NOAA Ocean Measurement Capabilities

April 8, 2015

GOES-R Field Campaign Workshop

Michael Ondrusek
NOAA/NESDIS/STAR

Coastal Ocean Applications and Science Team

September 29-30, 2004

GOES-R Calibration and Validation Requirements

Michael Ondrusek
NOAA/NESDIS/ORA

Monterey Bay September 3-16, 2006 Experiment Plan

- Goal to collect a data set that include all the key attributes of CWIS data:
  - Spectral coverage (.4 – 1.0 μm)
  - High signal-to-noise ratio (>300:1 prefer 900:1, for ocean radiances)
  - High spatial resolution (<100 m, bin to 300 m)
  - Hourly or better revisit
- Monterey Bay has long-term physical, biological and optical monitoring
  - Links to data at http://www.cencoos.org
- COAST conducted Intensive effort for 2 weeks supplementing the standard data sets to assure that all essential parameters are measured
- Aircraft overflights for at least three clear days and one partially cloudy day (to evaluate cloud clearing) during the two week period.
  - High altitude to include 90% or more of the atmosphere
  - 30 min repeat flight lines for up to 6 hours to provide a time series for models and to evaluate changes with time of day (illumination, phytoplankton physiology, etc.)
- All data to be processed and distributed over the Web for all users to test and evaluate algorithms and models http://weogeo.coas.oregonstate.edu .

Our Group has been conducting Ocean Color Remote Sensing validation since the CZCS days in the late 1970's

Started by Dennis Clark

Coastal Optical Characterization Experiment

"NOAA/NESDIS/STAR/SOCD/OSB/COCE"
Michael Ondrusek and Eric Stengel

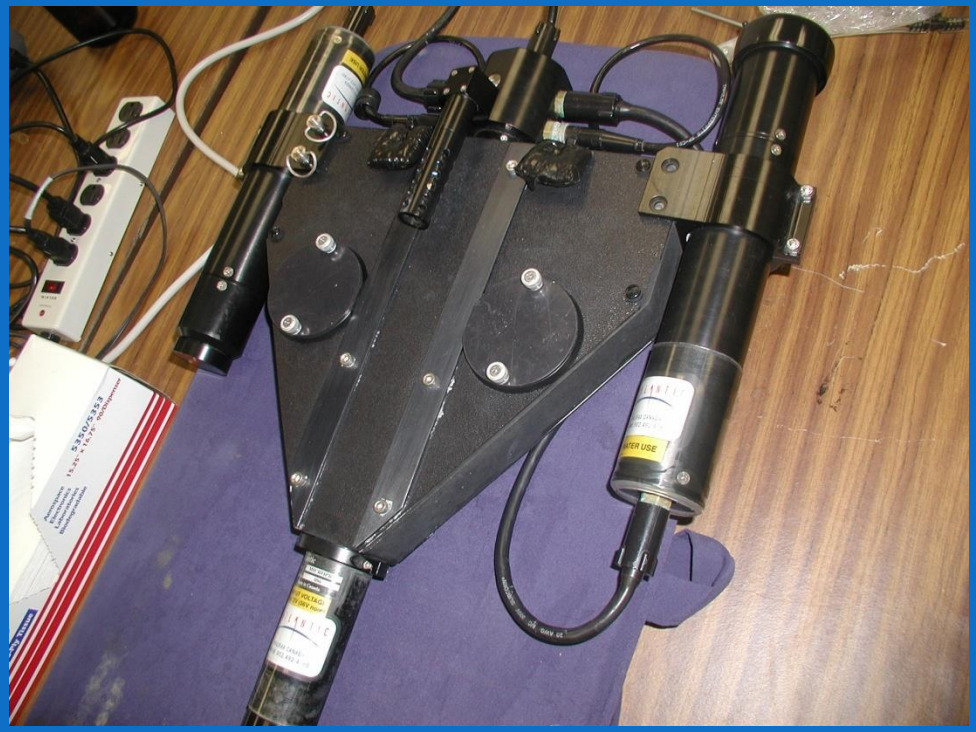
Ocean Color Validation Cruises since launch of VIIRS

Hawaii Validation Cruise (Sep. 2012, 24 Stations)
Florida Coast Cruise with U. of Miami (March 2013, 62 Stations)
Chesapeake Bay Cruise with CREST(Aug. 2013, 42 Stations)
GEOCAPE Cruise in Gulf of Mexico (Sept. 2013, 112 Stations)
MABEL/VIIRS Validation Cruise (Sept. 2013, 5 Stations)
Hawaii Validation Cruise (Mar. 2014, 12 Stations)
Puerto Rico Validation Cruise (May 2014, 15 Stations)
East Coast Validation Cruise (Nov. 2014, 24 Stations)
Puerto Rico Validation Cruise (Mar 2015, 15 Stations)
Chesapeake Bay Validation Stations (29 days) 5/1/13, 5/2/13, 5/3/13, 5/30/13, and 5/31/13, 6/21/13, 7/30/13, 8/12/13, 8/13/13, 8/14/13, 8/15/13, 8/16/13, 8/19/13, 8/20/13, 8/21/13, 8/22/13, 9/25/13, 10/11/13, 10/21/13, 12/11/13, 6/18/14, 6/27/14, 7/17/14, 7/18/14, 7/25/14, 7/28/14, 7/29/14, 7/30/14, 8/15/14, 8/27/15, 8/28/15, 8/30/15, 12/12/14, and 4/1/15.

Provide validation measurements (Rrs and Chl) from all stations to Ocean Color EDR Team
Provided VIIRS processing performance feedback to IDPS, NRL, NOAA, and NASA processing
Setup Calibration Facility at NCWCP

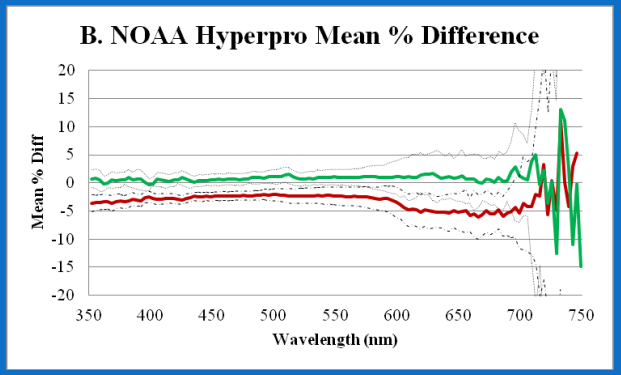
- **Validation of satellite ocean color sensors :**
  - Requires accurate and traceable in situ measurements
  - Hyperspectral to match all sensors
  - Many matchups and water types

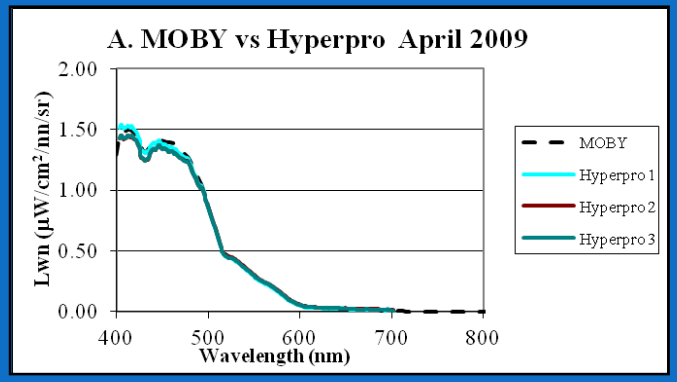
- **Satlantic Profiler II (Hyperpro) in-water radiometer:**
  - Hyperspectral (350-900 nm)
  - Profiling
  - Lu, Ed, and Es

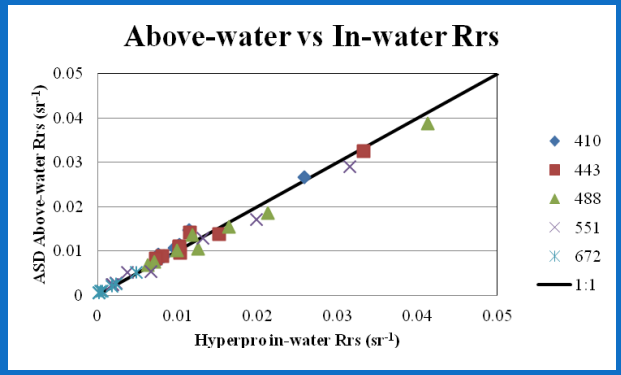


Validation of Ocean Color Sensors Using a Profiling Hyperspectral Radiometer

- Calibration stability
- Inter-calibrations
- Consistency between Hyperpros
- Matchups to MOBY and Boussole
- Comparison to above-water measurements

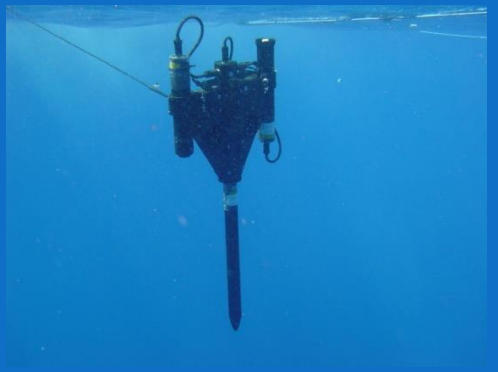






In-Water Instruments

- With good calibration techniques and careful attention to protocols, Hyperpros can provide accurate traceable validation measurements for ocean color sensors
- Repeatability and consistency between Hyperpros are very good
- Hyperpros matched MOBY and Boussole well
- Hyperpros compared well to above-water instrument
- Only accurate out to 900 nm



HAND HELD ABOVE-WATER SPECTROMETERS

ASD
Hand Held
2

Wavelength Range: 325-1075 nm
Wavelength Accuracy ±1 nm
Spectral Resolution < 3.0 nm @ 700 nm
Integration Time: 8.5 ms minimum
Field of View: 25°

ASD
Field Spec 4

Spectral Range: 350-2500 nm
Spectral Resolution: 3 nm @ 700 nm, 10 nm @ 1400/2100 nm
Sampling Interval: 1.4 nm @ 350-1050 nm, 2 nm @ 1000-2500 nm
Scanning Time:100 ms
Wavelength accuracy: 0.5 nm

Spectral Evolution
PSR+ 2500

Spectral Range: 350-2500nm
Spectral Resolution: <3nm@700nm, <22nm@1500nm, <22nm@2100nm
Sampling Interval: 1nm
Scanning Time: 100ms
Wavelength accuracy: 0.5 nm

Model 540 MICROTOPS II Sunphotometer is a 5 channel hand-held sunphotometer for measuring aerosol optical thickness.

The Microtops II Suphotometer provides the aerosol optical thickness at each of the 8 possible standard wavelengths 340, 380, 440, 500, 675, 870, 936, and 1020nm. Choose up to 5. It also measures direct solar irradiance at all chosen wavelengths and water vapor column with 936 and either one or both 870 &1020 nm.

Uses: Measures Aerosol Optical Thickness, Direct Solar Irradiance and Water Vapor Column

Optical Channels:
340 ± 0.3 nm, 2 nm FWHM
380 ± 0.4 nm, 4 nm FWHM
440 ± 1.5 nm, 10 nm FWHM
500 ± 1.5 nm, 10 nm FWHM
675 ± 1.5 nm, 10 nm FWHM
870 ± 1.5 nm, 10 nm FWHM
936 ± 1.5 nm, 10 nm FWHM
1020 ± 1.5 nm, 10 nm FWHM

Stray light:
340nm: 1E-6 λ<650nm; 1E-5 λ<1.0µm
380nm: 1E-6 λ<650nm; 1E-5 λ<1.0µm
440nm: 1E-5 λ<1.0µm
500nm: 1E-6 λ<1.1µm; 1E-5 λ<1.2µm
675nm: 1E-6 λ<1.1µm; 1E-5 λ<1.2µm
870nm: 1E-6 λ<1.1µm; 1E-5 λ<1.2µm
936nm: 1E-6 λ<1.1µm; 1E-5 λ<1.2µm
1020nm: 1E-6 λ<1.1nm; 1E-5 λ<1.2µm

Resolution:0.1W/m²
Dynamic range:>300,000
Viewing angle:2.5°
Precision:1-2%
Non linearity:max 0.002% FS
Operating environment:0 to 50°C, no precipitation
Computer interface: USB
Power source:4xAA Alkaline batteries
Weight:21 oz (600 grams)
Size: 4"W x 8"H x 1.7"D (10x20x4.3 cm)

http://solarlight.com/product/microtops-ii-sunphotometer/

Typcial routine measurements:

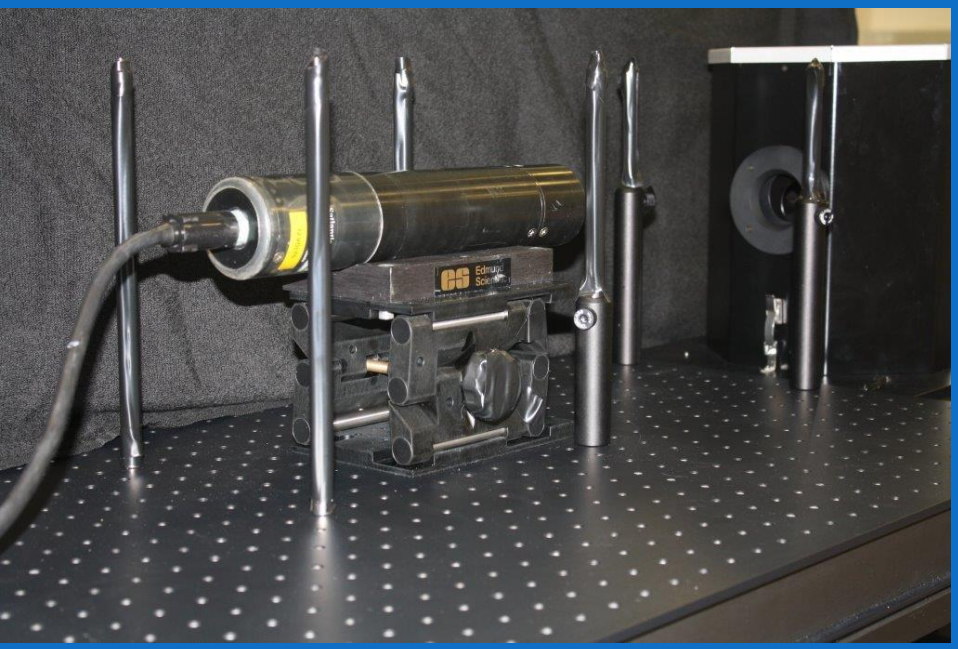
We have designated equipment and can sample on a small or large boat with minimal advance notice.

Surface incident irradiance (Satlantic Hyperpro hyperspectral profiling radiometer)
Downwelled irradiance (Satlantic Hyperpro hyperspectral profiling radiometer)
Upwelled radiance (Satlantic Hyperpro hyperspectral profiling radiometer, and ASD above water radiometer)
Fluorometric Chlorophyll a (Turner Fluorometer)
Total Suspended Matter (By weight)
Salinity (Seabird Conductivity Sensor)
Temperature (Seabird Sensor)
Pressure (Seabird pressure sensor)
Dissolved Oxygen (Seabird SBE43)
Spectral Transmission (Wetlabs transmissometer)
Aerosol optical thickness (Microtops)
CDOM absorption (Tidas)
Phytoplankton identifications
HPLC phytoplankton pigments
Spectral Absorption (Wetlabs ACS and AC9)

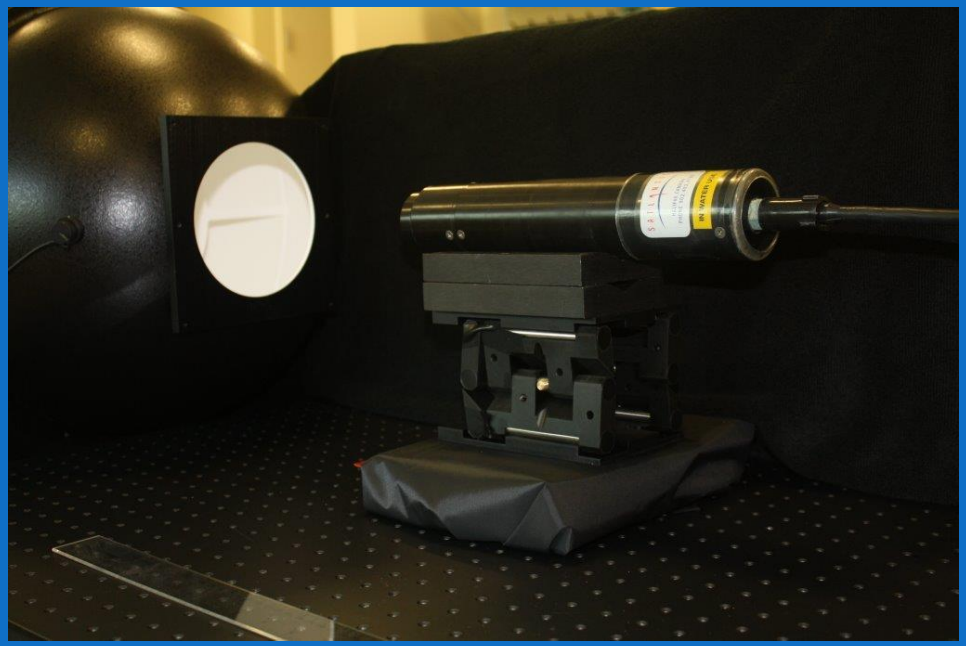
New calibration facility at NCWCP for optical calibrations.

- more frequent calibrations
- inter-calibration of team members.

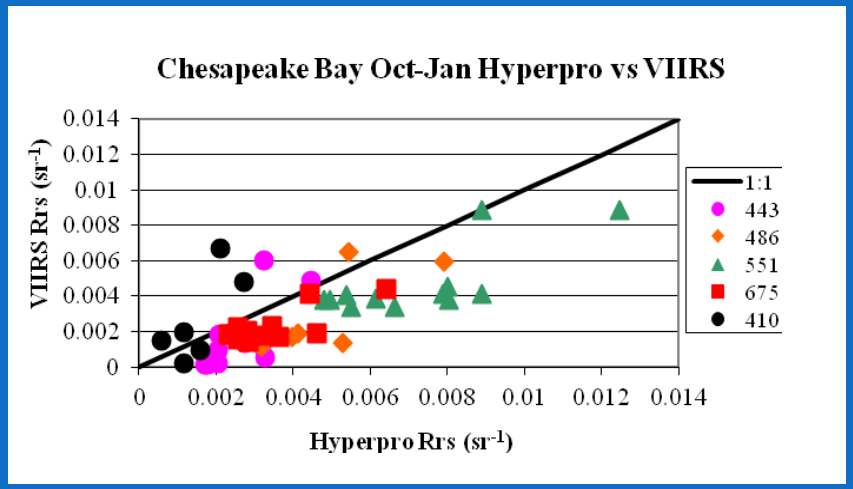
NIST Spectral Irradiance Standard with Gamma Sci. 5000 Housing

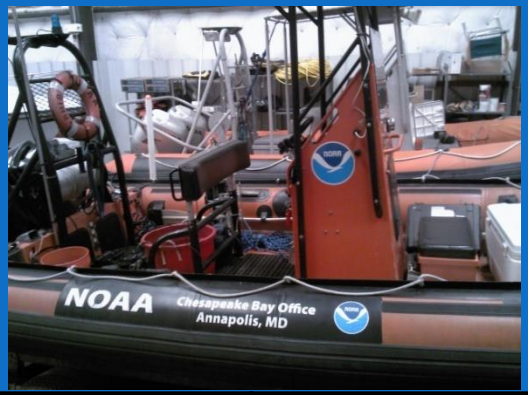


Gooch & Housego OL455 Integrating Sphere Radiance Calibration Source



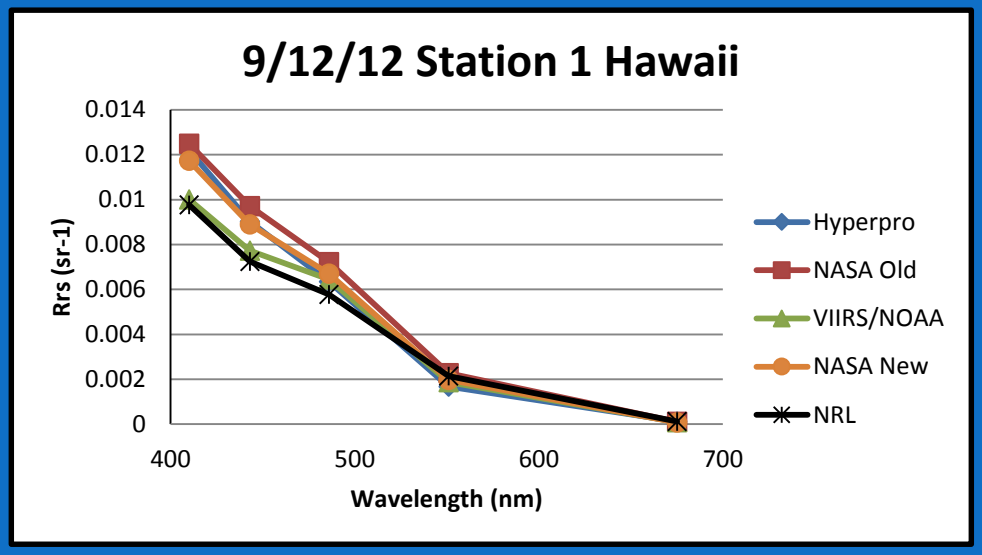
Chesapeake Bay VIIRS Ocean Color Validation: Conducted routine in-water Hyperpro and above-water ASD validation measurements in the Chesapeake Bay 12/1/11, 2/3/12, 3/27/12, 5/11/12, 7/3/12, 10/11/12, 11/2/12, 1/7/13, 1/10/13, 2/14/13, 2/15/13, 4/11/13, 5/1/13, 5/2/13, 5/3/13, 5/30/13, 5/31/13, 6/21/13 , 7/30/13, 8/12/13, 8/13/13, 8/14/13, 8/15/13, 8/16/13, 8/19/13, 8/20/13, 8/21/13, 8/22/13, 9/25/13, 10/11/13, 10/21/13, 12/11/13, 6/18/14, 6/27/14, 7/17/14, 7/18/14, 7/25/14, 7/28/14, 7/29/14, 7/30/14, 8/15/14, 8/27/15, 8/28/15, 8/30/15, 12/12/14, and 4/1/15. Total of 150 Stations in the Bay since Launch of VIIRS.

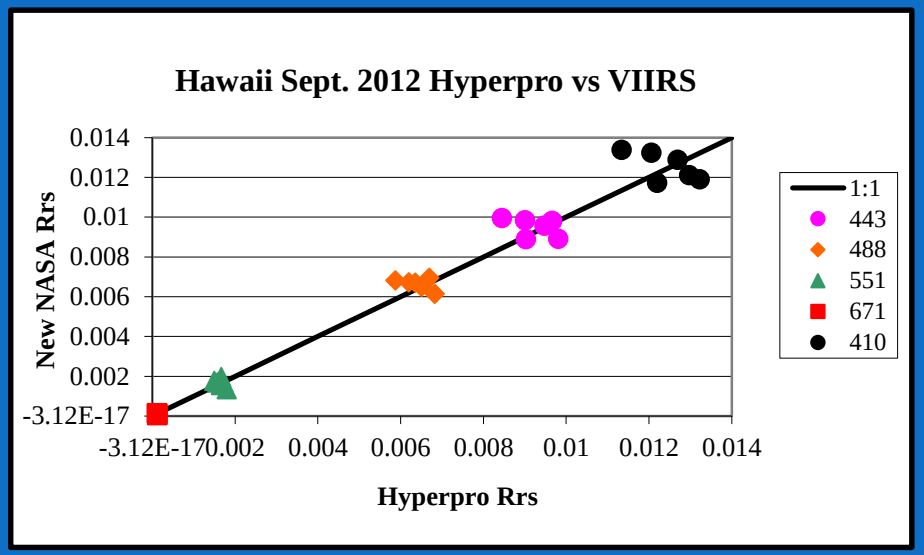




Band (nm)	Avg. % diff. Hyperpro – VIIRS Oct 12-Jan 13	Avg. % diff. Hyperpro – VIIRS Jun 13 – Jan 14
410	66	36
443	-50	-24
488	-46	-36
551	-35	-22
671	-33	-28
Average 443 to 671 nm	-41	-27

Hawaii 2012 Validations

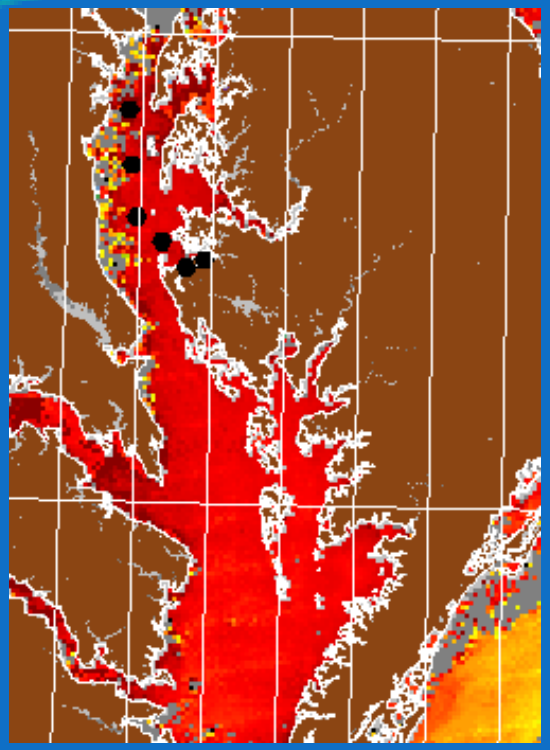


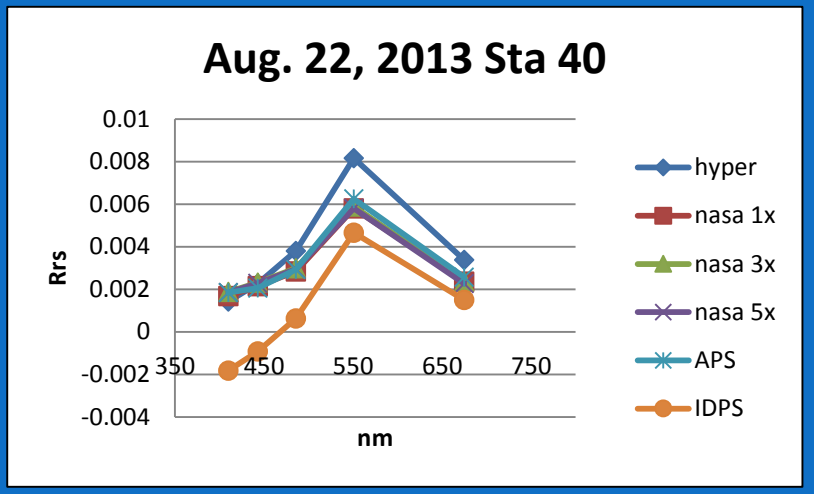


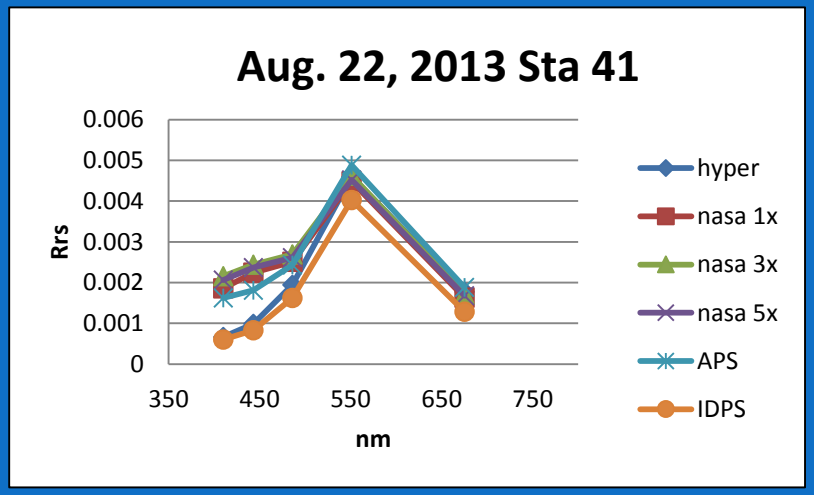
Averages of the percent differences between Hyperpro in-situ and VIIRS for Hawaii, Sept. 2012 comparing different processings. Sample dates include 9/11/12, 9/12/12, and 9/15/12. N = 6.

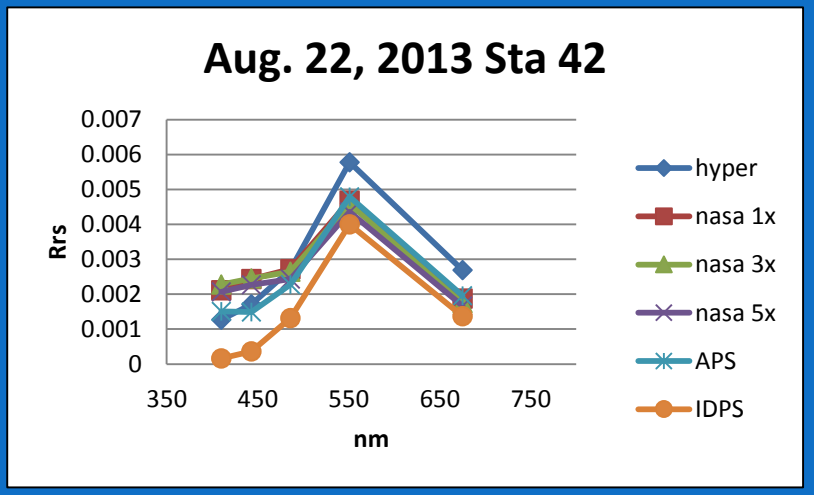
Band	Old NASA - New NASA	Hyperpro - New NASA	Hyperpro - NRL	Hyperpro - NOAA
410	-6.99	1.50	3.48	-16.56
443	-9.36	3.18	1.05	-14.13
488	-8.38	3.93	3.38	-8.16
551	-19.31	1.40	36.27	-15.39
671	-30.70	-8.81	158.79	-22.56
average 410 to 551	-11.01	2.50	11.05	-13.56

Two week, August 2013 Cruise with CUNY/CREST covering entire Chesapeake Bay. Shown, Day 234, transect up the bay. 42 Stations total

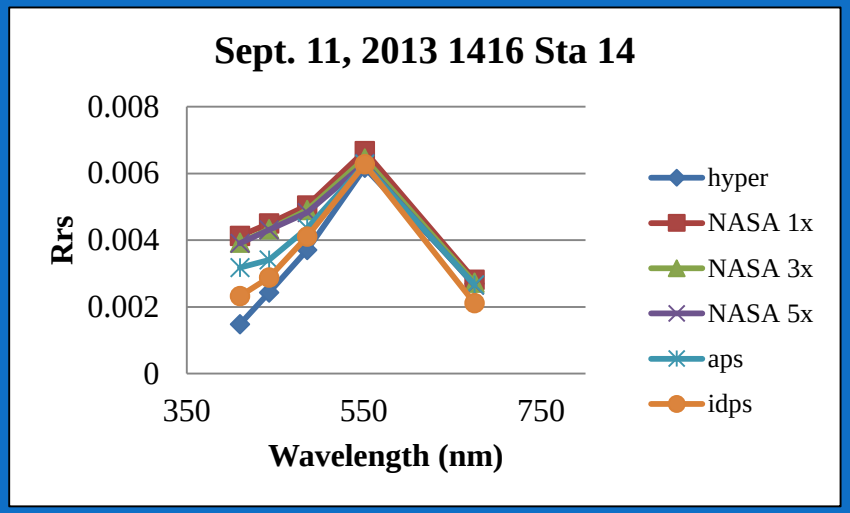


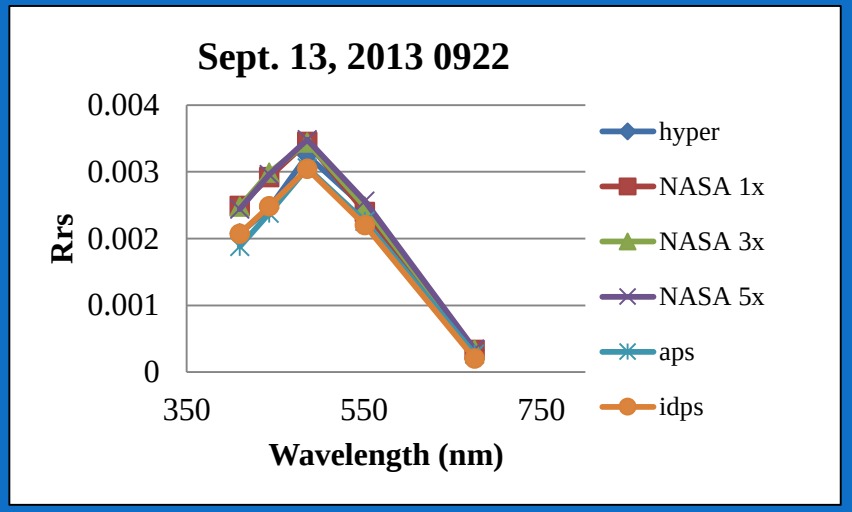


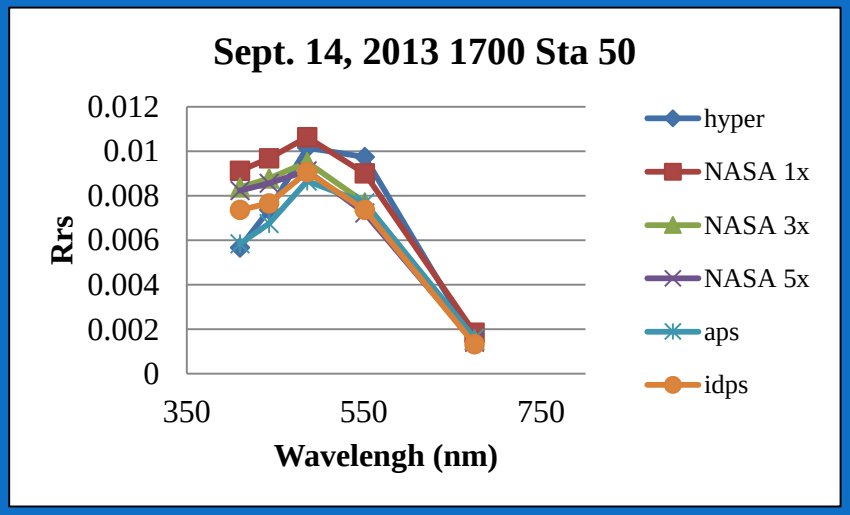


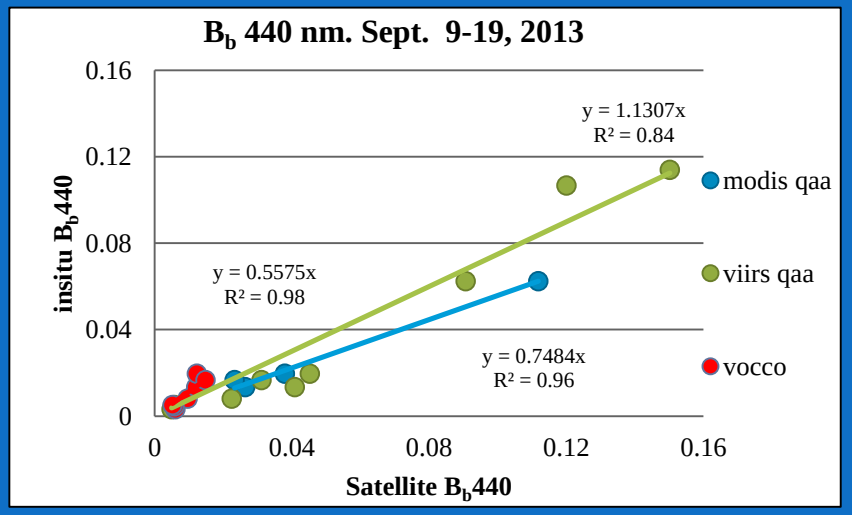


Sept. 2013 Geocape Cruise 112 Stations Rrs Data shown from 9/11, 13, and 14, 2013 and Ecopuc backscatter validations are show in bottom right.



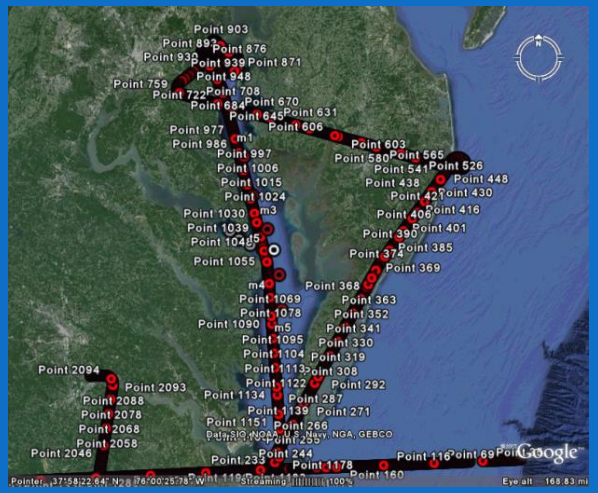




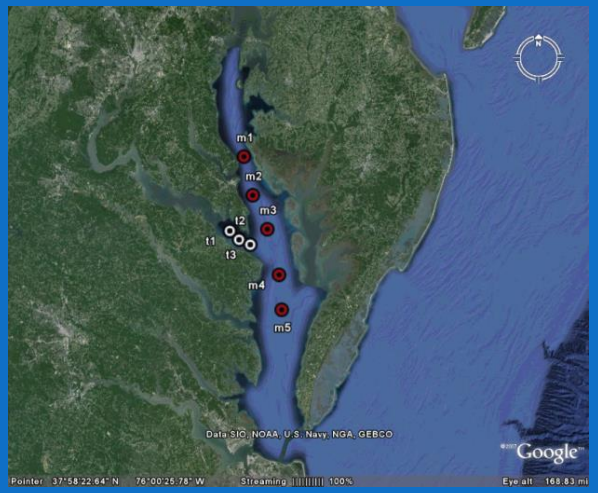


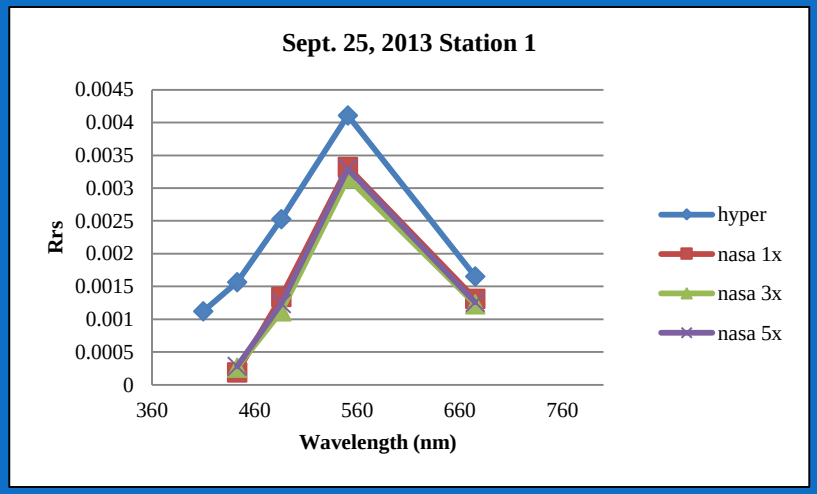
Sept. 25, 2013 VIIRS and *Multiple Altimeter Beam Experimental Lidar* (*MABEL*) Flyover Validations Locations, 5 Stations

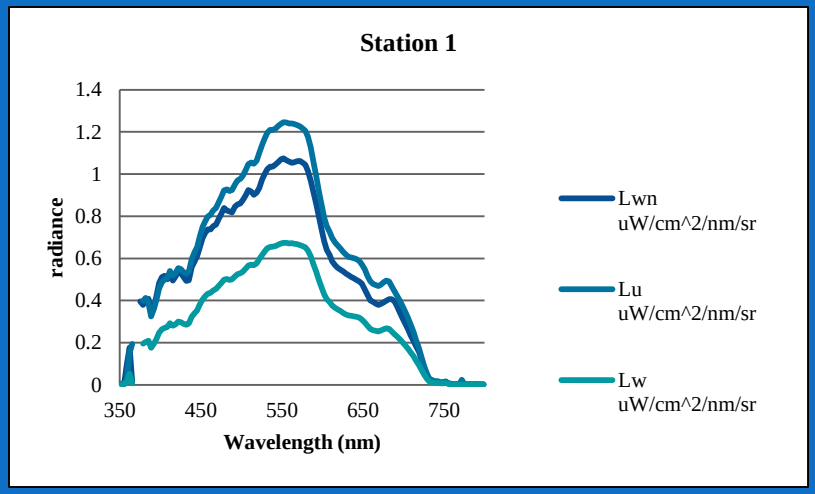
MABEL Track



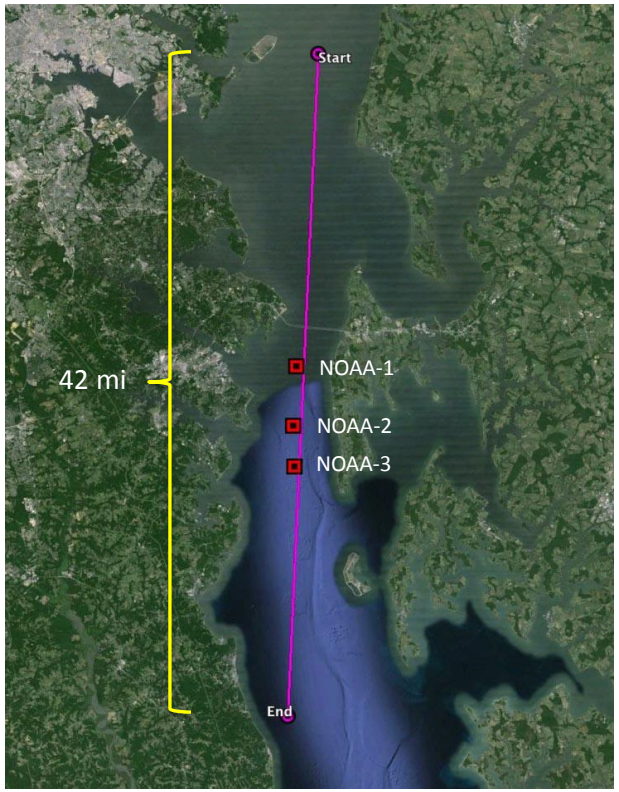
Validation Stations







NRL/NOAA Chesapeake Bay Sampling Locations; August 29, 2014



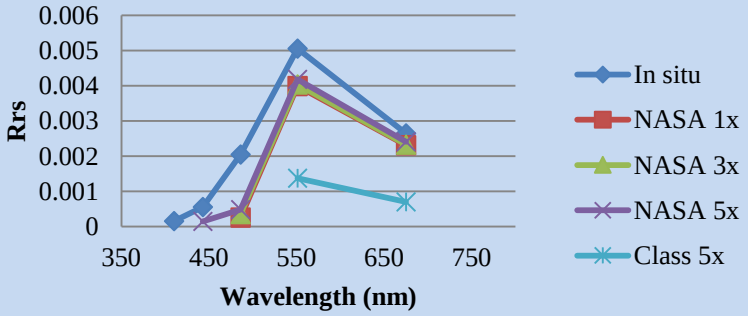
Station	Lat	Lon
NOAA-1	38.95967	76.39948
NOAA-2	38.90697	76.41194
NOAA-3	38.87022	76.41968

Flight Line	Lat	Lon
Start	39.23599	76.29894
End	38.64774	76.48347

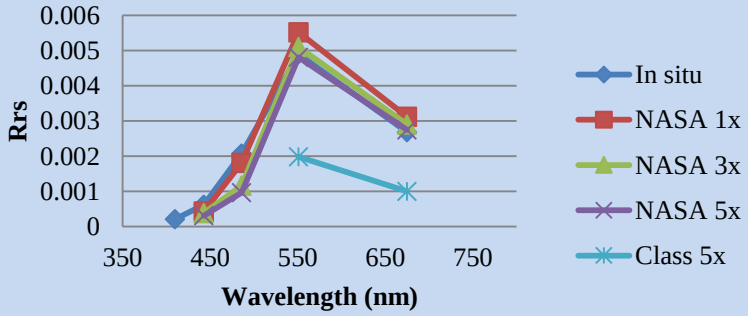
* Length of flight line = 42 mi.

Note: HICO overpass occured at 11:28 local time

August 29, 2014 Sta. 1
Chesapeake Bay, Chl 13 mg/m^3



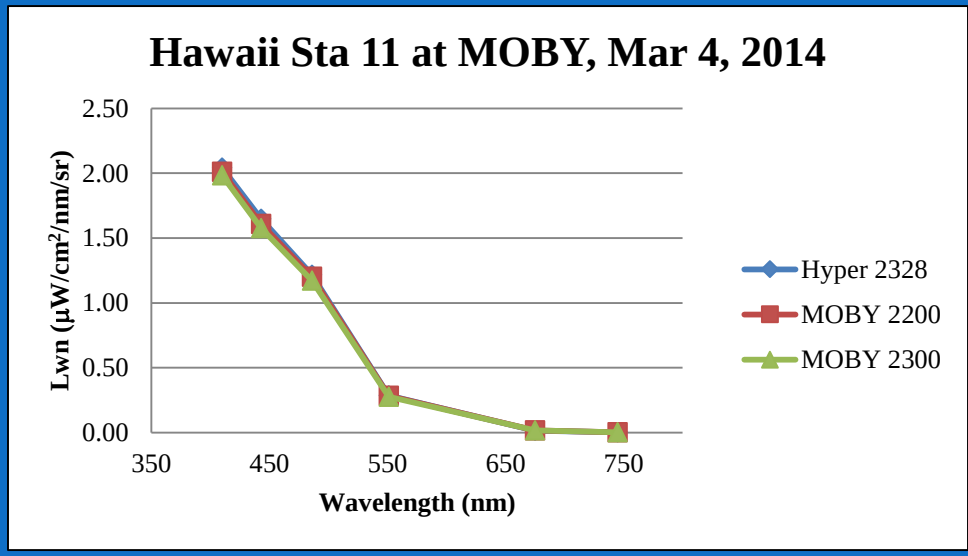
August 29, 2014 Sta. 2
Chesapeake Bay, Chl 18 mg/m3



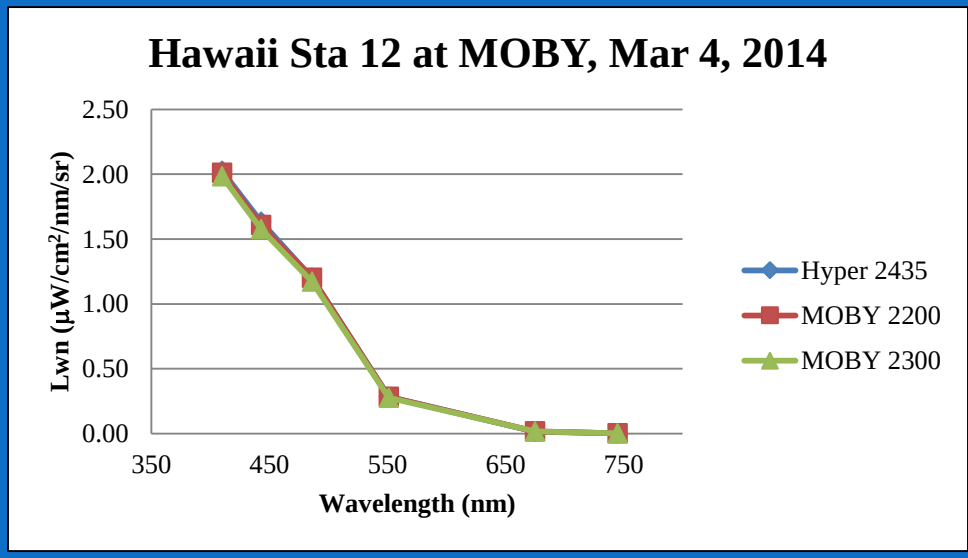
Blue water VIIRS ocean color validation at MOBY site in Hawaii. March 2 – 4, 2014: Conducted measurement comparisons between our Hyperpro, MOBY and Dr. Lee's (U. Mass) new skylight blocking radiometer at 12 stations.

Hyperpro vs MOBY for VIIRS total band at the MOBY site, Hawaii

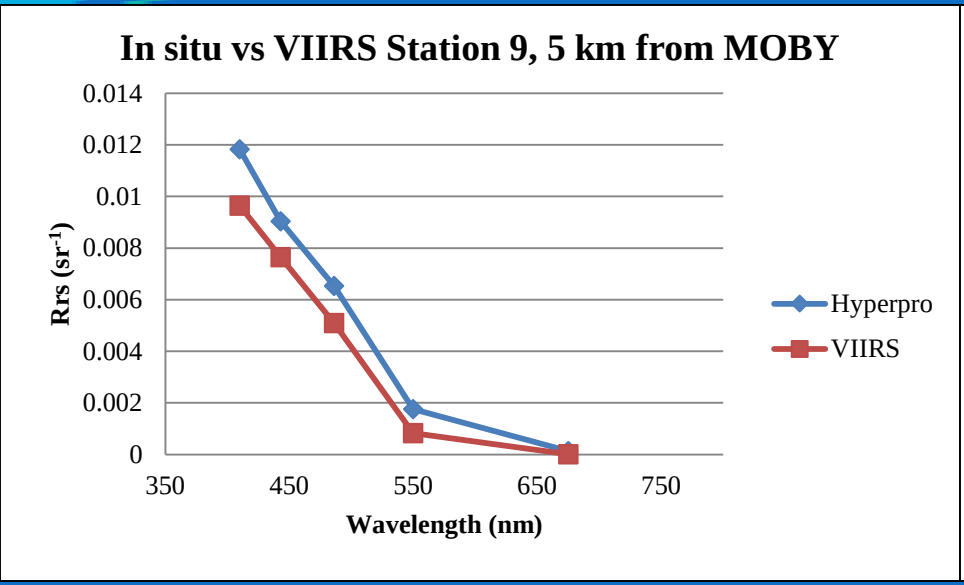
Station	11				
Year	2014	2014	2014		
Jday	63	63	63		
Time	23.467	22.674	23.768		
Lat	20.811	20.815	20.815		
Long	-157.203	-157.201	-157.202		
Lwn	Hyper 2328	MOBY 2200	MOBY 2300	% Diff	%Diff
410	2.042	2.012	1.983	-1.517	-3.007
443	1.648	1.608	1.577	-2.543	-4.520
486	1.217	1.200	1.171	-1.394	-3.905
551	0.285	0.283	0.276	-0.688	-3.239
675	0.014	0.017	0.017	14.979	15.973
745	0.002	0.003	0.003	29.554	29.554

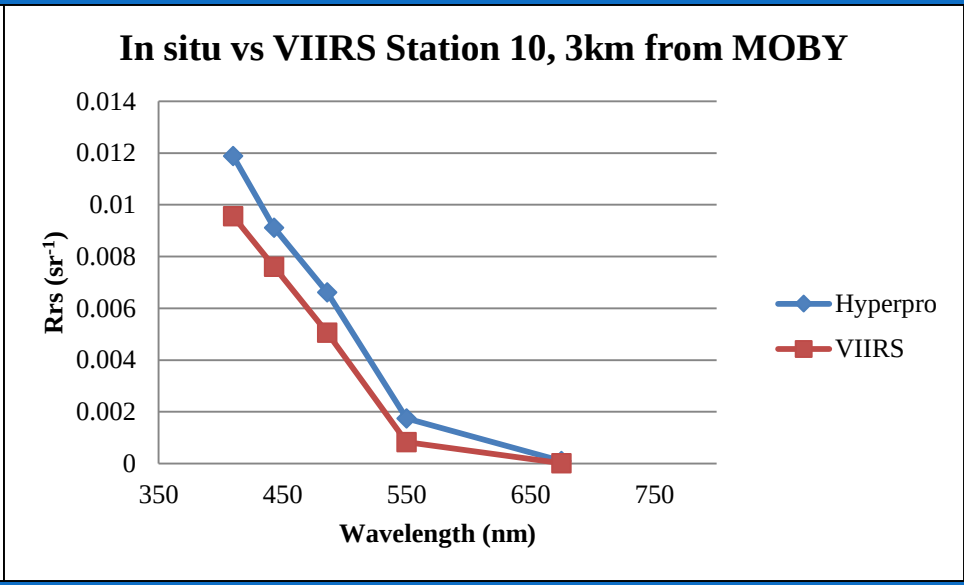


Station	12				
Year	2014	2014	2014		
Jday	63	63	63		
Time	24.583	22.674	23.768		
Lat	20.813	20.815	20.815		
Long	-157.203	-157.201	-157.202		
Lwn	Hyper 2435	MOBY 2200	MOBY 2300	% Diff	%Diff
410	2.026	2.012	1.983	-0.704	-2.182
443	1.633	1.608	1.577	-1.615	-3.574
486	1.200	1.200	1.171	0.007	-2.469
551	0.283	0.283	0.276	0.063	-2.469
675	0.016	0.017	0.017	6.302	7.397
745	0.002	0.003	0.003	29.434	29.434

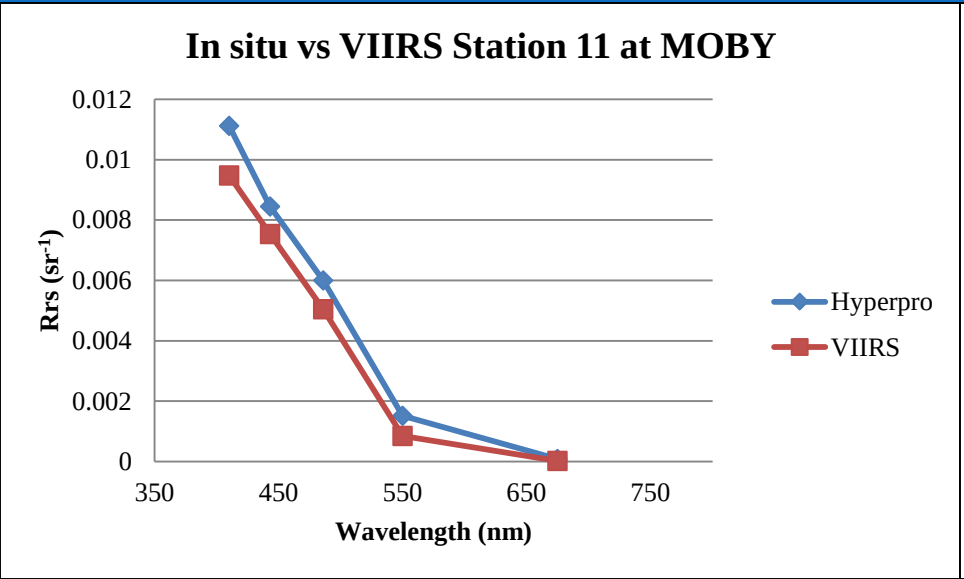


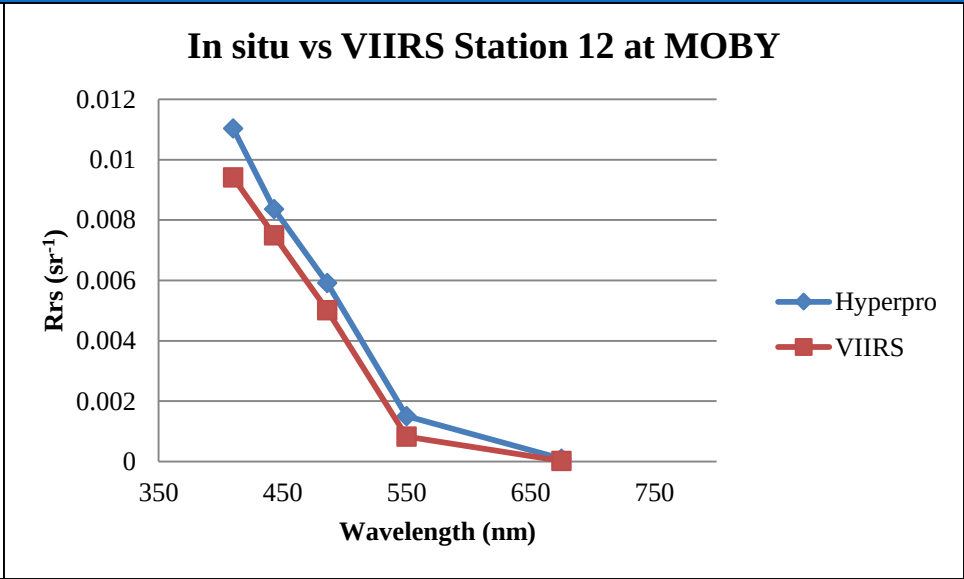
Hyperpro vs NASA VIIRS on March 4, 2014





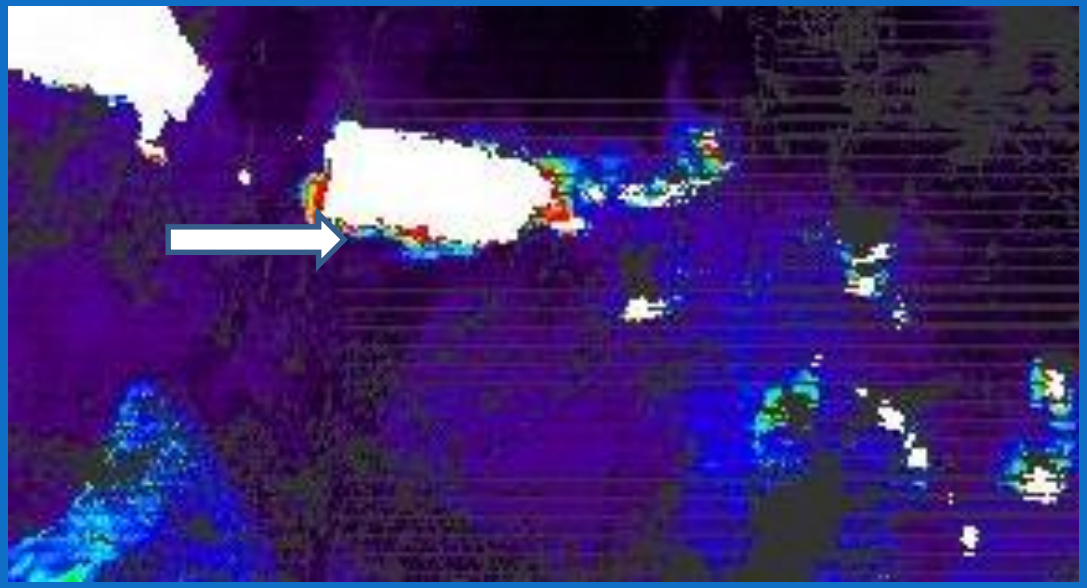
410 to 486, VIIRS averages 20% low or 0.001 sr^{-1}

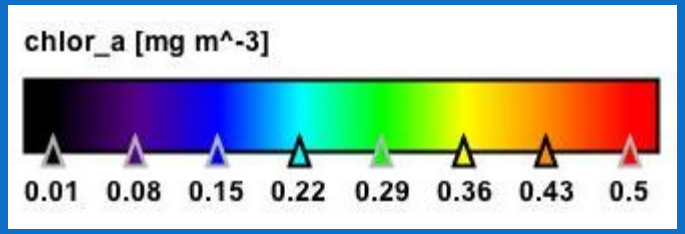




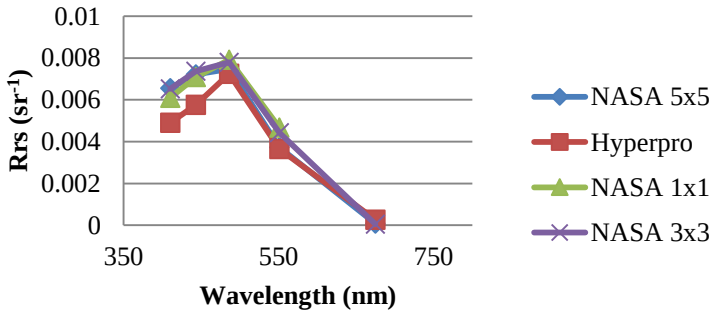
VIIRS/Landsat 8/SBA validation cruise South of Puerto Rico May3-5, 2014. 15 Stations

NASA chlorophyll image of Puerto Rico Sampling region. May 5, 2014

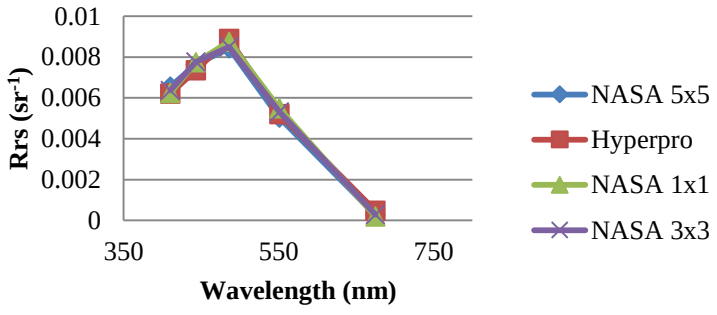




5/4, Station 7 offshore, 5 ft seas, 15 kt winds, some clouds near



5/4, Station 9, clear skies offshore, 12 kt winds, 2 ft seas, no clouds



Dedicated Ocean Color Cal/Val Cruise, Nov. 2014
10 Days out of Charleston, SC for VIIRS validation
http://www.moc.noaa.gov/nf/

NOAA Ship *Nancy Foster*

Hull Number	*R352*
Call Sign	WTER
Home Port	
Charleston, SC	
Marine Operations Center	
Atlantic (MOC-A)	
Port Office	
Charleston Marine Support Facility, Charleston, SC	
Regular Area of Operations	
Atlantic, Caribbean, and Gulf of Mexico	
General Classification	
Oceanographic Research Vessel	
Mailing Address	
NOAA Ship ***Nancy Foster*** Marine Operations Center, Atlantic 439 West York Street Norfolk, VA 23510-1145	

Dedicated VIIRS Cal/Val Cruise
NOAA Ship Nancy Foster
11-20 November 2014

Validation Measurements

- **Water-Leaving Radiance** - HyperPro, MicroPro, C-OPS, GER, SBA, TRIOS, HyperSAS, ASD
- **Aerosol Optical Depth** - Microtops
- **Chlorophyll** - HPLC, Fluorometric, (in situ and extracted)
- **Absorption** - ACS, AC9, Spectrophotometric
- **Backscatter** - BB9, BB7, BB3, ECO Puck
- **Bi-directional radiance distribution** - NURADS
- **Phytoplankton Physiology -** FRRF, FIRe, Alf-a
- **Carbon** - POC and DOC water analysis; plus CDOM
- **Total Suspended Matter** - Gravimetric

International, Interagency and Academic Collaborations:

US Agencies

- **NOAA**/NESDIS/STAR (NOAA)
- Naval Research Laboratory, Stennis Space Center (**NRL**)
- NASA/Goddard Space Flight Center (**NASA**)
- National Institute of Standards and Technology (**NIST**)

European Union

- Joint Research Center of the European Commission (**JRC**)

Universities

- City University of New York, Long Island; CREST
- Lamont-Doherty Earth Observatory, Columbia University
- University of Massachusetts, Boston
- University of Miami
- University of South Florida
- University of Southern Mississippi

Science Objectives for the Cruise

Goals

1) **Calibration and Validation of Satellite Ocean products VIIRS JPSS**
2) **Uncertainty of in situ bio-optical measurements**
3) **Ocean Processes**
   - **Fronts – Eddies**
   - **Water Mass Classification with bio-optical**
   - **Resolve the Subtle differences in open ocean waters !**

Validation Results

Occupied 23 Stations over 10 Days

Conducted pre- and post-cruise inter-cals

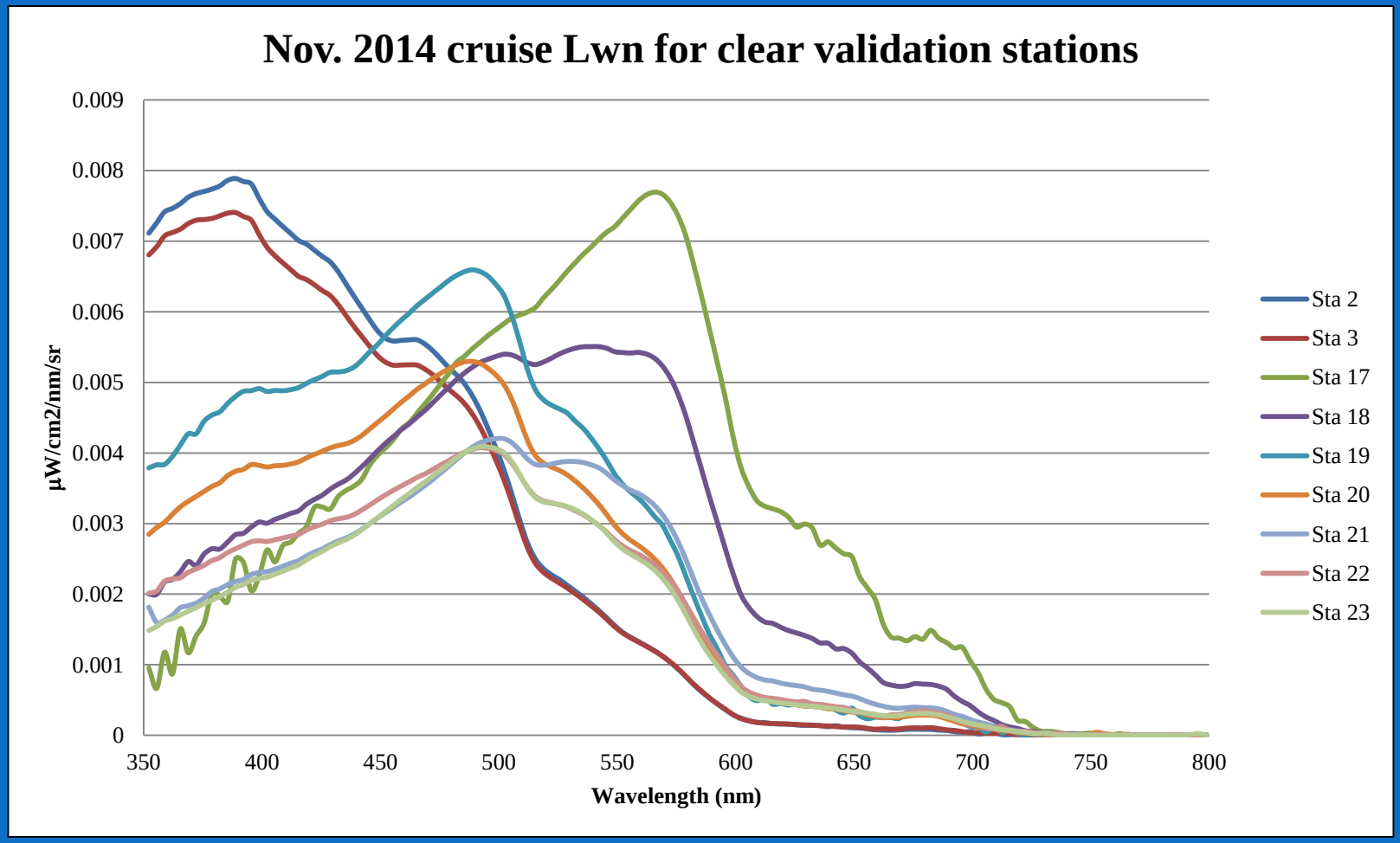
4 simultaneous profiling radiometers at each Sta.

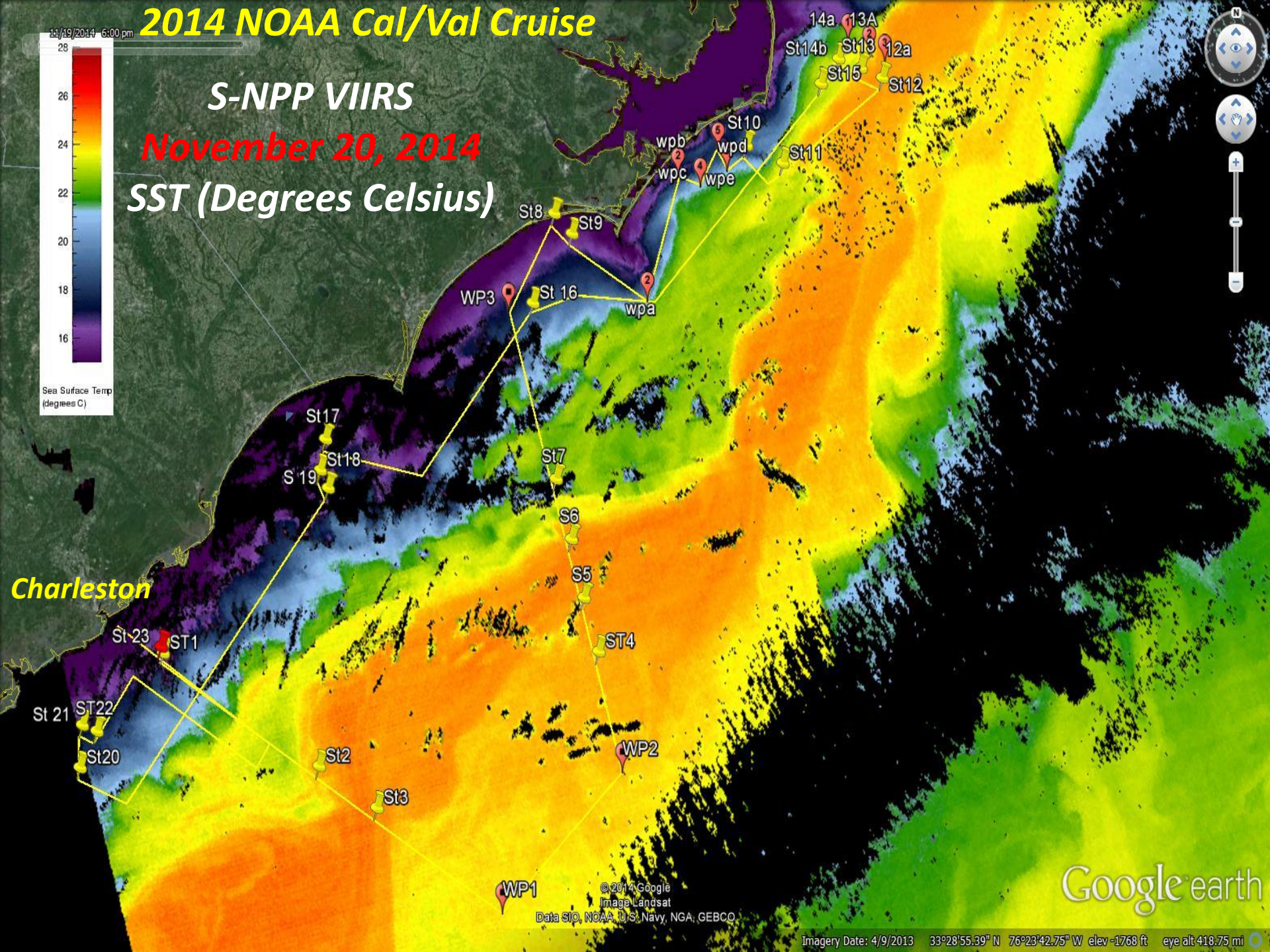
2 simultaneous floating radiometers at each Sta.

6 simultaneous above-water radiometers at each Sta.

11 potential station matchups with VIIRS

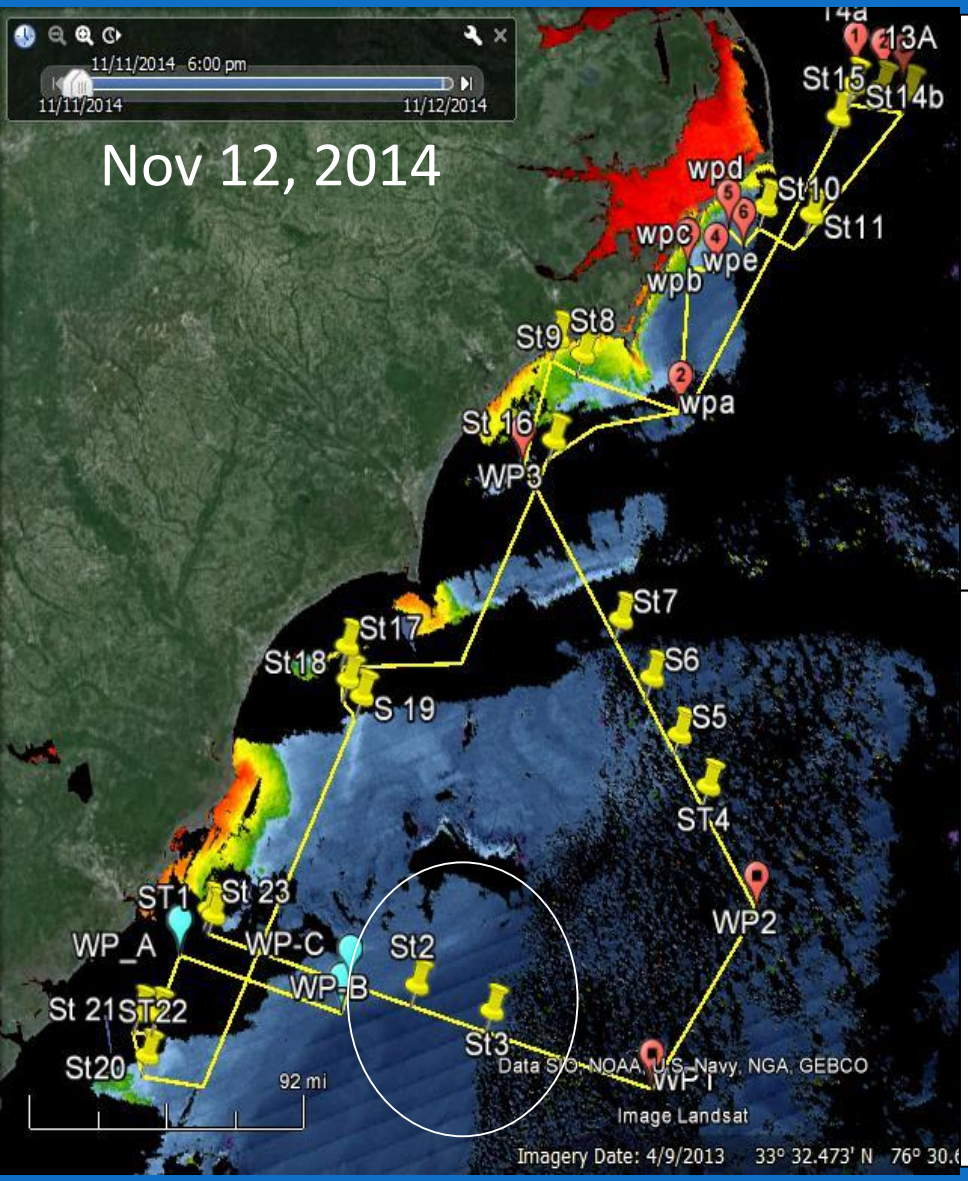
Normalized Water-Leaving Radiance Data Measured During Clear Sky Conditions on November 2014 Cal/Val Cruise

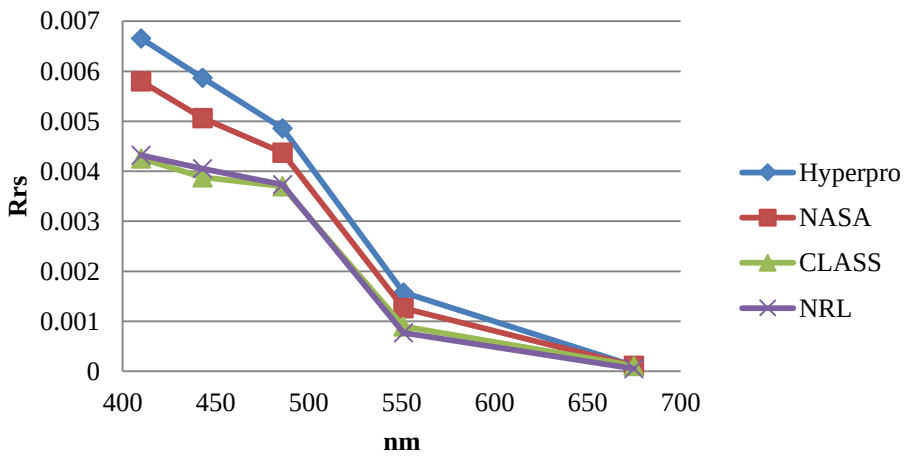


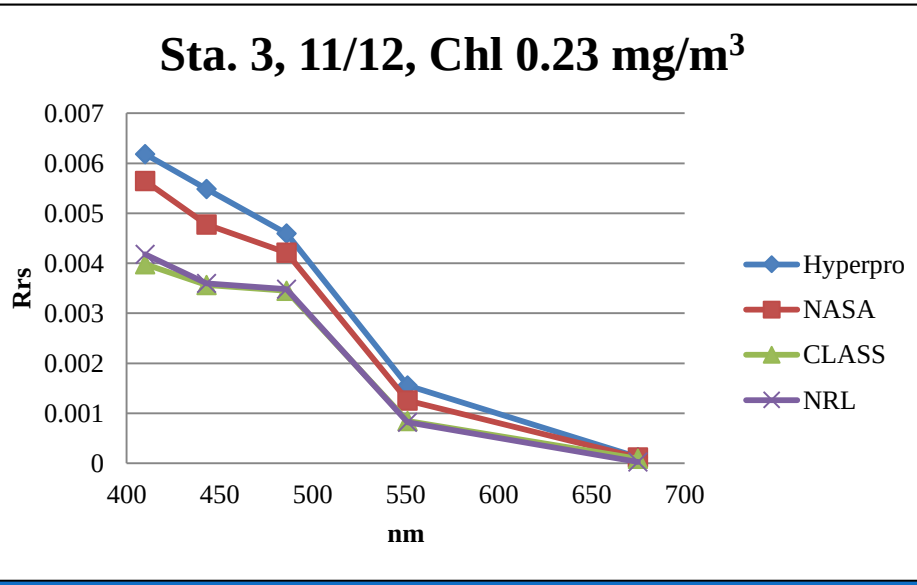

2014 NOAA Cal/Val Cruise
S-NPP VIIRS
November 20, 2014
SST (Degrees Celsius)
11/19/2014 6:00 pm
28
26
24
22
20
18
16
Sea Surface Temp (degrees C)
14a
13A
St14b
St13
12a
St15
St12
St10
wpb
wpd
wpc
wpe
St11
St8
St9
WP3
St 16
wpa
St17
St18
S 19
St7
S6
S5
Charleston
St 23
ST1
ST4
St 21
ST22
St20
St2
WP2
St3
WP1
©2014 Google
Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google earth
Imagery Date: 4/9/2013 33°28'55.39" N 76°23'42.75" W elev -1768 ft eye alt 418.75 mi

Very preliminary VIIRS vs NOAA Hyperpro comparisons from Nov. 14 Cal/Val Cruise. VIIRS NASA and CLASS data are 5x5 pixel averages. NRL is single pixel match.

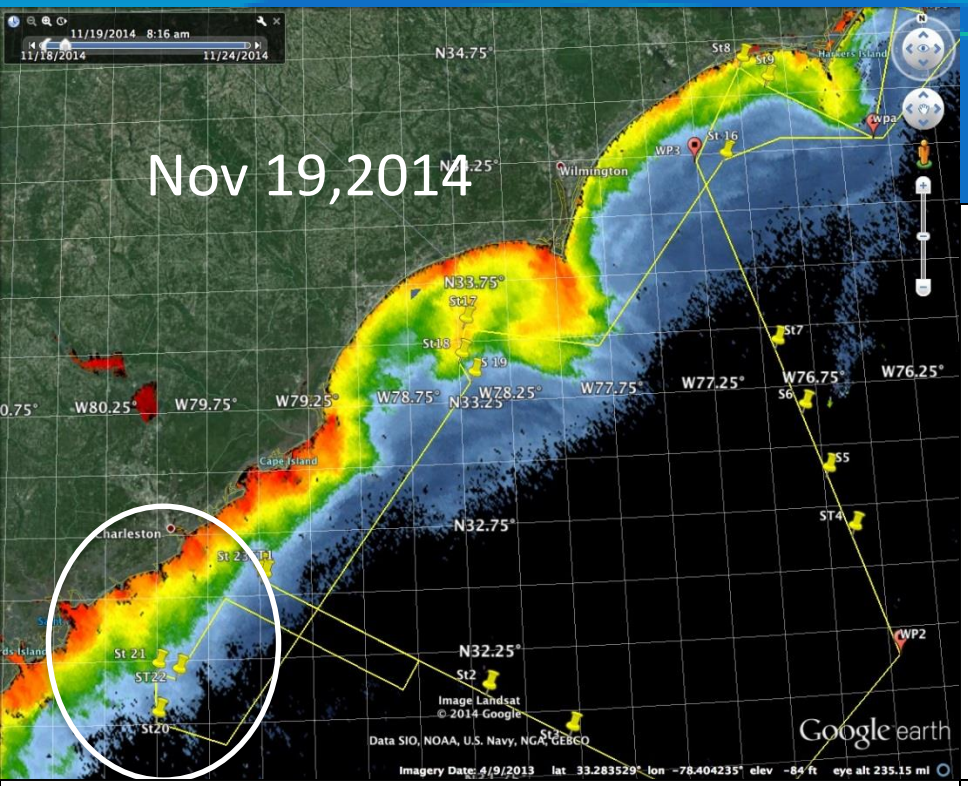
November 12, 2014 Blue water validations

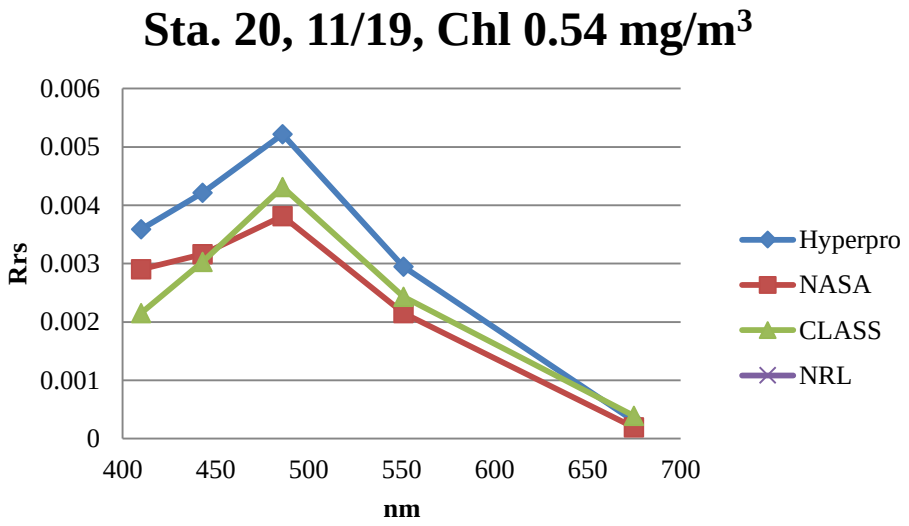


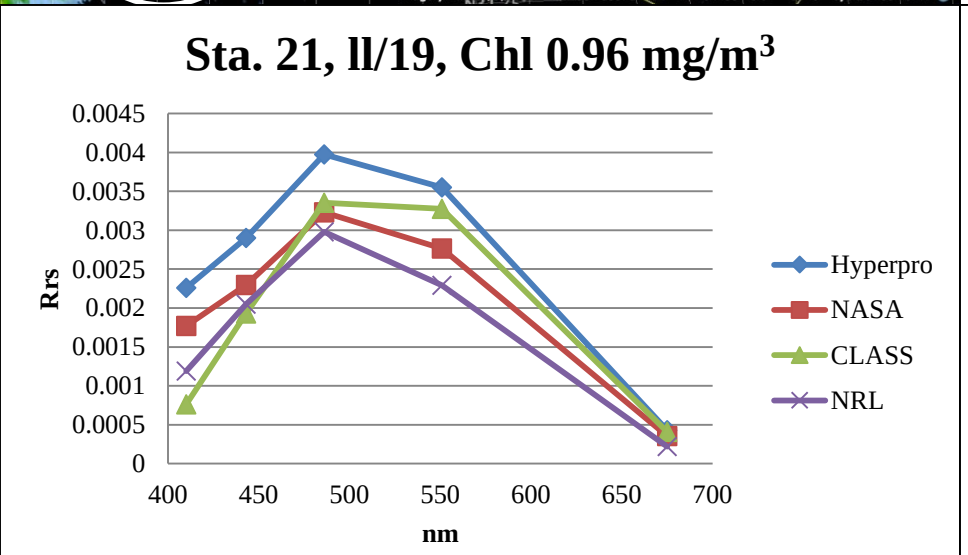


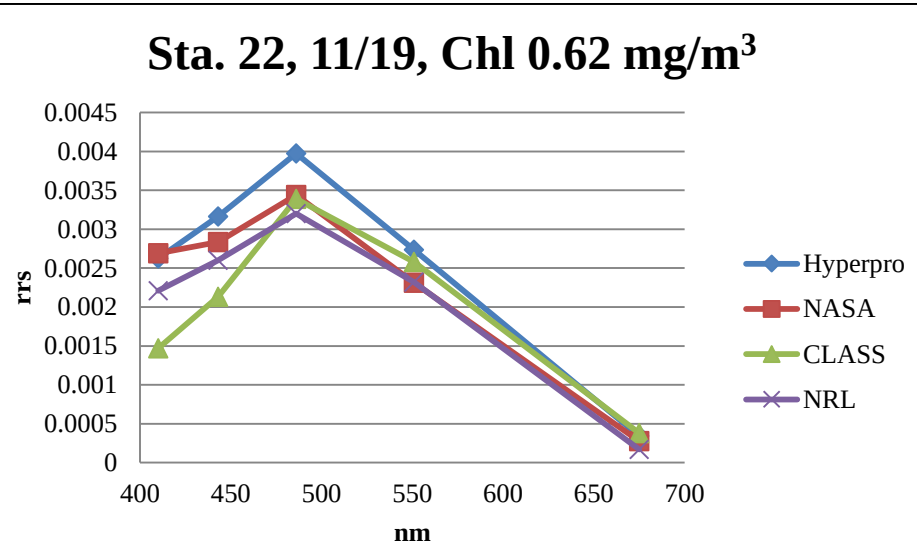


November 19, 2014 Close to the front from high chl to blue water



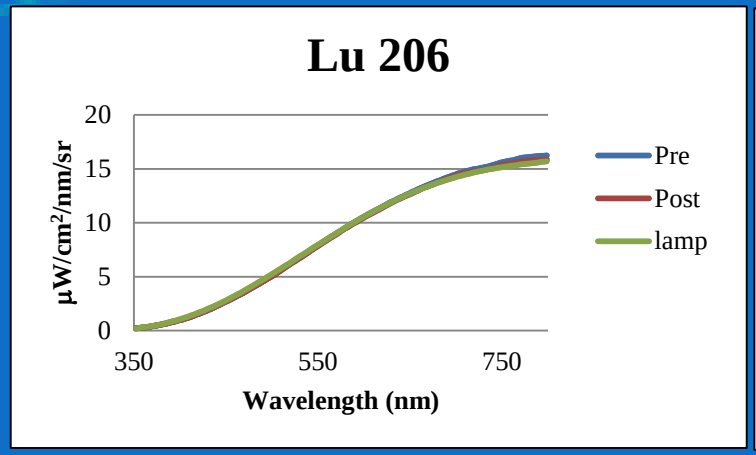


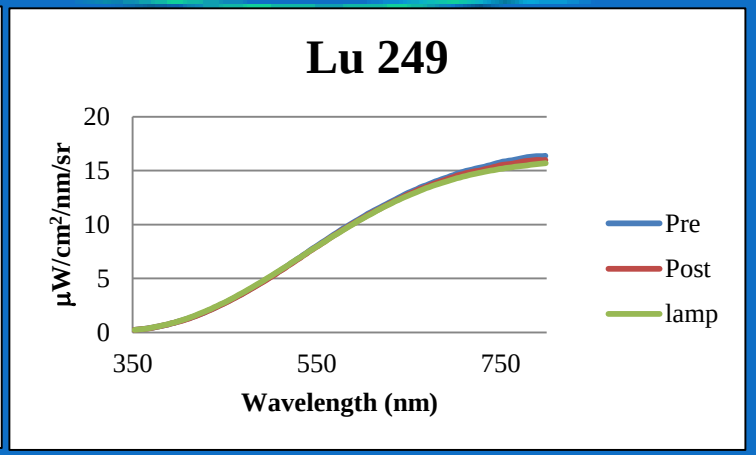




2) Uncertainty of in situ bio-optical measurements

Pre- and Post-cruise inter-calibration of radiance sensors used in Nov. 2014 Cal/Val cruise





Multiple profiling radiometers were used to simultaneously measure water-leaving radiances

Goes

Multiple above-water radiometers were used to simultaneously measure water-leaving radiances

Lin

Logistics

Floating Instruments

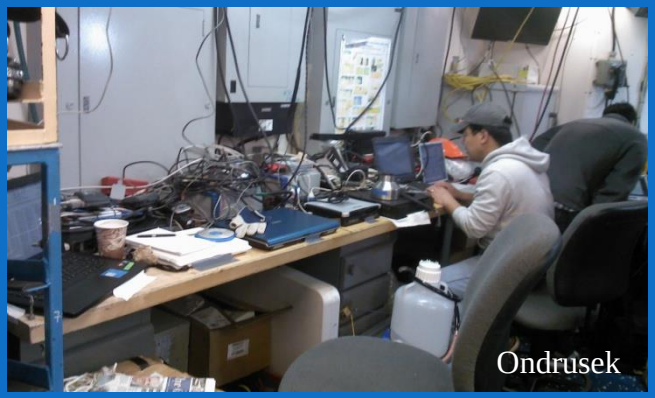
Hand Deployments

Instrument Packages

On Deck Refs.

Filtration Systems

Instrument Controls



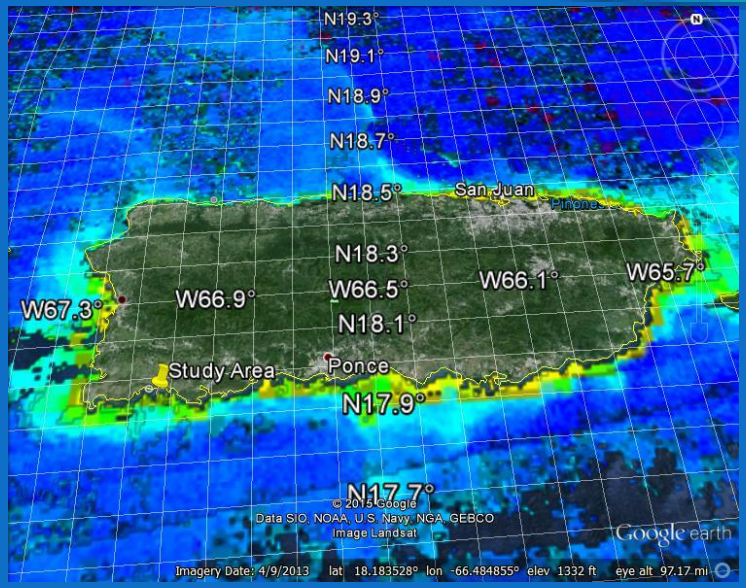
Flow Through Systems

Above Water Systems

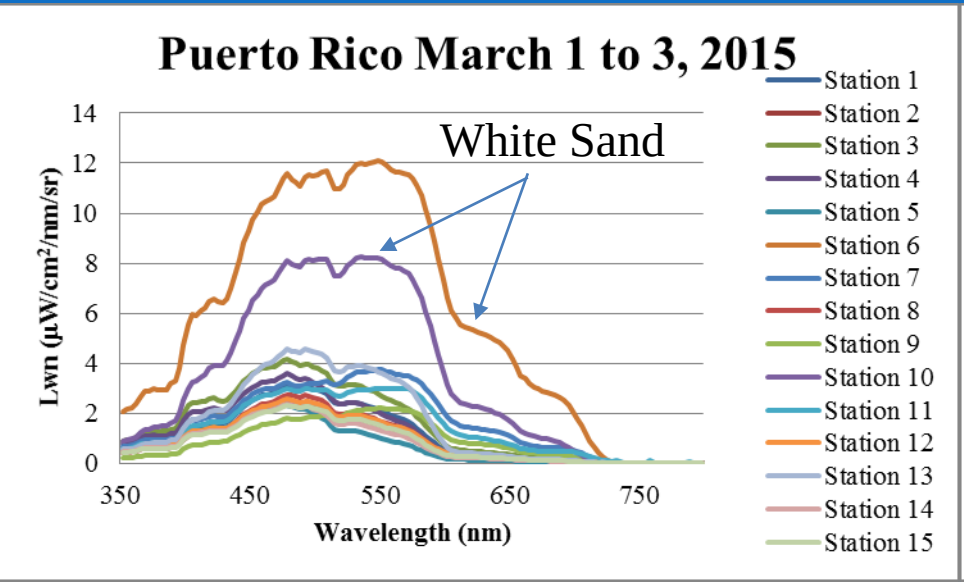
On Deck Measurements

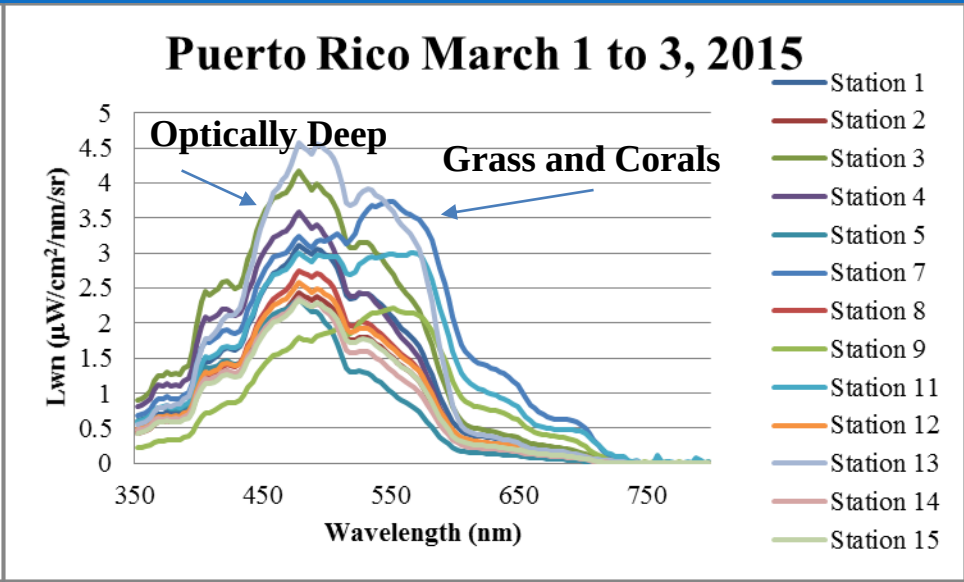
Lots of Wires

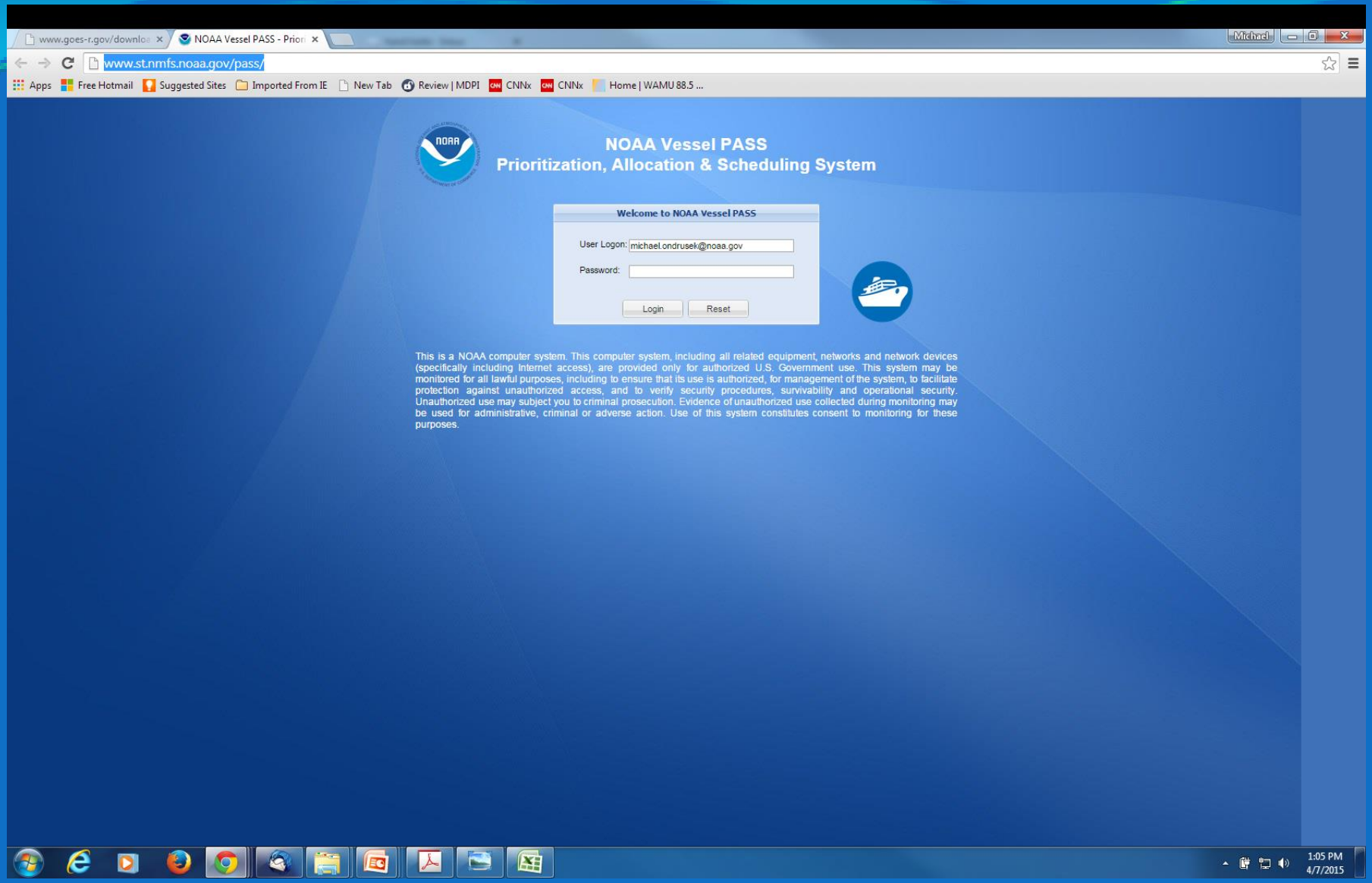
Conducted VIIRS Cal/Val cruise off Puerto Rico on March 2 to 4, 2015 in collaboration with UMB, UPR, and EPA.. (image chl composite of March 1 to 6, 2015)



Occupied 15 stations over 3 days in conditions ranging from shallow waters over sand and coral bottoms to optically deep waters

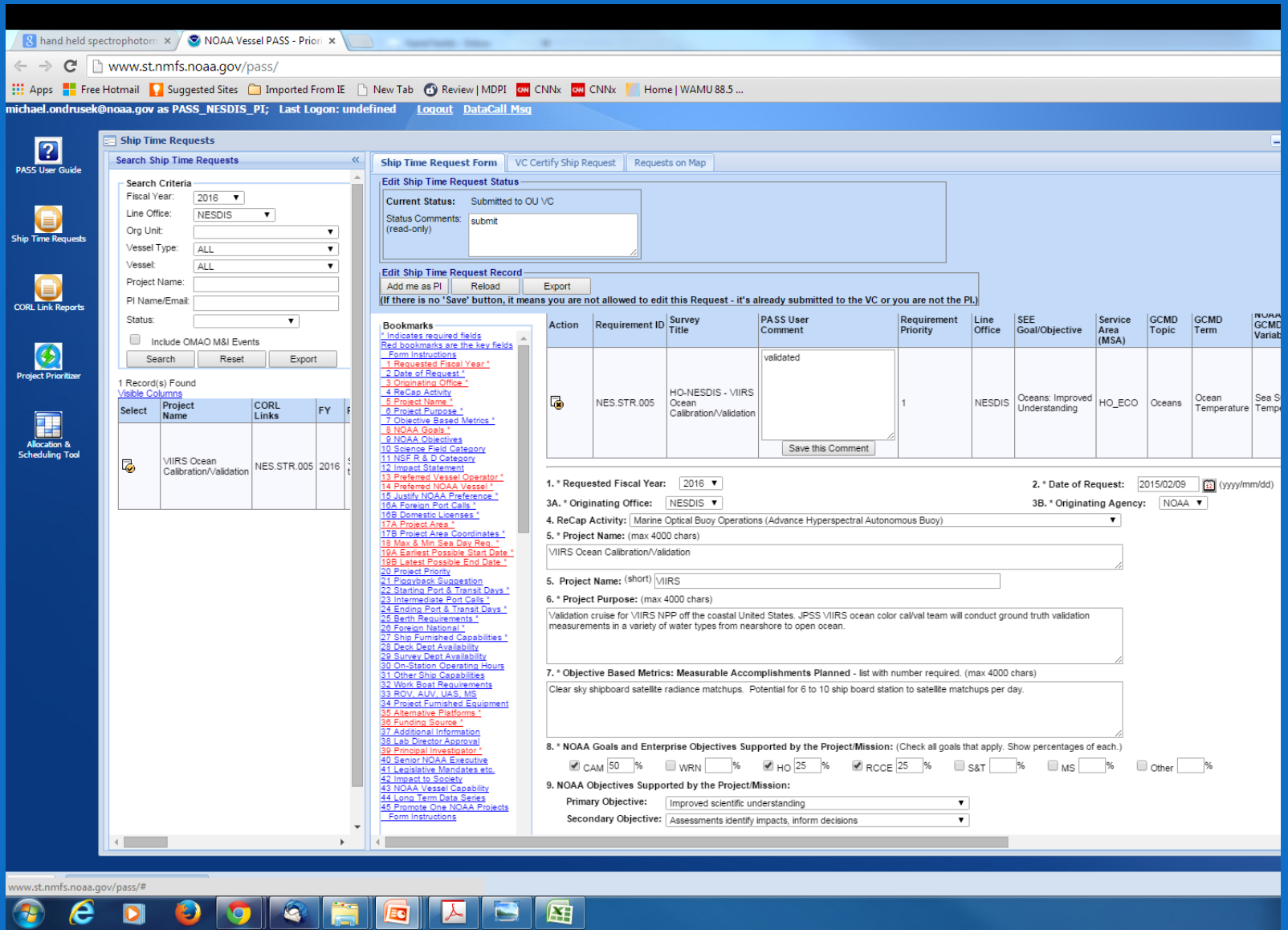






http://www.st.nmfs.noaa.gov/pass/

Screen shot of request form



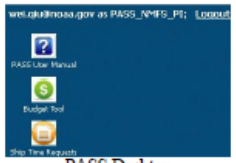
PASS PI Quick Start Guide

(For more details, please reference the PASS User's Guide)

NOTE: Please see reverse side for more information and data entry guidance.

1. Access PASS

PASS Login Page

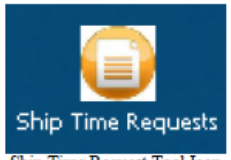


PASS Desktop

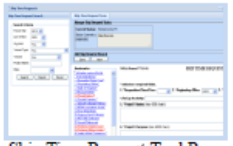
1. PIs will receive notification of PASS account access rights.
2. Go to https://www.st.nmfs.noaa.gov/pass (Prod Site). You will see the PASS Login Page.
3. Type your NOAA email address in the username box
4. Type your NOAA email account password in the password box
5. Click on the '**Login**' button
6. You will see the PASS desktop.

Contact wei.qiu@noaa.gov with access issues.

2. Start Ship Time Request Tool



Ship Time Request Tool Icon



Ship Time Request Tool Page

This tool allows PIs to fill out and submit a Ship Time Request Form (Form 57-11-01) online. PIs can search, create, update and clone Ship Time Requests.

1. Double click on the Ship Time Request icon on the PASS desktop.
2. You will see the Ship Time Request Main Page. Use the left panel to search database for existing request records; the right panel is to create, view, modify and submit request records.

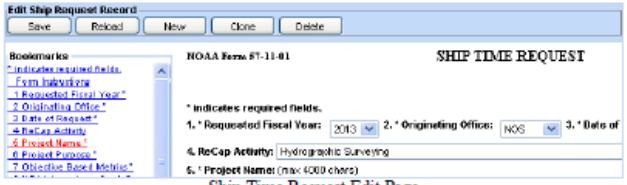
3. Search & View Ship Time Requests

Search Criteria Form

Search Result Grid

1. Fill out the Criteria Form
2. Click on the Search button
3. You will see the Search Result Grid
4. Click the Select icon to view a Record

4. Edit Request Records



Ship Time Request Edit Page

1. Click on the **Save** button the save changes.
2. Click on the **Reload** button to reload the record from the database.
3. Click on the **New** button to create a Request from scratch.
4. Click on the **Clone** button to clone an existing Request.
5. Click on the **Delete** button to delete the record.

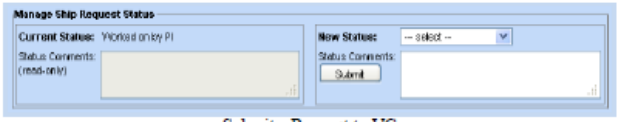
- You are only allowed to update and delete your own Requests.

5. View Requests with Allocation & Scheduling Tool

Allocation & Scheduling Tool

1. From PASS desktop, open the Allocation & Scheduler Tool
2. Select the Fiscal Year
3. Click on the Load button
4. You will see the Requests displayed on the scheduler
5. To modify your requests, use the Ship Time Request Tool.

6. Submit a Request to VC



Submit a Request to VC

1. Open the Request to be submitted in the Ship Time Request Tool
2. Select 'Submit to OU VC' from the Status dropdown list
3. Enter Comments in the 'Comments' box
4. Click on the Submit button

- Once a Request is submitted, you are not allowed to make changes.

7. How to enter 'Days' in the Ship Time Request form

Before submitting a PI request, ensure that the project's sea day requirements, possible start and end dates, starting and ending ports, and transit and staging days reflect actual requirements.

The operational area sea day requirement (block 18) should include all days at sea necessary to complete the project, from the starting port to the ending port, reflecting the fact that partial days underway count as days at sea. Staging and de-staging days should only be counted if they are 24-hour days at the dock. A partial staging day (the day of arrival or departure, for example) should not be counted again as a staging day, since it will be counted as a day at sea. Staging days do not add to project ship time cost, but must be scheduled and accommodated within OMAO operational policies (e.g. mandatory rest days). Pure transit days must be accounted within the operational area sea day requirement (block 18).
If a ship departs Newport on May 1, arrives in San Diego May 4, stages on May 5, departs to start the survey on May 6, arrives in San Diego on May 15, departs on May 16 and arrives in Newport on May 19, the project has used 18 sea days and 1 staging day. The project started May 1 in Newport and ended May 19 in Newport. The transit days in blocks 22 and 24 document sea days used purely to transport the ship. If some science objectives were accomplished while going to/from Newport, they should not be counted as transit days, though the days do count as part of the operational area sea day requirement (block 18).

Other than OMAO shipyard transits and trials, all days at sea are accounted to one project or another. LO Reps working with the OMAO Rep will agree to equitable distribution of transit days among scheduled projects, as required.

8. FY14-FY16 Data Call Guidance

1. Retrieve FY14 Requests:
(1) FY14 Requests from the FY13-FY15 data call are pre-loaded into PASS database.
(2) There is no need to create new FY14 requests if your requests are already in PASS; but please make necessary changes and **save it again with new current date** so PASS can revalidate your data record.
(3) Only create new Requests when you need to add new projects to FY14. You can create a new Request from scratch or clone an existing Request record and make the necessary edits.
(4) Submit FY14 Requests to the Vessel Coordinator (VC) - PIs are **NOT** allowed to modify the Requests once submitted.

2. Retrieve FY15 Requests:
(1) FY15 Requests from FY13-FY15 data call are pre-loaded into PASS database.
(2) There is no need to create new FY15 requests if your requests are already in PASS; but please make necessary changes and **save it again with new current date** so PASS can revalidate your data record.
(3) Only create new Requests when you need to add new projects to FY15. You can create a new Request from scratch or clone an existing Request and make the necessary edits.
(4) Do NOT submit FY15 Requests to the VCs - PIs are not allowed to modify the Requests once submitted, and PIs may need to modify the FY15 Requests when the next round of FY15-FY17 data call begins.

3. Create FY16 Requests:
(1) You can create a new FY16 Request from scratch or clone an existing Request and make the necessary edits.
(2) Do NOT submit FY16 Requests to the VCs - PIs are not allowed to modify the Requests once submitted and PIs may need to modify the FY16 Requests when FY15-FY17 data call begins.

9. Points of Contact

1. If you fail to access the online system and have any technical issues, contact wei.qiu@noaa.gov (301) 427 8165

2. If you have any system application tools or data entry issues, contact the following OMAO and Line Office Points of Contact:

Kathleen O'Neil kathleen.oneil@noaa.gov	NWS (228) 688-2823
LT Lecia Salerno lecia.salerno@noaa.gov	NESDIS (301) 683-3334
LCDR Richard Hester richard.e.hester@noaa.gov	OAR 301) 734-1048
Sid Thurston sidney.thurston@noaa.gov	OAR (301) 427- 2459
Russell C. Jones russell.c.jones@noaa.gov	NOS (301) 713-3000 x202
Lucy Hick lucy.hick@noaa.gov	NOS (301) 713-2702 x125
Allen Shimada allen.shimada@noaa.gov	NMFS (301) 427-8174
Michael S. Gallagher michael.s.gallagher@noaa.gov	NMFS (206) 526-4147
James W. "Bill" O'Clock james.w.o'clock@noaa.gov	OMAO (301) 713-7657

http://www.moc.noaa.gov/

NOAA Ship *Gordon Gunter* Characteristics and Capabilities – Updated 1/17/2014

NOAA Ship *Gordon Gunter*

Hull Number	*R336*
Call Sign	WTEO
Home Port	
Pascagoula, MS	
Marine Operations Center	
Atlantic (MOC-A)	
Port Office	
Gulf Marine Support Facility, Pascagoula, MS	
Regular Area of Operations	
Atlantic, Caribbean, and Gulf of Mexico	
General Classification	
Fishery Research Vessel	
Mailing Address	
NOAA Ship Gordon Gunter Operations Center, Atlantic 439 West York Street Norfolk, VA 23510-1145	

https://strs.unols.org/public/diu_login.aspx

UNOLS Vessels | UNOLS | UNOLS STRS - View Ship | RV Pelican

lumconvessels.com/rv-pelican

Apps | Free Hotmail | Suggested Sites | Imported From IE | New Tab | Review | MDPI | CNNx | CNNx | Home | WAMU 88.5 ...

LUMCON › Oceanographic Research Vessels — Cocodrie, Louisiana

HOME | ABOUT | RV PELICAN | RV ACADIANA | ROV COBIA | SMALL BOATS | CONTACT

R/V Pelican - Oceanographic Research Vessel

- Specifications
- Equipment
- Crew
- Schedule
- History
- Chartering
- rvPelican Photos

The R/V Pelican was built in 1985 at Allied Shipyard in LaRose, Louisiana with funds provided by the State of Louisiana. The vessel is owned by LUMCON and is operated out of the Marine Center in Cocodrie, LA. In 2003, the R/V Pelican underwent a refit upgrading most of the scientific equipment onboard and adding an additional ten feet to the stern.

The R/V Pelican was designed and outfitted to conduct a variety of oceanographic research missions. The reliability, utility and seaworthiness of the vessel have been well demonstrated. The R/V Pelican has successfully conducted scientific trawling, large box core sampling, thirty foot piston cores, shallow seismic surveys, current meter array and benthic boundary array deployment and recovery. Plankton sampling, hydrographic casts with CTD-rosette systems and underway sampling with towed water sampling systems have also been successfully conducted.

The main deck runs the length of the vessel and covers approximately 1,056 sq. ft of open aft aft deck and about 1000 sq. ft. of interior deck space forward.

The ship's 3 main labs: bottle lab, wet lab, and dry lab are located on the main deck, along with the galley and mess areas, electronics lab, and cold non-scientific cold storage facilities.

There are 16 ft. wide bulwark openings on the transom and 2 openings port (4') and starboard (7'5") aft of the cabin. Tie-downs are located centerline in the deck on approximately 2' and 4'centers. Located along the aft bulkhead of the main cabin are: ship's power (208V 3phase 30 and 60 amp, 277/480V 3phase 40 and 50 amp, 120V single phase 20 amp), running seawater (total capacity: 15 gpm and 100 gpm seawater located on port and starboard), fresh water, and 120 psi compressed air.

Over-the-side handling gear includes a trawl winch/A-frame, J-frame and crane. An

lumconvessels.com/rv-pelican

1:57 PM 4/7/2015