

iTunicate Newsletter

First
Edition
Feb 2011



Plate Watch

There are fish in the sea better than have ever been caught

Old Irish Saying

What's new in Marine Invasive Species monitoring in Alaska

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It's been a busy year for marine invasive species monitoring in Alaska. With the discovery of the colonial tunicate *D. vexillum* (also known as rock vomit) at Whiting Aquaculture farm in Sitka in June of 2010, much work has been done to learn about the species life history traits (growth, reproduction, recruitment), and to determine the extent of its distribution in Alaska, including surveys of aquaculture facilities around the state, and a large scale plate survey of 10 additional sites in the Sitka area. So far, the tunicate has not been found in any other area outside of Whiting Harbor.

We welcomed two new platewatch monitors this year, Julie Matweyou in Kodiak and Kate McLaughlin in Chenega. Anna Carey is now assisting with monitoring in Valdez. In addition, contacts have been made in the far north to initiate monitoring there (see story on page 3).

Green crabs are making their way north. Canadian surveys last summer found them at 3 localities north of Vancouver Island in British Columbia. Thankfully, our monitoring program in Ketchikan has greatly expanded the number of green crab monitoring sites in South East. A new citizen



National Geo sunset in Sitka! If all sample sites could be so beautiful.

science effort involving tourists on tour boats is trapping for green crabs on a daily basis during the summer months. This effort was spearheaded by Gary Freitag at the Ketchikan Sea Grant Marine Advisory Office, and will likely expand to other areas next summer.

Tsunami debris coming to a shore near you

Ever wonder where all that stuff you find on the beach comes from? Some of it just might be from Japan, a result of the devastating earth quake and tsunami there a year ago. Due to the nature of ocean currents in the Pacific, the bulk of the tsunami debris is not expected on the west coast until 2013, but debris has already washed up in Oregon,

Washington and in Yakutat and Kodiak, Alaska. In Kodiak the floats that washed up have now been identified by experts as belonging to an oyster farm in Japan. Fortunately, very little was growing on the floats. This debris represents a possible route for invasive marine invertebrates to come to Alaska. To address this issue, SERC, along with Alaska Fish

and Game, National Marine Fisheries Service and Sea Grant Marine Advisory Program, have put together a protocol for handling marine invertebrates associated with the debris. If you see organisms attached to marine debris, please report it! The protocol for reporting organisms on marine debris is on page 2, and on our website at <http://platewatch.nisbase.org>

Special points of interest:

- Tsunami debris reporting form page 2
- Tunicate stew recipe page 6

Standard Protocol for Collection and Preservation of Non-native Species from Marine Debris

Didemnum vexillum *Botrylloides spp* *Botryllus schlosseri* *Carcinus maenas* *Ciona intestinalis* *Watersipora subtorquata*



non-natives invertebrate species targeted for watch in Alaska (info at <http://platewatch.nisbase.org>)

- 1. Photograph specimen.** Prepare a photo ID number (see 2nd photo above) with printer, indelible marker or dark pencil (**not pen**), including site code. Take close-up photo in water if possible.
- 2. Record Data.** Include the date, collector name, location, GPS, and Photo ID number on datasheet and upload locality information and presence/absence of invasives on the map: <http://g.co/maps/3eb8e>
- 3. Collect sample and preserve. (Optional)** Use > 3 parts 95% ethanol, 1 part specimen by volume (Everclear works if ethanol is not available), include photo ID no. described in 1. If sample not taken, please put in dumpster.
- 4. Submit photo.** with collection datasheet by email to Linda McCann: mccannl@si.edu, Tammy Davis: tammy.davis@alaska.gov, Gary Freitag: gary.freitag@alaska.edu, & Linda Shaw: linda.shaw@noaa.gov
- 5. Review.** photographs will be reviewed by panel above and appropriate response determined.
- 6. Response.** Initial identification is emailed to collector. **It is not possible to process all specimens, but novel and unconfirmed specimens may be requested by panel. Guidelines for shipping will be provided with requests.**

Collector's name/Contact information	Date
GPS coordinates upload to map at http://g.co/maps/3eb8e	City, State, Zip
Specific Location (Dewey beach, marina, etc)	Substrate (buoy, line, etc)
Photo ID Number including site code below or make your own. Example: BE1, BE2	Identification/Description of specimen (color, feel, etc)
Sample taken? Yes or No	

Site Codes: **AK:** Chenega-CH, Dutch Harbor-DH, Glacier Bay-GB, Homer-HO, Ketchikan-KE, Kodiak-KO, Petersburg-PE, Seldovia-SL, Seward-SE, Sitka-SI, Valdez-VA. **BC:** Prince Rupert-PR. **CA:** Berkeley-BE, Morro Bay-MO, Richardson Bay-SA.

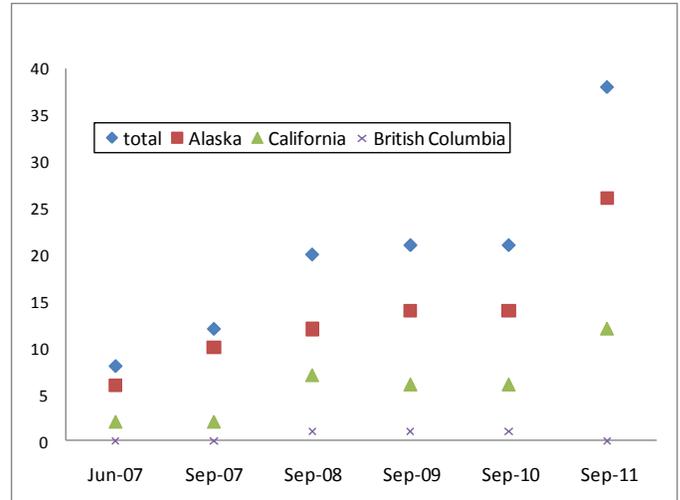
When debris is found, please record as much information about your find as possible. If the structure is wood, look for holes made by boring animals such as barnacles, clams and marine worms. Photos and removal of organism are first priority. If you have questions contact Linda McCann or Tammy Davis or another panel member above.

The monitoring network turns 5

The Platewatch monitoring Program began in June of 2007 when our first volunteers put out plates to collect Botryllids at 8 different sites! Since then, we've expanded the number of sites, run an Invasive Species Bioblitz and taught lots of people about invasive tunicates. This year we will focus on reaching more remote northern sites in Alaska and monitoring for additional invertebrate species. Several species present in the lower 48

are making their way north and may appear in Alaska at any time. Non-native species on the west coast that are capable of withstanding the harsh conditions in Alaska include the tunicates *Ciona intestinalis*, *Ciona savignyi*, *Styela clava* and *Didemnum vexillum*, the bryozoan *Watersipora subtorquata*, the European green crab *Carinus maenas*, and the Japanese kelp *Undaria pinnatifida*. Monitors will be given information on all of these species.

Sampling Sites Monitored since 2007

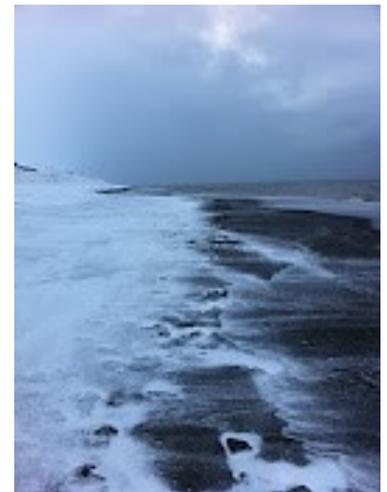


Sampling in the Arctic Circle

At this time of year, Barrow is covered in ice with temperatures below 0°C on a regular basis (today, Feb 1, it's -30°C). The coastline is structure-less, the presence of ice 9 months out of the year precluding the construction of any permanent docks in the water. The challenges of sampling in such an environment are considerable. But this summer, armed with a specially designed sled (pictured at right) to hold our collecting plates, Gary Freitag made his way to Barrow to test our luck. The sled was deployed in shallow water and anchored to the shore by a line.

Unfortunately, a storm threw the sled up on the beach before we were able to retrieve it. We gained valuable information from the trip about the logistics of sampling in the far north and we made important connections with the staff of the Barrow Arctic Science Consortium (BASC) and the school system there. A lecture about our program and the potential link between invasives and climate change, given to the Barrow community by our post doctoral fellow, Andy Chang, can be viewed at: <http://bit.ly/ylRihr>

With the onset of global warming, and the opening of new northern shipping routes through the Arctic, the likelihood of new invaders making their way to the north could increase dramatically. Yet, little information exists on the marine communities there. Establishment of a monitoring program in the Arctic could help the scientific community gather valuable baseline information, while serving as an early warning system for new invaders. We will continue to work on monitoring options for the Arctic regions.



Chukchi Sea



Sled designed for polar sampling. Photo: Gary Freitag



Andy Chang on the Chukchi Sea, Barrow. Photos: Andy Chang



Botryllus schlosseri close up showing flower-like pattern of zooids. Photo: Patrick Lee



Botrylloides violaceus overgrowing a farmed oyster near Ketchikan. Photo: Gary Freitag



Molgula citrina. Photo: Gretchen Lambert

Portrait of an invader

One of the most beautiful invaders, *Botryllus schlosseri* can be identified by the lovely flower like appearance of its zooids. Often two toned, its color ranges from black and white to shades of orange and red. A native of Europe, it was first noted on the west coast in San Francisco Bay, California in the 1940s. It is tolerant of a wide range of salinities (14-44 ppt) and is now distributed up and down the west coast. In Alaska, this species was first

recorded in 2001 in plate surveys in the Sitka area. Most recently it has been found in Ketchikan, Alaska by our plate-watch monitor, Gary Freitag. So far it has only been found on a barge towed on site for the new Ketchikan Mariculture facility, though it appears not to have arrived with it. Divers removed it from the barge and we will monitor adjacent structures for any signs of the species. The adjacent dock is one frequented in the summer

months by large sailing vessels from the lower 48. Like other tunicates, the larvae of *Botryllus schlosseri* are short lived in the water column, so that they must hitch a ride on something or someone in order to be moved any great distance. The species probably arrived with oyster aquaculture or on the bottom of boats. It has been identified on the hull of recreational vessels in different regions of the world, including British Columbia, Canada.

Botryllus schlosseri

Portrait of an invader

Often bright orange in color, *Botrylloides violaceus* has become a common sight on the U.S. west coast on hard surfaces. A native of China and Japan, it appeared on the west coast in the 1970s in San Francisco, California, and Willapa Bay and Puget Sound, Washington. This species was first recorded in Alaska in 1999 in plate sur-

veys in Tatitlek. Surveys over the following 3 years showed that the species was also present in Kachemak Bay, Sitka and Ketchikan. Interestingly, it has not been found in Kachemak Bay since its initial discovery in 2000. This species can grow fairly rapidly and is now quite abundant in Sitka and Ketchikan. It is unique in

the family in having very large larvae, about the same size as the zooids, making it easy to identify if one knows what to look for. Like its relative, *Botryllus schlosseri*, the species probably arrived to the west coast on the hull of a ship or via aquaculture activities, possibly with the culture of Pacific oysters.

Botrylloides violaceus

Portrait of an invader?

Like the other members of the Molgulidae family, *Molgula citrina* looks much like a dirty grape with siphons! A widely dispersed species in polar regions, it was first described in Alaska in 2008, from Seldovia, Kachemak Bay, Alaska. Genetic data has confirmed that it is identical to the east coast

species, suggesting that it may be non-native on the west coast. Since the species is easily confused with other *Molgula* including *M. pacifica* and *M. retortiformis* (both present in Alaska), and prevailing ocean currents are in the opposite direction for what one would expect for natural transport, it

Molgula citrina

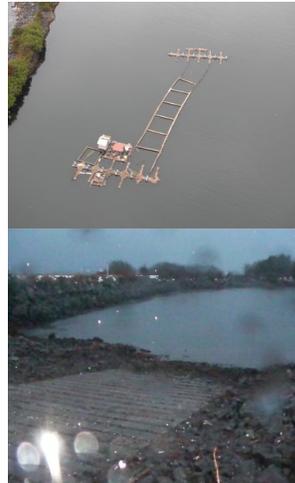
is unclear whether this is a new invasion or a native species that has just been overlooked. Museum specimens from Alaska collected in the early part of the century that may be *M. citrina* are currently being examined by a taxonomic expert, so the jury is still out on the native range of this species!

Portrait of an invader *Didemnum vexillum*

Didemnum vexillum, also known as rock vomit in some circles, is a fast growing tunicate native to the western Pacific that has spread to many temperate regions of the world, including New Zealand, the US and Europe. It forms extensive mats, that can be meters to kilometers in length. Though it occurs most often in shallow near shore areas, it also occurs at depths up to 81 meters. This tunicate species can spread rapidly, covering both man made and natural substrates. Given its ability to overgrow many species, it can have dramatic impacts on local marine ecosystems. A case in point is its extensive coverage of bottom habitat in Georges Bank on the east coast, one of the most important fishing grounds in US waters.

The first record of this species on the west coast was in San Francisco, California in 1993. Since then, it has been found as far south as San Diego, California, north to British Columbia and most recently,

Alaska. It was first documented in Alaska at the aquaculture farm in Whiting harbor, just outside of Sitka in the summer of 2010 during an Invasive Species Bioblitz. There is anecdotal evidence to suggest it arrived years earlier and was fouling a previous aquaculture farm there. This is currently the only known locality north of Vancouver, British Columbia. Since it's discovery, efforts have been underway to determine the full extent of the infestation and to test effective control methods. Unfortunately, this past fall, a severe storm hit the Sitka area and tore up the Aquaculture farm, potentially dispersing the species out of the Harbor. The Sitka community responded rapidly, working to remove the remaining parts of the farm and disposing of any pieces that had washed up. A protocol was put in place to deal with any additional debris that may wash up over the coming year (see page 2 for the protocol).



The Whiting Aquaculture Farm before and after the October 2011 storm in Sitka. Photos above left: Coast Guard and Tammy Davis, Alaska Fish and Game respectively.



***Didemnum vexillum* on aquaculture nets in Whiting (above right). Hard to imagine anything in that net was alive! A quick look inside suggested the oysters were dead. The tunicate grows very rapidly (cms/day) and can cover most anything! Photos above right: Linda Shaw NMFS**

Volunteers make it happen

Invasive species in marine environments have a lot of territory in which to hide on, the sea floor, boats, docks and other man-made structures. Alaska alone has over 70,800 km of coastline! That's where our volunteers come in. With their help, we are able to monitor a much larger area and

gain valuable information about coastal environments in Alaska. We welcome folks of all ages and backgrounds. All you need's enthusiasm and a willingness to get wet. If someone you know is interested in helping out, they can email me at mccannl@si.edu.

Photo: Katharine Miller



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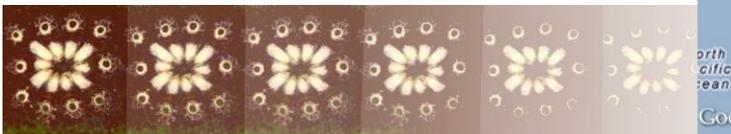
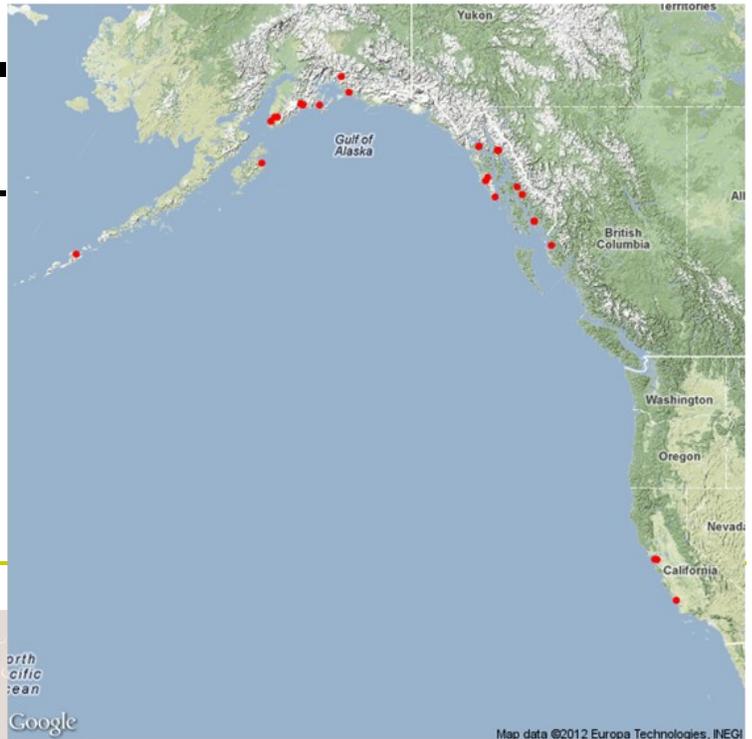
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We're on the web

<http://platewatch.nisbase.org>



Smithsonian Environmental
Research Center



Tunicates for lunch!



Styela clava in Washington state. Photo: Janna Nichols
Recipe at: <http://english.triptokorea.com/english/viewtopic.php?t=4251>

We are a group of concerned citizens and scientists working to safeguard our marine environment. We are monitoring for invasive species at sites up and down the west coast. The graph below shows the bays where monitoring has occurred since 2007. We'd like to expand our coverage to increase our likelihood of detecting non-native species. If you or someone you know might be interested in participating, we'd love to hear from you. Contact Linda McCann for more information about joining the network (mccannl@si.edu).

If you sit down to lunch in Korea, China or Japan, you may be surprised by what's on the menu. All kinds of invertebrates are traditionally eaten for protein in Asia, including many insects, and in the marine world, urchin eggs, sea cucumbers and tunicates are considered delicacies! For the adventurous at heart, try this recipe for Korean **Mideodok-chim** using a tunicate common on the west coast, *Styela clava*.

3 Tbsp rice, 100 g mideodok (*Styela*), 100g beef, clam meat, 100 g watercress, 200g bean sprouts, 1 onion, 5 young green peppers, 50 g bang-a leaves, 1/2 cup water, 3 Tbsp Perilla or mint powder, 3 Tbsp

red pepper, 3 Tbsp salt, 1 Tbsp green onion, 1 garlic clove

Directions

1. Wash rice and soak. Mix with red pepper and grind in a blender, strain in a sieve
2. Remove tunicate outer tunic and rinse insides thoroughly.
3. Trim watercress to use only the stems. Cut to about 4 cm
4. Trim bean sprouts, wash and boil in salted water
5. Shred beef and clam meat and stir fry in a pot
6. Steam tunicate well, add other ingredients continue steaming. Add rice mixture to thicken. Serve over noodles topped with beef and clam.