NEAR-REAL-TIME MONITORING OF OCEAN COLOR **VIIRS** DATA (BASED ON HYPERSAS-LISCO AND AERONET-OC DATA)

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Near-real time monitoring tool for validation of ocean color satellite data based on AERONET-OC data

Tool location: http://134.74.16.178/OCPValidator/index-lite.php

NEEDS:

→Assessment of quality and uncertainty of ocean color radiometry (OCR) satellite data by match-up comparison against "sea-truth" measurements

→ **Near-real time validation of current OCR satellites: MODIS, MERIS,… and future mission: NPP-VIIRS**

FACILITIES:

→ **Time series of continuous (~hourly) sea-truth data:**

• **AERONET-OC** network provides above-water **multi-spectral** measurements of the water-leaving radiance (SeaPRISM system)

• **LISCO** site combine AERONET-OC data plus **hyperspectral** measurements of a collocated HyperSAS system

Documentation

Start Over Documentation

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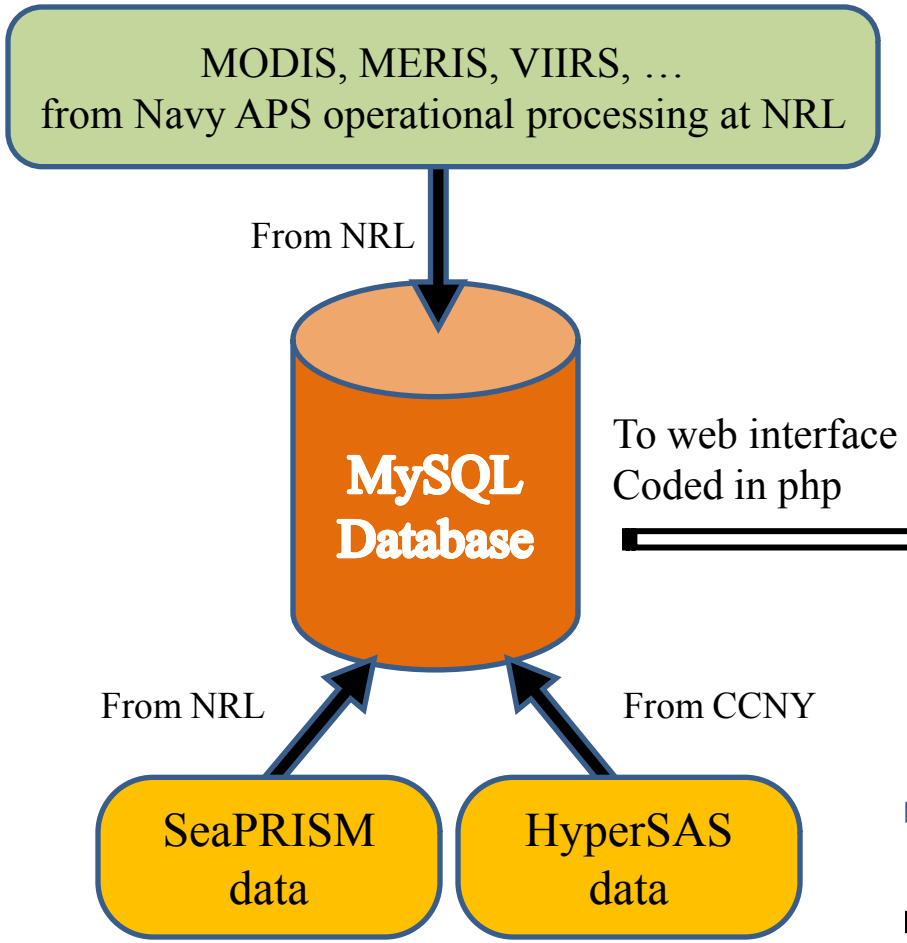
Database



Daily Data Transmission

Build a ftp flux with emailing alarm system

Code all the conditional boxes described below and the interactive plotting tool

Report and alarm e-mailing system

de geospotr@gmail.com

sujet **LISCO Daily Download Report**

pour Carl Chinatomby, d1at196@gmail.com, Tristan Harmel

```
Beginning Download Script at 2011-08-16 10:21:21.561802
Connecting to ftp.nrlssc.navy.mil
ftp.nrlssc.navy.milConnection Successful!
Downloading AAOT-output-aqua.2011214.0802.122239.D.L3.modis.AAO.v09.1000m.hdf.txt...Done
Downloading AAOT-output-aqua.2011221.0809.122844.D.L3.modis.AAO.v09.1000m.hdf.txt...Done
Downloading AAOT-output-envisat-1.2011221.0809.093154.D.L3.meris.AAO.v05.1200m.hdf.txt...Done
Downloading AbuAlBukhoosh-output-aqua.2011221.0809.090607.D.L3.modis.AAB.v09.1000m.hdf.txt...Done
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Downloading BoussoleBuoy-output-aqua.2011221.0809.122733.D.L3.hmodis.BOB.v09.250m.hdf.txt...Done
Downloading BoussoleBuoy-output-envisat-1.2011221.0809.093312.D.L3.meris.BOB.v05.1200m.hdf.txt...Done
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Downloading Cove-output-aqua.2011221.0809.190157.D.L3.modis.COV.v09.1000m.hdf.txt...Done
Downloading EUREKA-output-aqua.2011221.0809.203902.D.L3.hmodis.CCI.v09.250m.hdf.txt...Done
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Downloading EUREKA-output-aqua.2011221.0809.221725.D.L3.hmodis.CCI.v09.250m.hdf.txt...Done
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Downloading EUREKA-output-envisat-1.2011221.0809.175547.D.L3.meris.CCI.v05.1200m.hdf.txt...Done
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Downloading GDAT-output-aqua.2011221.0809.123217.D.L3.hmodis.GDT.v09.250m.hdf.txt...Done
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Downloading GageochoSeaprism-output-aqua.2011221.0809.041123.D.L3.modis.GSP.v09.1000m.hdf.txt...Done
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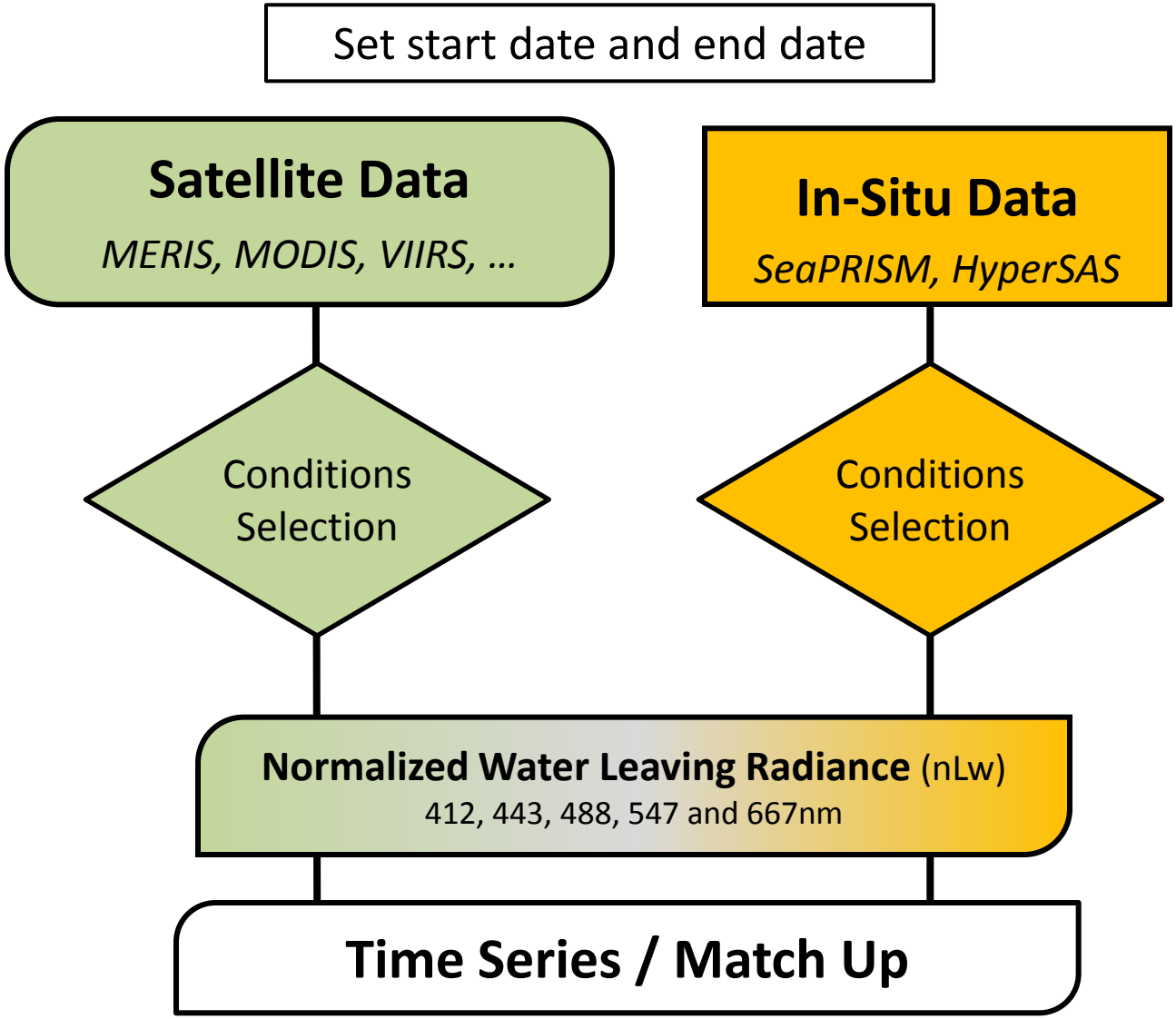
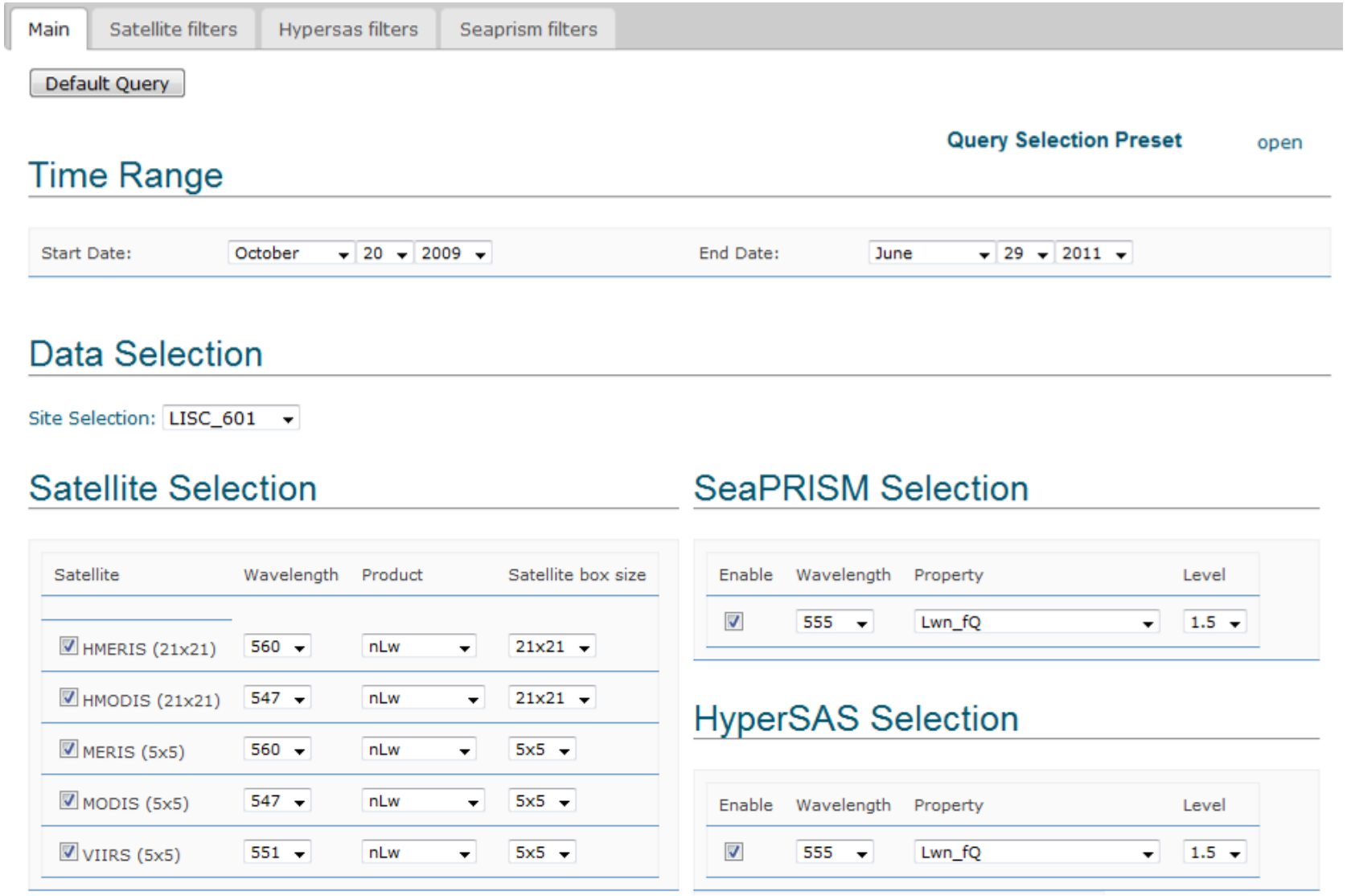
Comparison Strategy



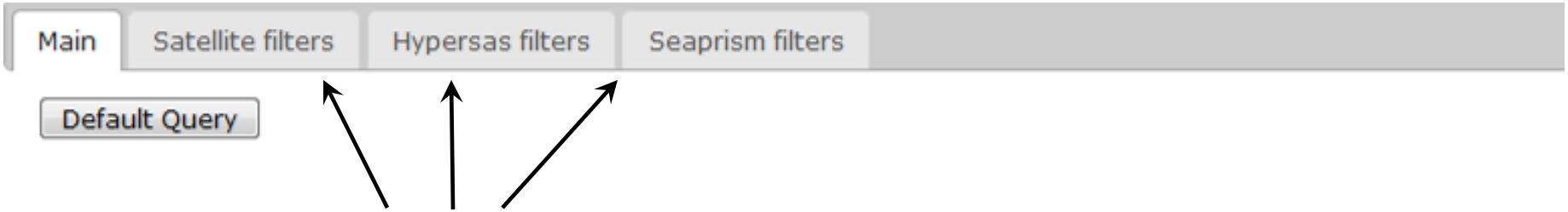
Main Page (data selection)



Filters Tabs

FILTERS

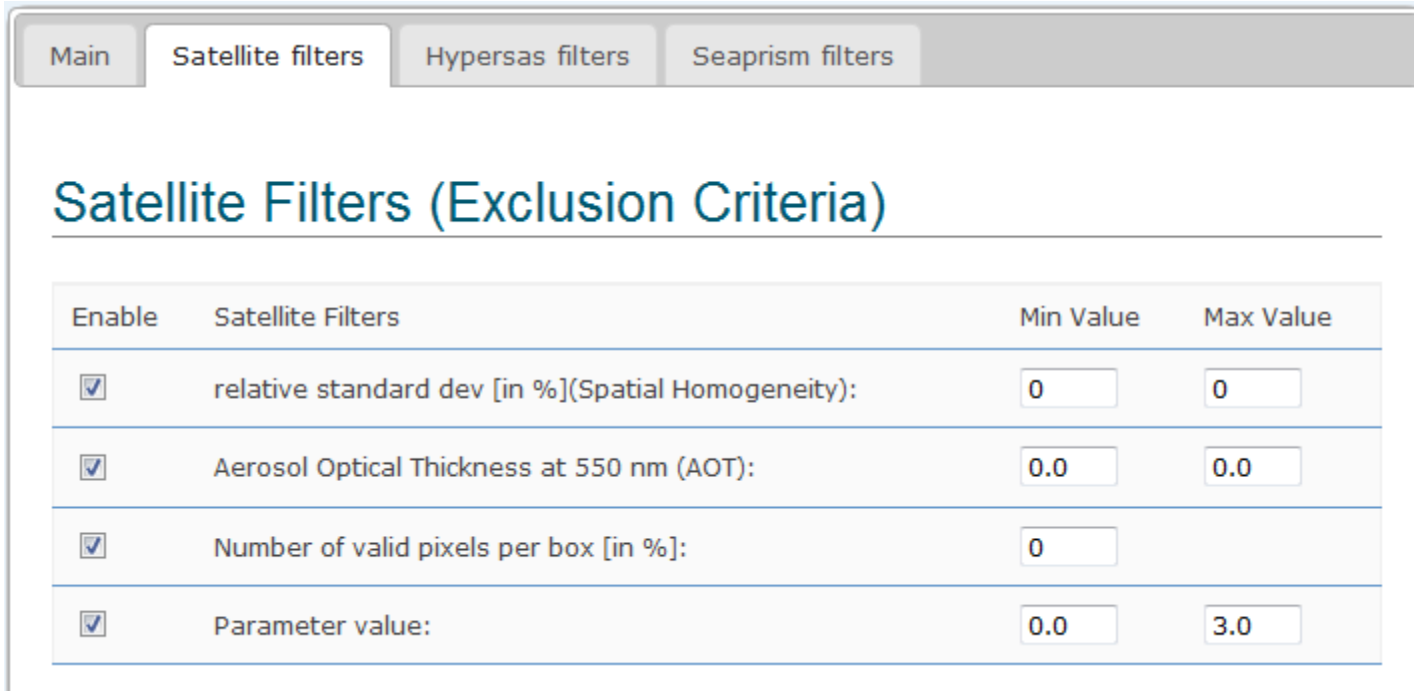
A comprehensive set of filter can be set by the user in order to eliminate bad quality data from the satellite/in situ data comparison



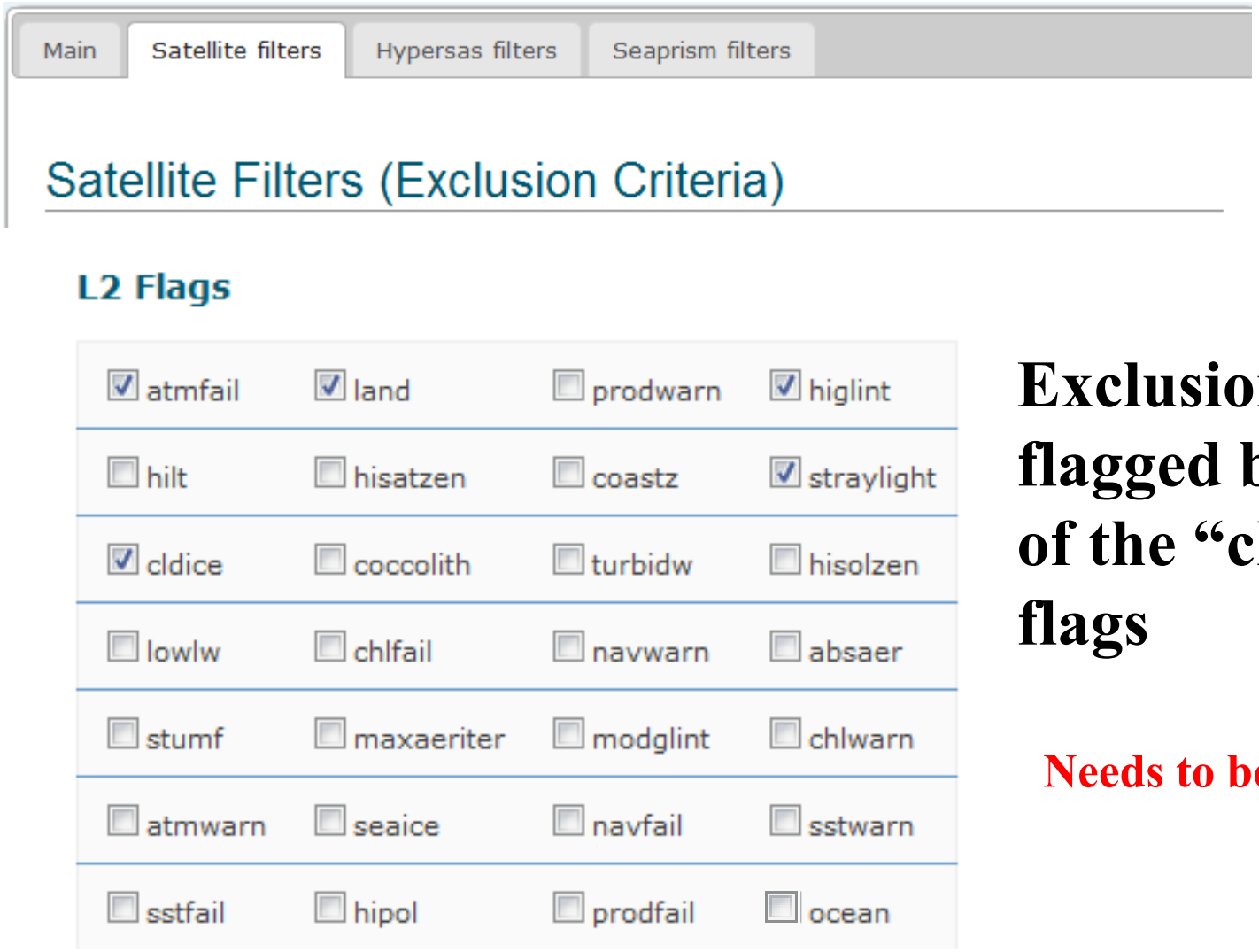
Three tabs to set the filter parameters specific to Satellite, HyperSAS and SeaPRISM data respectively

Filters Tabs

Satellite FILTERS



Filters Tabs



Exclusion of pixels flagged by at least 1 of the "checked" L2 flags

Needs to be validated !!

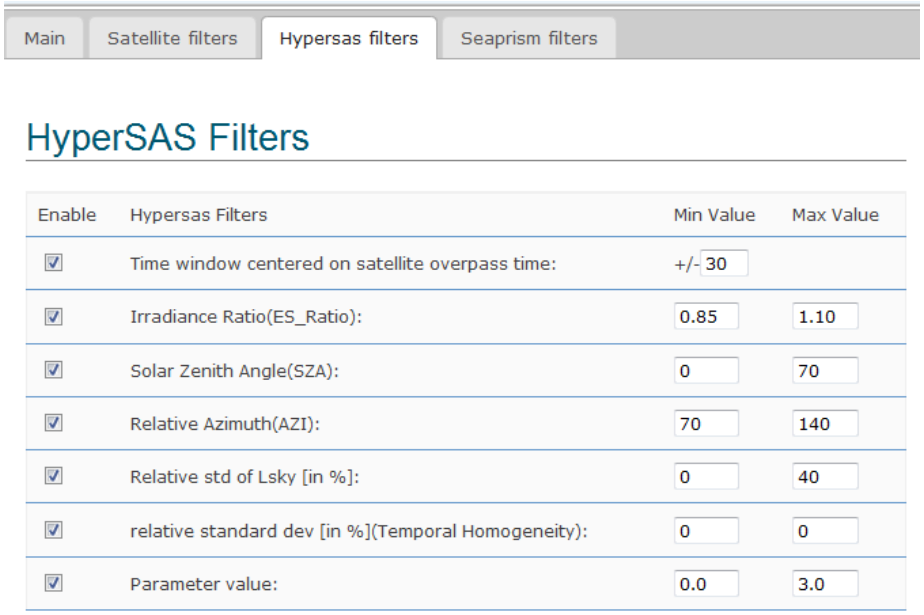
Filters Tabs

L2 flags NOMENCLATURE

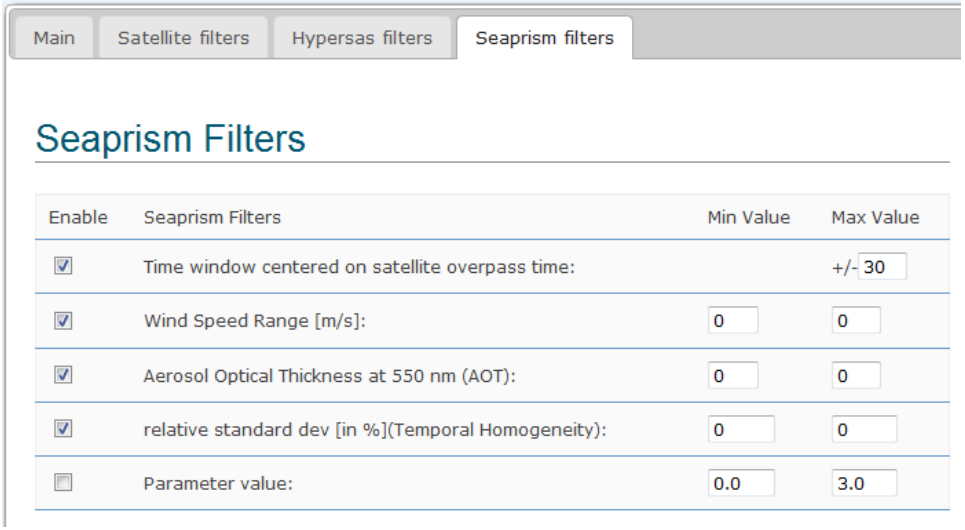
ATMFAIL	flag is used to indicate pixels for which the atmospheric correction failed.
LAND	flag is used to indicate pixels which contain land.
PRODWARN	flag is used to indicate pixels that have products that may not be optimal.
HIGLINT	flag is set only for non-land pixels and day time pixels. It is set whenever, the sun glint reflectance is above a given threshold (by default 0.005 sr^{-1}).
HILT	flag is used to indicate pixels that were saturated at the sensor level.
HISATZEN	flag is used to indicate pixels whose satellite zenith angle is larger than 60.0 deg.
COASTZ	flag is used to indicate pixels which are determined to be in water less than 30m.
STRAYLIGHT	flag gives an indication of the stray light contamination of the given pixel.
CLDICE	flag is used to indicate that the pixel is either ice or cloud covered.
COCCOLITH	flag is set to indicate the presence of coccolithophores.
TURBIDW	flag is set when the remote sensing reflectance at 670 nm is larger than 0.012 sr^{-1} .
HISOLZEN	flag is used to indicate pixels for which the solar zenith angle is larger than 75.0 deg.
LOWLW	flag is set when the normalized water leaving radiance at the green band (555 nm) is lower than 0.15 mW cm^{-2} sr^{-1} nm^{-1} .
CHLFAIL	flag indicates that the computation for chlorophlly-a has failed.
NAVWARN	flag is set when the error in the navigation is large.
ABSAER	flag indicates that the pixel is contaminated by an absorbing aerosol.
STUMPF	flag is set when the Stumpf 412 iteration has modified the originally derived reflectance.
MAXAERITER	flag indicates that the NIR iteration reached the maximum number of iterations and stopped.
MODGLINT	flag indicates that the pixel in question has moderate glint contamination. This bit is set on when the sun glint reflectance is greater than 0.0001 sr^{-1} .
CHLWARN	flag indicates that the chlorophyll-a concentration in not optimal.
ATMWARN	flag that the atmospheric correction for the given pixel is sub-optimal.
SEAICE	flag indicates that the pixel has a high probability of containing sea ice. This is based an a sea ice climatology file.
NAVFAIL	flag indicates that the navigation of the given pixel is invalid.
FILTER	flag is set when a filter is used and fails to provide valid data.
SSTWARN	flag indicates that the sea surface temperature has suboptimal quality.
SSTFAIL	flag indicates that the sea surface temperature is invalid.
HIPOL	flag is set when the degree of polarization is higher than 0.5.
PRODFAIL	flag indicates that the products generated for this pixel are suboptimal.
OCEAN	flag is used to indicate pixels that are water pixels. That is, not-land or cloud.

Filters Tabs

HyperSAS



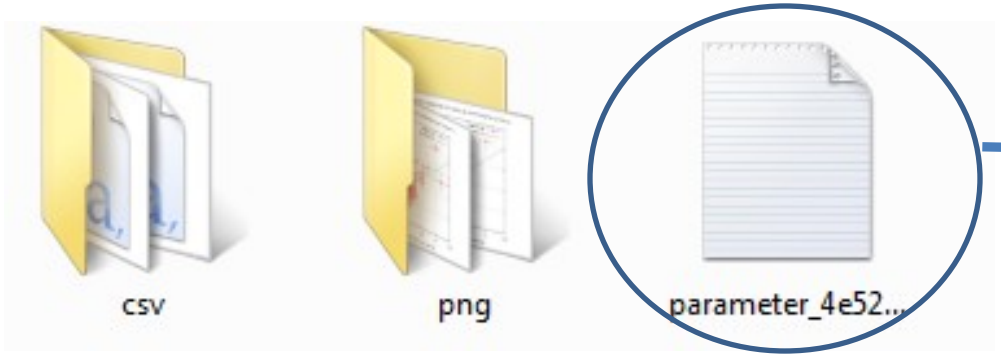
SeaPRISM

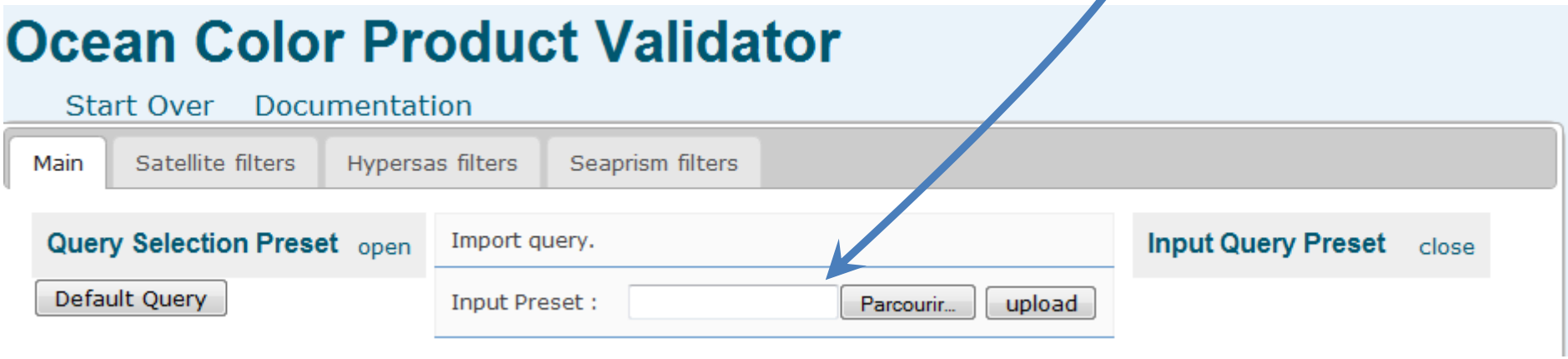


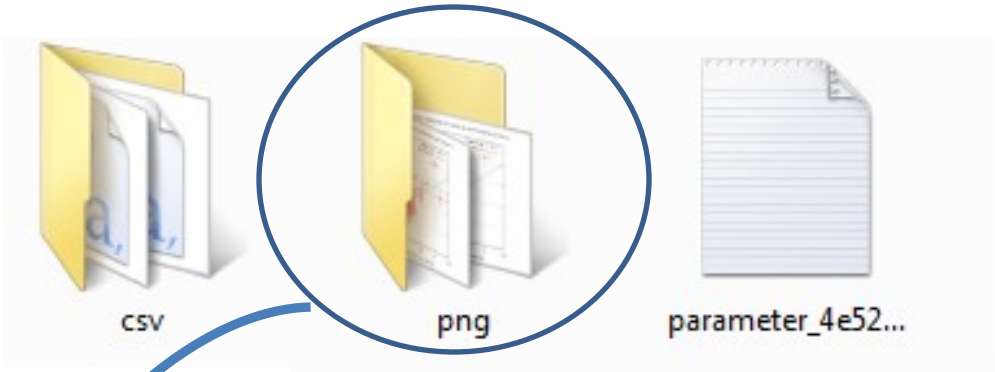
→ Endless combinations of filters for field and satellite data!

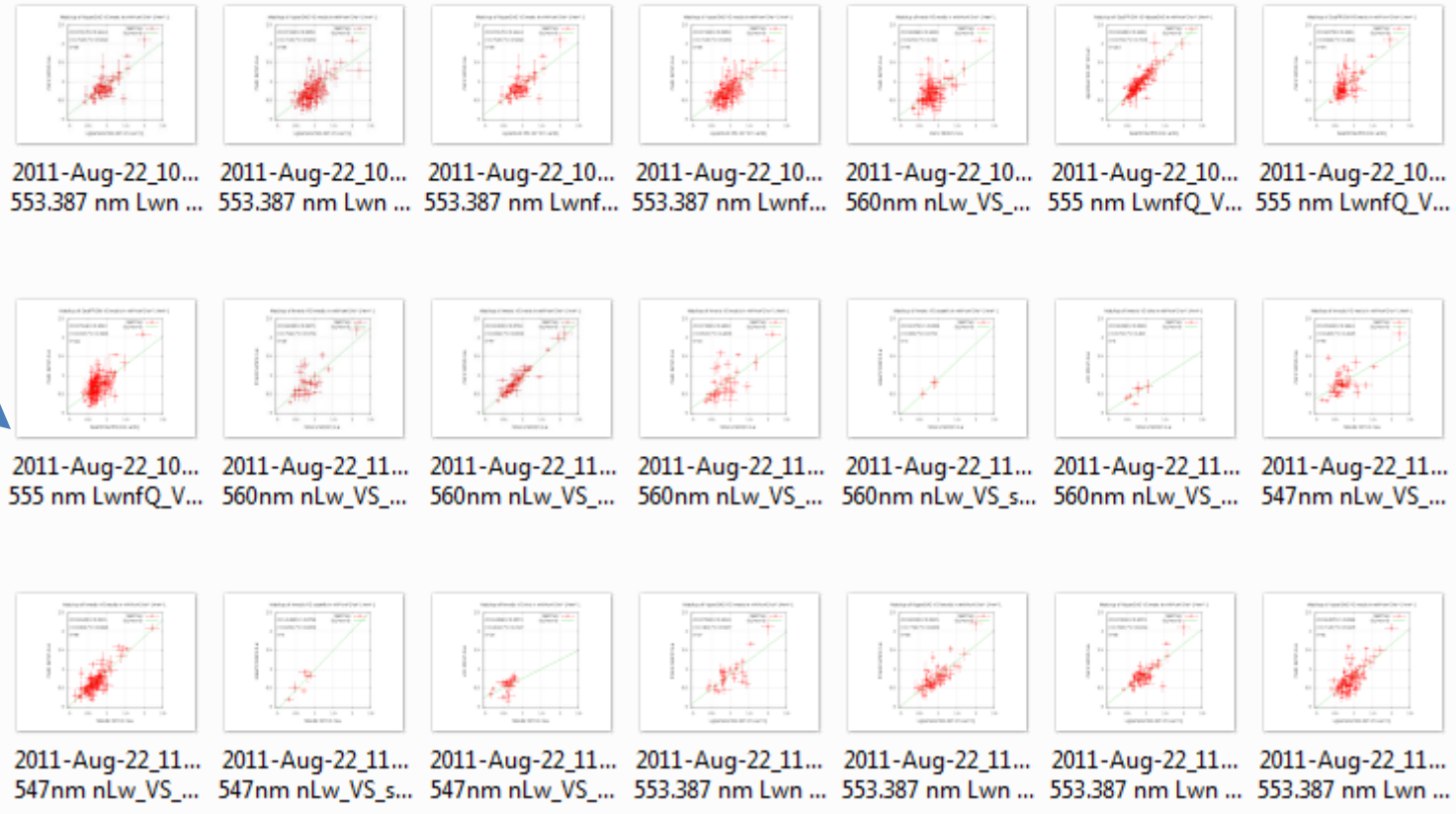
Filters Parameters Exportation/Importation

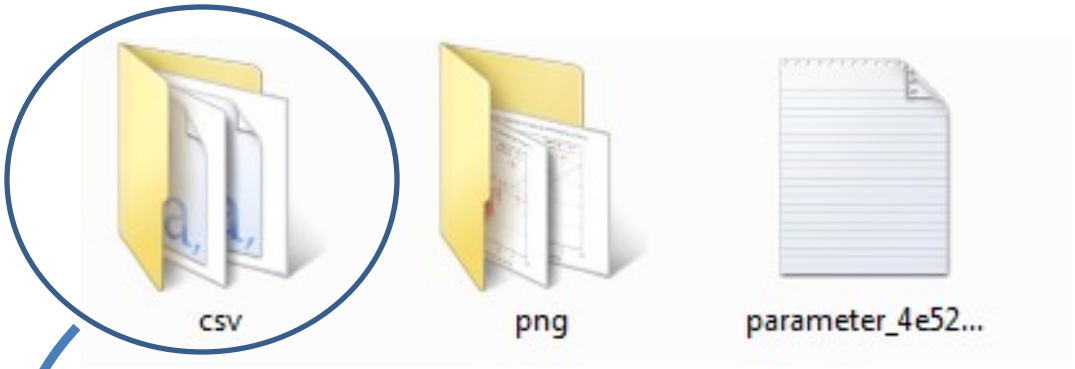
Set the filter parameters → **Click** [Render] → **Click** Download All Data and Images





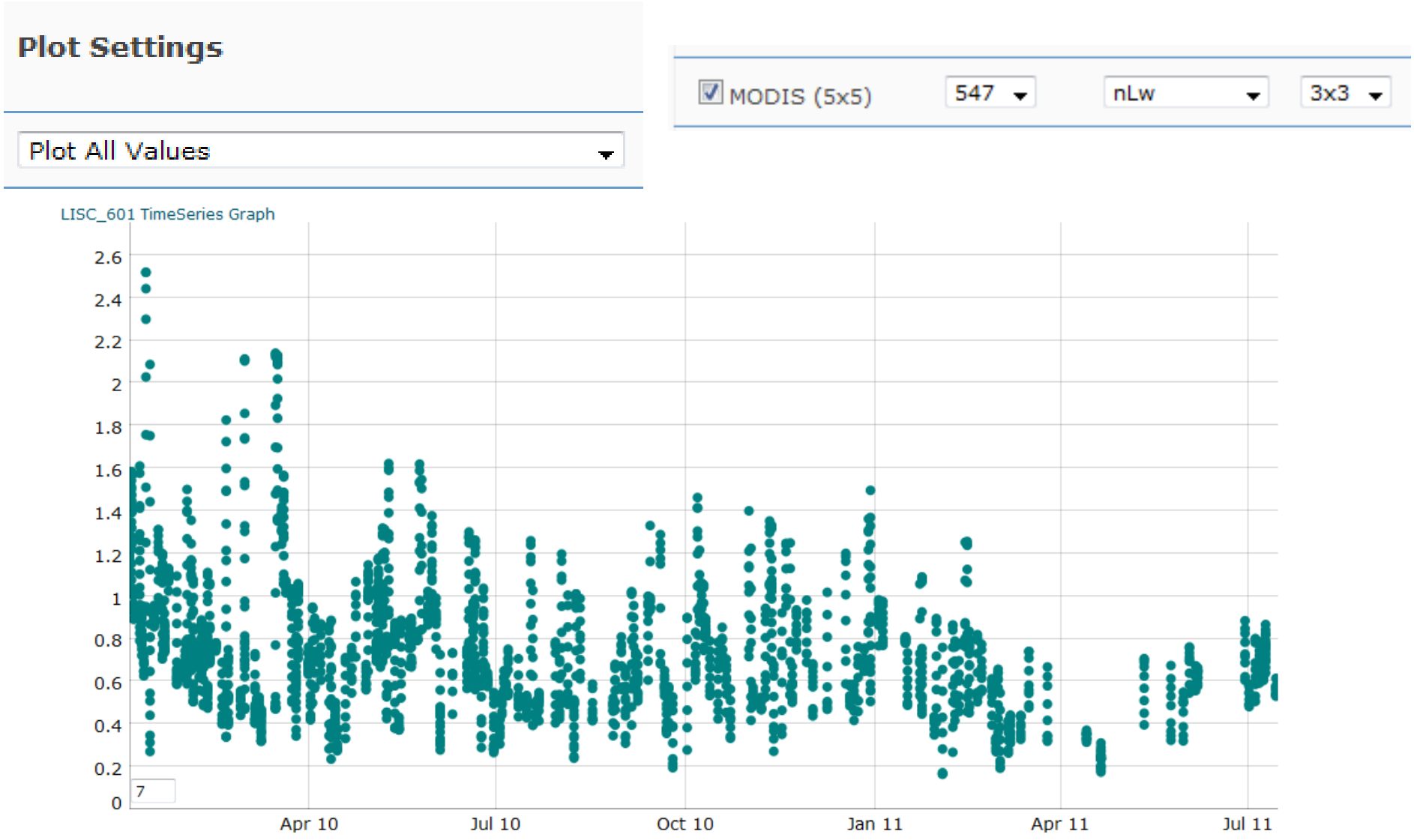

csv
png
parameter_4e52...


2011-Aug-22_10... 553.387 nm Lwn ...
2011-Aug-22_10... 553.387 nm Lwn ...
2011-Aug-22_10... 553.387 nm Lwnf...
2011-Aug-22_10... 553.387 nm Lwnf...
2011-Aug-22_10... 560nm nLw_VS_...
2011-Aug-22_10... 555 nm LwnfQ_V...
2011-Aug-22_10... 555 nm LwnfQ_V...
2011-Aug-22_10... 555 nm LwnfQ_V...
2011-Aug-22_11... 560nm nLw_VS_...
2011-Aug-22_11... 560nm nLw_VS_...
2011-Aug-22_11... 560nm nLw_VS_...
2011-Aug-22_11... 560nm nLw_VS_s...
2011-Aug-22_11... 560nm nLw_VS_...
2011-Aug-22_11... 547nm nLw_VS_...
2011-Aug-22_11... 547nm nLw_VS_...
2011-Aug-22_11... 547nm nLw_VS_s...
2011-Aug-22_11... 547nm nLw_VS_...
2011-Aug-22_11... 553.387 nm Lwn ...
2011-Aug-22_11... 553.387 nm Lwn ...
2011-Aug-22_11... 553.387 nm Lwn ...
2011-Aug-22_11... 553.387 nm Lwn ...

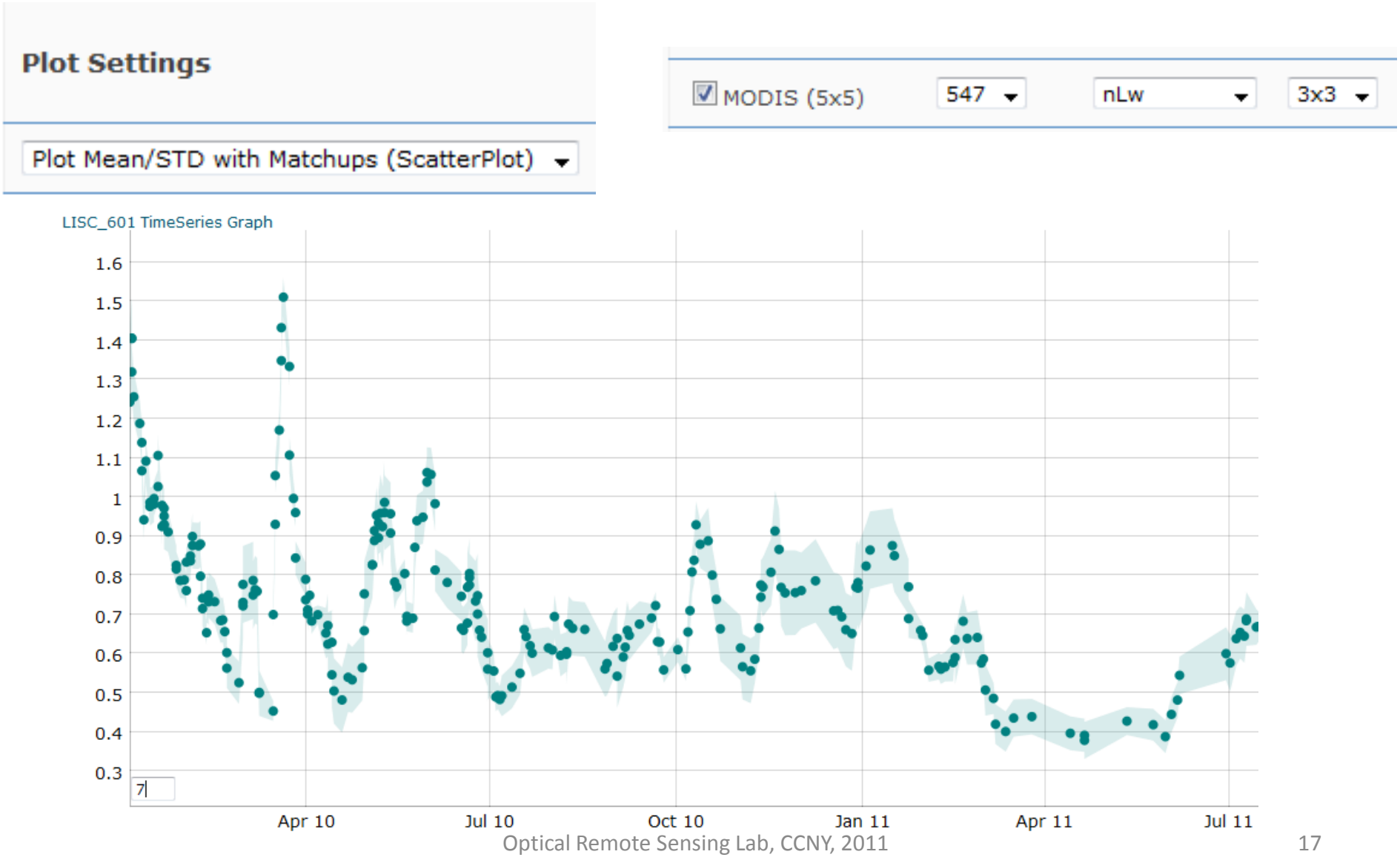


HyperSAS Lwn_fQ	STD	HMODIS Lwn	STD
1.55963075	0.067636844	1.347031816	0.151333645
0.865580833	0.072020805	0.892667999	0.110610441
0.8915516	0.038174239	1.3840643	0.338202408
0.922433	0.267325961	0.721384006	0.01704958
1.073609143	0.045147375	0.764536365	0.075134047
0.89516225	0.048664653	0.841323998	0.049887841
0.944065625	0.152654319	0.848786968	0.106884915
1.052865	0.141139298	0.608321739	0.028425883
0.82210025	0.19826569	0.868444002	0.043590448
0.654945333	0.024780496	0.451285711	0.073866482
0.591258667	0.048881379	0.645704342	0.061679553
0.4450075	0.02858907	0.633908693	0.251956505
0.393100333	0.004585358	0.459068	0.03554632
2.001154714	0.153739918	2.10449126	0.18934102
1.546161667	0.106196526	1.679108687	0.036636943
1.32644575	0.042598784	1.220427999	0.042610252
0.69612175	0.032557391	0.765258342	0.106257616
0.692452286	0.02462205	0.714973919	0.04817698
0.692370429	0.012216191	0.779378261	0.054504434
0.867174571	0.113358445	0.693447998	0.191127664

Comparison Results



Comparison Results

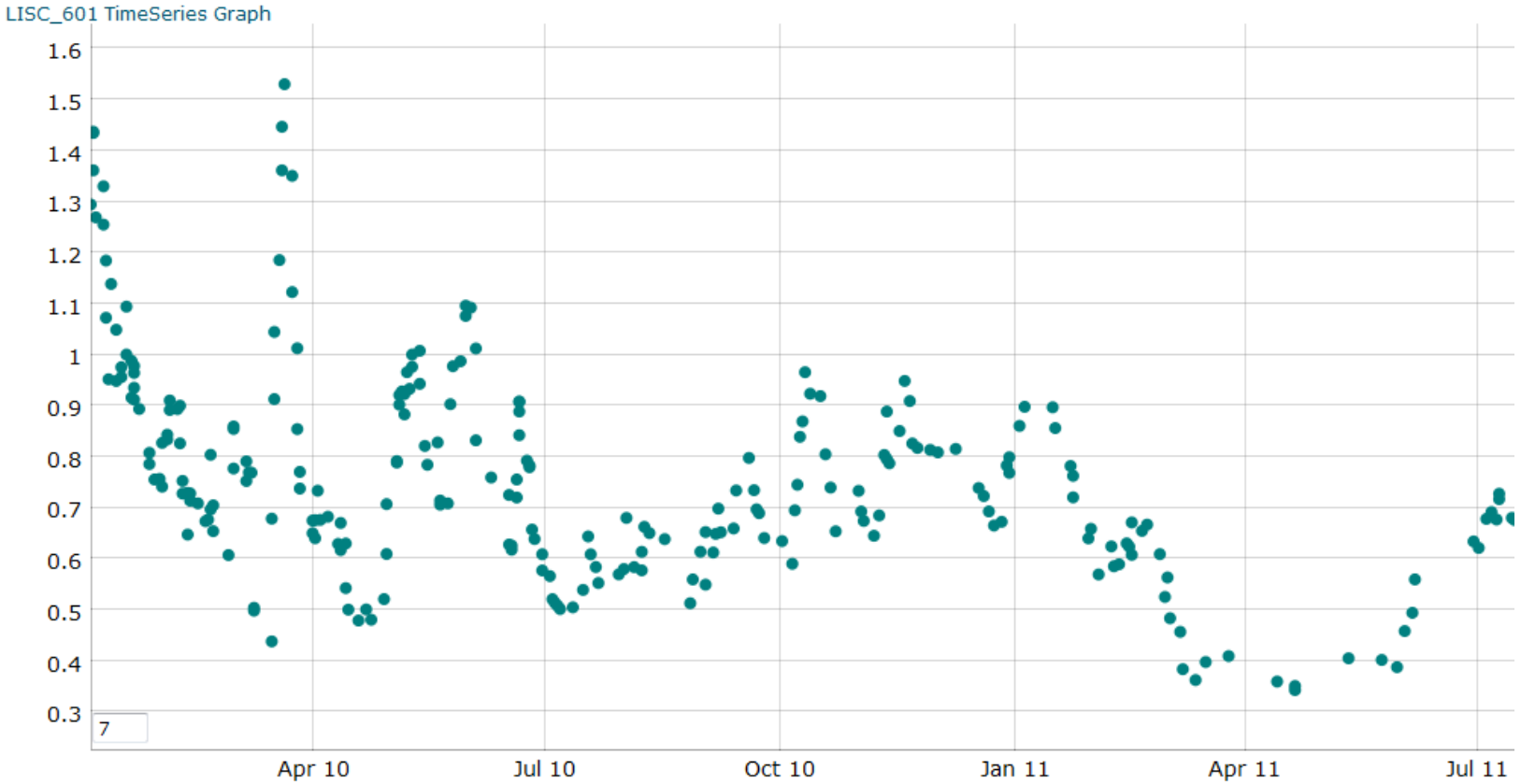


Comparison Results

Plot Settings

Plot Median Values with Matchups

MODIS (5x5) 547 nLw 3x3

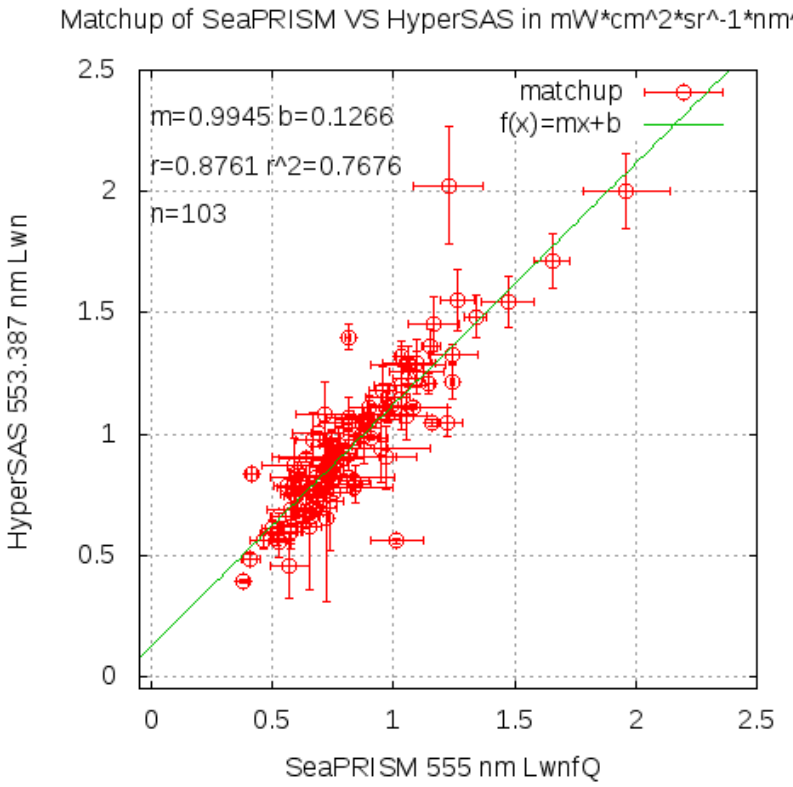


Comparison Examples

Field data control at LISCO site

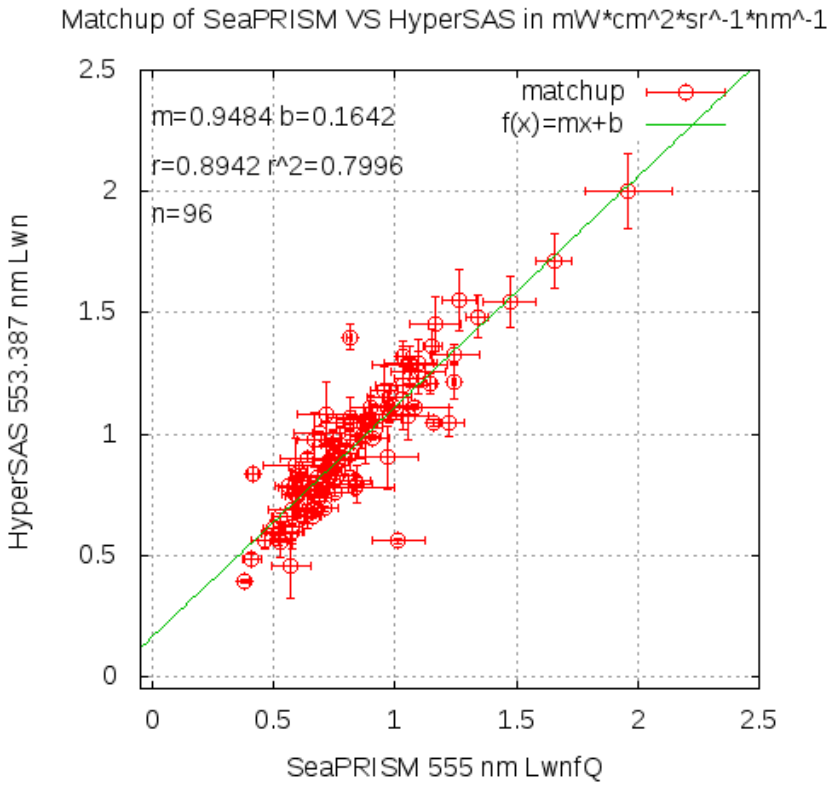
Filter adjustment :Temporal heterogeneity (STD in %)

STD = 50%



R2 = 0.77

STD = 20%



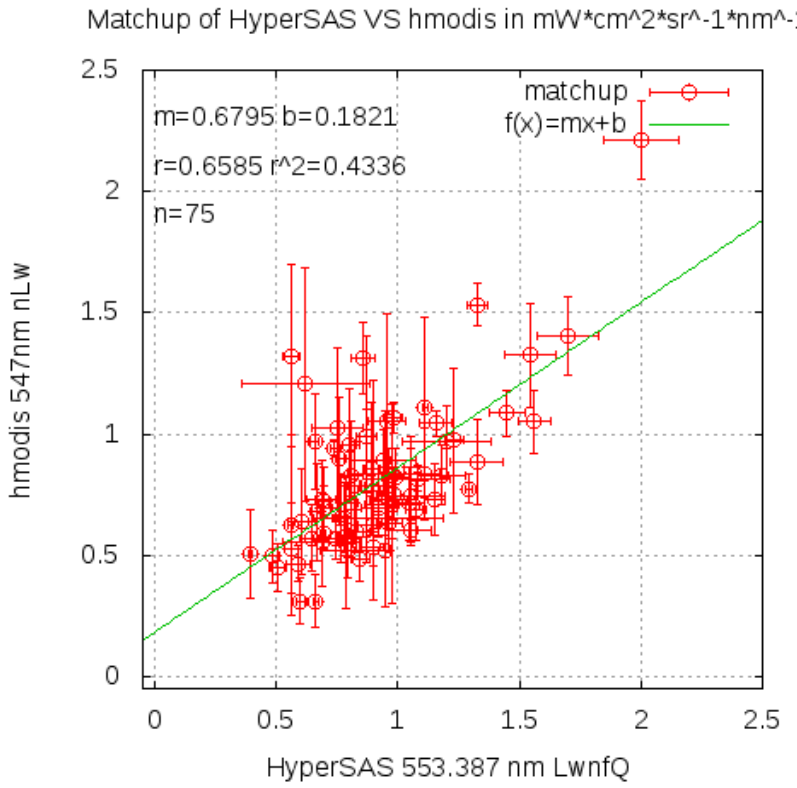
R2 = 0.80

Comparison Examples

HMODIS against HyperSAS

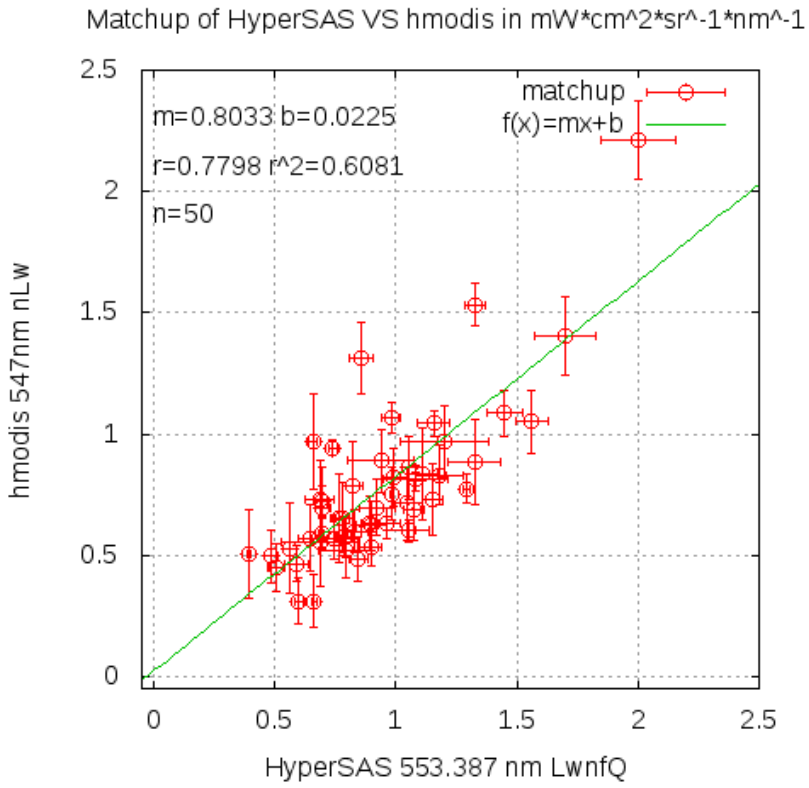
Filter adjustment :Spatial heterogeneity (STD in %)

STD = 50%



R2 = 0.43

STD = 20%



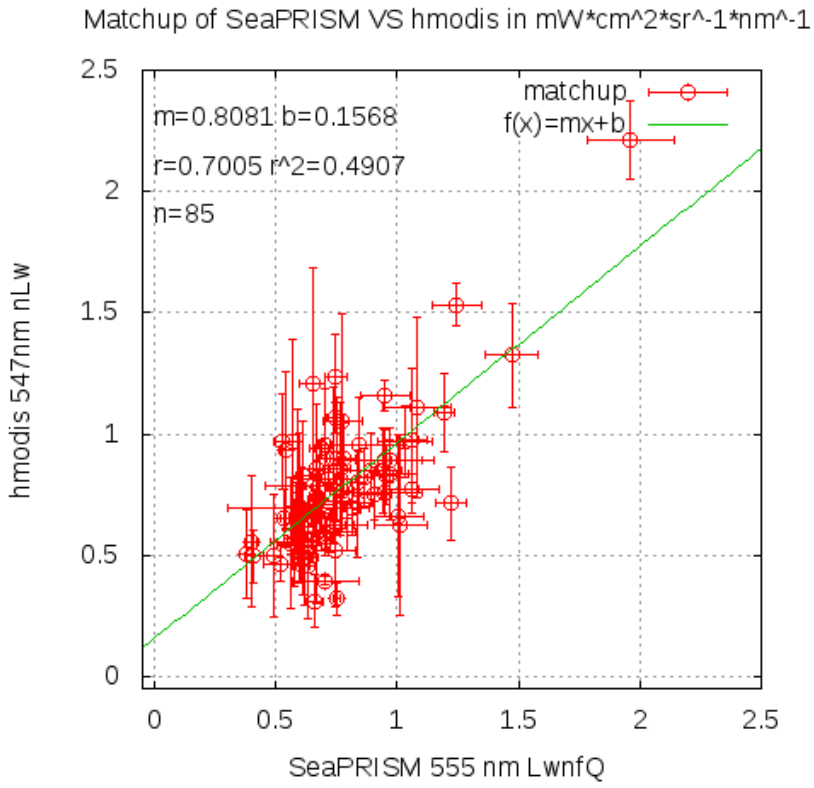
R2 = 0.61

Comparison Examples

HMODIS against SeaPRISM

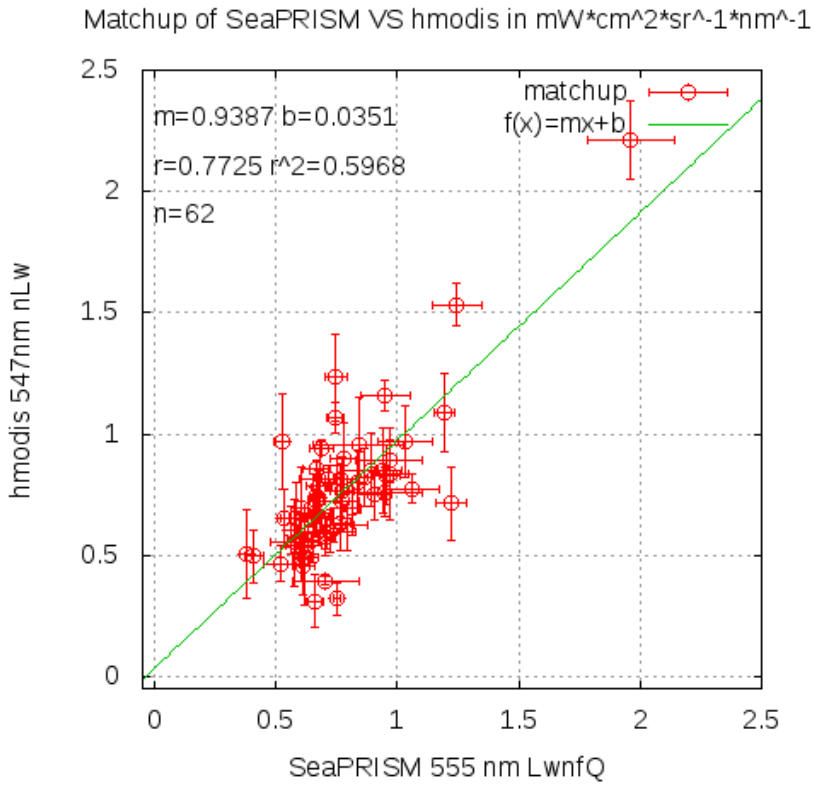
Filter adjustment :Spatial heterogeneity (STD in %)

STD = 50%



R2 = 0.49

STD = 20%



R2 = 0.60

Conclusion

CCNY Webtool

- **Satellite and field data daily imported to CCNY server with report and alarm e-mailing system**
- **Webtool outcomes (data files, plots, parameter file) can be exported for sanity checking or scientific communication between the different teams**
- **L2 flags filter still needs to be validated (improvement of the results are expected)**
- **Construction of specific "filter parameter" files for each field data site to improve representativeness of matchup comparison**