Surface Conditions Report
May 4th, 2011

Content:
• Personal flight impression p. 3-4
• Ferry and satellite p. 5-9
• Arial photography p. 10-30
• In situ mooring data p. 31-32
Long – Term Monitoring Network

Access archived data at:


Real – Time Sensor Network

Ferry and satellite : brandon.sachmann@ecy.wa.gov

Access archived data at:


Current Fresh Water Report

Wednesday May 4th was a beautiful day to sample, it was the first time this year it didn’t feel like winter! The waters were calm with little to no wind at most stations. We did notice very green water and small circular phytoplankton just large enough to notice with the naked eye. The only event of note was being circled by a Black Hawk helicopter in Carr Inlet. They have some amazing maneuvering capacity! All in all it was a great way to start off May sampling.
Date: Wednesday, May 4, 2011

Conditions: High cloud cover limited satellite image analysis

Observation: Ferry and satellite images confirm center of algae bloom in the Main Basin between West Point and the Triple Junction and indication of a bloom in Carr Inlet.
Puget Sound is beginning to warm while algal blooms intensify in the main basin.
Satellite
(Spatial Context)

Image from 5/4/11 confirm center of algae bloom in the Main Basin between West Point and the Triple Junction.

Fluorescent line height (FLH) products was least affected by high cloud cover.
High cloud cover during May 4, 2011 created uncertainties in the satellite products.

Fluorescent line height (FLH) product was least affected.
Satellite
(Temporal context)

Bloom likely got started on 2\textsuperscript{nd} of May consistent with meteorological data showing a nice clear day on 1 May.

Red line indicates reporting day of satellite images (May 4\textsuperscript{th}, 2011)
Flight observations between Olympia and Seattle

<table>
<thead>
<tr>
<th>Date:</th>
<th>Wednesday, May 4, 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Morning 8:07 AM:</strong></td>
<td>Seattle via Main Basin, Colvos Passage, Carr Inlet, Case Inlet, Dana Passage, Budd Inlet into Olympia</td>
</tr>
<tr>
<td><strong>Evening 5:26 PM:</strong></td>
<td>Olympia via Dana Passage, Anderson Island, Nisqually, Gordon Point, Commencement Bay, Quartermaster Harbor, Central Basin, Westpoint/Seattle</td>
</tr>
<tr>
<td><strong>Conditions:</strong></td>
<td>Altitude 2500 ft, calm, sunny, no clouds but hazy</td>
</tr>
</tbody>
</table>
Mixing and Fronts:
Fronts between Nisqually past Anderson Island (South Sound), fronts and mixing in Tacoma Narrows

Suspended sediment:
Fronts between Nisqually past Anderson Island (South Sound), and near some shorelines in Main Basin

Visible blooms:
Multicolored in South Sound (Eld, Budd, Case and Carr Inlet) also visible in central Main Basin and Quartermaster Harbor

Debris (anything floating at surface):
Moderate occurrence associated mainly with fronts

Comment: Oil sheen in Colvos Passage, multiple blooms in South Sound and Main Basin.
Morning flight from Seattle to Olympia at 250 ft altitude

Long oil sheen in the northern reaches of Colvos Passage at 8:20 AM
Morning flight from Seattle to Olympia at 250 ft altitude

A strong bright green algae bloom at 8:30 AM in, Lay Inlet, near Rosedale, Carr Inlet 8:35 AM
Morning flight from Seattle to Olympia at 250 ft altitude

Two optically distinct algae blooms separated by a front in Carr Inlet across Kopachuck State Park at 8:30 AM
Watermasses with blooms and separated by debris meeting near Boston Harbor (near Olympia) and entering Dana Passage at 8:45 AM. Unfortunately very hazy!

Morning flight from Seattle to Olympia at 250 ft altitude
Morning flight from Seattle to Olympia at 250 ft altitude

Layers and lines of algae blooms in northern Budd Inlet (near Olympia) 8:47 AM
Morning flight from Seattle to Olympia at 250 ft altitude

Layers and lines of algae blooms or plume? in northern Budd Inlet (near Olympia) 8:47 AM
South Sound: AM

Flyer Name: Christopher Krenz
Date: 5/4/2011
Departure (KEN 1, OLY 1) - Time: 8:07 AM
Arrival (KEN 1, OLY 1) - Time: 8:30 AM
Route (1, 2)
Altitude: 2500
Wind Direction: —
Waves (White Caps [], Ripples []): Calm [], Mixed []
Clouds (Overcast [], Partly Cloud [], Clear []):
Precipitation (Heavy [], Light [], None []):
Visibility (High [], Intermediate [], Limited []):
Colors (Plume [], Bloom [], Front [], Debris []):
Comment:
Central Sound AM
Evening flight from Olympia to Seattle at 2500 ft altitude

Dana Passage, with contrasting water colors meeting high algae bloom during flood tide 4:30 PM
Mixing over shoal in Henderson Inlet, 4:30 PM

Evening flight from Olympia to Seattle at 2500 ft altitude
Evening flight from Olympia to Seattle at 2500 ft altitude

Nisqually River plume (front) extending past Anderson Island (right Amsterdam Bay) into Case Inlet
Narrow band of Nisqually River plume extending past Anderson Island and breaking and dissipating against shore line with eddies
Tacoma Narrows, (Day Island). Mixing of incoming tide with water from Carr Inlet confirming an algae bloom, 4:45 PM
Tacoma Narrow (Point Defiant) Mixing of two separate water masses during incoming tide, 4:48PM
Quartermaster Harbor, bloom or suspended sediment on south western side, 4:50 PM.
Quartermaster Harbor (Burton), algae bloom, 4:50 PM.
Evening, South Sound PM

Flyer Name: Christopher Knudis
Date: 5/4/2011
Departure (KEN, OLY) - Time: 4:26 PM
Arrival (KEN, OLY) - Time: 5:26 PM
Route (1, 2)
Altitude: 2,500
Wind Direction: ~
Waves (White Caps, Ripples, Cairn, Mixed)
Clouds (Overcast, Partly Cloudy, Clear)
Precipitation (Heavy, Light, None)
Visibility (High, Intermediate, Limited)
Colors (Plume, Bloom, Front, Debris)
Comment: High algae bloom activity
color from brown to bright green
### Legend to map annotations

#### 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
Mooring observation in Whidbey Basin and South Sound


Date: April 4 to May 5, 2011

Squaxin Island (South Sound):
Dissolved oxygen and temperature rose between April 4 and May 4, 2011. Average DO conc. increased from an average of 9.2 to 11.7 mg/L. Average temperature increased from 8.5- 9.8 C. Much of the increase in dissolved oxygen concentration and temperature occurred after April 21. Average salinity increased from 26.3 to 27.0 (PSU).

Mukelteo (Whidbey Basin):
Dissolved oxygen (DO) levels and temperature continued to rise and jumped to from an average of 9.86 to 10.7 mg/L DO and from an average of 8.2 to 8.5 C. on April 26.
Mooring data near Squaxin Island (South Sound) and Mukelteo (Whidbey Basin) confirm high DO concentrations in the water.