

What's Blooming in Budd in 2024?

Location: Port Plaza Dock (near Farmer's Market)

Date: Thursdays (June 20 – September 5)

Time: 10 AM – 12 PM

This summer, PSI will sample weekly at Port Plaza, Budd Inlet, thanks to generous funding from Stream Team and the Inspire Olympia Fund! Come join us! Everyone is welcome!

PSI will have water quality equipment, plankton nets, and microscopes available for plankton viewing and identifying harmful algal bloom (HAB) species for NOAA's [SoundToxins](#) program. As always, you may check here weekly to view data, photos, videos, and a commentary on our sampling experience.

Every week, plankton communities change. Every week, we see something new!

We would love to see you on the dock or hear from you! Contact us anytime with your burning plankton questions, or to arrange for group presentations.

Mary Elizabeth maryelizabeth@pacshell.org & Aimee Christy, aimee@pacshell.org



June 20, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 3.2 meters

Blooming Phytoplankton Species: *No blooming species.*

Common Phytoplankton Species: *Pleurosigma/Gyrosigma, Noctiluca*

Zooplankton: bivalve larvae, copepods, larvaceans, polychaete larvae, rotifers, crustacean nauplii, tintinnids, barnacle larvae, ciliates

Harmful Algal Bloom (HAB) Species: *Pseudo-nitzschia* (6 cells/L), *Dinophysis sp* (6 cells/L), *Akashiwo sanguinea* (6 cells/L)



	Surface	1.5m	3.0m
Temp (°C)	17.1	15.7	13.9
Salinity (ppt)	14.92	27.49	28.4
Oxygen (mg/l)	7.06	6.92	5.92
pH	7.63	7.71	7.67

What an amazing kick-off to the What’s Blooming in Budd summer season. Thank you, Jeanne Koenings and Mia Widrow (Olympia HS intern), for volunteering to educate folks about plankton and Budd Inlet water quality! We had 66 visitors swing by the table to peek through the microscopes, including campers from Olympia Community Sailing and out-of-town guests from Colorado, Florida, and Humboldt County!

The zooplankton were the stars of the plankton today – plenty of action from the copepods, larvaceans, and rotifers. Our timing hit peak low tide (-2ft), dropping surface salinities and reflecting the lower dissolved oxygen and pH levels measured directly off-bottom a 10-foot depth. The tide was so low that you could see TONS of sea stars and plumose anemones! So amazing! Kids kept themselves very busy attempting to catch sticklebacks and ctenophores.



From left to right: *Noctiluca* (dinoflagellate), *Fragilaria*, *Asterionella*, *Pleurosigma/Gyrosigma*(diatoms)

June 27, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 3.4 meters

Blooming Phytoplankton Species: *Small species of Chaetoceros.*

Common Phytoplankton Species: *Lauderia, Noctiluca, Ceratium fusus, Scrippsiella*

Zooplankton: copepods, polychaete larvae, rotifers, crustacean nauplii, tintinnids, ciliates

Harmful Algal Bloom (HAB) Species: *Pseudo-nitzschia* (12 cells/L), *Dinophysis sp* (30 cells/L), *Noctiluca* (429 cells/L)



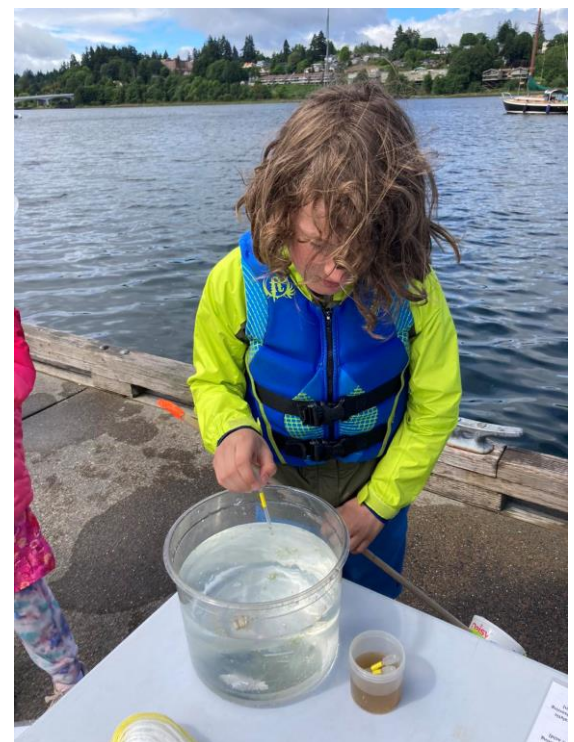
	Surface	1.5m	3.0m
Temp (°C)	ND	ND	ND
Salinity (ppt)	27.77	28.55	28.72
Oxygen (mg/l)	9.22	8.23	8.37
pH	8.02	7.96	7.98



Today's "What's Blooming in Budd?" started off overcast & windy, but lucky for us, the wind helped our [#olympiacomunitysailing](#) campers make record time to the dock. The campers helped us gather our plankton sample and YSI data before heading to their land-based activities. Thank you, campers!

There are still plenty of Zooplankton dominating the sample with polychaetes, larvaceans, and rotifers. Thank you to our very hardy volunteers Jeanne & Roberta for sticking out the morning! The sun did come through and made 99 visitors very appreciative of a gorgeous day on the dock.

Thank you, Inspire Olympia, StreamTeam, and Rose Foundation for supporting these fun and educational events.



July 3, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 4.5 meters

Blooming Phytoplankton Species: *Ceratium fusus*

Common Phytoplankton Species: *Lauderia*, *Noctiluca*, *Scrippsiella*, *Heterocapsa*

Zooplankton: copepods, polychaete larvae, rotifers, crustacean nauplii, tintinnids, ciliates, tiarina, larvaceans

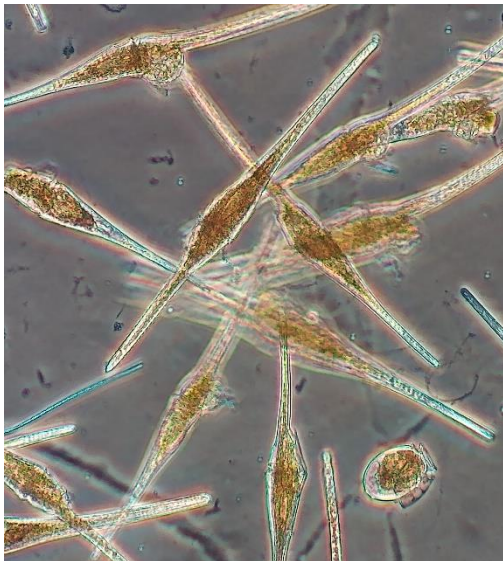
Harmful Algal Bloom (HAB) Species: *Pseudo-nitzschia* (83 cells/L), *Dinophysis sp* (185 cells/L), *Noctiluca* (482 cells/L), *Akashiwo sanguinea* (18 cells/L).



	Surface	1.5m	3.0m
Temp (°C)	18.10	16.10	15.10
Salinity (ppt)	26.32	27.98	28.43
Oxygen (mg/l)	9.14	10.95	10.89
pH	7.90	8.10	8.12

PSI staff are enjoying the July 4th holiday this week, so no official “What’s Blooming in Budd?” event took place at Port Plaza this week. Instead, I collected a quick sample on July 3rd.

Ceratium fusus was certainly blooming and we observed the highest species richness of the season – a whopping 45 species (20 diatoms, 15 dinoflagellates, and 10 zooplankton species).



Ceratium fusus with a small *Dinophysis acuminata*



Noctiluca scintillans



Dinoflagellates like this *Scrippsiella* were common

July 11, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 1.75 meters

Blooming Phytoplankton Species: *Ceratium fusus*

Common Phytoplankton Species: *Lauderia*, *Noctiluca*, *Scrippsiella*, *Heterocapsa*, *Akashiwo*

Zooplankton: copepods, rotifers, crustacean nauplii, tintinnids, ciliates, tiarina, larvaceans, barnacle nauplii, nematodes, eggs

Harmful Algal Bloom (HAB) Species: *Pseudo-nitzschia* (95 cells/L), *Dinophysis sp* (214 cells/L), *Noctiluca* (327 cells/L), *Akashiwo sanguinea* (482 cells/L), *Protoceratium reticulatum* (24 cells/L).



	Surface	1.5m	3.0m
Temp (°C)	21.10	17.40	15.50
Salinity (ppt)	20.20	28.78	28.30
Oxygen (mg/l)	8.74	10.24	11.38
pH	8.00	8.07	8.18



Today’s “What’s Blooming in Budd” was a welcomed relief from the heat we have been having this week! A cool breeze swept across as visitors explored the dock. When participants gathered a secchi disc reading the water clarity was only 1.75m! We grabbed our plankton sample and observed a *Ceratium fusus* bloom in progress, a harmless phytoplankton typical of this time of year. Other species shown in the accompanying photo include *Dinophysis fortii* and *Noctiluca*

scintillans. Larger zooplankton species such as moon jellies and egg yolk jellies were plentiful!

It's incredible to see the change in phytoplankton blooms week to week.

July 18, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 2.1 meters

Blooming Phytoplankton Species: *Ceratium fusus*

Common Phytoplankton Species: *Noctiluca*, *Scrippsiella*, *Heterocapsa*, *Akashiwo*, *Cylindrotheca*, *Nitzschia acicularis*.

Zooplankton: copepods, rotifers, crustacean nauplii, tintinnids, ciliates, tiarina, larvaceans, barnacle nauplii, nematodes, eggs.

Harmful Algal Bloom (HAB) Species: *Pseudo-nitzschia* (179 cells/L), *Dinophysis sp* (48 cells/L), *Noctiluca* (476 cells/L), *Akashiwo sanguinea* (333 cells/L), *Protoceratium reticulatum* (24 cells/L), *Alexandrium sp.* (6 cells/L).



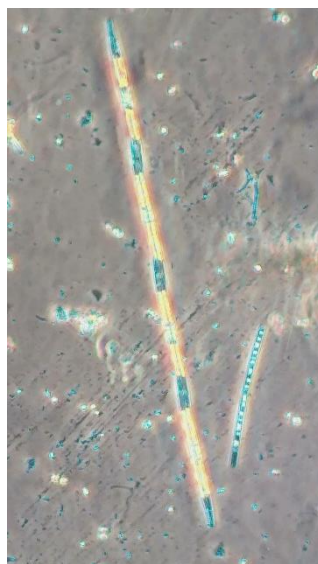
	Surface	1.5m	3.0m
Temp (°C)	20.60	18.60	15.50
Salinity (ppt)	26.75	28.07	28.50
Oxygen (mg/l)	10.77	11.14	7.31
pH	8.21	8.14	7.84

What a great day on the dock! There were lots of pulsing moon jellies and swimming nudibranchs at the surface. It was such a treat to have last year's Olympia HS intern, Shriya Prasanna, helping!

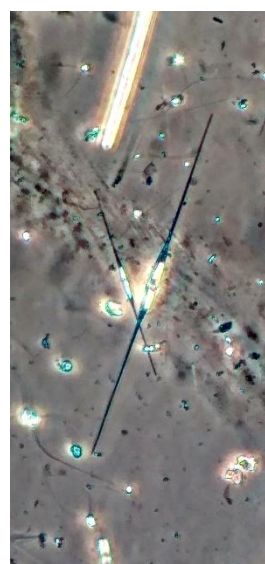
Similar to last week, species richness was very high. *Ceratium fusus* (which apparently underwent a recent name change to *Tripes fusus*) was blooming along with a sub-bloom of *Scrippsiella trochoidea*. *Noctiluca* was still common along with many slender diatom species including *Nitzschia acicularis* and *Cylindrotheca Closterium*. Zooplankton were zipping around all over the slides! So much life in Budd Inlet!! Here are some examples of a few long, skinny pennate diatoms from today's sample!



Nitzschia acicularis



Pseudo-nitzschia



Cylindrotheca closterium



Thalassionema nitzschioides

July 25, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 3.8 meters

Blooming Phytoplankton Species: *Ceratium fusus*

Common Phytoplankton Species: *Akashiwo*, *Cylindrotheca*, *Nitzschia acicularis*, *Dinophysis*.

Zooplankton: copepods, rotifers, crustacean nauplii, tintinnids, tiarina, larvaceans, eggs.

Harmful Algal Bloom (HAB) Species: *Pseudo-nitzschia* (220 cells/L), *Dinophysis sp* (1,399 cells/L), *Noctiluca* (95 cells/L), *Akashiwo sanguinea* (1,595 cells/L), *Protoceratium reticulatum* (30 cells/L), *Alexandrium sp.* (12 cells/L).



	Surface	1.5m	3.0m
Temp (°C)	17.40	16.70	16.10
Salinity (ppt)	26.26	28.38	28.77
Oxygen (mg/l)	7.24	9.03	8.06
pH	7.79	8.02	7.95

Thursday's 'What's Blooming' had a special blast from the past as former PSI educator Mary



Middleton joined us on the dock! We are so thankful to have had her expertise and enthusiasm for the day. Thank you, Mary! There was a constant flow of visitors and plenty of moon jellies in the water. The Sound Toxins net tow sample showed a significant increase in two Harmful Algal Bloom species: both *Dinophysis* (1399 cells/L) and *Akashiwo* (1595 cells/L). PSI alerted SoundToxins to the change and will be sampling again this Thursday for anyone who's curious about what this recent rain might do to alter the plankton community and what else is blooming this week!

Official SoundToxins YSI and plankton data collected on July 23rd.

August 1, 2024 – Budd Inlet, Port Plaza

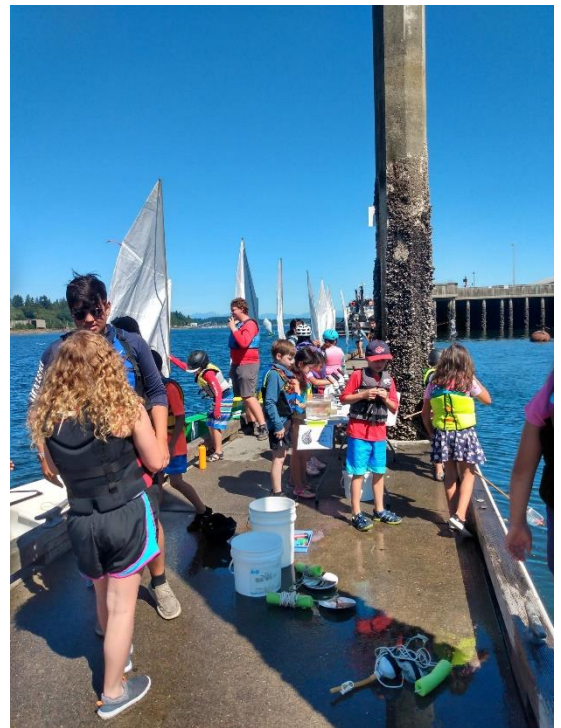
Secchi disk (water clarity): 5+ meters

Blooming Phytoplankton Species: *Ditylum brightwellii*

Common Phytoplankton Species: *Eucampia zodiacus*

Zooplankton: copepods, rotifers, crustacean nauplii, tintinnids, bivalve larvae, barnacle nauplii.

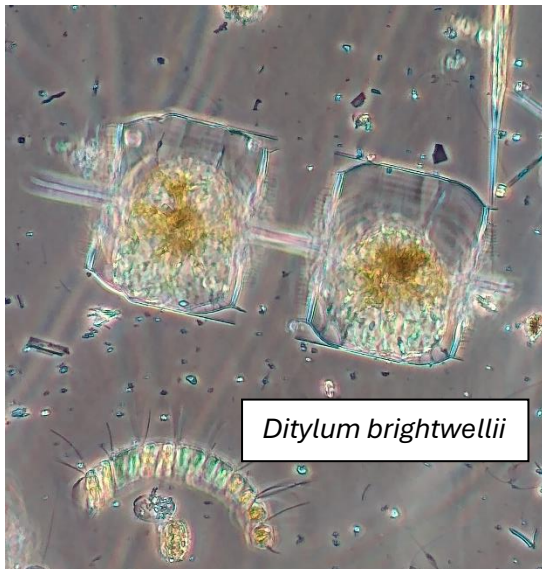
Harmful Algal Bloom (HAB) Species: *Dinophysis sp* (83 cells/L), *Noctiluca* (36 cells/L), *Akashiwo sanguinea* (6 cells/L).



	Surface	1.5m	3.0m
Temp (°C)	16.80	16.60	16.40
Salinity (ppt)	28.57	28.63	28.81
Oxygen (mg/l)	5.36	6.10	7.15
pH	7.61	7.75	7.90

Oh my gosh! So many enthusiastic campers today. We had 38 kids from Olympia Community Sailing camps alone visit the dock to learn about plankton and water quality. Thank you to Zoey, an Olympia HS student, and Jeanne for your help! The kiddos really kept us on our toes!

Last week’s rain and cooler temperatures completely changed the plankton community composition. Previously, the water was full of dinoflagellates with *Ceratium fusus* (now *Tripus fusus*) blooming and spikes of 2 HAB species: *Akashiwo* and *Dinophysis*. Today, most of those 3 species were gone and the diatom, *Ditylum brightwellii* was blooming. A complete plankton turnover! Who will dominate next week as temperatures crank up again? Stay tuned!



Official SoundToxins YSI data and plankton collected on July 31st.

August 8, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 3.5 meters

Blooming Phytoplankton Species: *Ditylum brightwellii*, *Akashiwo sanguinea*

Common Phytoplankton Species: *Eucampia zodiacus*, *Heterocapsa*, *Scrippsiella*

Zooplankton: copepods, rotifers, crustacean nauplii, tintinnids, polychaetes, larvaceans.

Harmful Algal Bloom (HAB) Species: *Dinophysis sp* (131 cells/L), *Noctiluca* (65 cells/L), *Akashiwo sanguinea* (613 cells/L), *Pseudo-nitzschia* (83 cells/L), *Protoceratium reticulatum* (89 cells/L).



Official SoundToxins YSI and plankton collected on Aug. 7.



	Surface	1.5m	3.0m
Temp (°C)	20.80	18.50	15.70
Salinity (ppt)	22.04	27.73	29.20
Oxygen (mg/l)	7.85	8.93	5.02
pH	8.02	8.04	7.70

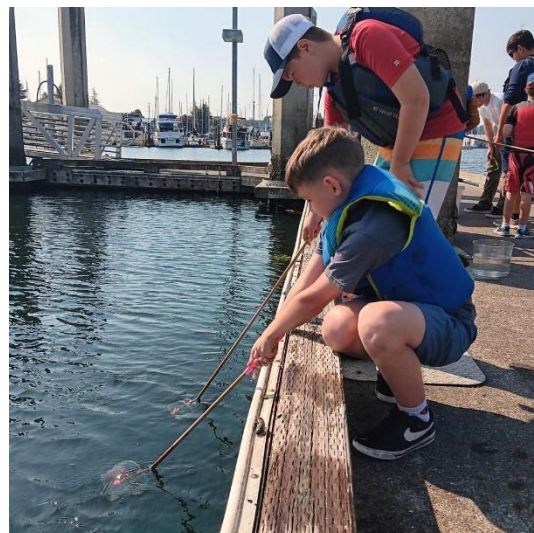
Man, did we have the dream team today! Jeanne Koenings and I were thrilled to welcome Max Wiecek and Malena Reyes, from WA Department

of Health’s shellfish program to "What's Blooming in Budd?"

Together, we shared with 90 visitors how SoundToxins phytoplankton monitoring and WDOH's routine shellfish biotoxin testing help us better understand harmful algal blooms and ensure that shellfish are safe to eat. Learn more at

<https://doh.wa.gov/.../recreational.../illnesses/biotoxins>

The plankton have been amazing after last week's rain/sun combo! A beautiful bouquet of diatoms, dinoflagellates, and zooplankton! Come join us next week to see what's blooming.



August 15, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 3.2 meters

Blooming Phytoplankton Species: *Ditylum brightwellii*

Common Phytoplankton Species: *Eucampia zodiacus*, *Skeletonema*, *Heterocapsa*, *Scrippsiella*

Zooplankton: rotifers, crustacean nauplii, tintinnids, polychaetes (lots), larvaceans, tiarina.

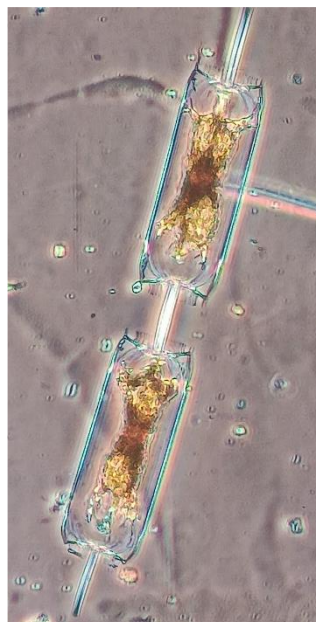
Harmful Algal Bloom (HAB) Species: *Dinophysis* sp (12 cells/L), *Noctiluca* (54 cells/L), *Pseudo-nitzschia* (613 cells/L), *Protoceratium reticulatum* (6 cells/L).



	Surface	1.5m	3.0m
Temp (°C)	16.80	15.90	15.60
Salinity (ppt)	25.72	29.00	29.09
Oxygen (mg/l)	3.05	4.09	4.45
pH	7.48	7.66	7.72

Thank you, Evie, Roberta and Jeanne for jumping in to host “What’s Blooming?” this week while the regular staffers were out on vacation and sick! We knew we were in great hands!!

This week, *Ditylum brightwellii* was blooming in robust concentrations. Many cells were actively dividing. This summer has been quite unusual in that the plankton composition is not dominated by the dinoflagellates, *Akashiwo* and *Ceratium*. Instead, the assemblages are rather diverse and water clarity has been very good around 3-meters. The oxygen/pH levels are surprisingly low this week suggesting that winds might be pushing up water from near the bottom of the inlet. Hopefully, this is temporary and values will increase next week. We’ll also keep an eye on the increasing *Pseudo-nitzschia* levels.



Thalassiosira & *Ditylum* (triangular when viewing straight down on the long, hollow tube (rimoportula) extending from each valve; *Ditylum* (rectangular from side/girdle view); polychaete larvae.

August 22, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 3.3 meters

Blooming Phytoplankton Species: *Odontella mobiliensis*, *Ditylum brightwellii*

Common Phytoplankton Species: *Ditylum brightwellii*, *Skeletonema*, *Scrippsiella*

Zooplankton: rotifers, tiarina, crustacean nauplii, polychaetes, larvaceans, copepods.

Harmful Algal Bloom (HAB) Species: *Dinophysis sp* (113 cells/L), *Noctiluca* (71 cells/L), *Pseudo-nitzschia* (869 cells/L), *Akashiwo* (185 cells/L)



	Surface	1.5m	3.0m
Temp (°C)	17.80	16.50	15.80
Salinity (ppt)	22.35	29.01	29.28
Oxygen (mg/l)	7.06	7.88	6.22
pH	7.83	7.96	7.82



Official YSI and plankton data collected on Aug 20th.

The plankton assemblage was incredibly diverse this week! The combination of rain, nutrients and sunshine really resulted in a rich plankton community. The diatom, *Odontella mobiliensis*, was blooming with a sub-bloom of *Ditylum brightwellii*. Large centric *Coscinodiscus* were common as well as a mix of dinoflagellates including *Akashiwo*, *Heterocapsa*, *Scrippsiella*, *Protoperidinium*. The zooplankton were lively, especially the larvaceans, tiarina, tintinnids and polychaetes (so many!). My daughter took a picture of an adult polychaete worm while she was working at a local shellfish farm this week. The closeup of the head is unbelievable!!! So cute!!!

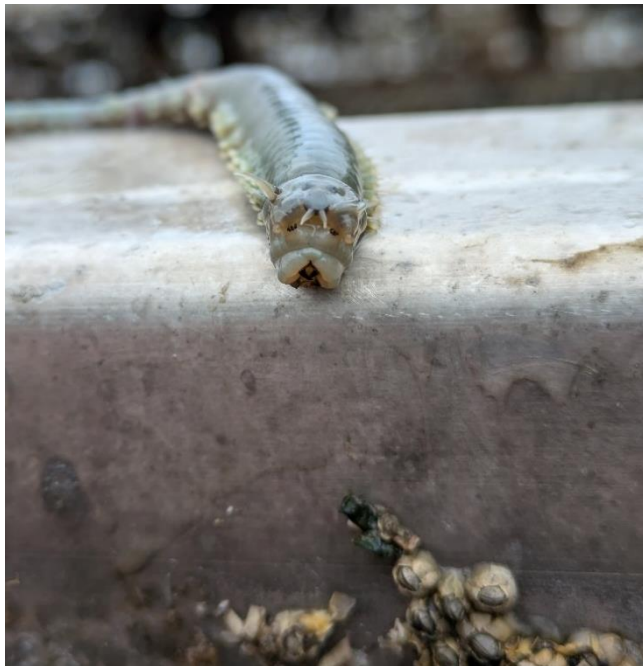


Photo credit: Samantha Christy

August 29, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 3.5 meters

Blooming Phytoplankton Species: *Odontella mobiliensis*,
(*Akashiwo sanguinea* the following day)

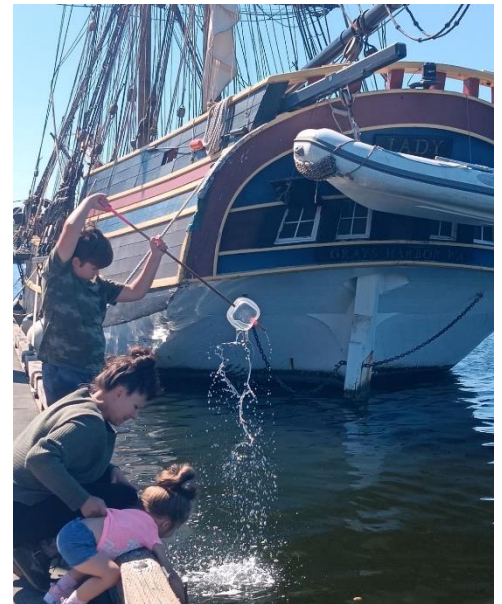
Common Phytoplankton Species: *Eucampia*, *Scrippsiella*.

Zooplankton: rotifers, tiarina, bivalve larvae, polychaetes, larvaceans, ctenophore larvae, tintinnids.

Harmful Algal Bloom (HAB) Species: *Dinophysis sp* (18 cells/L), *Noctiluca* (345 cells/L), *Pseudo-nitzschia* (18 cells/L), *Akashiwo* (310 cells/L).



	Surface	1.5m	3.0m
Temp (°C)	17.10	16.30	15.50
Salinity (ppt)	22.07	28.69	29.31
Oxygen (mg/l)	7.47	6.70	5.90
pH	7.79	7.80	7.80



Official SoundToxins YSI and plankton data collected August 28th.

What an incredible way to head into a beautiful long weekend-

Thursday’s “What’s Blooming in Budd?” was absolute perfection. Many visitors from across the nation and lots of Olympia locals were thrilled to spend some time on the dock leading up to Harbor Days. We were lucky enough to be stationed right next to the beautiful tall ship Lady Washington. The water was warm and clear!! One participant read 5-m visibility on the secchi disc. The plankton was sparse but had a lot of biodiversity.

Zooplankton: Rotifers, Larvaceans, Bivalve larvae, Crustacean nauplius, Ctenophores and Jellies.
Phytoplankton: *Coscinodiscus*, *Scrippsiella*, *Eucampia*, *Ditylum*, *Heterocapsa* and *Protoperidinium*.

HABs: No noted species of human health concern. We did have a surprising increase (from only one day prior) in the presence of *Akashiwo sanguinea*, a species associated with shellfish mortality events. We are looking forward to seeing how this bloom progresses.



September 5, 2024 – Budd Inlet, Port Plaza

Secchi disk (water clarity): 4.5 meters

Blooming Phytoplankton Species: *Skeletonema*, *Scrippsiella*

Common Phytoplankton Species: *Akashiwo*, *Polykrikos*

Zooplankton: rotifers, tiarina, bivalve larvae, polychaetes (so many larvae!), larvaceans, copepods, crustacean nauplii.

Harmful Algal Bloom (HAB) Species: *Dinophysis* sp (12 cells/L), *Noctiluca* (95 cells/L), *Akashiwo* (417 cells/L).



	Surface	1.5m	3.0m
Temp (°C)	17.70	16.30	15.90
Salinity (ppt)	24.87	29.11	29.25
Oxygen (mg/l)	4.63	3.57	3.23
pH	7.55	7.56	7.60

Today is “back to school day” for most students, but we still had almost 80 visitors peek into the microscopes to discover What’s Blooming. The plankton were sparse, but after dragging the net through the water repeatedly, we had plenty of interesting species to look at. Lots of polychaete larvae in various stages of development. Plenty of long *Skeletonema* chains, *Polykrikos*, and *Akashiwo*. And check out this interesting water beetle that our young scientist scooped out of the water. I thought it was terrestrial at first, but it’s quite comfortable gliding through the water. Anyone know what this is?

Harmful Algal Bloom species were minimal. Back in the lab we only detected a few *Dinophysis* in our counting chamber. *Akashiwo* cells have also dissipated since last week.

While today is officially the last scheduled “What’s Blooming in Budd?” event for the summer, we may continue hosting events every Thursday as long as they’re well attended. We truly enjoy spending time on the dock and engaging in fascinating conversations with everyone that stops by.

A special thank you to Jeanne Koenings and Roberta Woods for volunteering their time this summer to help folks with the sampling equipment and microscopes. You are so appreciated!

