Japan Tsunami Debris

www.tsunamidebrisbc.ca

UBCM Clinic
September 25, 2012

Robin Brown, Ocean Science Division, DFO
Jim Standen, Environmental Protection Division, Province of BC
Russel Dyson, CAO, Alberni Clayoquot Regional District
Karla Robison, Environmental & Emergency Services, District of Ucluelet
Panel Discussion Outline

1. Tsunami Debris 101: What Science Says
   Robin Brown, DFO

2. Coordinated Response Strategies
   Jim Standen, Ministry of Environment

3. Role of Local Government
   Russel Dyson, CAO, Alberni Clayoquot Regional District
   Karla Robison, Emergency Services, District of Ucluelet
Tsunami Debris 101: What does the Science Say?

UBCM Clinic
September 25, 2013

Robin Brown
Manager, Ocean Sciences Division, Fisheries and Oceans Canada
Robin.Brown@dfo-mpo.gc.ca
Information on tsunami debris in popular media is not always accurate.

Photo was actually taken on 13 March 2011, very close to coast of Japan.
Modeled Movement of the Marine Debris Generated by the March 2011 Japan Tsunami

On March 11, 2011, an estimated 5 million tons of debris washed out by the tsunami.

Estimated 30% floated away and dispersed.

Estimated 70% sank near Japan.

Japan Ministry of the Environment estimates that 5 million tons of debris washed into the ocean.

They further estimated that 70% of that debris sank near the coast of Japan soon after the event.

~ 1.5 million tons floating.

Model Results: High windage items may have reached the Pacific Northwest coast as early as winter 2011-2012.

Majority of modeled particles are still dispersed north and east of the Hawaiian Archipelago.

NOAA expects widely scattered debris may show up intermittently along shorelines for a long period of time, over the next year, or longer.

NOAA used a computer model to simulate the movement of tsunami debris from March 11, 2011, to the present day. This GNOME model (General NOAA Operational Modeling Environment) simulation is based on ocean surface currents from the US Navy (the Hybrid Coordinate Ocean Model) and winds from NOAA (the NOAA blended wind product). The computer model simultaneously released 1,000 simulated particles from each of 8 locations on the Japan coastline where tsunami wave heights were 3.5 meters or greater. Particles were randomly assigned windage values from 1-5%, meaning that they were moved not only by ocean currents, but were also moved by 1-5% of wind speed in the downwind direction. The dotted black line contains 95% of all simulated particles. The cross-hatched area indicates the region of the highest concentration of simulated debris with 1% windage at the end of the simulation. For more details on this model, please visit marinedebris.noaa.gov. Have you seen tsunami debris? Report it to: DisasterDebris@noaa.gov.
Surface currents over the North Pacific

Schematic of currents adapted from Tabata (1975)
Where will debris arrive?

• Just about anywhere along the west coast of North America...

But:

• Probably not much in the Strait of Georgia, Queen Charlotte Strait and mainland inlets
  – Due to estuarine circulation
Current sightings – from NOAA Database

This map includes all debris reported to NOAA as possible tsunami debris since December 2011. Confirmed sightings (red triangle) indicate objects that were identified and traced back to the tsunami impact area. Potential sightings (yellow circle) indicate objects that may be linked to the tsunami, based on location, type, and markings, but that may not have the unique identifiers necessary, such as a serial number or contact information, to confirm its origin.

Marine debris is an everyday problem, and not all debris found on U.S. shorelines is from Japan. It is important to note that potential sightings may not be from the tsunami impact area, but items lost or abandoned before or after the tsunami from sources around the Pacific Rim. For more information regarding tsunami marine debris from Japan please visit: http://marinedebris.noaa.gov/tsunamidebris
When will debris arrive?

- Some of is already here, especially some of the high windage components
- There have been some high profile confirmed sightings
- Frankly, the high windage material arrived before most people predicted
- Current monitoring does not suggest that large volumes are accumulating on BC beaches
- We expect the heavier amounts to arrive in the spring of 2013
How much debris will arrive?

- This is a very hard thing to estimate – there are lots of assumptions
- Miller and Brennan (2012) had a stab at this:

<table>
<thead>
<tr>
<th>CASE</th>
<th>Tons per mile of coast line</th>
<th>Metric tonnes per kilometer of coast line</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Tsunami baseline</td>
<td>0.5</td>
<td>0.28</td>
<td>Data from Washington coast</td>
</tr>
<tr>
<td>Low end</td>
<td>0.5 – 6.7</td>
<td>0.28 – 3.8</td>
<td>2%; whole coast</td>
</tr>
<tr>
<td>Medium</td>
<td>10.4</td>
<td>5.9</td>
<td>2%; BC, Washington and Oregon only (outer coast only)</td>
</tr>
<tr>
<td>Worst case</td>
<td>131</td>
<td>74</td>
<td>25% of all debris makes landfall (no retention; no sinking; outer coast only)</td>
</tr>
</tbody>
</table>

Will it be radioactive?

Probably not, because:

- Debris was washed into the ocean immediately, but radionuclides were released later
- There is a lot of opportunity for dilution
- A trip across the ocean provides a lot of opportunity for material to be washed off
- Some confirmed debris has been tested and none of it has shown contamination

(Including a fishing boat washed ashore on Spring Island)
Is it safe to eat fish?

Yes, because:

- There is opportunity for a great deal of dilution
- Fish caught in North America do not inhabit the area off Japan
- The Japanese government has done a lot of testing and contamination has proved to be limited (but some fish are contaminated and some fisheries closed)
- CFIA has tested food imports

But:

- There is a publication noting clear signs of Fukushima contamination in bluefin tuna caught off California (levels much lower that those presenting human health concerns)
# Things to read

<table>
<thead>
<tr>
<th>Resource</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOAA Marine Debris web site</td>
<td><a href="http://marinedebris.noaa.gov/">http://marinedebris.noaa.gov/</a></td>
</tr>
<tr>
<td>Federal- Provincial Joint Tsunami Debris site</td>
<td><a href="http://www.tsunami-debris.ca">http://www.tsunami-debris.ca</a></td>
</tr>
</tbody>
</table>
2. Coordinated Response Strategies
Tsunami Debris

- An issue without precedent for BC.
- Estimated 1.5 million tons of debris with potential to reach NA.
- Need for communication, collaboration and support from all partners to build an appropriate and effective strategy.
Recognizing Community Issues and Concerns

- Cleanup?
- Costs?
- Toxic wastes or chemicals?
- Radiation hazard?
- Contamination of fish?
- Aquatic invasive species?
- Personal effects and items of “cultural significance”?
Marine Debris Management
Prior to the Tsunami...

- Marine debris not a new issue
- Limited information on historic levels
- No programs or budget specifically allocated to marine debris in BC.
- Groups like Surfriders and Vancouver Aquarium have history of successful volunteer shoreline cleanup events
- Protocol in place for some marine debris e.g. hazardous waste
Response Challenges:

- Many unknowns
- Limited capacity
- Adaptive management
- Accessibility
- Cost and Safety
- Coordinated Support
Federal & Provincial Response Activities

- Japan Tsunami Debris Coordination Committee
- Pacific Coast Collaborative agreement BC, WA, OR, & CA
- Single portal website: www.tsunamidebrisbc.ca
- Letters to stakeholders, coastal communities and First Nations
- Bulletins for public information on debris handling
- DFO Science Response Report
- Minister of Environment Community Tour
- BC Tsunami Debris Management Plan Phase I
International Collaboration

Working with NOAA’s Marine Debris Program

• Using NOAA’s existing Debris Reporting system
• Sharing information, modeling and arrival forecasting
• Common approach to risk assessment
• Common approach to communications
Role of the Japan Tsunami Debris Coordinating Committee
(Struck January 2012)

Bring together the various levels of government and key interest groups to coordinate a debris management strategy.
# Key Partners

## Provincial Government
- Treaty and non-treaty First Nations
- Pacific Coast Collaborative
- US National Oceanographic and Atmospheric Administration
- Consulate General of Japan in Vancouver

## Federal Government

## Other Governments
- Local governments
- Treaty and non-treaty First Nations
- Pacific Coast Collaborative
- US National Oceanographic and Atmospheric Administration
- Consulate General of Japan in Vancouver

## Other Partners
- Canadian Red Cross
- Local agencies
- Surfrider Foundation
- Vancouver Aquarium - The Great Canadian Shoreline Cleanup
- Maritime Museum of BC
Committee Structure

Co-chairs:
Jim Standen, ADM MoE and Paul Kluckner, RDG Environment Canada

Debris Management Planning
Science and Monitoring
Communications
Intergovernmental Relations
BRITISH COLUMBIA TSUNAMI DEBRIS MANAGEMENT PLAN: Phase I
BRITISH COLUMBIA TSUNAMI DEBRIS MANAGEMENT PLAN: Phase I

- Risk Assessment
- Roles and Responsibilities
- Management Protocols
- Public Notification and Reporting Guidelines
Focus of Phase II

- Debris Disposal and Management Options
- Monitoring
- Volunteer Framework
- Possible funding sources
Initial Steps to Address Japan Tsunami Debris in Ucluelet, BC

NOAA Marine Debris Shoreline Program
Great Canadian Shoreline Clean-up Program
Local Marine Debris Shoreline Clean-up Program
Visitor Marine Debris Shoreline Clean-up Program
Response and Recovery Plan
Communications
Regional Tsunami Debris Coordinating Committee
Next Steps and Recommendations
Questions and Discussion

Environmental & Emergency Services

Karla Robison

September 25, 2012
It is difficult to distinguish tsunami debris from other typical marine debris. The District of Ucluelet (DOU) is conducting scientific analysis to determine debris trends over time.

Monitor, Inventory, Weigh, Storage….

- All material collected is weighed and inventoried. Two tsunami debris bins were placed at the Ucluelet Public Works Yard at the beginning of May 2012. This is a starting point storage location.
NOAA Marine Debris Shoreline Program
Wyndansea Beach

Typical Ucluelet Shoreline

1 km shoreline plot

Accumulation Surveys
Debris deposition rate
(# of items/unit area/unit time)

The DOU has Indicator Shoreline Sites
around Ucluelet – WPT and Harbour

Latitude: 48.955411° N
Longitude: 125.588429° W
The Grade 11 and Grade 12 geography class from USS assisted with the initial establishment of the NOAA monitoring plot in June 2012. The plan is for the students to assist with monthly monitoring for the length of the program.
Monitoring results are incorporated into the Science & Monitoring Team.
Sept 21 – Ucluelet Harbour Clean-up Program
Vancouver Aquarium Great Canadian Shoreline Program

Provincial Grant
- Crew of 4
- 5 months
- 17 tons of debris

Site Coordinator - Karla Robison
Volunteers - Ucluelet Aquarium and a Team of Locals
Local and Visitor Marine Debris Shoreline Clean-up Programs

**Local**
Locals and local volunteer groups - Ucluelet Aquarium, Wild Pacific Trail, Surfrider Foundation, etc.) with debris collection.

Weekly inventory and weighing of debris. These tasks will be ongoing for years to come.

**Visitor**
This program provides visitors an opportunity to be a part of tsunami debris clean-up on the west coast.

- Signs and information pertaining to how visitors can help with debris clean-up is available at the Ucluelet Municipal Hall, the Ucluelet Chamber of Commerce office and accommodation providers.
- The program provides an opportunity to collaborate with neighbouring communities and jurisdictions.
- Visitors as far as Burnaby have participated in the program.
Specialized Clean-up Teams

The DOU aims to coordinate specialized groups to help address moderate to high risk material, for example:

- Trained individuals to assist with hazardous material identification and collection. On Sept 28-30 Hazardous Material Training for First Responder Operations is taking place.
- Debris items in problematic areas (WISAR, UVFB, RCMP)
- Transportation crews (ATV, boats, barges, helicopters)
- Radiation monitoring
- Marine mammal entanglement (DFO Marine Mammal Response Network volunteers)
Response and Recovery Plan

Collect → Sort → Process → Transport → Recycle

Purpose

• Consider and minimize health and safety for workers, public, volunteers, etc.
• Conduct impact assessments
• Determine resources and equipment available.
• Recommendations for sorting, recycling, reusing, temporary storing sites, efficient transportation and disposal for debris.
• Review recommendations with partners, stakeholders, private sectors, Provincial and Federal governments etc.
• Estimate costs and develop a finance tracking/monitoring system.
• Collaborate with Regional, Provincial and Federal governments, and determine appropriate reporting protocols and agreements with these authorities.
• Communicate with the public and collaborate with the Clayoquot and Barkley Sound Regional Working Group.

Short Term

• Collect debris safely and efficiently
• Sort debris appropriately
• Store debris properly

Mid to Long Term

• Process and transport debris in a cost effective manner
Japanese prediction Sept 2012
CBC, Vancouver Sun, Times Colonist
20,000 tons / ~1000 miles
6 miles off west coast
in Feb 2013
= 20 tons / mile

Ucluelet has been actively planning since March 2012.

NOW

“1-2 years”
Debris accumulations scenarios in Washington state from the March 2011 Tohoku Tsunami
- Ian Miller and Jim Brennan -

Predictions vary up to 10 times in actual amount.

Spring, summer, fall are the windows to conduct an At Sea Clean-up Program.

Summer  Winter  Summer  Winter  Summer  Winter  Summer
2012    |      2013    |      2014    |      2015
Marine Debris End of Life

Collection
- Site Coordinator - $20/hr.
- Specialized Clean-up Teams (Training, Equipment, Supplies)
- Priority Areas
- Remote Areas

Transport
- Ground, Marine and Aerial Crews (ATV, Truck, Boat, Heli)
- Truck
  - Ucluelet to Tofino $115/hr.
  - Ucluelet to Nanaimo $600/trip
- Aerial
  - Light - $2K/hr. 1000-1500 Lbs.
  - Medium - $4K/hr. 3600-3800 Lbs.
  - Heavy - $20K/hr. 15,000 Lbs.

Separate + Sort
- Rigid (Hard) Plastics
- Soft (Film) Plastics
- Styrofoam (Foam) Plastics
- Scrap Metal
- Wood Waste
- Hazardous Materials
- Returnable Items
- Reusable Material
- Significant Items

Storage
- Bins + Centralized Locations
  - 3 Yard - $45/month
  - 6 Yard - $52/month
  - 20 Yard - $150/month
  - 40 Yard - $279/month

Process
- Crush, Chip, Compact, Bale
  - Fibre Glass & Glass Crusher $10K
  - Styrofoam Densification $30-$45K
  - Plastic Baler $60K
  - Metal Crusher $100K
  - Wood Chipper $200-700K
### Comparison of Compaction Method

#### Take styrofoam to Nanaimo

<table>
<thead>
<tr>
<th>Trucking foam</th>
<th>Tipping fee</th>
<th>Loads per year</th>
<th>Rent BIN</th>
<th>Compact Ucluelet</th>
<th>TOTAL /year</th>
</tr>
</thead>
<tbody>
<tr>
<td>$600</td>
<td>trucking empty foam</td>
<td>1</td>
<td>3,750</td>
<td>479</td>
<td>4,229</td>
</tr>
<tr>
<td>$100</td>
<td>waiting $224</td>
<td>2</td>
<td>3,750</td>
<td>959</td>
<td>4,708</td>
</tr>
<tr>
<td>$784</td>
<td>incl tax $251</td>
<td>3</td>
<td>3,750</td>
<td>1,438</td>
<td>5,188</td>
</tr>
<tr>
<td>$1,035</td>
<td>Cost / BIN</td>
<td></td>
<td>4,397</td>
<td>6,147</td>
<td></td>
</tr>
</tbody>
</table>

#### Compactor comes to Ucluelet

<table>
<thead>
<tr>
<th>Cost of compactor from Nanaimo</th>
<th>Cost / BIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>$428 per trip</td>
<td></td>
</tr>
<tr>
<td>$479 incl tax</td>
<td></td>
</tr>
<tr>
<td>$479 Cost / BIN</td>
<td></td>
</tr>
</tbody>
</table>

Efficiency = Cost Savings

Bale + Compact + Crush + Densify Locally → Reduces Transportation → Reduces Carbon Footprint → Saves Money in the Long Run
# Tsunami and Beach Debris - Suggested Options and Costs

By Karla Robison, District of Ucluelet

Based on a moderate amount of debris and renting equipment as needed

<table>
<thead>
<tr>
<th>Item</th>
<th>Solution</th>
<th>Partner</th>
<th>Needs</th>
<th>Rate</th>
<th>Quantity / month</th>
<th>Est. $ / year</th>
<th>% of budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management</td>
<td>Paid coordinator</td>
<td>Committee</td>
<td>Salary, expenses</td>
<td>$2,000 / mon</td>
<td>1</td>
<td>$24,000</td>
<td>7.3%</td>
</tr>
<tr>
<td>Volunteers</td>
<td>Community groups</td>
<td></td>
<td>Food, expenses</td>
<td>$100 / day</td>
<td>4 days</td>
<td>$4,800</td>
<td>1.5%</td>
</tr>
<tr>
<td>Supplies</td>
<td>Collecting containers</td>
<td>Local stores</td>
<td>Bags, bins</td>
<td>$50 / day</td>
<td>4 days</td>
<td>$2,400</td>
<td>0.7%</td>
</tr>
<tr>
<td>Transportation expenses</td>
<td></td>
<td></td>
<td>boats, fuel, etc.</td>
<td>$200 / day</td>
<td>4 days</td>
<td>$9,600</td>
<td>2.9%</td>
</tr>
<tr>
<td>Inaccessible</td>
<td>Helicopter lift</td>
<td>Ascent Helicopters</td>
<td>Light Lift</td>
<td>$2,000 / hr</td>
<td>1 hr</td>
<td>$24,000</td>
<td>7.3%</td>
</tr>
<tr>
<td>debris</td>
<td></td>
<td>Qualicum Beach</td>
<td>Medium Lift</td>
<td>$4,000 / hr</td>
<td>1 hr</td>
<td>$48,000</td>
<td>14.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Heavy Lift</td>
<td>$15,000 / hr</td>
<td>1 hr</td>
<td>$180,000</td>
<td>54.5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Box/Grapple</td>
<td>$500 / day</td>
<td>1 day</td>
<td>$6,000</td>
<td>1.8%</td>
</tr>
<tr>
<td>Non-recyclables</td>
<td>Rent bin</td>
<td>SonBird, Ucluelet</td>
<td>20 yd Bin</td>
<td>$168 / mon</td>
<td>1 bin</td>
<td>$2,016</td>
<td>0.6%</td>
</tr>
<tr>
<td>dirty debris</td>
<td>Compact/shred</td>
<td>SonBird, Ucluelet</td>
<td>Compactor?</td>
<td>$1,000 / hr</td>
<td>1 hr</td>
<td>$12,000</td>
<td>3.6%</td>
</tr>
<tr>
<td>fiberglass boats..</td>
<td>Truck to Landfill</td>
<td>Westcoast Landfill</td>
<td></td>
<td>$112 / trip</td>
<td>1 trip</td>
<td>$1,344</td>
<td>0.4%</td>
</tr>
<tr>
<td>unwanted misc.</td>
<td></td>
<td>SonBird, Ucluelet</td>
<td>1 ton</td>
<td>$120 / ton</td>
<td>1 ton</td>
<td>$1,440</td>
<td>0.4%</td>
</tr>
<tr>
<td>Styrofoam</td>
<td>Rent bin</td>
<td>SonBird, Ucluelet</td>
<td>40 yd bin</td>
<td>$312 / mon</td>
<td>1 bin</td>
<td>$3,744</td>
<td>1.1%</td>
</tr>
<tr>
<td></td>
<td>Compact &amp; Recycle</td>
<td>Nanaimo Recycling</td>
<td>Rent Compactor</td>
<td>$428 / trip</td>
<td>1 trip</td>
<td>$5,136</td>
<td>1.6%</td>
</tr>
<tr>
<td>Wood</td>
<td>Rent bin</td>
<td>SonBird, Ucluelet</td>
<td>20 yd Bin</td>
<td>$168 / mon</td>
<td>1 bin</td>
<td>$2,016</td>
<td>0.6%</td>
</tr>
<tr>
<td></td>
<td>Truck to Parksville</td>
<td>SonBird, Ucluelet</td>
<td>1 ton</td>
<td>$500 / trip</td>
<td>0.3 trip</td>
<td>$1,800</td>
<td>0.5%</td>
</tr>
<tr>
<td></td>
<td>Chip in Parksville</td>
<td>Porter Industries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recyclable</td>
<td>Rent bin</td>
<td>SonBird, Ucluelet</td>
<td>6 yard bin</td>
<td>$58 / mon</td>
<td>1 bin</td>
<td>$696</td>
<td>0.2%</td>
</tr>
<tr>
<td>Plastics</td>
<td>Truck to Tofino Recycle</td>
<td>SonBird, Ucluelet</td>
<td></td>
<td>$120 / trip</td>
<td>0.5 trip</td>
<td>$720</td>
<td>0.2%</td>
</tr>
<tr>
<td>Metals</td>
<td>Smaller bins</td>
<td>SonBird, Ucluelet</td>
<td>Bins and boxes</td>
<td>each</td>
<td>3 bin</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td>Expert companies</td>
<td>TERVTA, Cumberland</td>
<td>Bins and boxes</td>
<td>$30 each</td>
<td>3 bin</td>
<td>$90</td>
<td>0.0%</td>
</tr>
<tr>
<td>Valuable</td>
<td>Smaller bins</td>
<td>Stores, Japan, museum</td>
<td>Bins and boxes</td>
<td>$30 each</td>
<td>6 bins</td>
<td>$180</td>
<td>0.1%</td>
</tr>
</tbody>
</table>

Total / year $329,982 100%
Community - Communication, Collaboration, Cooperation…

People working together to reach a common goal.

Everyone needs to be on board to deal with marine debris!

NOAA Marine Debris Program Photos
Clayoquot & Barkley Sound Regional Committee

Nuu-chah-nulth Traditional Territory

A frontline committee that will allow for scalable, fast and effective communication to those affected, and provides an opportunity to work efficiently with Provincial and Federal partners.

Sub-Committees
Volunteer Cleanup Groups and Specialized Clean-up Teams.

Communities
- Ucluelet
- Tofino
- ACRD
- Bamfield

Jurisdictions
- Pacific Rim National Park
- BC Parks
- RCMP
- Coast Guard

First Nations
- The Maa-nulth,
- Tla-o-qui-aht,
- Hesquiaht,
- Ahousaht,
- Kyuquot/Cheklesahht,
- Ehattesaht,
- Mowachat/Muchalaht,
- Nuchatlaht

The DOU feels an important first step is to interconnect our local marine debris response plan into a regional response plan, which can be incorporated into the provincial plan. The regional committee and regional marine debris response plan could act as a pilot project or model for other communities affected along British Columbia’s coast.
Communication - Marine Debris Awareness

District of Ucluelet Tsunami Debris Public Information Session

Ucluelet Community Centre

August 1, 2012 – 7:00 to 8:30 p.m.

Initial Steps to Address Tsunami Marine Debris

Presented by Karla Robison,
Manager of Environmental & Emergency Services

On March 11, 2011 a magnitude 9.0 earthquake struck northern Japan. The subsequent tsunami washed an estimated 26-25 million tons of debris into the sea. There is an estimated 1.3-3 million tons of debris floating towards the coast line between Alaska and California. The beginning of the main bulk of debris is expected to hit the West Coast in the coming months and for years to come.

The District of Ucluelet is implementing a Marine Debris Program which consists of a Marine Debris Response Plan, Scientific Monitoring, Local and Visitor Cleanup Programs, a Harbour Cleanup through the Great Canadian Shoreline Program, Specialized Cleanup Teams, and a proposed Regional Working Group.

Please report tsunami debris sightings to DisasterDebris@noaa.gov and emergency@ucluelet.ca or at 250-726-7744.

For more information, including FAQs, please visit B.C. Ministry of Environment tsunami debris website www.TsunamiDebris.ca or visit the District of Ucluelet’s website www.ucluelet.ca or contact Karla Robison at 250-726-7744.

Ukee Day Exhibit - July 28 & 29, 2012

District of Ucluelet Exhibit - Karla Robison

Peter Clarkson Marine Art Exhibit

More info on the District of Ucluelet Website
The DOU is working with Dr. Nick Hedley and his Spatial Interface Research Lab (SIRL) have developed *Marine Debris Mapping App* which can capture everything the current NOAA marine debris app has, plus: object size; material type; debris origin estimates; photo capture; and local knowledge geo-tagging. These features were added as a result of consultation with DOU debris monitoring teams.

SFU/DOU will be testing the app in the coming weeks and look forward to sharing the info collected and demonstrating its potential to be deployed in communities across BC.

Benefits of SFU mobile marine debris app collaboration:
- Experts in spatial information, interfaces & apps
- Far less expensive than consultants!
- Cultivating new spatial information talent in BC
- Continuous follow-up/feedback/refinement/dev
Next Steps

- Continue to work with the Prov/Fed Debris Mgmt. Planning Team + Scientific and Monitoring Team
- Complete the Ucluelet Marine Debris Response and Recovery Plan
- Continue with the implementation of the Ucluelet Marine Debris Program
- Assist with the Clayoquot and Barkley Sound Marine Debris Committee
- Public education + communication

Recommendations

- Clayoquot and Barkley Sound Marine Debris Committee
- Response Teams and Training
- Tsunami Debris Symposium
- Sustainable regional solutions
- Pilot Project and Model

The DOU looks forward on to working with senior governments, our neighbours, First Nations and volunteers on **effective collaboration and measures to address the Japan tsunami debris matter on the west coast.**
Photo by K. Edwards