

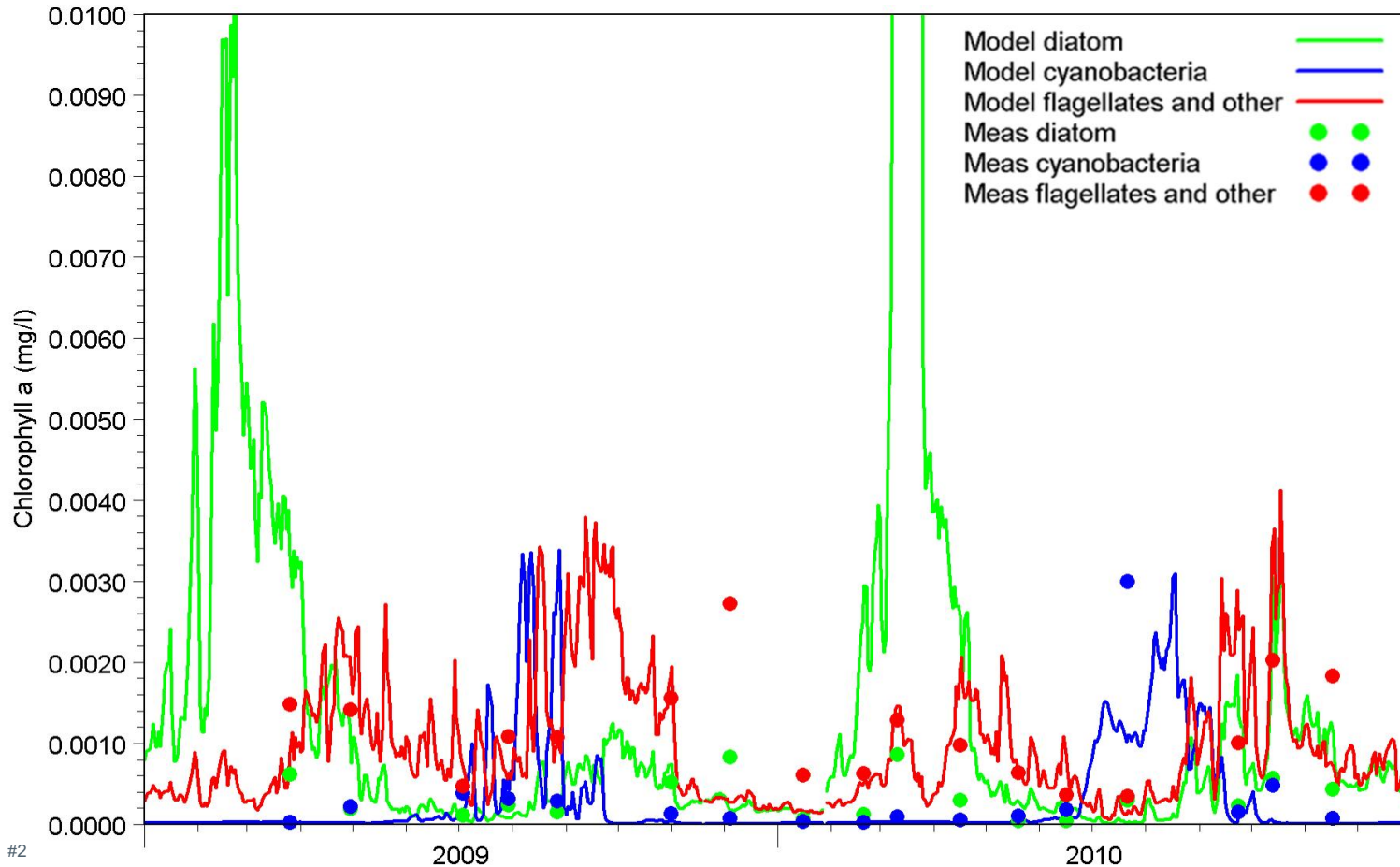
FerryBox data used for calibration of an ecological Baltic Sea model – a strong supplement to traditional monitoring data

Closter, R.M., Erichsen, A.C., Kaas, H, Andersson, J.H.1, Uhrenholdt, T. from DHI & Hansen, L.B. from GRAS



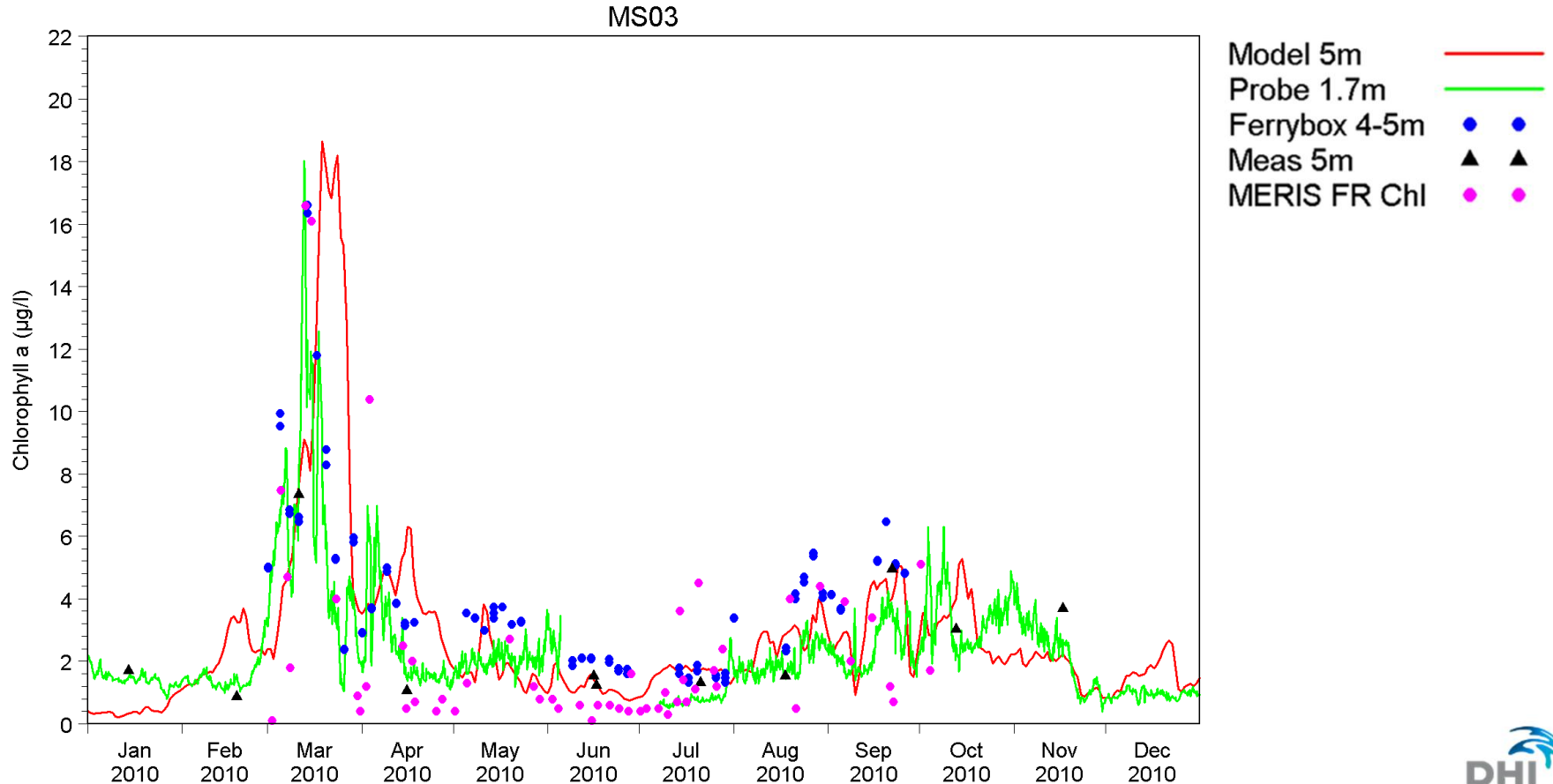
24. April 2013

Phytoplankton groups – seasonal variation



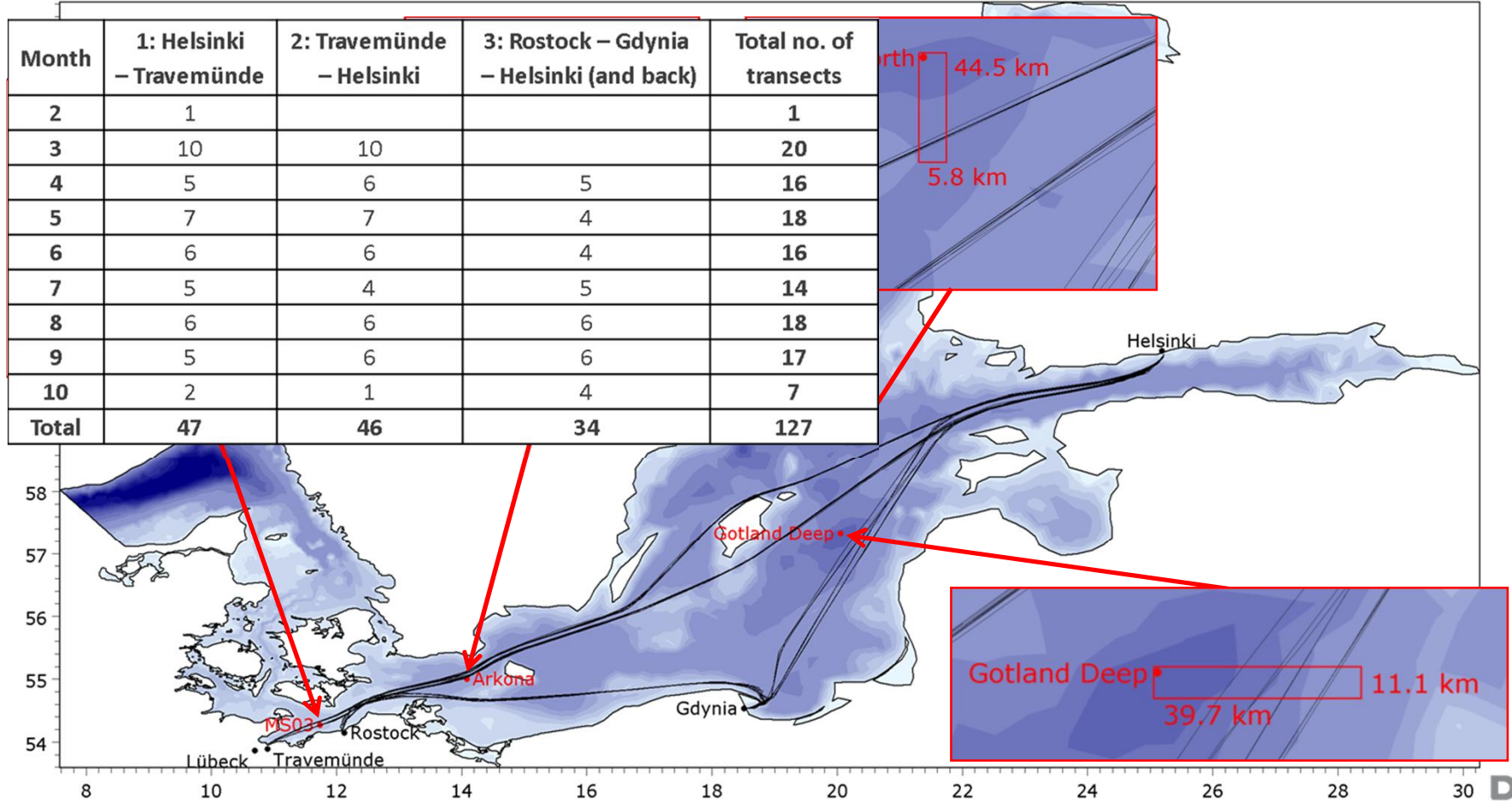
Timing and phytoplankton species varies from year to year. Some variations can be explained, while others are of a more "surprising" character!

Chlorophyll a – types of measurements



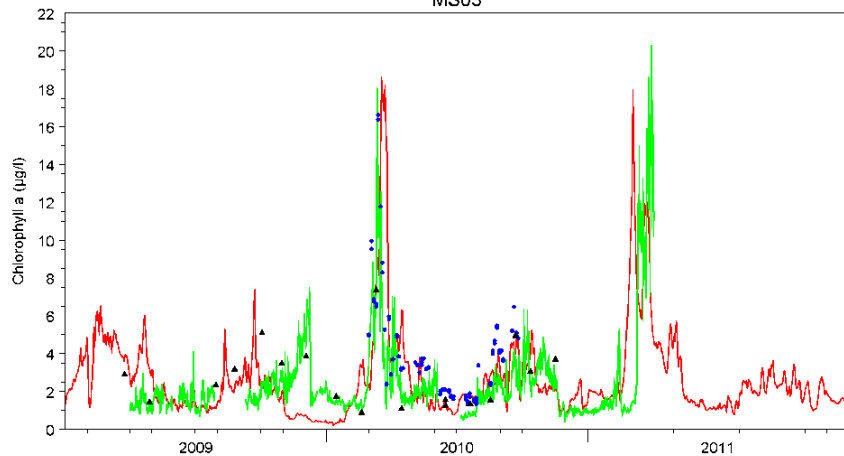
Time series – monitoring stations

Alg@line (Seppälä *et al.*, 2007)

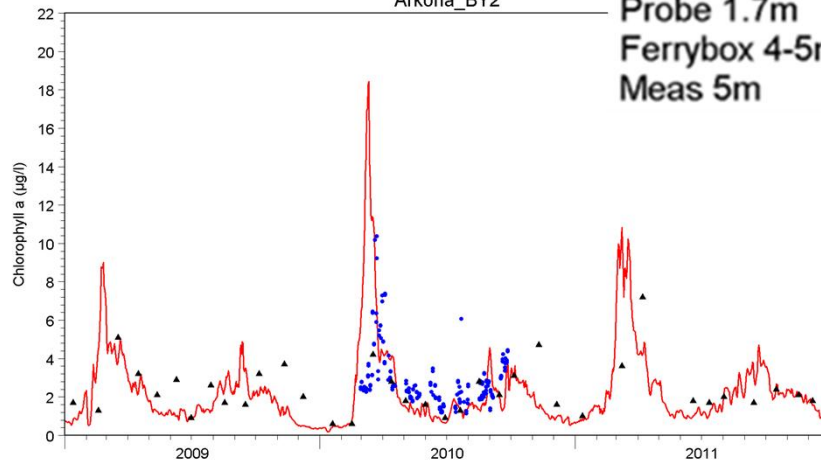


Time series – Chlorophyll a

MS03

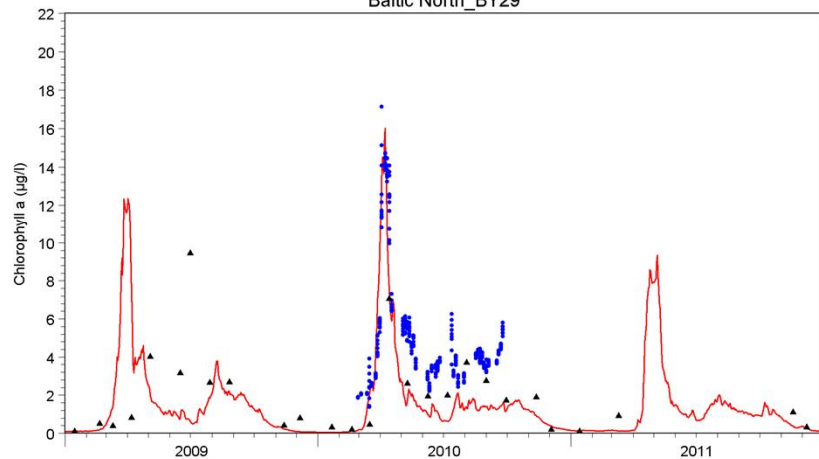


Arkona_BY2

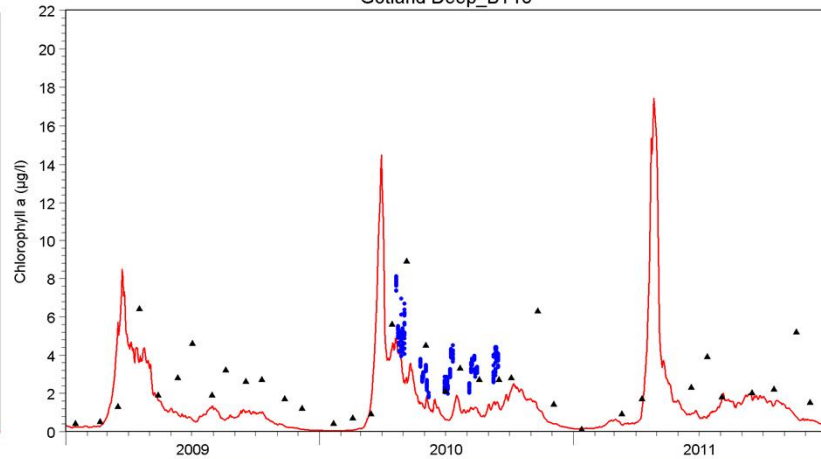


Model 5m —
Probe 1.7m —
Ferrybox 4-5m ● ●
Meas 5m ▲ ▲

Baltic North_BY29

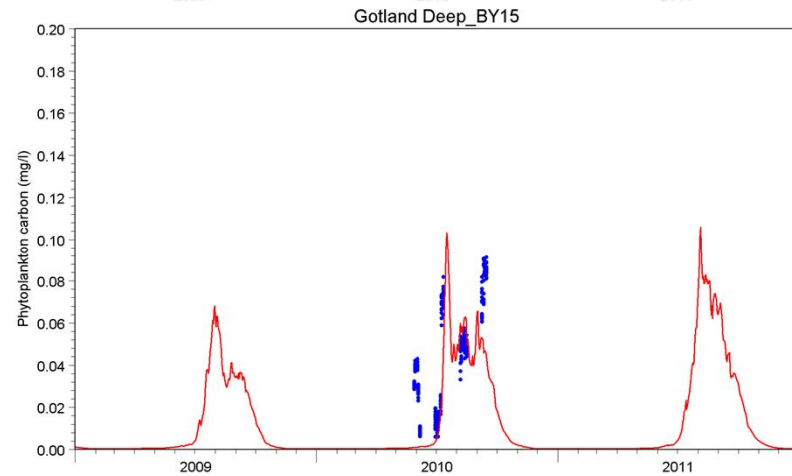
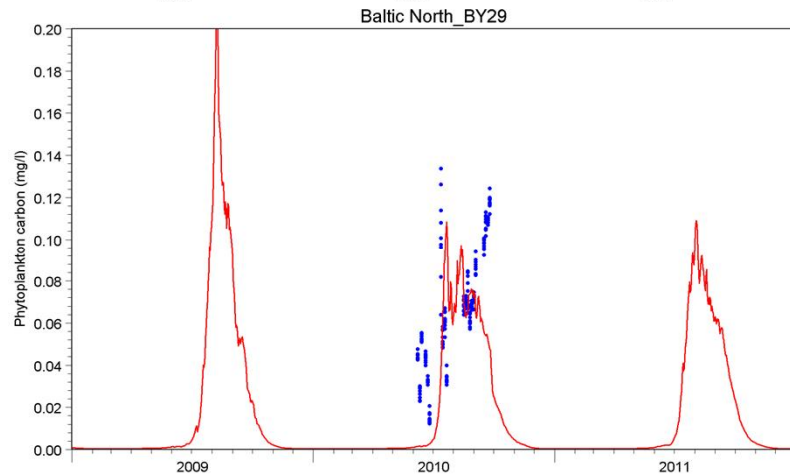
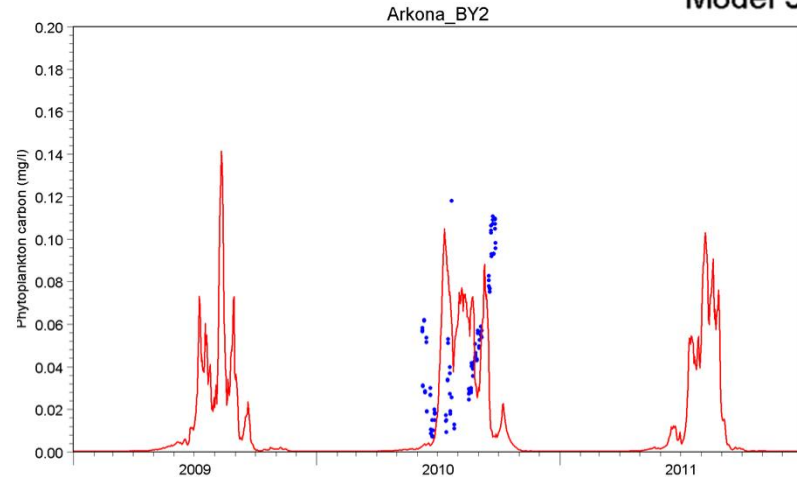
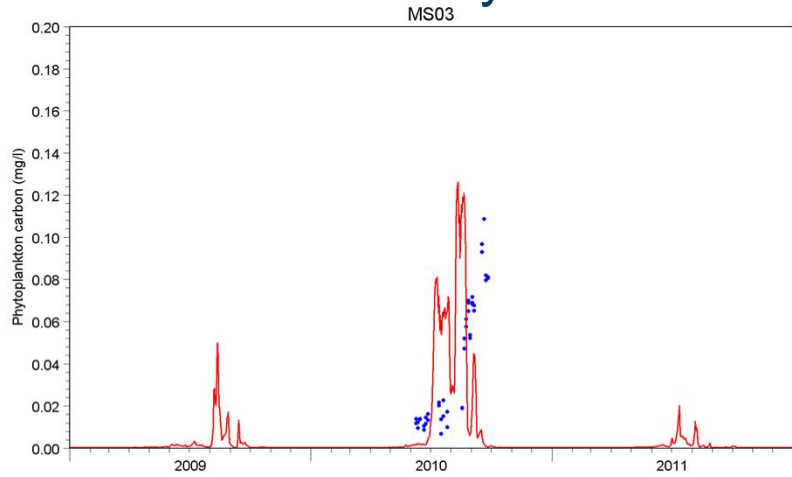


Gotland Deep_BY15

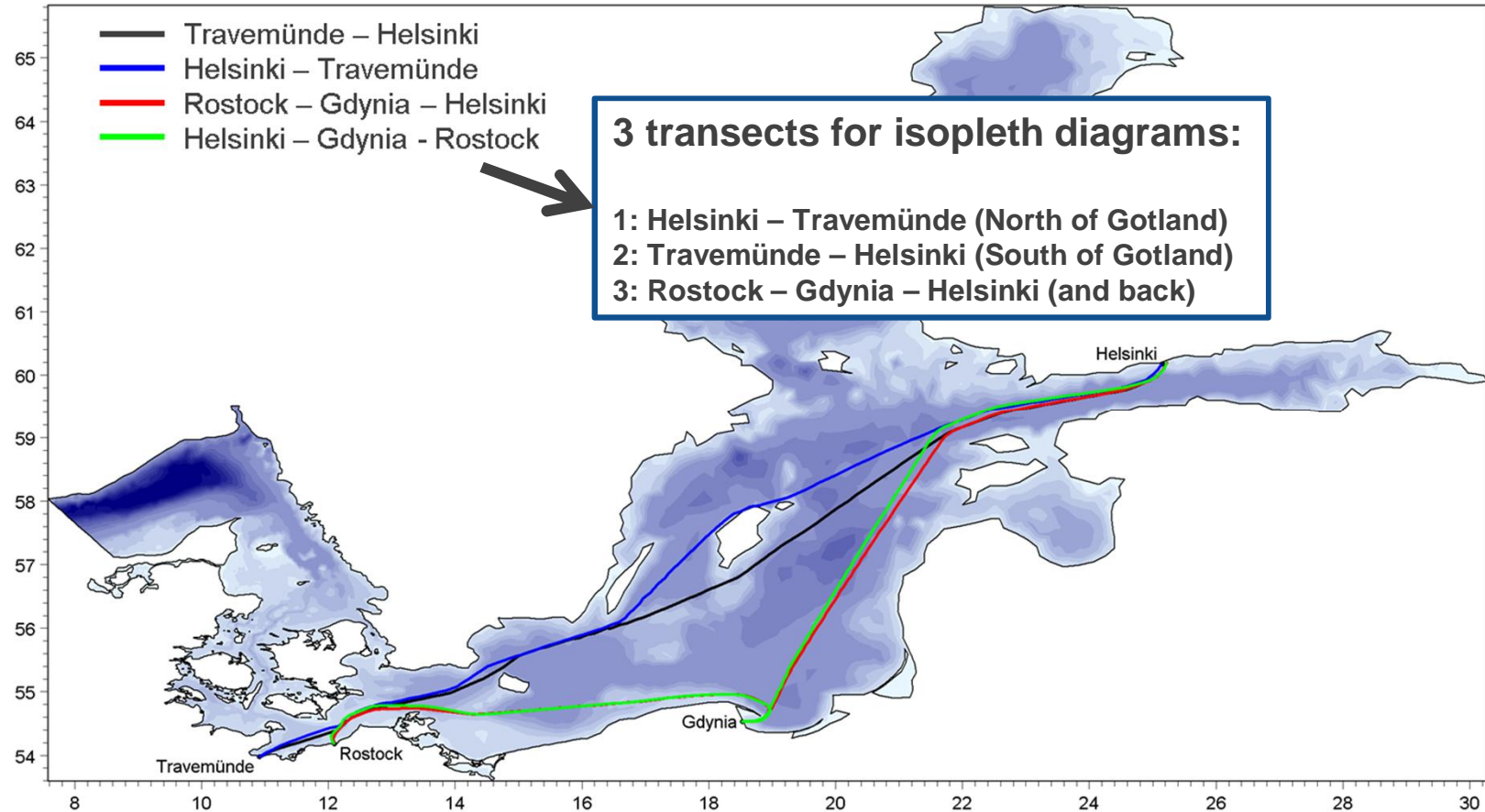


Time series – Cyanobacteria

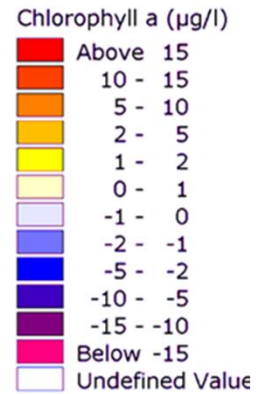
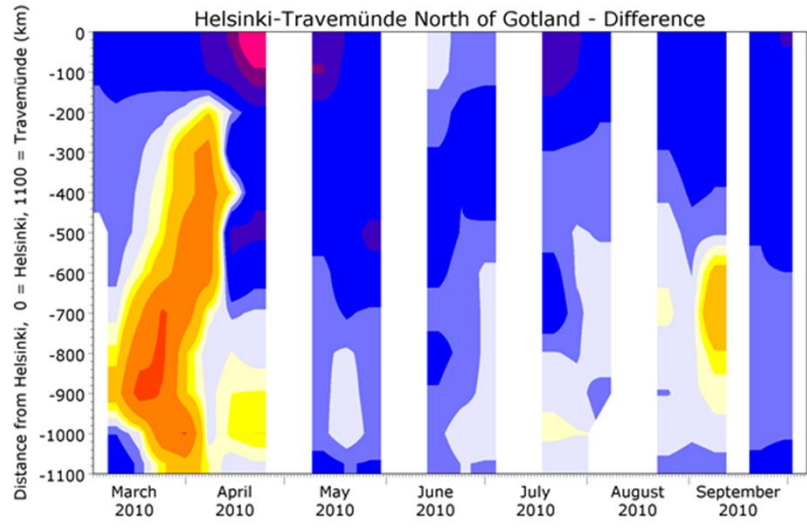
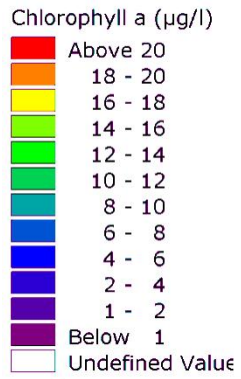
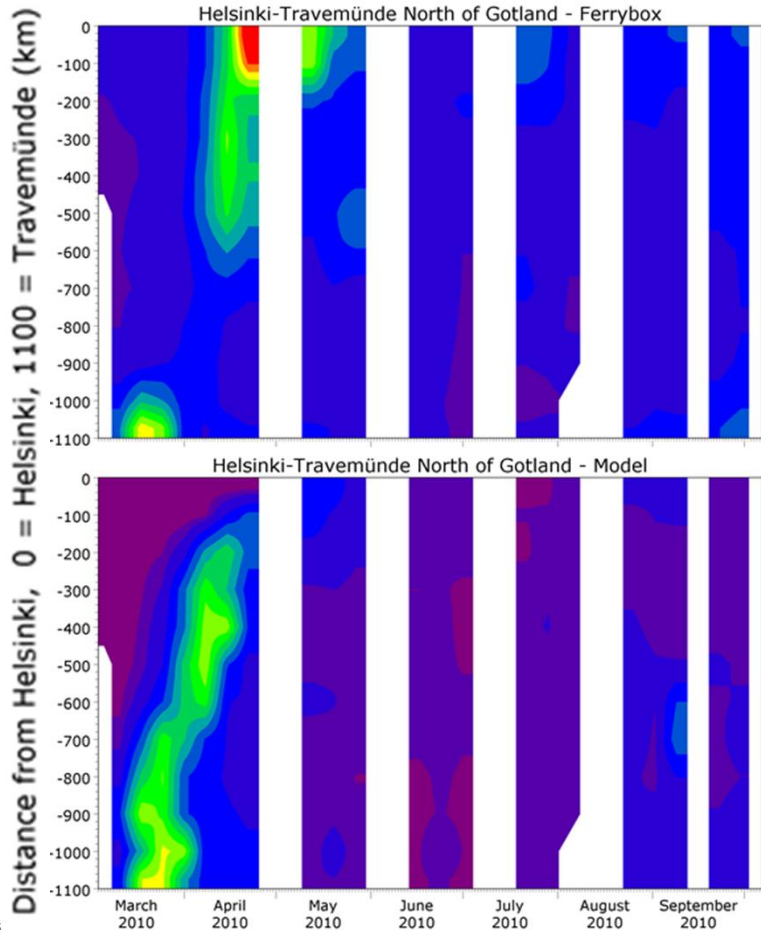
Ferrybox 4-5m • •
Model 5m —



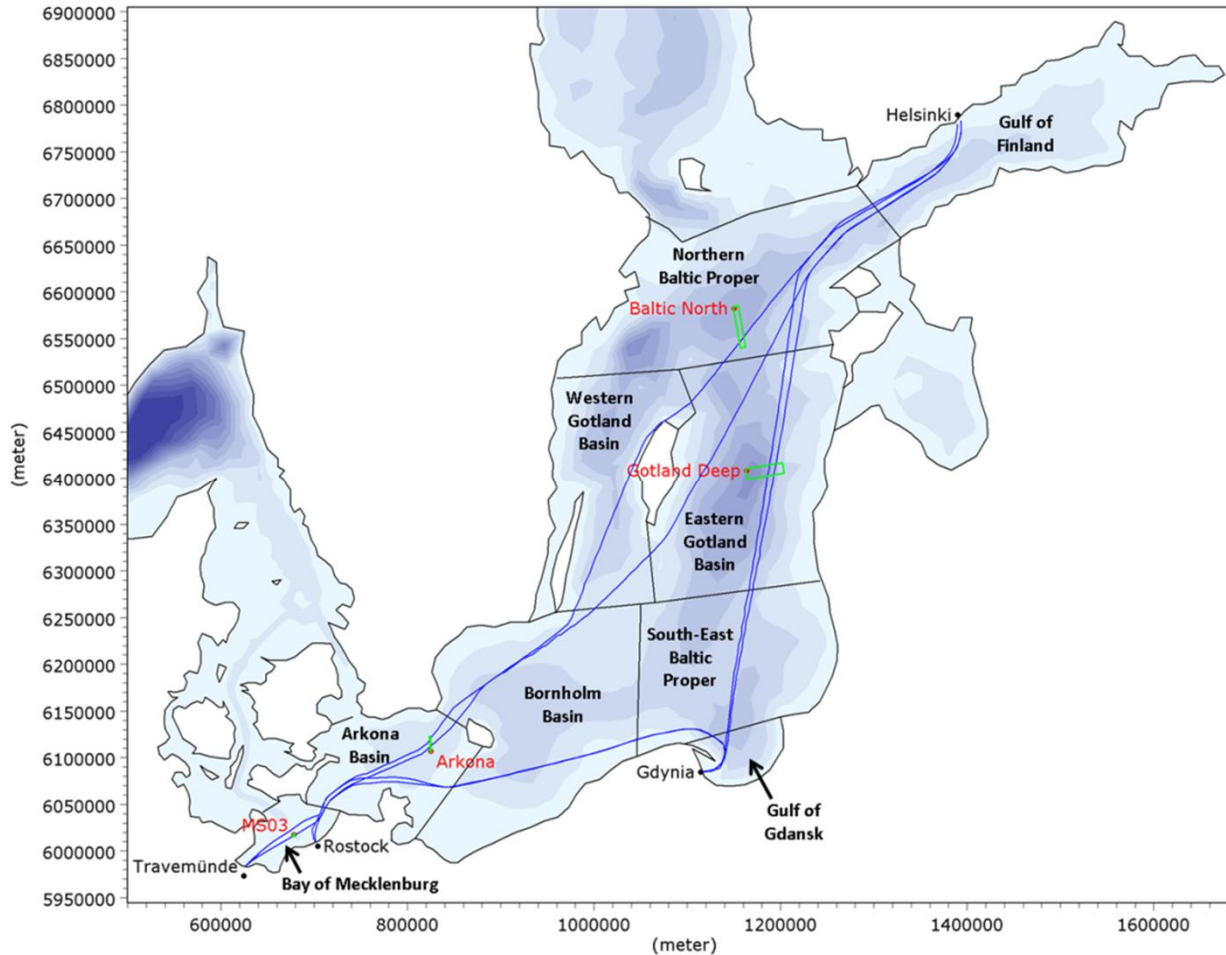
Isopleth diagrams - transects



Isopleth diagrams – chlorophyll a

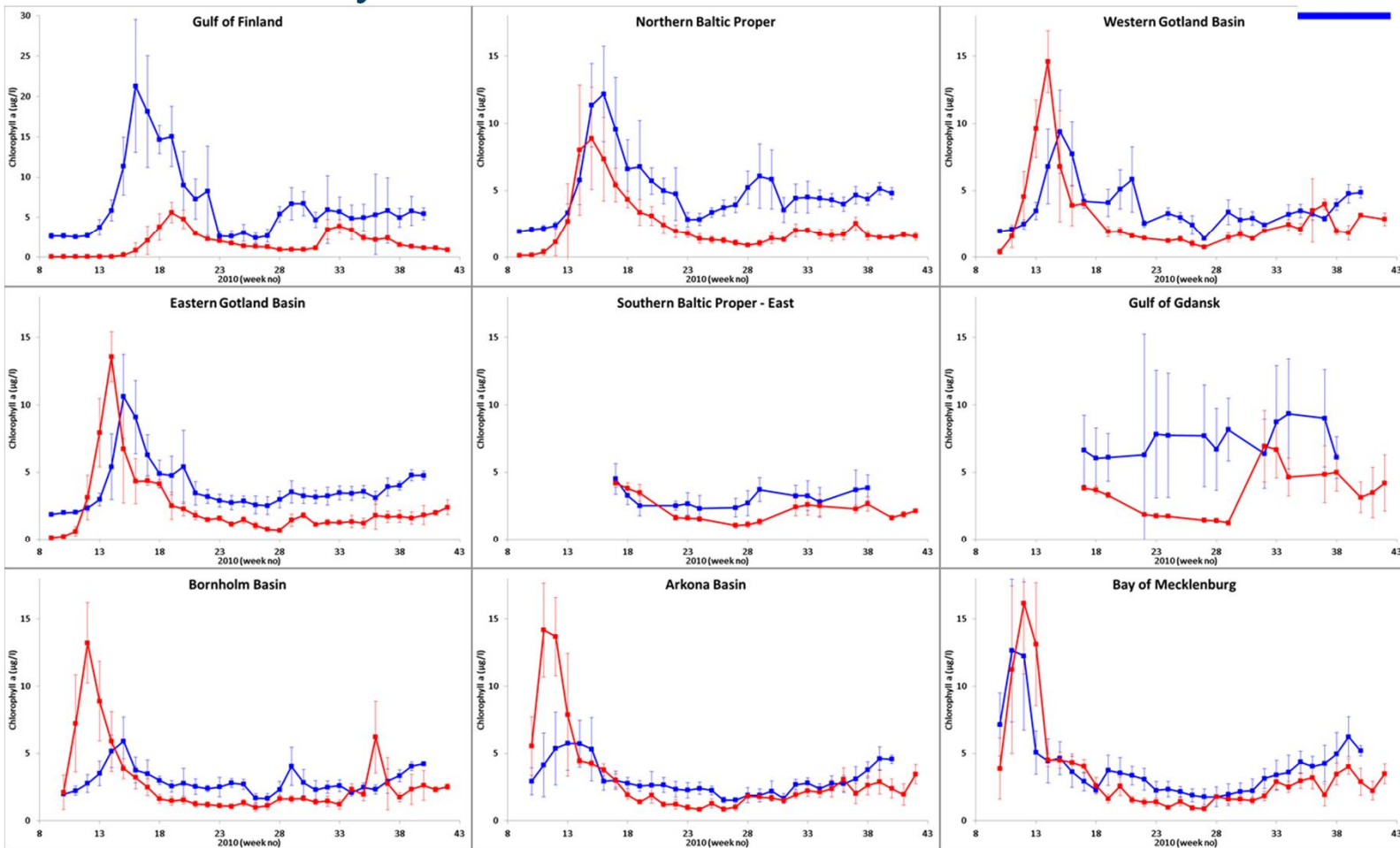


Sub-basin analyses



Sub-basin analyses

— Model
— Ferrybox



Sub-basin analyses

		Average	Geometric mean	Standard Deviation	n	Bias	RMSE	R ²	RSD	Pbias
Arkona Basin	Ferrybox	3.07	2.86	1.23	31	0.08	2.59	0.41	0.38	0.026
	Model	3.15	2.33	3.24	31					
Bay of Mecklenburg	Ferrybox	4.08	3.54	2.60	31	-0.55	2.09	0.68	0.73	-0.14
	Model	3.52	2.61	3.56	31					
Bornholm Basin	Ferrybox	2.95	2.82	0.96	31	-0.09	2.66	0.04	0.35	-0.03
	Model	2.85	2.17	2.74	31					
Eastern Gotland Basin	Ferrybox	3.91	3.59	1.89	32	-1.47	2.73	0.27	0.71	-0.38
	Model	2.44	1.65	2.66	32					
Gulf of Finland	Ferrybox	6.59	5.43	4.70	32	-4.82	6.49	0.12	3.24	-0.73
	Model	1.76	0.93	1.45	32					
Gulf of Gdansk	Ferrybox	7.34	7.26	1.16	14	-3.88	4.42	0.01	0.59	-0.53
	Model	3.46	2.93	1.96	14					
Northern Baltic Proper	Ferrybox	4.92	4.47	2.39	32	-2.52	2.85	0.68	1.11	-0.51
	Model	2.40	1.68	2.16	32					
South-East Baltic Proper	Ferrybox	3.10	3.04	0.66	14	-0.81	1.15	0.28	0.66	-0.26
	Model	2.30	2.10	1.00	14					
Western Gotland Basin	Ferrybox	3.84	3.50	1.83	27	-0.80	2.70	0.26	0.60	-0.21
	Model	3.05	2.23	3.03	27					

Calibration v26

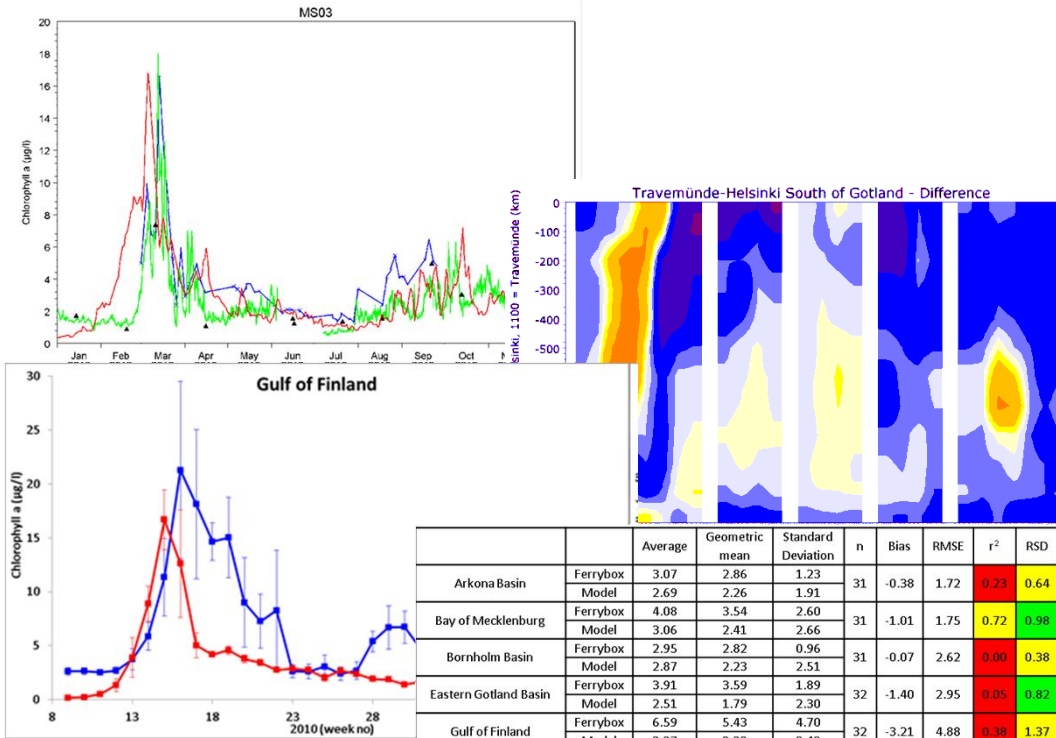
r ²	RSD	Pbias
0.23	0.64	-0.12
0.72	0.98	-0.25
0.00	0.38	-0.02
0.05	0.82	-0.36
0.38	1.37	-0.49
0.01	0.85	-0.47
0.11	1.02	-0.46
0.00	0.81	-0.26
0.00	0.64	-0.17

Calibration v12

r ²	RSD	Pbias
0.53	0.52	-0.57
0.03	0.65	-0.47
0.21	0.64	-0.64
0.64	1.02	-0.71
0.74	1.90	-0.79
0.24	0.26	-0.25
0.58	1.28	-0.77
0.11	1.36	-0.72
0.59	1.10	-0.69

Calibration v5

Ferry Box data used for



Time series comparison

Transect isopleths

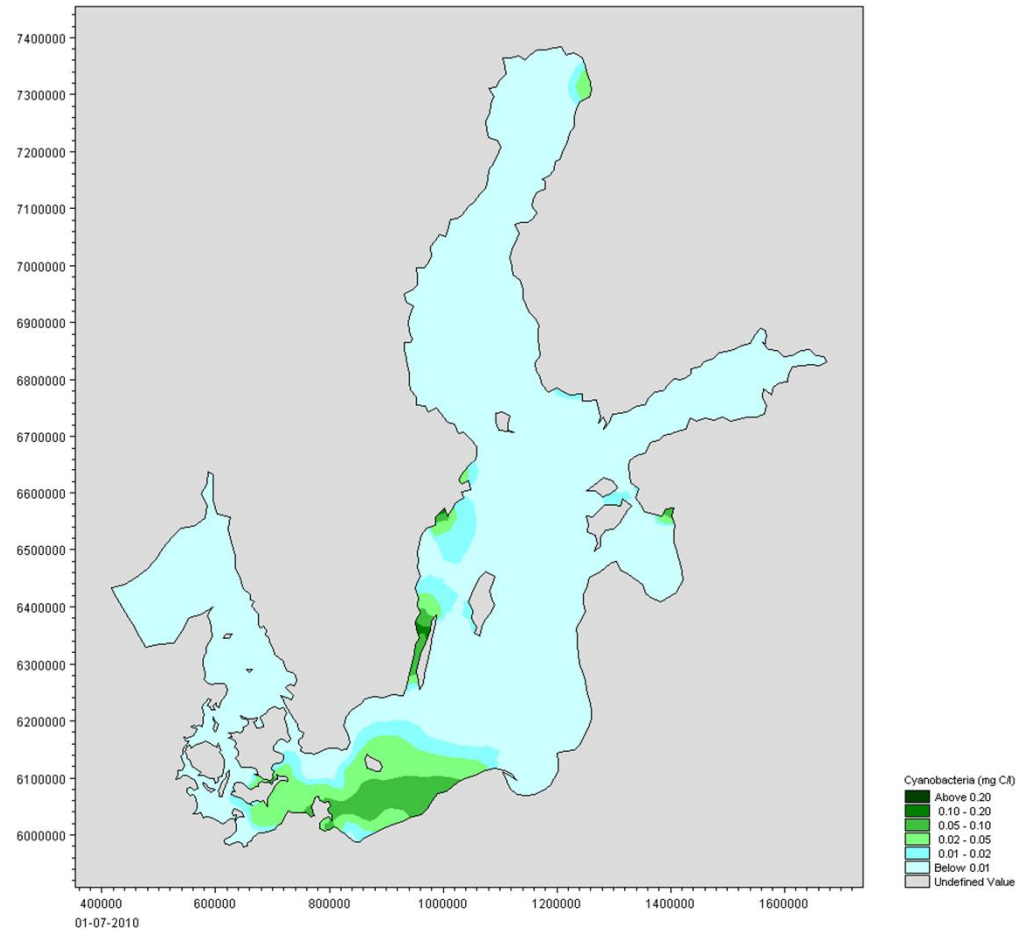
Weekly average from sub-basins

Traffic-light table sub-basins

		Average	Geometric mean	Standard Deviation	n	Bias	RMSE	r ²	RSD	Pbias
Arkona Basin	Ferrybox	3.07	2.86	1.23	31	-0.38	1.72	0.23	0.64	-0.12
	Model	2.69	2.26	1.91						
Bay of Mecklenburg	Ferrybox	4.08	3.54	2.60	31	-1.01	1.75	0.72	0.98	-0.25
	Model	3.06	2.41	2.66						
Bornholm Basin	Ferrybox	2.95	2.82	0.96	31	-0.07	2.62	0.00	0.38	-0.02
	Model	2.87	2.23	2.51						
Eastern Gotland Basin	Ferrybox	3.91	3.59	1.89	32	-1.40	2.95	0.05	0.82	-0.36
	Model	2.51	1.79	2.30						
Gulf of Finland	Ferrybox	6.59	5.43	4.70	32	-3.21	4.88	0.38	1.37	0.49
	Model	3.37	2.32	3.42						
Gulf of Gdansk	Ferrybox	7.34	7.26	1.16	14	-3.44	3.82	0.01	0.85	0.47
	Model	3.90	3.68	1.36						
Northern Baltic Proper	Ferrybox	4.92	4.47	2.39	32	-2.26	3.52	0.11	1.02	0.46
	Model	2.67	1.96	2.34						
South-East Baltic Proper	Ferrybox	3.10	3.04	0.66	14	-0.82	1.28	0.00	0.81	-0.26
	Model	2.28	2.16	0.82						
Western Gotland Basin	Ferrybox	3.84	3.50	1.83	27	-0.66	3.30	0.00	0.64	-0.17
	Model	3.18	2.49	2.86						

Current and coming work

- Baltic Sea model (CoBiOS)
- Danish water framework



Thank you for the attention!

