


Eyes Over Puget Sound

[Field log](#)[Water column](#)[Aerial photos](#)[Ferry and Satellite](#)

Surface Conditions Report

August 27, 2012

We have a new website ([take a look](#))

[Start here](#)

Up-to-date observations of visible water quality conditions in Puget Sound and the Strait of Juan de Fuca

Field log

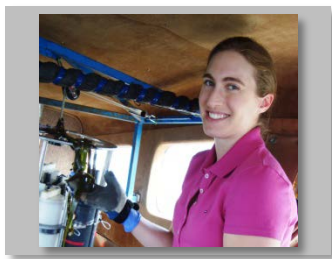
Water column

Aerial photos

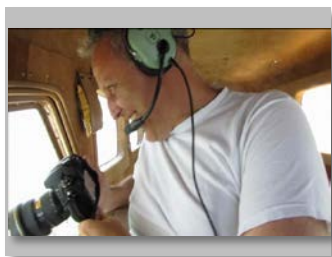
Ferry and Satellite

LONG-TERM MARINE MONITORING UNIT

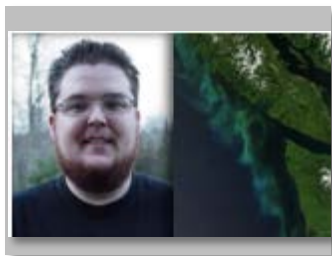
Laura Friedenberg



Dr. Christopher Krembs



Dr. Brandon Sackmann



Personal flight impression

[p. 3](#)

Jellyfish are on the loose in Budd Inlet, large vortex in Rich Passage.

Aerial photography

[p.5-23](#)

High abundance of marcoalgae aggregations in Central Sound. Red-brown blooms in South Sound Inlets and parts of Central Sound. Jellyfish patches numerous and increasing in size in Sinclair and Budd Inlets.

Ferry and satellite

[p. 24-26](#)

Low-Moderate fluorescence and turbidity in Main Basin and Admiralty Inlet. Temperatures in Main Basin drop below 15 °C, near-surface salinity >28 PSU

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Marine Flight 3 (Central Sound)



Another successful flight with pilot Joe Leatherman

During the Central Sound flight a very interesting algal vortex caught our eye. It was located in Rich Passage and looked like a green, spiral-shaped bloom. Because we have never seen anything this large on previous flights, it was a great opportunity to take pictures.

Budd Inlet was also very biologically active. We saw numerous patches of jellyfish and thick algal blooms in shades of red and brown.



Jellyfish are on the loose in Budd Inlet

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Aerial photos

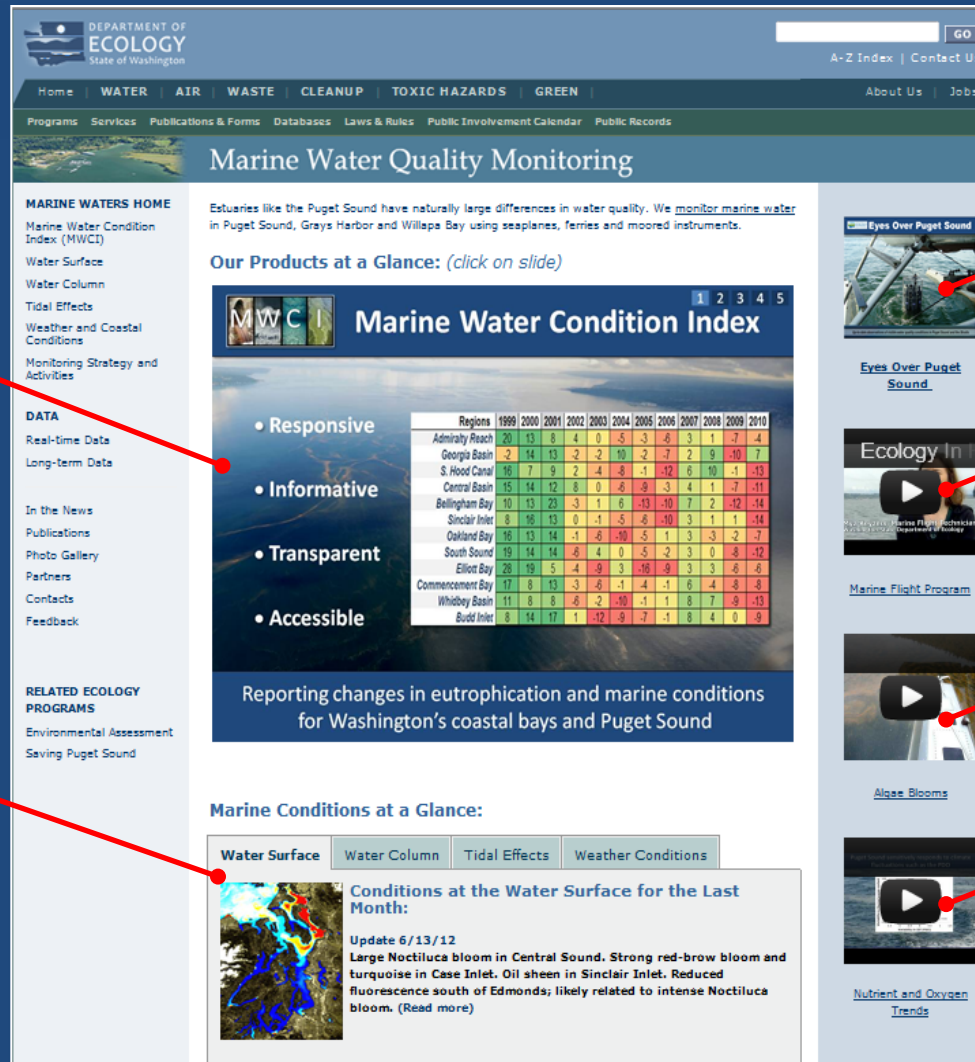
Ferry and Satellite

Combined reporting of long-term monitoring products and present conditions

Go to website

Slideshow highlighting data products and the Marine Water Condition Index (MWCI)

Find past conditions for the water column, surface and mooring sites



DEPARTMENT OF ECOLOGY
State of Washington

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Marine Water Quality Monitoring

MARINE WATERS HOME

- Marine Water Condition Index (MWCI)
- Water Surface
- Water Column
- Tidal Effects
- Weather and Coastal Conditions
- Monitoring Strategy and Activities

DATA


- Real-time Data
- Long-term Data
- In the News
- Publications
- Photo Gallery
- Partners
- Contacts
- Feedback

RELATED ECOLOGY PROGRAMS

- Environmental Assessment
- Saving Puget Sound

Estuaries like the Puget Sound have naturally large differences in water quality. We [monitor marine water](#) in Puget Sound, Grays Harbor and Willapa Bay using seaplanes, ferries and moored instruments.

Our Products at a Glance: *(click on slide)*



Marine Water Condition Index

- Responsive
- Informative
- Transparent
- Accessible

Regions	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Admiralty Reach	20	13	8	4	0	-5	-3	-6	3	1	-7	-4
Georgia Basin	-2	14	13	-2	-2	10	2	-7	2	9	-10	7
S. Hood Canal	16	7	9	2	-4	-8	-1	12	6	10	-1	-13
Central Basin	15	14	12	8	0	-6	-9	-3	4	1	-7	-11
Bellingham Bay	10	13	23	-3	1	6	-13	-10	7	2	-12	-14
Sinclair Inlet	8	16	15	0	-1	5	-6	-10	3	1	1	-14
Oakland Bay	-16	13	14	-1	-6	-10	-5	1	3	-3	-2	-7
South Sound	19	14	14	-6	4	0	-5	-2	3	0	-8	-12
Elliot Bay	28	19	5	-4	-9	3	-16	-9	3	3	-6	-6
Commencement Bay	17	8	13	-3	-6	-1	-4	-1	6	-4	-8	-8
Whidbey Basin	11	8	8	-6	-2	-10	-1	1	8	7	-9	-13
Budd Inlet	6	14	17	1	-12	-9	-7	-1	8	4	0	-9

Reporting changes in eutrophication and marine conditions for Washington's coastal bays and Puget Sound

Marine Conditions at a Glance:

Water Surface | Water Column | Tidal Effects | Weather Conditions

Conditions at the Water Surface for the Last Month:

Update 6/13/12
Large Noctiluca bloom in Central Sound. Strong red-brow bloom and turquoise in Case Inlet. Oil sheen in Sinclair Inlet. Reduced fluorescence south of Edmonds; likely related to intense Noctiluca bloom. (Read more)

EOPS releases

Video of the Marine Waters Unit activities

Video and information on algal blooms

Video of long-term nutrient trends

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High abundance of marcoalgae aggregations in Central Sound. Red-brown blooms in South Sound Inlets and parts of Central Sound. Jellyfish patches are numerous and increasing in size in Sinclair and Budd Inlets.

Start here

Algal mats off Delano Road KP S – Carr Inlet



Bloom in Eagle Harbor – Bainbridge Island



Front

Mixing and Fronts: [1](#) [2](#) [11](#) [12](#)

Fronts in Elliot Bay, Sinclair Inlet, Tacoma Narrows and Quartermaster Harbor.

Plume

Suspended sediment: [5](#) [6](#) [11](#) [12](#)

Sinclair Inlet, Tacoma Narrows, Case Inlet Budd Inlet and Commencement Bay.

Bloom

Visible blooms: [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#) [8](#) [9](#) [10](#) [11](#) [13](#) [14](#) [15](#)

Red-brown: Sinclair, Case , Budd, Eld, Henderson Inlets, Squaxin Island and Quartermaster Harbor.

Olive to green: Elliot Bay, Port Madison, Sinclair Inlet, Quartermaster Harbor, Eagle Harbor, Jarrel Cove (Pickering Passage).

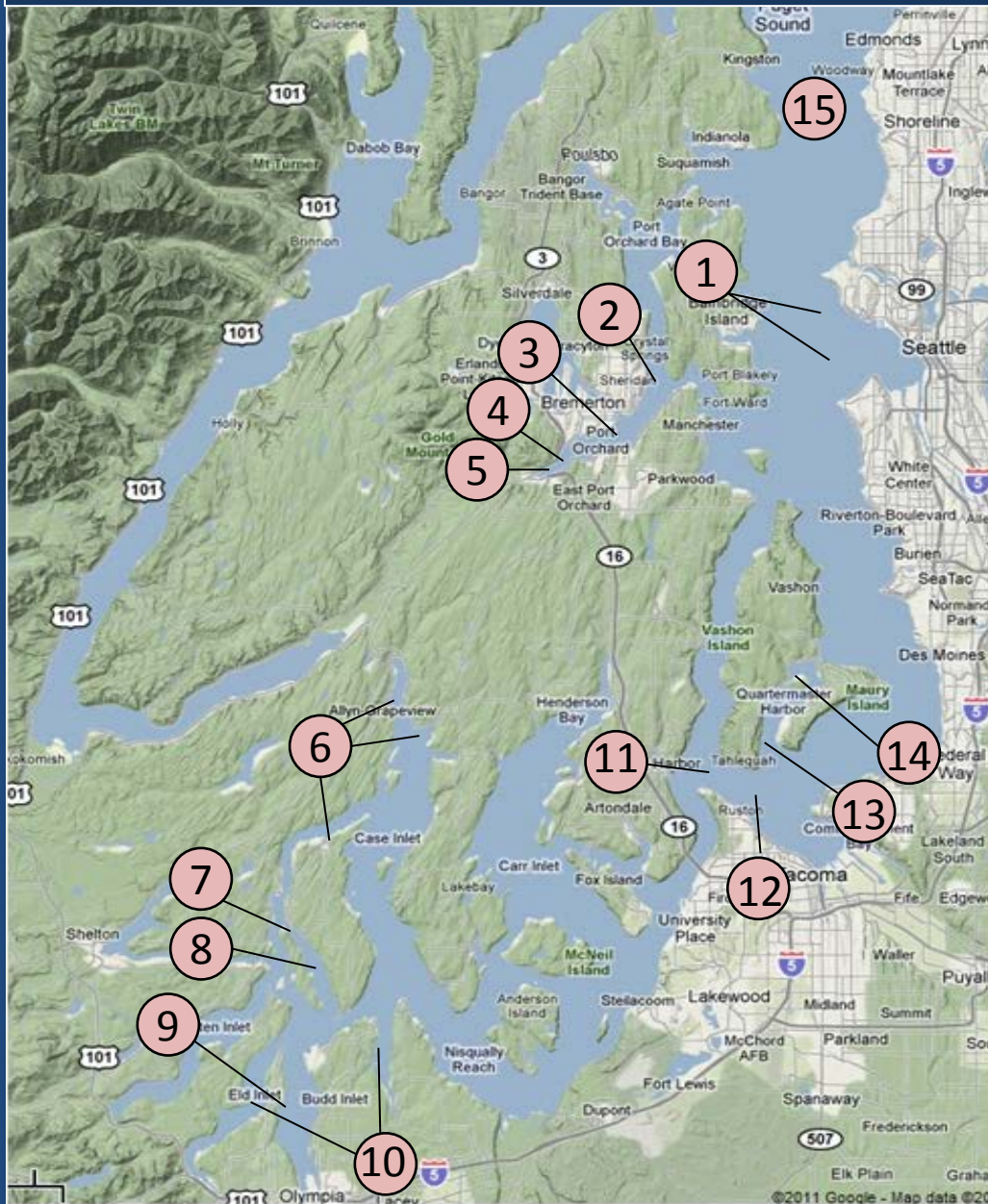
Macroalgae : Central Sound.

Debris

Debris (unidentified) [2](#) [3](#) [8](#) [9](#) [11](#) [12](#)

Abundant in Central Sound and usual locations in South Sound (Squaxin Passage, Case & Carr Inlets).

High tides : 12:48 AM 3:43 PM, Low tides: 7:56 AM, 9:05 PM



Aerial photography navigation guide 8-27-2012



Click on numbers

Flight Information:

- **Afternoon flight (round trip):**
High visibility, windy, broken
cloud cover and reflections on
the water.

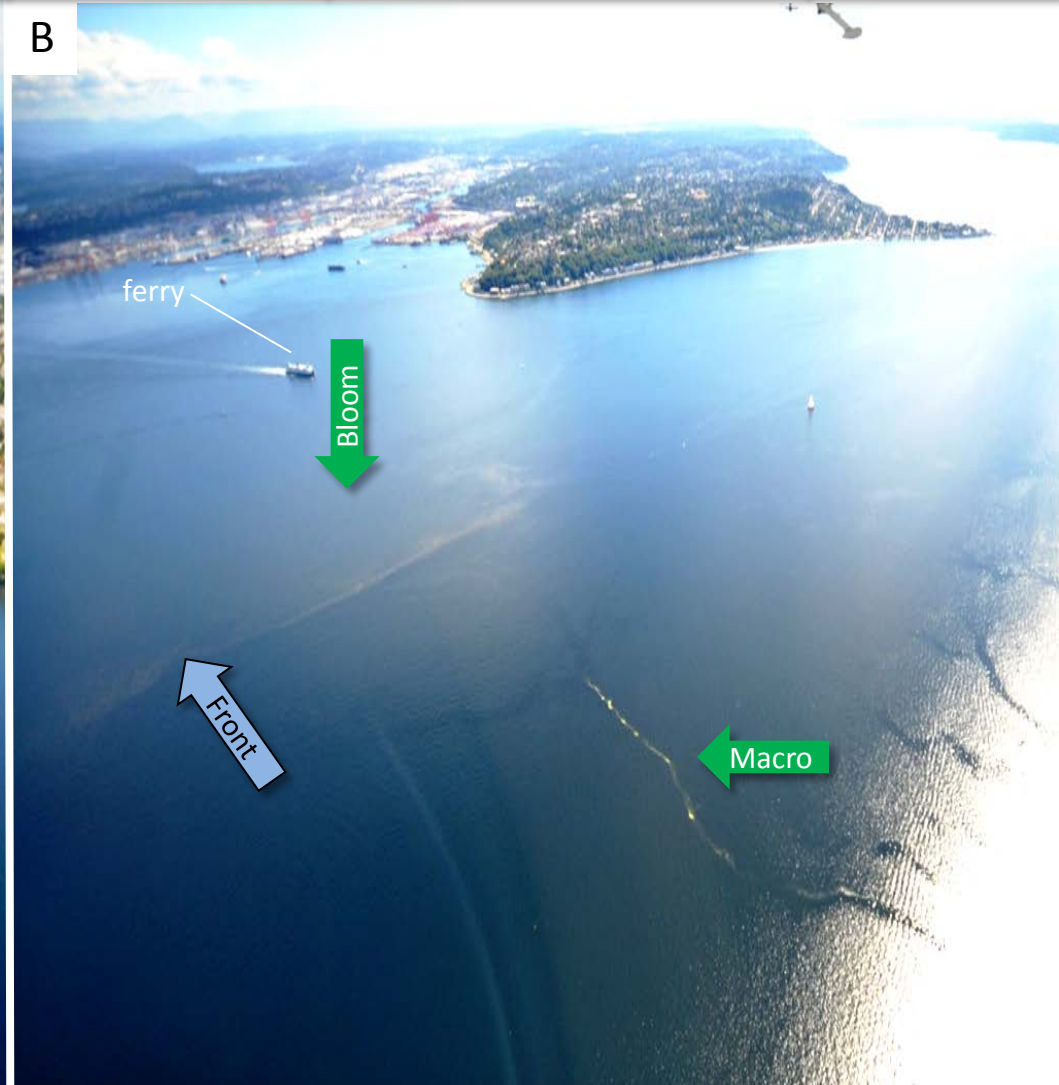
Observation Maps:

[click here](#)

A



B



Macroalgae. Location: Between Elliott Bay and Sinclair Inlet (Central Sound), 2:18 PM.
A) Looking north towards Discovery Park. B) Looking south towards West Seattle.



Field log

Water column

Aerial photos

Ferry and Satellite



Green bloom. Fronts from different water masses and Dyes Inlet.
Location: Sinclair Inlet (Central Sound), 2:24 PM.



Field log

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Red-brown and turquoise bloom. Location: Sinclair Inlet (Central Sound), 2:26 PM.

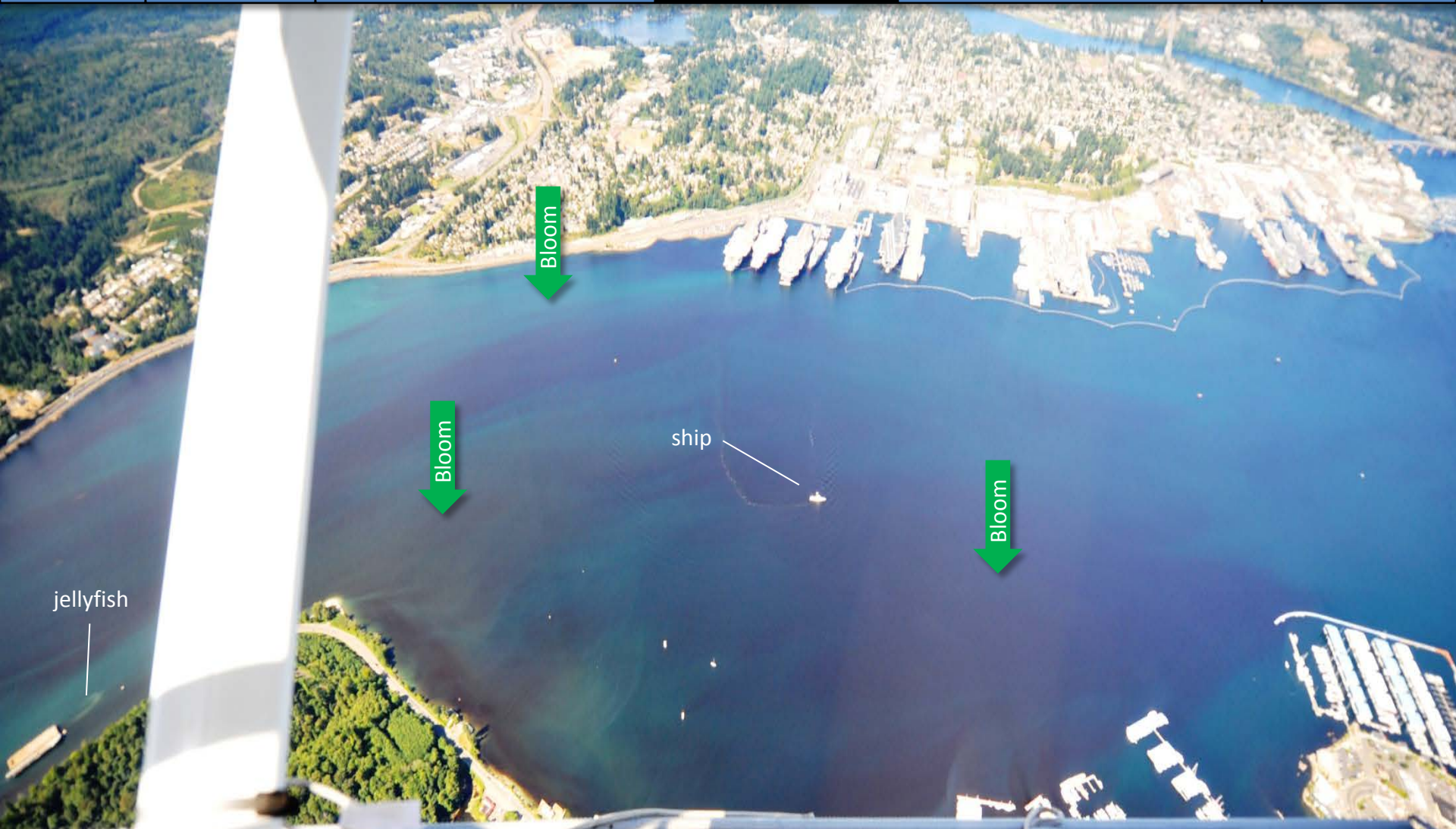


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Red-brown, brown and turquoise bloom. Location: Sinclair Inlet (Central Sound), 2:26 PM.

Field log

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Jellyfish, red-brown and turquoise bloom. Location: Sinclair Inlet (Central Sound), 2:26 PM.



Field log

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Ferry and Satellite

A



B



C



Red-brown bloom. Location: A) North Bay, B) Rocky Bay,
C) Jarrell Cove, Case Inlet (South Sound), 2:37 PM.

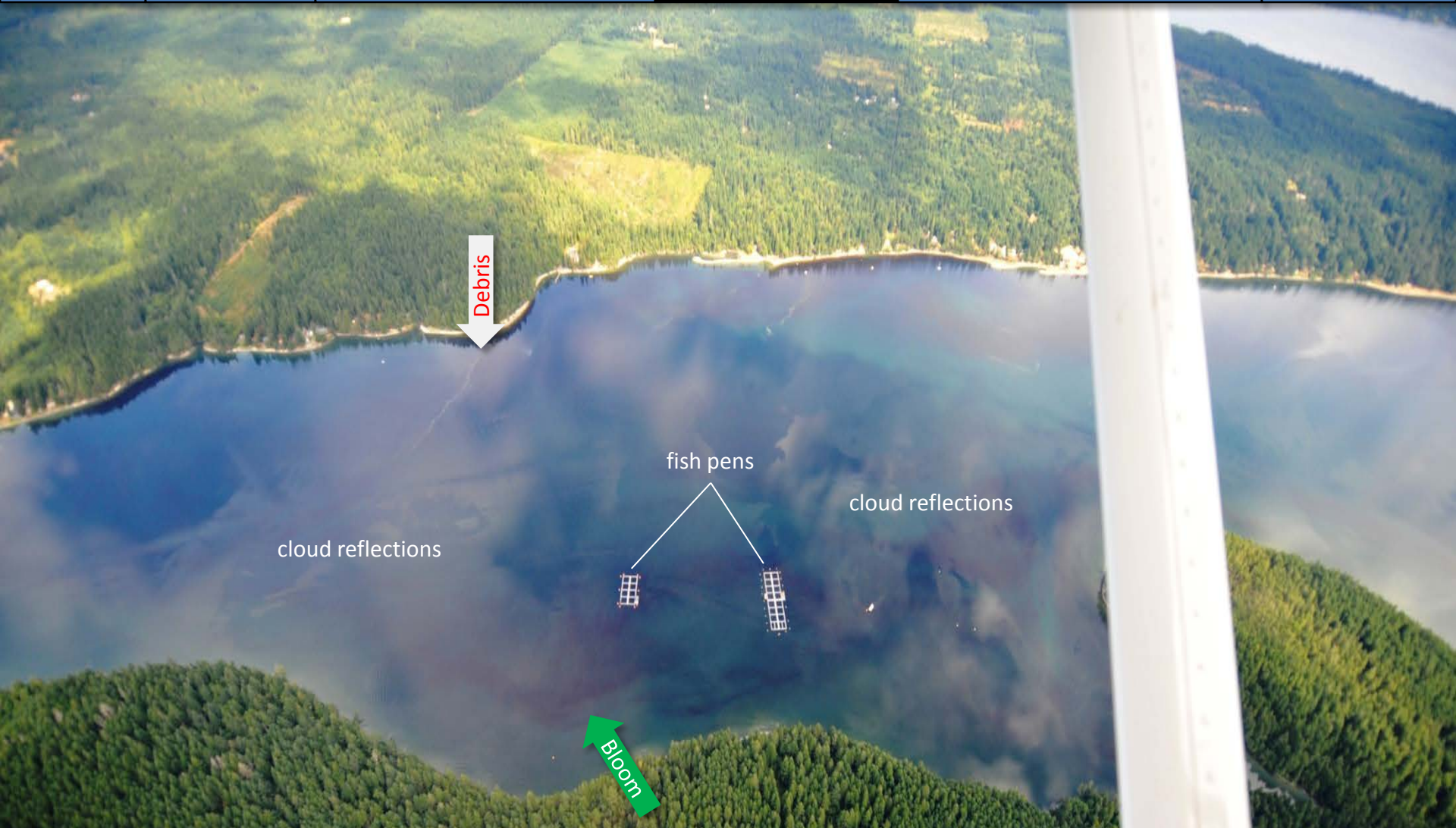


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Red-brown and turquoise bloom. Location: Between Squaxin and Harstine Island (South Sound), 2:43 PM.



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Red-brown and turquoise bloom. Location: Between Squaxin and Harstine Island (South Sound), 2:43 PM.

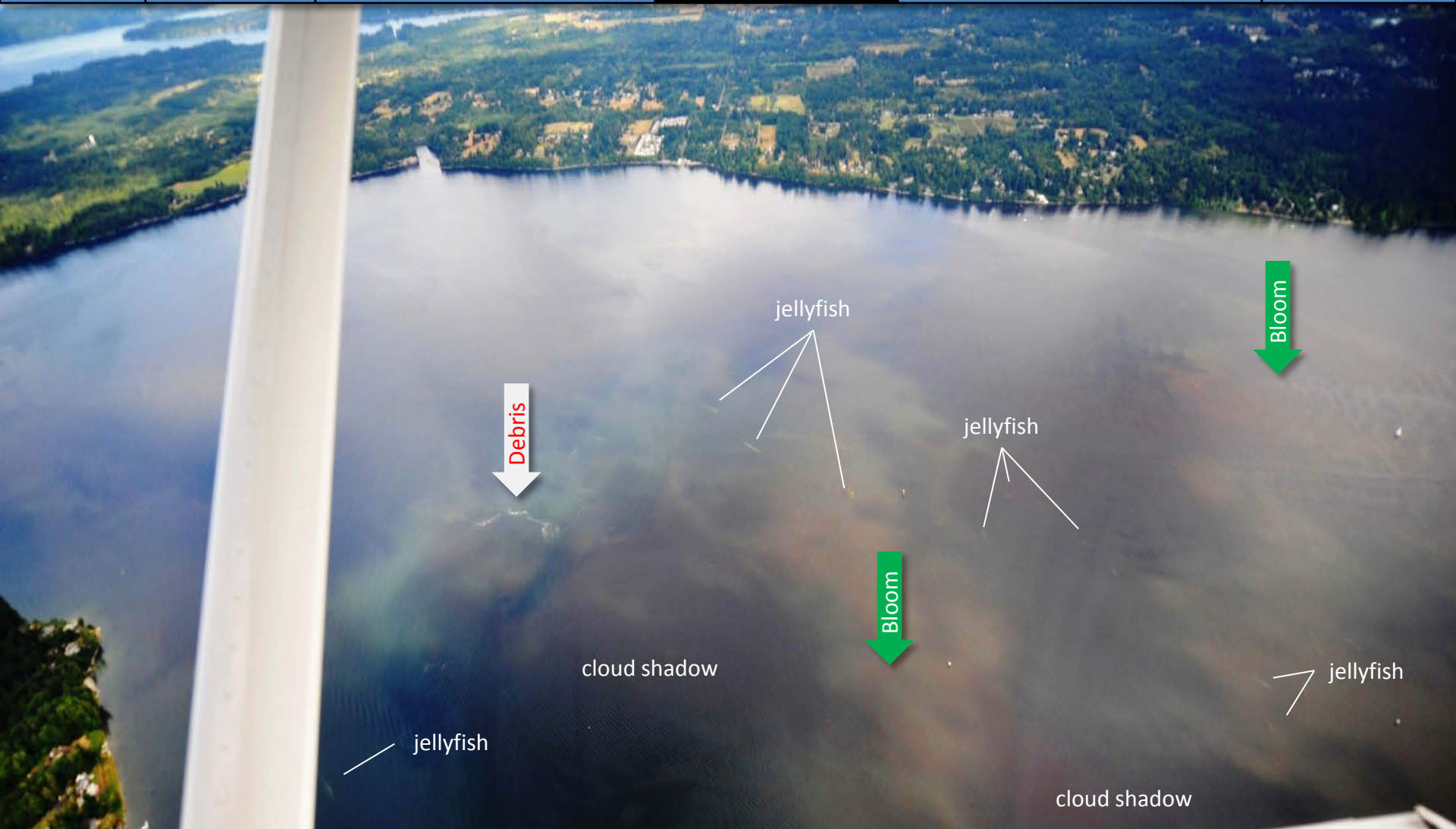


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Red-brown bloom, jellyfish and turquoise water (+ cloud reflections). Location: Budd Inlet (South Sound), 2:52 PM.

A

cloud reflections

Bloom

cloud shadow

B

Bloom

Red-brown bloom and turquoise bloom (+ cloud reflections). Location: A) Eld Inlet,
B) Henderson Inlet (South Sound), 2:52 PM.



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Structured surface water with distinct fronts. Puyallup plume appears south of Point Defiance.
Location: Tacoma (Central Sound), 3:10 PM.



Field log

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Puyallup River plume. Location: Commencement Bay, Tacoma (Central Sound), 3:11 PM.

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Red-brown and green bloom. Location: Quartermaster Harbor - Vashon Island
(Central Sound), 3:13 PM.



Field log

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Green bloom. Location: Quartermaster Harbor - Vashon Island (Central Sound), 3:14 PM.



Field log

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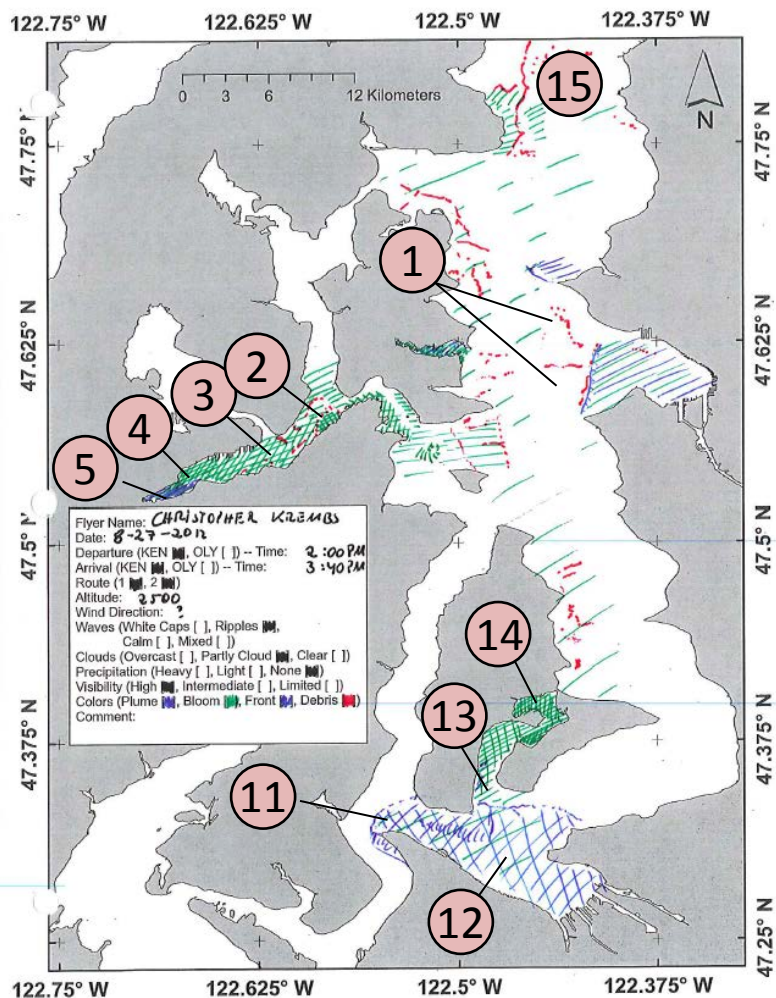
Ferry and Satellite



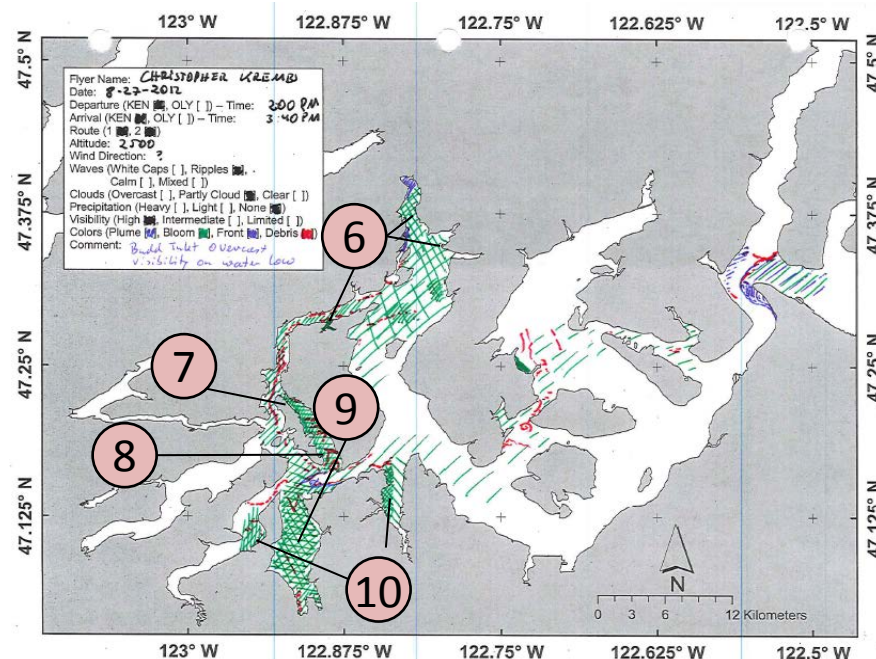
Large macroalgae aggregations. Location: Near Edmond (Central Sound), 3:27 PM.

[Field log](#)
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Central Sound



South Sound












We had the opportunity to fly a complete loop without interruption. Maps are therefore only separated by location.

Field log

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Plumes	
• Freshwater with sediment solid	
• Freshwater with sediment dispersed	
• Coastal erosion with sediment	
Blooms	
• Dispersed	
• Solid	
Debris	
• Dispersed	
• Solid	
Front	
• Distinct water mass boundaries	
• Several scattered	

Comments:

Maps are produced by observers during and after flights. They are intended to give an approximate reconstruction of the surface conditions on scales that connect to and overlap with satellite images in the section that follows.

Field log

Water column

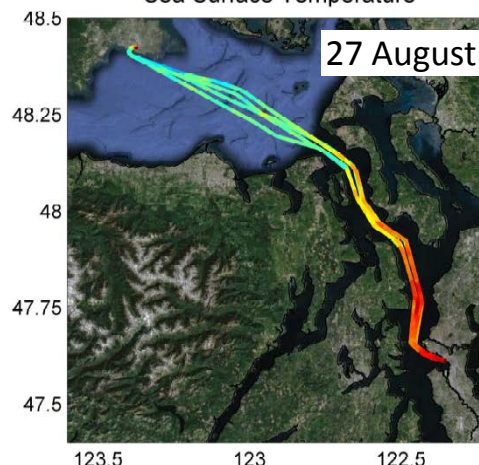
Aerial photos

Ferry and Satellite

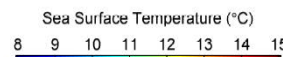
Contact: brandon.sackmann@ecy.wa.gov



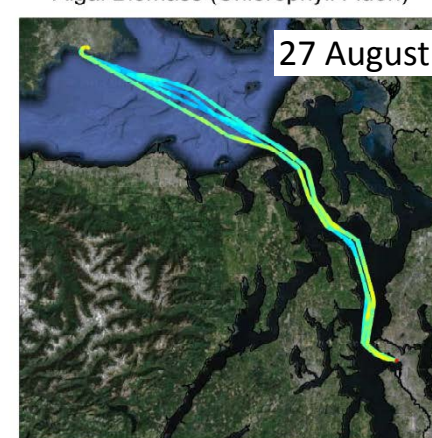
Sea Surface Temperature



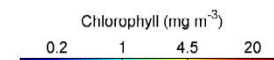
Sea surface temperature (SST) is the water temperature close to the surface (2-3 m below). Warm colors show higher SST.



Algal Biomass (Chlorophyll Fluor.)



Chlorophyll a fluorescence gives an estimate of algal concentration/biomass. Warm colors show larger concentrations.



Current Conditions: Low-Moderate fluorescence and turbidity in Main Basin and Admiralty Inlet. Temperatures in Main Basin drop below 15 °C, near-surface salinity >28 PSU.

--- Daily 'Quick-Look' Products Available ---

http://www.ecy.wa.gov/programs/eap/mar_wat/eops/clipper.html

Ferry & satellite observations, 8-1-2012 to 8-27-2012

Field log

Water column

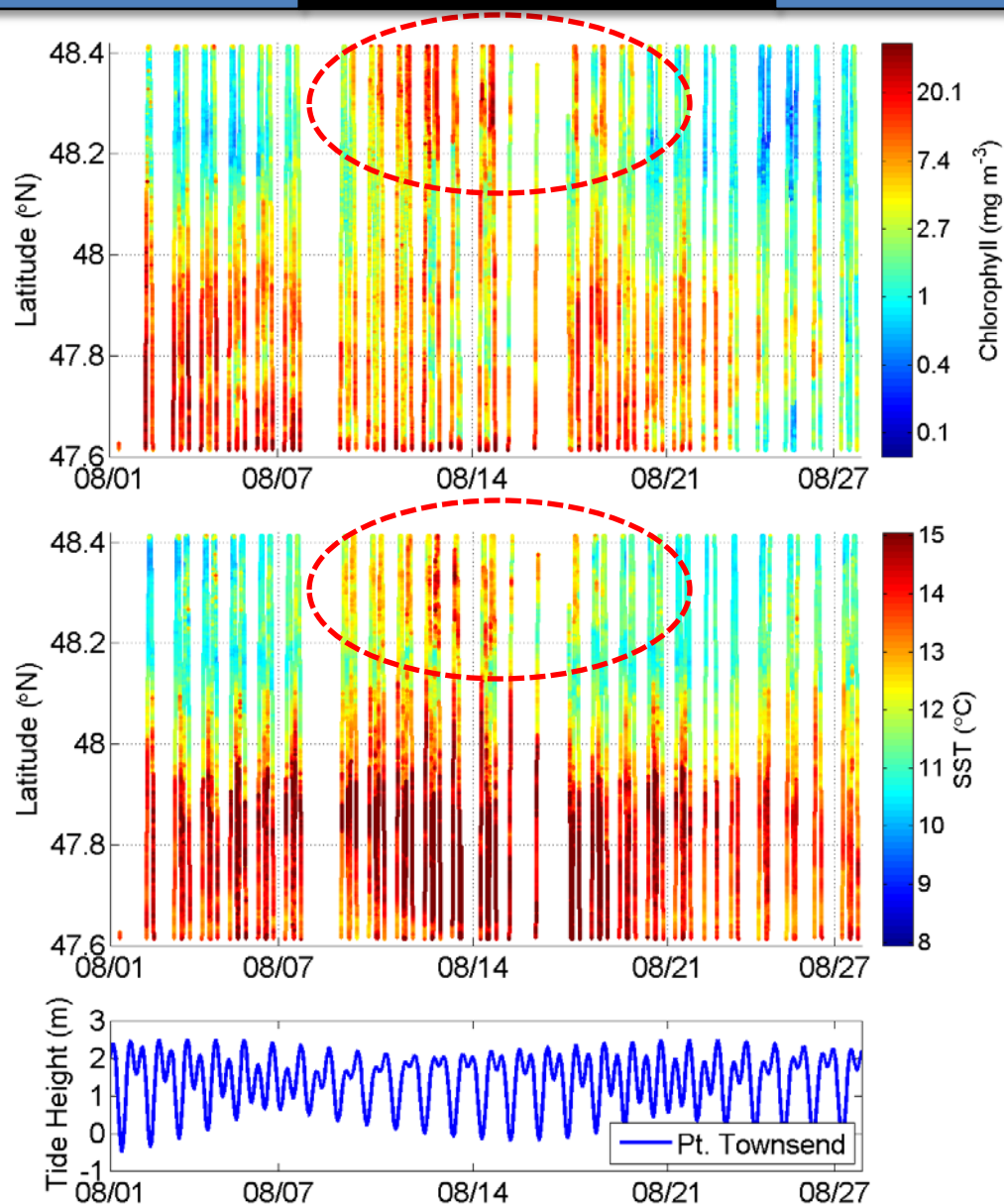
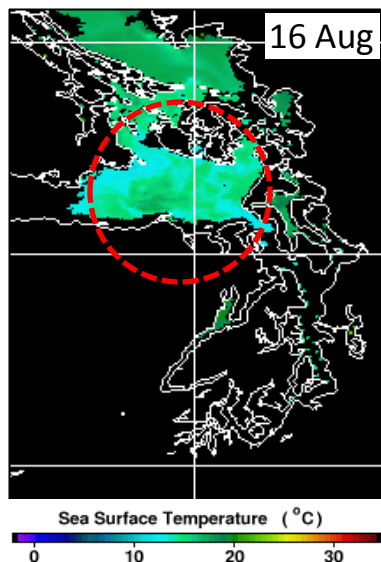
Aerial photos

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Warm near-surface temperatures in Strait of Juan de Fuca promote widespread phytoplankton bloom in mid-August.

Strong bloom in Main Basin begins to fade over last few days as temperatures drop below 15 °C.

MODIS-Aqua (Daytime SST)



Ferry & satellite observations 8-1-2012 to 8-27-2012

Field log

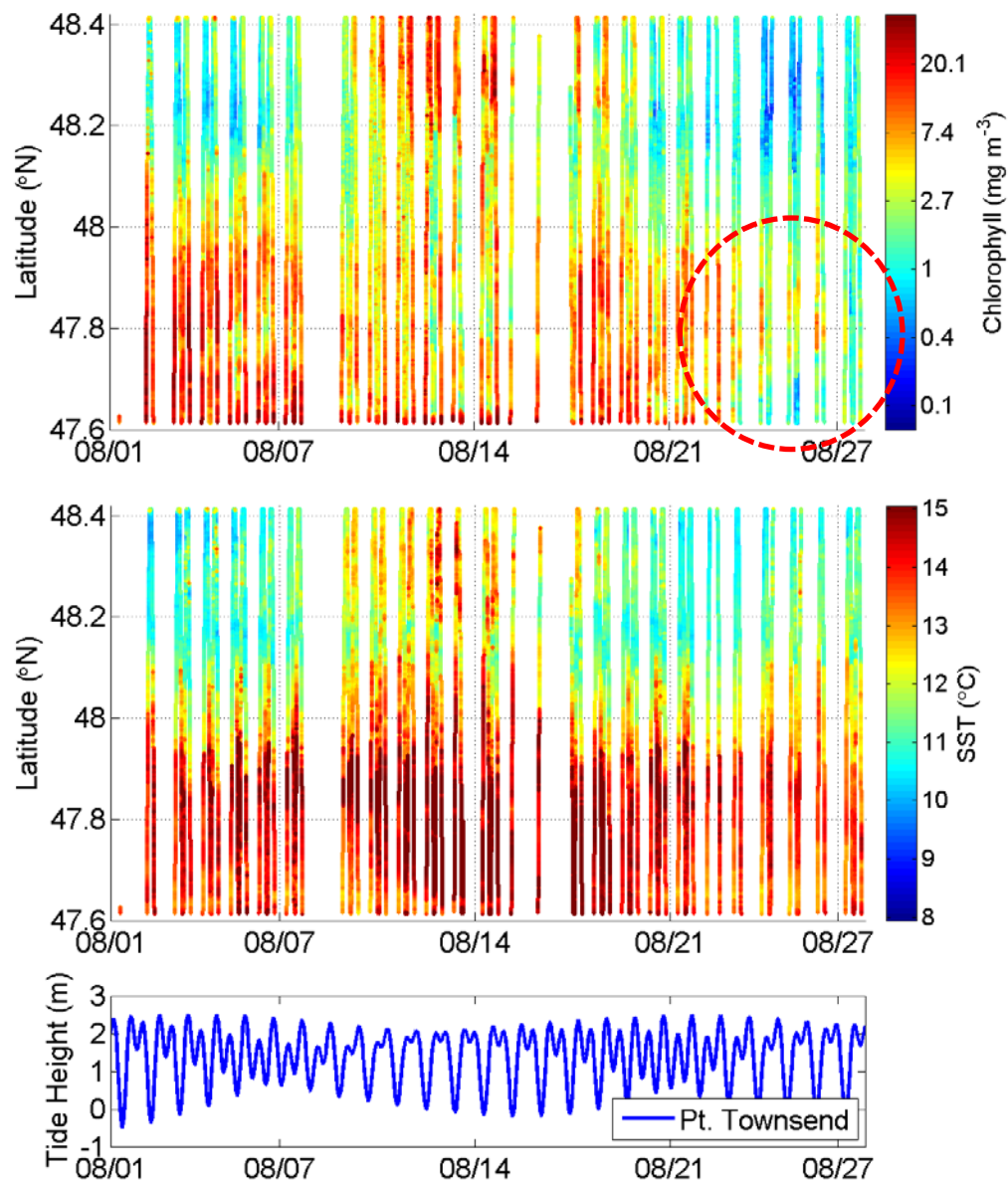
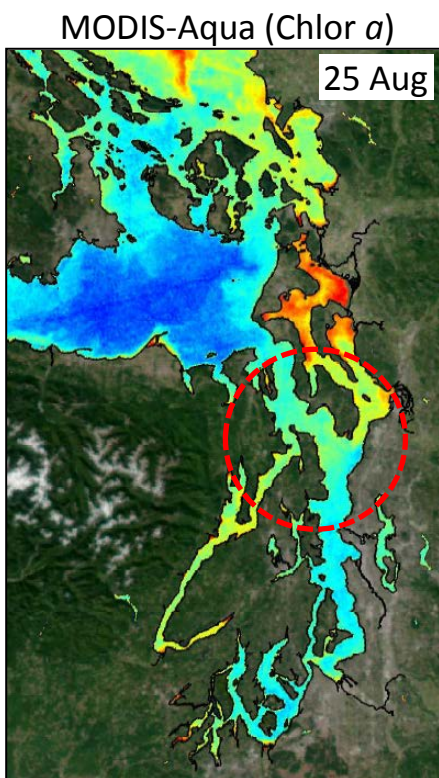
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Warm near-surface temperatures in Strait of Juan de Fuca promote widespread phytoplankton bloom in mid-August.

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Get data from Ecology's Monitoring Programs



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Long-Term Monitoring Network

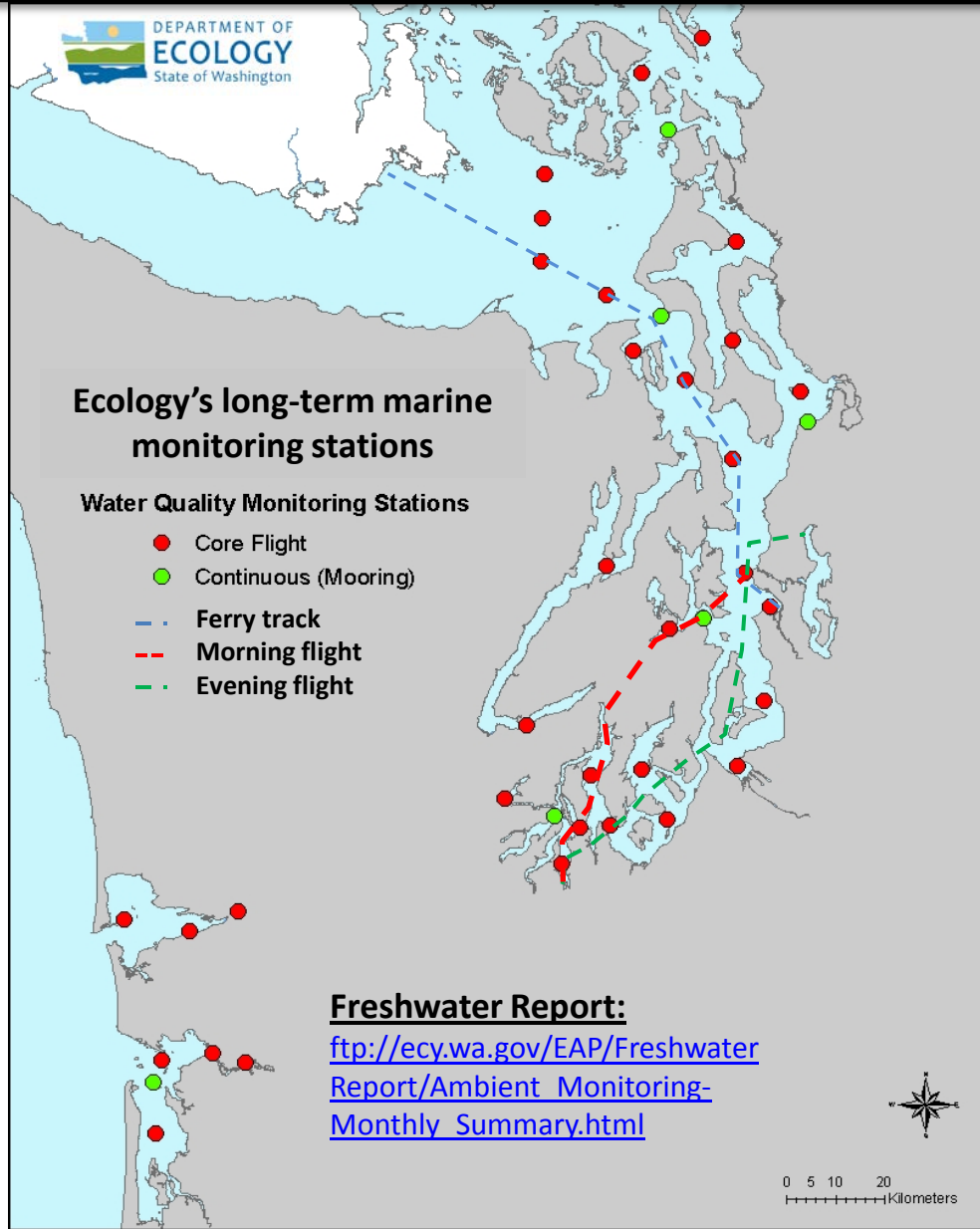


christopher.krembs@ecy.wa.gov



Access core monitoring data:

<http://www.ecy.wa.gov/apps/eap/marinewq/mwdataaset.asp>



Real-Time Sensor Network



brandon.sackmann@ecy.wa.gov



Access mooring data:

<http://www.ecy.wa.gov/programs/eap/marinewq/mwdataaset.asp>

You may subscribe or unsubscribe to the Eyes Over Puget Sound email listserv by going to:

<http://listserv.wa.gov/cgi-bin/wa?A0=ECOLOGY-EYES-OVER-PUGET-SOUND>



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We are looking for feedback to improve our products.

Dr. Christopher Krembs

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**Marine Monitoring Unit
Environmental Assessment Program
WA Department of Ecology**

