MARINE RESEARCH CENTRE

Calibration, validation and bio- fouling prevention of optical sensors in Alg@line project

Seppo Kaitala, Jukka Seppälä, Petri Maunula

SYKE

Jerico WP4 workshop, 9.2.2012

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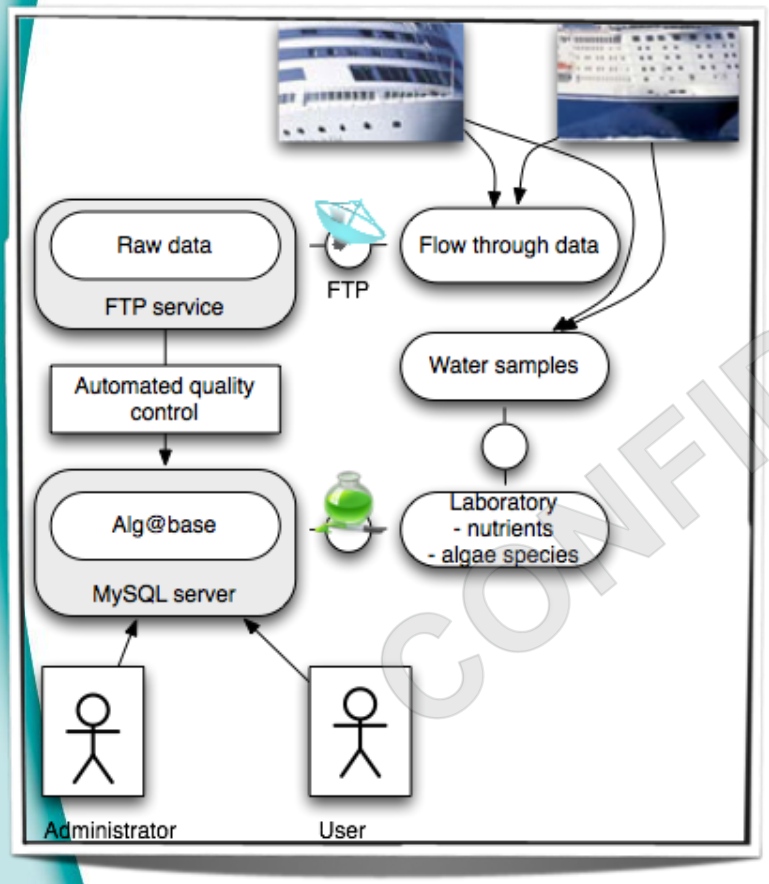
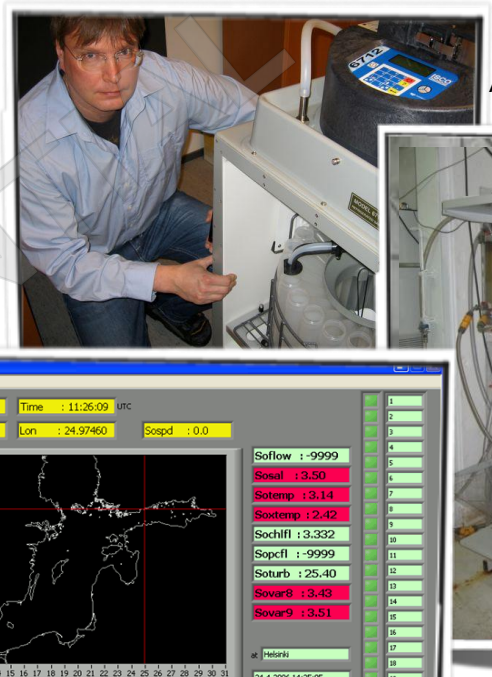
Management



Alg@line dataflow



Automatic watersampler

Ferrybox-software

Flow-through equipment

Ferrybox-software controls operations of automatic flow-through and watersampling equipment onboard

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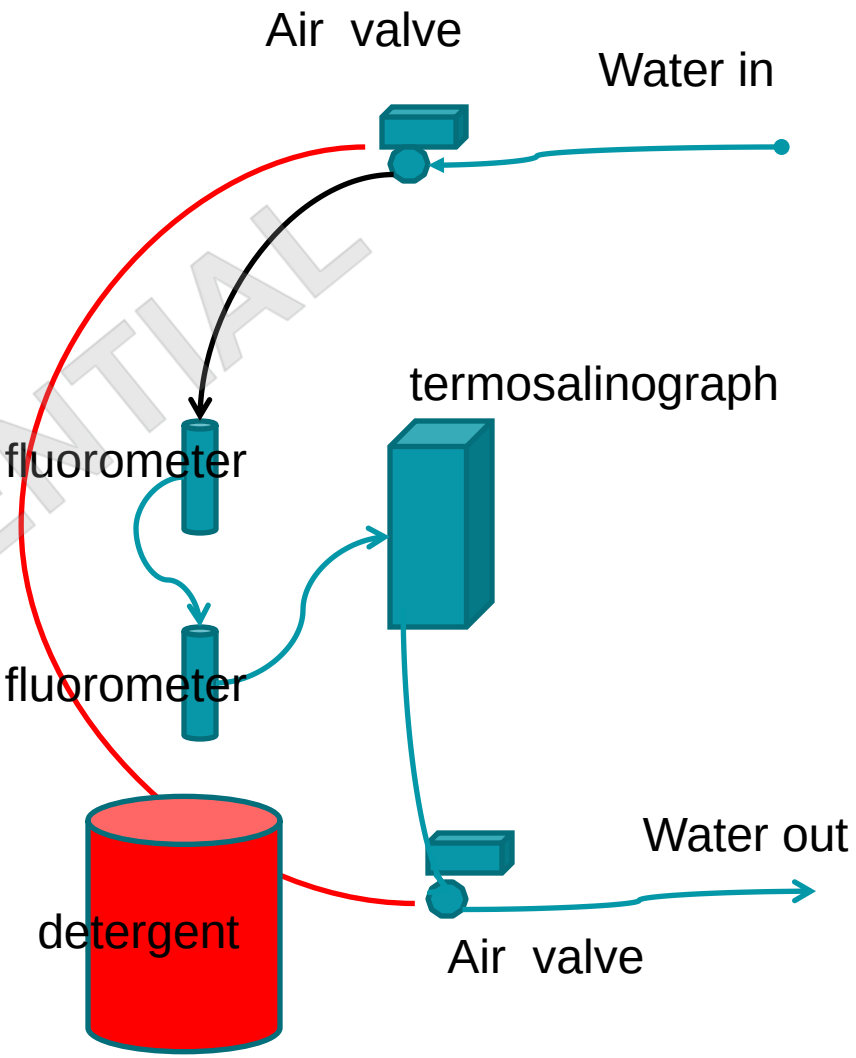

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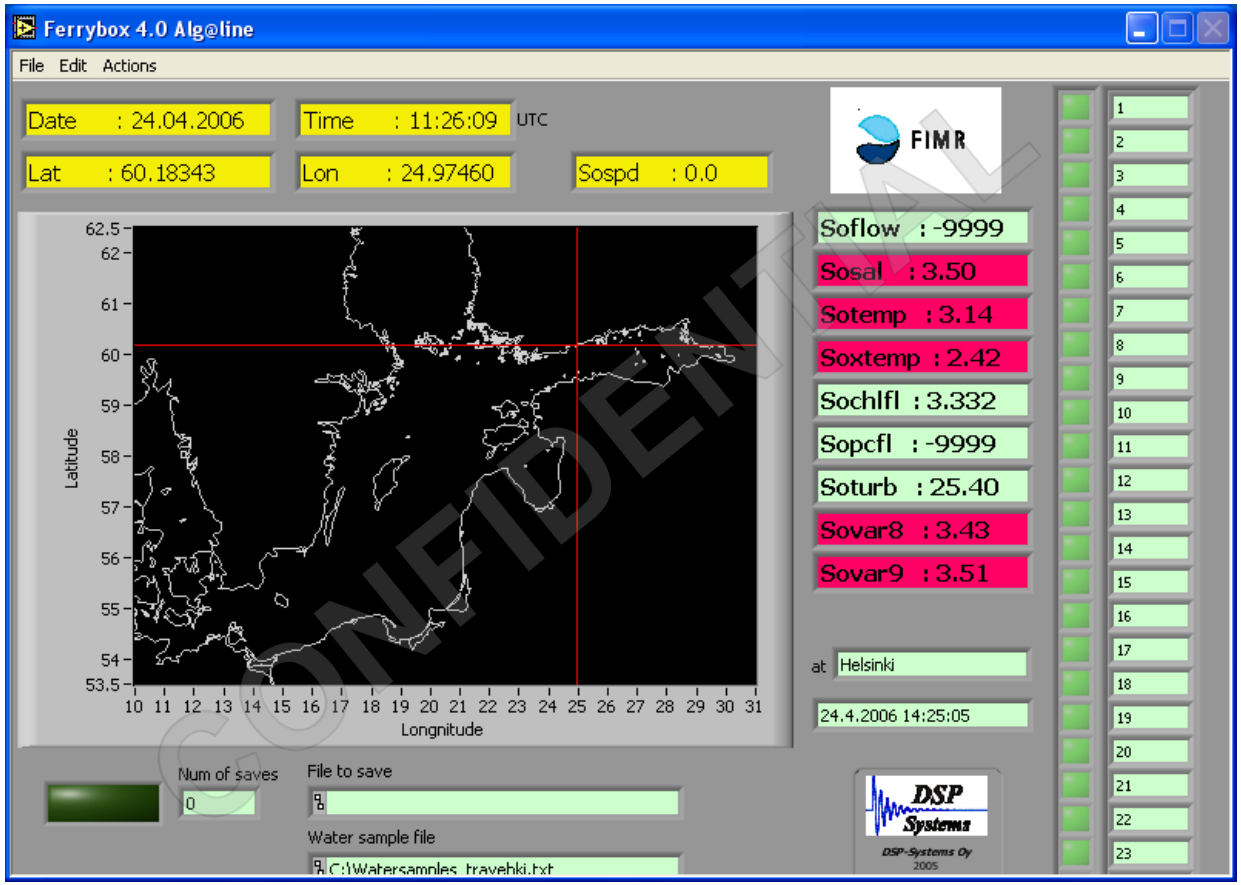
Magement with ferrybox software



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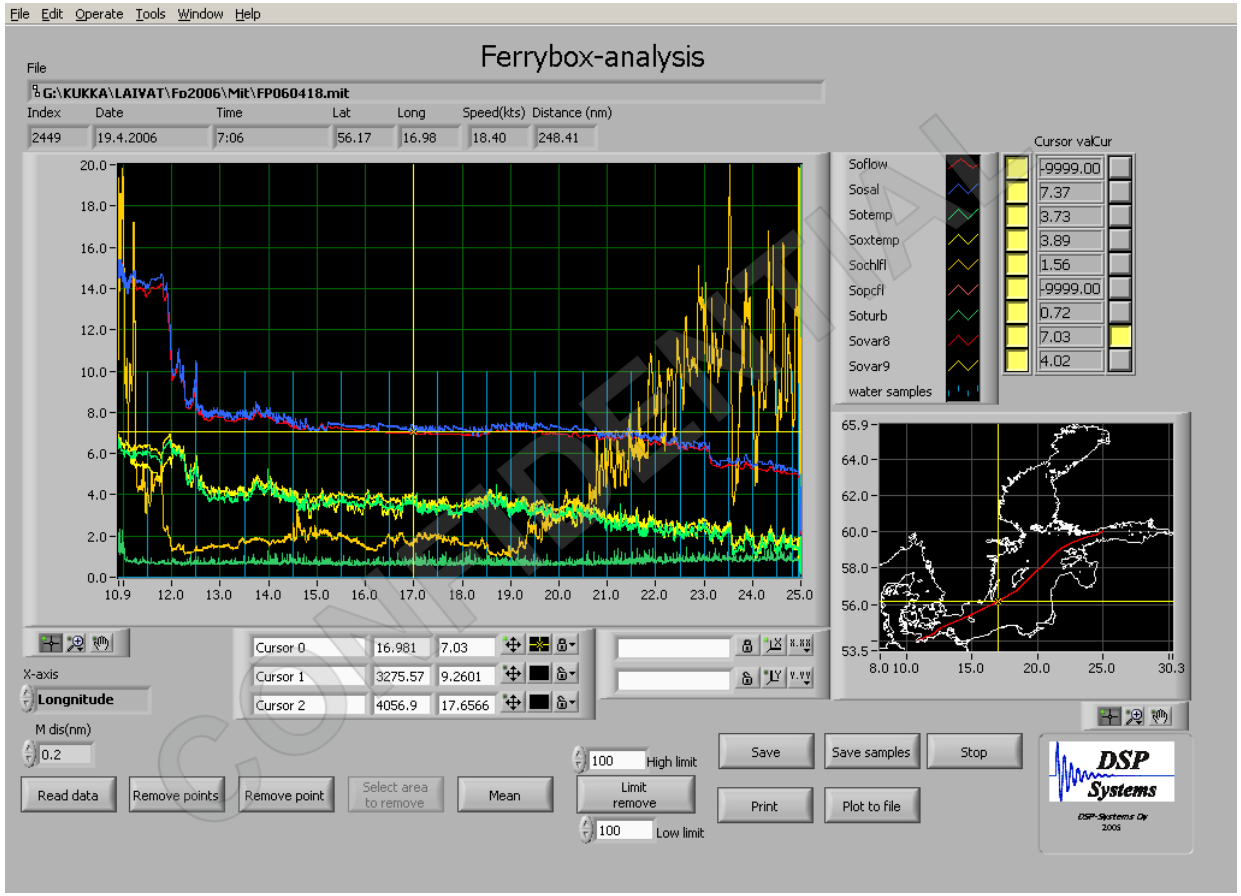
Checking data with ferrybox analysis



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Finnmaid Diary 2010

Week Date Who	Mit- files G=good, U=usefull,but fixed B=bad, leaved to original_files folder If corcections, how Parameters ja georecords original_files	device	Samplin gyes/no maintenance comments
4 27.1.2010 PeMa	FM100121 G FM100123 G FM100124 G FM100126 G	SEABIRD TSG 45 Calibration of conductivity13.1.2010	
7 16.2.2010 PeMa	FM100127 G FM100129 G FM100130 G FM100201 G FM100203 G FM100205 G FM100206 G FM100208 G FM100210 G FM100212 G FM100213 G FM100215 G	SEABIRD TSG 45	Samples ok FM100215 G salinity comparison

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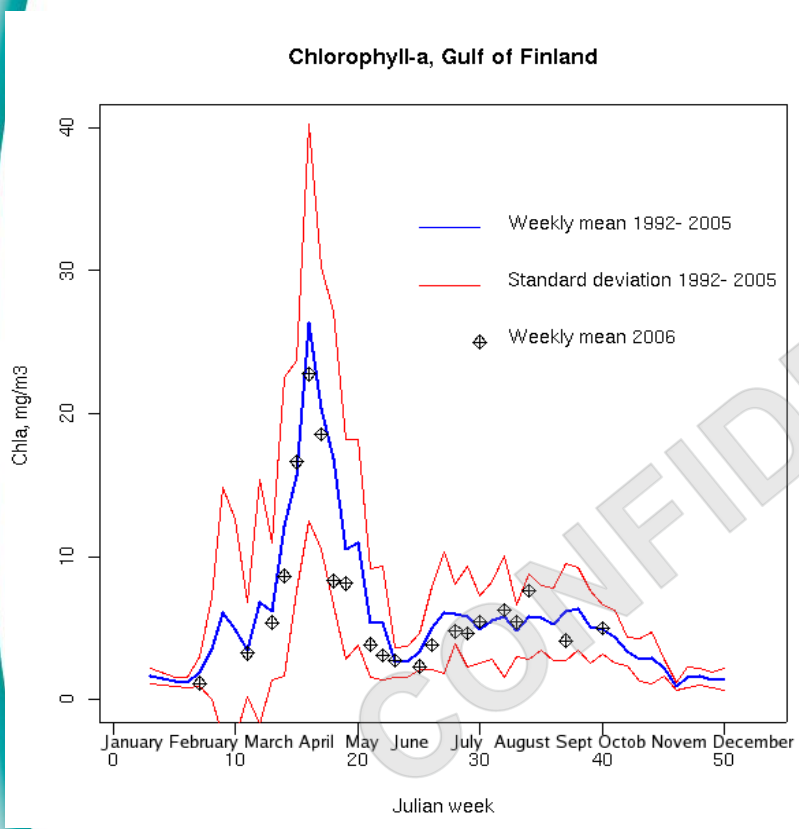
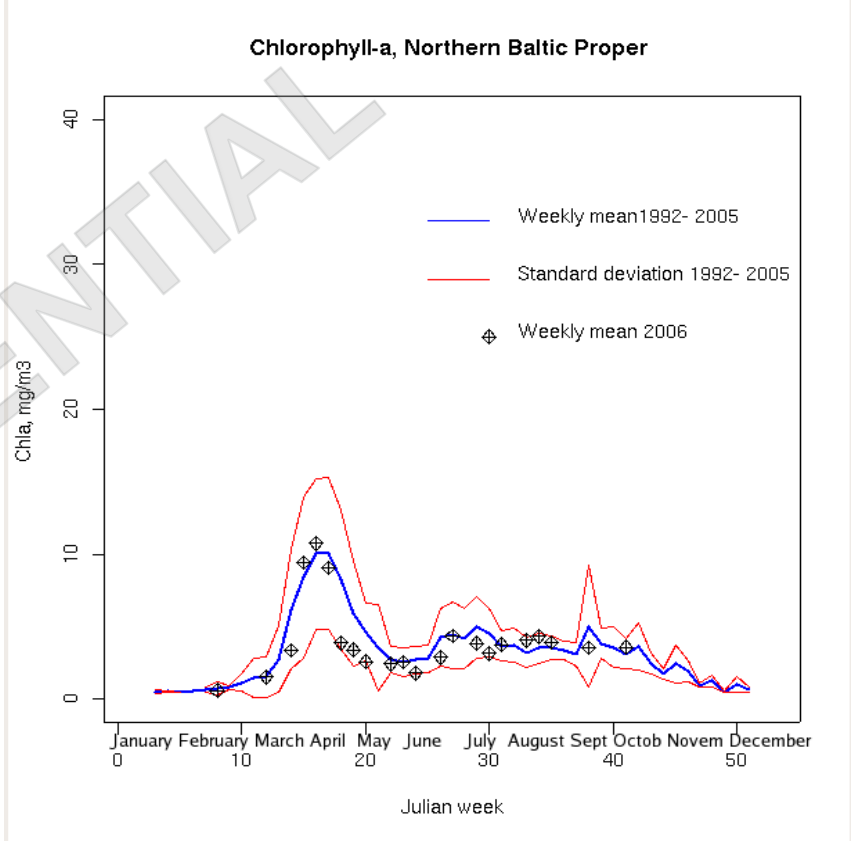
Annual variation of chlorophyll *a* (mg m-3) in the Western Gulf of Finland and in the Northern Baltic Proper





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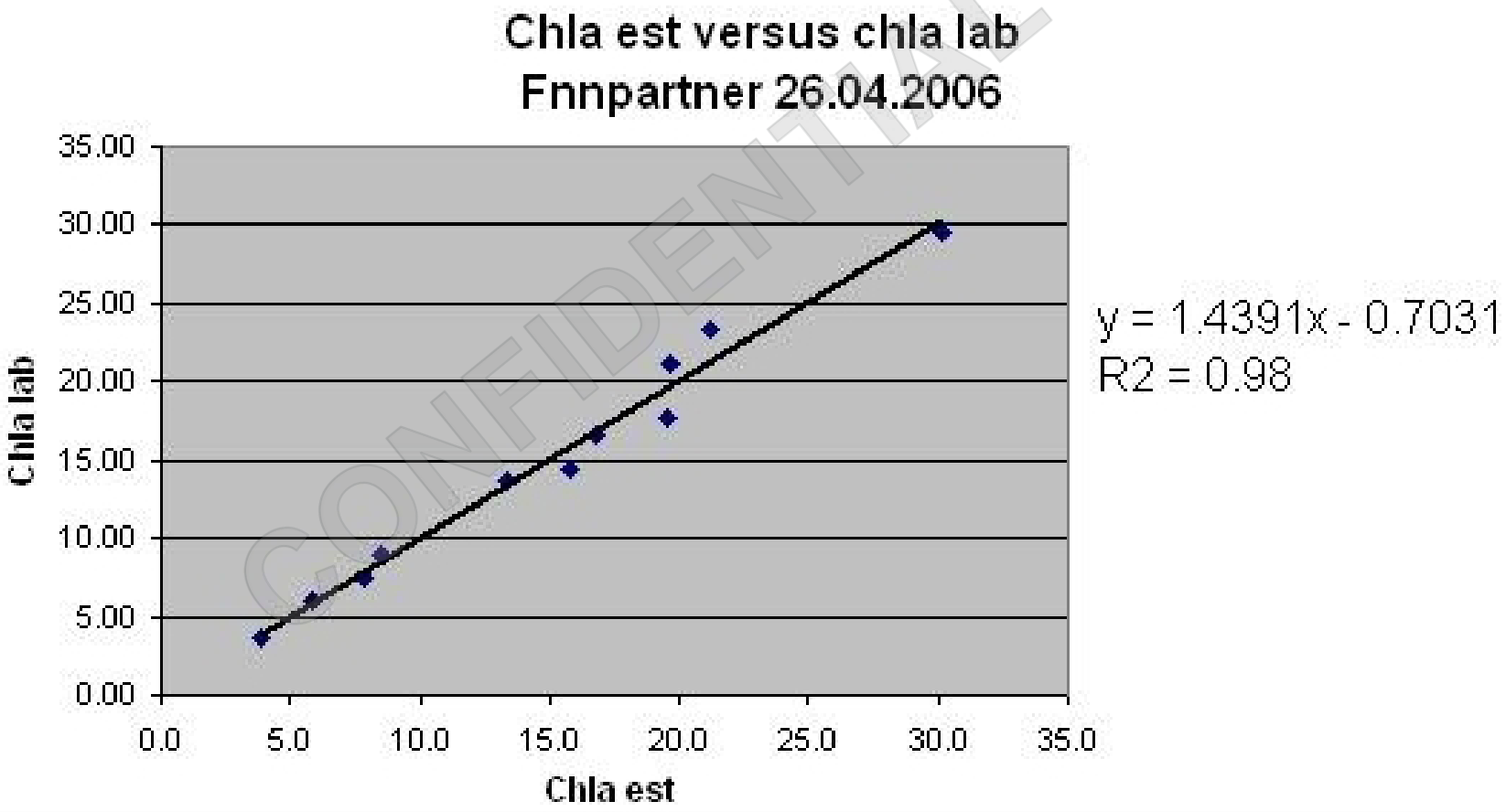
Chlorophyll a validation of chlorophyll-a fluorescence against chlorophyll-a analysis with extraction.



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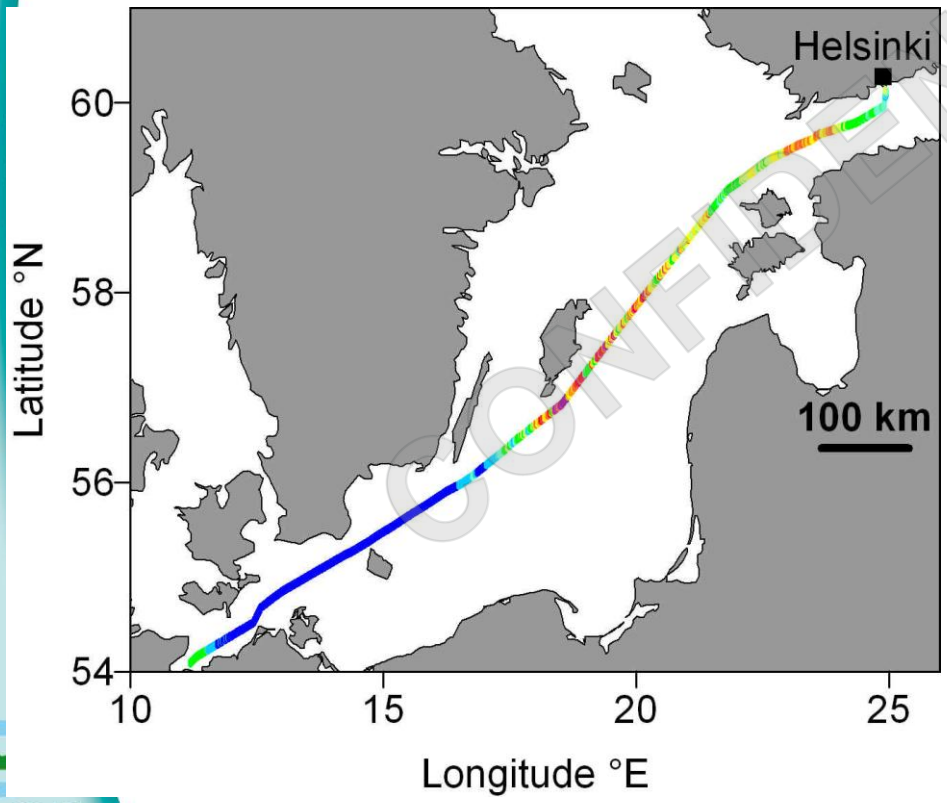
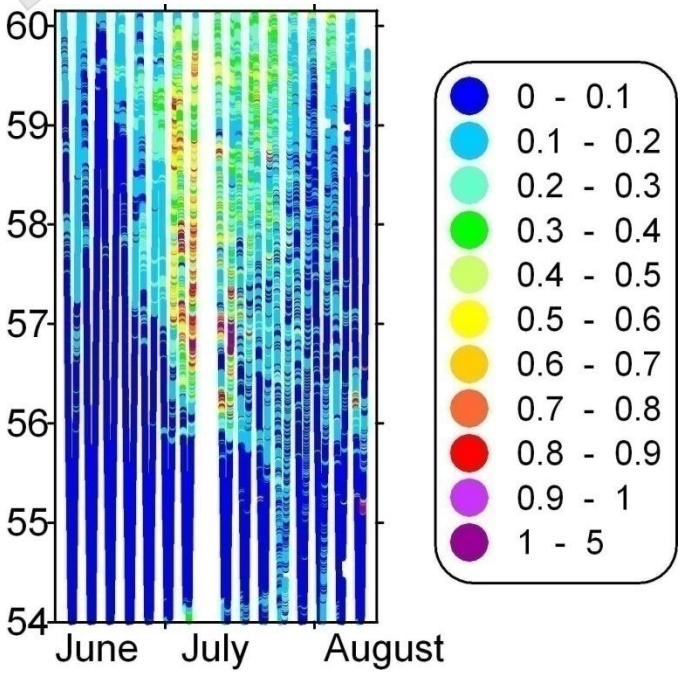
Phycocyanin Fluorescence in the Baltic Sea

Phycocyanin fluorescence, July 5-7, 2005



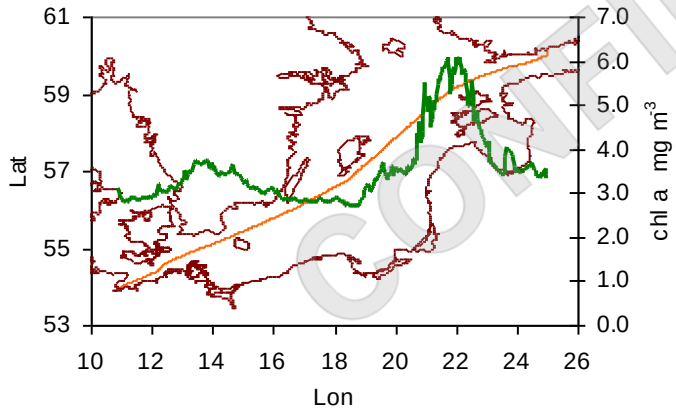
Phycocyanin fluorescence, Summer 2005



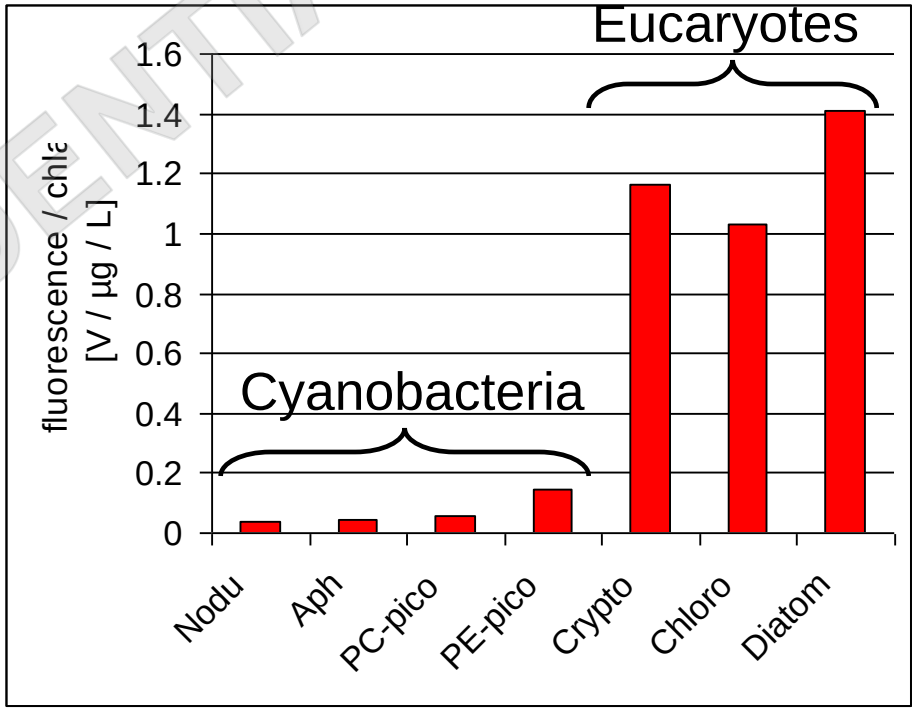
Seppälä et al. (2007) ECSS 73

Detection of Baltic Cyanobacteria

Optical detection of phytoplankton typically yields a bulk Chlorophyll *a* signal, no taxonomic information.



Chl*a* in living cyanobacterial cells fluoresces very weakly.



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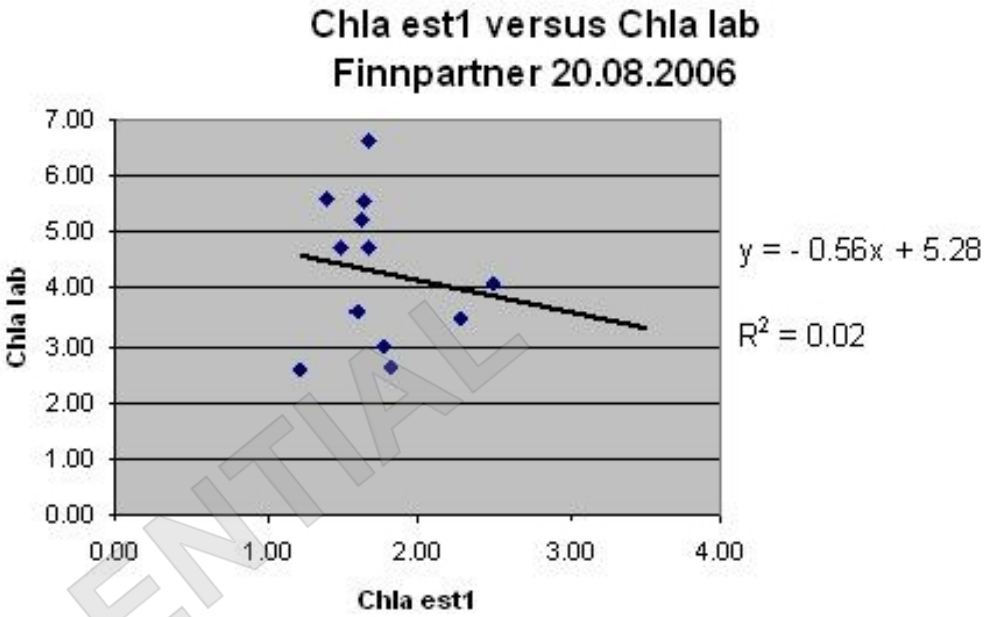
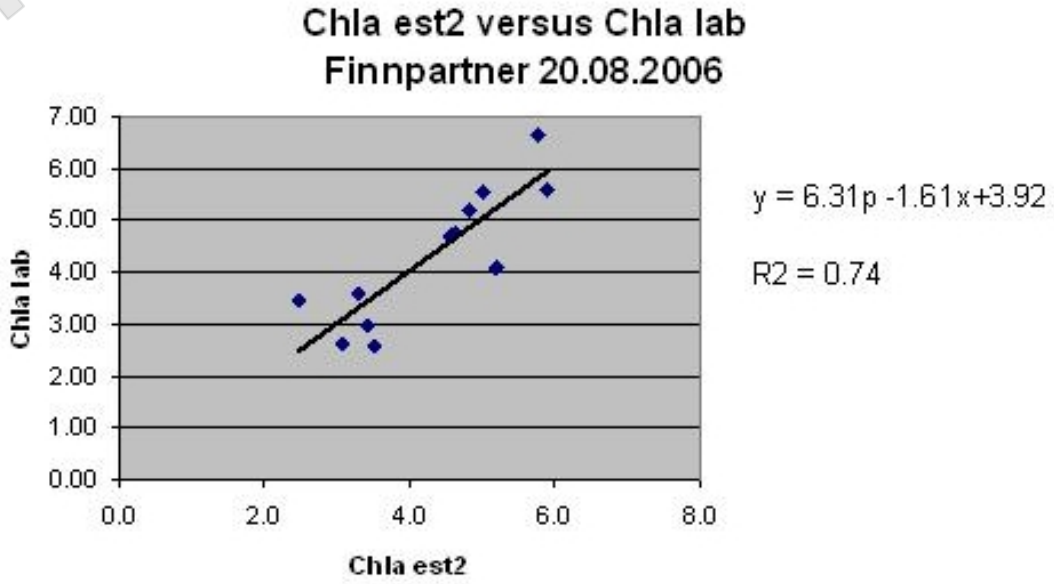
Chlorophyll-a validation of chlorophyll-a fluorescence against chlorophyll-a analysis with extraction (upper)



validation of same records with phycocyanin as auxiliary parameter (lower).



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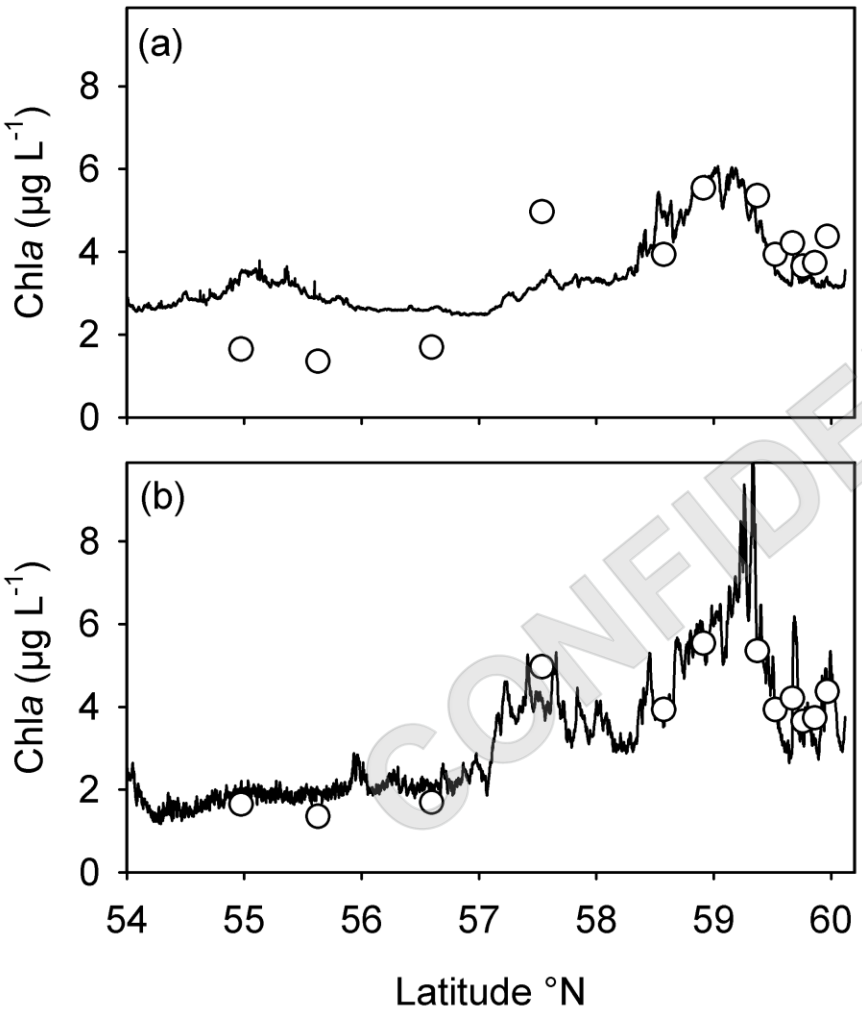
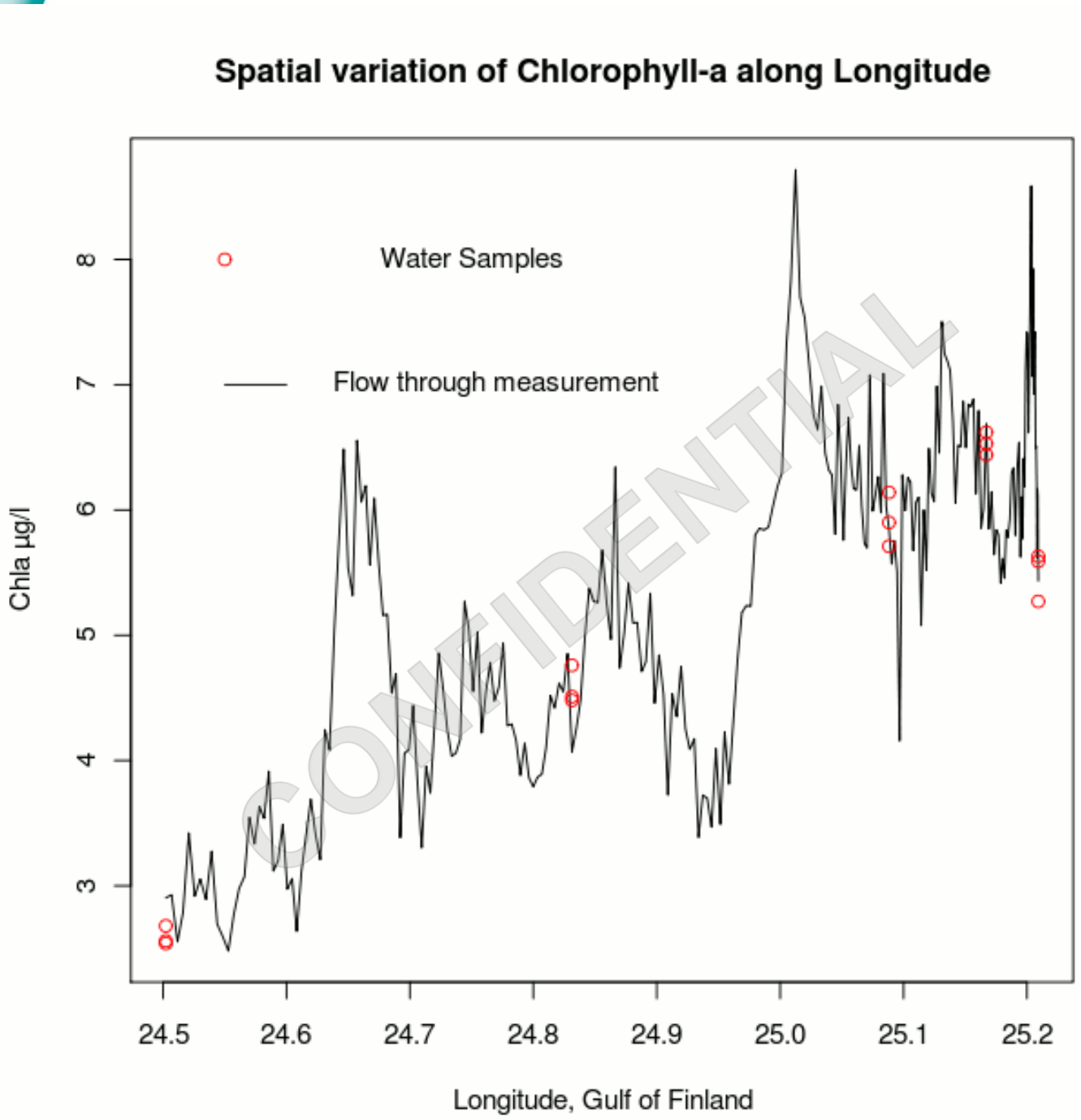
Measuring both Phycocyanin and Chl*a* fluorescence will improve Chl*a* concentration estimates.



$[Chla] = b_0 + b_1 * Chla\ Fl$

$[Chla] = b_0 + b_1 * Chla\ Fl + b_2 * PC\ Fl$


Spatial variation of Chlorophyll-a along Longitude
Water Samples
Flow through measurement
Chla µg/l
3
4
5
6
7
8
24.5
24.6
24.7
24.8
24.9
25.0
25.1
25.2
Longitude, Gulf of Finland
CONFIDENTIAL

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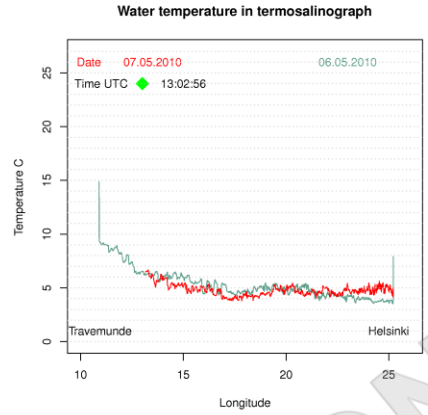
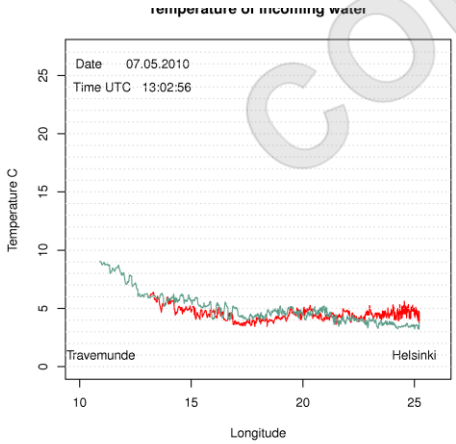
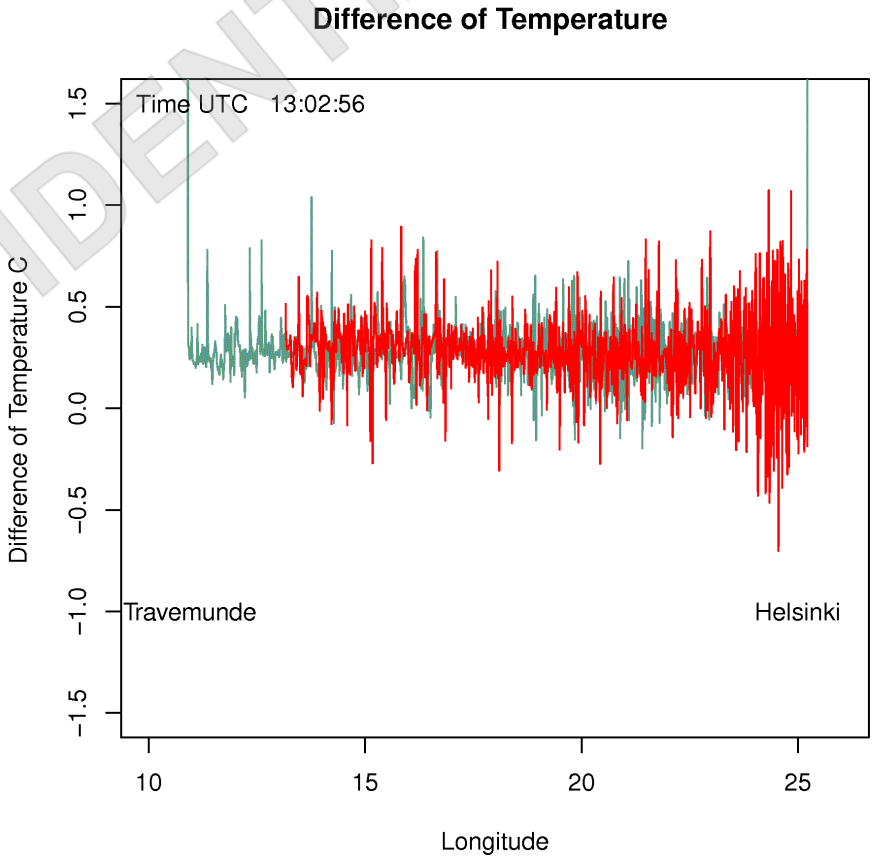
One of the tasks is to ensure the routine validation of real-time production In Algaline monitoring this is partly carried out with the difference of 2 parallel observations of temperature; termometer by the water inlet and the termosalinograph. Red is current observations, gray is previous cruise data.







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Real Time Quality Control of biogeochemical measurements

Table 1: Quality flag scale. Codes marked in red are mandatory following the RTQC procedure **Code**	**Meaning**
0	No QC was performed
1	Good data
2	Probably good data
3	Bad data that are potentially correctable
4	Bad data
5	Value changed
6	Below detection limit
7	In excess of quoted value
8	Interpolated value
9	Missing value
A	Incomplete information

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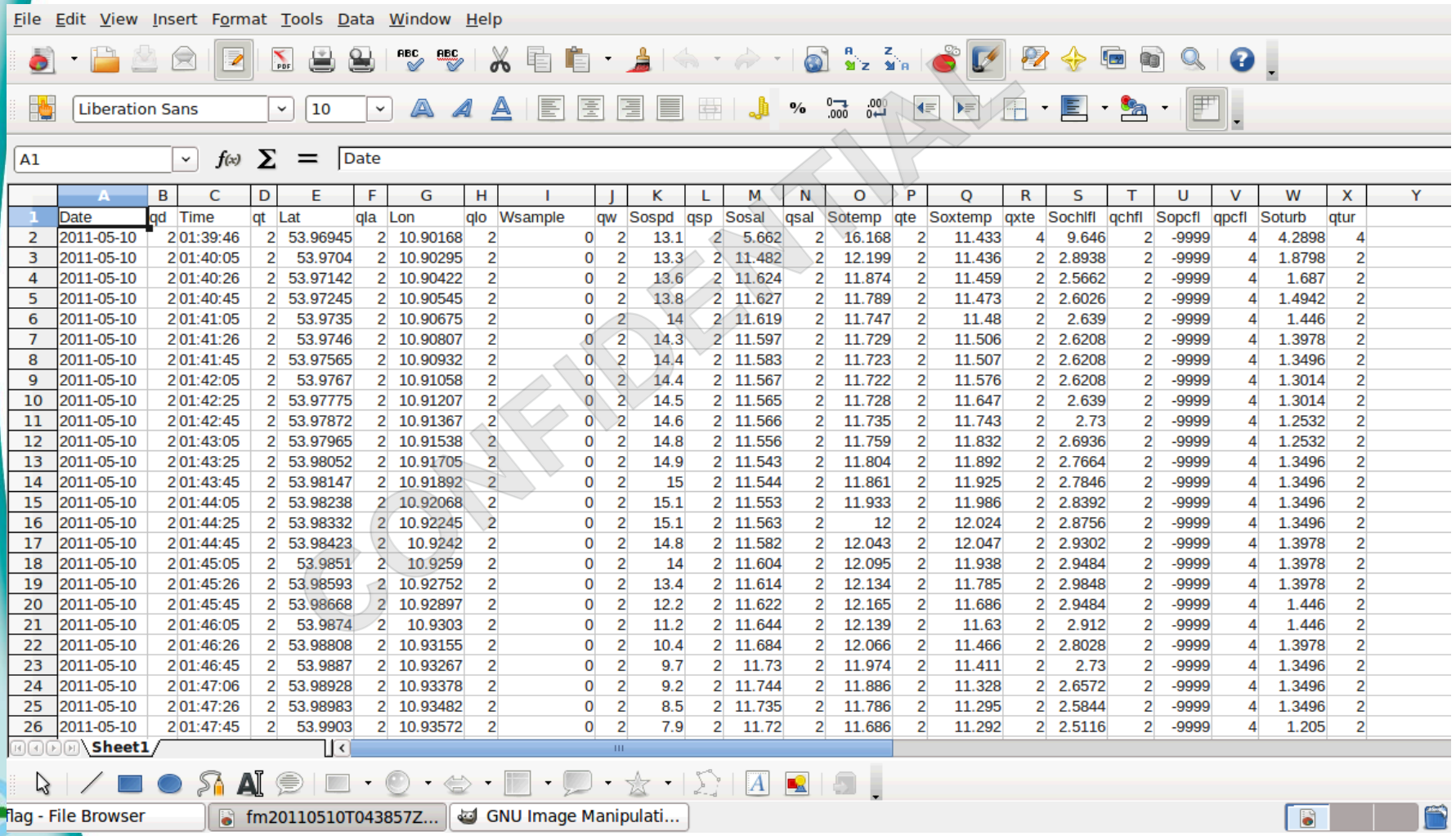
Flaged data to database



File Edit View Insert Format Tools Data Window Help

Liberation Sans 10

A1 Date

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
1	Date	qd	Time	qt	Lat	qla	Lon	qlo	Wsample	qw	Sospd	qsp	Sosal	qsal	Sotemp	qte	Soxtemp	qxte	Sochlfl	qchfl	Sopcfl	qpcfl	Soturb	qtur	
2	2011-05-10	2	01:39:46	2	53.96945	2	10.90168	2	0	2	13.1	2	5.662	2	16.168	2	11.433	4	9.646	2	-9999	4	4.2898	4	
3	2011-05-10	2	01:40:05	2	53.9704	2	10.90295	2	0	2	13.3	2	11.482	2	12.199	2	11.436	2	2.8938	2	-9999	4	1.8798	2	
4	2011-05-10	2	01:40:26	2	53.97142	2	10.90422	2	0	2	13.6	2	11.624	2	11.874	2	11.459	2	2.5662	2	-9999	4	1.687	2	
5	2011-05-10	2	01:40:45	2	53.97245	2	10.90545	2	0	2	13.8	2	11.627	2	11.789	2	11.473	2	2.6026	2	-9999	4	1.4942	2	
6	2011-05-10	2	01:41:05	2	53.9735	2	10.90675	2	0	2	14	2	11.619	2	11.747	2	11.48	2	2.639	2	-9999	4	1.446	2	
7	2011-05-10	2	01:41:26	2	53.9746	2	10.90807	2	0	2	14.3	2	11.597	2	11.729	2	11.506	2	2.6208	2	-9999	4	1.3978	2	
8	2011-05-10	2	01:41:45	2	53.97565	2	10.90932	2	0	2	14.4	2	11.583	2	11.723	2	11.507	2	2.6208	2	-9999	4	1.3496	2	
9	2011-05-10	2	01:42:05	2	53.9767	2	10.91058	2	0	2	14.4	2	11.567	2	11.722	2	11.576	2	2.6208	2	-9999	4	1.3014	2	
10	2011-05-10	2	01:42:25	2	53.97775	2	10.91207	2	0	2	14.5	2	11.565	2	11.728	2	11.647	2	2.639	2	-9999	4	1.3014	2	
11	2011-05-10	2	01:42:45	2	53.97872	2	10.91367	2	0	2	14.6	2	11.566	2	11.735	2	11.743	2	2.73	2	-9999	4	1.2532	2	
12	2011-05-10	2	01:43:05	2	53.97965	2	10.91538	2	0	2	14.8	2	11.556	2	11.759	2	11.832	2	2.6936	2	-9999	4	1.2532	2	
13	2011-05-10	2	01:43:25	2	53.98052	2	10.91705	2	0	2	14.9	2	11.543	2	11.804	2	11.892	2	2.7664	2	-9999	4	1.3496	2	
14	2011-05-10	2	01:43:45	2	53.98147	2	10.91892	2	0	2	15	2	11.544	2	11.861	2	11.925	2	2.7846	2	-9999	4	1.3496	2	
15	2011-05-10	2	01:44:05	2	53.98238	2	10.92068	2	0	2	15.1	2	11.553	2	11.933	2	11.986	2	2.8392	2	-9999	4	1.3496	2	
16	2011-05-10	2	01:44:25	2	53.98332	2	10.92245	2	0	2	15.1	2	11.563	2	12	2	12.024	2	2.8756	2	-9999	4	1.3496	2	
17	2011-05-10	2	01:44:45	2	53.98423	2	10.9242	2	0	2	14.8	2	11.582	2	12.043	2	12.047	2	2.9302	2	-9999	4	1.3978	2	
18	2011-05-10	2	01:45:05	2	53.9851	2	10.9259	2	0	2	14	2	11.604	2	12.095	2	11.938	2	2.9484	2	-9999	4	1.3978	2	
19	2011-05-10	2	01:45:26	2	53.98593	2	10.92752	2	0	2	13.4	2	11.614	2	12.134	2	11.785	2	2.9848	2	-9999	4	1.3978	2	
20	2011-05-10	2	01:45:45	2	53.98668	2	10.92897	2	0	2	12.2	2	11.622	2	12.165	2	11.686	2	2.9484	2	-9999	4	1.446	2	
21	2011-05-10	2	01:46:05	2	53.9874	2	10.9303	2	0	2	11.2	2	11.644	2	12.139	2	11.63	2	2.912	2	-9999	4	1.446	2	
22	2011-05-10	2	01:46:26	2	53.98808	2	10.93155	2	0	2	10.4	2	11.684	2	12.066	2	11.466	2	2.8028	2	-9999	4	1.3978	2	
23	2011-05-10	2	01:46:45	2	53.9887	2	10.93267	2	0	2	9.7	2	11.73	2	11.974	2	11.411	2	2.73	2	-9999	4	1.3496	2	
24	2011-05-10	2	01:47:06	2	53.98928	2	10.93378	2	0	2	9.2	2	11.744	2	11.886	2	11.328	2	2.6572	2	-9999	4	1.3496	2	
25	2011-05-10	2	01:47:26	2	53.98983	2	10.93482	2	0	2	8.5	2	11.735	2	11.786	2	11.295	2	2.5844	2	-9999	4	1.3496	2	
26	2011-05-10	2	01:47:45	2	53.9903	2	10.93572	2	0	2	7.9	2	11.72	2	11.686	2	11.292	2	2.5116	2	-9999	4	1.205	2	

Sheet1

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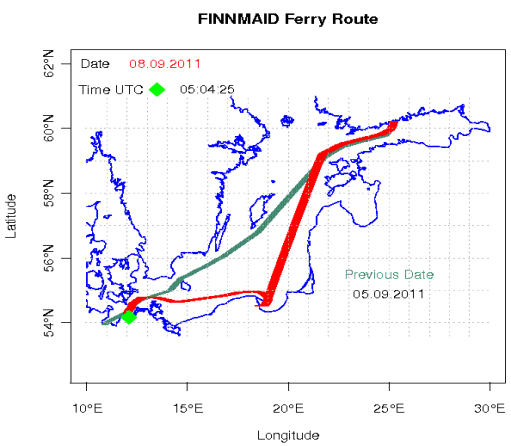
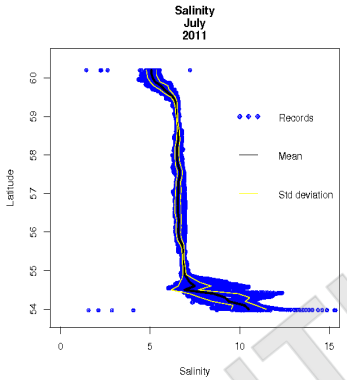
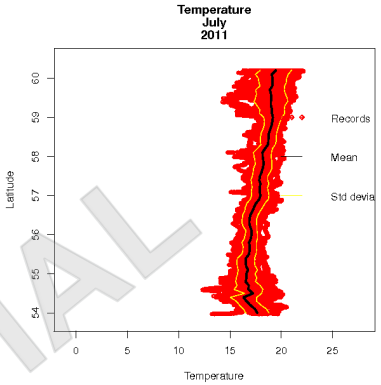
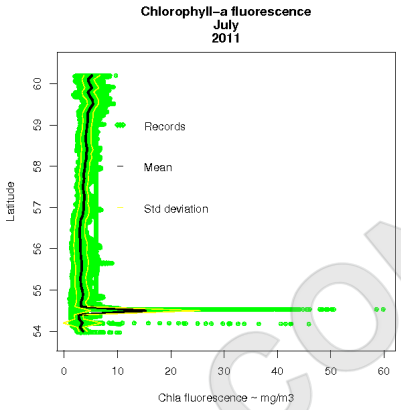
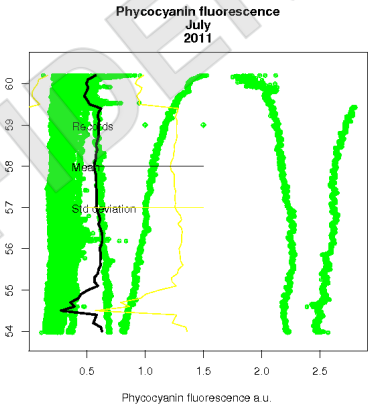
Monthly diagnostic plots against latitude



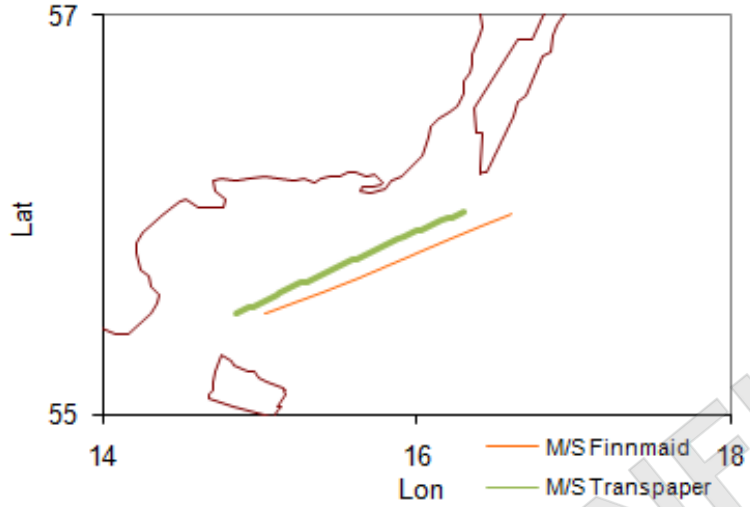


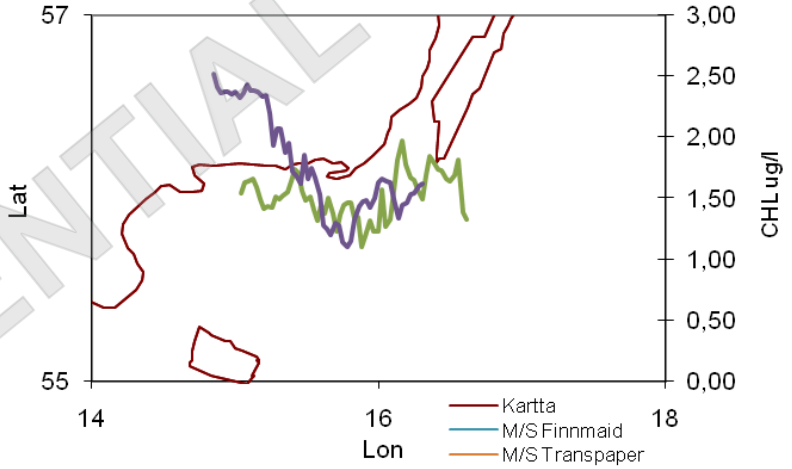


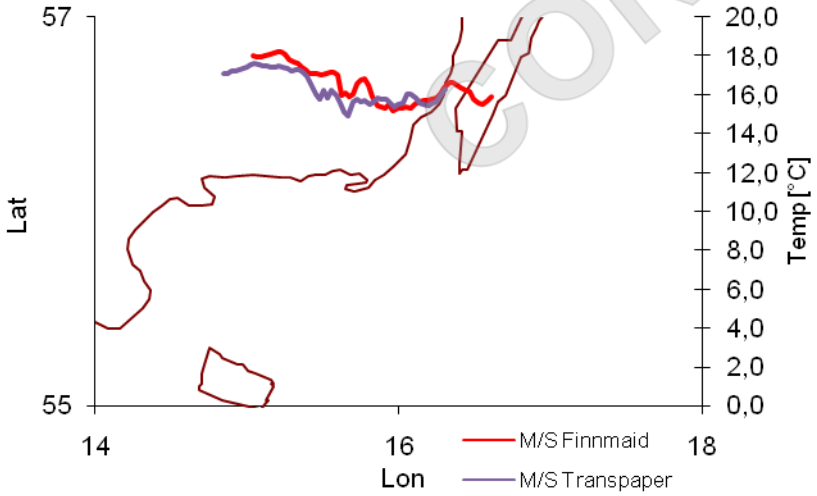


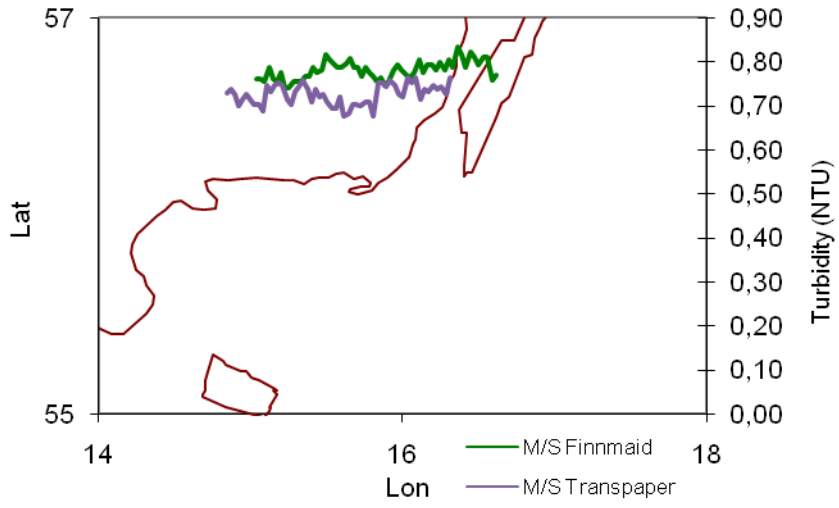


Comparison of TRANSPAPER and FINNMAID on 26.7.2010, time diff 2.5 h









Comparison of TRANSPAPER and FINNMAID on 26.7.2010, time diff 2.5 h