KACHEMAK BAY RESEARCH RESERVE

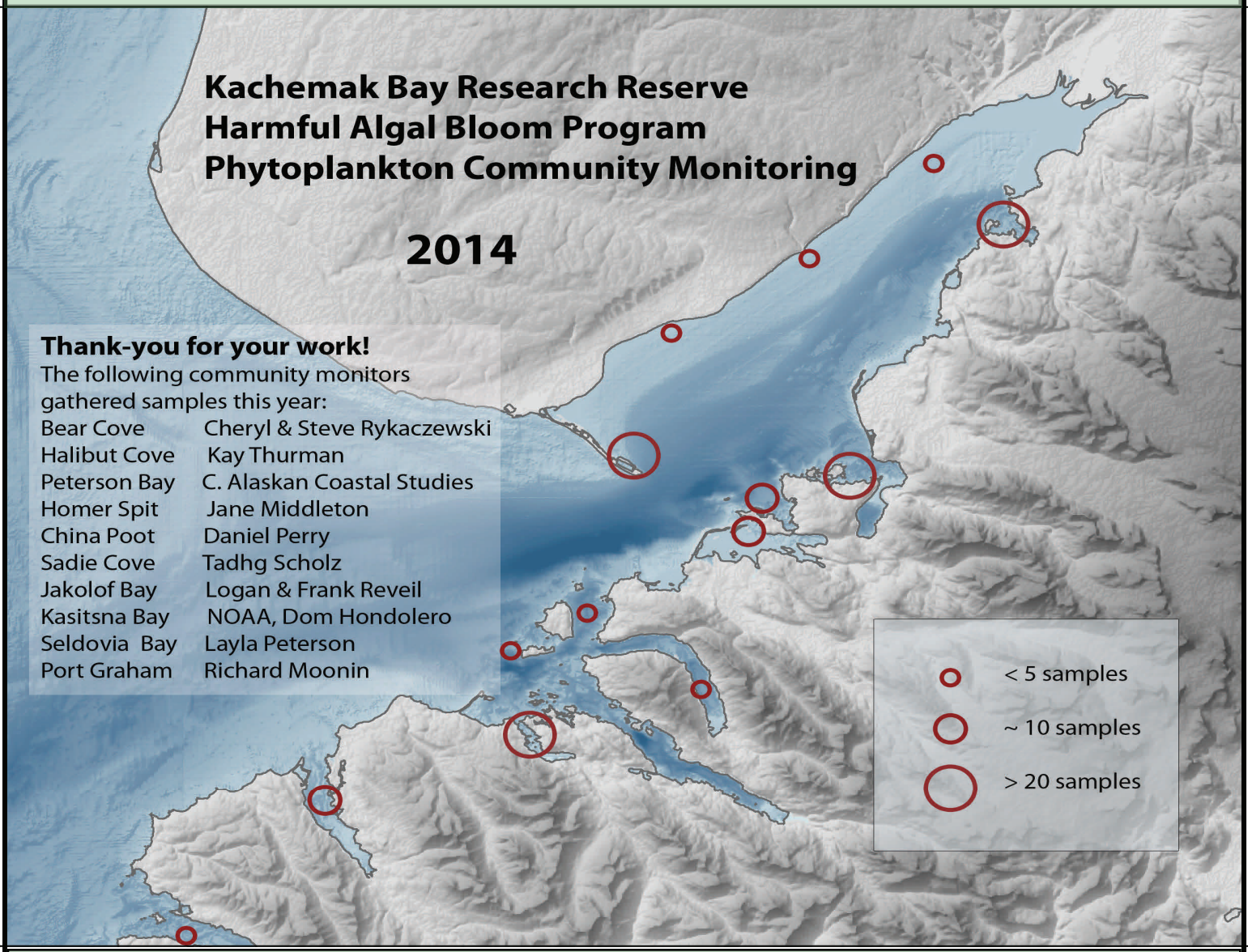
Harmful Algal Bloom Monitoring

2014 Progress Report

The main goal of the Harmful Algal Bloom monitoring program is to look for groups of phytoplankton that are known to carry toxins that can result in shellfish poisoning. We are part of the national Plankton Monitoring Network and we depend on training and expertise from both the Charleston and Beaufort NOAA labs.

No toxic blooms were detected in 2014.

185 samples were collected from 15 sites by 10 community monitors and KBRR staff.



Kachemak Bay Research Reserve

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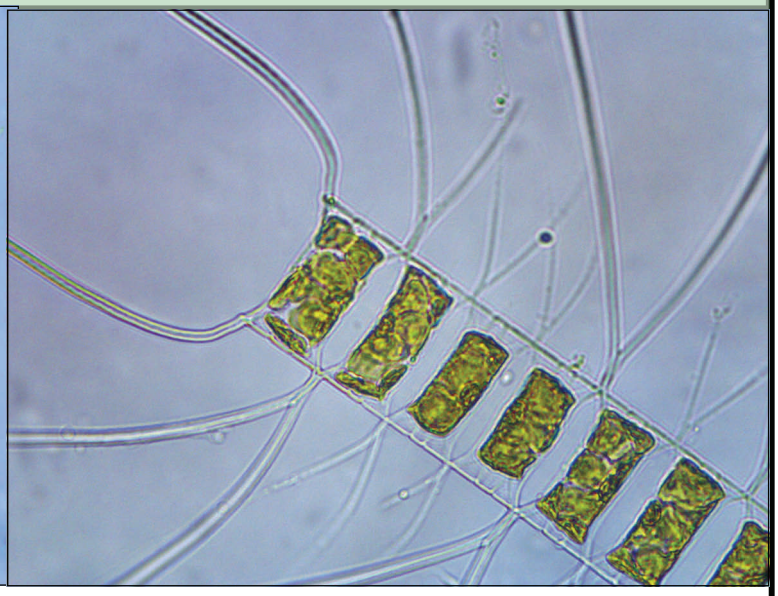
2014

What is a Bloom?

Phytoplankton blooms are a common phenomenon in the ocean. They are caused by many different kinds of microscopic plants that float in the upper, sunlit layers of water. When large numbers of colored phytoplankton are concentrated in one area, the color of the water can change. Large blooms are part of every summer in our thriving Kachemak Bay and fortunately are rarely toxic. Below are photos of the cells from our largest blooms this summer.

A new player this summer, *Cerataulina* sp.



Chaetoceros sp. with green chloroplasts.

The next page is a rough overview of what our phytoplankton timing looks like over the course of a year. This 'phenology' chart doesn't say anything about how **much** plankton there was, but it tells us which group dominated the Kachemak Bay waters and when.

The top color bar is the outer bay (west of the Homer spit) and it is interesting to compare it to what was going on in the inner bay (Homer spit and east) in 2014…(We are finding that the sub-bays in the inner bay all do pretty much the same thing as far as phytoplankton blooms. Our major sampling sites of Jakolof and Seldovia in the outer bay look very similar to each other as well.)

Question...where is the change from inner to outer bay? The Spit and the discharge of the Wosnesenski River are both huge physical barriers… but does the phytoplankton in Eldred Passage look like Jakolof? If you know anyone in that area that might want to join the monitoring team, have them give me a call!

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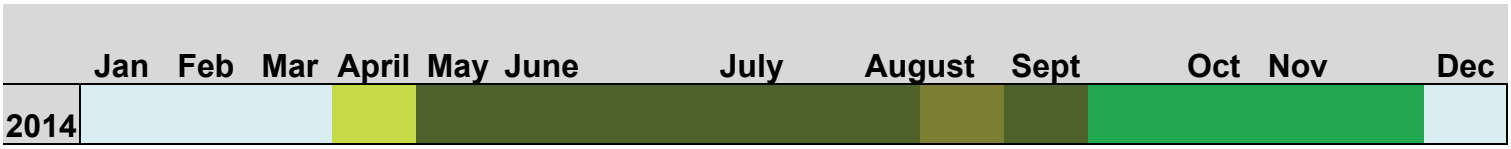
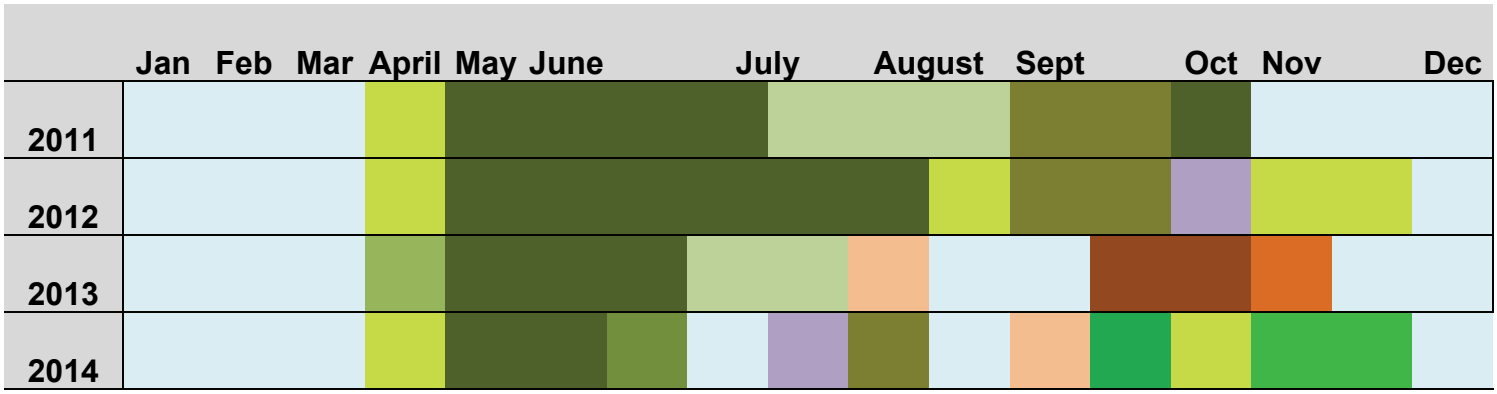
Outer Kachemak Bay 2014 Dominant phytoplankton groups



Inner Kachemak Bay 2011-2014 Dominant phytoplankton groups



Dinoflagellates

- dinoflagellate mix
- Ceratium furca
- Karenia mikmotoi

Diatoms

- *Chaetoceros*
- *Cerataulina*
- *Leptocylindrus*
- *Pseudo-nitzschia*
- *Rhizosolenia*
- *Skeletonema*
- *Stephanopyxis*
- *Thalassiosira*
- Diverse diatoms

low levels of phytoplankton

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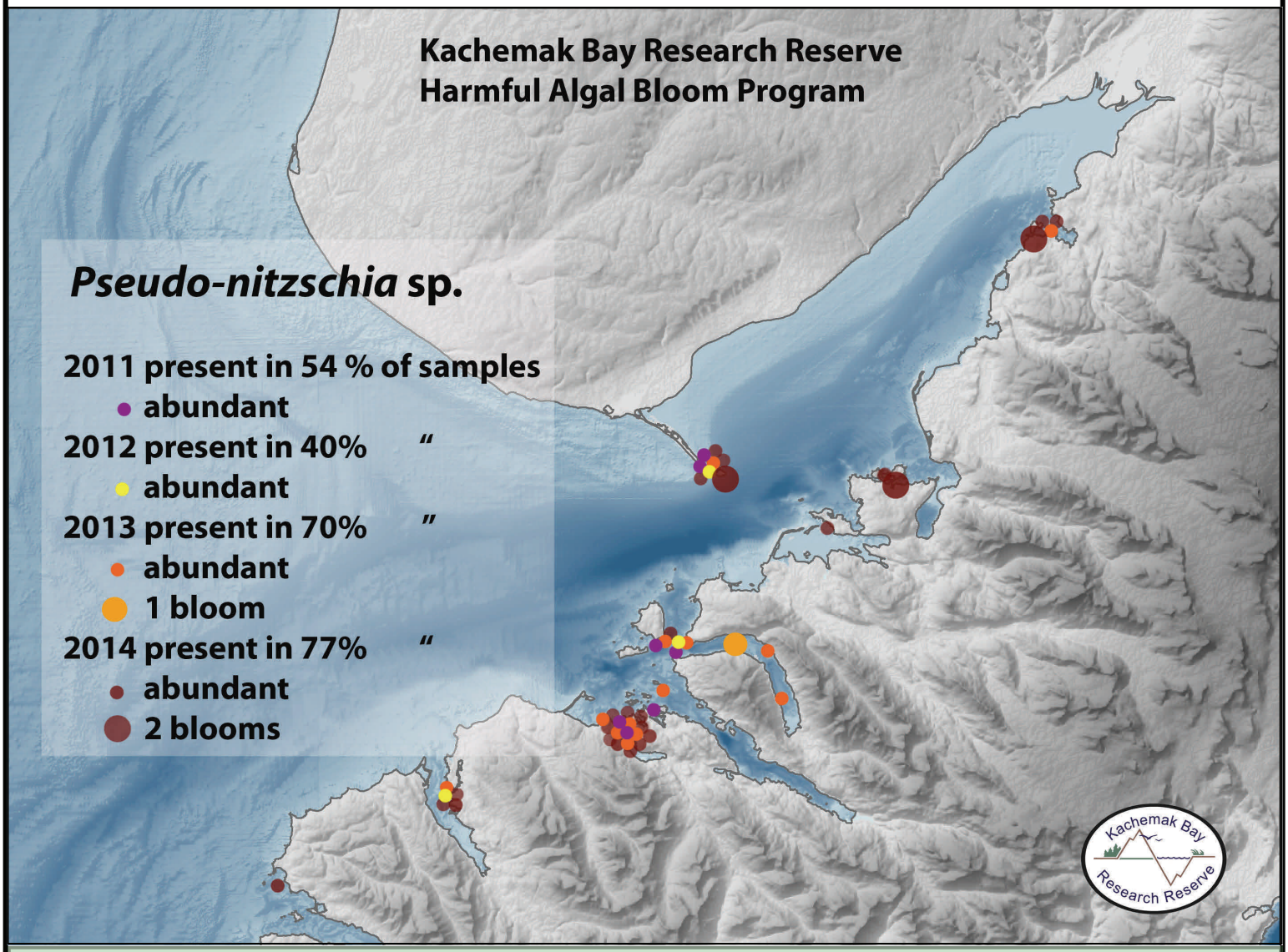

Where have we seen *Pseudo-nitzschia* sp. ?

This map shows where we have spotted an abundance or a bloom of *Pseudo-nitzschia* sp. cells in the past four years of sampling. This diatom, whick can cause Amnesic Shellfish Poisoning, was seen at "abundant " levels more often in 2014 than previous years. We sent in a sample from one of the blooms we had this summer and the results came back saying that toxicity was below detection level. Some scientists think that bacteria attached to the cells are really the source of, or catalyst for, the toxin. Remember that different sites are sampled at different frequencies. Refer to first page to see which sites get sampled the most.

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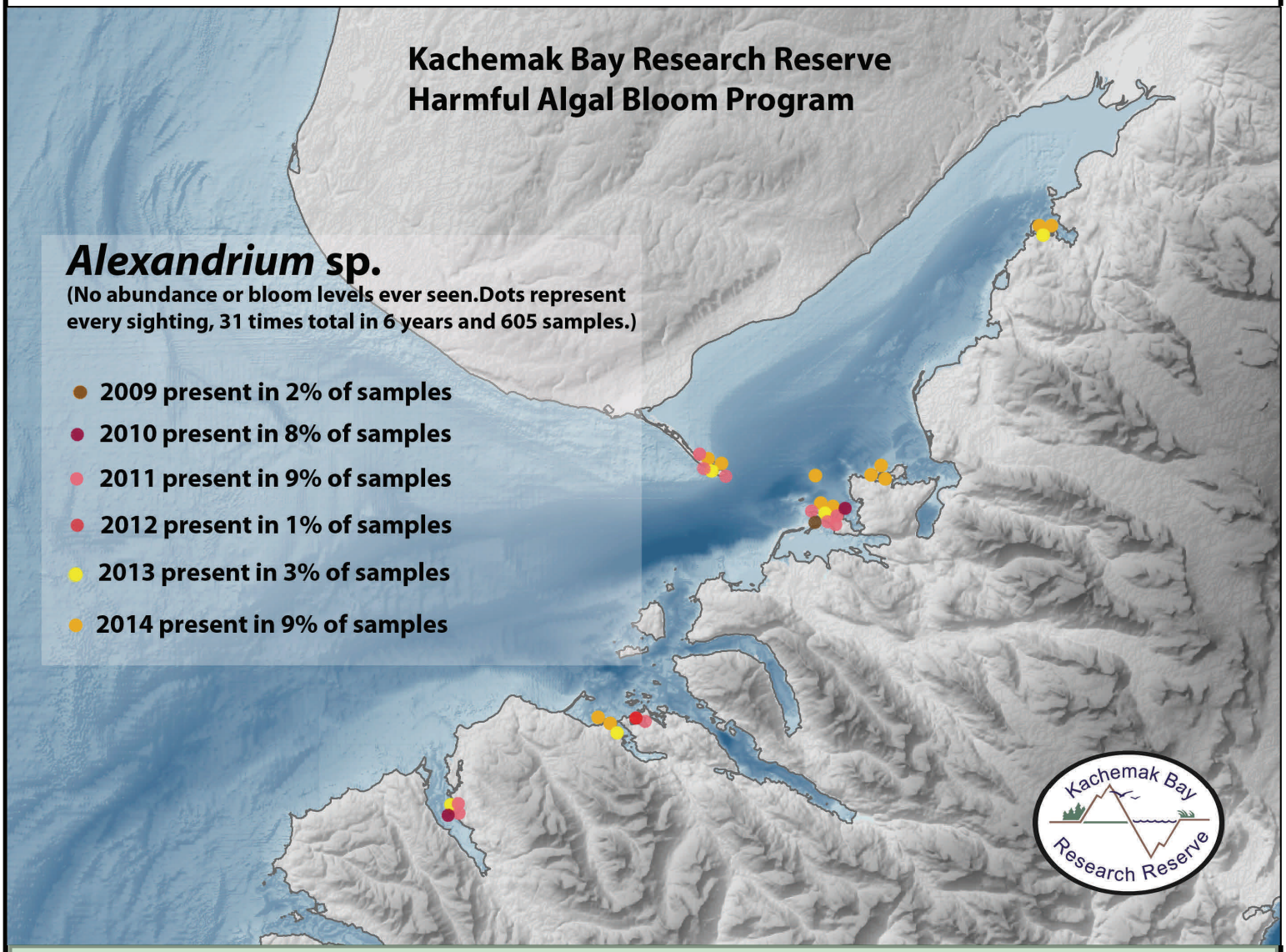

Where have we seen *Alexandrium* sp.?

We made this map to see if there were any patterns or hot spots for the relatively few times we have seen *Alexandrium* sp. cells in our samples. This map shows that we find *Alexandrium* sp. cells throughout our sampling area and not in just a few locations. These dots do not represent an abundance but only sightings of a few cells. We also sent in a 2014 sample to be tested for saxitoxins, which causes Paralytic Shellfish Poisoning, and fortunately, it came back with very low toxicity.

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Counting phytoplankton cells.....really?

Yes, this is really something people do! If you want to know how MANY cells are in the water you have to count them and you also have know exactly how much water those cells are in. This gives you the standard unit of measure in this field; cells/liter. What kind of information can counting cells give you? Well, you have a better idea of the density of a bloom. This is important with toxic events. You also end up with a concrete number to use to compare with another study or water body. Counting is very time consuming and we are so fortunate to have a college intern making this project possible this year! With this information we will be able to combine our results with other studies in Kachemak Bay by Gulf Watch Alaska and Alaska Dept of Fish & Game. We will also be able to compare, for example, Bear Cove to Peterson Bay.

Ryan Ward, an undergraduate at the University of North Carolina at Willmington, is spending this semester at UAA, Kachemak Bay Campus with the **Semester on the Bay** program. He has dedicated 20 hours/week to counting!!!

The 2014 Phytoplankton Conference was held last February. Key goals were created by consensus. Here are some action items that we have worked together to accomplish since the conference:

Create a database for all local phytoplankton studies:	
Research existing databases.	Done
Identify database needs.	Done
Determine resources for creation.	Done
Create database	winter '15
Populate database	summer '15
Maintain database	2015.....
Information sharing:	
Coordinate 2014 summer sampling.	Done
Conduct one day sampling blitz.	Done
Hold spring training in identification.	Done
Hold August training on counting.	Done
Send out bi-monthly phyto updates.	Done
Update KBRR phyto guide	underway
Toxic Event Response:	
Refine toxicity concentration levels.	Done
Create flow chart for communication.	Done

Lots more on the list, but great work on getting this far!!!

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