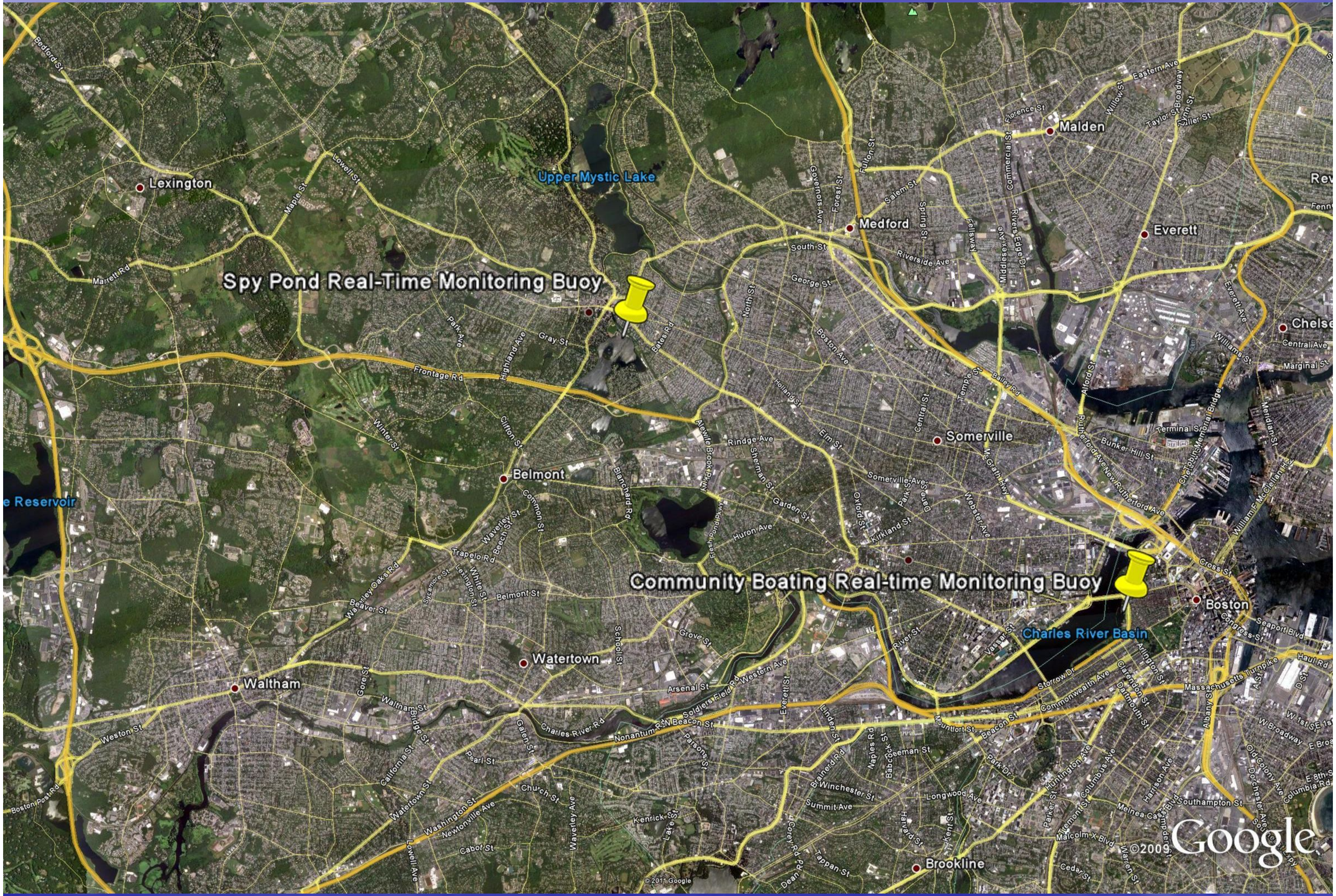
Using Real-Time Monitoring for Assessing Cyanobacteria Algal Blooms and Water Quality Conditions in the Charles and Mystic River Watersheds.

Tom Faber and Liz McCarthy
US EPA New England Regional Laboratory


Spy Pond Real-Time Monitoring Buoy
Community Boating Real-time Monitoring Buoy
Lexington
Upper Mystic Lake
Medford
Malden
Everett
Somerville
Belmont
Watertown
Waltham
Boston
Charles River Basin
Brookline
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Charles River Rd Square
Revere
Embankment Rd
Charles Real Real-Time Monitoring Buoy
Brimmer St
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Arlington
Spy Pond Real-Time Monitoring Buoy
Spy Pond
Kelwyn Manor
East Arlington
Linwood St
Spy Pond Pkwy
Bay State Rd
Garrison Rd
Concord Turnpike
Roanoke Rd
Hamilton Rd
Massachusetts Ave
Broadway
Pond Ln
Wellington St
Lombard Terrace
Academy St
Gray St
Norfolk Rd
Gould Rd
Brentwood Rd
Windermere Ave
Wildwood Ave
Maple St
Pelham Terrace
Oak Knoll St
Irving St
Peabody Rd
Hopkins Rd
Addison St
Lakeview St
Jason St
Whittemore St
Franklin St
Medford St
Wyman St
Allen St
Foster St
Tufts St
Marion Rd
Elmhurst Rd
Freeman St
Oxford St
Winter St
Cleveland St
Warwick St
Windsor St
Melrose St
Varnum St
Chandler St
Herbert Rd
Newcomb St
Randolph St
Orvis Rd
Lakehill Ave
Alfred Rd
Pondview Rd
Cheswick Rd
Pioneer Rd
Eliot Rd
Cabot Rd
Homestead Rd
Littlejohn St
Parker St
White St
Margaret St
Dorothy Rd
Mott St
Milton St
Tobey Rd
Albert Ave
Cross St
Gilmore Rd
Damon Park
Webster St
Palmer St
Beacon St
Fordham St
Exeter St
Dartmouth St
Cornell St
Bowdoin St
Amherst St
Warren St
Rawson Rd
River St
Ernest Rd
University Rd
Regis Rd
Wellesley Rd
Yale Rd
Mystic Valley Pkwy
Harlow St
Everett St
Grafton St
Bates Rd
Heath Rd
Purcell St
N Union St
Mystic St
©2009 Google
Goo

Charles and Mystic River Real-Time Monitoring
EPA New England Regional Laboratory

The Real-Time Monitoring Buoys are off-line for the season

Purpose:

Environmental Protection Agency (EPA) has established monitoring buoys in the Charles and Mystic Watersheds. These buoys collect and transmit water quality data that is available to the public. EPA has established these buoys to help with the tracking of cyanobacteria blooms and water quality conditions.

Note: **All water quality measurements are collected 1 meter below the water's surface**

Last Sonde Verification: 9/29/2011

Click here

Project Partners:

Community Boating Inc. Boston

MyRWA Mystic River Watershed Association *your community • your watershed*

Commonwealth of Massachusetts Department of Public Health

CRWA

dcr

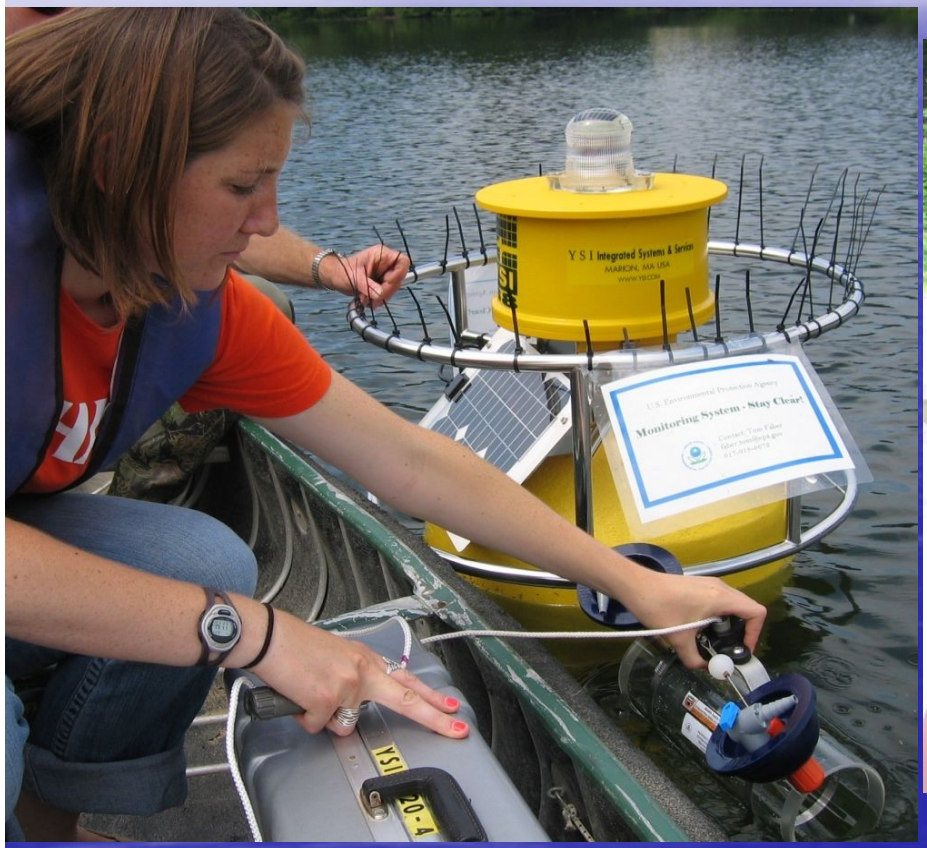
Disclaimer:

The data presented on this website is considered preliminary data and may be subject to future revision or qualifiers. The data from this site is transmitted directly from the instrument with no or little review. Inaccuracies may be presented because instrument malfunction or physical changes at buoy location.

Sonde Measurements

- Recorded every 15 minutes
- Charles measurement period 6/06-9/26/11
- Spy Pond measurement period 6/16-9/29/11
- Measurements collected at 1 meter depth
- Parameters
  - Temperature,
  - Conductivity
  - pH
  - Dissolved oxygen
  - Turbidity
  - Chlorophyll
  - Phycocyanin

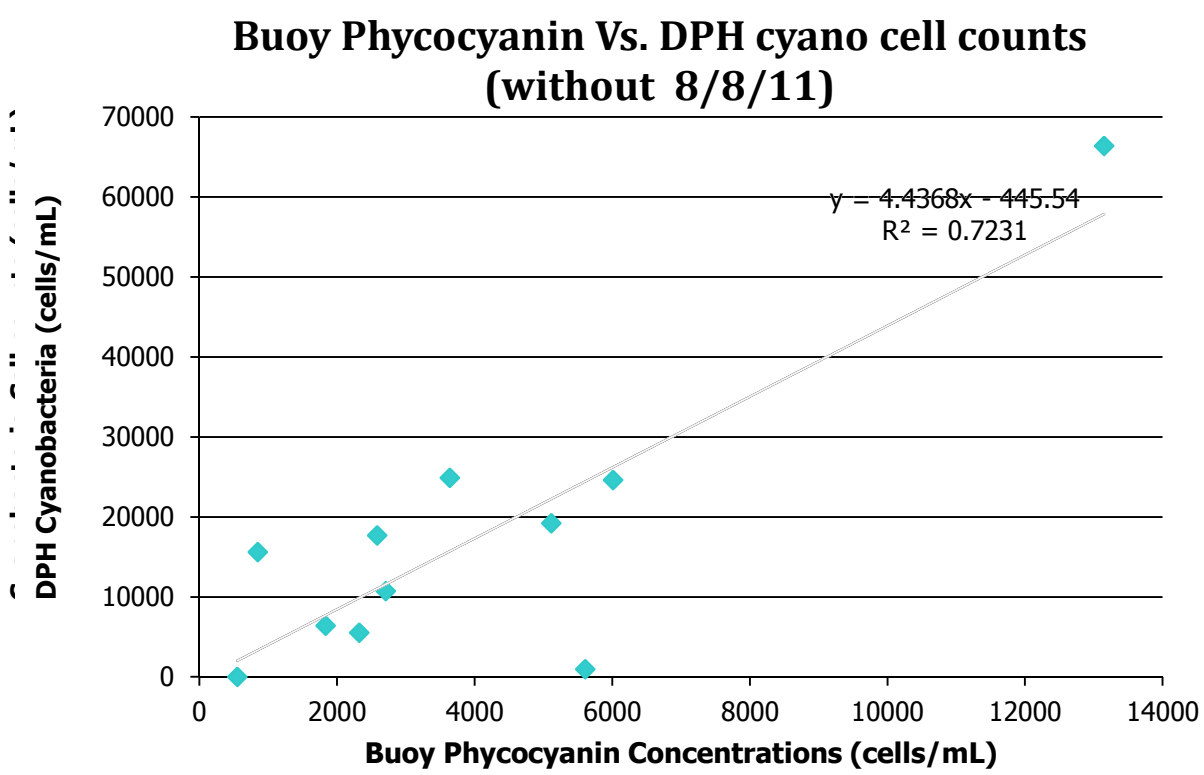
Field Samples collected and processed for Chlorophyll a and Phycocyanin

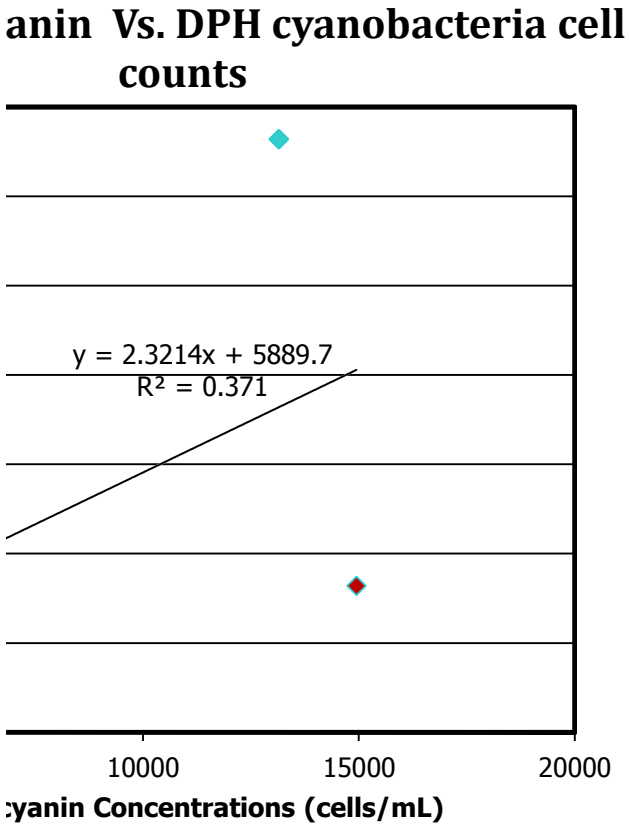


Buoy chlorophyll and phycocyanin correlated with Lab data

- Chlorophyll a
  - EPA lab EPA Ref. method 445 (Dick Siscanaw EPA Chemist)
- Cyanobacteria cell counts
  - EPA Contract lab
  - DPH data

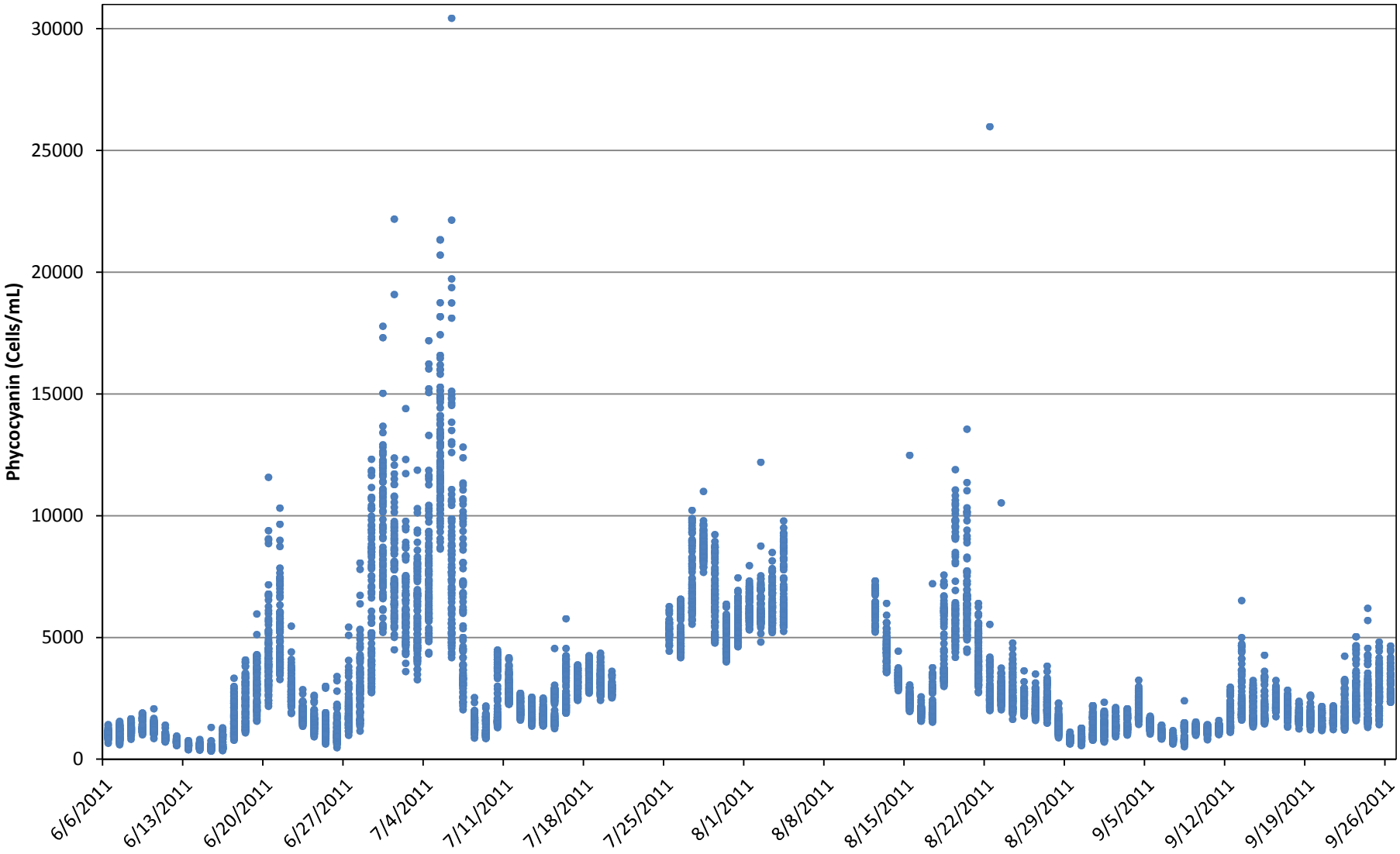
Phycocyanin probe correlation with Laboratory Cyanobacteria cell counts



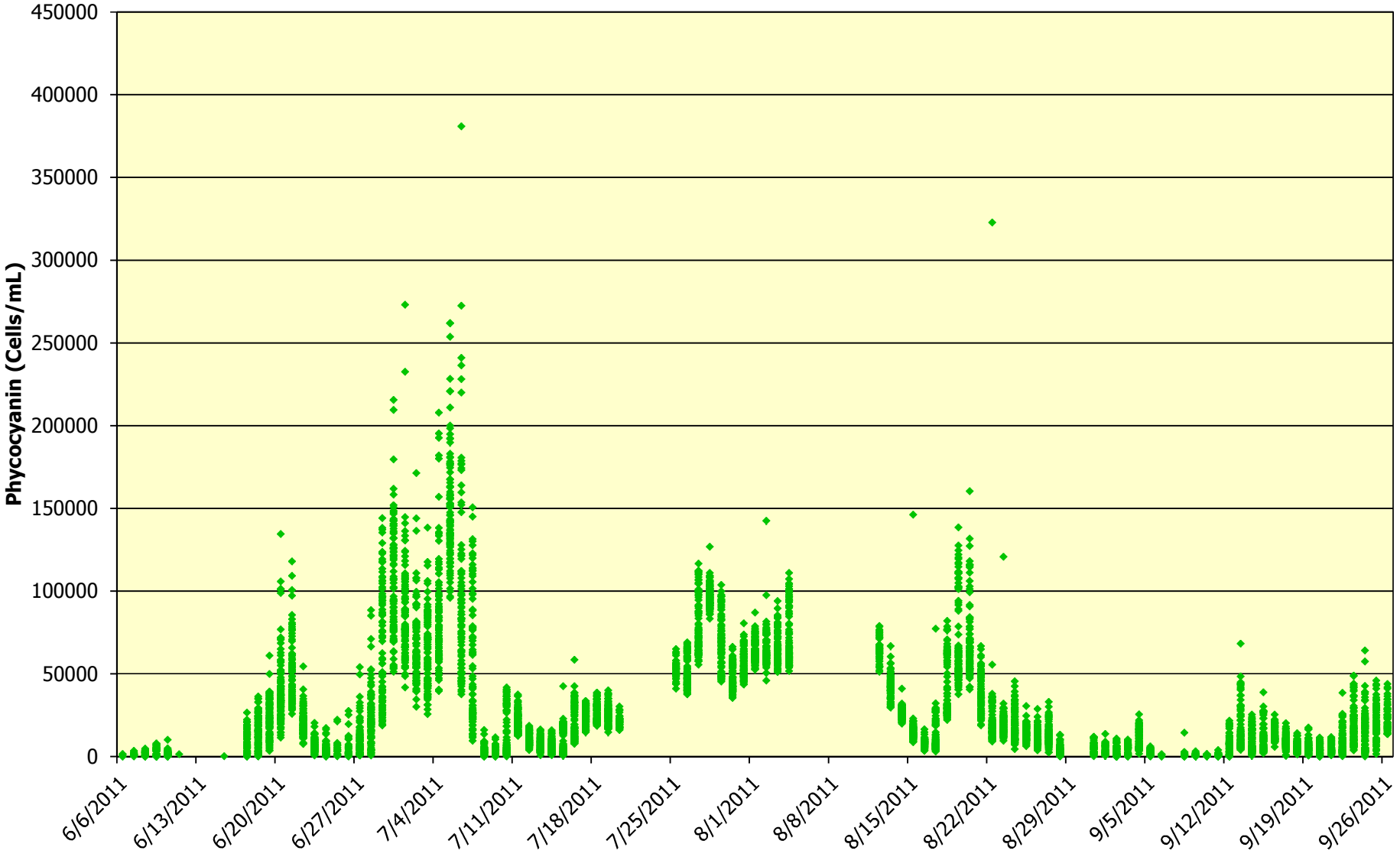


Note: DPH samples collected ~35 feet away at dock 6" deep

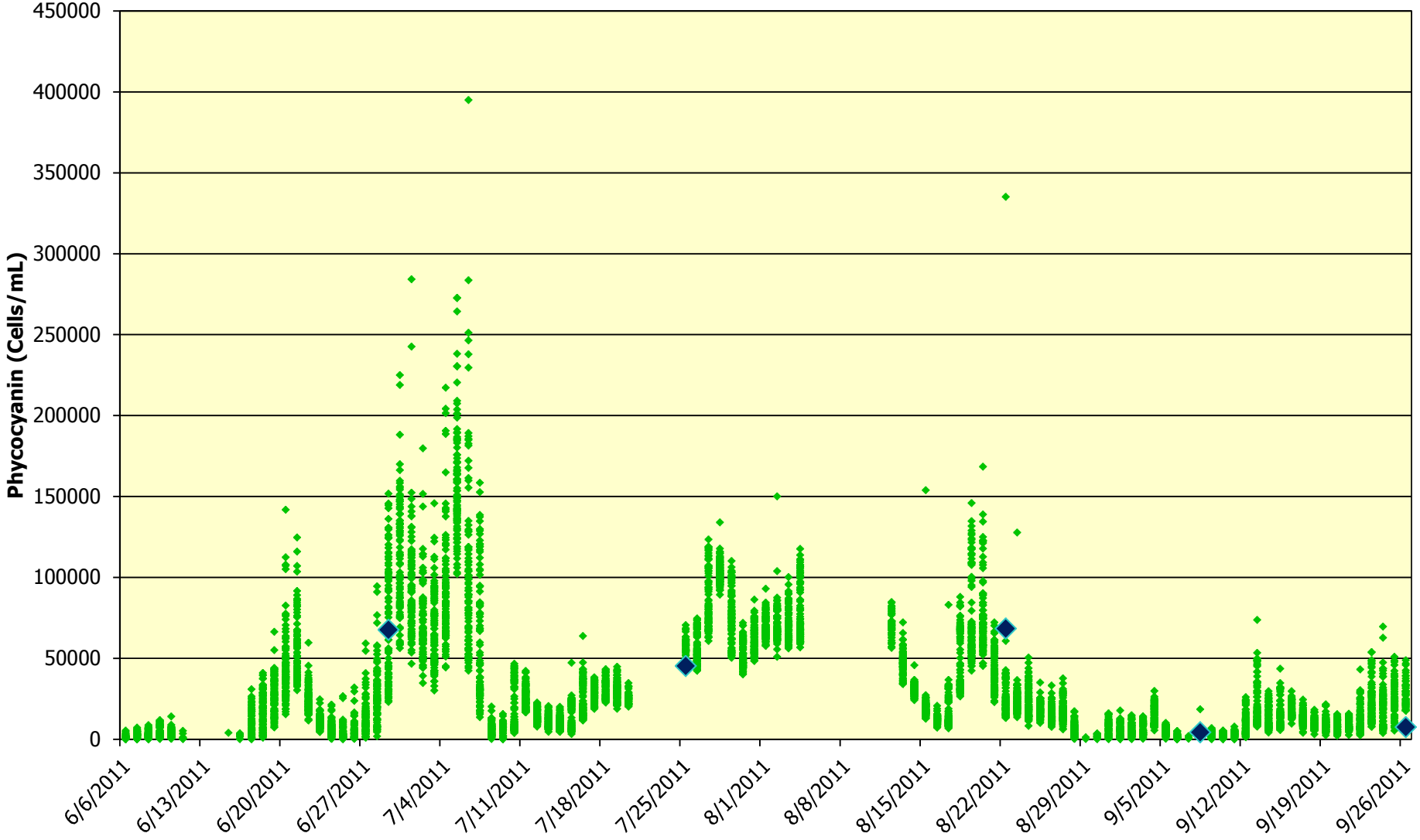
Charles Buoy Phycocyanin Concentrations - 2011



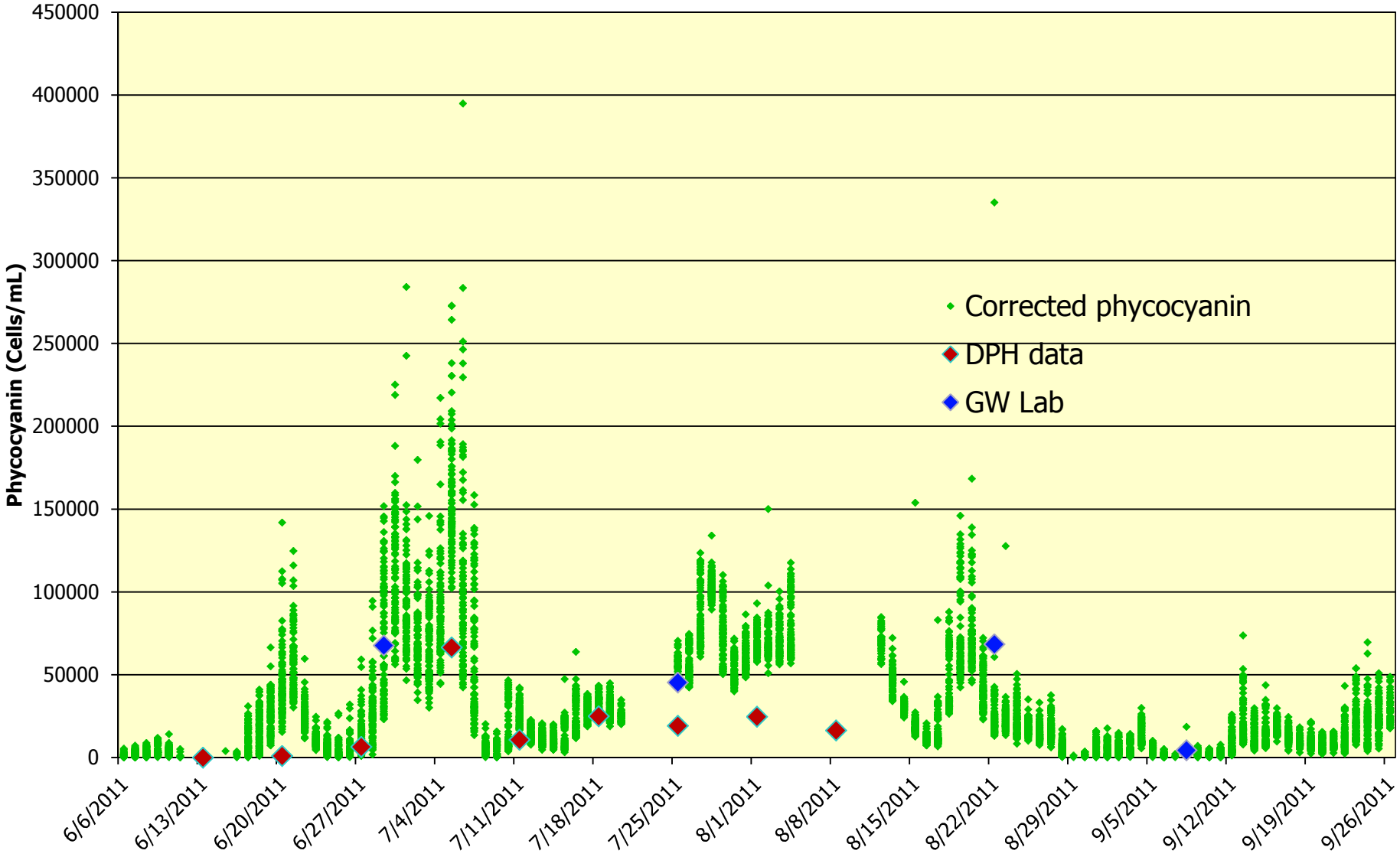
Charles Buoy Corrected Phycocyanin Concentrations - 2011



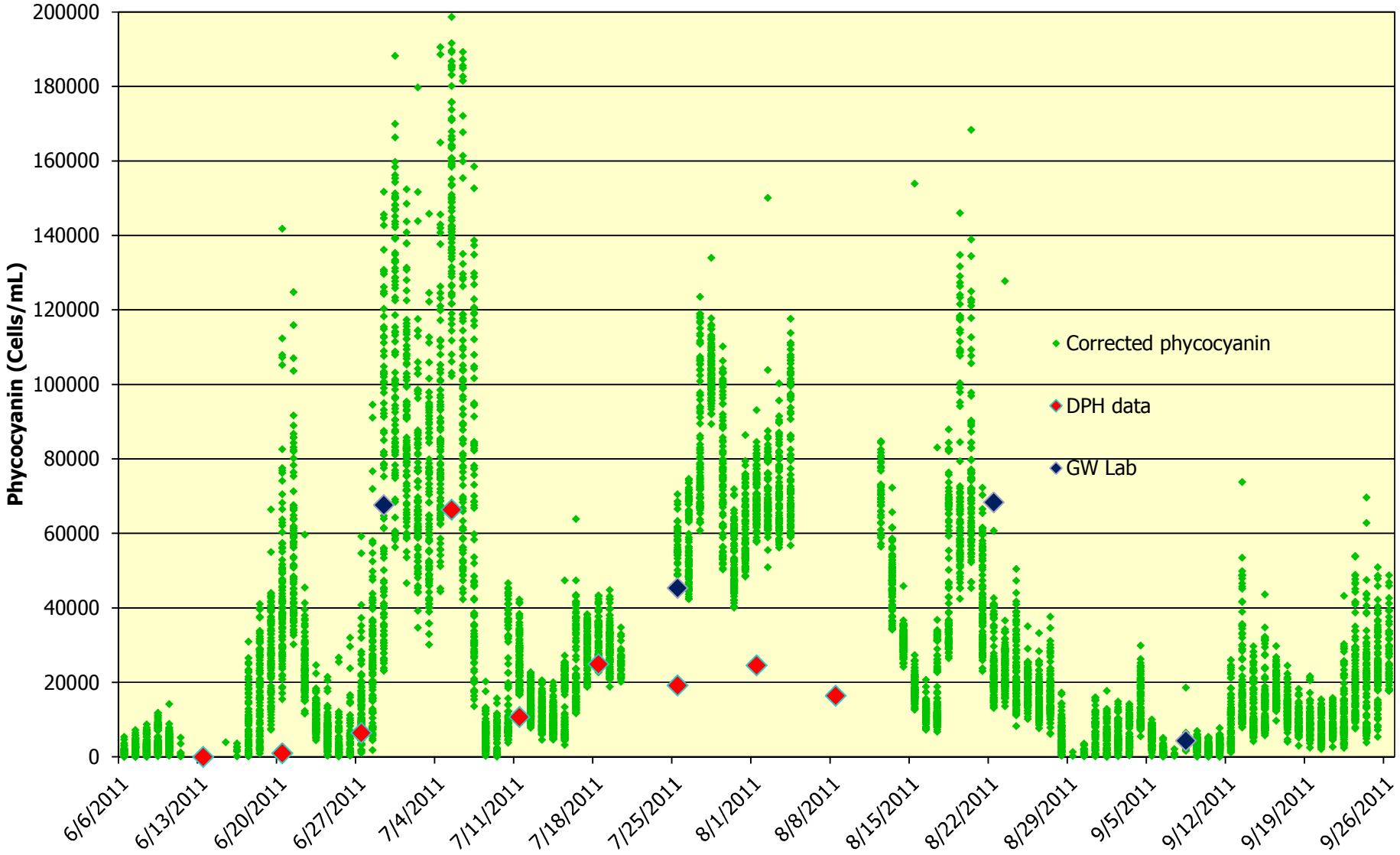
Charles Buoy Corrected Phycocyanin Concentrations W/ GW
Lab counts- 2011



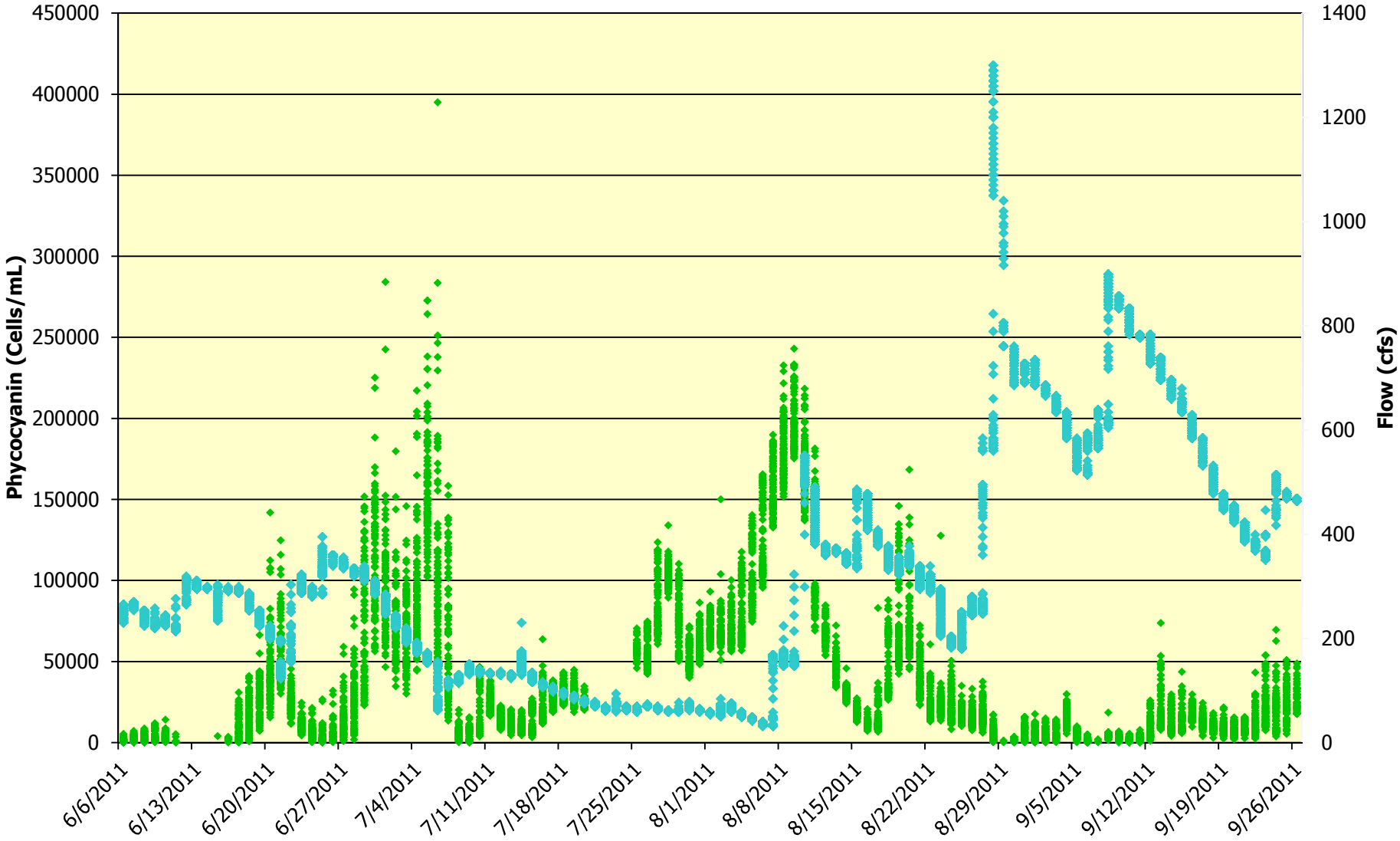
Charles Buoy Corrected Phycocyanin Concentrations W/ GW and DPH counts- 2011



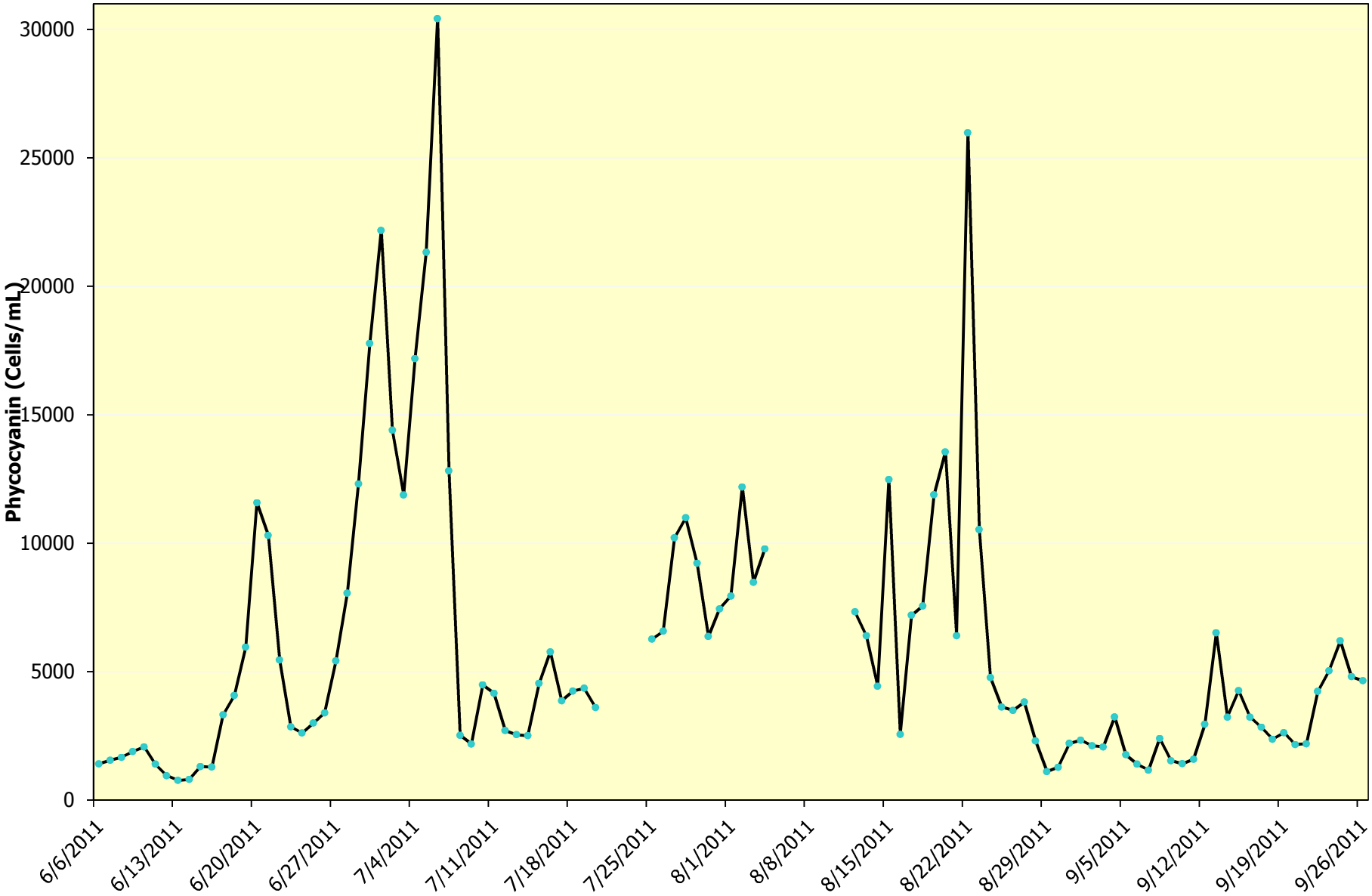
Charles Buoy Corrected Phycocyanin Concentrations W/ GW and DPH counts- 2011



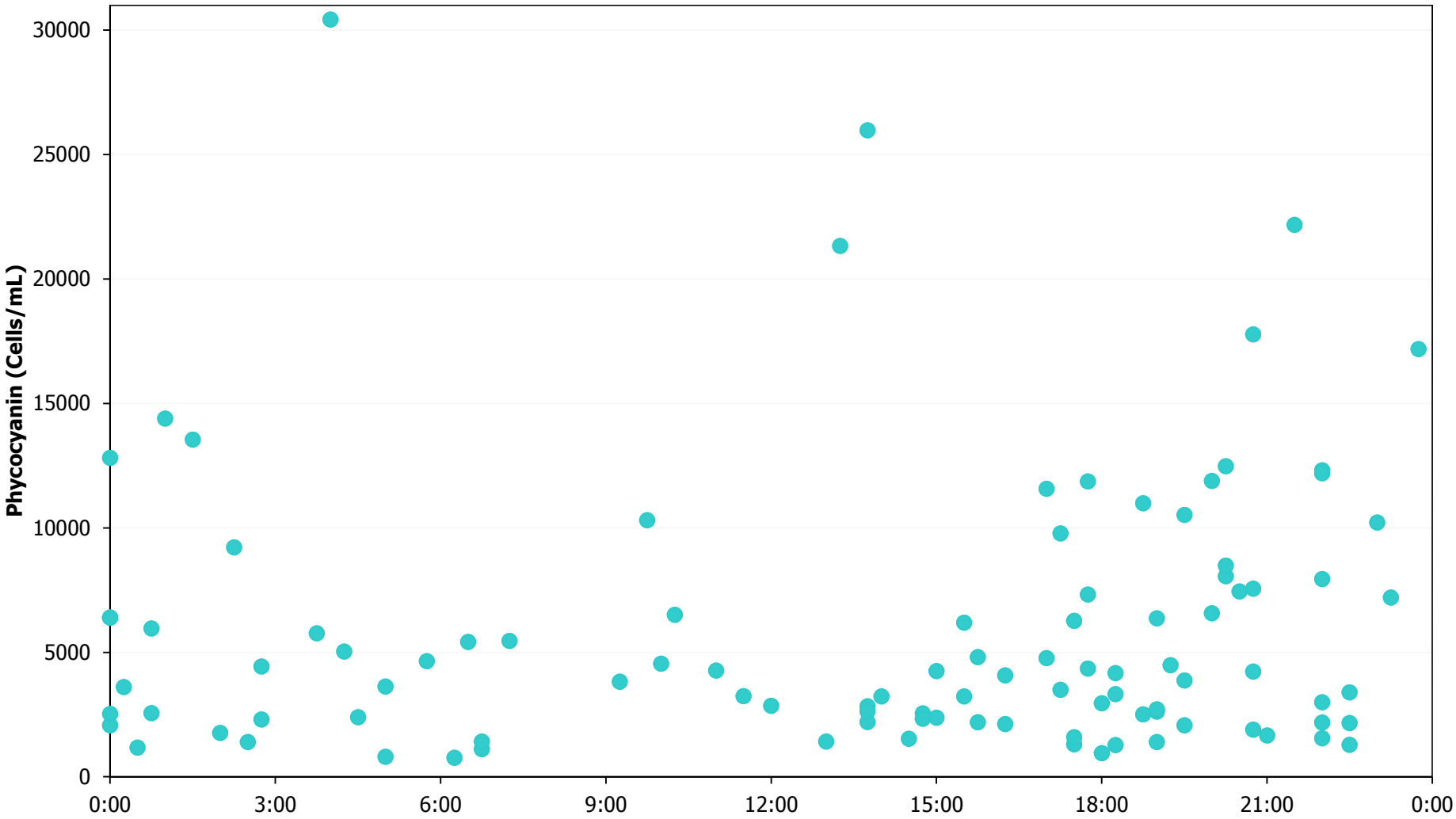
Charles Buoy Corrected Phycocyanin Concentrations and River Flow



Charles Buoy Daily Max Phycocyanin Concentrations - 2011

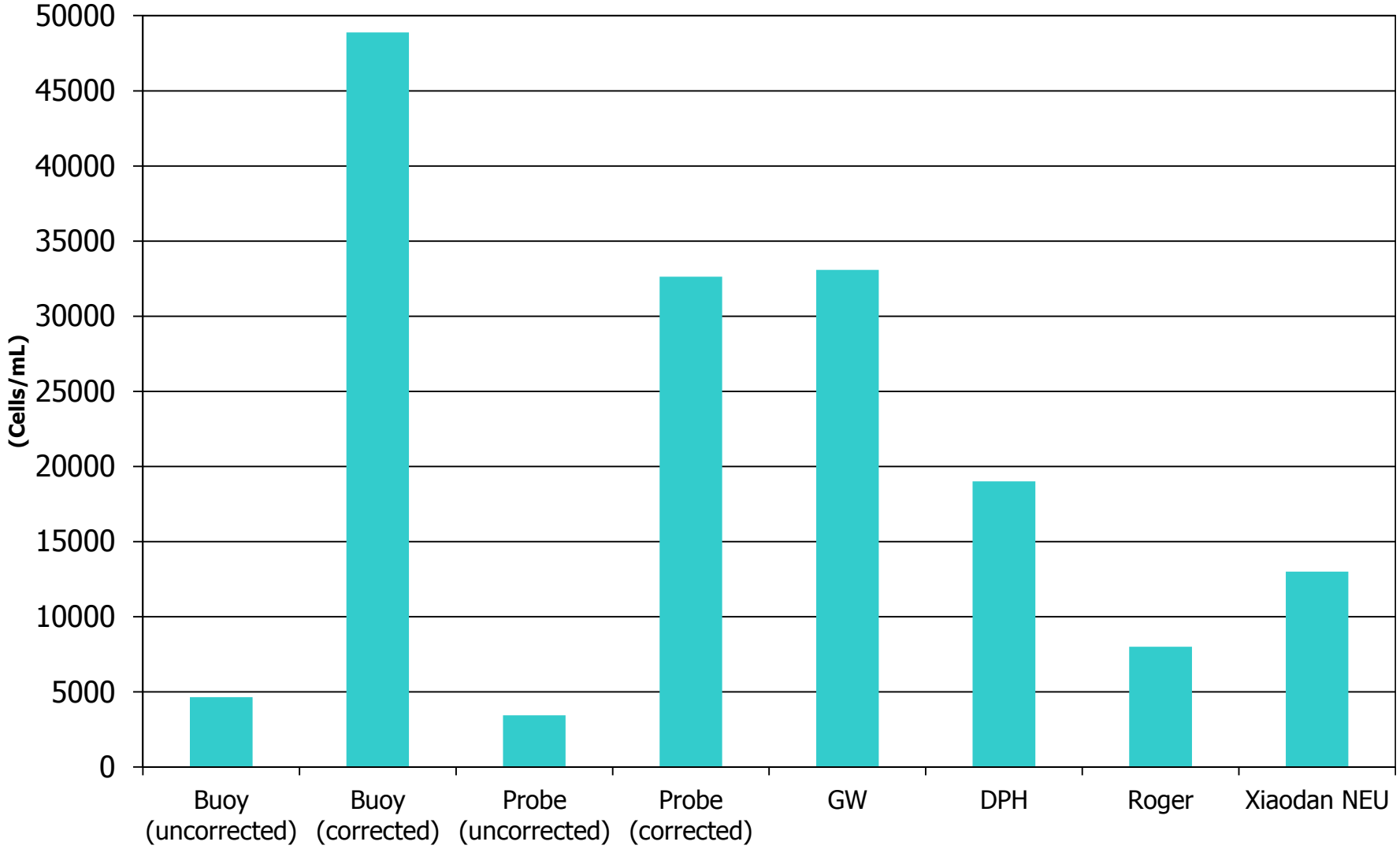


Charles Buoy Daily Max Phycocyanin Concentrations - 2011

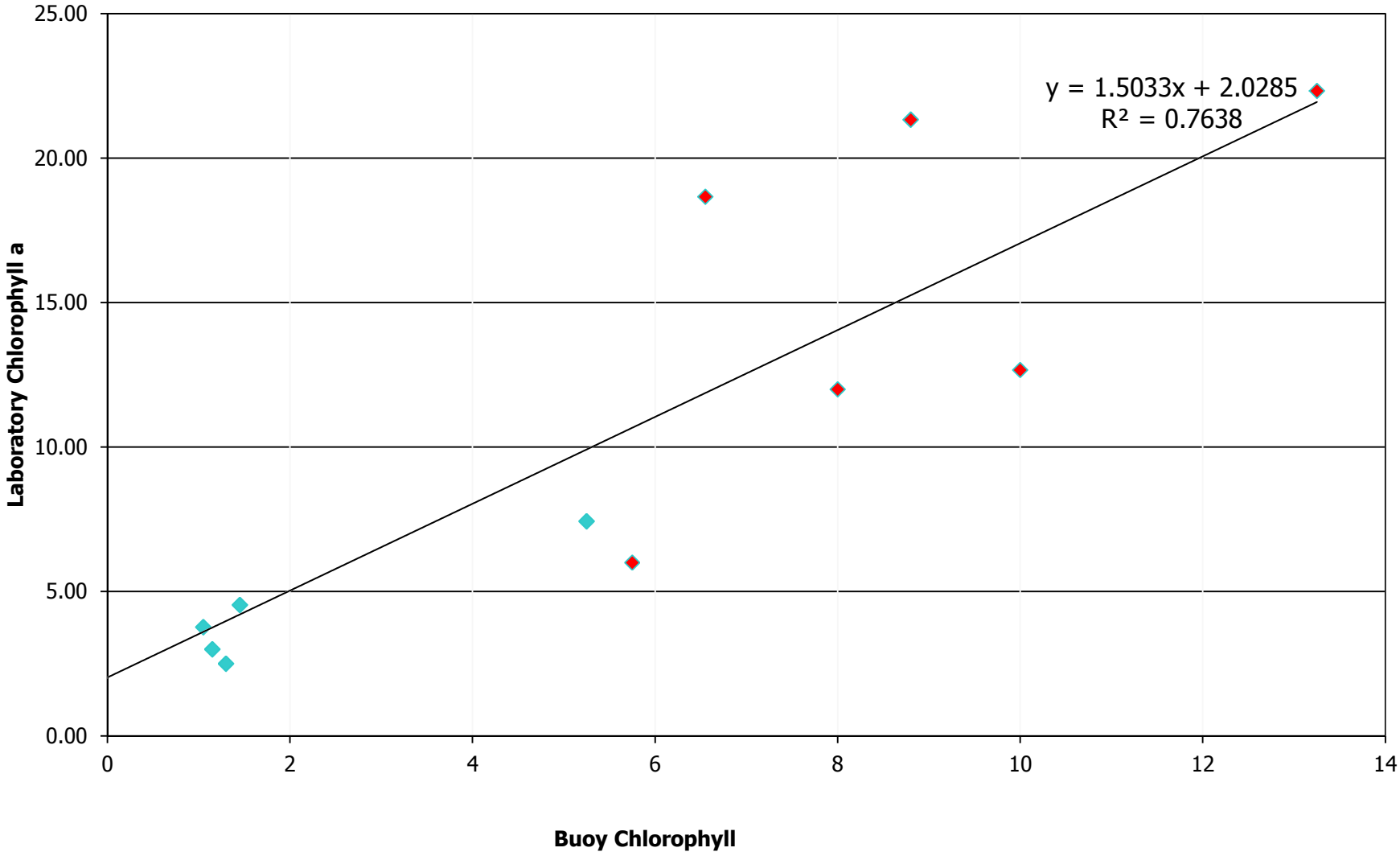


71% of daily maximums occurred in the 12 hr period between 3:00 pm and 3:00 am

Cyanobacteria Cell Count Split Samples -7/25/2011

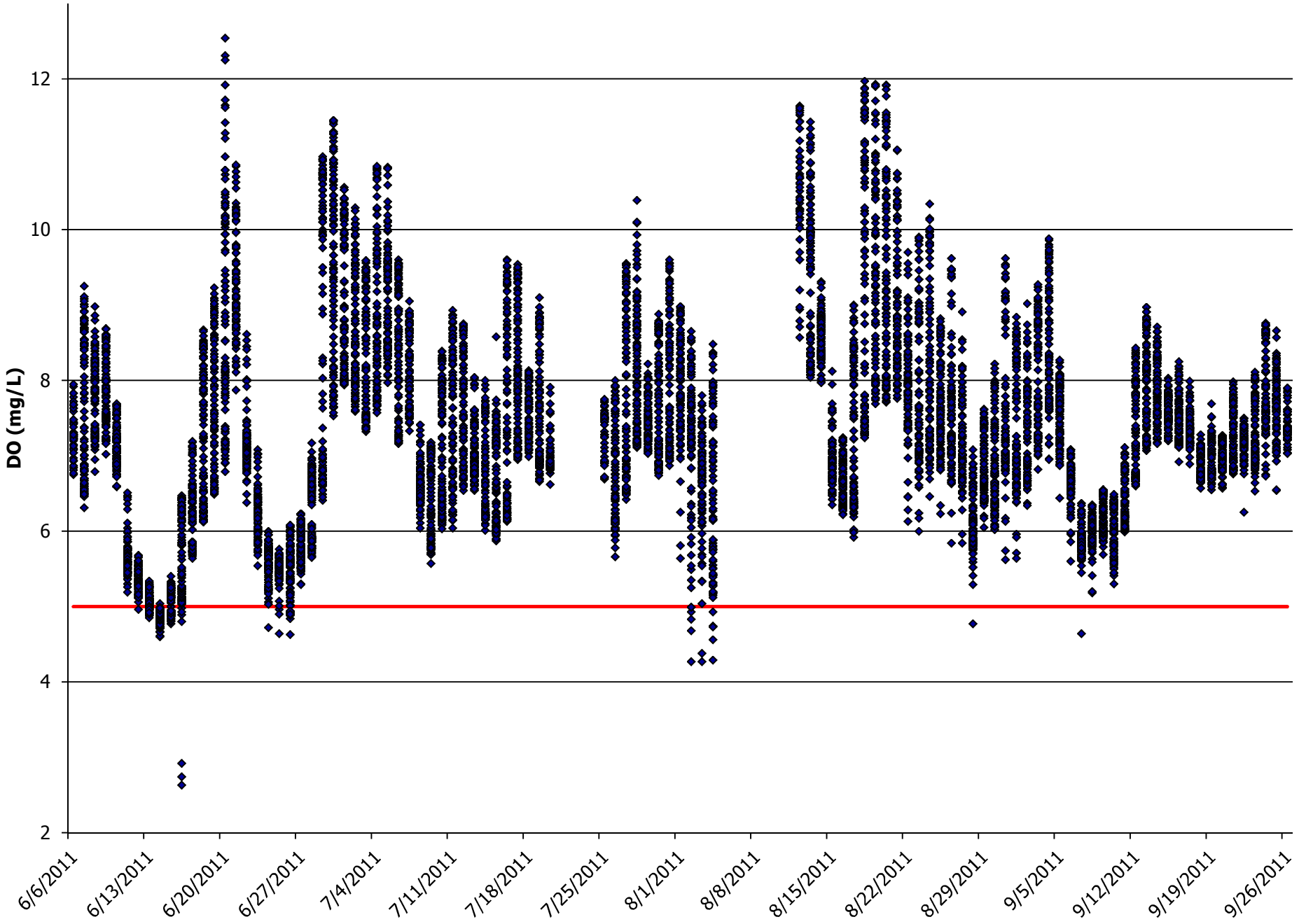


Buoy Chlorophyll (side by side) Vs. Lab Chlorophyll a

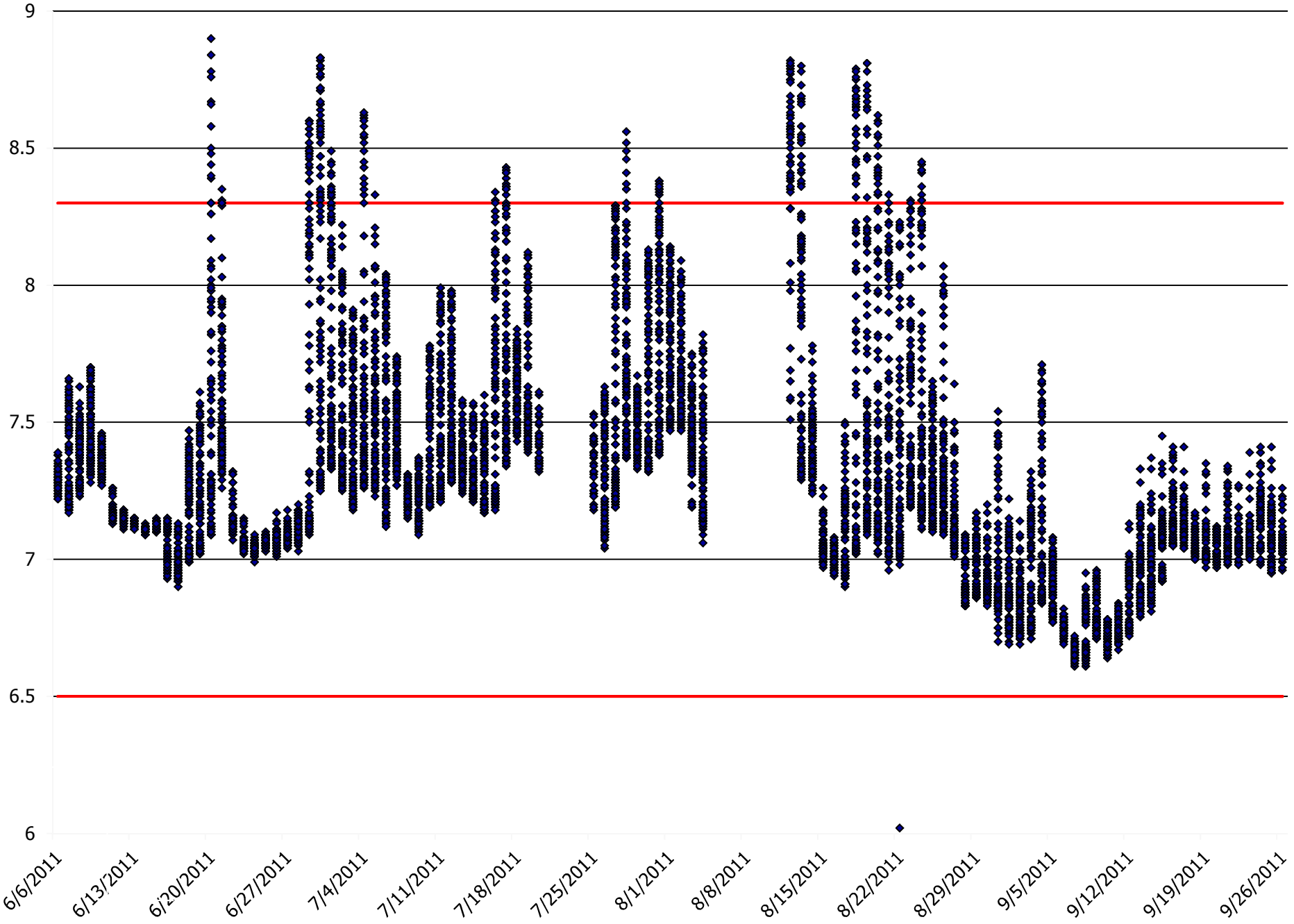


Note: Red marks = Charles Samples, Blue =Mystic
Some data preliminary

Charles Buoy - Dissolved Oxygen -2011

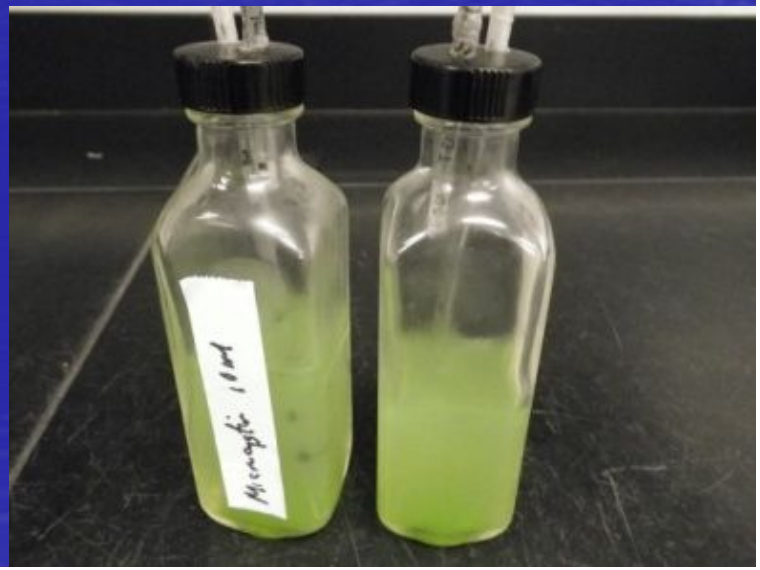


Charles Buoy pH - 2011



Next steps for RTM Buoy Project

- Finalize data file
- Compare dye calibration for Phycocyanin with in-house (*Microcystis aeruginosa*) culture
- Develop monitoring plan for 2012
- Goal to use a correction factor for data generated for chlorophyll and phycocyanin



Acknowledgements:

EPA New England Regional Laboratory

- Liz McCarthy
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- Diane Switzer

Questions?