Jennifer Stock: Hello everybody, and welcome! You're listening to Ocean Currents, I'm Jennifer Stock, and on Ocean Currents we delve into the blue watery part of our planet and highlight ocean related topics. We talk with scientists, educators, explorers, policy makers, ocean enthusiasts, ocean adventurers, ocean archaeologists, and more, all trying to learn more about that mysterious and vital part of our planet. I bring this show to you from NOAA's Cordell Bank National Marine Sanctuary. Cordell Bank is located just off of the KWMR listening radius, off the Marin/Sonoma Coast. It is a hotspot for the ocean life above and below the surface. Today we're going to talk a little bit about a larger phenomenon, we're talking about tsunamis, we're going to focus on tsunamis in general but on the second half of the show we're going to talk about the marine debris impact from the tsunami last year, its about a year now that the Japan tsunami hit, and were thinking about all the folks and people trying to rebuild their country and also thinking about the lasting impact of that. So when we come back toady on the half hour we'll talk about marine debris. In just a few moments well be talking to Dr Vasily Titov, from NOAA's center for tsunami research so stay with us.
We're back, thanks for staying with us; you're tuned to ocean currents. Today were going to talk a lot about tsunamis and the lasting effects of them. So on the phone with me, from Washington, I have Dr Vasily Titov from the NOAA center of Tsunami Research, and I just want to brief this a little bit, a year ago from March 11th Japan suffered one of the worst natural disasters and human tragedies in history, a 9.0 earthquake and following tsunami claimed around 16,000 lives, hurt 6,000 more, and damaged buildings. Tsunamis are a painful reminder of how the earth's power dominates. On the first half we'll be talking about tsunamis in general, and some of us in California might be thinking more about it because e had an earthquake this morning, but it probably wasn't strong enough to generate a tsunami. But here is Dr Titov, welcome!

Dr. Vasily Titov: Good to be here Jennifer

Jennifer Stock: Thanks so much! So I wanted to talk about what the work is that you do at the Center for Tsunami Research, what is the main focus of the center?

Dr. Vasily Titov: Well we are the research part of NOAA, and NOAA provides forecasts and tsunami forecasts are part of that mission. Our job is research in support of that. We study all aspects of tsunami and particular we develop forecasts that will be implemented into operations. So, tsunami forecasts which include detection,

modeling, and putting it all together to provide what we call real-time forecasts, we try to predict how high and intense the tsunami will be for mostly US coastline in real-time, before it actually hits the coastline and in a particular location.

Jennifer Stock:

So this probably relies on a lot of technology, what time period did we start having the technology to be able to put this science together to predict more and forecast?

Dr. Vasily Titov:

Well yeah, its very technologically intense and scientifically intense, it boils down to many challenges, engineering, mathematical challenges, the forecast of course we want to look into the future so that we can do only with numerical modeling, so numerical modeling is a big part of it, we develop models that can produce a forecast accurately, but we want forecast to be accurate and fast because the tsunami nature is a phenomenon and it would attack a close coastline in a half an hour at the most, so we want to make this forecast very fast, but if it is wanted to be accurate it has to be reliant on actual real time data, so its an engineering challenge to provide data in real time, very fast, that can be ingested into models and then the models provide this forecast, how the waves that we just measured can manifest itself at the coastline, it's a challenge

Jennifer Stock:

I bet. How exactly is a tsunami generated? Sometimes its hard to fathom with the size of the ocean, that something so destructive can come ashore from something that's generated hundreds of miles away, can you talk a little bit about how a tsunami is actually generated.

Dr. Vasily Titov:

Yes well that is still probably the biggest mystery, is that problem, you know how exactly a tsunami is generated. We have some ideas and theories but its very difficult to go into the source of the tsunami and see, while it in fact has never been done, but with bits and pieces of data we have some ideas of how it is generated but we don't know everything, and that's the challenge, we want to forecast something that we don't really know well what the origin is, so the main theory is that its generated by some big scale event that produces some kind of large scale abrupt disturbance of the ocean floor. That manifests itself on the surface ion the ocean as a big disturbance on the ocean surface, and I mean big, a hundred miles long and wide, its a huge part of underwater real estate that lifts up or drops and creates the disturbance of the ocean floor, and the gravity takes over and it will propagate a very long way, so long that you wont see the crest of the wave. This is why the tsunami, it is a wave that many people have the wrong perception

that when we are talking about tsunami wave, they picture ocean swells that people are familiar with, but this is something very much different, because its so long because the disturbance generated is so vast. You don't see the nice curly wave that you see at the coast, you will see more like a surge that will bring water from the ocean on to the land.

Jennifer Stock:

What factors in the ocean influence the speed of travel for this wave?

Dr. Vasily Titov:

The nature of this wave is that its very long and behaves a bit differently from ocean waves, the speed of the wave propagation depends almost solely on depth of the ocean, so the deeper the ocean the faster the wave travels, and in deep ocean, a tsunami wave will be traveling about 500 or 600 mph, it's the speed of a jet liner, it propagates very fast, it could cross an ocean fairly fast, but it still gives us some time to make predictions. And the other thing that tsunamis characterize is the fact that the energy is preserved very well, it takes the energy that the earthquake generates and puts it into the ocean, in the water column, and then it can transport that energy far from the source, unlike the earthquake shaking, which is mostly felt right near the epicenter. Tsunami waves transport the energy far from the epicenter

Jennifer Stock:

So what are the detection units that you have to get data to track the wave? I'm assuming you have buoys around the ocean?

Dr. Vasily Titov:

Yeah since we want to predict and detect the wave as soon as possible, we will put out detectors in deep water where the wave propagates very fast, so the wave can reach them very fast and we place them near potential sources, and in the case of the Japan tsunami we could detect them in about half an hour or so, so we actually saw the tsunami waves and saw how high this wave was, so this detector site is really an engineering marvel, very intricate instruments, the detector itself is sitting on the ocean floor, measuring static pressure of the water, basically the weight of the water, and the small disturbance of these water columns changes the pressure of the instrument and that detects the wave. The wave flows above the detector, changes the pressure, which is sent to the buoy on the top of the ocean, and the data is sent to satellite and then to tsunami centers. It is intricate but very accurate, the pressure detector sitting on the ocean floor about 3 miles under the surface can detect about 1cm high tsunami

Jennifer Stock:

That's amazing to me that we have these buoys that are so deep in the ocean to detect the slight changes, I imagine that maintenance

and upkeep of the technology is vital to keep the system intact to save lives

Dr. Vasily Titov:

You're absolutely right, it's difficult but it's exactly what NOAA is committed to do.

Jennifer Stock:

So in terms of waves, I don't know a lot about tsunamis, I haven't seen a lot of pictures or video, the Japanese one was heart-wrenching, and it seemed like a huge mass of water compared to what I thought about tsunamis before. Is there a difference in danger between the small waves and the big waves? Because it seems that the aftereffect of that tsunami hitting California, we didn't have a huge wave but we had a lot of damage. So is there any difference between sizes of the waves in terms of danger?

Dr. Vasily Titov:

Well the tsunami in Japan propagated only about 100km, maybe 50 miles from the epicenter, so it lost very little energy, and the earthquake was immense, it was one of the largest tsunami ever seen or recorded, but it was the largest ever recorded, but its one of the largest on the books in terms of historical council. For the Japan, the waves lost very little energy so the amplitude was huge, we measured the highest point where the wave reached was about 40m above the ocean, its more than 120 feet, its huge, its vertical, it inundated miles inland, huge scale event, very difficult to image, and of course California is thousands of miles away from this source, so the energy was lost and the amplitude was much smaller when it reached the coastline of the US and California, but what's important to understand is that even with a small amplitude, you could see how much energy was still transported, the tsunami with high amplitude would inundate land and destroy things in its path, but it generates very strong currents that you don't see near harbors and coastline, which is another danger anywhere, even far away from the source, it was seen in Hawaii, all over the west coast, and that's why there was so much damage in harbors because the harbors were not designed to withstand currents that were generated by these waves, even though the wave height was not enough to inundate, we still felt the power of the wave by the approach of huge flows of currents that were generated inside the harbors

Jennifer Stock:

So this is such an important line of work that you're in, 24 hours around the clock type of job, where were you the day the earthquake started off the coast of Japan

Dr. Vasily Titov:

There are tools that have 24/7 tsunami warning operations, one in Hawaii and one in Alaska, but we are developing the tools for

them. In the case of the Japan earthquake, I was actually far away teaching a training course in African Tanzania, so in some interesting ways shows the global reach of this phenomenon, we were in Africa but teaching tsunami forecasting and developing international tsunami warning systems.

Jennifer Stock:

That's wonderful, reaching out to other nations. Speaking of vulnerability of coastlines and areas, where do you consider the most vulnerable areas on the west coast, particularly California in terms of tsunamis?

Dr. Vasily Titov:

Well any coastal area is vulnerable, the recent tsunami showed that, many happen in places where we didn't anticipate them and then the 2004 tsunami in Indonesia was a good example, it was not expected to be that large in that area. Even Japans tsunami, even though Japan was considered very active _____, tectonically very active, the tsunami in this area was a great surprise for the scientific community. Any coastline is actually vulnerable, but the risk is different California is fortunately not very high on the list of the places that are very vulnerable to tsunami, but the Japan tsunami has shown that the ____ can be substantial, that the biggest problem for the US, the tsunami sources that are close to the US coastline, are mostly in Alaska, and along the west coast, the subduction zone that goes from Canada to northern California, these are the two big areas that provide pretty big hazard to coastal populations, of the united states, and Japan showed what we could expect in case of a big earthquake or tsunami on the west coast and Cascadia because it is very similar, and the tsunami that we expected, you know, could be hundreds of years from now, but it may happen much sooner, it will probably look very similar to what we see in Japan.

Jennifer Stock:

It's a good reminder, I know there's a lot of efforts in California to keep people aware, just like preparedness in earthquakes, same thing for tsunamis, just because we don't see them very often doesn't mean we aren't in danger. Is there a website that people can go to to see the models of how the waves travel and the network of data that you study to predict tsunami impacts?

Dr. Vasily Titov:

There are several resources in the web, one can start with our website, a research oriented website, but you could see how the tsunamis have been forecasted, and what's the system that's MCTR.NOAA.gov is a good place to start with links to other resources, educational and government resources for someone in terms of tsunami science, preparedness, inundation, maps all linked there, so it's a good resource for people to start exploring

what they need to know about tsunamis, and everybody need to something about tsunami because we will all be involved at some point, so its important to know simple steps and simple things to be aware of that will really save your life, that's the main goal

Jennifer Stock:

The website again is NCTR.PMEL.NOAA.GOV
Ok very good, well we have a couple minutes here before 1:30, and I just want to invite any listeners to call in with any questions about tsunamis, Dr Vasily Titov, our number is 415-663-8317, we just have 5 minutes for any calls if anyone wants to give a call in to learn and give a little bit more, we have a call here.
Hello, you're live on KWMR!

Unknown Caller:

Hello, ok we had a little earthquake this morning, so I live in Olema with this 15 feet above sea level, if there was to be an earthquake at the mouth of Tomales Bay similar to the one in Japan that generated a 40m tsunami which would come down the bay, I mean how high is Mt. Wittenberg? Do you know?

Jennifer Stock:

I think Mount Wittenberg is about a thousand feet

Unknown Caller:

Ok I mean where I live I'm close to Olema hills, so I'd escape that way, go up on my 4wd vehicle into the pastureland, how far did that 40m tsunami travel?

Dr. Vasily Titov:

The good news is we probably wouldn't see a tsunami of that scale in California just because we don't have similar sources right on the coastline there, but the good resource would be to go see what the local plan for evacuation is in case of a tsunami warning, go to California emergency services website and see what the inundation maps for your area show, California has pretty uniform coverage of tsunami evacuation maps, I'm sure your coastal town is covered by that, and that will show you projected worst case scenario maps and they will show you evacuation routes.

Unknown Caller:

The topography of the ocean floor off the coast in the immediate vicinity is different to what transpired in Japan that that likelihood of such a devastating effect to occur here is not as likely as what is likely to happen in Japan

Dr. Vasily Titov:

I guess that's correct, we don't see a fault, we cant say it never can happen but we don't see the same setting as in Japan, the tsunami was generated by a fault that s located at what we call subduction zones, a very big fault between two continental plates, we don't see that in California, however we see we have the same symbol of fault along Washington, Oregon, and part of northern California.

Unknown Caller:

Right, ok well thank you very much!

Jennifer Stock:

Thanks for the call

Unknown Caller:

Ok bye bye

Jennifer Stock:

That was a question I was going to ask, because Tomales Bay is right next to our watershed near the west Marin community, it's a very narrow entrance to the Bay, does tsunami energy get bigger waves with smaller entrances? You were talking about harbors and bays, would it make it a bigger wave coming inside?

Dr. Vasily Titov:

That's a very involved question, the word tsunami is Japanese, a combination of 2 different characters, one means harbor, the other means wave. What it means is that it's a wave that you can see only in the harbor. That's sort of back to the dynamic of the tsunami wave, that it really manifests itself near the coastline in the harbors. What we saw in Japan, a lot of engineering, the harbors were protected by jetties and sea walls and that didn't seem to work very well if you see a tsunami of that scale as we did in Japan. So while the engineering approach has been tested and tried, it has limited expanse but it is not the only one. The jetties and the narrow entrances to the harbors usually protect the harbors from wind waves, they would not protect very well from tsunami waves.

Jennifer Stock:

Ok well have to look a little closer at our global emergency authorities here, at Tomales Bay, that's been on my mind. But were just out of time here, and I want to say thank you Vasily for your time, and your work, and using science to help forecast for the modeling for notification systems around the world, its vital science, I appreciate your time today.

Dr. Vasily Titov:

Thank you very much, it was my pleasure

Jennifer Stock:

Thanks. Folks in just a minute or two we'll come back and talk about the aftereffects of the tsunami, the marine debris that entered the ocean and were going to talk a bit about that in just a few moments so please stay with us.
Thanks for staying with us. With me on the phone is Dianna Parker from the NOAA Marine Debris Program, welcome Dianna you're live on the air!

Dianna Parker:

Thanks Jennifer for having me

Jennifer Stock:

Welcome, we just had a lot of energy talk about tsunamis, of course everybody wants to know about the aftereffects because of all the marine debris that entered the ocean from this recent tsunami, so do you know how many hundreds of miles of coastline this tsunami in Japan covered?

Dianna Parker:

The tsunami covered roughly 217 square miles and from some perspectives that's roughly half the area of Santa Cruz county, so just an enormous amount of coastline inundated by this tsunami, the waves had a maximum height of about 130 feet and the tsunami caused about 15-20 ft rise of 100 mile wide seabed nearly 40 miles from shore.

Jennifer Stock:

And basically everything in its path was pulled out to sea, including thousands of buildings and structures and cars and boats, with an event like this, what is the immediate response by NOAA's marine debris program>?

Dianna Parker:

Early on we knew that the debris would be an issue first with the massive human tragedy, the disaster took more than 16,000 lives, injured another 6,000, destroyed 10,000's of buildings, we know that all the heavier debris would sink off the coast of Japan but the lighter debris made to float could be an issue. We quickly started to observe the debris from satellite, we worked with the Japanese coast guard and with the US navy who were out doing search and rescue missions.

Jennifer Stock:

Debris was able to be seen by satellite for nearly a month, and then pretty much waves and dispersion just wasn't able to be detected anymore by satellite, although we know there's lots of debris floating around, what were the ongoing efforts that happened to try and track this debris, is there modeling going on? I know there are oceanographic models I've heard about that predict where things are going to go.

Dianna Parker:

We are working with other government organizations to try and find the debris where we think it might be located with high resolution satellites, because we couldn't see with the satellites we were originally using, those were lower resolution so were looking with much higher resolution satellites, and we also modeled the debris potential path, just a quick note about modeling, you know those can tell us where we can reasonably expect debris to go and when but its not quite real world, it is possible for the debris to sink and break up and we remind people that its been at the mercy of the enormous pacific ocean for almost a year, anything is possible.

Jennifer Stock:

In terms of predictions, I know there's lots of different forces that can affect these, but what is the projected path at this point, a year later, of what we know in terms of the remaining floating debris? I've heard that it's in the Hawaiian Islands, that it's already hit the west coast, but what the latest of those predictions?

Dianna Parker:

Our models tell us that if the debris follows the path that historical ocean conditions might make a piece of debris go, it would pass the northwestern Hawaiian islands this winter, now, then it would make its way to the west coast, Alaska, Canada, in 2013, and would circle back to the Hawaiian islands in 2014, and we think beachgoers would notice increases in small pieces on the beach, there have been reports of buoys washing up on the west coast, and at this point NOAA hasn't confirmed that these pieces are from the tsunami, its very difficult to say where any one piece of debris came from, just because that type of debris show up on the west coast all the time, particularly from Asia, but we aren't ruling it out, its possible for these things that are made to float to catch wind and then show up ahead of schedule

Jennifer Stock:

So that would be the westerly winds?

Dianna Parker:

Yes correct

Jennifer Stock:

Coming straight across. Ok so California, we can expect 2013 as a potential, but were not talking about this massive debris field, are we, how do we know what is tsunami debris versus what's just regular marine debris? Its horrible that we have this categorization now about what washes up on the beaches, it's a fact we have a ton of plastic in the ocean, what is the difference a? And is there anything a beachgoer would be able to tell in terms of if it is from the tsunami?

Dianna Parker:

Absolutely, and you're right, the flotilla of floating debris floating towards the US is dramatic. The debris has dispersed far across the pacific ocean to the point where our partners in vessels and planes who regularly cross the ocean are calling in very few debris sightings, we would like people to notice an increase in types of debris that typically wash up anyway, its possible that some hazmat materials, for example an oil drum might come ashore, and we encourage people not to touch those types of debris, leave it and report it to authorities, but otherwise people should feel free to pick up the debris, join in on clean up, or be generally aware that this is an ongoing problem for many communities in the northwest and in California

Jennifer Stock:

And perhaps due to the heightened media about it, more people may come out for some clean up, which is always great to clean up the always ongoing input we are getting. I had Curtis Ebbesmeyer on the show, and this was before there was not a lot of science in terms of danger, we talked a little bit about hypothetically radioactive events, is there any chance of debris coming ashore to be what we call "hot" in terms of radioactivity?

Dianna Parker:

Right. Radiation experts have all agreed that it is highly unlikely that radioactivity will be a problem just given the timing of events and the amount of time that the debris has spent in the ocean at this point, the EPA and the FDA were regularly monitoring for radioactivity in the days following the tsunami and the meltdown, and they found none. Highly unlikely that that will be a problem.

Jennifer Stock:

The idea of the heavy stuff sinking near shore and when Dr Titov was talking about the impact and the uplift of the tsunami, my mind was immediately going to the near shore habitats of Japan, and what those look like right now, is there any efforts by the NOAA marine debris program to look at the near shore submerged impacts, in terms of the stuff that has sunk and is there anything that can be done?

Dianna Parker:

Well we are working very closely with the Japanese government, they have done a tremendous amount of work on this issue even while rebuilding their nation and the tragedy, they have done a lot of work and they are planning to release some figures in the next month, I wont speculate until it actually comes out but yes work is being done.

Jennifer Stock:

Yes I'm sure it's a huge impact on their economy as well, since there is a lot of seafood harvested in Japan as well, pretty scary. In terms of what's happening now, there's probably folks who are wanting to get involved in terms of monitoring and getting a baseline assessment, and most of our listeners are probably here in CA, but they could be elsewhere, is there any type of effort of getting baseline data about items and amounts of items and can people help contribute to that?

Dianna Parker:

Absolutely, and we need volunteers to help with that baseline data, we know we need to know what's out there, and what volume and what types of debris are on the beaches every day, then well be able to notice a change in volume or type of debris, so anyone who's interested in helping out can request Marine Debris

Program's Monitoring Guide, and they can request it at MD.Monitoring@NOAA.gov

Jennifer Stock:

What does this monitoring guide entail, what does it have?

Dianna Parker:

It's a very user friendly protocols of how to survey beaches put together by our ace researchers here at NOAA, it's a how-to guide for going out and surveying the beach in a way that we can collect the most scientifically sound data.

Jennifer Stock:

Here in the Gulf of the Faralonnes region we have a program called Beach Watch, its been an ongoing program where volunteers are out taking baseline data of our beaches and taking a look out for things, so I'm sure they'll be involved in contributing to your data needs there.

Dianna Parker:

That's great

Jennifer Stock:

Are there any specific types of items that might be characterized as "from the tsunami" that you would want to know about at the Marine Debris program, and should people try to contact you?

Dianna Parker:

Not every item with Asian writing is from the tsunami, and at our program its a big problem, these things wash up all the time but we are asking beachcombers who spot significant volumes of debris or any item that they feel certain are connected to the tsunami to report it to disasterdebris@noaa.gov and of course they should gather as much information as possible as to where they saw it, what type of item it is, and give us an idea of what's washing up on the beaches out there.

Jennifer Stock:

In the northwestern Hawaiian islands, where it sounds like its closest there right now, those are some fragile islands and coral atolls around there, and breeding albatrosses and all sorts of seabirds, is there efforts to try to collect debris that makes landfall there on those islands?

Dianna Parker:

We are working very closely with the Fish and Wildlife Service, as you mentioned some of those northwestern islands are the most unique ecosystems in the world, they have an active staff there that monitors the beach, they do a lot of debris removal up there as well.

Jennifer Stock:

Any reports yet of any items washing up?

Dianna Parker:

No not yet

Jennifer Stock:

I know one of the big concerns out there is the endangered monk seal, severely endangered and highly impacted by specifically fishing nets.

Dianna Parker:

Right, I will say that we don't know exactly how much debris is floating out there and exactly what's still floating, like what type, but we do know from our everyday experience that it's the debris like nets that ensnare animals and they can eat plastic so it has the potential to negatively impact our ecosystem as well as navigation

Jennifer Stock:

Its an ongoing issue, I keep going back to the problem of plastic in the ocean and its just continuing to go in, what are some efforts the Marine Debris program is taking in terms of the ongoing problem of plastic, not necessarily associated with the tsunami but just the ongoing issue of plastic getting into the ocean?

Dianna Parker:

Well obviously the most important piece is education, because the more people recycle the less they use, the ore they reduce the amount of plastic, you know no littering is our key message, it's the only way we can prevent the plastic problem.
With fishing we do have a pretty successful program called Fishing for Energy, located all over the country, we partner with Covanta energy and _____ to place bins at ports where fishermen can recycle their old fishing gear for free, and then Covanta energy burns the nets for energy, and that program is also pretty popular in Hawaii where we started it, so that's one of our efforts to keep fishing gear out of the ocean.

Jennifer Stock:

Interesting, how much energy can it generate?

Dianna Parker:

Oh, it's a lot but at this point I think we've collected about 700 tons of gear, which can power a lot of homes.

Jennifer Stock:

Wow that's incredible. Well if anybody wants to give a call in, I'm going to open up the phone for just a few minutes, just 3-4 minutes here, so if anyone has a burning question, you can talk with Dianna Parker here from NOAA Marine Debris. We have a caller, hold on a second
Welcome you're live on the air!

Unknown Caller:

Hi, I have a question, I don't know if your guest is familiar with __Helen ____, but she stated that the genies out of the bottle and any fish off the coast of Japan should not be consumed, and all the nuclear waste is poured into the ocean, I mean you know the shelf life is a big thing, its indefinitely radioactive compared to a human

lifespan so anything coming onto the coastline that would be conceived to be from Japan should only be ventured upon in a waste costume and a Geiger machine, how can you say anything is benign without, it just seems impractical, so I'll take my answer off the air, thank you.

Jennifer Stock:

Any comment on that? I think there was a difference there, I think the ingestion, bioaccumulation question is different than the actual transfer of debris,

Dianna Parker:

Yeah I cant really speak to the seafood issue very well, every radiation expert that we've spoken to over the last couple of months ahs assured us that even if a piece of debris was exposed to the contaminated water, by the time it came over here the levels would be so low beyond concern, and you know that said there have been some spot checks, a Russian research vessel found a small fishing boat in September, northwest of the northwestern Hawaiian islands, registered to the Fukishima, and they tested it and the levels were normal, there's just a lot of evidence that this is not going to be a major concern.

Jennifer Stock:

I think the other question that he proposed is something I'm going to try to look into and see if there's more information about the impact on living things in terms of the bioaccumulation and that's something well look into for a future show, thanks for that question, we have time for one more question, and we have another caller, so caller you're live on the air!

Richard James:

Hi Jen, this is Richard James

Jennifer Stock:

Hi there! Our local beachcomber extraordinaire! I'm sure you'll be hearing from him Dianna.

Richard James:

Hi there Dianna, I'm wondering if NOAA has ever looked into any kind of program to assign costs to the fisherman who deposit so much plastic to the ocean, you know some kind of CRV like we pay a nickel on a bottle of fruit juice, each year during of crab season I pick up thousands and thousands of feet of oil based rope and crab buoys and hundreds of bait jars, and it seems like if I'm a crab fisherman, I can just dump all this stuff out in the ocean, and I've talked to fishermen and they get mad they lose every day, they lose but what can be done to assign pass that cost on to the consumer but the earth is paying the price and all we care about is how much crab costs on the market.

Dianna Parker:

One of the things about our program that we think is working pretty well is that we are taking a non-regulatory approach to some of our prevention and outreach activities, were finding that people are willing to participate in our recycling and prevention programs and as you mentioned there's a lot of fishermen out there who are losing good gear that they don't want to lose, sometimes it just gets lost out there, I definitely think that maybe there are other groups out there exploring those options but our approach is one of something voluntary where people can make the active choice to recycle their gear.

Jennifer Stock:

Thanks a lot for taking those questions Dianna, I know this is a really challenging issue for those of us that absolutely love the ocean and the coast and this problem of plastic and gear in the ocean is huge, it's a national and international effort and there's so many questions of how do we solve those problems, so thank you for your time today and talking a bit about this specific event that's tied to a much larger issue in terms of plastic and debris in the ocean, and we appreciate your time today

Dianna Parker:

Thank you so much for having me!

Jennifer Stock:

Thank you, and thanks to the callers calling in bringing up questions about marine debris and the ocean, and I'm going to look into the bioaccumulation in terms of radiation and I'll see if we can find some expert regarding that issue, but the matter of fact is that we know we have a lot of plastic in the ocean, this is a really tough issue in solving, and we have to look where we can touch on some individual behavior habits and join community and larger efforts to reduce our dependence on plastic for sure. In the meantime, stay tuned to the marinedebris.noaa.gov website for updated news about the marine debris related to the tsunami, there is an FAQ page on that website that you can learn about, based on the most available science, based on the partners they work with, working with the university of Hawaii quiet a bit, and putting out a great amount of effort in terms of science and keep updated on that and certainly if things change ill be bringing them up here on ocean currents because we want to keep an eye on our coastline.
Thank you again for tuning in to ocean currents, this is Jennifer stock, this show will be saved as a pod cast on the Cordell bank website. I'm going to wrap it up here, thanks for tuning in today to Ocean Currents.