	0	0.0%	0	0.0%	38	0.0%	0	0.0%	0	0.0%	75	0.6%
		Films	6	0.1%	0	0.0%	125	0.2%	0	0.0%	0	0.0%	6	0.0%
		Sponge	0	0.0%	6	0.2%	0	0.0%	0	0.0%	0	0.0%	6	0.0%
		Fibers	0	0.0%	225	6.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
		Fishing Lines	56	0.5%	250	7.2%	3,644	4.6%	6	0.3%	0	0.0%	125	1.0%
		Ropes	138	1.1%	63	1.8%	313	0.4%	0	0.0%	0	0.0%	56	0.4%
		Urethane	6	0.1%	331	9.5%	219	0.3%	31	1.4%	0	0.0%	0	0.0%
		Burnt Plastics	275	2.3%	0	0.0%	1,431	1.8%	88	3.8%	81	3.3%	194	1.5%
	Sub Total	11,400	93.5%	3,456	99.1%	74,869	94.0%	1,950	85.5%	2,069	85.1%	12,219	96.3%	
	Items	Resin Pellets	769	6.3%	13	0.4%	4,644	5.8%	306	13.4%	356	14.7%	450	3.5%
		Farm Chemical Capsules	0	0.0%	0	0.0%	0	0.0%	6	0.3%	0	0.0%	0	0.0%
		Oyster Farm Pipes	0	0.0%	0	0.0%	44	0.1%	0	0.0%	0	0.0%	6	0.0%
		Oyseter Pipe Washers	6	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
		Plastic Caps	0	0.0%	6	0.2%	38	0.0%	0	0.0%	0	0.0%	13	0.1%
		Fishing Nets	19	0.2%	6	0.2%	44	0.1%	0	0.0%	0	0.0%	0	0.0%
		Others	0	0.0%	6	0.2%	0	0.0%	6	0.3%	6	0.3%	0	0.0%
		Subtotal	794	6.5%	31	0.9%	4,769	6.0%	319	14.0%	363	14.9%	469	3.7%
		Subtotal	12,194	100.0%	3,488	100.0%	79,638	100.0%	2,269	99.5%	2,431	100.0%	12,688	100.0%
Non Plastics		0	0.0%	0	0.0%	6	0.0%	13	0.5%	0	0.0%	0	0.0%	
Total	12,194		3,488		79,644		2,281		2,431		12,688			

The Driftage Density of Micro Plastic Fragments (over 5.0 mm)



The driftage density is shown in Figure 7 of the micro plastic fragments larger than 0.5 mm. The highest density was shown in Kamilo Point, Hawaii where the density showed as high as 800000 /m².

According to Fujieda (2011) the average density of the micro plastic fragments in the Seto Inland Sea, Japan, indicated 45, 833/m² for Styrofoam litters, 892/m² for hard plastic debris, and 211/m² for resin pellets.

When compared with these at Kamilo Beach, Hawaii Island, Styrofoam debris indicated very low density as 1,094 / m², 1/40 of the average, whereas the hard plastics were more than 50 times (52, 019/ m²) and 20 times for resin pellets (4,644/ m²). This indicates even at remote areas from the plastic litter source, at Kamilo Beach, Hawaii Islands, micro plastic fragments and resin pellets are found. Thus, these beaches have different problems from those of the inner beaches close to the region with dense population.

Figure 8 also indicates the size breakdown of the hard plastics collected at Kamilo Point, Hawaii Island. The hard plastics occupies 23% of the whole, which indicates there might as well exist those under 0.5 mm.

Because of the above, in the North Pacific, the decayed-then-fragmentized plastics are found after a considerable floating on the current to Hawaii Islands and West coast of the United States. So will the plastics washed away due to the Tsunami along with the long term floating be smaller particles.

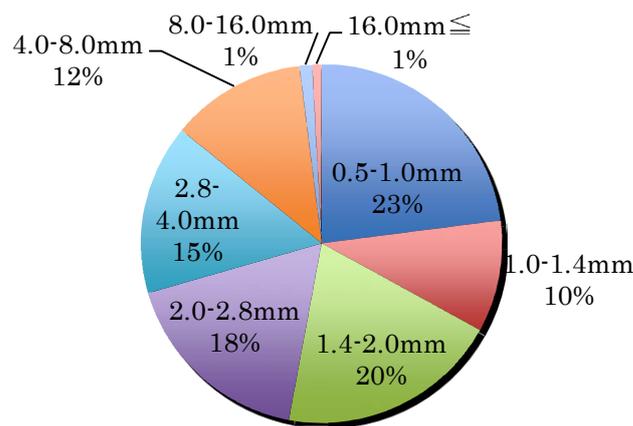


Figure 8 Size Differences of Hard Plastics at Kamilo Point

II-3-4. Marine Debris Treatment Investigation

II-3-4-1. Hawaii Beaches

At Hawaii Beaches, three beaches of the three different islands were investigated of their driftage at the shore, looked into their site details so that the practical and smooth collection of debris and would be possible.

Kahuku Beach (Oahu Island)

Kahuku Beachh is conveniently located as it is only 15 min. drive from Turtle Bay Condos, our base, and is 90 min. from the Honolulu City. There is a grass filed for parking, just along from the gate of the James Campbell National Wild Reservation to the beach, which surely enables the team of volunteers to work on debris collection . However, the bathroom is in distance as 3km away, in the office of the Reservation, which is the only one around. Plus, the investigators may have to prepare their own waters for drinking. Since the beach itself is relatively large, the collected debris may need some people to get it transported. Some shallow shores had a lot of micro plastics captured. A small cottage is next to the reservation office and an open space, initial briefing for the collection can be done here, then drive to the gate, and start exploring the beach.

Kamiro point (Hawaii Island)

Kamiro Point is about 4 hours and 20 minutes away by driving from Hiro Hawaiian Hotel, the team base. Because of the time for commuting, the team may be limited to work only for a few hours though keeping an early start. The bathroom is only located at the nearest park by the highway which is still one hour distance, coupled with a bumpy drive if the volunteers go to beach for collection. The investigators have to have a 4WD vehicle and a truck to the collection site. Plus, temporary restrooms should be installed.

Also, drinking water should be secured. Considering this beach circumstances, only less than 100 people can work for collection. Moreover, some large sized fishing nets were drifted along with a lot of plastic debris. Worse enough, the car rental company did not allow its cars to pass these bad roads. The collected litter is taken to the dump store, where the local citizens bring in their house garbage since the garbage collection system has not yet been established. Then the litter is sort out, stored, and transported to Oahu Island in the containers for disposals.

Waiehu Beach (Maui Island)

Waiehu Beach is 10 minutes away from the base, The Maui Beach Hotel, but only 6-7 cars are available to park. Hence, to secure the parking space is necessary in a large team activity. Also, temporary bathrooms should be installed for a long time practice of

collection. The beach is relatively narrow and long where a lot of wood and fishing nets are adrift. Plus, probably because of the golf yard nearby, many golf balls were found.

Findings of Hawaii Coasts

Foreign volunteer staff can work on the pre-ground contacts with the local community leaders and the ICC coordinators and other interest groups are very active and well tied throughout the islands.

However, regarding Kamilo Point, Hawaii Island, where the largest driftage was found, the beach accessibility is a little problematic. For the visiting staff, it will be a little difficult to fully work.

In order for sending Japanese volunteer staff in response to the Japan origin debris, before the need arises, securing the manpower who coordinates those with a high command of Japanese language and understanding of the culture is necessary. Also a certain amount of funds may require for the payment of the salaries, the travels costs, and for the transportation. At the same time, money for the pre-ground operational work done by ICC coordinators and related groups should be secured.

From the investigation, though a lot of drifted objects were found, not yet to judge them as the disaster debris. Also, it is important the general marine litter issues are the basis of this disaster marine debris problem. Considering this, Japan - US NGOs should work collaboratively on 1) the debris collections conducted when the semi annual ICC is held in September, and 2) keeping the local volunteer workers registered in case for the large driftage to occur.

II-3-4-2. Oregon Beaches

In Oregon state, "OREGON BEACH CLEANUP" by SOLVE is conducted semi annually, in spring and fall, dividing the whole state beaches into 14 zones.

The Oregon beaches expand to the south and north along with Oregon Coast Highway on the coastlines. There are nearby residential areas and it is very easy to commute the beach. The river oriented drifted debris, such as large trees, can be found on these sandy beaches.

Particularly at this investigation, not much driftage was found other than some micro plastic particles. At the bordering backside areas of the beaches, still not much driftage, debris, was identified which indicates very few objects are drifted on the daily basis.

Chinook Winds Beach (Lincoln City)

Chinook Winds Beach is at the north of Road's End State Park, with Chinook Winds Resort Hotel as its landmark in the center of the lengthy beach. In front of the hotel, the beach spans from the north, Road's End Beach Park to the south end, Siletz Bay FOR 11 km. The

hotel is neighboring the parking lot, restaurants, and the shopping center.

From the Portland Airport, the shuttle bus drives to the hotel, with the reservation needed, for about 120 miles taking two hours and a half. The access to the beach is secured though a bit far from the airport.

Plus, the beach is neighboring the hotel and Japanese volunteers may feel it easy to go for debris collection. The beach is of singing sand that is not so steep. Thus, when the tide is low, the 100m sand beach reveals, and the highest tide may cover whole the beach. Debris collection may be disturbed when the tide is highest, moreover, some re-driftage back to the ocean could take place. As its severe winter brings a lot of windy rain than sunshine, the debris treatment may require a lot of hard work.

There are some other hotels available and the rate becomes rather expensive in the summer as more guests are expected. This beach is in ZONE 6, "Road's End State Beach" as categorized on the OREGON BEACH CLEAN UP Web site. The debris taken from this zone is transported to North Lincoln Sanitary Service for disposals, located at the south Devils Lake. The debris from this investigation was, too, taken there for disposals.

Gleneden Beach (Lincoln Beach)

Gleneden Beach is located at the center of 9km sandy beach, lying from the south of Siletz Bay to Lincoln Beach and is 20 minutes drive from the Chinook Winds Resort Hotel. Parking space is available approximately for 10 cars. The beach is very close to the parking lot. There was a relatively more debris. The sandy beach is higher than the sea level, and even in high tide, the beach would not be fully covered, and re-driftage does not often take place.

This is ZONE 6 beach, registered as "Gleneden Beach" on the SOLVE OREGON CLEANUP website, whose litters are taken to North Lincoln Sanitary Service for disposals.

Nye Beach (Newport)

Nye Beach is a 6.5 km beach, lying the north of Newport Port. The beach is less steep as is Chinook Winds Beach, and reveals itself at the lowest tide. It is located at the south of the Chinook Winds Resort Hotel, about 45 minutes of driving on the Oregon Coast Highway as far as 45 km from the hotel. Parking space is available and surrounding are the residential areas or summer houses expecting a lot of beach goers.

This beach is registered as "Nye Beach" in ZONE 7 whose litter disposal is conducted at Thompson's Sanitary Service.

Overview of Oregon Debris Management

To Oregon state, 5 direct flights per week are available from Narita International Airport. Also, flights are available via Seattle, Vancouver, Hawaii, and San Francisco. All of them, however, may require early reservation, which makes it not so suitable for the emergency trip for the Japanese debris team.

SOLVE, the main ICC coordinator in Oregon, hosting Oregon Beach Cleanup, is well connected with each of the municipal organizations. One of the major recreational activities of them is "beach calming", in which participants enjoy walking while searching for the debris drifted. This is an acknowledged activity from the whole states, and the state wide awareness to the debris is relatively high.

Other than "211" calling system, debris monitoring staff are deployed at each beach. Also, preparing for the huge future driftage, the training of emergency cleanup is tailored; by e-mail, phone, fax or SNS are used to gather as many volunteer staff in a limited time to respond to the debris. They are very well prepared and available for the prospective large driftage.

Once the large driftage hits, SOLVE has to focus on the first response to it, it is difficult to ask them for the arrangement to accommodate Japanese volunteers. Rather, it may be realistic for the Japanese volunteers to participate in the semi annual events, Oregon Beach Cleanup, may be the better solution.

II-4. Meeting with the NGOs and other representatives

II-4-1. NGO meeting at Hawaii Investigation

In Hawaii investigation, ICC coordinators from each island and the Japanese delegation had a meeting, also with the NGO/NPO related staffs, NOAA, and Hawaii State government officials. The content was as follows:

In Hawaii, the environmental hazard response is well formed among the related organizations, though the financial resource may need to secure.

From the Japanese participants, ideas were proposed for the under water debris monitoring. We would like to forward this idea so that it would make possible to work with the underwater conservancy run by divers.

Also, collecting and sharing the debris information and data should be advanced in order for more accurate calculation. NOAA has been conducting under water monitoring for 14 years at some areas.

In Hawaii, some cases are reported that people hurt themselves while snorkeling. Also the damage of the coral leafs, and invasive foreign species are the current

environmental issues to concern.

To prepare for the treatment of memorable items when adrift. Now that the collecting of information is getting ready for the prospective driftage.

As for now, the focus should be on how to manage the information flow to whoever concerned; Japan US NGOs, government organizations, local community, and general citizens, because this becomes the strongest and necessary counteract against the debris problems. The participants agreed that they proceed on strengthening the communication basis among all.

It is necessary to give primacy on the things on the working list; which beach should be the first to clean up or so. This will enable us the most efficient way of utilizing the limited resources, both human and financial.

Others

After the US- Japan NGO meeting, Hawaii ICC coordinators had a suggestion from the NOAA representative, as to implement the web cam beach debris monitoring system made by a team of Japanese researchers. Responding to it, OWS has started to seek for the sponsors for this project with JEAN.

II-4-2. Oregon meeting and workshops at the investigation

During the investigation at Oregon, the delegation had a meeting with the local Japanese related groups and community organizers as well as holding the special workshop with them.

In Oregon, there is a long history of beach maintenance with the local NGOs. Plus the close relationship among the Japan related organizations has already been established.

In Oregon, 5 beach rangers periodically watch the beach at PARKS AND RESEARCH DEPARTMENT, and litter collection, and sorting out of the data are also conducted. The information is share with SOLVE.

Among the state of Washington, Oregon, and California, the governors already set up an alliance in order for them to actively involved in marine debris management cooperating with the environmental NGOs under state-wide collaborative plans.

" We now fully realized that Japan and US are tied by the ocean. Not only against the debris impacts, but also toward the rebuilding of Japanese disaster struck areas, we very much would like to start to cooperate." (workshop comments)

III Inter Japan Efforts for Awareness Raising

Two forums were held in Sendai and Tokyo to officially report the outcomes of the investigations and related activities. They were held for the Japanese NGOs, the private organizations and other groups involved in marine environment conservation, including the debris management, in the hope that the outcomes will be fully taken advantage by these attendees.

III-1. Domestic Conference; Tokyo Forum

The details of Tokyo Forum are as follows;

(1) Time, Date and Venue

Time & Date :13:30-16:30, Friday, March 15, 2013

Venue: #2 TKP Star Conference Room,

1-8-6 Horinaka Building, Yotsuya, Shinjuku, Tokyo

(2) Title and Hosts:

Title ;"Tsunami Generated Marine Debris and its Management with Overviews on
Ocean Litters ~Japan - US NGO Joint Investigation Review ~"

Hosted by ; Environmental Restoration and Conservation Agency of Japan

Operated by ; JEAN, General Incorporated Association

In Cooperation with ; Sasagawa Peace Foundation, Ocean Conservancy

(3) Contents

13:00 Registration

13:30 Opening by Environmental Restoration and Conservation Agency,
Independent Administrative Institutions

13:35 About the Forum by JEAN

13:40 On site investigation and the outcome

1 Overview of Investigation Results

by Shigeru Fujieda, Professor, Kagoshima University

2 Further Findings from Hawaii Investigation

by Kosaku Yokoyama, Chair, OWS

3 Further Findings from Oregon Investigation,

by Rika Yamamoto, Emergency Response Manager,

Peace Wind Japan

14:15 Commentaries from ICC Coordinators and other representatives

1. From Hawaii by Chris Woolaway

2. From Oregon by Briana Goodwin

3. From Alaska by Patrick Chandler and Christopher Pallister
15:00 Intermission; DVD showing; On site investigation video
15:15 General Ocean Debris Issues by JEAN
15:35 Additional Commentaries by Nicholas Mallos, Ocean Conservancy
15:45 Questions and Answers
16:30 Closing by JEAN

*conference dismissed 10 min. later than scheduled.

(4) Other

Poster session was in the lobby regarding the on site investigation and general marine debris problems

(5) Participants

In total, 65 people attended. The groups and organizations, besides individual participants, that attended were as follows (except the press, in the order of registration);

- The Sasagawa Peace Foundation
- Pasco Co., Ltd.
- Castle International Co., Ltd
- Toyo Construction Co., Ltd.
- Mitsui & Co., Ltd.
- Japan Sea born Art Association
- Tokyu Agency Inc.
- Ocean Family Marine Nature Experience Center, NPO
- The Ocean Wildlife Society, NPO
- KIDS NOW, NPO
- International Institute of environment Japan (IIEJ)
- Amway Japan LLC.
- Peace Winds Japan
- Tottori University of Environmental Studies
- Umimori Jimukyoku
- World Oceans Day Japan (WODL), NPO
- Eco Publishing Ltd.
- Lake Blue
- The Japan Society of Naval Architects and Ocean Engineers
- Asahi Advertising Inc.
- Kinki Nippon Tourist Co. Ltd.
- Northwest Pacific Action Plan (NOWPAP) Regional Coordinating Unit (RCU)
- Okinawa Ocean Culture & Environment Action Network
- Japan NUS Co., Ltd.
- OSEAN
- Environmental Management Bureau, Ministry of Environment

- The Chief Cabinet Marine Policy Head Quarters
- Gulf of Alaska Keeper Japan Office
- Bio Island Network
- Earth Works Society
- Center for Research and Promotion of Japan Islands
- Kanagawa Prefectural Fisheries Technology Center

III-2. Domestic Conference; Sendai Forum

The details of Sendai Forum are as follows;

(1) Time, Date, and Venue

Time & Date : 14:00-17:00, Sunday, March 17

* AM: US NGO delegation visited Tsunami hit areas

Venue: 6th Floor Gallery, El Park Sendai

141 Building, 4-11-1 Ichibancho, Sendai, Aobaku, Miyagi

(2) Title and Hosts:

Title ; "Tsunami Generated Marine Debris and its Management with Overviews
on Ocean Litters ~Japan - US NGO Joint Investigation Review ~"

Hosted by ; Environmental Restoration and Conservation Agency of Japan

Operated by ; JEAN, General Incorporated Association

Supported by ; Ministry of Environment

In Cooperation with ; Sasagawa Peace Foundation, Ocean Conservancy, KIDS NOW

(3) Contents

13:30 Registration Starts

14:05 Opening

by Environmental Restoration and Conservation Agency,
Independent Administrative Institutions

14:05 About the Forum by JEAN

14:10 On site investigation and the outcome

1 Overview of Investigation Results

by Shigeru Fujieda, Professor, Kagoshima University

2 Further Findings from Hawaii Investigation

by Kzaumichi Sato, Chair, NPO Partnership Office

3 Further Findings from Oregon Investigation

by Tetsuhiro Nagayama, Chair, KIDS NOW

14:45 Commentaries from ICC Coordinators and other representatives

1 From Hawaii by Chris Woolaway

2 From Oregon by Briana Goodwin

3 From Alaska by Patrick Chandler and Christopher Pallister
15:30 Intermission; DVD showing; On site investigation video
15:45 General Ocean Debris Issues by JEAN
16:05 Additional Commentaries by Nicholas Mallos, Ocean Conservancy
16:15 Questions and Answers; Opening speech Mr. Ito, Cleanup Gamo,
17:00 Closing by JEAN

*conference dismissed 15 min. later than scheduled.

(4) Other

Poster session was in the lobby regarding the on site investigation and general marine debris problems

(5) Participants

In total, 158 people attended. The groups and organizations, besides individual participants, that attended were as follows (except the press, in the order of registration);

- Michinoku Sonpo Club
- East Japan Earth Quake Hit Area Creation Center, NPO
- Aomori Sanpchi Fishery Arrangement Head Office
- Aomori Prefectural Agricultural Bureau Fishery Division
- Mutsu City
- Sanyo Girls' Junior High School
- Sendai Environmental Web Site Tamakisan Headquarter
- Kesenuma Rebuilding Association
- Sapporo Breweries Ltd. Tohoku Branch
- Rokugo Shichigo Cominet Head Office
- Funbaro Higasshi Nihon Project
- Sendai City Fire Department
- Miyagi Counter Disaster Volunteer Center
- Environmental Management Bureau, Ministry of Environment
- Honorary Consulate-General of the Republic of Fiji
- Clean up Gamou
- ALPS Electric Co., Ltd.
- Fujitsu Ltd.

III.3. Japan Forum Meeting Minutes

The following comments were collected at the two inter Japan forums at Tokyo and Sendai. Additions to the investigation results from the delegation.

The investigation brought about the opportunities for both parties to share the information and exchange ideas.

Debris problems had existed long before the disaster, and the seriousness of the matter has been recognized deeply.

Some people in the disaster stricken area are blaming themselves too much for the Tsunami debris problems. However, not so many US citizen feel that way. Rather, such debris could naturally flew from the neighbors in the North Pacific. These comments may as well be delivered to Japanese citizens.

Not only the disaster North American debris management at the west coasts, also, these findings should well be known among Japanese people as the issue itself is would not get dried for discussion.

About Alaska

In the state of Alaska, the coastlines are longer than those of other states, and only few roads have been ready to the shores. The official state road runs only half of the other states in number.

The cleanup activities are grouped into two; one is nearby the residential areas, while the remote clean up requires the helicopters and boats to travel afar for the activity.

Alaskan debris problems, remote cleanup is taking an important part, but theit requires financial back up and has security problems.

For 7 years, by the helicopter shots, the debris data has been collected. However, for the disaster debris, not yet state budget yet has been allotted particularly to the disaster debris.

Styrofoam are of high impacts as the amount is large that prevents smooth transportation and disposals.

The population of the State of Alaska is facilitated with the disposal site only enough to serve 720,000 people. For the large amount of drifted litters, they are taken to Seattle since state's disposal capacity is limited.

The state of Alaska is grateful that many people in Japan are concerned with the disaster debris from Japan. The people understand what happened to people at the Great East Japan Earthquakes.

The driftage increased as much as 80 to 100 times compared to before the earthquake.

As the Styrofoam fragments are found in the rivers where the wild salmon inhabit and the swamps in the state, the concern for environmental destruction increased.

The collected large sea farming buoys were given to oyster farms on Prince Williams Island for recycling.

Alaskan State Government has not yet allotted budget for the debris management. The activities so far have been supported by the federal government. The pollution consolatory money from Japan may be the largest amount.

The voices about disaster debris have given impacts to Alaskan citizens as to raise the awareness on the other end.

The broadcasted news about the marine debris from disaster also moved Japanese government.

From the US NGO Staff Members

Regarding the disaster marine debris issue, taken up by JEAN , and their visits to the U.S. have given a start of taking counteraction against the debris problems by the US government.

Same has happened to NOAA and Hawaii State government. That has made them strive for the problem.

In the State of Oregon, the beaches are well maintained because of the constant cleanups by the volunteers. However, some remote beaches are not, with a lot of driftage.

At present, 15 workshops have taken place throughout the state's 15 beaches. At the end of this series of workshops, all the Oregon areas will have been covered and be ready for the marine debris management. After the disaster of Japan, the volunteer workers increased in number.

The highest number of disaster marine debris have been adrift to the state of Alaska. What we have been collecting is in a form of broken objects, but truly these are the pieces of their daily life, the tragic memories, and the path of somebody's whole life. We would like to let the people in my country know much about this.

Visiting Japan enabled me to view the problem as a whole, not only by my brain but at my heart. Seeing the disaster stricken beaches, areas and meeting people there, were all very precious moments for me.

I was so impressed at the effort of the people even though they have been through such a big disaster.

Such conversation has brought us the ties across the wide ocean.

The disaster debris are only a part of whole sea litter pollution issue.

We might as well tackle the marine debris problem going through the hardships of the Tsumani and earthquake.

We would appreciate the Japan effort for the pre and post disaster experience, in terms of preparation and how to deal it afterwards. This should get known to everybody in the U.S.

The governmental consolatory money for pollution has been used for the large debris treatment such as removing of the drifted floating pier from Japan washed to Washington State.

From Forum Participants

The recognition toward debris "as life-memory items" is a very warm thought for us.

The ICC global net work enables us to be on the " same page" as this let us share the feeling, the working principles, and the feed back after the activities.

Marine debris problems are the issues reflecting our society, just down sized.

The marine debris is truly derived from humans. The suggestion lies in is that we need to look back our lifestyles.

We very much would like the international marine debris summit in the disaster area.

Returning of Drifted Objects

The treatment of the drifted objects should be more and more careful to identify the source and the original owner.

In the Lions Club Oregon, the fund raising activities have started for the efforts to return these drifted objects. Probably, there is a room for cooperation with the Miyagi local Lions Club.

In Japan, with the ties of JEAN, KIDS NOW and others, we would like to advance the project for the returning of the memorial objects.

IV The future Projects

Disaster debris investigation breakdown is indicated in figure 4. Before February 2013, some large debris from the Japan disaster have been identified. Also, some Styrofoam debris and urethane foam items are now found adrift in these beaches, not like before. Other than these, in Hawaii Coasts, analysis found that disaster origin debris have been giving more influence on the other debris. Some objects had not been yet adrift to these particular beaches, but now so conspicuous. Also, on the Hawaii Beaches, there found a lot influence from pre disaster drifted plastics.

It is considered that because of Tsunami, not only the torn down houses, but from the other resources, the plastic debris traveled long way from Japan. The calculation shows that those adrift at shores will continue floating some years on. Thus, more serious environmental hazards are possible, furthermore, it might keep influencing the surrounding environment.

Talking about the counteracts, the readiness for the upcoming driftage could set the networking among the inter Japan interest groups. Throughout the year round efforts, this enables the smooth flow of information about the disaster debris In the State of Hawaii, where many of Japanese volunteer workers are expected, the coordinators are distributed on each island so that periodical cleanups have been conducted and disposal work flow has been established.

In Oregon, Oregon Beach Cleanup is held state wide twice in a year, in spring and fall. The networking has been well established among the municipal governments and local working groups. From the emergency call (211) system acknowledgement and distribution of the beach watch staff for the major upcoming driftage, to the emergency cleanup training and dumpster (collection containers) installation, Oregon is able to implement many of the counter driftage action plans.

However, the problems lies if Japanese staff wish to give a quick on site help; the overseas traveling cost, time differences, and initial response for the emergency, plus the language barriers. Furthermore, access is limited because the public transportation is not available to the beaches. As the Ministry of Environment submitted, the calculation of the prospective path of huge disaster debris was revealed to reach Canadian West Coast.

Thus, once this major driftage is acknowledged, the local staff will be fully demanded for the initial treatment of the drifted debris. In order for the acceptance of volunteer staff from overseas for a long term, there required a full time coordinator for Japanese volunteers very soon.

As for the future plans, the following states or regions might as well be subject for the on site investigation as early as possible once the weather permits, say, after spring

this year. Because in these areas, the investigations were not able to conduct due to the severe winter weather of January and February even though the driftage is identified; Alaska, Washington, and British Columbia, Canada.

If the constant driftage is expected, in order to reduce the application workload for the local coordinators, the periodical openings of clean up activities should be informed throughout the nation so that it may prevent the concentration of volunteers to one place than the others. Also, for the issues to be kept aware of, collaborative cleanups between the countries should be held on the same timely basis. Furthermore, the current ocean debris problems may partially be because of the litters from Japan, not only just post disaster debris.

The disaster marine debris from the Great East Japan Earthquake has multiplied in number in the long floating and decaying. This again increases the distribution among the areas so does the level and length of the influence of the problem. Hence, in Hawaii, the center of the Pacific Rim, ICC cleanup and workshops by the NGOs and researchers should be held so that this debris issue could be informed to the world.

This is the outcome from the US-Japan NGO collaboration, entrust establishment, and discussion for the debris impact management.

Figure 4 Disaster Debris Investigations Outcome

	Japan	Hosting States	
		Hawaii	Oregon
Driftage Level		<ul style="list-style-type: none"> Large sized driftage is identified 	
		<ul style="list-style-type: none"> Small Japanese debris driftage is identified. Large amount of plastic debris are found adrift at certain points of the beach 	<p>Despite the driftage, the relatively clean environment is maintained.</p>
Preparation	<ul style="list-style-type: none"> Domestic Coordinator has appointed Information gathering for the hosting of volunteer staff 	<ul style="list-style-type: none"> Each Island has own coordinators Periodical Cleanup is conducted 	<ul style="list-style-type: none"> Local coordination by SOLVE Emergency hotline (211) establishment 海岸監視員の配置 Beach Watch is deployed Training for emergency cleanups Spring and Fall clean ups are conducted.
		Disposal flow confirmed	
Issues to consider	<ul style="list-style-type: none"> Distance (travel fees, time difference, and emergency procedure) Language Barrier Access to the Beach 	<ul style="list-style-type: none"> On site Coordinator is required. 	
Future Plans	Collaborative Cleanups	Open information for the Inter island cleanups to summon the volunteer workers	Semi annual Oregon Beach Cleanups in Spring and Fall
	<ul style="list-style-type: none"> The whole marine debris consists of the both pre and post disaster debris and measures should be implemented on the basis of well round understating of the nature of marine environmental problems. A lot of the debris is yet adrift, and long term management and planning are required for this marine litter issue. 		

references

Shigeru FUJIEDA, *Micro Plastic Fragments in the Seto Inland Sea*, 24(1),57-65,2011, Journal of Japan Association for Coastal Zone Studies

Shigeru FUJIEDA, *Rifting and Grounding of Plastic Pipes used in Oyster Farming in the Seto Inland Sea*, 77(1),23-30,2011, Nippon Suisan Gakkai Magazine

The whole findings of this project were reviewed in the third committee meeting. Plus, thorough discussion was made regarding the networking expected among the NGOs. Refer to the following comments:

The field reports will be created by JEAN and posted on the Website both in Japanese and English. The details will be discussed further.

Sendai forum videos will be available for those wish to view. The film ought to be under control of the hosting organization.

Regarding the tons of buoys collected in Alaksa, they shall be returned following the discussion between the US-Japan NGO staff members, in respect to the original owners' needs ,their conditions, types, amount, as well as its transportation costs.

Costal Clean UP of US - Japan synchronized holding require the utilizing of Skype or other communication methods. Probably the best to open is around ICC September 13.

We shall not regard the sending of volunteer stuff for debris collecting as given the highest priority.

For the volunteers should work on their own budget. If too much debris adrift, some technical research should be done.

For the Hawaii State, some volunteer tours can be considered setting the time to coincide with the ICC holding period.

Info. Site for the debris should be once terminated at the end of March 13 while the MALIP information disclosure continues.

Further discussion may require for the future large debris adrift: how to deal with it either inside or outside Japan including organized response and assigning of the jobs among the stuff related.

Dealing of the drifted objects to the original owners- thought- to -be is a

matter of discussion in respect to its job flow of returning, cost assurance, object storage, and duration of the storage.

The mailing list should be utilized for the setting up of the meeting among the NGO staff members regardless how official they should be.

This project is now to finish, however, JEAN will become responsible for assigning which entities or organizations to take the initiatives to the tasks assigned. For this purpose, meetings to shall hopefully be proposed by JEAN early next year. As a last note, we would like to acknowledge and show our gratefulness to the related people and organizations such as and Environmental Management Bureau, Ministry of Environment. Also, we would like to thank Sasagawa Peace Foundation for their dedication to invite those US NGO staff and related people.

Mach, 2013

JEAN

General Incorporated Association

Project Operator

Figure 1 Subject Beaches and Types of Investigations

State	Island/ City	Beach	Date	Disaster Origin Marine Debris Investigation	Japanese Origin Marine Debris Investigation	Coastal Driftage Investi- gation	Marine Debris Treatment Investi- gation
Hawaii	Oahu	Kahuku beach	Jan.10 2013	○	○	◎	○
	Hawaii	Kamilo point	Jan.12 2013	○	○	◎	○
	Maui	Waiehu beach	Jan.14 2013	○	○	○	○
Oregon	Lincoln City	Chinook winds beach	Feb.15 2013	○	○	◎	○
	Lincoln City	Gleneden beach	Feb.15 2013	○	○		○
	New Port	Nye beach	Feb.152 013	○	○		○

◎Including the plastic fragments

II-2-1. Disaster Origin Marine Debris Investigation

In "Disaster Origin Marine Debris Investigation", mainly the drifted items thought from the disaster were collected for checking their amount and condition.

II-2-2. Japanese Origin Debris Investigation

In "Japanese Origin Marine Debris Investigation", the focus was on those objects potentially from Japan but non TSUNAMI origin, by classifying them same as above. The subjects were;

- Disposable lighters, identifiable of their sources
- Oyster farm instruments or part of instruments ; oyster pipes, baby tubes, and the washers
- Pet bottles identifiable of their countries
- Other debris with some Japanese written on

Also, the followings were collected for the comparison;

- Chinese orange buoys
- Chinese blue buoys
- Korean conger traps
- Korean Sea -squirt farm wires

If the driftage were too much, debris were collected in "Coastal Driftage Investigation".

II-2-3. Coastal Driftage Investigation

To understand the density of driftage and proportional ratio of the items, 5 cm × 5cm quadrats were set on the beach vertically across from the shoreline to the closest greens. The oyster farm baby tubes, as large as 1.5 square meters, and objects larger were collected from the quadrats. The features of the debris were recorded on the International Coastal Cleanup Data Card, Japanese version, for the breakdown and calculation.

For the plastic fragments smaller than the "Baby Pipes", 40 cm × 40 cm × 5cm quadrats, were placed inside the above coastal driftage investigation quadrats. Every 8Ls of sand were collected and put in the watered bucket for the floating objects to be collected.

The collected objects were screened by the laboratory sieves after dried. The sieve sizes of the mesh were 0.5mm, 1.0mm, 1.4mm, 2.0mm, 2.8mm, 4.0mm, and 8.0mm, with which 2 minutes of screenings were conducted. The objects were then classified into 8 types according to their sizes as 0.5-1.0mm, 1.0-1.4mm, 1.4-2.0mm, 2.0-2.8mm, 2.8-4.0mm, 4.0-8.0mm, 8.0-16mm, and 16mm or greater.

II-2-4. Marine Debris Treatment Investigation

To calculate the whole amount of objects, "Ashore Litter Calculations Standardized Method" was applied. At the same time, the accessibility to the beach (time and distance) was checked to see the potentiality of sample collection. Also, the interviews were conducted to grasp the sorting out /disposal procedure.

II-3. Field Investigation Analysis

II-3-1. Disaster Origin Marine Debris Investigation

In the Hawaii coastlines, some refrigerators or lighters with Japanese words written on were found. Although some fish luring lights with Japanese words on were found in Oregon. However, the keys to determine their origins were not found. Thus, it was hardly possible to judge if they were the disaster origins. For many of the US citizens, it was too difficult to distinguish languages other than English (Korean, Chinese, Taiwanese, Russian, and Japanese). Many inquiry calls about drifted objects with foreign languages were over generalizing that every item was of Tsunami origin regardless of the language written. In Oregon beaches, despite their unknown origins, broken roofing applications made of rigid polyurethane or fishery buoys of Styrofoam were found.

II-3-2. Japanese Origin Marine Debris Investigation

At Hawaii coastal areas, 237 disposable lighters have been collected, including those found for the past one year period. Among them, 84 were US origin to form the largest

group as 35.4 %, then 54 Japanese, 22.8%, and then 15 Taiwanese lighters were found to be 6.3%. (figure 2). Further among these, the followings are found their origin; ; 12 from Maui Island ,1 from Hualien County, Taiwan, 1 from Xinzhuang City, Taiwan, and 1 from Yamagata, Japan. From 3 beaches in Oregon, only 1 lighter were found and its home is yet identified.

The popular oyster farm utensils in Japan, baby tubes, and the oyster pipes and washers, particularly used in Hiroshima oyster farms, were found at all the sampling beaches (see Coastal Driftage Figure2 for details). As Figure 3 indicates, these pipes exceeded 70/m density at Kamilo Point, Hawaii. Among them, over 17 % were the pipes used in Hiroshima that indicates the driftage source can be the Seto Inland Sea to the outer ocean.

On the other hand, to be described in Coastal Driftage Investigation, very few pet bottles were found with clear origins; only 10 throughout the 4 beaches. Thus, the origin trace was omitted. Also, Korean EEL sieves, sea squirt farm wires, large ball buoys, Japanese seaweed farm rings, Chinese orange buoys, and blue buoys were not found in Hawaii whereas not in Oregon beaches.

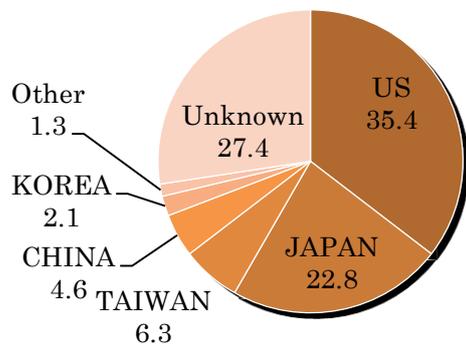


Figure 2. The origins of the disposable lighters found on Hawaii Beaches

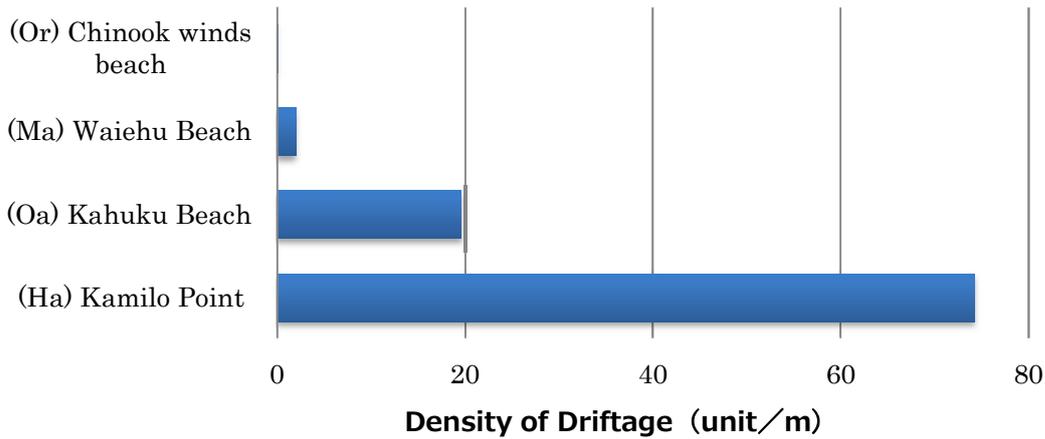


Figure 3. Driftage Density of oyster pipes found on Hawaii Beaches

II-3-3. Coastal Driftage Investigation

The drifted debris breakdown is as in Figure 2. The debris such as Styrofoam pieces and resin pellets smaller than the standard subject size were omitted from recording on the ICC Japanese Data Card. Details are in the micro plastic analysis section.

For the reference and comparison, the attached are the coastal debris breakdown on the Japan Pacific side by ICC, Sept. – Oct, 2012 as well as the 2011 ICC debris breakdown conducted by JEAN at Midway Atoll.

Figure 4 indicates the proportion of the coastal drifted objects. Regarding the results, the findings were similar to those at Pacific side of Japan done by ICC, there scattered some beverage related items, tobacco filters, fire works and so forth. Those were mainly disposed by the beach goers.

However, at Midway Atoll or Hawaii Islands, the largest debris was hard plastics posing over 90%, especially on Hawaii or Oahu Islands, showing a strong deviation to one from the others.

The oyster pipes were ranked as "Worst 10" items both in Midway and in U.S. coastal areas, also counted as worst 2 especially on Hawaii Islands and Oahu Islands. Bottle caps, ropes, and strings were ranked within the worst 10. As described, a lot of Styrofoam and urethane foam debris were found at Chinook Winds Beach, Oregon.

Fig 2 Marine Debris Drifted Brakdown from Hawaii and Oregon Beach Investigation (Compared with :Pacific Ocean Debris, ICC, Fall 2012 and Midway Atoll 2011)

State		Hawaii						Oregon						Data for Comparison					
City and Island Location		Maui Island Waiehu Beach			Hawaii Island Kamilo Point			Oahu Island Kahuku Beach			Lincoln City Chinook winds beach			Midway Atoll Sand Island North beach			Japan ICC (Pacific) 2012		
Types	Item	Number	Percentage	Rank	Number	Percentage	Rank	Number	Percentage	Rank	Number	Percentage	Rank	Number	Percentage	Rank	Number	Percentage	Rank
Pieces/ Broken Items	Hard plastics pieces	309	47.9%	1	4872	87.1%	1	3182	89.0%	1	529	34.3%	1	1192	73.0%	1	18,819	29.8%	1
	Plastic sheets/ Pieces of bags	93	14.4%	2	14	0.3%	9	5	0.1%	12	48	3.1%	6	3	0.2%	7	12,508	19.8%	2
	Styrofoam Pieces: Small: (below 1?)																		
	Styro Foam Pieces: Large (over 1?)	41	6.4%	4	7	0.1%	10	64	1.8%	5	467	30.3%	2	0	0.0%	24	4,239	6.7%	4
	Glasses or Ceramics	1	0.2%	22	19	0.3%	8	76	2.1%	4	9	0.6%	11	0	0.0%	24	980	1.5%	13
	Paper	0	0.0%	27	0	0.0%	26	0	0.0%	24	5	0.3%	16	0	0.0%	24	1,373	2.2%	8
	Metals	13	2.0%	8	0	0.0%	26	0	0.0%	24	2	0.1%	23	0	0.0%	24	384	0.6%	20
	※Ullethane Foams	0	0.0%	27	3	0.1%	16	10	0.3%	10	85	5.5%	4	1	0.1%	12	0	0.0%	62
Life Items/La nd Source(D aily, Medical, and other)	Cigarettes / Filters	2	0.3%	17	0	0.0%	26	1	0.0%	19	177	11.5%	3	0	0.0%	24	2,667	4.2%	6
	Cigarette packages /Wrappings	0	0.0%	27	0	0.0%	26	0	0.0%	24	1	0.1%	27	0	0.0%	24	150	0.2%	28
	Cigar tips	0	0.0%	27	1	0.0%	20	0	0.0%	24	6	0.4%	15	0	0.0%	24	137	0.2%	31
	Disposable Lighters	1	0.2%	22	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	455	0.7%	18
	Plastic Beverage Bottles	1	0.2%	22	4	0.1%	14	0	0.0%	24	5	0.3%	16	3	0.2%	7	1,149	1.8%	11
	Glass Beverage Bottles	2	0.3%	17	0	0.0%	26	0	0.0%	24	7	0.5%	14	1	0.1%	12	409	0.6%	19
	Beverage can	18	2.8%	6	0	0.0%	26	0	0.0%	24	4	0.3%	21	0	0.0%	24	656	1.0%	15
	Caps, Lids	25	3.9%	5	268	4.8%	4	91	2.5%	3	82	5.3%	5	161	9.9%	2	4,987	7.9%	3
	Pull tabs	0	0.0%	27	1	0.0%	20	0	0.0%	24	0	0.0%	32	0	0.0%	24	198	0.3%	26
	6 Pack holders	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	12	0.0%	53
	Picnic items(Knives, Forks, Spoons or C	0	0.0%	27	0	0.0%	26	1	0.0%	19	2	0.1%	23	1	0.1%	12	241	0.4%	22
	Straws, Stirrers	1	0.2%	22	5	0.1%	13	2	0.1%	16	10	0.6%	10	0	0.0%	24	1,282	2.0%	10
	Food Package, wrappings, vessels	4	0.6%	13	1	0.0%	20	1	0.0%	19	9	0.6%	11	0	0.0%	24	3,332	5.3%	5
	Plastic bags (non agricultural purposes)	4	0.6%	13	0	0.0%	26	0	0.0%	24	5	0.3%	16	1	0.1%	12	1,369	2.2%	9
	Paper bags(non agricultural purposes)	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	77	0.1%	39
	Bags for farm chemicals or fertilizers	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	89	0.1%	36
	Sheetings (Leisue Sheets)	0	0.0%	27	0	0.0%	26	1	0.0%	19	0	0.0%	32	0	0.0%	24	27	0.0%	47
	Gardening pots	1	0.2%	22	0	0.0%	26	0	0.0%	24	1	0.1%	27	0	0.0%	24	210	0.3%	24
	Shotgun shells (for hunting rifles)	0	0.0%	27	1	0.0%	20	0	0.0%	24	8	0.5%	13	0	0.0%	24	32	0.1%	46
	Resin pellets																		
	Syringes	0	0.0%	27	2	0.0%	18	1	0.0%	19	1	0.1%	27	1	0.1%	12	37	0.1%	44
	Medical wastes other than syringes	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	1	0.1%	12	134	0.2%	32
	Detergent / Bleach bottles	0	0.0%	27	1	0.0%	20	0	0.0%	24	0	0.0%	32	1	0.1%	12	81	0.1%	38
	Spray Cans	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	37	0.1%	44
	Common life items	5	0.8%	10	27	0.5%	5	13	0.4%	9	5	0.3%	16	7	0.4%	6	1,088	1.7%	12
	Toys	2	0.3%	17	3	0.1%	16	5	0.1%	12	1	0.1%	27	1	0.1%	12	317	0.5%	21
	Balloons	0	0.0%	27	2	0.0%	18	3	0.1%	14	0	0.0%	32	0	0.0%	24	40	0.1%	42
	Fireworks	0	0.0%	27	1	0.0%	20	0	0.0%	24	18	1.2%	8	1	0.1%	12	631	1.0%	16
	Clothes	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	216	0.3%	23
	Shoes, sandals	4	0.6%	13	0	0.0%	26	0	0.0%	24	0	0.0%	32	2	0.1%	10	204	0.3%	25
	Electric appliances, Furniture	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	17	0.0%	49
	Batteries(including car batteries)	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	13	0.0%	51
	Bikes, Motorcycles	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	2	0.0%	60
	Tires	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	16	0.0%	50
	Car Parts (excluding car batteries)	2	0.3%	17	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	13	0.0%	51
	Car oil cans, bottles	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	8	0.0%	56
	Wooden packagings	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	24	0.0%	48
	Shipping pallets	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	2	0.0%	60
	Shipping straps, bonages	0	0.0%	27	7	0.1%	10	3	0.1%	14	1	0.1%	27	1	0.1%	12	156	0.2%	27
	Oil drums	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	0	0.0%	62
	Nails, wires	0	0.0%	27	0	0.0%	26	0	0.0%	24	2	0.1%	23	0	0.0%	24	139	0.2%	30
	Construction materials (excluding nails	5	0.8%	10	0	0.0%	26	0	0.0%	24	5	0.3%	16	0	0.0%	24	576	0.9%	17
	Condoms	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	4	0.0%	59
	Tampon applicators	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	9	0.0%	55
	Diapers	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	5	0.0%	57
River or Ocean, Waterwa y Source Debris	Fishing lines	17	2.6%	7	0	0.0%	26	0	0.0%	24	3	0.2%	22	0	0.0%	24	118	0.2%	33
	Ropes , strings	74	11.5%	3	309	5.5%	3	56	1.6%	6	42	2.7%	7	129	7.9%	3	2,063	3.3%	7
	Fishing Nets	3	0.5%	16	0	0.0%	26	32	0.9%	7	2	0.1%	23	3	0.2%	7	108	0.2%	35
	Styrofoam floats	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	1	0.1%	12	88	0.1%	37
	Floats, buoys	0	0.0%	27	4	0.1%	14	0	0.0%	24	0	0.0%	32	10	0.6%	5	149	0.2%	29
	Fishing traps	2	0.3%	17	18	0.3%	7	2	0.1%	16	0	0.0%	32	2	0.1%	10	57	0.1%	41
	Fishing boxes	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	5	0.0%	57
	Bait vessels	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	71	0.1%	40
	Bulbs, Fluroroescent Lights (including ho	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	1	0.1%	12	39	0.1%	43
	Lures, Fluoro-light-sticks	0	0.0%	27	6	0.1%	12	8	0.2%	11	0	0.0%	32	0	0.0%	24	115	0.2%	34
	Oyster farm pipes	10	1.6%	9	371	6.6%	2	196	5.5%	2	13	0.8%	9	109	6.7%	4	856	1.4%	14
	※Knottings	5	0.8%	10	18	0.3%	7	16	0.4%	8	0	0.0%	32						
	※Rings	0	0.0%	27	0	0.0%	26	2	0.1%	16	0	0.0%	32						
Waste oil poles	0	0.0%	27	0	0.0%	26	0	0.0%	24	0	0.0%	32	0	0.0%	24	11	0.0%	54	
Total		645	100.0%		5,594	100.0%		3,575	100.0%		1,542	100.0%		1,633	100.0%		63,231	100.0%	
Oysterfarm pipes					63			33			1								
Baby farm pipes					297			165			11								
Washers					11			8			1								
Weight (kg)		7.1			10.7			8.3			11.1								
Capacity(l)		40			60			60			120								
Area		25			25			50			140,000								
Coastline Length (m)		5			5			5			1,400								

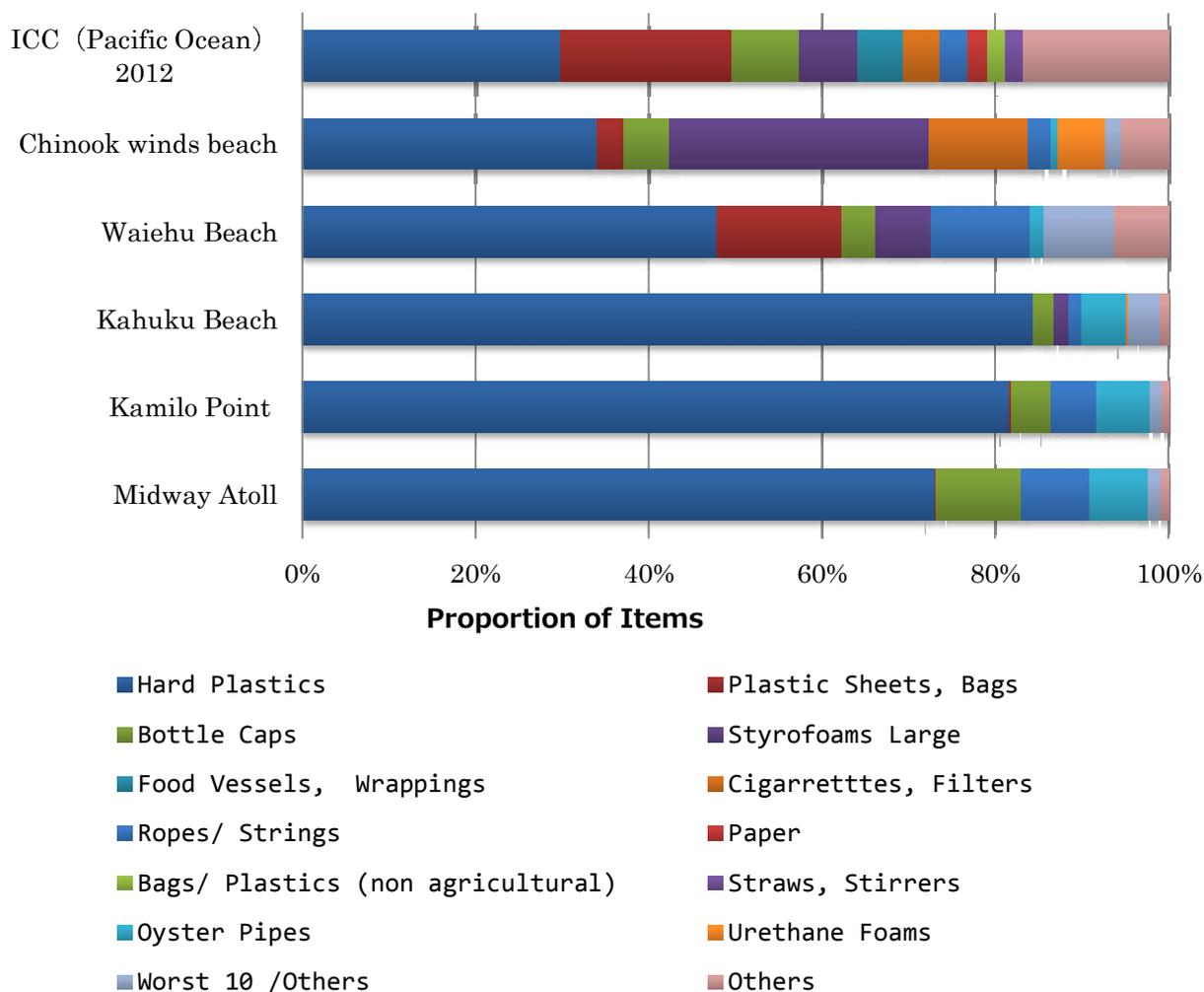


Figure 4. Breakdown of Drifted Items

The density of drifted objects are shown in Figure 5. The highest density was found in Kamilo point, Hawaii Island at 1119 unit/m. On the other hand, the density at Chinook Beach Oregon was as little as 1/m, and its weight was smaller than 0.1kg/m, 100 times less than that of Hawaii Islands; 1.4-2.1kg/m.

From the above, on Hawaii Islands, the hard plastic fragments occupies largely while on the Oregon coastlines, usually only little drifted litters are expected. Micro plastics' proportion is in Graph 6, Figure 3.

On those islands as Hawaii and Oahu, further, on their beaches as Kamilo Point and Kahuku Beach, the hard micro plastic fragments occupied over 80 % of the whole micro plastics. Also, in Oregon, where Styrofoam debris took 30 % of the whole drifted objects through Ocean Driftage Investigation, even in the micro plastic category, Styrofoam debris took more than 20 %. Resin pellets found in these beaches accounted over 5 %.

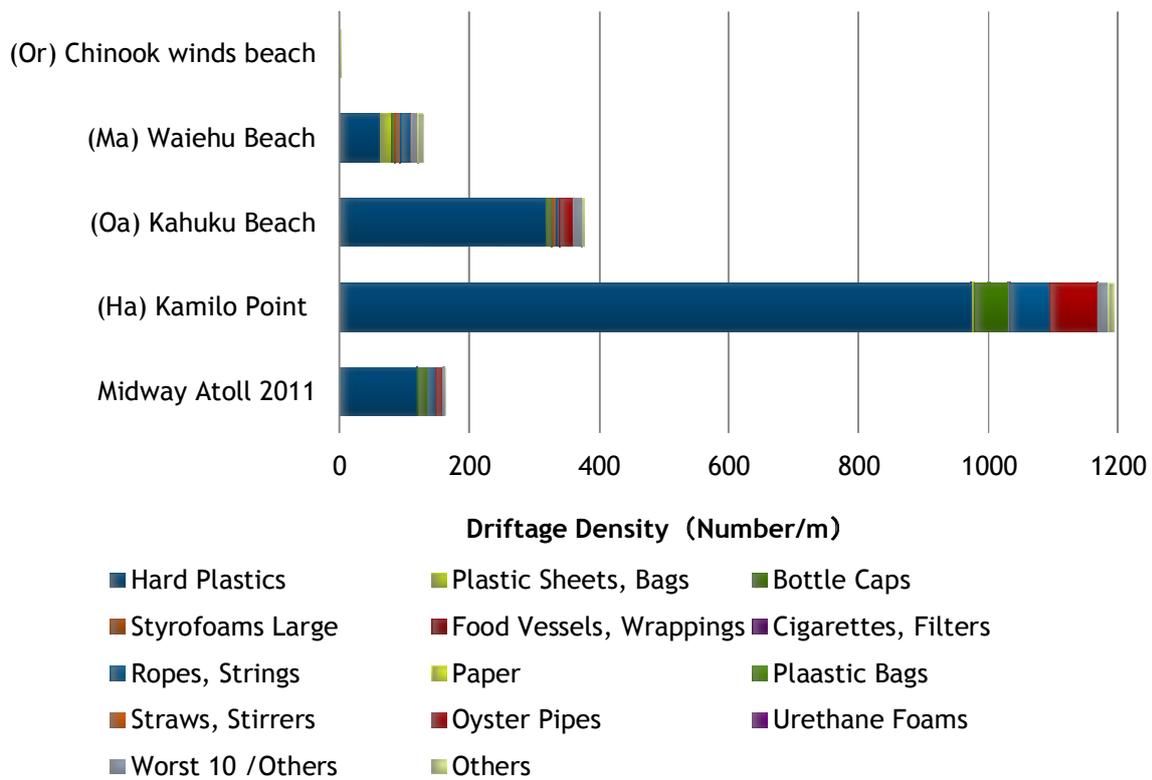


Figure 5 The density of the drifted objects

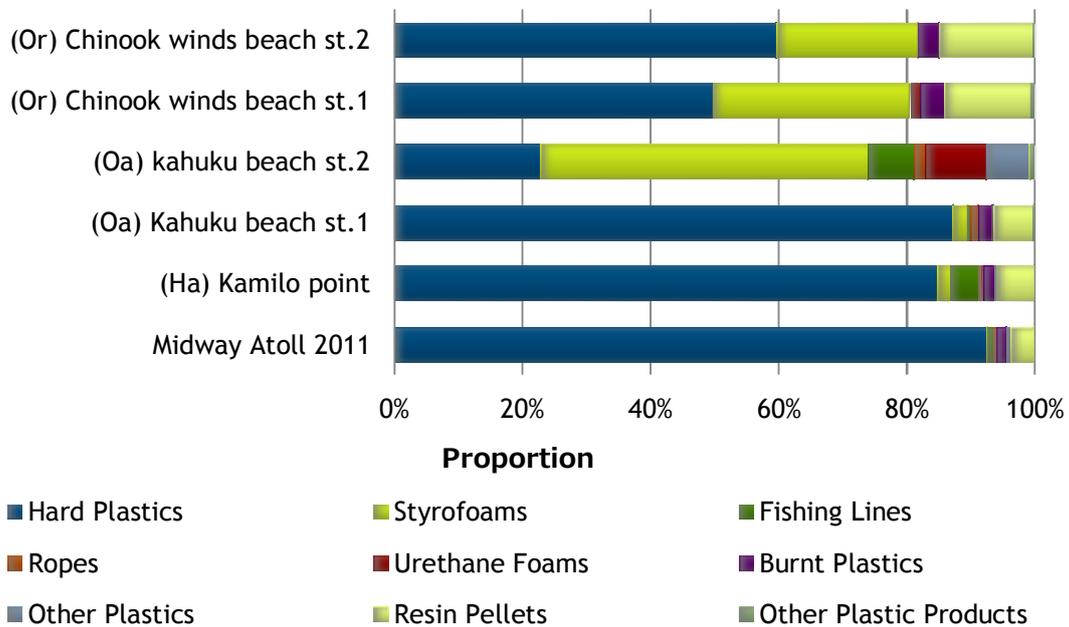
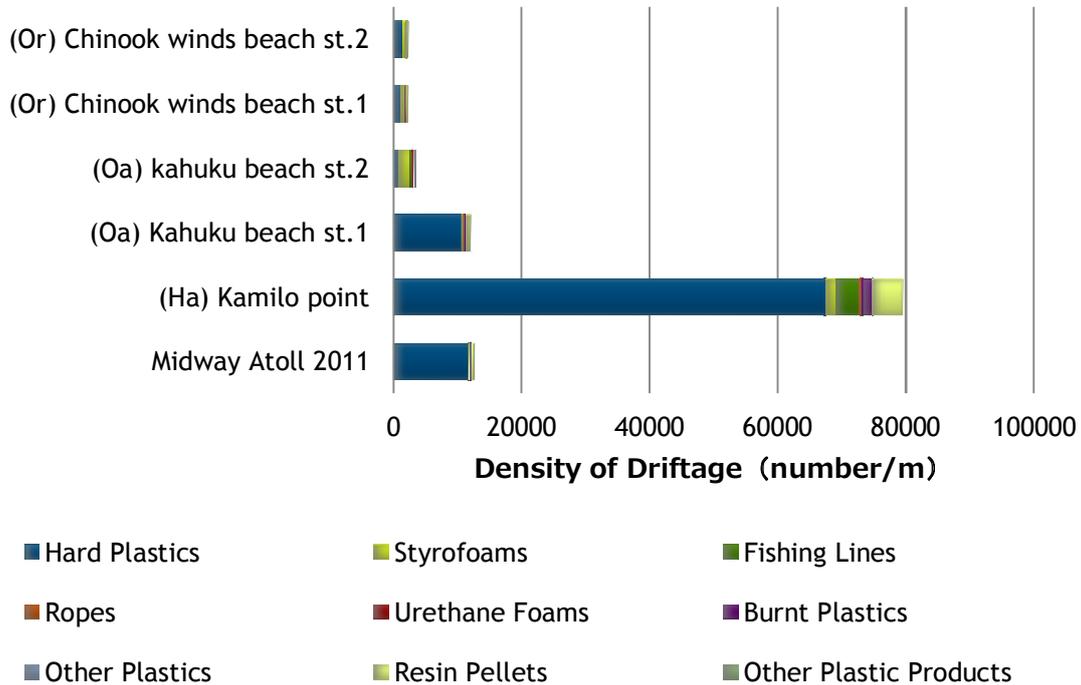


Figure 6 Proportion of Micro Plastics (over 0.5m)

Figure 3 Microplastic Drifted Objects Collected size 0.5mm>; Density (1m²) and Propotional Ratio

Category	Type	Objects	Sampling points											
			Oahu Island, kahuku beach st.1		Oahu Island, kahuku beach st.2		Hawaii Island, Kamiro point		Chinook winds St.1		Chinook winds St.2		Midway Atoll, Sand Island, Old seaplane Beach	
Platstics	Pieces	Styrofoam Pieces	281	2.3%	1,788	51.3%	1,606	2.0%	694	30.4%	538	22.1%	13	0.1%
		Hard Plastics	10,638	87.2%	794	22.8%	67,494	84.7%	1,131	49.6%	1,450	59.6%	11,744	92.6%
		Artificial Grass	0	0.0%	0	0.0%	38	0.0%	0	0.0%	0	0.0%	75	0.6%
		Films	6	0.1%	0	0.0%	125	0.2%	0	0.0%	0	0.0%	6	0.0%
		Sponge	0	0.0%	6	0.2%	0	0.0%	0	0.0%	0	0.0%	6	0.0%
		Fibers	0	0.0%	225	6.5%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
		Fishing Lines	56	0.5%	250	7.2%	3,644	4.6%	6	0.3%	0	0.0%	125	1.0%
		Ropes	138	1.1%	63	1.8%	313	0.4%	0	0.0%	0	0.0%	56	0.4%
		Urethane	6	0.1%	331	9.5%	219	0.3%	31	1.4%	0	0.0%	0	0.0%
		Burnt Plastics	275	2.3%	0	0.0%	1,431	1.8%	88	3.8%	81	3.3%	194	1.5%
	Sub Total	11,400	93.5%	3,456	99.1%	74,869	94.0%	1,950	85.5%	2,069	85.1%	12,219	96.3%	
	Items	Resin Pellets	769	6.3%	13	0.4%	4,644	5.8%	306	13.4%	356	14.7%	450	3.5%
		Farm Chemical Capsules	0	0.0%	0	0.0%	0	0.0%	6	0.3%	0	0.0%	0	0.0%
		Oyster Farm Pipes	0	0.0%	0	0.0%	44	0.1%	0	0.0%	0	0.0%	6	0.0%
		Oyseter Pipe Washers	6	0.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
		Plastic Caps	0	0.0%	6	0.2%	38	0.0%	0	0.0%	0	0.0%	13	0.1%
		Fishing Nets	19	0.2%	6	0.2%	44	0.1%	0	0.0%	0	0.0%	0	0.0%
		Others	0	0.0%	6	0.2%	0	0.0%	6	0.3%	6	0.3%	0	0.0%
		Subtotal	794	6.5%	31	0.9%	4,769	6.0%	319	14.0%	363	14.9%	469	3.7%
		Subtotal	12,194	100.0%	3,488	100.0%	79,638	100.0%	2,269	99.5%	2,431	100.0%	12,688	100.0%
Non Plastics		0	0.0%	0	0.0%	6	0.0%	13	0.5%	0	0.0%	0	0.0%	
Total	12,194		3,488		79,644		2,281		2,431		12,688			

The Driftage Density of Micro Plastic Fragments (over 5.0 mm)



The driftage density is shown in Figure 7 of the micro plastic fragments larger than 0.5 mm. The highest density was shown in Kamilo Point, Hawaii where the density showed as high as 800000 /m².

According to Fujieda (2011) the average density of the micro plastic fragments in the Seto Inland Sea, Japan, indicated 45, 833/m² for Styrofoam litters, 892/m² for hard plastic debris, and 211/m² for resin pellets.

When compared with these at Kamilo Beach, Hawaii Island, Styrofoam debris indicated very low density as 1,094 / m², 1/40 of the average, whereas the hard plastics were more than 50 times (52, 019/ m²) and 20 times for resin pellets (4,644/ m²). This indicates even at remote areas from the plastic litter source, at Kamilo Beach, Hawaii Islands, micro plastic fragments and resin pellets are found. Thus, these beaches have different problems from those of the inner beaches close to the region with dense population.

Figure 8 also indicates the size breakdown of the hard plastics collected at Kamilo Point, Hawaii Island. The hard plastics occupies 23% of the whole, which indicates there might as well exist those under 0.5 mm.

Because of the above, in the North Pacific, the decayed-then-fragmentized plastics are found after a considerable floating on the current to Hawaii Islands and West coast of the United States. So will the plastics washed away due to the Tsunami along with the long term floating be smaller particles.

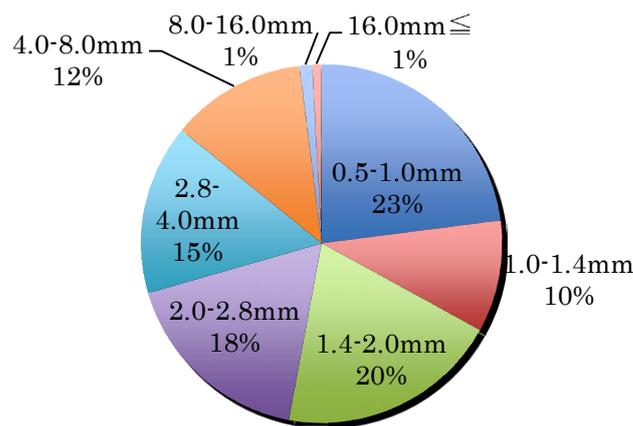


Figure 8 Size Differences of Hard Plastics at Kamilo Point

II-3-4. Marine Debris Treatment Investigation

II-3-4-1. Hawaii Beaches

At Hawaii Beaches, three beaches of the three different islands were investigated of their driftage at the shore, looked into their site details so that the practical and smooth collection of debris and would be possible.

Kahuku Beach (Oahu Island)

Kahuku Beachh is conveniently located as it is only 15 min. drive from Turtle Bay Condos, our base, and is 90 min. from the Honolulu City. There is a grass filed for parking, just along from the gate of the James Campbell National Wild Reservation to the beach, which surely enables the team of volunteers to work on debris collection . However, the bathroom is in distance as 3km away, in the office of the Reservation, which is the only one around. Plus, the investigators may have to prepare their own waters for drinking. Since the beach itself is relatively large, the collected debris may need some people to get it transported. Some shallow shores had a lot of micro plastics captured. A small cottage is next to the reservation office and an open space, initial briefing for the collection can be done here, then drive to the gate, and start exploring the beach.

Kamiro point (Hawaii Island)

Kamiro Point is about 4 hours and 20 minutes away by driving from Hiro Hawaiian Hotel, the team base. Because of the time for commuting, the team may be limited to work only for a few hours though keeping an early start. The bathroom is only located at the nearest park by the highway which is still one hour distance, coupled with a bumpy drive if the volunteers go to beach for collection. The investigators have to have a 4WD vehicle and a truck to the collection site. Plus, temporary restrooms should be installed.

Also, drinking water should be secured. Considering this beach circumstances, only less than 100 people can work for collection. Moreover, some large sized fishing nets were drifted along with a lot of plastic debris. Worse enough, the car rental company did not allow its cars to pass these bad roads. The collected litter is taken to the dump store, where the local citizens bring in their house garbage since the garbage collection system has not yet been established. Then the litter is sort out, stored, and transported to Oahu Island in the containers for disposals.

Waiehu Beach (Maui Island)

Waiehu Beach is 10 minutes away from the base, The Maui Beach Hotel, but only 6-7 cars are available to park. Hence, to secure the parking space is necessary in a large team activity. Also, temporary bathrooms should be installed for a long time practice of

collection. The beach is relatively narrow and long where a lot of wood and fishing nets are adrift. Plus, probably because of the golf yard nearby, many golf balls were found.

Findings of Hawaii Coasts

Foreign volunteer staff can work on the pre-ground contacts with the local community leaders and the ICC coordinators and other interest groups are very active and well tied throughout the islands.

However, regarding Kamilo Point, Hawaii Island, where the largest driftage was found, the beach accessibility is a little problematic. For the visiting staff, it will be a little difficult to fully work.

In order for sending Japanese volunteer staff in response to the Japan origin debris, before the need arises, securing the manpower who coordinates those with a high command of Japanese language and understanding of the culture is necessary. Also a certain amount of funds may require for the payment of the salaries, the travels costs, and for the transportation. At the same time, money for the pre-ground operational work done by ICC coordinators and related groups should be secured.

From the investigation, though a lot of drifted objects were found, not yet to judge them as the disaster debris. Also, it is important the general marine litter issues are the basis of this disaster marine debris problem. Considering this, Japan - US NGOs should work collaboratively on 1) the debris collections conducted when the semi annual ICC is held in September, and 2) keeping the local volunteer workers registered in case for the large driftage to occur.

II-3-4-2. Oregon Beaches

In Oregon state, "OREGON BEACH CLEANUP" by SOLVE is conducted semi annually, in spring and fall, dividing the whole state beaches into 14 zones.

The Oregon beaches expand to the south and north along with Oregon Coast Highway on the coastlines. There are nearby residential areas and it is very easy to commute the beach. The river oriented drifted debris, such as large trees, can be found on these sandy beaches.

Particularly at this investigation, not much driftage was found other than some micro plastic particles. At the bordering backside areas of the beaches, still not much driftage, debris, was identified which indicates very few objects are drifted on the daily basis.

Chinook Winds Beach (Lincoln City)

Chinook Winds Beach is at the north of Road's End State Park, with Chinook Winds Resort Hotel as its landmark in the center of the lengthy beach. In front of the hotel, the beach spans from the north, Road's End Beach Park to the south end, Siletz Bay FOR 11 km. The

hotel is neighboring the parking lot, restaurants, and the shopping center.

From the Portland Airport, the shuttle bus drives to the hotel, with the reservation needed, for about 120 miles taking two hours and a half. The access to the beach is secured though a bit far from the airport.

Plus, the beach is neighboring the hotel and Japanese volunteers may feel it easy to go for debris collection. The beach is of singing sand that is not so steep. Thus, when the tide is low, the 100m sand beach reveals, and the highest tide may cover whole the beach. Debris collection may be disturbed when the tide is highest, moreover, some re-driftage back to the ocean could take place. As its severe winter brings a lot of windy rain than sunshine, the debris treatment may require a lot of hard work.

There are some other hotels available and the rate becomes rather expensive in the summer as more guests are expected. This beach is in ZONE 6, "Road's End State Beach" as categorized on the OREGON BEACH CLEAN UP Web site. The debris taken from this zone is transported to North Lincoln Sanitary Service for disposals, located at the south Devils Lake. The debris from this investigation was, too, taken there for disposals.

Gleneden Beach (Lincoln Beach)

Gleneden Beach is located at the center of 9km sandy beach, lying from the south of Siletz Bay to Lincoln Beach and is 20 minutes drive from the Chinook Winds Resort Hotel. Parking space is available approximately for 10 cars. The beach is very close to the parking lot. There was a relatively more debris. The sandy beach is higher than the sea level, and even in high tide, the beach would not be fully covered, and re-driftage does not often take place.

This is ZONE 6 beach, registered as "Gleneden Beach" on the SOLVE OREGON CLEANUP website, whose litters are taken to North Lincoln Sanitary Service for disposals.

Nye Beach (Newport)

Nye Beach is a 6.5 km beach, lying the north of Newport Port. The beach is less steep as is Chinook Winds Beach, and reveals itself at the lowest tide. It is located at the south of the Chinook Winds Resort Hotel, about 45 minutes of driving on the Oregon Coast Highway as far as 45 km from the hotel. Parking space is available and surrounding are the residential areas or summer houses expecting a lot of beach goers.

This beach is registered as "Nye Beach" in ZONE 7 whose litter disposal is conducted at Thompson's Sanitary Service.

Overview of Oregon Debris Management

To Oregon state, 5 direct flights per week are available from Narita International Airport. Also, flights are available via Seattle, Vancouver, Hawaii, and San Francisco. All of them, however, may require early reservation, which makes it not so suitable for the emergency trip for the Japanese debris team.

SOLVE, the main ICC coordinator in Oregon, hosting Oregon Beach Cleanup, is well connected with each of the municipal organizations. One of the major recreational activities of them is "beach calming", in which participants enjoy walking while searching for the debris drifted. This is an acknowledged activity from the whole states, and the state wide awareness to the debris is relatively high.

Other than "211" calling system, debris monitoring staff are deployed at each beach. Also, preparing for the huge future driftage, the training of emergency cleanup is tailored; by e-mail, phone, fax or SNS are used to gather as many volunteer staff in a limited time to respond to the debris. They are very well prepared and available for the prospective large driftage.

Once the large driftage hits, SOLVE has to focus on the first response to it, it is difficult to ask them for the arrangement to accommodate Japanese volunteers. Rather, it may be realistic for the Japanese volunteers to participate in the semi annual events, Oregon Beach Cleanup, may be the better solution.

II-4. Meeting with the NGOs and other representatives

II-4-1. NGO meeting at Hawaii Investigation

In Hawaii investigation, ICC coordinators from each island and the Japanese delegation had a meeting, also with the NGO/NPO related staffs, NOAA, and Hawaii State government officials. The content was as follows:

In Hawaii, the environmental hazard response is well formed among the related organizations, though the financial resource may need to secure.

From the Japanese participants, ideas were proposed for the under water debris monitoring. We would like to forward this idea so that it would make possible to work with the underwater conservancy run by divers.

Also, collecting and sharing the debris information and data should be advanced in order for more accurate calculation. NOAA has been conducting under water monitoring for 14 years at some areas.

In Hawaii, some cases are reported that people hurt themselves while snorkeling. Also the damage of the coral leafs, and invasive foreign species are the current

environmental issues to concern.

To prepare for the treatment of memorable items when adrift. Now that the collecting of information is getting ready for the prospective driftage.

As for now, the focus should be on how to manage the information flow to whoever concerned; Japan US NGOs, government organizations, local community, and general citizens, because this becomes the strongest and necessary counteract against the debris problems. The participants agreed that they proceed on strengthening the communication basis among all.

It is necessary to give primacy on the things on the working list; which beach should be the first to clean up or so. This will enable us the most efficient way of utilizing the limited resources, both human and financial.

Others

After the US- Japan NGO meeting, Hawaii ICC coordinators had a suggestion from the NOAA representative, as to implement the web cam beach debris monitoring system made by a team of Japanese researchers. Responding to it, OWS has started to seek for the sponsors for this project with JEAN.

II-4-2. Oregon meeting and workshops at the investigation

During the investigation at Oregon, the delegation had a meeting with the local Japanese related groups and community organizers as well as holding the special workshop with them.

In Oregon, there is a long history of beach maintenance with the local NGOs. Plus the close relationship among the Japan related organizations has already been established.

In Oregon, 5 beach rangers periodically watch the beach at PARKS AND RESEARCH DEPARTMENT, and litter collection, and sorting out of the data are also conducted. The information is share with SOLVE.

Among the state of Washington, Oregon, and California, the governors already set up an alliance in order for them to actively involved in marine debris management cooperating with the environmental NGOs under state-wide collaborative plans.

" We now fully realized that Japan and US are tied by the ocean. Not only against the debris impacts, but also toward the rebuilding of Japanese disaster struck areas, we very much would like to start to cooperate." (workshop comments)

Inter Japan Efforts for Awareness Raising

Two forums were held in Sendai and Tokyo to officially report the outcomes of the investigations and related activities. They were held for the Japanese NGOs, the private organizations and other groups involved in marine environment conservation, including the debris management, in the hope that the outcomes will be fully taken advantage by these attendees.

III-1. Domestic Conference; Tokyo Forum

The details of Tokyo Forum are as follows;

(1) Time, Date and Venue

Time & Date :13:30-16:30, Friday, March 15, 2013

Venue: #2 TKP Star Conference Room,

1-8-6 Horinaka Building, Yotsuya, Shinjuku, Tokyo

(2) Title and Hosts:

Title ; "Tsunami Generated Marine Debris and its Management with Overviews on
Ocean Litters ~Japan - US NGO Joint Investigation Review ~"

Hosted by ; Environmental Restoration and Conservation Agency of Japan

Operated by ; JEAN, General Incorporated Association

In Cooperation with ; Sasagawa Peace Foundation, Ocean Conservancy

(3) Contents

13:00 Registration

13:30 Opening by Environmental Restoration and Conservation Agency,
Independent Administrative Institutions

13:35 About the Forum by JEAN

13:40 On site investigation and the outcome

1 Overview of Investigation Results

by Shigeru Fujieda, Professor, Kagoshima University

2 Further Findings from Hawaii Investigation

by Kosaku Yokoyama, Chair, OWS

3 Further Findings from Oregon Investigation,

by Rika Yamamoto, Emergency Response Manager,
Peace Wind Japan

14:15 Commentaries from ICC Coordinators and other representatives

1. From Hawaii by Chris Woolaway

2. From Oregon by Briana Goodwin

3. From Alaska by Patrick Chandler and Christopher Pallister

15:00 Intermission; DVD showing; On site investigation video

15:15 General Ocean Debris Issues by JEAN

15:35 Additional Commentaries by Nicholas Mallos, Ocean Conservancy

15:45 Questions and Answers

16:30 Closing by JEAN

✕onference dismissed 10 min. later than scheduled.

(4) Other

Poster session was in the lobby regarding the on site investigation and general marine debris problems

(5) Participants

In total, 65 people attended. The groups and organizations, besides individual participants, that attended were as follows (except the press, in the order of registration);

- The Sasagawa Peace Foundation
- Pasco Co.,Ltd.
- Castle International Co., Ltd
- Toyo Construction Co.,Ltd.
- Mitsui & Co.,Ltd.
- Japan Sea born Art Association
- Tokyu Agency Inc.
- Ocean Family Marine Nature Experience Center, NPO
- The Ocean Wildlife Society, NPO
- KIDS NOW, NPO
- International Institute of environment Japan(IIEJ)
- Amway Japan LLC.
- Peace Winds Japan
- Tottori University of Environmental Studies
- Umimori Jimukyoku
- World Oceans Day Japan(WODL), NPO
- Eco Publishing Ltd.
- Lake Blue
- The Japan Society of Naval Architects and Ocean Engineers
- Asahi Advertising Inc.
- Kinki Nippon Tourist Co. Ltd.
- Northwest Pacific Action Plan(NOWPAP) Regional Coordinating Unit(RCU)
- Okinawa Ocean Culture & Environment Action Network
- Japan NUS Co.,Ltd.
- OSEAN
- Environmental Management Bureau, Ministry of Environment
- The Chief Cabinet Marine Policy Head Quarters
- Gulf of Alaska Keeper Japan Office
- Bio Island Network

- Earth Works Society
- Center for Research and Promotion of Japan Islands
- Kanagawa Prefectural Fisheries Technology Center

III-2. Domestic Conference; Sendai Forum

The details of Sendai Forum are as follows;

(1) Time, Date, and Venue

Time & Date : 14:00-17:00, Sunday, March 17

* AM: US NGO delegation visited Tsunami hit areas

Venue: 6th Floor Gallery, El Park Sendai

141 Building, 4-11-1 Ichibancho, Sendai, Aobaku, Miyagi

(2) Title and Hosts:

Title ; "Tsunami Generated Marine Debris and its Management with Overviews
on Ocean Litters ~Japan - US NGO Joint Investigation Review ~"

Hosted by ; Environmental Restoration and Conservation Agency of Japan

Operated by ; JEAN, General Incorporated Association

Supported by ; Ministry of Environment

In Cooperation with ; Sasagawa Peace Foundation, Ocean Conservancy, KIDS NOW

(3) Contents

13:30 Registration Starts

14:05 Opening

by Environmental Restoration and Conservation Agency,
Independent Administrative Institutions

14:05 About the Forum by JEAN

14:10 On site investigation and the outcome

1 Overview of Investigation Results

by Shigeru Fujieda, Professor, Kagoshima University

2 Further Findings from Hawaii Investigation

by Kzaumichi Sato, Chair, NPO Partnership Office

3 Further Findings from Oregon Investigation

by Tetsuhiro Nagayama, Chair, KIDS NOW

14:45 Commentaries from ICC Coordinators and other representatives

1 From Hawaii by Chris Woolaway

2 From Oregon by Briana Goodwin

3 From Alaska by Patrick Chandler and Christopher Pallister

15:30 Intermission; DVD showing; On site investigation video

15:45 General Ocean Debris Issues by JEAN

16:05 Additional Commentaries by Nicholas Mallos, Ocean Conservancy

16:15 Questions and Answers; Opening speech Mr. Ito, Cleanup Gamo,

17:00 Closing by JEAN

※conference dismissed 15 min. later than scheduled.

(4)Other

Poster session was in the lobby regarding the on site investigation and general marine debris problems

(5)Participants

In total, 158 people attended. The groups and organizations, besides individual participants, that attended were as follows (except the press, in the order of registration);

- Michinoku Sonpo Club
- East Japan Earth Quake Hit Area Creation Center, NPO
- Aomori Sanpchi Fishery Arrangement Head Office
- Aomori Prefectural Agricultural Bureau Fishery Division
- Mutsu City
- Sanyo Girls' Junior High School
- Sendai Environmental Web Site Tamakisan Headquarter
- Kesenuma Rebuilding Association
- Sapporo Breweries Ltd. Tohoku Branch
- Rokugo Shichigo Cominet Head Office
- Funbaro Higasshi Nihon Project
- Sendai City Fire Department
- Miyagi Counter Disaster Volunteer Center
- Environmental Management Bureau, Ministry of Environment
- Honorary Consulate-General of the Republic of Fiji
- Clean up Gamou
- ALPS Electric Co.,Ltd.
- Fujitsu Ltd.

III.3. Japan Forum Meeting Minutes

The following comments were collected at the two inter Japan forums at Tokyo and Sendai. Additions to the investigation results from the delegation.

The investigation brought about the opportunities for both parties to share the information and exchange ideas.

Debris problems had existed long before the disaster, and the seriousness of the matter has been recognized deeply.

Some people in the disaster stricken area are blaming themselves too much for the Tsunami debris problems. However, not so many US citizen feel that way. Rather, such debris could naturally flew from the neighbors in the North Pacific. These comments may as well be delivered to Japanese citizens.

Not only the disaster North American debris management at the west coasts, also, these findings should well be known among Japanese people as the issue itself is would not get dried for discussion.

About Alaska

In the state of Alaska, the coastlines are longer than those of other states, and only few roads have been ready to the shores. The official state road runs only half of the other states in number.

The cleanup activities are grouped into two; one is nearby the residential areas, while the remote clean up requires the helicopters and boats to travel afar for the activity.

Alaskan debris problems, remote cleanup is taking an important part, but theit requires financial back up and has security problems.

For 7 years, by the helicopter shots, the debris data has been collected. However, for the disaster debris, not yet state budget yet has been allotted particularly to the disaster debris.

Styrofoam are of high impacts as the amount is large that prevents smooth transportation and disposals.

The population of the State of Alaska is facilitated with the disposal site only enough to serve 720,000 people. For the large amount of drifted litters, they are taken to Seattle since state's disposal capacity is limited.

The state of Alaska is grateful that many people in Japan are concerned with the disaster debris from Japan. The people understand what happened to people at the Great East Japan Earthquakes.

The driftage increased as much as 80 to 100 times compared to before the earthquake.

As the Styrofoam fragments are found in the rivers where the wild salmon inhabit and the swamps in the state, the concern for environmental destruction increased.

The collected large sea farming buoys were given to oyster farms on Prince Williams Island for recycling.

Alaskan State Government has not yet allotted budget for the debris management. The activities so far have been supported by the federal government. The pollution consolatory money from Japan may be the largest amount.

The voices about disaster debris have given impacts to Alaskan citizens as to raise the awareness on the other end.

The broadcasted news about the marine debris from disaster also moved Japanese government.

From the US NGO Staff Members

Regarding the disaster marine debris issue, taken up by JEAN , and their visits to the U.S. have given a start of taking counteraction against the debris problems by the US government.

Same has happened to NOAA and Hawaii State government. That has made them strive for the problem.

In the State of Oregon, the beaches are well maintained because of the constant cleanups by the volunteers. However, some remote beaches are not, with a lot of driftage.

At present, 15 workshops have taken place throughout the state's 15 beaches. At the end of this series of workshops, all the Oregon areas will have been covered and be ready for the marine debris management. After the disaster of Japan, the volunteer workers increased in number.

The highest number of disaster marine debris have been adrift to the state of Alaska. What we have been collecting is in a form of broken objects, but truly these are the pieces of their daily life, the tragic memories, and the path of somebody's whole life. We would like to let the people in my country know much about this.

Visiting Japan enabled me to view the problem as a whole, not only by my brain but at my heart. Seeing the disaster stricken beaches, areas and meeting people there, were all very precious moments for me.

I was so impressed at the effort of the people even though they have been through such a big disaster.

Such conversation has brought us the ties across the wide ocean.

The disaster debris are only a part of whole sea litter pollution issue.

We might as well tackle the marine debris problem going through the hardships of the Tsumani and earthquake.

We would appreciate the Japan effort for the pre and post disaster experience, in terms of preparation and how to deal it afterwards. This should get known to everybody in the U.S.

The governmental consolatory money for pollution has been used for the large debris treatment such as removing of the drifted floating pier from Japan washed to Washington State.

From Forum Participants

The recognition toward debris "as life-memory items" is a very warm thought for us.

The ICC global net work enables us to be on the " same page" as this let us share the feeling, the working principles, and the feed back after the activities.

Marine debris problems are the issues reflecting our society, just down sized.

The marine debris is truly derived from humans. The suggestion lies in is that we need to look back our lifestyles.

We very much would like the international marine debris summit in the disaster area.

Returning of Drifted Objects

The treatment of the drifted objects should be more and more careful to identify the source and the original owner.

In the Lions Club Oregon, the fund raising activities have started for the efforts to return these drifted objects. Probably, there is a room for cooperation with the Miyagi local Lions Club.

In Japan, with the ties of JEAN, KIDS NOW and others, we would like to advance the project for the returning of the memorial objects.

The future Projects

Disaster debris investigation breakdown is indicated in figure 4. Before February 2013, some large debris from the Japan disaster have been identified. Also, some Styrofoam debris and urethane foam items are now found adrift in these beaches, not like before. Other than these, in Hawaii Coasts, analysis found that disaster origin debris have been giving more influence on the other debris. Some objects had not been yet adrift to these particular beaches, but now so conspicuous. Also, on the Hawaii Beaches, there found a lot influence from pre disaster drifted plastics.

It is considered that because of Tsunami, not only the torn down houses, but from the other resources, the plastic debris traveled long way from Japan. The calculation shows that those adrift at shores will continue floating some years on. Thus, more serious environmental hazards are possible, furthermore, it might keep influencing the surrounding environment.

Talking about the counteracts, the readiness for the upcoming driftage could set the networking among the inter Japan interest groups. Throughout the year round efforts, this enables the smooth flow of information about the disaster debris In the State of Hawaii, where many of Japanese volunteer workers are expected, the coordinators are distributed on each island so that periodical cleanups have been conducted and disposal work flow has been established.

In Oregon, Oregon Beach Cleanup is held state wide twice in a year, in spring and fall. The networking has been well established among the municipal governments and local working groups. From the emergency call (211) system acknowledgement and distribution of the beach watch staff for the major upcoming driftage, to the emergency cleanup training and dumpster (collection containers) installation, Oregon is able to implement many of the counter driftage action plans.

However, the problems lies if Japanese staff wish to give a quick on site help; the overseas traveling cost, time differences, and initial response for the emergency, plus the language barriers. Furthermore, access is limited because the public transportation is not available to the beaches. As the Ministry of Environment submitted, the calculation of the prospective path of huge disaster debris was revealed to reach Canadian West Coast.

Thus, once this major driftage is acknowledged, the local staff will be fully demanded for the initial treatment of the drifted debris. In order for the acceptance of volunteer staff from overseas for a long term, there required a full time coordinator for Japanese volunteers very soon.

As for the future plans, the following states or regions might as well be subject for the on site investigation as early as possible once the weather permits, say, after spring this year. Because in these areas, the investigations were not able to conduct due to the severe winter weather of January and February even though the driftage is identified;

Alaska, Washington, and British Columbia, Canada.

If the constant driftage is expected, in order to reduce the application workload for the local coordinators, the periodical openings of clean up activities should be informed throughout the nation so that it may prevent the concentration of volunteers to one place than the others. Also, for the issues to be kept aware of, collaborative cleanups between the countries should be held on the same timely basis. Furthermore, the current ocean debris problems may partially be because of the litters from Japan, not only just post disaster debris.

The disaster marine debris from the Great East Japan Earthquake has multiplied in number in the long floating and decaying. This again increases the distribution among the areas so does the level and length of the influence of the problem. Hence, in Hawaii, the center of the Pacific Rim, ICC cleanup and workshops by the NGOs and researchers should be held so that this debris issue could be informed to the world.

This is the outcome from the US-Japan NGO collaboration, entrust establishment, and discussion for the debris impact management.

Figure 4 Disaster Debris Investigations Outcome

		Hosting States
--	--	----------------

	Japan	Hawaii	Oregon
Driftage Level		<ul style="list-style-type: none"> Large sized driftage is identified 	
		<ul style="list-style-type: none"> Small Japanese debris driftage is identified. Large amount of plastic debris are found adrift at certain points of the beach 	Despite the driftage, the relatively clean environment is maintained.
Preparation	<ul style="list-style-type: none"> Domestic Coordinator has appointed Information gathering for the hosting of volunteer staff 	<ul style="list-style-type: none"> Each Island has own coordinators Periodical Cleanup is conducted 	<ul style="list-style-type: none"> Local coordination by SOLVE Emergency hotline (211) establishment Beach Watch is deployed Training for emergency cleanups Spring and Fall clean ups are conducted.
		Disposal flow confirmed	
Issues to consider	<ul style="list-style-type: none"> Distance (travel fees, time difference, and emergency procedure) Language Barrier Access to the Beach 	<ul style="list-style-type: none"> On site Coordinator is required. 	
Future Plans	Collaborative Cleanups	Open information for the Inter island cleanups to summon the volunteer workers	Semi annual Oregon Beach Cleanups in Spring and Fall
	<ul style="list-style-type: none"> The whole marine debris consists of the both pre and post disaster debris and measures should be implemented on the basis of well round understating of the nature of marine environmental problems. A lot of the debris is yet adrift, and long term management and planning are required for this marine litter issue. 		

references

Shigeru FUJIEDA, *Micro Plastic Fragments in the Seto Inland Sea*, 24(1),57-65,2011,

Shigeru FUJIEDA, *Rifting and Grounding of Plastic Pipes used in Oyster Farming in the Seto Inland Sea*, 77(1),23-30,2011, Nippon Suisan Gakkai Magazine

The whole findings of this project were reviewed in the third committee meeting. Plus, thorough discussion was made regarding the networking expected among the NGOs. Refer to the following comments:

The field reports will be created by JEAN and posted on the Website both in Japanese and English. The details will be discussed further.

Sendai forum videos will be available for those wish to view. The film ought to be under control of the hosting organization.

Regarding the tons of buoys collected in Alaksa, they shall be returned following the discussion between the US-Japan NGO staff members, in respect to the original owners' needs ,their conditions, types, amount, as well as its transportation costs.

Costal Clean UP of US - Japan synchronized holding require the utilizing of Skype or other communication methods. Probably the best to open is around ICC September 13.

We shall not regard the sending of volunteer staff for debris collecting as given the highest priority.

For the volunteers should work on their own budget. If too much debris adrift, some technical research should be done.

For the Hawaii State, some volunteer tours can be considered setting the time to coincide with the ICC holding period.

Info. Site for the debris should be once terminated at the end of March 13 while the MALIP information disclosure continues.

Further discussion may require for the future large debris adrift: how to deal with it either inside or outside Japan including organized response and assigning of the jobs among the staff related.

Dealing of the drifted objects to the original owners- thought- to -be is a matter of discussion in respect to its job flow of returning, cost assurance, object storage, and duration of the storage.

The mailing list should be utilized for the setting up of the meeting among the NGO staff members regardless how official they should be.

This project is now to finish, however, JEAN will become responsible for assigning which entities or organizations to take the initiatives to the tasks assigned. For this purpose, meetings to shall hopefully be proposed by JEAN early next year. As a last note, we would like to acknowledge and show our gratefulness to the related people and organizations such as and Environmental Management Bureau, Ministry of Environment. Also, we would like to thank Sasagawa Peace Foundation for their dedication to invite those US NGO stuff and related people.

Mach, 2013

JEAN

General Incorporated Association

Project Operator