JTMD Task Force Meeting
November 14, 2013

A 165 ton concrete Japanese Dock washes ashore on Agate Beach in Newport, Ore. June 2012.

JTMD Task Force Agenda

INTRODUCTIONS – Dave Stuckey (Chair, Governor's Task Force on JTMD)

<u>RECAP OPERATIONS BY AGENCY</u>

1. **Oregon Parks and Recreation Dept. – Chris Havel *(Oregon Parks and Recreation Dept.)***
2. **Oregon Dept. of Fish and Wildlife – Caren Braby *(Marine Resources Program Manager, ODFW)***
3. **Oregon State University – John Chapman, Dept. Fisheries and Wildlife Hatfield Marine Science Center *(Scientist)* along with Terry Thompson *(Lincoln County Commissioner)***
4. **GOVERNOR'S OFFICE – Gabriela Goldfarb *(Natural Resources Advisor)***
5. **NOAA- Nir Barnea *(Marine Debris Coordinator, National Oceanic & Atmospheric Administration*)**
   - **Weather and Funding Update**
6. **NGO Update– Gus Gates *(Surfrider Foundation)***
7. **Senator Jeff Merkely's Office – Katie Gauthier *(District Aide)***
   - **Legislative Update**

<u>NEXT STEPS FOR JTMD TASK FORCE</u>

- **Closing Comments – Dave Stuckey *(Chair, Governor's Task Force on JTMD)***

INTRODUCTIONS

Dave Stuckey (Chair, Governor's Task Force on JTMD)

RECAP OPERATIONS BY AGENCY

Oregon Parks and Recreation Dept.

Chris Havel

Oregon Parks and Recreation Dept.

Oregon Parks & Recreation Department

Marine Debris Update

Marine Debris Update

Oregon Parks & Recreation Department

- **Status of the beach**
- **Public involvement**
- **Reporting and response systems**
- **Pacific Rim Marine Debris meeting**
- **Emerging issues**

Oregon Parks & Recreation Department

Status of the beach

- **State park beach rangers and Oregon Marine Debris Partnership supporting steady stream of small cleanups.**
- **Slightly higher-than-average load across entire beach, but central and north coast bearing the brunt.**
- **10-50% of debris guessed to be associated with tsunami, depending on beach.**
- **Plastic bottles, construction lumber, fishing gear**

Public involvement

Oregon Parks & Recreation Department

Public involvement

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Public involvement

- **5 cleanups since September.**
- **More than 15 cubic yards of debris removed.**
- **Focusing on high-load areas of central coast.**
- **2-3 more between now and January.**
- **Park stuff provide supplies, site support, hands-on help, landfill.**

Oregon Parks & Recreation Department

Public involvement

- **Small bags distributed at all major beach accesses.**
- **Recovery varies widely, but 100-300 per month typical.**

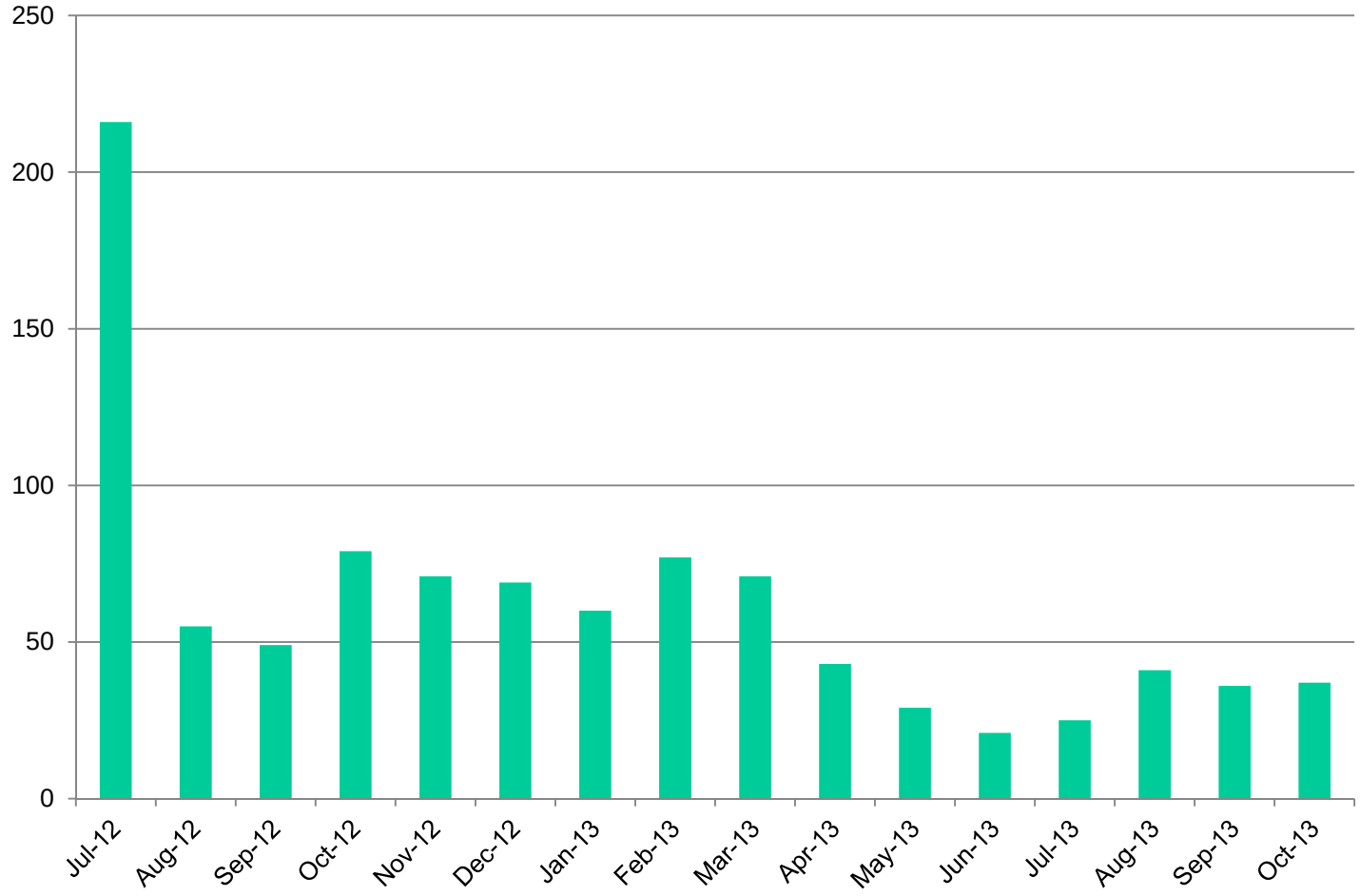
Oregon Parks & Recreation Department

Reporting and response

- **Email and 211 very slow, matching debris flow.**
- **After surge in summer 2012, about 1 call per day to 211.**

Reporting and response

Oregon Parks & Recreation Department



Oregon Parks & Recreation Department

Pacific Rim Marine Debris

- **About 50 people from government, education, and nonprofits.**
- **Discuss science and solutions.**
- **Focus fell on plastics.**
- **Generally three kinds of response:**
  - **Control manufacture of plastics.**
  - **Avoid mishandling.**
  - **Fast response once released into the wild.**

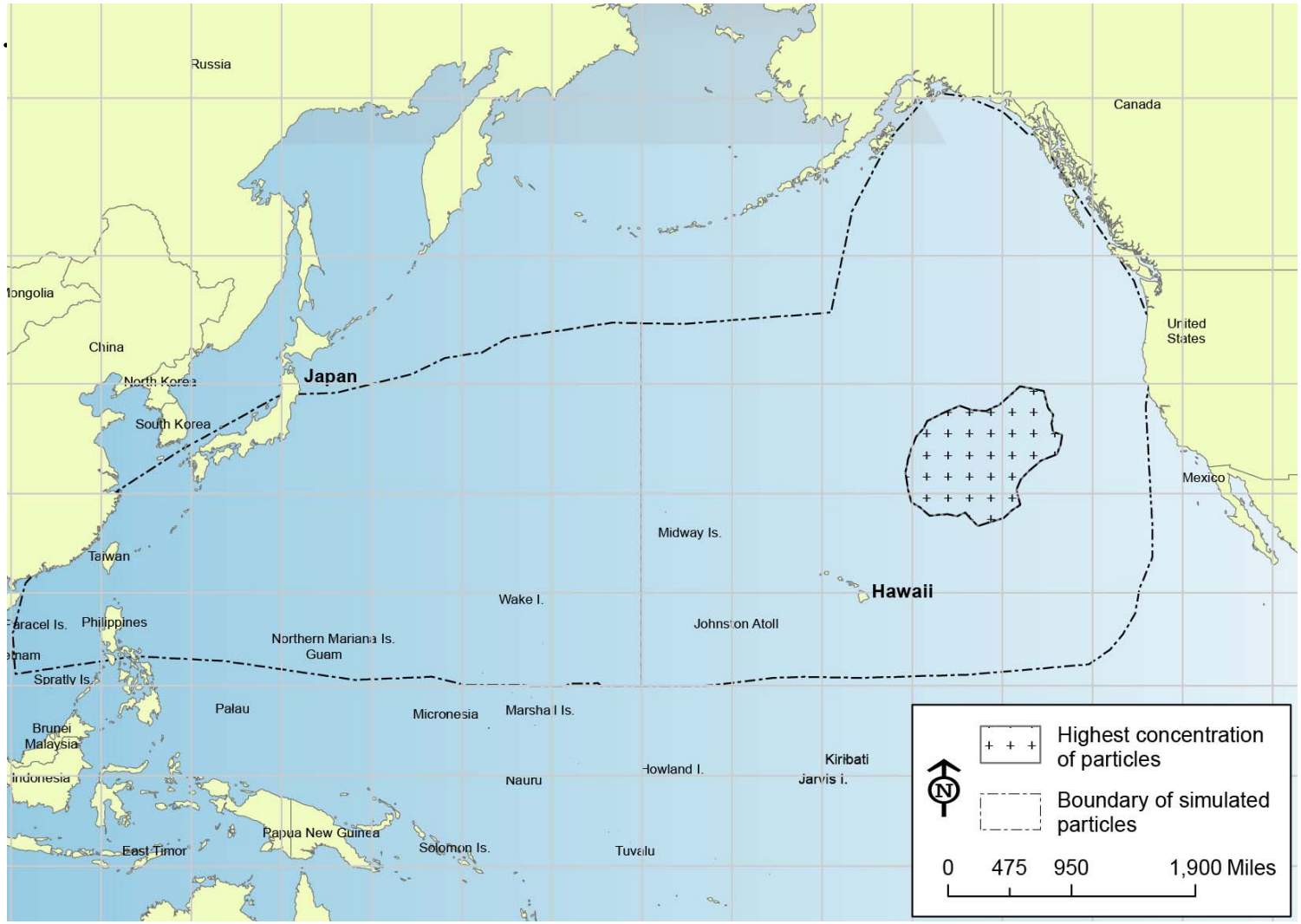
Oregon Parks & Recreation Department

Pacific Rim Marine Debris

- **Near urban areas, most debris is domestic, consumer waste.**
- **In remote areas, debris tends to be from marine-dependent industry or marine traffic.**
- **Emerging focus on microplastics.**

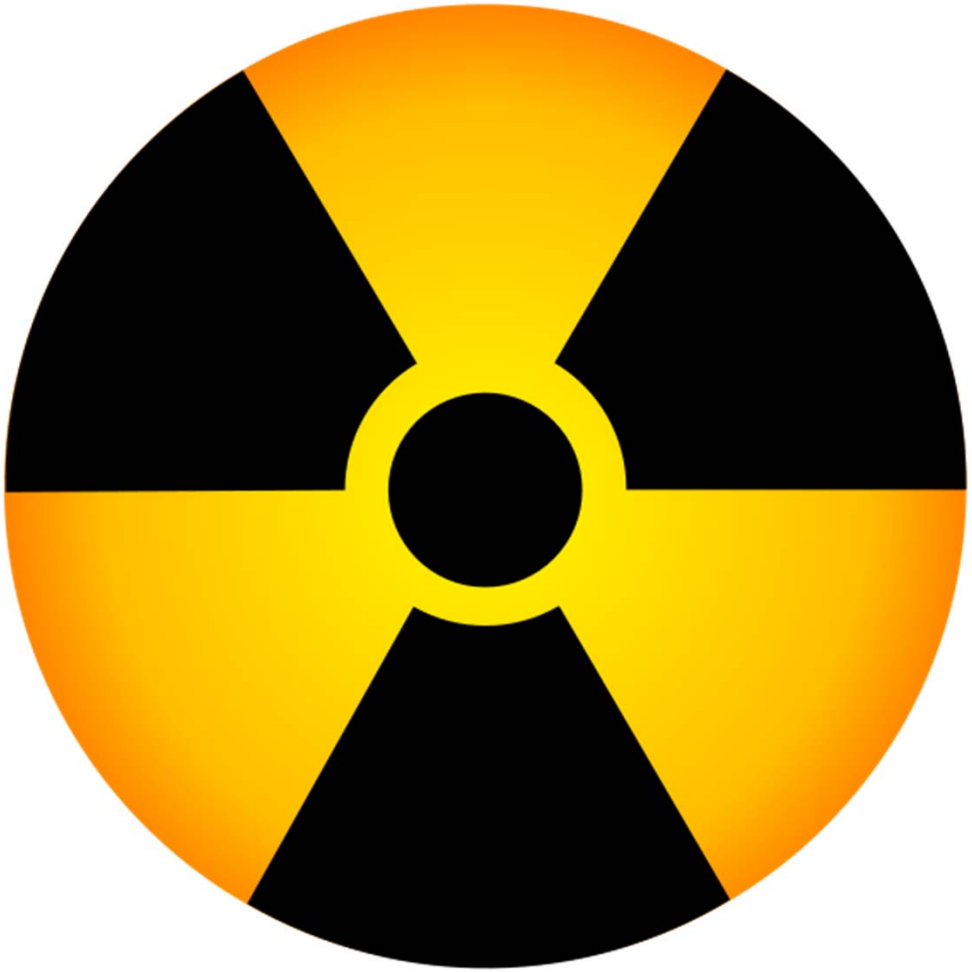
Oregon Parks & Recreation Department

Emerging issues



Emerging issues

Oregon Parks & Recreation Department



Oregon Dept. of Fish and Wildlife

Caren Braby

Marine Resources Program Manager, ODFW

Oregon State University

John Chapman

Dept. Fisheries and Wildlife Hatfield Marine Science Center, Scientist

along with Terry Thompson

Lincoln County Commissioner

KOMATSU
HONDA

被害状況

◆三沢漁港の被害状況

県管理漁港の被害状況

●三沢市における水産関係被害状況

漁港名	主な施設名	件数	被害額（判明分）
三沢漁港 施設被害	航路・泊地、一3m岸壁、船揚場、外南防波堤、用地、道路、海岸環境施設、その他	64箇所	2,092百万円
漁業関連建物被害	組合事務所、荷捌施設、作業保管施設、漁船保全修理施設、鮮度保持施設、燃油等補給施設、他	32棟	1,557百万円
漁船被害	滅失、破損（大破・中破・小破） 注）三沢市、おいらせ町、六ヶ所村所属船	97隻	435百万円

●おいらせ町における水産関係被害状況

漁港名	主な施設名	件数	被害額（判明分）
百石漁港 施設被害	航路・泊地、北・南防波堤《根固ブロック》、船揚場《張ブロック》、一2.5m物揚場《エプロン》、その他	16箇所	232百万円
漁業関連建物被害	作業保管施設他	1棟	1百万円
漁船被害	滅失、破損（大破・中破・小破） 注）おいらせ町所属船	28隻	93百万円

●八戸市における水産関係被害状況

漁港名	主な施設名	件数	被害額（判明分）
八戸漁港 施設被害	航路・泊地、導流堤、3号館鼻防波堤、一6m岸壁、用地護岸、用地、道路、その他	69箇所	1,171百万円
漁業関連建物被害	組合事務所、荷捌施設、作業保管施設、漁船保全修理施設、種苗生産施設、鮮度保持施設、その他	32棟	2,932百万円
漁船被害	滅失、破損（大破・中破・小破）、大型漁船 注）八戸市、おいらせ町、六ヶ所村所属船	324隻	10,633百万円

●階上町における水産関係被害状況

漁港名	主な施設名	件数	被害額（判明分）
小舟渡漁港 施設被害	航路・泊地、外東防波堤、臨港道路、その他	11箇所	153百万円
漁業関連建物被害	荷捌施設、作業保管施設、漁船保全修理施設、種苗生産施設、燃油等補給施設、その他	29棟	142百万円
漁船被害	滅失、破損（大破・中破・小破） 注）階上町所属船	124隻	163百万円

●管内市町における水産関係被害状況（合計）

施設名	主な施設名	件数	被害額
4漁港 施設被害		160箇所	3,648百万円
漁業関連建物被害		94棟	4,632百万円
漁船被害		573隻	11,324百万円

AMZ-6339

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YAMAHA
第八正進丸

"Perhaps" 5,000,000 tons of debris washed into the Pacific, and perhaps 30% floated away.

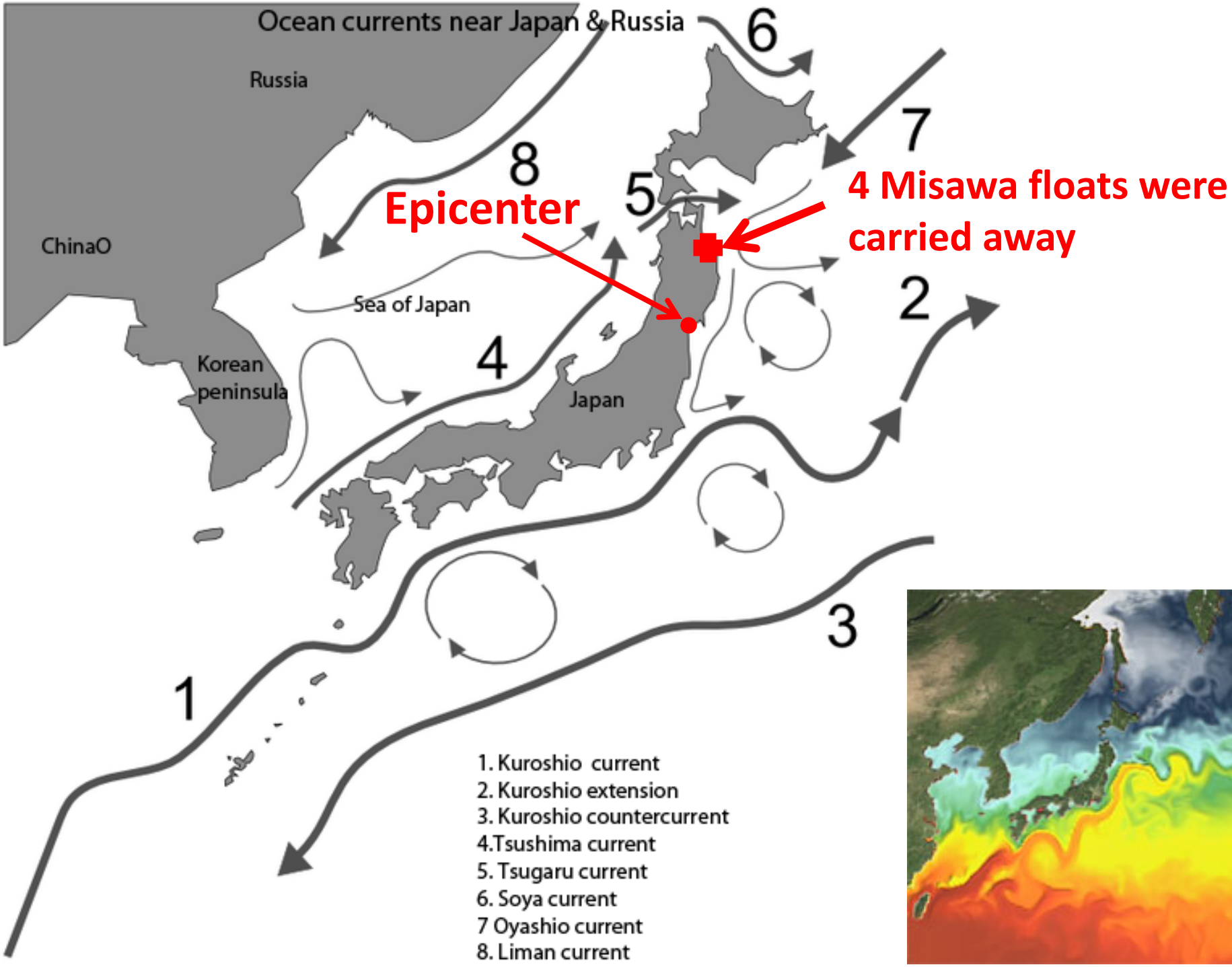
John Chapman

Dept. Fisheries & Wildlife, HMSC
Oregon State University
John.Chapman@OregonState.Edu

Acknowledgements:

Amy Chapman, Jessica Miller, Jim Carlton, Toshio Furota, Ralph Breitenstein, Gayle Hansen, Terry Thompson, Leslie Harris, Michio Otani, Masanori Taru and many, many others

Emergency Task Force Meeting 14
November 2013


Ocean currents near Japan & Russia
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6. Soya current
7 Oyashio current
8. Liman current

Long Beach, WA . . . 733 Days

Misawa 1, Pacific City, OR ~ day 537, June 2012

North Pacific around 600 days

Additional species are discovered on new debris . . . Which continues to arrive.

Clatsop Beach, 9 Oct 2013 . . . 943 Days

BIOFOULING SPECIES

On Tsunami-Generated Debris from the Japanese Earthquake and Tsunami

Native gooseneck barnacles
Length from <1" to >24"

NOT an invasive species & common on marine debris

Examples of debris with potentially invasive species

Examples of organisms not typically on marine debris that ***could be*** non-native and invasive

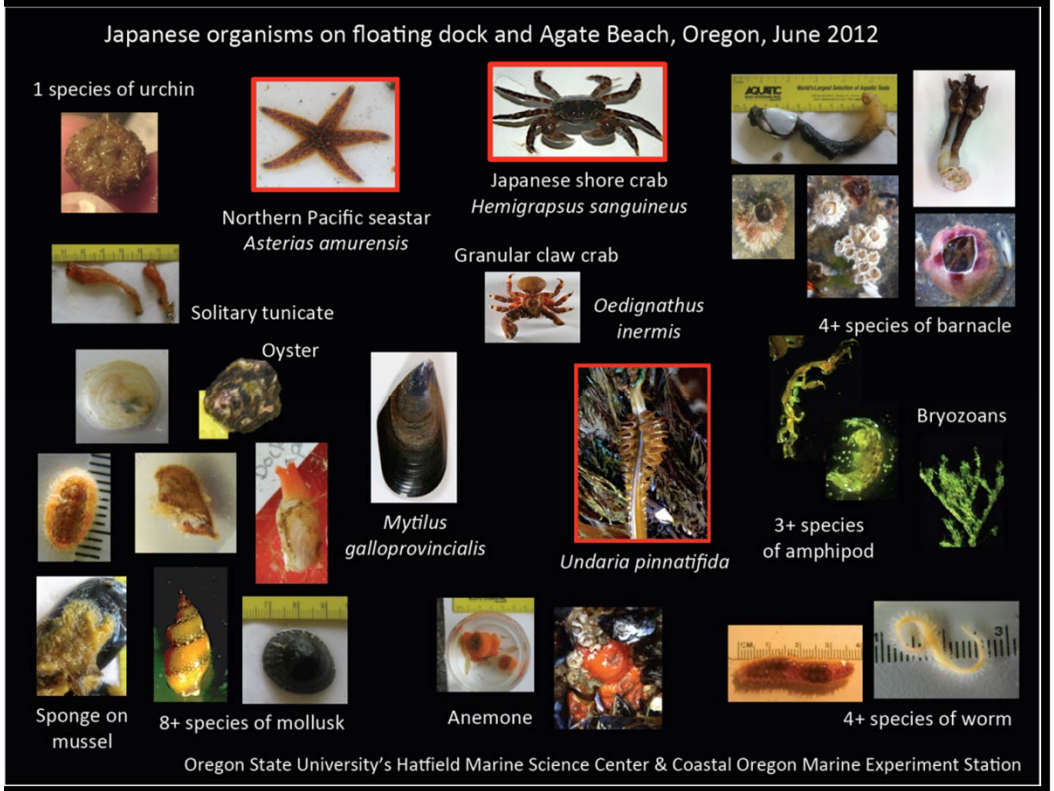
Japanese Kelp
Undaria pinnatifida

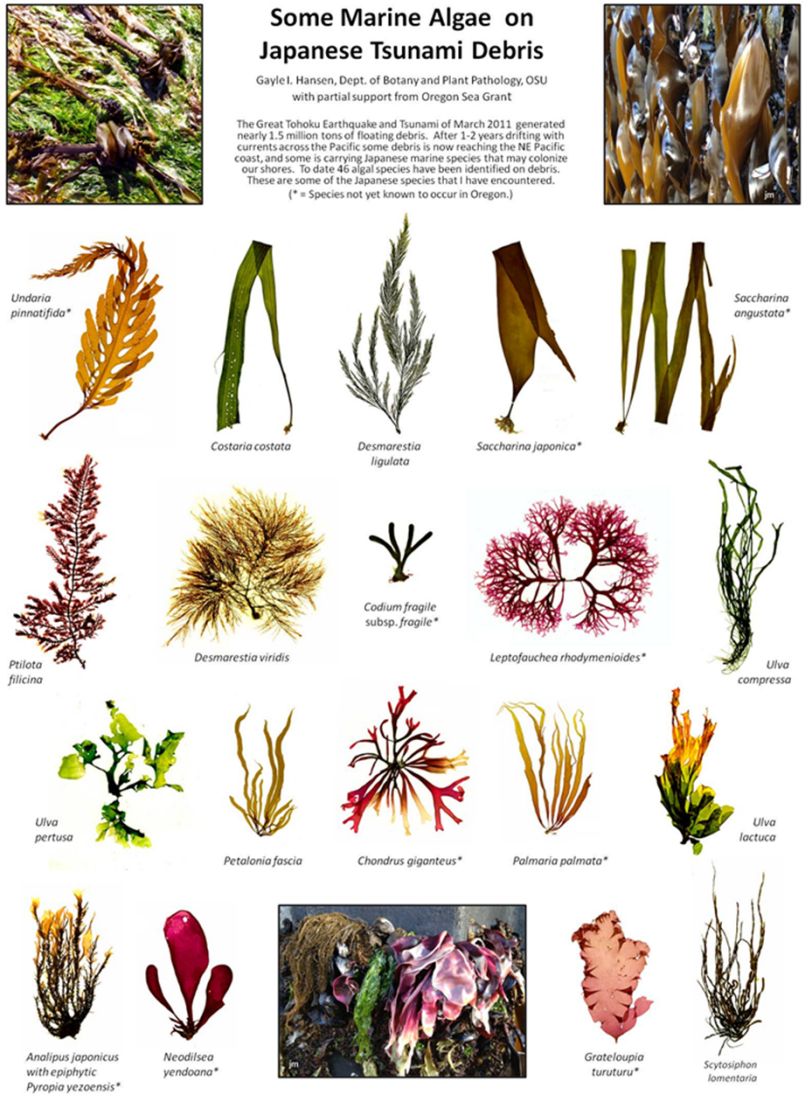
Mussel
Mytilus

Japanese Barnacle
Megabalanus rosa

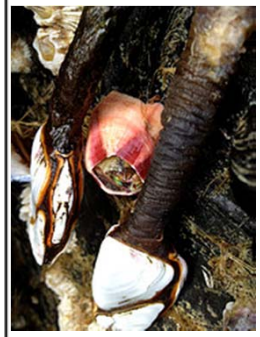
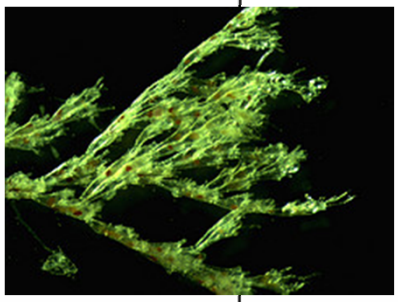
Japanese Oyster
Crassostrea gigas

> 120 pilgrims on Misawa 1
Oct 2013 count > 165 species



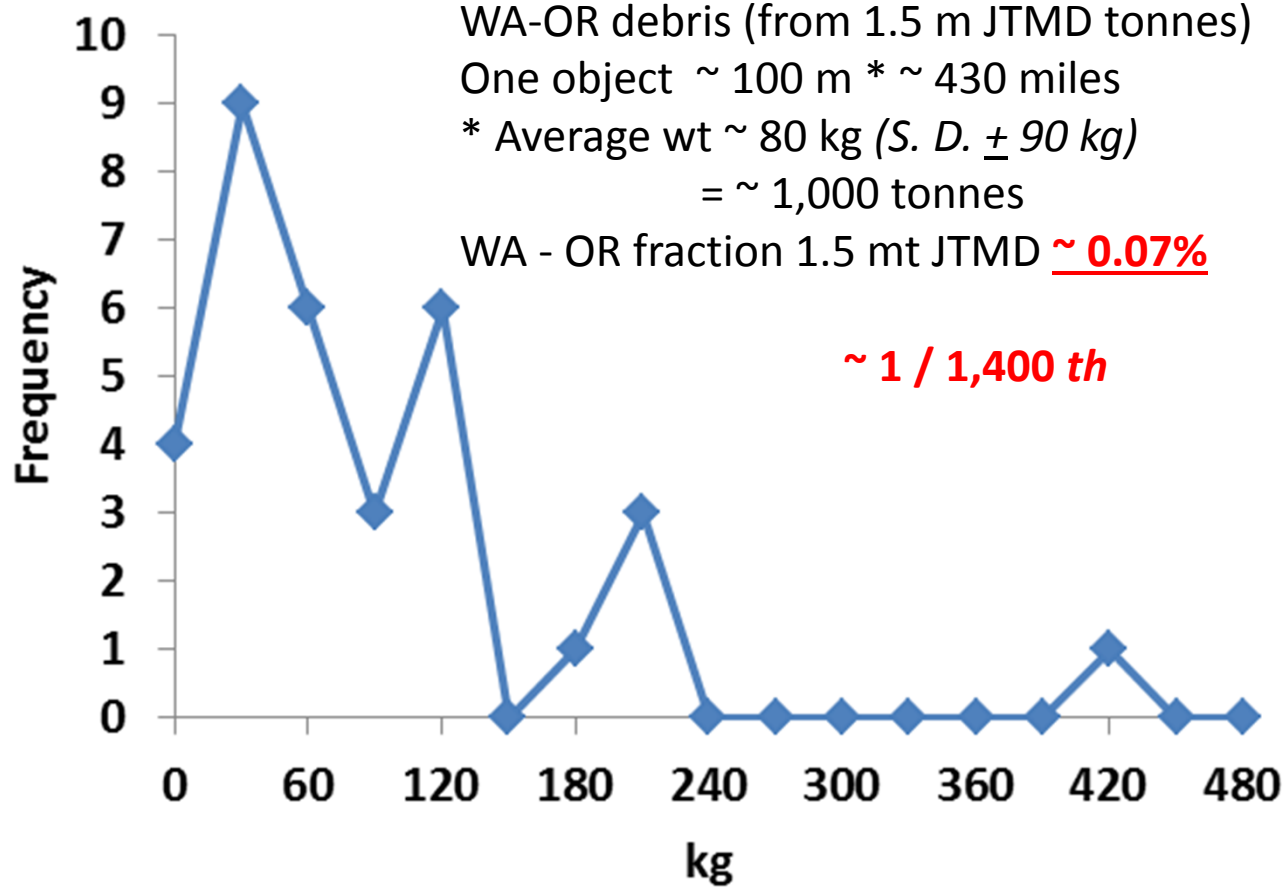


Types of JTMD Species

	Species **Not Known to Occur** on East Pacific Coast	Species Already **Known to Occur** on the East Pacific Coast	Species Pelagic	Not Yet Identified	Total Estimated Number of Animal Species
As of October 2012	**27 (37.5%)**	**22 (30.5%)**	**3 (4%)**	**20 (28%)**	**72**
At least 11 known invasive species	*Acrocirrus* sp. *Amphitrite* sp. ***Anomia chinensis*** *Arca navicularis* *Caprella cristibrachium* Chrysopetalidae species *Dynoides* sp. ***Hemigrapsus sanguineus*** ***Hydroides ezoensis*** *Lepidonotus* sp. *Lottia* sp. ***Megabalanus rosa*** *Mitrella moleculina* *Mopalia seta* *Musculus cupreus* *Nereiphylla* sp. *Nipponacmae habei* *Polydora* sp. *Sertularella mutsuensis* *Syllis* spp. (n = 5) *Temnotrema sculptum* *Terebella* sp. *Trypanosyllis zebra?*	*Ampithoe "valida"* *Arabella semimaculata?* ***Asterias amurensis*** ***Caprella mutica*** *Cibicides lobatulus* *Crassostrea gigas* ***Cryptosula pallasiana*** *Eulalia quadrioculata* *Gromia "oviformis"* *Halosydna brevisetosa* *Harmothoe imbricata* *Hiatella arctica* ***Jassa marmorata*** ***Mytilus galloprovincialis*** *Nereis pelagica* *Oedignathus inermis* *Parastenhelia spinosa* *Semibalanus cariosus* *Syllis "elongata"-complex* ***Tricellaria sp.*** ***Watersipora subtorquata*** *Zeuxo normani*	Pteropoda *Lepas antifera* *Conchoderma auritum*		
					

Dr. James Carlton, Williams College

Little of the floating JTMD has arrived . . . . . YET



Measuring JTMD biodiversity, dimensions, density, turnover should be part of the emergency cleanup and response!

Thanks!　ありがとう

Bonus slides!

- International Reciprocity
- Significant JTMD Biological Risk?
- How much more?
- How much longer?

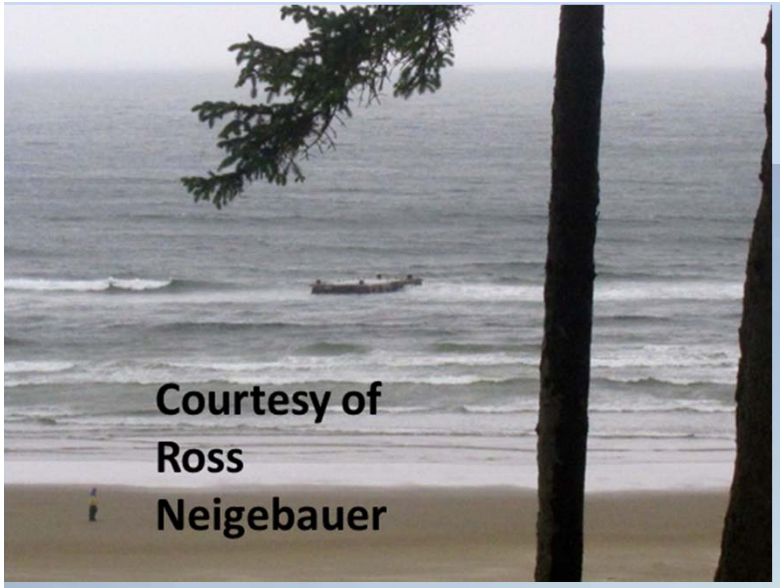
Toshio Furota's survey of Misawa - 2013

The (400 year) scientific opportunity

6
THE NORTH FACE

Terry Thompson
Masanori Taru
Leslie
Harris
Mishio Otani

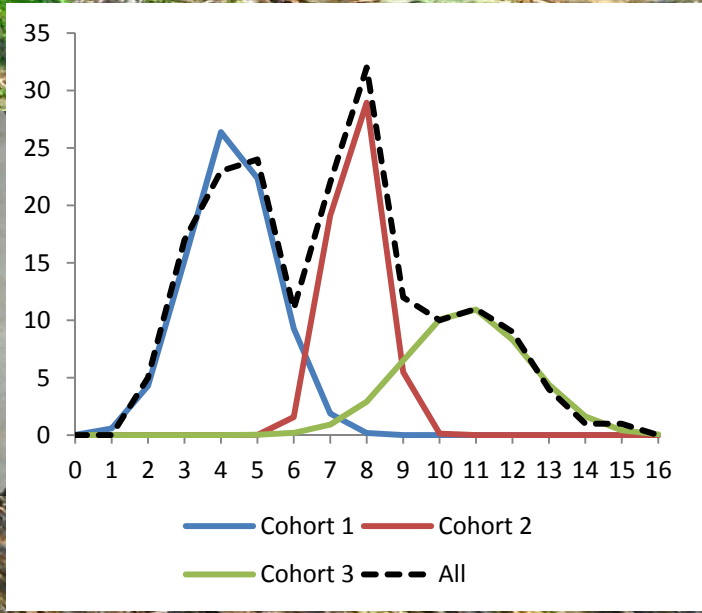
The 5 June 2012 surprise!



Japanese Marine Tsunami Debris (JTMD) crosses the North Pacific to Oregon in 541 days.

and buried or burned on 7 June 2012

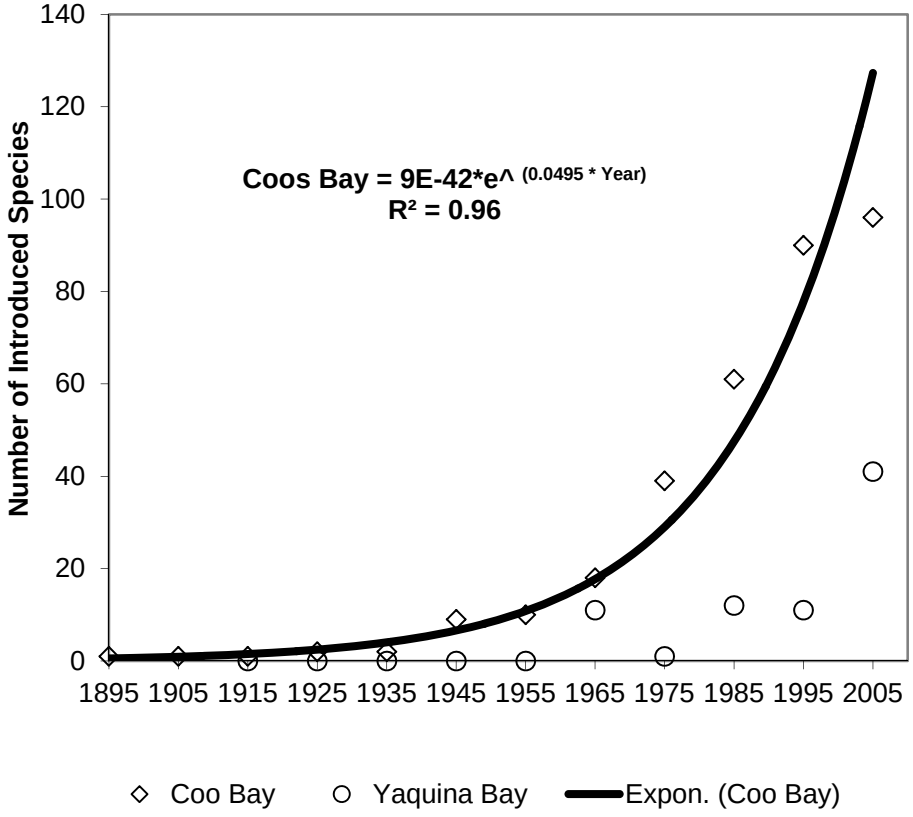
Telmatogeton?



http://www.hawaii.edu/hsrc/home/aqphoto.htm

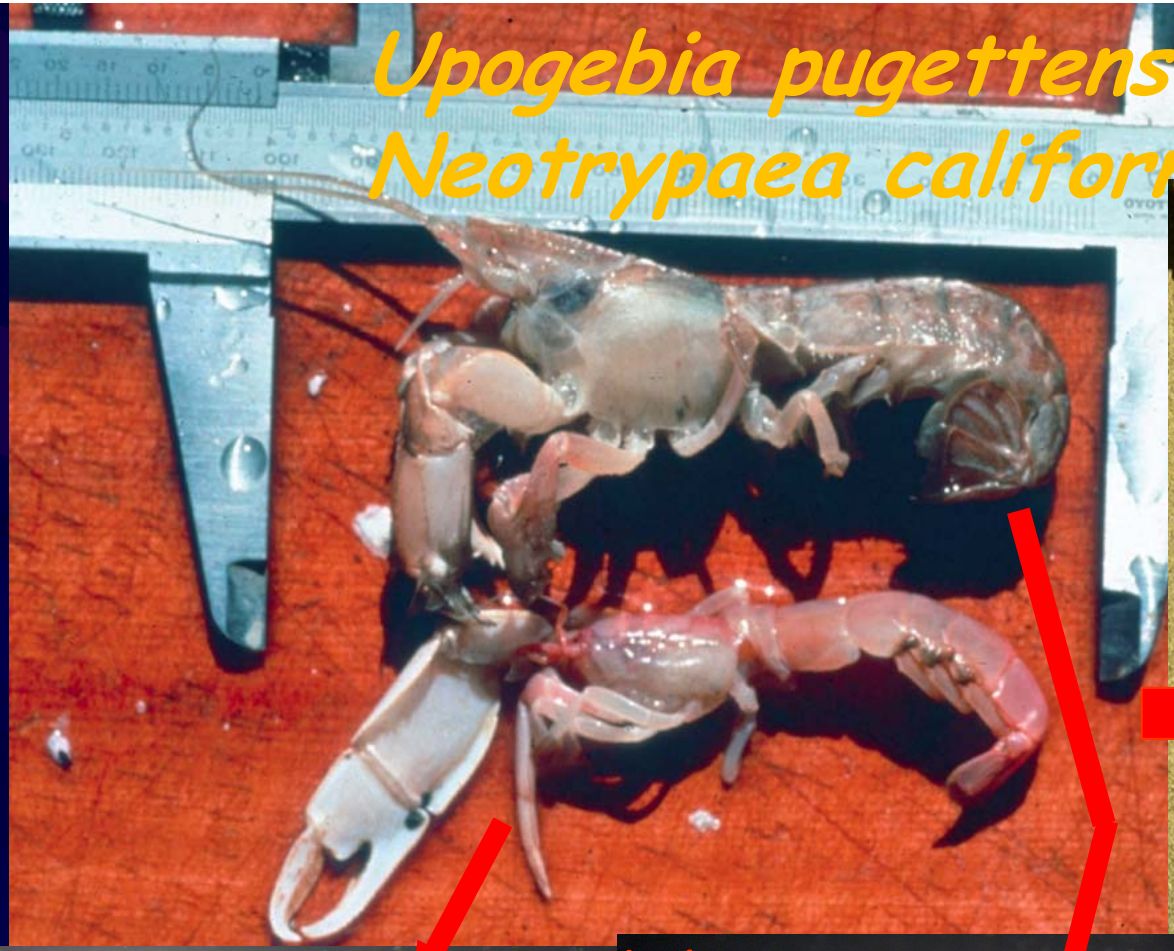
We have found plenty of introductions to the Oregon coast

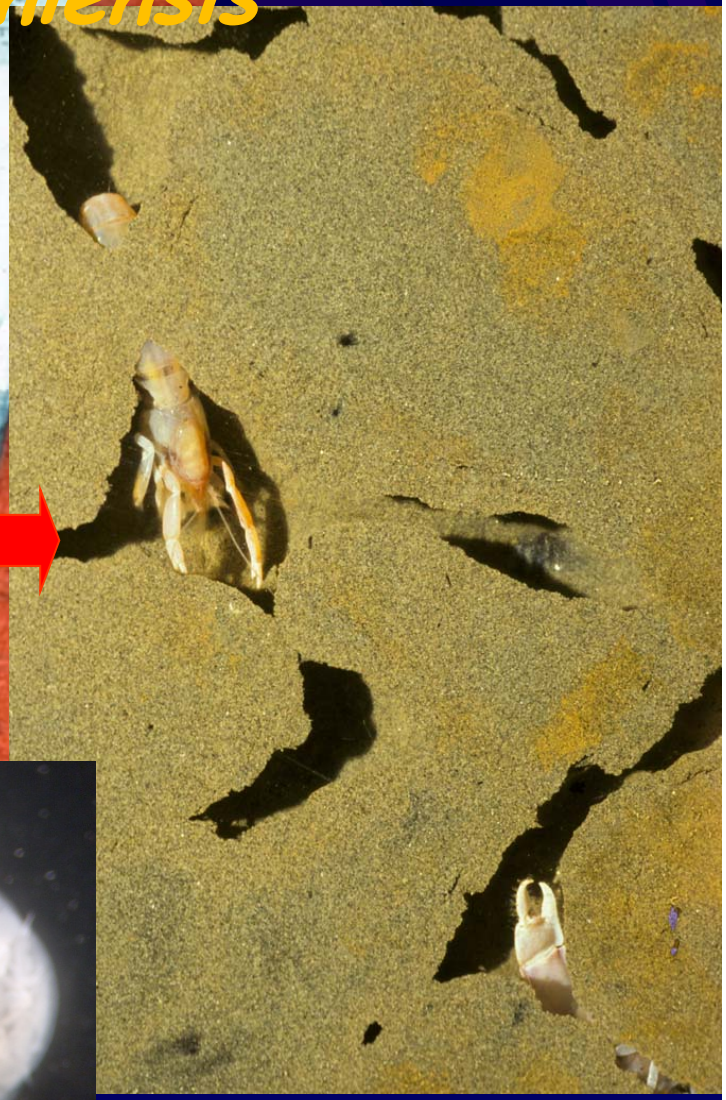
Accumulation of introduced species in Coos Bay and Yaquina Bay Oregon up to 2010 RAS



Some of these introductions are super bad

Upogebia pugettensis and *Neotrypaea californiensis*



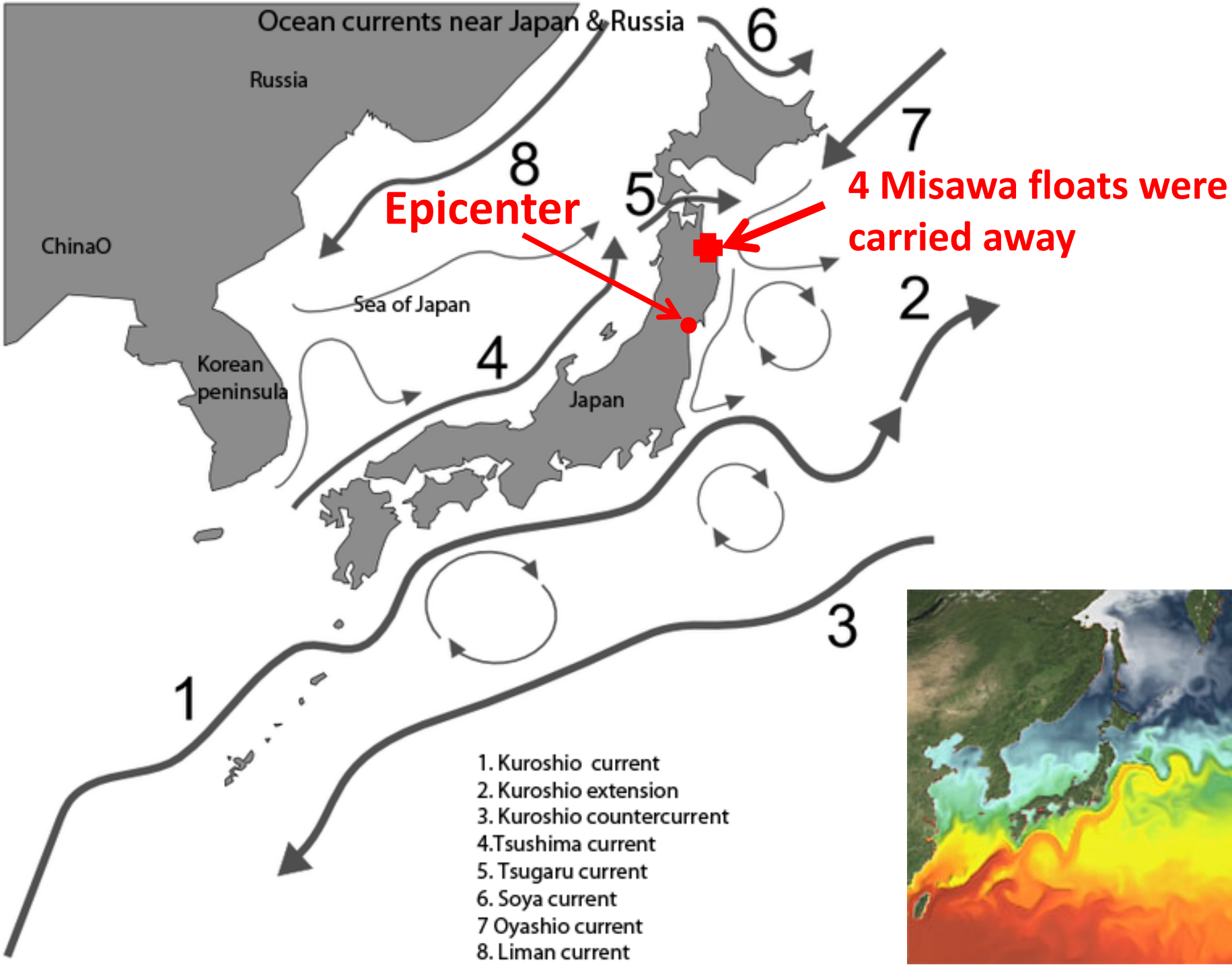


Burrowing *Neotrypaea*

– and their parasites

Ione corniculata

Orthione griffenis


Ocean currents near Japan & Russia
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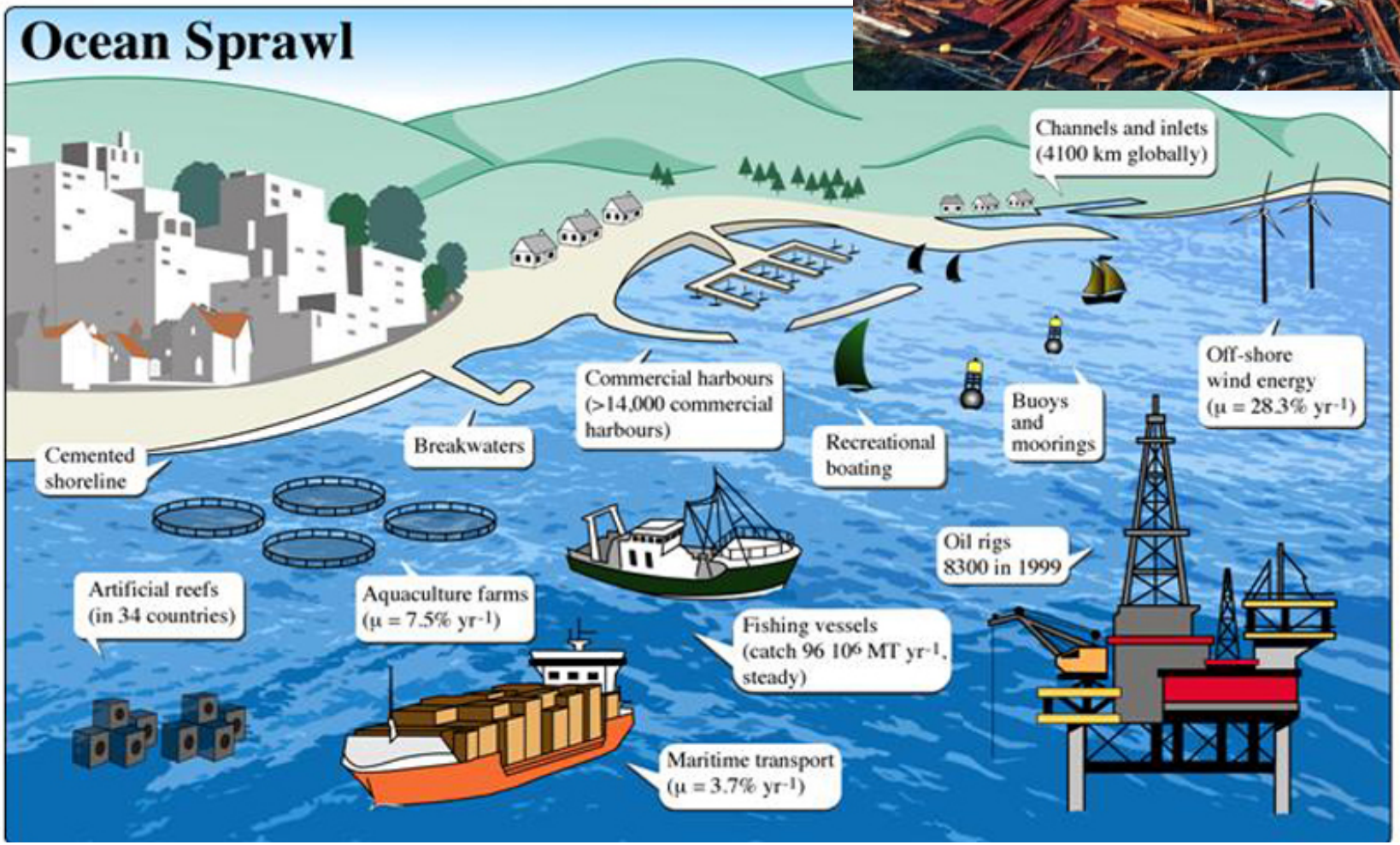
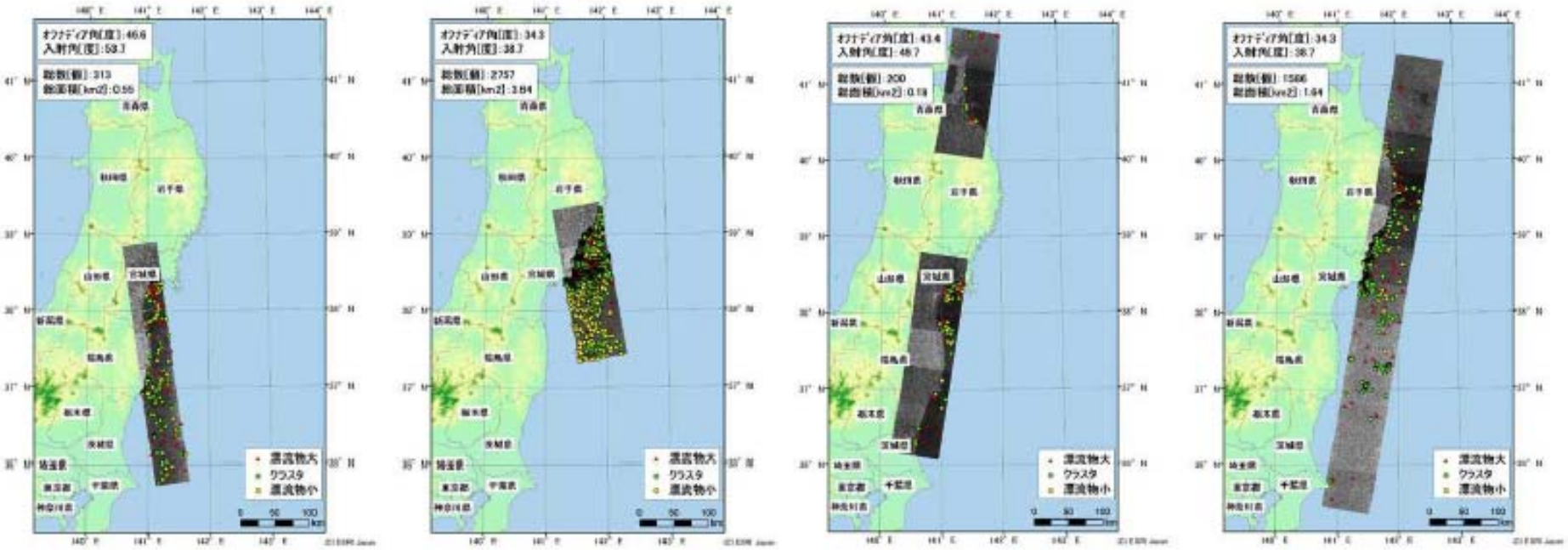
JTMD is the experimental invasion

Ocean Sprawl Increases Substrate for Polyps
-Duarte *et al*. (2012) Front. Ecol. Envir.

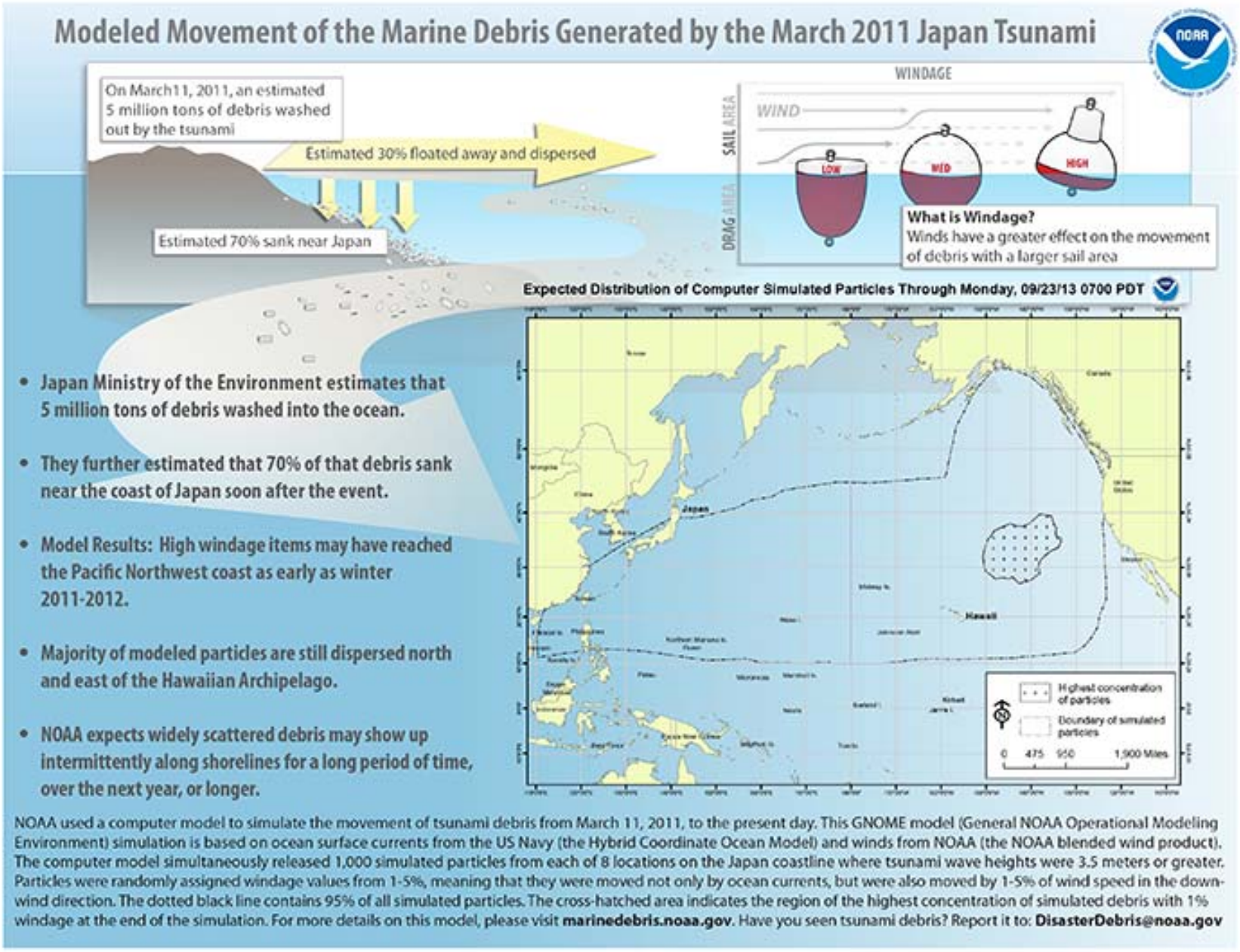


Japanese Coast Guard Survey March 2011



2011 年 3 月 13 日　　3 月 15 日　　3 月 16 日　　3 月 21 日

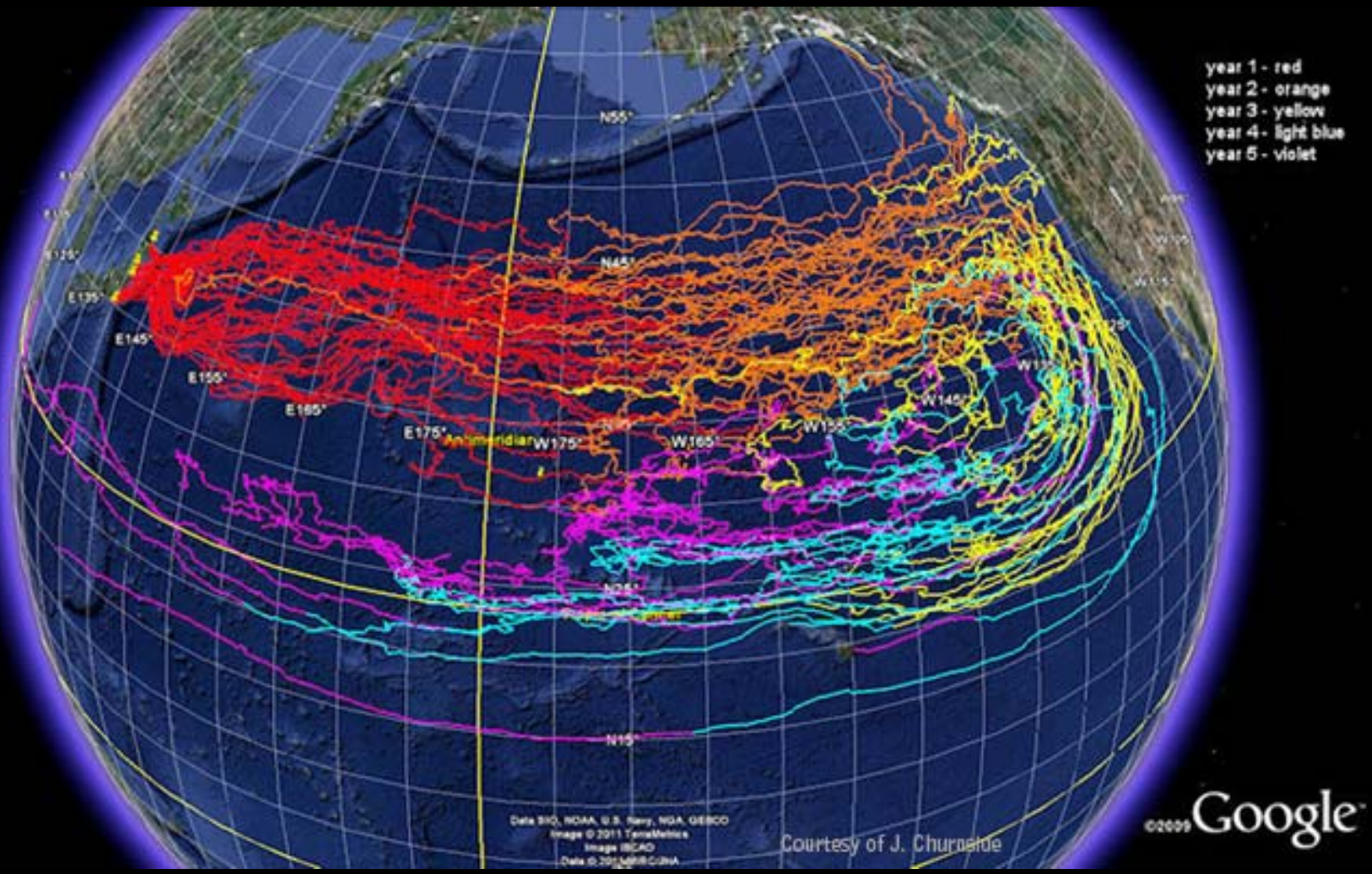
4 concrete floats of the Misawa Fishing Port were carried away



Data as of September 23, 2013 - http://response.restoration.noaa.gov/about/media/new-noaa-model-improves-understanding-potential-paths-japan-tsunami-debris.html

Direct North Pacific JTMD transits are probably rare.

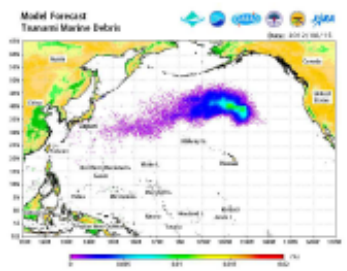
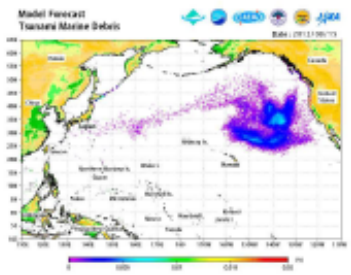
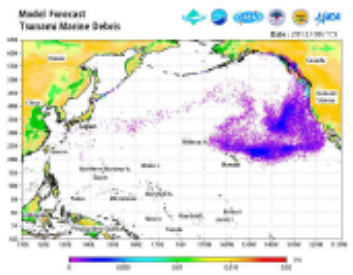
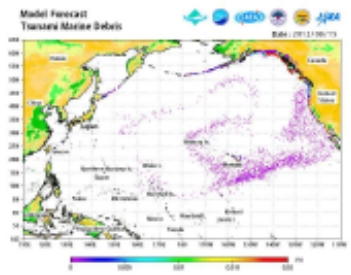
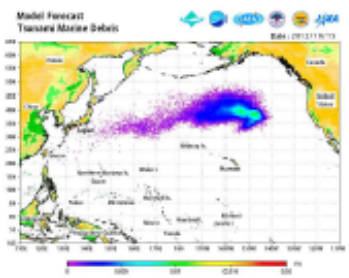
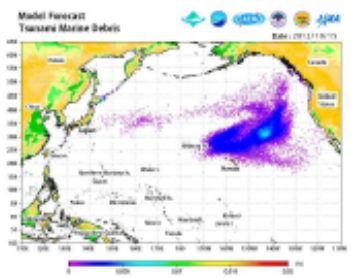
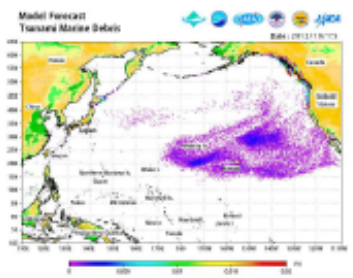
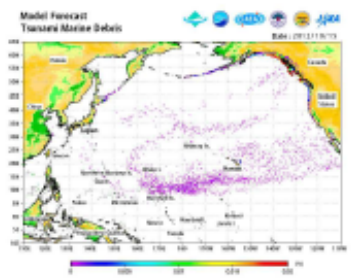
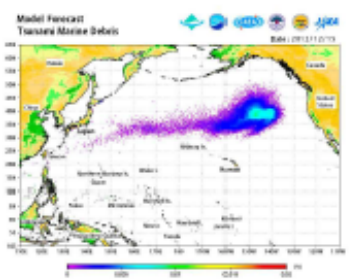
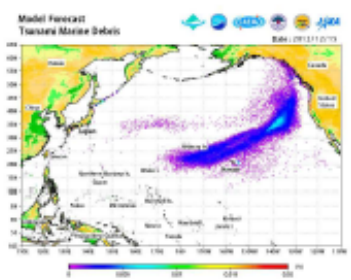
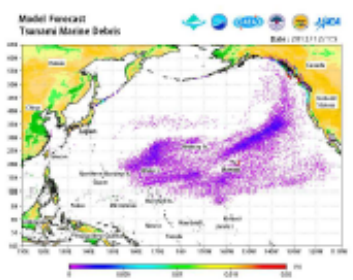
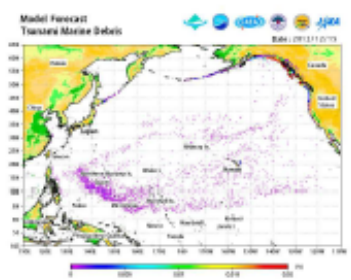
Predicted debris dispersal (image courtesy of NOAA)
http://blogs.oregonstate.edu/breakingwaves/?cat=1702



Buoyancy is assumed to be an important determinant of drift rate

Low ⟷ High

別紙２．予測結果

	海面上：海面下＝０：１	海面上：海面下＝１：１	海面上：海面下＝２：１	海面上：海面下＝４：１
2012 年 8 月				
2012 年 10 月				
2012 年 12 月				

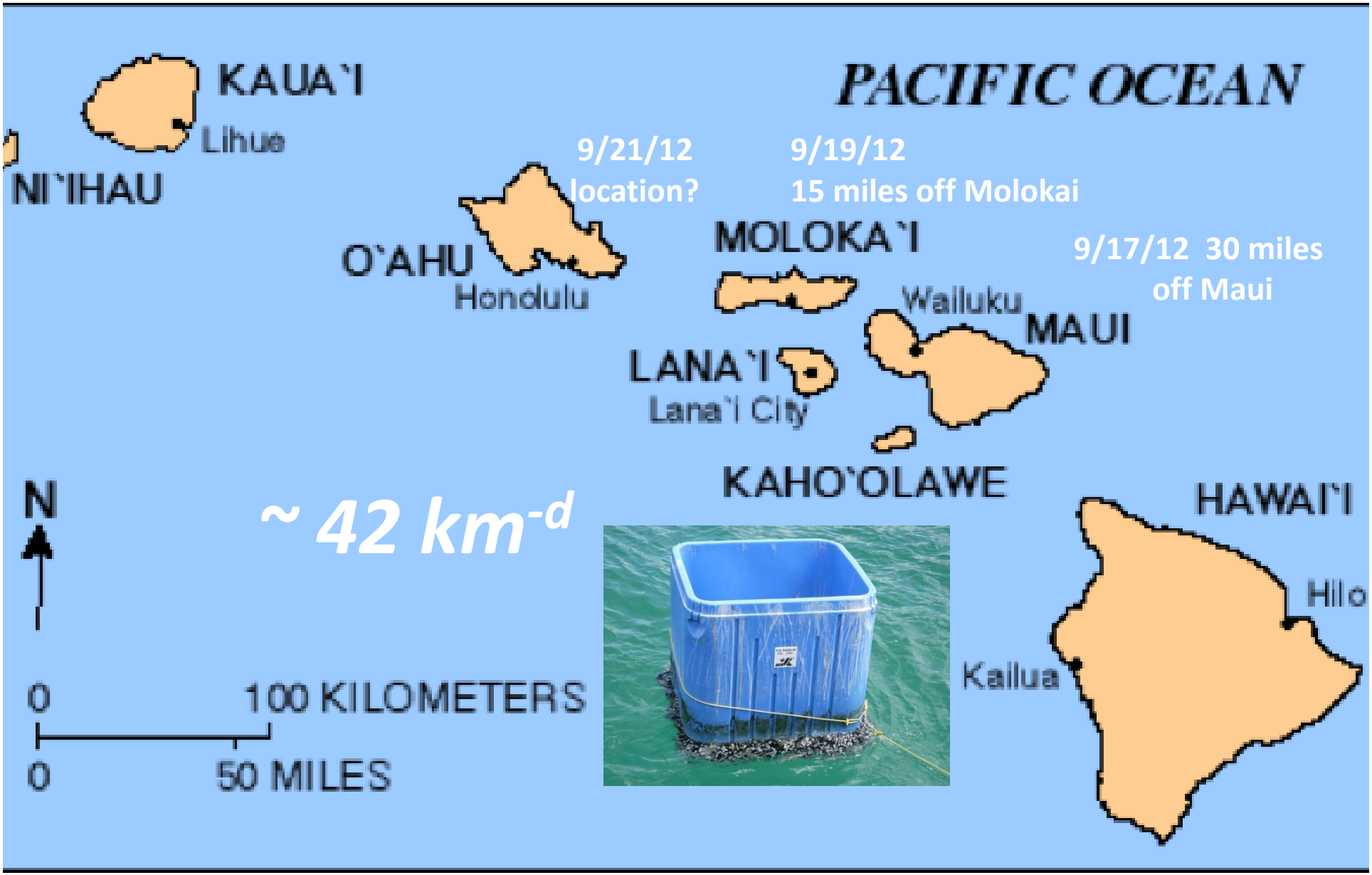
Ryou-Un Maru

Sunk in Gulf of Alaska on 6 April 2012, 392 days after the Japanese tsunami

4 concrete floats of the Misawa Fishing Port were carried away

http://www.katu.com/news/local/Hoax-or-real-Could-this-be-more-tsunami-debris-162620346.html

Misawa 2: Hawaii 17 Sept 2012 (18 months, 556 days)


PACIFIC OCEAN
KAUA`I
Lihue
NI`IHAU
O`AHU
Honolulu
9/21/12
location?
9/19/12
15 miles off Molokai
MOLOKA`I
9/17/12 30 miles
off Maui
Wailuku
MAUI
LANA`I
Lana`i City
KAHO`OLAWE
HAWAI`I
Hilo
Kailua
N
~ 42 km-d
0
100 KILOMETERS
0
50 MILES

Misawa 3 –
644 days later
~ 60 Asian
species > 90%
lost

Aphelasterias japonica

R. Emlet, OIMB, 20 Feb 2013 from 6 m panga, Horsefall Beach, OR

The JTMD is the greatest modern-day experiment in marine biogeography:

- Tens of thousands of JTMD (such as docks, vessels, and buoys), generated by the March 2011 Tohuku Earthquake and Tsunami

Lessons learned

- JTMD is more than marine debris
- The history of the debris is written in the biology
- The debris diversity and biodiversity is underestimated

Misawa 1 bumper
3 August 2012

Three major hypotheses framed under *invasion process theory* we are testing:

- ***Extremely long-distance oceanic transport is possible on artificial debris.***
- ***Debris species diversity, declines over time.***
- ***Arriving debris species can be genetically traced to their source populations.***

GOVERNOR’S OFFICE

Gabriela Goldfarb

Natural Resources Advisor

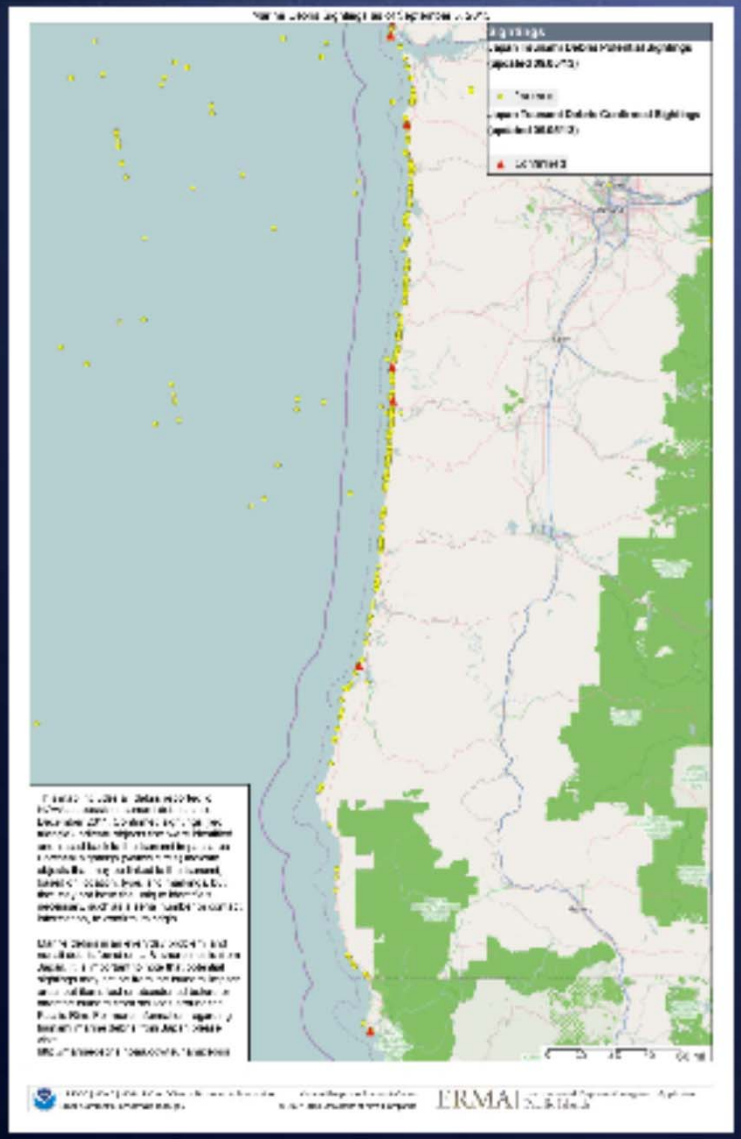
NOAA

Nir Barnea

Marine Debris Coordinator, National Oceanic & Atmospheric Administration

Marine Debris

NOAA Marine Debris Program | Office of Response and Restoration | NOAA National Ocean Service



ERMA Summary for Oregon, September 2013

NOAA Update to Oregon JTMD Task Force

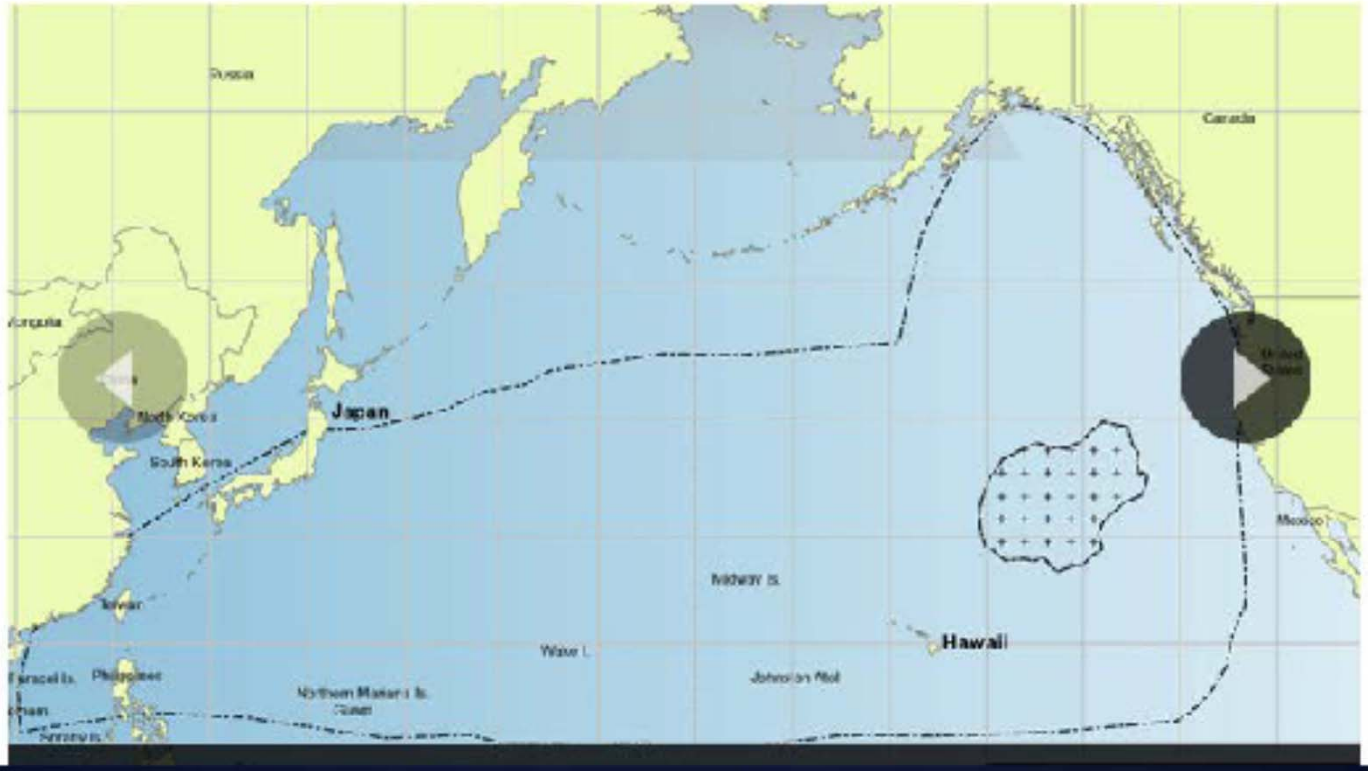
November 14, 2013

NOAA Marine Debris Program

From the Media…

Japan's 'toxic' monster creeping towards US

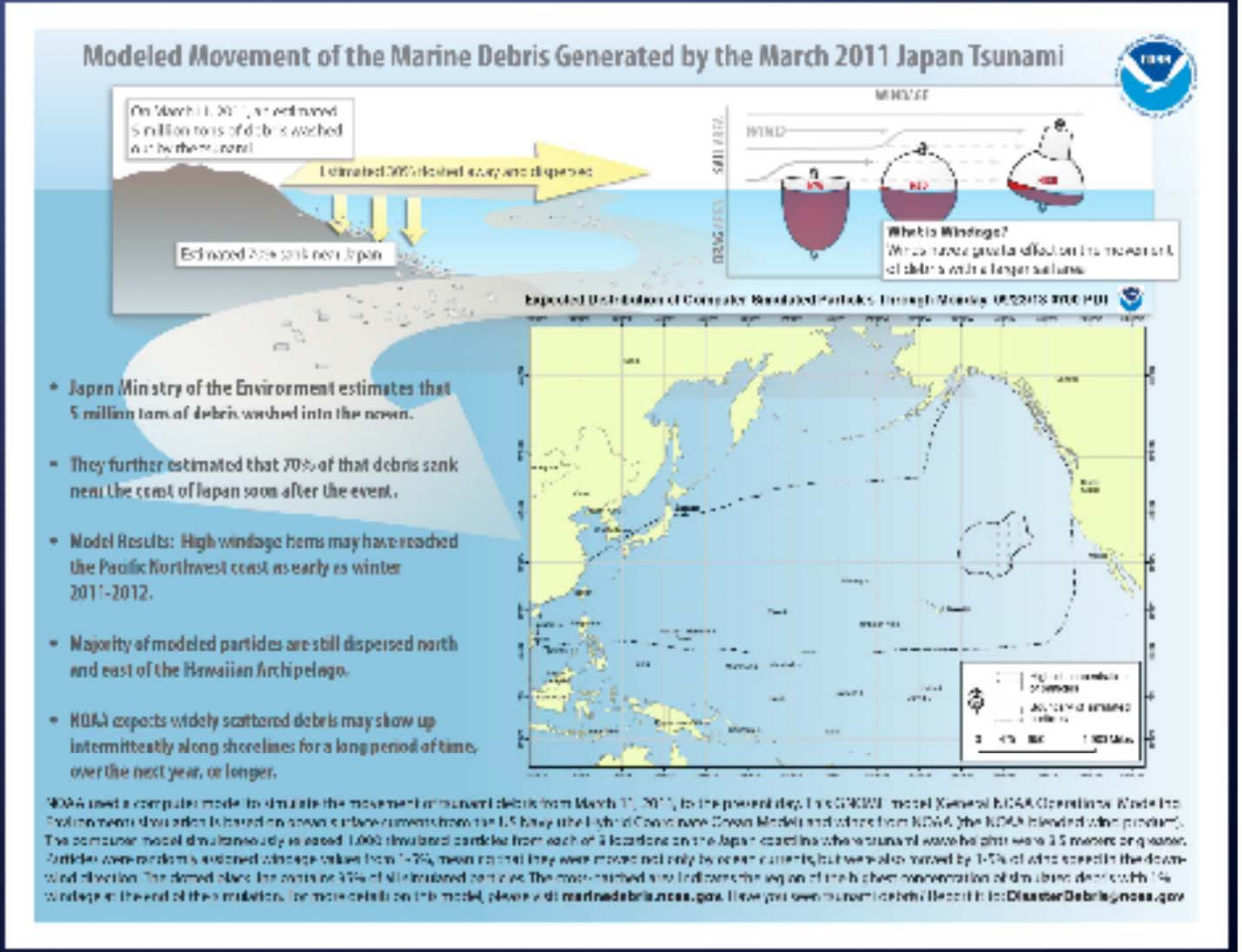
By Maxim Lott / Published November 01, 2013 / FoxNews.com



http://www.foxnews.com/science/2013/11/01/japans-toxic-monster-creeping-towards-us/

Modeling Output

- Hindcast model
- Updated bi-monthly
- No significant changes since March 2013
- Available on the Web

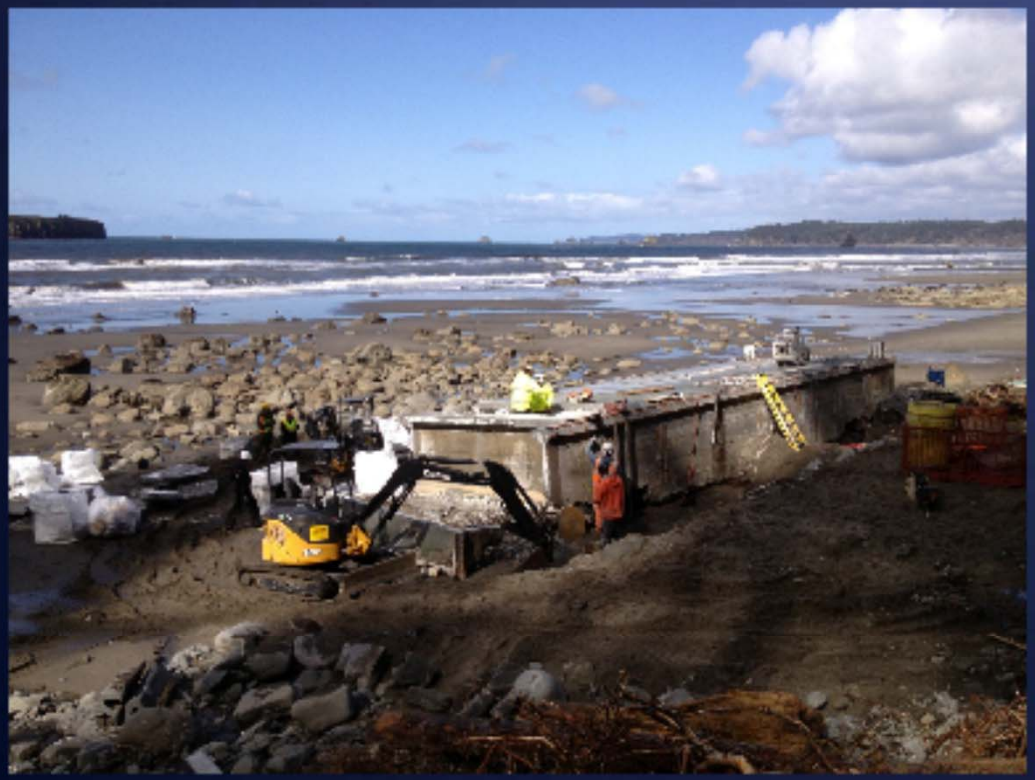


http://marinedebris.noaa.gov/info/images/gnome_graphic.jpg

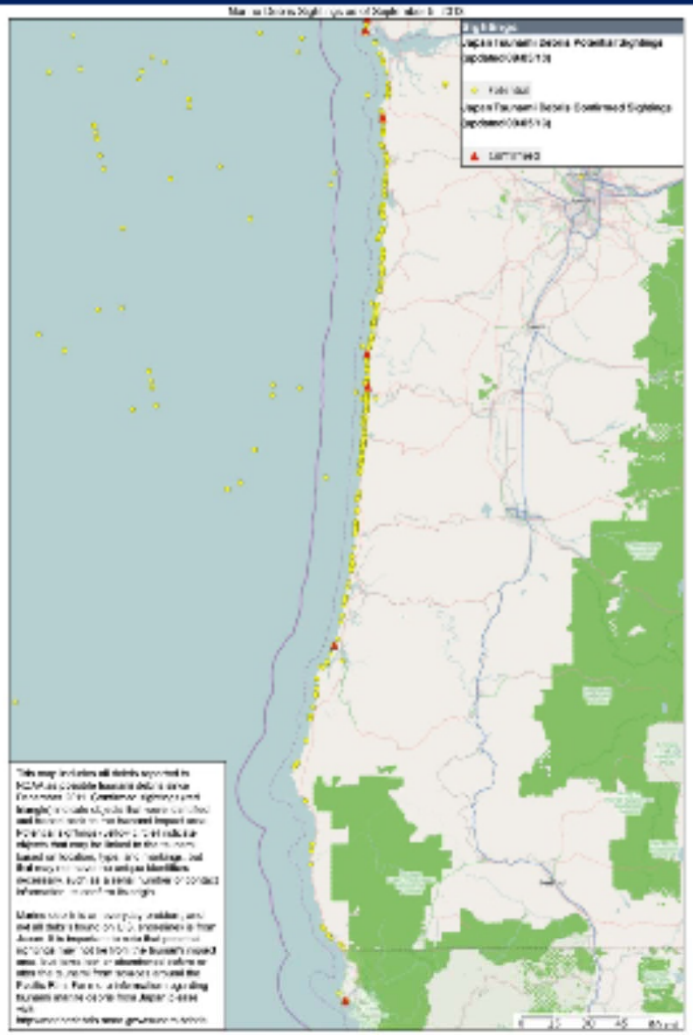
Long Term Outlook

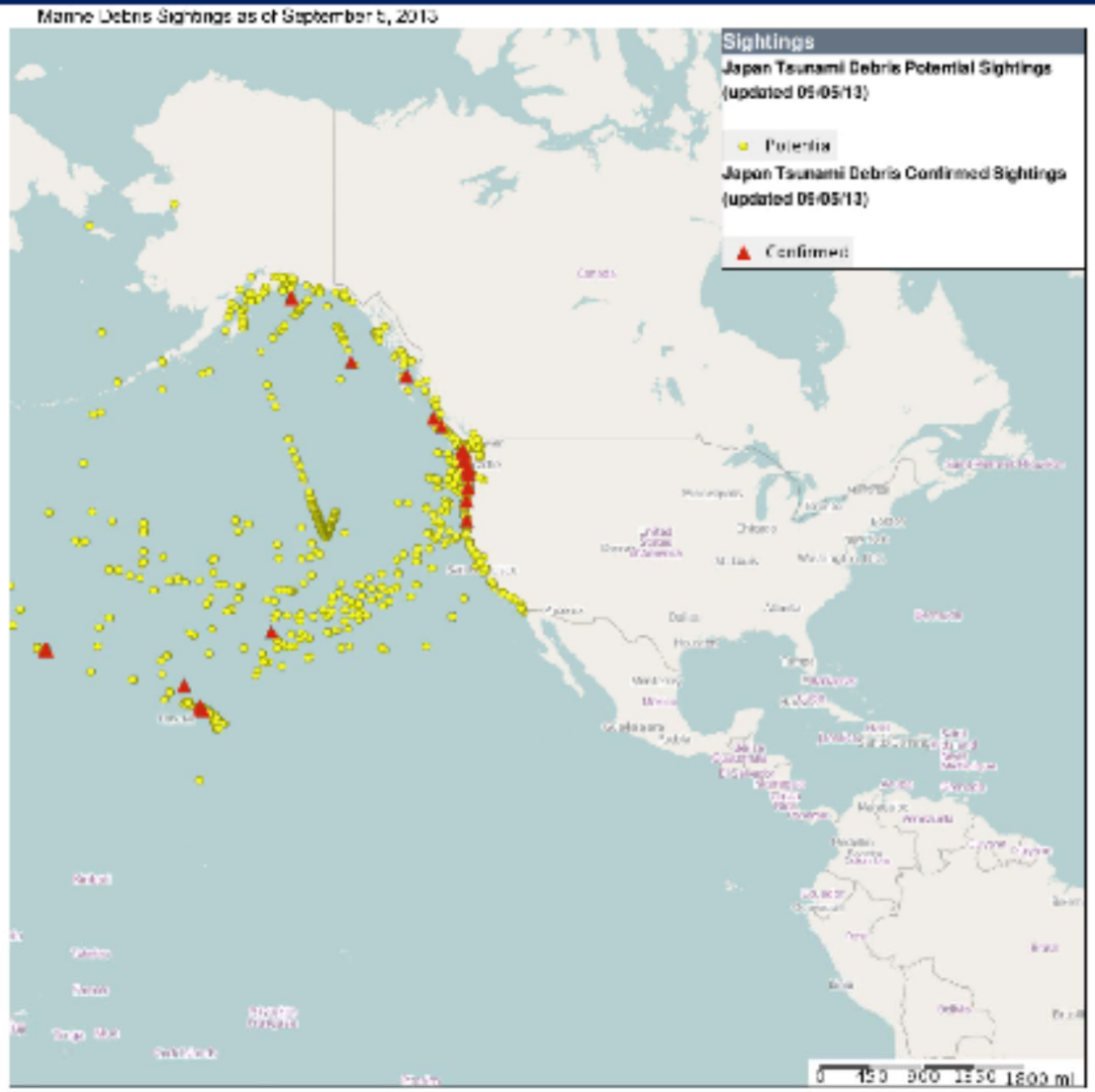
- In winter 2013-2014, additional JTMD, mixed with other debris, will arrive along the West Coast.
- Intermittent, widely scattered
- Can't predict how much, or exactly where and when
- **JTMD is still a safety and an environmental concern**

The Other Dock…



JTMD Sightings: Pacific Rim

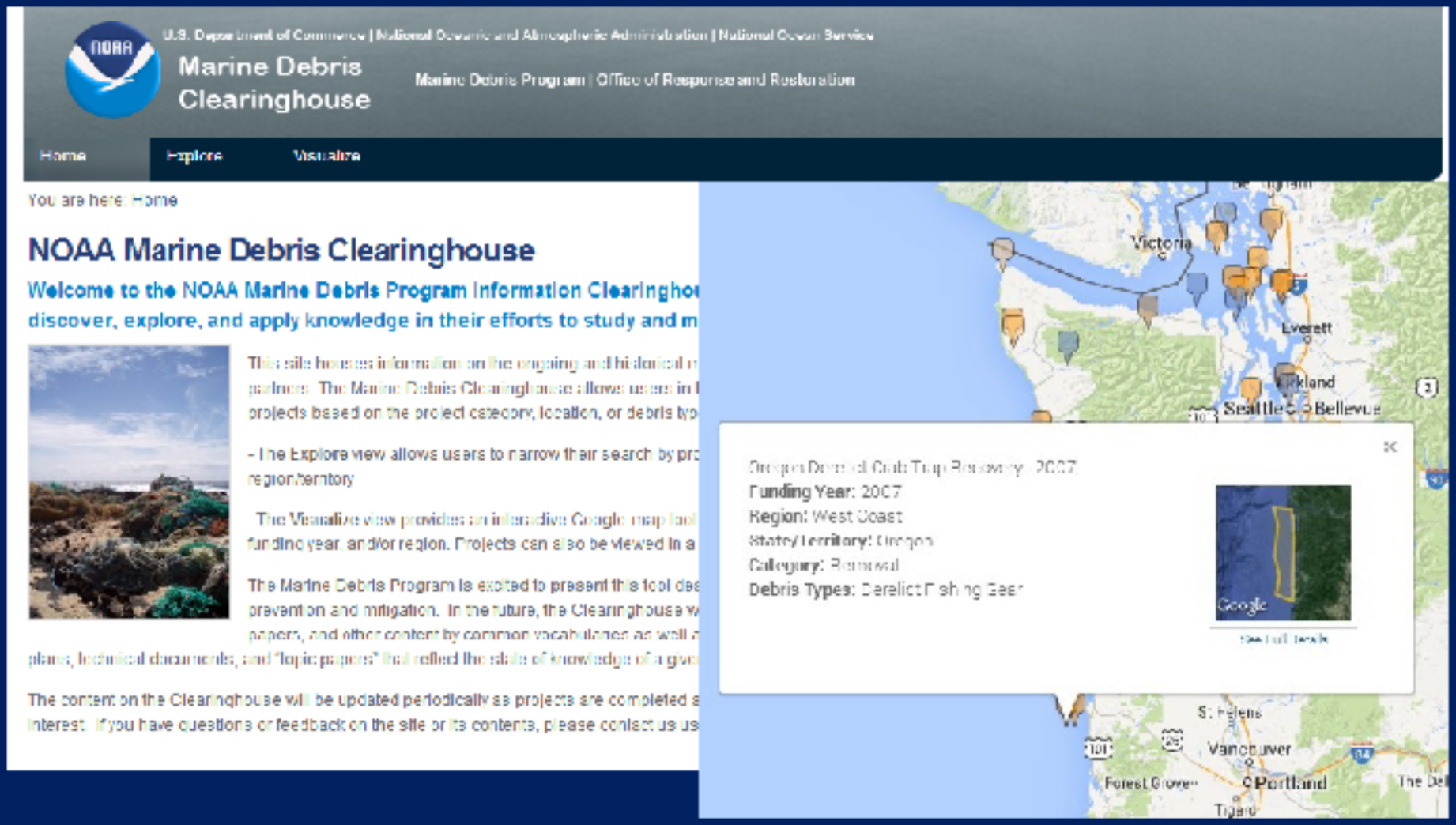




ERMA | Environmental Response Management Application Pacific Islands

http://marinedebris.noaa.gov/tsunamidebris/debris_sightings.html

Beyond JTMD



http://clearinghouse.marinedebris.noaa.gov/

Thank you

Get info:

http://marinedebris.noaa.gov/tsunamidebris/

http://www.oregon.gov/OPRD/PARKS/Pages/tsunami_debris.aspx

Report sightings:

disasterdebris@noaa.gov

Nir Barnea
Nir.barnea@noaa.gov
206-526-6943

NGO Update

Gus Gates

Surfrider Foundation

Oregon Marine Debris Team Updates

SURFRIDER FOUNDATION

the WASHED ASHORE PLASTICS, SEA LIFE & ART exhibit

SOLVE

Sea Grant Oregon

OREGON SHORES CONSERVATION COALITION

JTMD Task Force Meeting Nov. 14th

Gus Gates- Surfrider Foundation

Recent Cleanups

* Fall Beachcleanup postponed due to weather
* Held on Oct. 12th & 26th instead
* 1,157 volunteers participated at 42 sites
* 13,145 lbs. of debris and recyclables removed
* 2,700 lbs. diverted by Washed Ashore for educational art

Effective Partnerships

* Rapid response cleanups in coordination with OPRD Beach Rangers
* Targeting hard to reach areas like Netarts Spit, Tahkenitch Creek
* Large volumes removed in short time

Community Grants Program

* Support for up to 10 community groups to participate in NOAA shoreline monitoring
* Up to $500 for each group to cover transportation, bags, and equipment to complete reporting for 2 years.
* Training support provided by OMDT members
* Deadline to apply Dec. 1st, visit www.omdt.org for application
* More info: fawn@oregonshores.org

The BIGGER Challenge…

Senator Jeff Merkely’s Office

Katie Gauthier

District Aide

NEXT STEPS FOR JTMD TASK FORCE

Closing Comments

Dave Stuckey

Chair, Governor’s Task Force on JTMD

Questions?