Joint European Research Infrastructure network for Coastal Observatories

Integrated Pan European Atlas Report on Coastal Observing systems D2.3

Grant Agreement n° 262584
Project Acronym: JERICO

Project Title: Towards a Joint European Research Infrastructure network for Coastal Observatories

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1. Document description

REFERENCES

Annex 1 to the Contract: Description of Work (DoW)

Document information	
Document Name	Integrated Pan European Atlas / report on Coastal Observing systems
Document ID	***JERICO-WP2-D2.3-130719-V1***
Revision	1.1
Revision Date	2013-09-24
Author	Jerico WP 2 team
Security	

History			
Revision	**Date**	**Modification**	**Author**
0.1	20/06/13	All paragraphs	H Wehde
1.0	19/07/13	First complete version	WP 2 team
1.1	24/09/13	First complete version revised	P.Farcy

Diffusion list				
Consortium beneficiaries	X			
Third parties				
Associated Partners				

2. Executive Summary

This JERICO deliverable provides an atlas of the existing Coastal Observing systems that are integrated in Europe. It provides the overview of established systems in the European Seas by the regional Alliances of the European Global Ocean observing system (EuroGOOS).

The regional systems covered are:

1. Arctic Regional Ocean Observing system (Arctic ROOS)
2. North West European Shelf Operational Oceanography system (NOOS)
3. Baltic Sea Operational Oceanography system (BOOS)
4. Ireland-Biscay-Iberia Regional Operational Oceanography System (IBIROOS)
5. Mediterranean Operational Network for the Global Ocean System (MONGOOS)
6. Black Sea Global Ocean Observing System (Black Sea GOOS)

This report forms the version 1 of the integrated Pan European Atlas and will be updated within the course of the JERICO project duration.

3. Introduction

The European waters are rich in natural resources and contain a large number of diverse marine habitats. The sectors of fisheries & aquaculture, tourism, maritime transport, renewable energy and oil and gas exploitation and increasing human activities (offshore and onshore) are utilizing these resources and climate change impacts form considerable pressures on the marine environment.

The different European regions are characterized by their own specific needs and therefore the monitoring systems aiming for a good overview of the status of the oceans are of very different form, i.e. in the use of measurement methodology in the divers regions of the European waters.

Impact as well from climate change as human activities can have a variety of major implications for marine ecosystems and subsequently for individual marine species. Environmental, social and economic interests often form an area of conflict and sustainable management of marine resources is becoming increasingly important and has been implemented in EU policies and governance strategies such as the Marine Strategy Framework Directive or the Common Fisheries Policy support international activities such as the Global Ocean Observing System and the Global Earth Observation System of System.

However, sustainable management of the marine environment and its resources requires a deep understanding of the physical, biogeochemical, and biological processes, their interaction and synergies and impacts on the marine ecosystem. Only with this understanding it is possible to build predictive ecosystem based management models that are able to combine and integrate the major stressors and their environmental impacts.

The integrative approach to management of the marine ecosystem implies to develop challenging new tools and approaches that deal with the complexity of interactive processes to evaluate trade-offs by simulating scenarios of management plans.

Part of this integrative approach are the observational systems implemented within the EuroGOOS regional alliances for the European waters. Over the last years several European wide projects has been conducted to integrate the in Situ observations towards a system that can serve all the need from the different users. Based on the EuroGOOS ROOSes these different projects such as actual the MyOcean for mostly Realtime data and the SeaDataNet for historical data are complemented by programmes like EMODnet.

The main aim for this report is to provide an integrated review of the existing coastalerving systems and there placement within the European waters.

4. Coastal observing systems in the Arctic ROOS region

The definition of the Arctic ROOS region used in the report is that the region covers the high latitudinal Oceans north of 61 N. Overall, the Arctic ROOS area is severely undersampled regarding In Situ observations. A major part of the observatory is conducted in annual or biannual cruises with some times repeated transects or stations. The actual report focusses on the high frequently sampled stations and fixed platforms as well as the ferrybox observations ongoing on regular transects as well as unregular cruises.

The actual available systems providing data on a high frequently basis are displayed in the Figures 4.1-4.3. The tables 4.1-4.3 provide informations on data provider and positioning of the Coastal observatory system

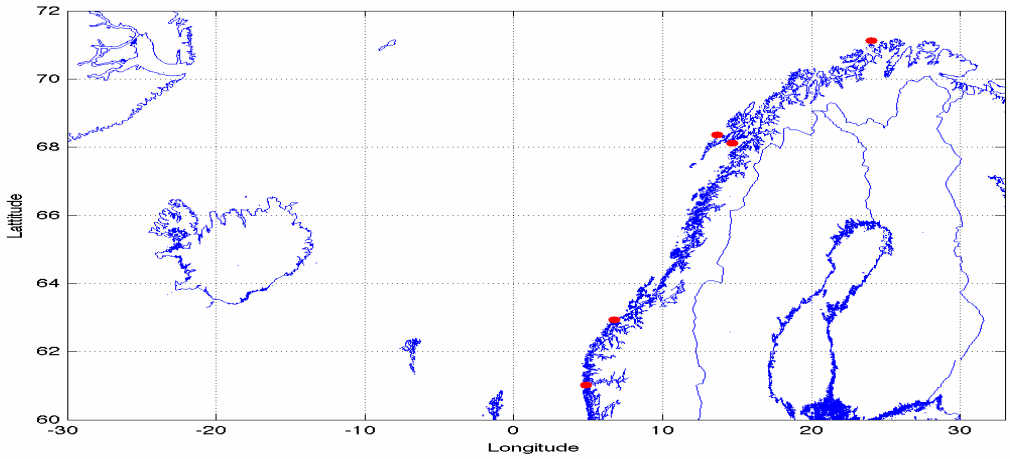

Figure 4.1: Positions of observational temperature data from Coastal Observatories provided for temperature for the Arctic ROOS region.

Table 4.1 Overview of the available high frequently measured temperature data from Coastal observatory systems for the Arctic ROOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
IMR	Ingøy	Temperature	24,011	71,133
IMR	Eggum	Temperature	13,633	68,366
IMR	Skrova	Temperature	14,650	68,116
IMR	Bud	Temperature	6,783	62,933
IMR	Sognesjøen	Temperature	4,840	61,023

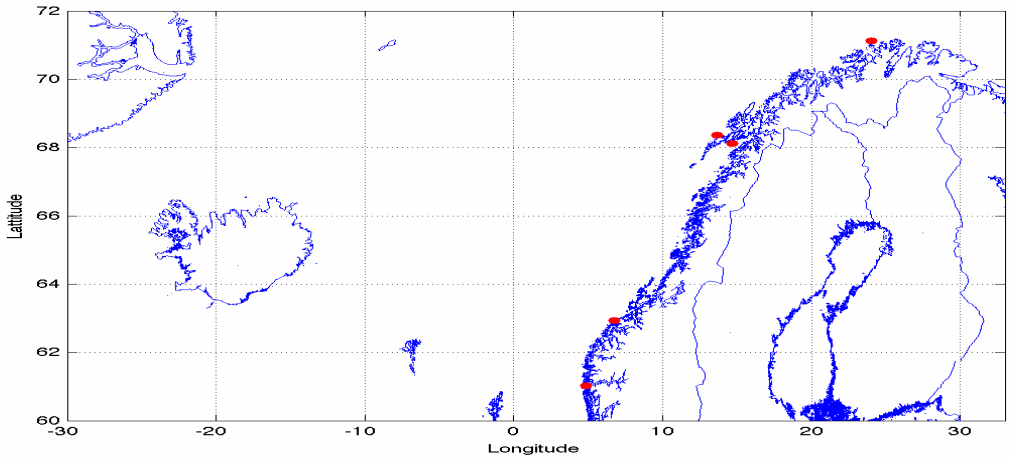

Figure 4.2: Positions of observational salinity data from Coastal Observatories provided for temperature for the Arctic ROOS region.

Table 4.2 Overview of the available high frequently measured salinity data from Coastal observatory systems for the Arctic ROOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
IMR	Ingøy	Salinity	24,011	71,133
IMR	Eggum	Salinity	13,633	68,366
IMR	Skrova	Salinity	14,650	68,116
IMR	Bud	Salinity	6,783	62,933
IMR	Sognesjøen	Salinity	4,840	61,023

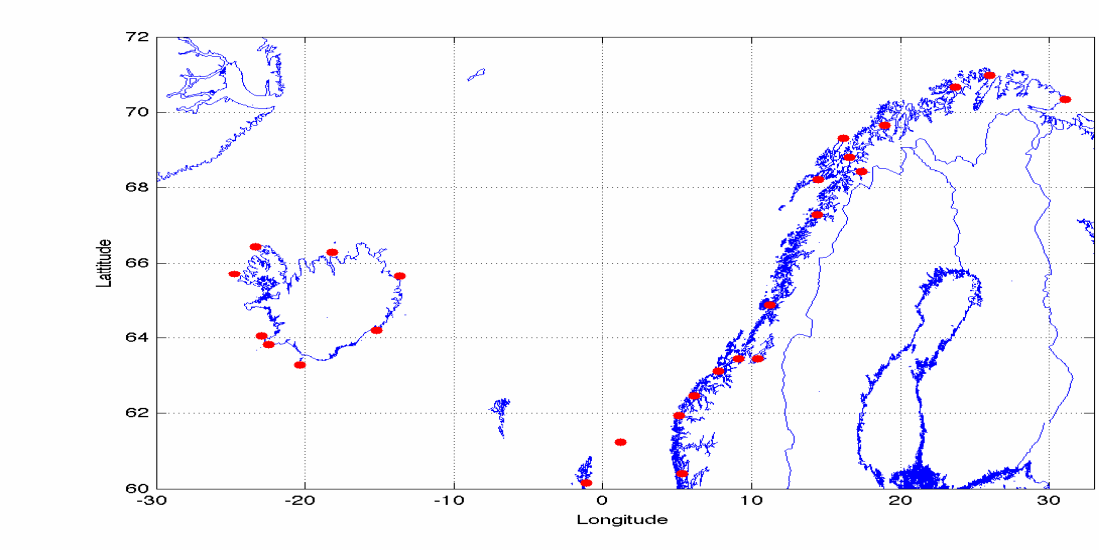

Figure 4.3: Positions of observational sealevel data from Coastal Observatories provided for temperature for the Arctic ROOS region.

Table 4.3 Overview of the available high frequently measured sealevel data from Coastal observatory systems for the Arctic ROOS region.

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
IMA	Blakknes	Sealevel	-24,780	65,690
IMA	Garoskagi	Sealevel	-22,930	64,040
IMA	Grimseyjarsund	Sealevel	-18,190	66,290
IMA	Grindavik	Sealevel	-22,460	63,810
IMA	Hornafjordur	Sealevel	-15,180	64,190
IMA	Kogur	Sealevel	-13,620	65,640
IMA	Straumnes	Sealevel	-23,360	66,430
IMA	Surtsey	Sealevel	-20,340	63,280
NOC	Lerwick	Sealevel	-1,138	60,155
Norwegian Hydro. Serv.	Ålesund	Sealevel	6,150	62,467
Norwegian Hydro. Serv.	Andenes	Sealevel	16,150	69,317

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Norwegian Hydro. Serv.	Bergen	Sealevel	5,300	60,400
Norwegian Hydro. Serv.	Bodo	Sealevel	14,383	67,283
Norwegian Hydro. Serv.	Tregde	Sealevel	7,566	70,667
Norwegian Hydro. Serv.	Hammerfest	Sealevel	23,683	70,667
Norwegian Hydro. Serv.	Harstad	Sealevel	16,550	68,800
Norwegian Hydro. Serv.	Hejmsjo	Sealevel	9,117	63,433
Norwegian Hydro. Serv.	Helgeroa	Sealevel	25,983	70,983
Norwegian Hydro. Serv.	Honningsvåg	Sealevel	25,983	70,983
Norwegian Hydro. Serv.	Kabelvåg	Sealevel	14,500	68,217
Norwegian Hydro. Serv.	Kristiansund	Sealevel	7,750	63,117
Norwegian Hydro. Serv.	Maloy	Sealevel	5,117	61,933
Norwegian Hydro. Serv.	Narvik	Sealevel	17,417	68,433
Norwegian Hydro. Serv.	Ny-Ålesund	Sealevel	11,950	78,933
Norwegian Hydro. Serv.	Rorvik	Sealevel	11,250	64,867
Norwegian Hydro. Serv.	Tromso	Sealevel	18,967	69,650
Norwegian Hydro. Serv.	Trondheim	Sealevel	10,400	63,433
Norwegian Hydro. Serv.	Vardo	Sealevel	31,100	70,333
Norwegian Hydro. Serv.	Stavanger	Sealevel	5,748	58,983
Norwegian Hydro. Serv.	Viker	Sealevel	10,950	59,033
Norwegian Hydro. Serv.	Oscarsborg	Sealevel	10,601	59,690
Norwegian Hydro. Serv.	Oslo	Sealevel	10,750	59,900
Oil Platform	North Comorant	Sealevel	1,170	61,230

In addition to these, the real time data provision system is mainly based on drifters and Argo buoys. In Figure 4.4 the status of real time data provided via the MyOcean data delivery is displayed for the month of September 2012. A total number of 98 plattforms are reporting to the Arctic ROOS Real time data delivery system

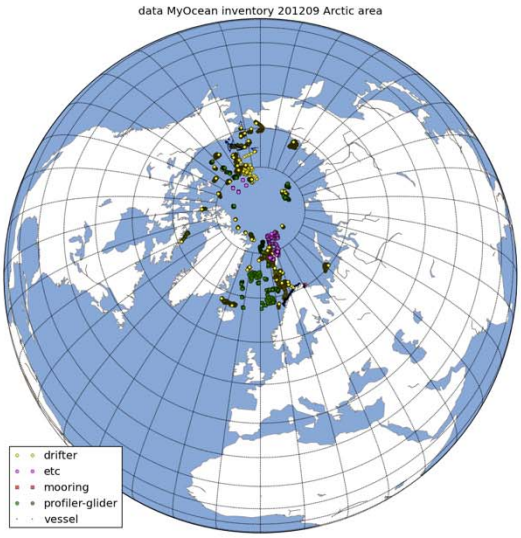

Figure 4.4: Realtime Data provided for the Arctic ROOS region via the EC supported MyOcean project.

Additionally to the real time observations provided, the Arctic ROOS members conduct a large number of observations that are covering different methodologies:

- Hydrographical surveys using research and monitoring vessels.
- Moorings in the different straits important for the water exchange between the North Atlantic and the higher lattitudes
- Ice-tethered profile measurements
- Ice breakers and drifting icestations
- Under-ice observations

These observations are eitheron temporally differing positions or only very lowfrequently available. The most relevant data for the improved understanding of Coastal variability are the repeated transects undertaken from IMR in Norway with a frequency from 1-6 times per year. (Positioning of the transects can be found in Figure 4.5).

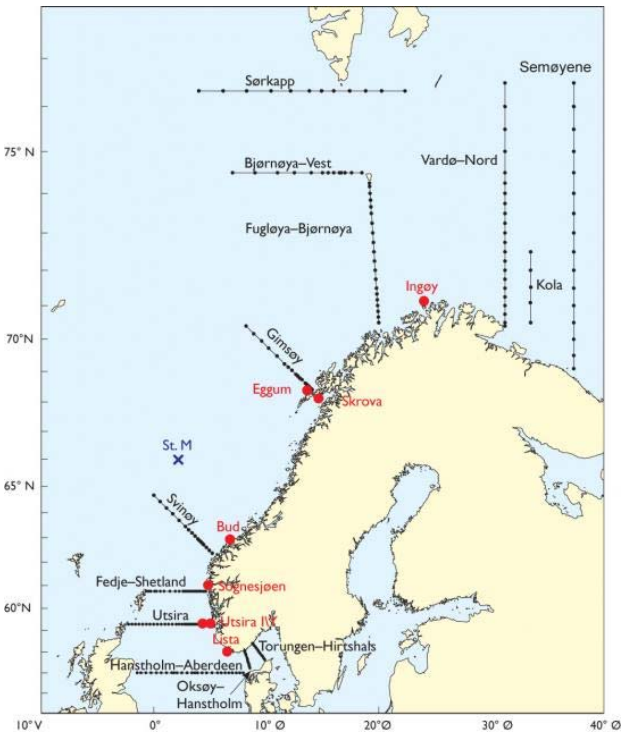

Figure 4.5: Repeated sections aiming for monitoring climate variability within the Norwegian waters. The transects are conducted since the 1950s and 1960s. The red dots display coastal stations established in the 1930s and since then regularly sampled by vertical profiles. The cross marked with StM displays the position of the historical wheathership Mike, which were measurements were undertaken since 1948 and which was removed in 2010. On that position a moored multiparameter buoy is established aiming to continue the valuable data time series.

The Glider activities within the Arctic ROOS region became stronger within the last years, but there is no operational monitoring conducted for the reggion up til noe. An overview over the European activities is given in Deliverable D-3-2 from the Jerico project and the reader is reffered to that.

Figure 4.6 displays the distribution of Ferrybox lines running within the European waters. Table 4.4 summarises the Ferrybox activities ongoing on the six ferrybox routes established in the European Arctic region.

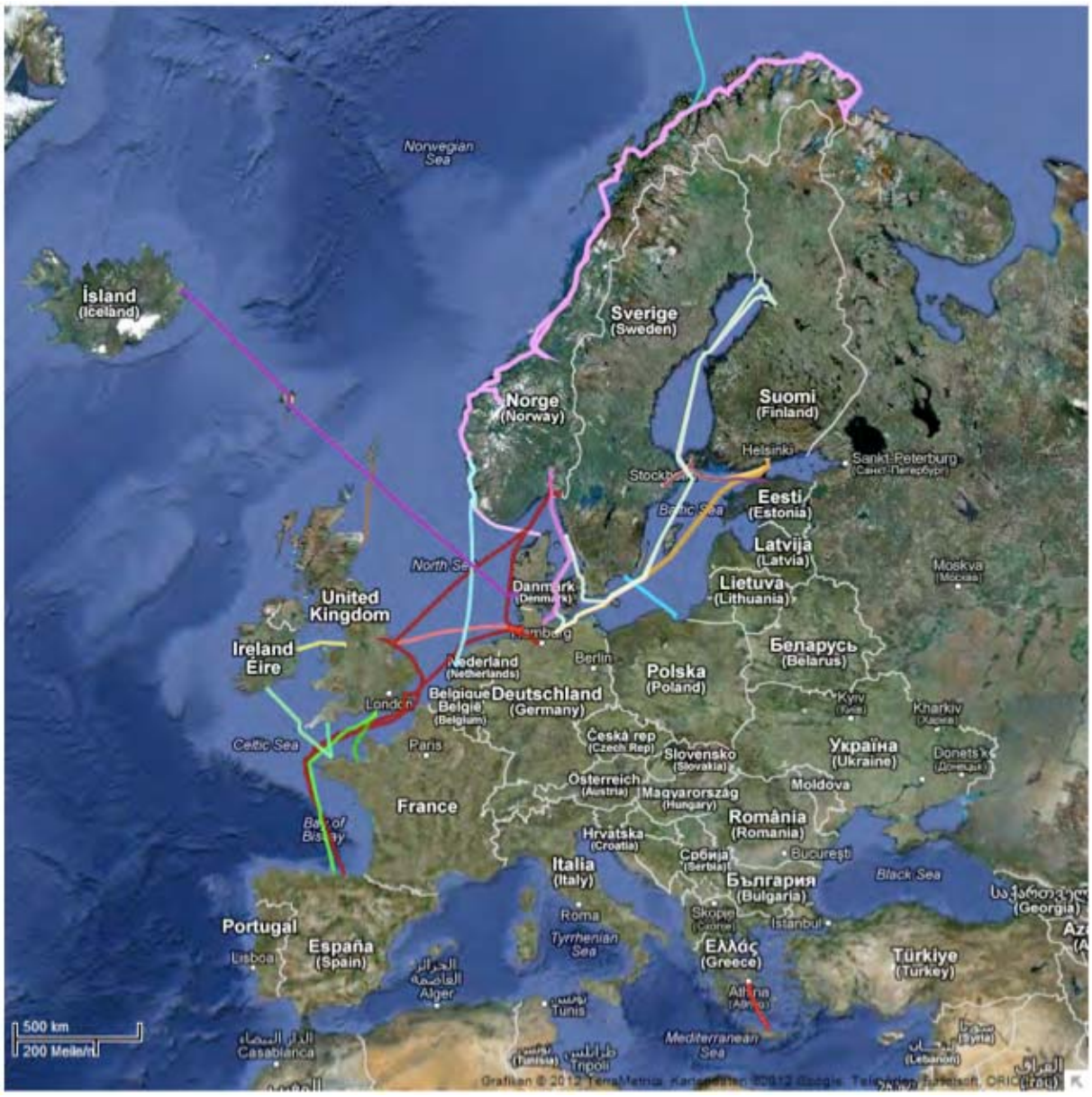

Figure 4.6: Distribution of Ferryboxes running within European waters. Within the Arctic ROOS region there are six Ferryboxes running.

Table 4.4: Ferrybox lines running in the Arctic ROOS area.

Name of the Ship	Route	Dataprovider	Variables covered
MS Vesterålen	Bergen (N)-Kirkenes (N)	IMR	T, S, Diss Oxygen, Fluorescence
KV TOR	West Coast Norway, Coastwatch ship, no regular route	IMR	T, S, Diss. Oxygen, Fluorescence,
MS Bergensfjord	Bergen(N)-Hirtshals(DK)	NIVA	T,S, Turbidity, Fluorescence, nutrients, Oxygen
MS Trollfjord	Bergen (N)-Kirkenes (N)	NIVA	T, S, Fluorescences, Oxigen, PCO2, Nutrients, irradiance, radiance, wind
MS Norbjørn	Tromsø (N)-Longyearbyen (N)	NIVA	T, S, Fluorescences, Oxigen, PCO2, Nutrients, irradiance, radiance
MS Norønna	Esbjerg (DK)-Seydisfjord (IS)	NIVA Marlab	T, S, Fluorescence

The Arctic region is the region experiencing the most dramatic changes and transformations trough the influence of the climatic changes occurring recently an which are expected to impact the higher latitudes even more in the upcoming years.

The opening up of areas that until recently have been almost inaccessible for commercial activities is a major development following the retreat of the sea ice. These changes in ocean climate and ice regime are likely to be followed by changes in the Arctic Ocean ecosystem.

5. Coastal observing systems in the NOOS region

The NOOS region covers the entire North Sea region and is extended into the North Atlantic Ocean. The observational system consists of multiplatform real time observing system that is composed mainly by Drifters, Tidgauges/Moorings and Argo observations.

The actual available systems providing data on a high frequently basis are displayed in the Figures 4.1-4.3. The tables 4.1-4.3 provide informations on data provider and positioning of the Coastal observatory system

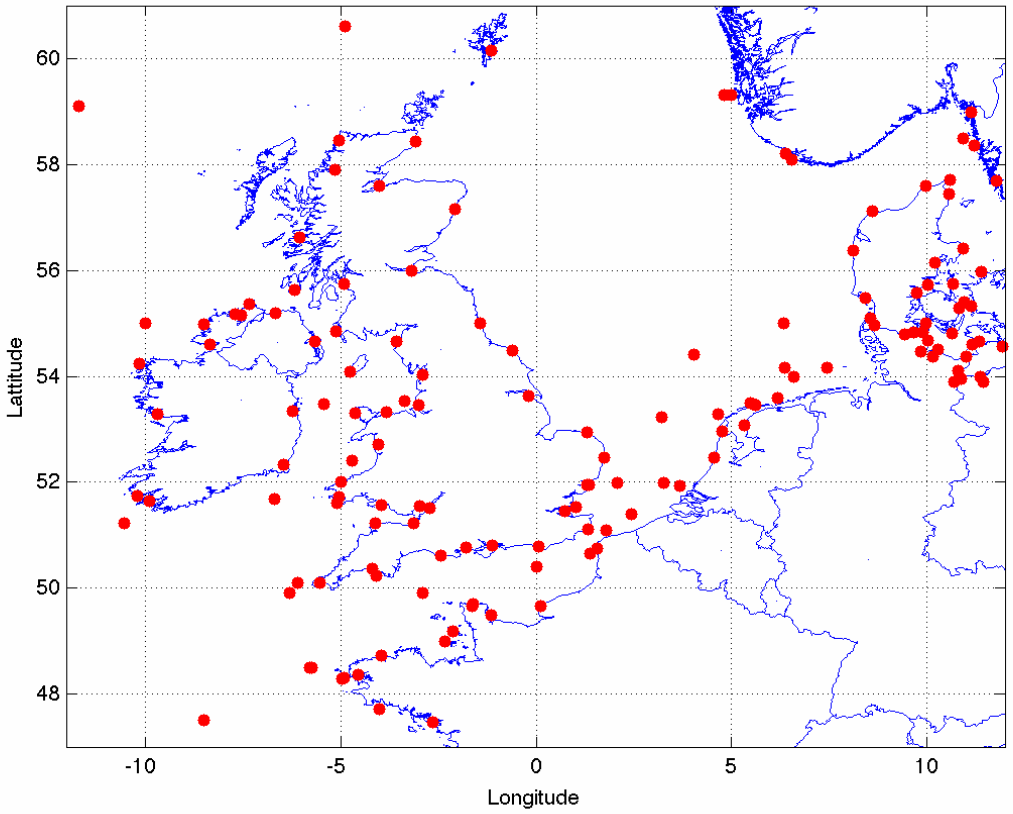

Figure 5.1: Positions of observational temperature data from Coastal Observatories provided for temperature for the NOOS region.

Table 5.1 Overview of the available high frequently measured temperature data from Coastal observatory systems for the NOOS region

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
BSH	Eckernfoerde	Temperature	9,836	54,475
BSH	FehmarnBelt	Temperature	11,150	54,600
BSH	FINO1	Temperature	6,583	54,000
BSH	Flensburg	Temperature	9,433	54,795
BSH	Heiligenhafen	Temperature	11,006	54,373
BSH	Kalkgrund	Temperature	9,888	54,825
BSH	Kiel_Holtenau	Temperature	10,157	54,372
BSH	KielLT	Temperature	10,273	54,500
BSH	Langballigau	Temperature	9,654	54,823
BSH	Luebeck	Temperature	10,703	53,893
BSH	Neustadt	Temperature	10,813	54,097
BSH	NsbII	Temperature	6,333	55,000
BSH	Schleimuende	Temperature	10,037	54,673
BSH	TimmendorfPoel	Temperature	11,376	53,992
BSH	Travemuende	Temperature	10,872	53,958
BSH	TWEms	Temperature	6,350	54,167
BSH	UFSDeutscheBucht	Temperature	7,450	54,167
BSH	Wismar	Temperature	11,458	53,899
CEFAS	LiverpoolBay	Temperature	-3,362	53,533
CEFAS	OysterGround	Temperature	4,042	54,415
CEFAS	Warp-TH1-	Temperature	1,026	51,526
CEFAS	WestGabbard	Temperature	2,082	51,980
CETMEF	62059	Temperature	-1,620	49,695
CETMEF	62068	Temperature	-3,961	48,717
CETMEF	62069	Temperature	-4,968	48,290
DMI	Havneby Romo	Temperature	8,560	55,090
DMI	Torsminde havn	Temperature	8,110	56,370

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
DMI	Esbjerg	Temperature	8,430	55,470
DMI	Hanstholm	Temperature	8,600	57,120
DMI	Hirtshals	Temperature	9,970	57,600
DMI	Vidåslusen	Temperature	8,660	54,960
DMI	Aarhus	Temperature	10,217	56,150
DMI	Bagenkop	Temperature	10,633	54,817
DMI	Ballen	Temperature	10,667	55,750
DMI	Fredericia	Temperature	9,750	55,567
DMI	Frederikshavn	Temperature	10,567	57,433
DMI	Fynshav	Temperature	9,983	55,000
DMI	Gedser	Temperature	11,933	54,567
DMI	Grena	Temperature	10,933	56,417
DMI	Juelsminde	Temperature	10,017	55,717
DMI	Korsor	Temperature	11,133	55,333
DMI	Rodby	Temperature	11,350	54,650
DMI	SjaellandsOdde	Temperature	11,383	55,983
DMI	Skagen	Temperature	10,600	57,717
DMI	Slipshavn	Temperature	10,833	55,283
DMI	W26	Temperature	10,950	55,400
IFREMER	62021	Temperature	-2,657	47,460
IFREMER	62061	Temperature	-2,343	48,988
IFREMER	62072	Temperature	1,370	50,659
IFREMER	62443	Temperature	1,570	50,745
IFREMER	62450	Temperature	-4,552	48,358
IMR	Indre Utsira	Temperature	4,983	59,316
IMR	Lista	Temperature	6,533	58,083
IMR	Ytre Utsira	Temperature	4,800	59,316
Marine Inst.	Aranmore	Temperature	-8,500	54,990
Marine Inst.	Belmulet	Temperature	-10,146	54,230
Marine Inst.	Castletownbere	Temperature	-9,900	51,650
Marine Inst.	Donegal	Temperature	-8,353	54,610
Marine Inst.	DublinPort	Temperature	-6,222	53,346
Marine Inst.	Kenmare	Temperature	-10,212	51,740

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
Marine Inst.	Kilkieran	Temperature	-9,702	53,291
Marine Inst.	Lough	Temperature	-7,550	55,159
Marine Inst.	M2	Temperature	-5,420	53,470
Marine Inst.	M3	Temperature	-10,550	51,220
Marine Inst.	M4	Temperature	-9,992	54,998
Marine Inst.	M5	Temperature	-6,700	51,690
Marine Inst.	M6	Temperature	-15,920	53,060
Marine Inst.	Malin Head	Temperature	-7,334	55,372
Marine Inst.	Mulroy	Temperature	-7,710	55,170
Marine Inst.	Wexford	Temperature	-6,460	52,340
METEO FRANCE	62052	Temperature	-5,800	48,500
METEO FRANCE	IF000548	Temperature	-4,003	47,715
METEO FRANCE	IF000550	Temperature	-1,157	49,492
METEO FRANCE	IF000562	Temperature	0,123	49,669
MUMM	Westhinder	Temperature	2,440	51,390
NOC	62103	Temperature	-2,900	49,900
NOC	62107	Temperature	-6,100	50,100
NOC	62163	Temperature	-8,500	47,500
NOC	62301	Temperature	-4,700	52,400
NOC	62303	Temperature	-5,100	51,600
NOC	62304	Temperature	1,800	51,100
NOC	62305	Temperature	0,000	50,400
NOC	64045	Temperature	-11,700	59,100
NOC	64046	Temperature	-4,900	60,600
NOC	Aberdeen	Temperature	-2,083	57,150
NOC	Avonmouth	Temperature	-2,711	51,507
NOC	Bangor	Temperature	-5,669	54,665
NOC	Barmouth	Temperature	-4,033	52,717

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
NOC	Bournemouth	Temperature	-1,800	50,767
NOC	Cromer	Temperature	1,304	52,934
NOC	Devonport	Temperature	-4,184	50,368
NOC	Dover	Temperature	1,317	51,117
NOC	Felixstowe	Temperature	1,348	51,957
NOC	Fishguard	Temperature	-4,983	52,013
NOC	Harwich	Temperature	1,292	51,948
NOC	Heysham	Temperature	-2,912	54,034
NOC	Hinkley	Temperature	-3,133	51,217
NOC	Holyhead	Temperature	-4,631	53,309
NOC	Ilfracombe	Temperature	-4,117	51,217
NOC	Immingham	Temperature	-0,183	53,633
NOC	Jersey	Temperature	-2,117	49,183
NOC	Kinlochbervie	Temperature	-5,050	58,457
NOC	Leith	Temperature	-3,180	55,990
NOC	Lerwick	Temperature	-1,138	60,155
NOC	Liverpool	Temperature	-3,017	53,450
NOC	Llandudno	Temperature	-3,824	53,315
NOC	Lowestoft	Temperature	1,752	52,473
NOC	Milford	Temperature	-5,050	51,717
NOC	Millport	Temperature	-4,905	55,750
NOC	Moray Firth	Temperature	-4,001	57,599
NOC	Mumbles	Temperature	-3,974	51,570
NOC	Newhaven	Temperature	0,067	50,783
NOC	Newlyn	Temperature	-5,533	50,100
NOC	Newport	Temperature	-2,986	51,550
NOC	North Shields	Temperature	-1,438	55,007
NOC	Plymouth	Temperature	-4,083	50,233
NOC	Port Ellen	Temperature	-6,189	55,628
NOC	Port Erin	Temperature	-4,767	54,085
NOC	Portpatrick	Temperature	-5,119	54,842

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
NOC	Portrush	Temperature	-6,667	55,200
NOC	Portsmouth	Temperature	-1,110	50,800
NOC	Sheerness	Temperature	0,745	51,445
NOC	St Mary's	Temperature	-6,316	49,918
NOC	StHelier	Temperature	-2,117	49,183
NOC	Stornoway	Temperature	6,388	58,208
NOC	Tobermory	Temperature	-6,063	56,623
NOC	Ullapool	Temperature	-5,157	57,896
NOC	Weymouth	Temperature	-2,447	50,608
NOC	Whitby	Temperature	-0,613	54,490
NOC	Wick	Temperature	-3,083	58,433
NOC	Workington	Temperature	-3,567	54,650
RWS	Amelander11	Temperature	5,481	53,500
RWS	Amelander12	Temperature	5,484	53,500
RWS	Amelander21	Temperature	5,574	53,470
RWS	Amelander31	Temperature	5,604	53,450
RWS	Cherbourg	Temperature	-1,636	49,652
RWS	DenHelder	Temperature	4,750	52,970
RWS	Europlatform	Temperature	3,270	51,990
RWS	Ijmuiden	Temperature	4,550	52,460
RWS	K13a	Temperature	3,220	53,220
RWS	KornwerderzandBuiten	Temperature	5,340	53,070
RWS	LesPierresNoires	Temperature	-4,915	48,310
RWS	LichteilandGoeree	Temperature	3,669	51,925
RWS	Ouessantlarge	Temperature	-5,750	48,500
RWS	Roscoff	Temperature	-3,960	48,720
RWS	Wadden E.Gat	Temperature	4,660	53,280

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
RWS	WaddenSchiermonnikoog	Temperature	6,170	53,590
SMHI	GoteborgTorshamnen	Temperature	11,791	57,685
SMHI	Kungsvik	Temperature	11,127	58,997
SMHI	Smogen	Temperature	11,218	58,354
SMHI	Vaderoarna	Temperature	10,933	58,483

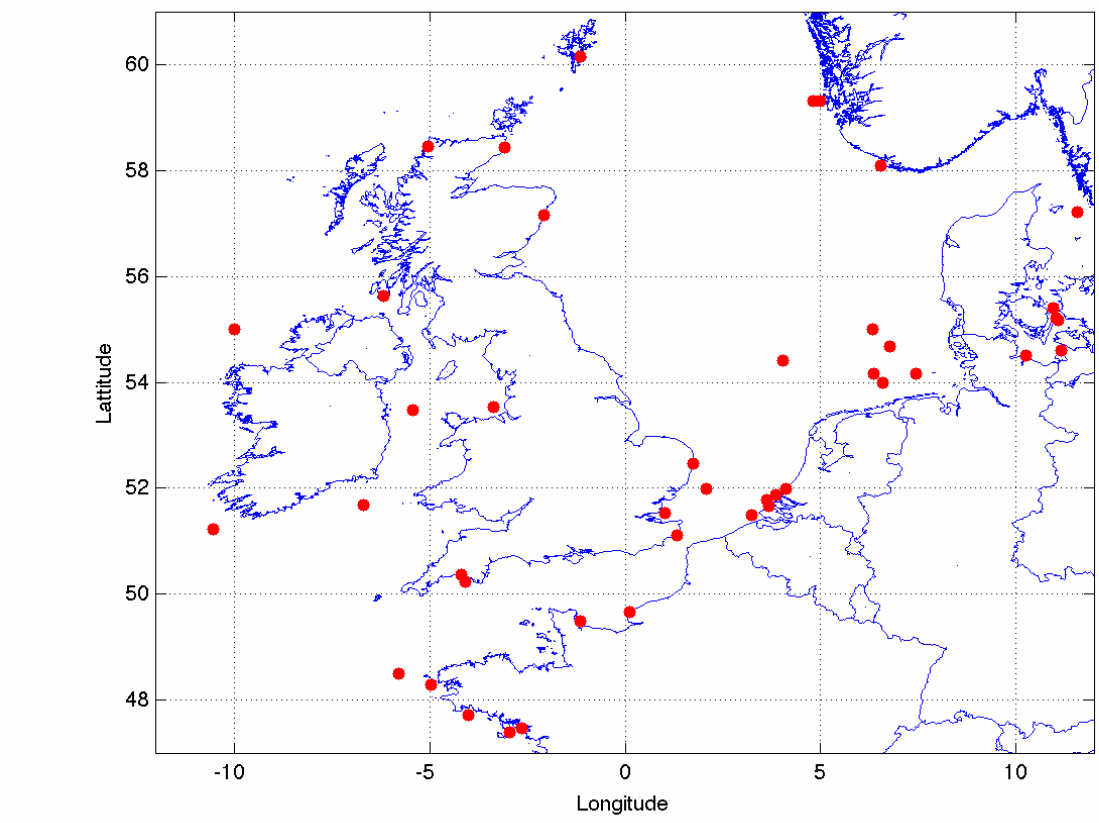

Figure 5.2: Positions of observational salinity data from Coastal Observatories provided for salinity for the NOOS region.

Table 5.2 Overview of the available high frequently measured salinity data from Coastal observatory systems for the NOOS region

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
BSH	FINO1	Salinity	6,583	54,000
BSH	TWEms	Salinity	6,350	54,167
BSH	UFSDeutscheBucht	Salinity	7,450	54,167
BSH	FehmarnBelt	Salinity	11,150	54,600
BSH	NsbII	Salinity	6,333	55,000
BSH	Fino1	Salinity	6,583	54,000
BSH	Ems	Salinity	6,350	54,167
BSH	Dbucht	Salinity	7,450	54,170
BSH	Kiel	Salinity	10,267	54,500
BSH	FehmarnBelt	Salinity	11,150	54,600
BSH	Nsb3	Salinity	6,783	54,683
BSH	Nsb2	Salinity	6,333	55,000
CEFAS	Warp-TH1-	Salinity	1,026	51,526
CEFAS	WestGabbard	Salinity	2,082	51,980
CEFAS	LiverpoolBay	Salinity	-3,362	53,533
CEFAS	OysterGround	Salinity	4,042	54,415
CETMEF	62069	Salinity	-4,968	48,290
DMI	W26	Salinity	10,950	55,400
DMI	Store Bält S	Salinity	11,080	55,180
DMI	Store Bält N	Salinity	11,030	55,220
IFREMER	IF000549	Salinity	-2,958	47,394
IFREMER	IF000548	Salinity	-4,003	47,715
IFREMER	IF000550	Salinity	-1,157	49,492
IFREMER	IF000562	Salinity	0,123	49,669
IFREMER	61284	Salinity	4,866	43,319
IFREMER	62309	Salinity	-0,546	44,863
IFREMER	62307	Salinity	-0,249	44,914
IFREMER	62306	Salinity	-0,743	45,198
IFREMER	62021	Salinity	-2,657	47,460
IFREMER	62021	Salinity	-2,657	47,460
IMR	Lista	Salinity	6,533	58,083

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
IMR	Indre Utsira	Salinity	4,983	59,316
IMR	Ytre Utsira	Salinity	4,800	59,316
Marine Inst.	M3	Salinity	-10,550	51,217
Marine Inst.	M5	Salinity	-6,704	51,690
Marine Inst.	M2	Salinity	-5,425	53,480
Marine Inst.	M4	Salinity	-10,000	55,000
METEO FRANCE	IF000548	Salinity	-4,003	47,715
METEO FRANCE	IF000548	Salinity	-4,003	47,715
METEO FRANCE	62052	Salinity	-5,800	48,500
METEO FRANCE	IF000550	Salinity	-1,157	49,492
METEO FRANCE	IF000562	Salinity	0,123	49,669
NOC	Lerwick	Salinity	-1,138	60,155
NOC	Wick	Salinity	-3,083	58,433
NOC	Kinlochbervie	Salinity	-5,050	58,457
NOC	Aberdeen	Salinity	-2,083	57,150
NOC	Lowestoft	Salinity	1,752	52,473
NOC	Port Ellen	Salinity	-6,189	55,628
NOC	Plymouth	Salinity	-4,083	50,233
NOC	Devonport	Salinity	-4,184	50,368
NOC	Dover	Salinity	1,317	51,117
RWS	Vlaktev Raan	Salinity	3,240	51,500
RWS	Oosterschelde4	Salinity	3,690	51,660
RWS	Brouwershavensegat	Salinity	3,617	51,769
RWS	Haringvliet	Salinity	3,861	51,864
RWS	Hoek Van Holland NAP	Salinity	4,120	51,979
SMHI	Läsö	Salinity	11,570	57,217

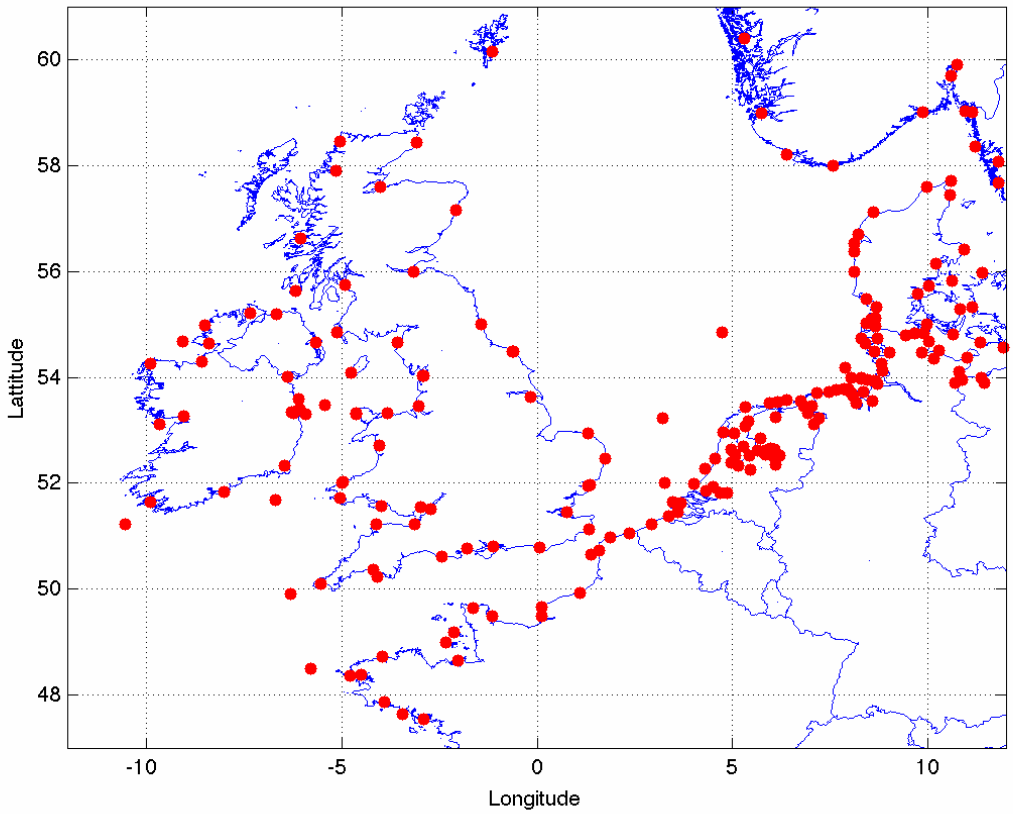

Figure 5.3: Positions of observational sealevel data from Coastal Observatories provided for temperature for the NOOS region.

Table 5.3 Overview of the available high frequently measured sealevel data from Coastal observatory systems for the NOOS region

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
BSH	Borkum Fischerbalje	Sealevel	6,750	53,560
BSH	Cuxhaven	Sealevel	8,720	53,870
BSH	Luebeck	Sealevel	10,703	53,893
BSH	Wismar	Sealevel	11,458	53,899
BSH	Travemuende	Sealevel	10,872	53,958
BSH	Timmendorf	Sealevel	10,376	53,991
BSH	Rostock	Sealevel	12,155	54,083
BSH	Neustadt	Sealevel	10,813	54,097
BSH	Warnemuende	Sealevel	12,103	54,170
BSH	Helgoland Binnenhafen	Sealevel	7,890	54,180
BSH	Heiligenhafen	Sealevel	11,006	54,373
BSH	Eckernfoerde	Sealevel	9,836	54,475
BSH	KielLT	Sealevel	10,273	54,567
BSH	LT Kiel	Sealevel	10,280	54,500
BSH	Sassnitz	Sealevel	13,640	54,510
BSH	Schleimuende	Sealevel	10,037	54,673
BSH	Flensburg	Sealevel	9,433	54,795
BSH	Langballigau	Sealevel	9,654	54,823
BSH	Kalkgrund	Sealevel	9,888	54,825
BSH	Bremerhaven	Sealevel	8,570	53,550
BSH	Cuxhaven	Sealevel	8,720	53,870
BSH	Helgoland	Sealevel	7,880	54,180
BSH	Kiel-Holtenau	Sealevel	10,160	54,360
BSH	Husum	Sealevel	9,030	54,470
BSH	Wittduen	Sealevel	8,390	54,630
DMI	Havneby Romo	Sealevel	8,560	55,090
DMI	Hvide Sande havn	Sealevel	8,110	56,000
DMI	Torsminde havn	Sealevel	8,110	56,370
DMI	Vidåslusen	Sealevel	8,660	54,960
DMI	Esbjerg	Sealevel	8,430	55,470

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
DMI	Fredericia	Sealevel	9,750	55,567
DMI	Hanstholm	Sealevel	8,600	57,120
DMI	Hirtshals	Sealevel	9,970	57,600
DMI	Gedser	Sealevel	11,933	54,567
DMI	Rodby	Sealevel	11,350	54,650
DMI	Bagenkop	Sealevel	10,633	54,817
DMI	Fynshav	Sealevel	9,983	55,000
DMI	Slipshavn	Sealevel	10,833	55,283
DMI	Korsor	Sealevel	11,133	55,333
DMI	SjaellandsOdde	Sealevel	11,383	55,983
DMI	Hornbaek	Sealevel	12,466	56,100
DMI	Aarhus	Sealevel	10,217	56,150
DMI	Grena	Sealevel	10,933	56,417
DMI	Frederikshavn	Sealevel	10,567	57,433
DMI	Skagen	Sealevel	10,600	57,717
DMI	Hesnaes	Sealevel	12,150	54,830
DMI	Ballum sluse	Sealevel	8,667	55,117
DMI	Rødvig	Sealevel	12,380	55,250
DMI	RibeKammersluse	Sealevel	8,680	55,330
DMI	Juelsminde	Sealevel	10,020	55,720
DMI	Ballen	Sealevel	10,630	55,820
DMI	Ferring havn	Sealevel	8,110	56,530
DMI	Thyboron havn	Sealevel	8,220	56,700
Marine Inst.	GalwayPort	Sealevel	-9,040	53,260
Marine Inst.	Sligo	Sealevel	-9,580	54,300
Marine Inst.	Killybegs	Sealevel	-8,390	54,630
Marine Inst.	M3_SW_Mizen_Head	Sealevel	-10,550	51,220
Marine Inst.	Castletownber	Sealevel	-9,903	51,650
Marine Inst.	M5_South_East	Sealevel	-6,700	51,690
Marine Inst.	Ballycotton	Sealevel	-8,001	51,828
Marine Inst.	Wexford	Sealevel	-6,459	52,339
Marine Inst.	Inishmore	Sealevel	-9,667	53,118

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
Marine Inst.	Kish	Sealevel	-5,922	53,312
Marine Inst.	River Dodder	Sealevel	-6,230	53,331
Marine Inst.	Dublin Port	Sealevel	-6,222	53,346
Marine Inst.	River Liffey	Sealevel	-6,284	53,347
Marine Inst.	Howth Harbour	Sealevel	-6,068	53,392
Marine Inst.	M2_E_of_Lambay	Sealevel	-5,420	53,470
Marine Inst.	Skerries Harbour	Sealevel	-6,108	53,585
Marine Inst.	Dundalk	Sealevel	-6,386	54,008
Marine Inst.	Ballyglass	Sealevel	-9,890	54,253
Marine Inst.	M4_Donegal_Bay	Sealevel	-9,070	54,670
Marine Inst.	Aranmore	Sealevel	-8,496	54,990
Marine Inst.	Malin Head	Sealevel	-7,334	55,205
Meteo France	62052	Sealevel	-5,800	48,500
Meteo France	62061	Sealevel	-2,343	48,988
Meteo France	IF000550	Sealevel	-1,157	49,492
Meteo France	IF000562	Sealevel	0,123	49,669
Meteo France	62072	Sealevel	1,370	50,659
MUMM	Oostende	Sealevel	2,920	51,230
NOC	Jersey	Sealevel	-2,117	49,183
NOC	St Mary's	Sealevel	-6,316	49,918
NOC	Devonport	Sealevel	-4,184	50,368
NOC	Fishguard	Sealevel	-4,983	52,013
NOC	Cromer	Sealevel	1,303	52,934
NOC	Holyhead	Sealevel	-4,631	53,309
NOC	Heysham	Sealevel	-2,912	54,034
NOC	Port Erin	Sealevel	-4,767	54,085
NOC	Whitby	Sealevel	-0,613	54,490
NOC	North Shields	Sealevel	-1,438	55,007
NOC	Port Ellen	Sealevel	-6,189	55,628
NOC	Millport	Sealevel	-4,905	55,750

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
NOC	Moray Firth	Sealevel	-4,001	57,600
NOC	Stornoway	Sealevel	-6,388	58,208
NOC	Kinlochbervie	Sealevel	-5,050	58,457
NOC	Lerwick	Sealevel	-1,138	60,155
NOC	StHelier	Sealevel	-2,117	49,183
NOC	Newlyn	Sealevel	-5,533	50,100
NOC	Plymouth	Sealevel	-4,083	50,233
NOC	Weymouth	Sealevel	-2,447	50,608
NOC	Portsmouth	Sealevel	-1,110	50,800
NOC	Ilfracombe	Sealevel	-4,117	51,217
NOC	Hinkley	Sealevel	-3,133	51,217
NOC	Avonmouth	Sealevel	-2,711	51,507
NOC	Newport	Sealevel	-2,986	51,550
NOC	Harwich	Sealevel	1,292	51,948
NOC	Llandudno	Sealevel	-3,824	53,315
NOC	Bangor	Sealevel	-5,669	54,665
NOC	Portpatrick	Sealevel	-5,119	54,842
NOC	Portrush	Sealevel	-6,667	55,200
NOC	Tobermory	Sealevel	-6,063	56,623
NOC	Ullapool	Sealevel	-5,157	57,896
NOC	Bournemouth	Sealevel	-1,800	50,770
NOC	Newhaven	Sealevel	0,070	50,780
NOC	Dover	Sealevel	1,320	51,120
NOC	Ilfracombe	Sealevel	-4,120	51,220
NOC	Hinkley Point	Sealevel	-3,130	51,220
NOC	Sheerness	Sealevel	0,750	51,450
NOC	Mumbles	Sealevel	-3,980	51,570
NOC	Milford haven	Sealevel	-5,050	51,720
NOC	Felixstowe	Sealevel	1,350	51,970
NOC	Fishguard	Sealevel	-4,980	52,020
NOC	Lowestoft	Sealevel	1,750	52,470
NOC	Barmouth	Sealevel	-4,030	52,720
NOC	Holyhead	Sealevel	-4,620	53,320
NOC	Liverpool	Sealevel	-3,020	53,450

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
NOC	Immingham	Sealevel	-0,180	53,630
NOC	Heysham	Sealevel	-2,920	54,030
NOC	Whitby	Sealevel	-0,620	54,480
NOC	Workington	Sealevel	-3,570	54,650
NOC	Aberdeen	Sealevel	-2,080	57,150
NOC	Wick	Sealevel	-3,080	58,430
Norwegian Hydrographic Serv.	Stavanger	Sealevel	5,748	58,983
Norwegian Hydrographic Serv.	Viker	Sealevel	10,950	59,033
Norwegian Hydrographic Serv.	Oscarsborg	Sealevel	10,601	59,690
Norwegian Hydrographic Serv.	Oslo	Sealevel	10,750	59,900
Norwegian Hydrographic Serv.	Bergen	Sealevel	5,300	60,400
Norwegian Hydrographic Serv.	Tregde	Sealevel	7,570	58,000
Norwegian Hydrographic Serv.	Helgeroa	Sealevel	9,870	59,000
Oil Platform	North Comorant	Sealevel	1,170	61,230
RWS	Cadzand	Sealevel	3,376	51,381
RWS	Vlissingen	Sealevel	3,600	51,450
RWS	RoompotBuiten	Sealevel	3,682	51,621
RWS	Oosterschelde11	Sealevel	3,481	51,644
RWS	WerkendamBuiten	Sealevel	4,877	51,808
RWS	Dordrecht	Sealevel	4,671	51,821

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
RWS	Spijkenisse	Sealevel	4,334	51,863
RWS	Rotterdam	Sealevel	4,500	51,922
RWS	Hoek Van Holland_stroompaal	Sealevel	4,010	51,990
RWS	Europlatform	Sealevel	3,275	51,999
RWS	Nijkerkersluis	Sealevel	5,466	52,260
RWS	NoordwijkMeetpost	Sealevel	4,295	52,275
RWS	Hollandse Brug	Sealevel	5,141	52,327
RWS	Olst	Sealevel	6,106	52,343
RWS	Schellingwoude	Sealevel	4,969	52,379
RWS	Ijmuiden	Sealevel	4,566	52,468
RWS	Katerveer	Sealevel	6,055	52,510
RWS	Spoldersluis	Sealevel	6,056	52,511
RWS	Edam	Sealevel	5,071	52,517
RWS	Vechterweerd	Sealevel	6,213	52,519
RWS	Houtribsluizen Zuid	Sealevel	5,430	52,520
RWS	RoggebotsluisNoord	Sealevel	5,857	52,542
RWS	Kampen	Sealevel	5,925	52,552
RWS	Mond Der Vecht	Sealevel	6,103	52,565
RWS	Ketelhaven	Sealevel	5,784	52,585
RWS	Kamperhoek	Sealevel	5,643	52,609
RWS	Ramspolbrug	Sealevel	5,843	52,613
RWS	Zwartsluis	Sealevel	6,080	52,640
RWS	Berkhout	Sealevel	4,980	52,644
RWS	Kadoelen	Sealevel	5,983	52,659
RWS	KrabbersgatsluizenZuid	Sealevel	5,281	52,692
RWS	Lemmer	Sealevel	5,715	52,839
RWS	Den Oever Buiten	Sealevel	5,047	52,932
RWS	Den Helder	Sealevel	4,750	52,970
RWS	KornwerderzandBinnen	Sealevel	5,339	53,070
RWS	NieuwBeerta	Sealevel	7,096	53,112
RWS	Harlingen	Sealevel	5,410	53,177
RWS	K13 Platform	Sealevel	3,220	53,220
RWS	Nieuw_ statenzijl	Sealevel	7,210	53,230

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
RWS	Lauwersoog	Sealevel	6,110	53,240
RWS	Delfzijl	Sealevel	6,934	53,328
RWS	Terschelling_noordzee	Sealevel	5,330	53,440
RWS	Eemshaven	Sealevel	6,830	53,450
RWS	Wierumergronden	Sealevel	5,960	53,510
RWS	Schiermonnikoog	Sealevel	6,161	53,534
RWS	Huibertgat	Sealevel	6,399	53,568
RWS	F3_Platform	Sealevel	4,732	54,851
RWS	Leith	Sealevel	-3,167	55,985
SHOM	LeCrouestyTG	Sealevel	-2,895	47,543
SHOM	PortTudyTG	Sealevel	-3,446	47,644
SHOM	ConcarneauTG	Sealevel	-3,907	47,874
SHOM	LeConquetTG	Sealevel	-4,781	48,359
SHOM	BrestTG	Sealevel	-4,495	48,383
SHOM	SaintMaloTG	Sealevel	-2,028	48,641
SHOM	RoscoffTG	Sealevel	-3,966	48,718
SHOM	LeHavreTG	Sealevel	0,106	49,482
SHOM	CherbourgTG	Sealevel	-1,636	49,651
SHOM	DieppeTG	Sealevel	1,085	49,929
SHOM	BoulogneSurMerTG	Sealevel	1,577	50,728
SHOM	CalaisTG	Sealevel	1,868	50,969
SHOM	DunkerqueTG	Sealevel	2,367	51,048
SHOM	Le Conquet	Sealevel	-4,780	48,360
SHOM	Cherbourg	Sealevel	-1,630	49,650
SMHI	Viken	Sealevel	12,560	56,150
SMHI	Ringhals	Sealevel	12,120	57,250
SMHI	Göteborg	Sealevel	11,800	57,680
SMHI	Stenungsund	Sealevel	11,800	58,080
SMHI	Smögen	Sealevel	11,220	58,360
SMHI	Kungsvik	Sealevel	11,130	59,000
WSA	Dukegatt	Sealevel	7,020	53,465
WSA	Wilhelmshaven	Sealevel	8,160	53,520
WSA	Voslapp	Sealevel	8,080	53,650
WSA	Schillig	Sealevel	8,040	53,700

Institution	Station	Type	Longitude [degrees east]	Latitude [degrees north]
WSA	Norderney	Sealevel	7,150	53,710
WSA	Langeoog	Sealevel	7,470	53,720
WSA	Dwarsgatt	Sealevel	8,340	53,720
WSA	Spiekeroog	Sealevel	7,660	53,755
WSA	Wangerooge Nord	Sealevel	7,900	53,755
WSA	Wangerooge Ost	Sealevel	7,970	53,780
WSA	Wangerooge West	Sealevel	7,850	53,790
WSA	Mittelgrund	Sealevel	8,600	53,930
WSA	Zehnerloch	Sealevel	8,650	53,940
WSA	Scharhoern	Sealevel	8,450	53,950
WSA	Bake A	Sealevel	8,300	53,980
WSA	Leuchtturm Alte Weser	Sealevel	8,040	54,000
WSA	Bake Z	Sealevel	8,300	54,000
WSA	Buesum	Sealevel	8,850	54,130
WSA	Eidersperrwerk	Sealevel	8,820	54,260
WSA	Pellworm	Sealevel	8,630	54,480
WSA	Dagebuell	Sealevel	8,700	54,730
WSA	Hoernum	Sealevel	8,300	54,735
WSA	List	Sealevel	8,420	55,020

The real time data for the NOOS region is available via the NOOS data protal (http://noos.cc). Figure 5.4 displays the status of real time data provided via the data delivery system is displayed. A temperature salinity climatology for the 1990-actual period is available via the MyOcean project efforts.

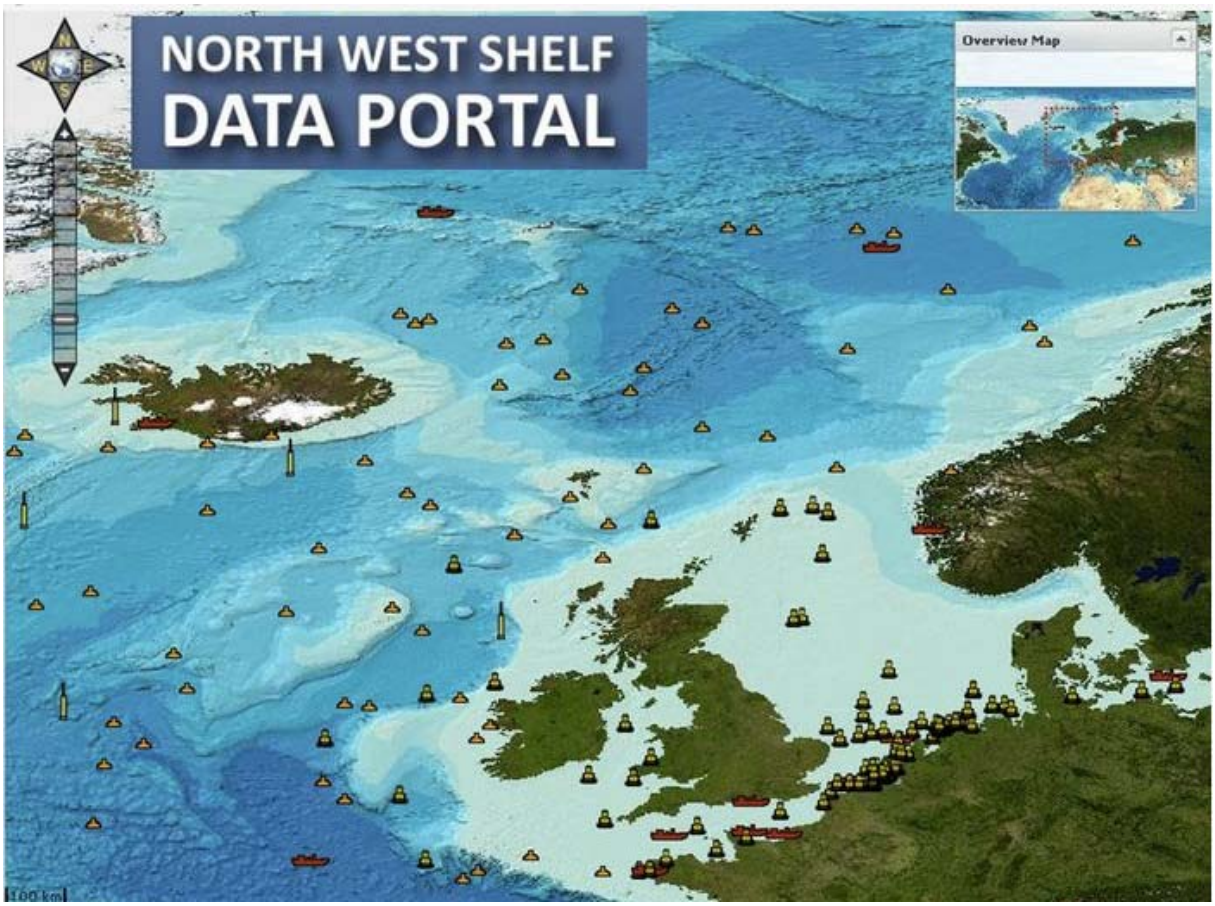

Figure 5.1: Realtime Data provided for the NOOS region via the NOOS Data protal (www.noos.cc)

The NOOS community provides information on additional variables via the NOOS web portal. Waves data information is also provided as real time service for use. The positioning of the additional data provided by the NOOS region will be included within the updated version of the Deliverable.

The Glider activities have become stronger also within the NOOS region within the last years, nevertheless also here is no operational monitoring conducted for the reggion up til now. An overview over the European activities is given in Deliverable D-3-2 from the Jerico project and the reader is reffered to that.

Figure 5.4 displays the distribution of Ferrybox lines running within the European waters. Table 5.4 summarises the Ferrybox activities ongoing on the six ferrybox routes established in the European Arctic region.

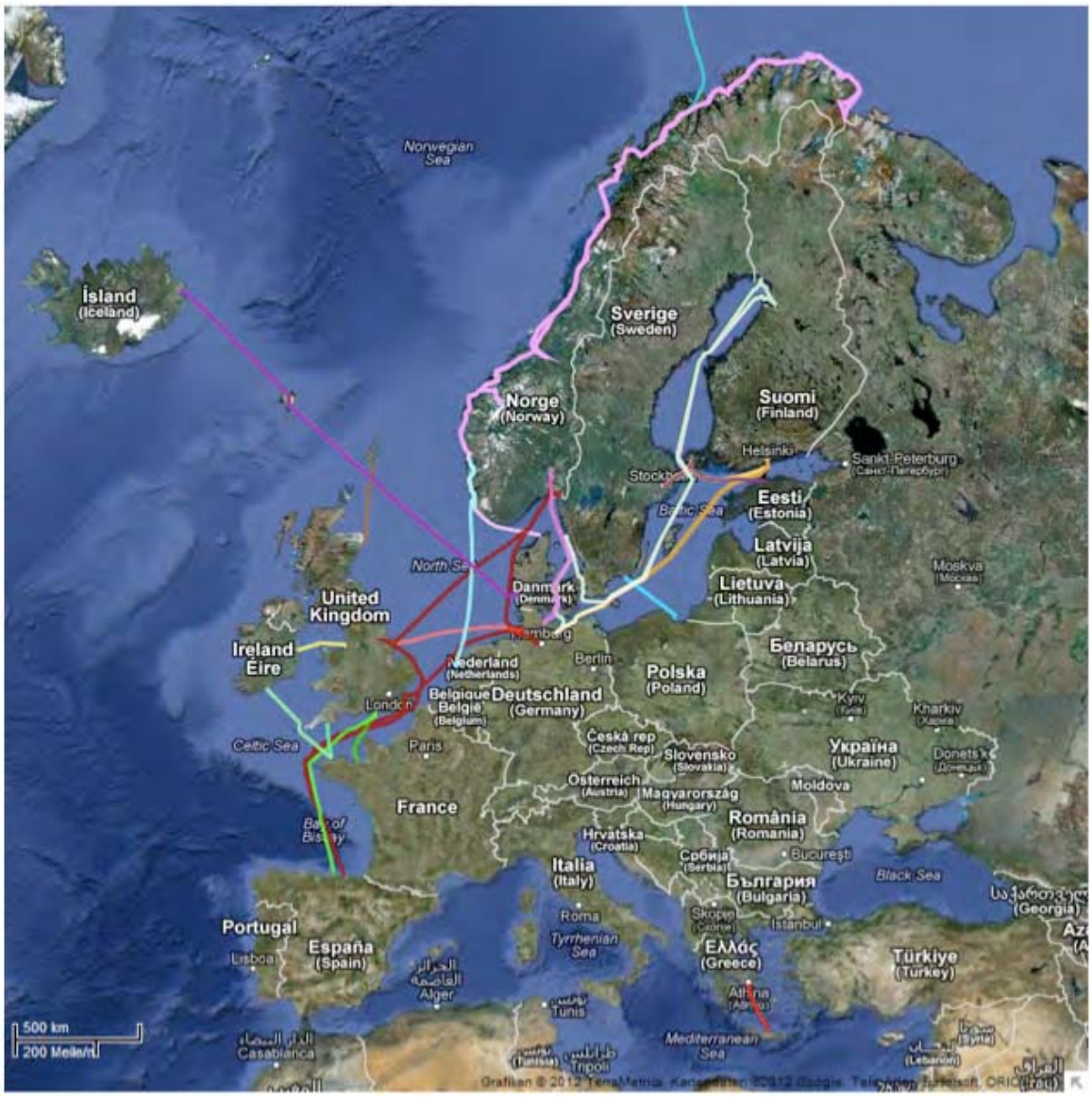

Figure 5.4: Distribution of Ferryboxes running within European waters. Within the NOOS region there are nine Ferryboxes running.

Table 5.4: Ferrybox lines running in the NOOS area.

Name of the Ship	**Route**	**Dataprovider**	**Variables covered**
MS Trans Carrier	Bergen (N)-Amsterdam (NL)	BCCR, UIB	PCO2,T,S, Turbidity,pH, Fluorescence
Dutchess of Scandinavia Stopped service	Cuxhaven-Harwich	HZG	T, S, Diss. Oxygen, Fluorescence,
Tor Dania Stopped service	Bergen(N)-Hirtshals(DK)	HZG	T,S, Turbidity, Fluorescence, nutrients, Oxygen
Lysbris	Moss (N)-Cuxhaven(G)-Chatham(GB)- Bilbao (S)- Immingham	HZG	T, S, Diss Oxygen, Fluorescence, pH, Turbidity, nutrients
MS FunnyGirl	Cuxhaven (G) - Helgoland(G)-Buesum(G)	HZG	T, S, Fluorescences, Oxigen, PCO2, Nutrients, irradiance, radiance
MS Norønna	Esbjerg (DK)-Seydisfjord (IS)	NIVA Marlab	T, S, Fluorescence
NIOLON	Marseille Algier	IFREMER	T,S
Pont Aven	Portsmouth(GB)-Santander(S)- Roscoff (F)- Cork (I)	IFREMER	T, S, Diss. Oxygen, Fluorescence, Turbidity, CDOM
MS Bergensfjord	Bergen(N)-Hirtshals(DK)	NIVA	T,S, Turbidity, Fluorescence, nutrients, Oxygen

6. Coastal observing systems in the BOOS region

The BOOS region covers the entire Baltic Sea region. The observational system consists mainly of tide gauges and moored buoys/fixed platforms providing real time observations. Ships of Opportunity and some Research vessel activity complementing the real time data delivery system.

The actual report focusses on the high frequently sampled stations and fixed platforms as well as the ferrybox observations ongoing on regular transects as well as unregular cruises.

The actual available systems providing data on a high frequently basis are displayed in the Figures 4.1-4.3. The tables 4.1-4.3 provide informations on data provider and positioning of the Coastal observatory system.

The existing observational system serves the main needs of the actual Marine Forecasting system. However the observational system should be improved in order to reduce the uncertainty of the knowledge obtained. Hereby the BOOS community identifies the following main issues that are subject for improvement of the observational system for the BOOS area within the actual environmental status:

- Ferrybox network – The existing Ferrybox network should be expanded
- Establishment of additionally at least one fixed platform in every basin of the Baltic with near real time measurements in the water column for temperature, salinity, waves, currents, oxygen, nutrients, fluorescence and meteorological parameters
- Near real time current measurements in the Belts and the Sound
- Extension of the Water level measurement network especially in the Southern Baltic and Gotland (Visby) region
- Development of a reliable Real time data transmission system from research vessels

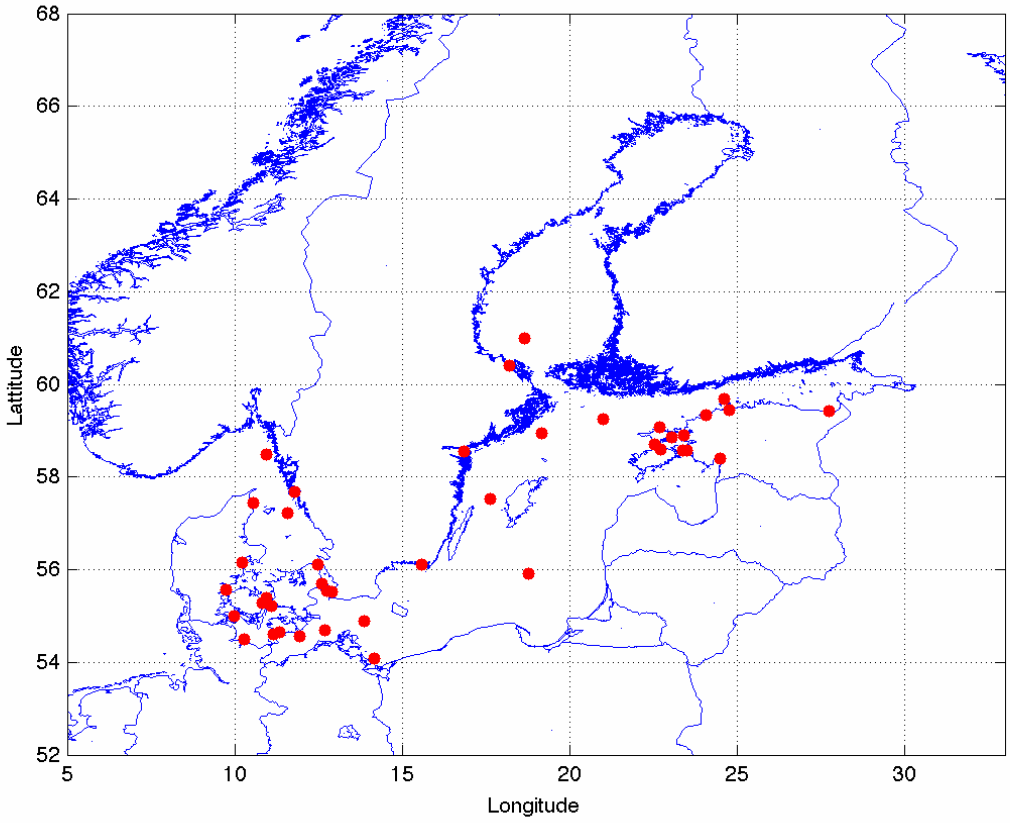

Figure 6.1: Positions of observational temperature data from Coastal Observatories provided for temperature for the BOOS region.

Table 6.1 Overview of the available high frequently measured temperature data from Coastal observatory systems for the BOOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
BSH	Oderbank	Temperature	14,167	54,083
BSH	KielLT	Temperature	10,273	54,500
BSH	FehmarnBelt	Temperature	11,150	54,600
BSH	DarsserS	Temperature	12,700	54,700
BSH	DarsserS_WR	Temperature	12,700	54,700
BSH	Arkona_WR	Temperature	13,867	54,883
BSH	Arkona	Temperature	13,867	54,883
DMI	Aarhus	Temperature	10,217	56,150
DMI	Fredericia	Temperature	9,750	55,567
DMI	Frederikshavn	Temperature	10,567	57,433
DMI	Fynshav	Temperature	9,983	55,000
DMI	Gedser	Temperature	11,933	54,567
DMI	Hornbaek	Temperature	12,467	56,100
DMI	Kobenhavn	Temperature	12,600	55,700
DMI	Rodby	Temperature	11,350	54,650
DMI	Slipshavn	Temperature	10,833	55,283
DMI	Drogden	Temperature	12,742	55,535
DMI	Vengeance	Temperature	11,083	55,216
DMI	W26	Temperature	10,950	55,400
FMI	Northern Baltic	Temperature	21,000	59,250
MSI	Kuivastu	Temperature	23,394	58,574
MSI	Lehtma	Temperature	22,697	59,069
MSI	Paldiski	Temperature	24,080	59,335
MSI	Rohukula	Temperature	23,425	58,905
MSI	Sillamae	Temperature	27,740	59,423
MSI	Soru	Temperature	22,523	58,694
MSI	Tallinn	Temperature	24,764	59,444
MSI	Triigi	Temperature	22,717	58,591

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
MSI	Virtsu	Temperature	23,508	58,576
MSI	Uusmadal	Temperature	24,623	59,685
MSI	Paernu	Temperature	24,485	58,388
MSI	Heltermaa	Temperature	23,041	58,859
SMHI	Forsmark	Temperature	18,211	60,409
SMHI	GoteborgTorshamnen	Temperature	11,791	57,685
SMHI	HuvudskarOst	Temperature	19,167	58,933
SMHI	Klagshamn	Temperature	12,894	55,522
SMHI	Kungsholmsfort	Temperature	15,589	56,105
SMHI	Marviken	Temperature	16,837	58,554
SMHI	Vaderoarna	Temperature	10,933	58,483
SMHI	Finngrundet	Temperature	18,667	61,000
SMHI	Knolls Grund	Temperature	17,616	57,516
SMHI	Sødra Østersjøen	Temperature	18,783	55,916
SMHI	Læsø Ost	Temperature	11,566	57,216

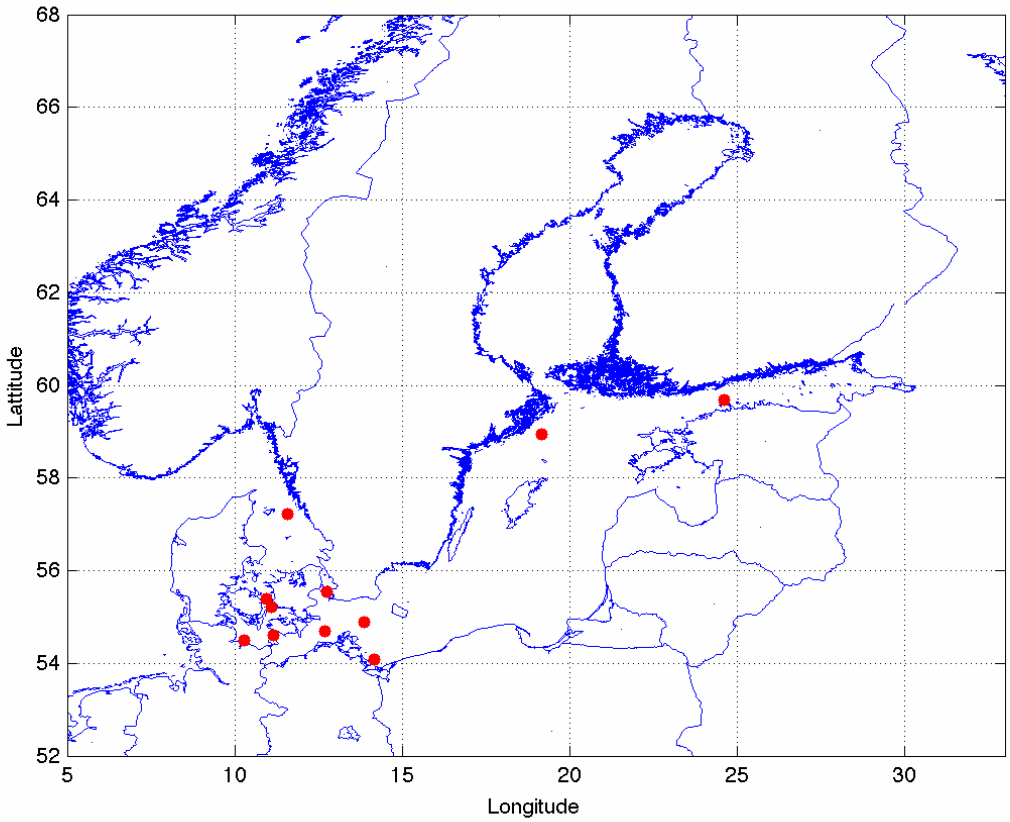

Figure 6.2: Positions of observational salinity data from Coastal Observatories provided for temperature for the BOOS region.

Table 6.2 Overview of the available high frequently measured salinity data from Coastal observatory systems for the BOOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
BSH	Oderbank	Salinity	14,167	54,083
BSH	KielLT	Salinity	10,273	54,500
BSH	FehmarnBelt	Salinity	11,150	54,600
BSH	DarsserS	Salinity	12,700	54,700
BSH	Arkona	Salinity	13,867	54,883
DMI	Drogden	Salinity	12,742	55,535
DMI	Vengeance	Salinity	11,083	55,216
DMI	W26	Salinity	10,950	55,400
MSI	Uusmadal	Salinity	24,623	59,685
SMHI	HuvudskarOst	Salinity	19,167	58,933
SMHI	Læsø Ost	Salinity	11,566	57,216

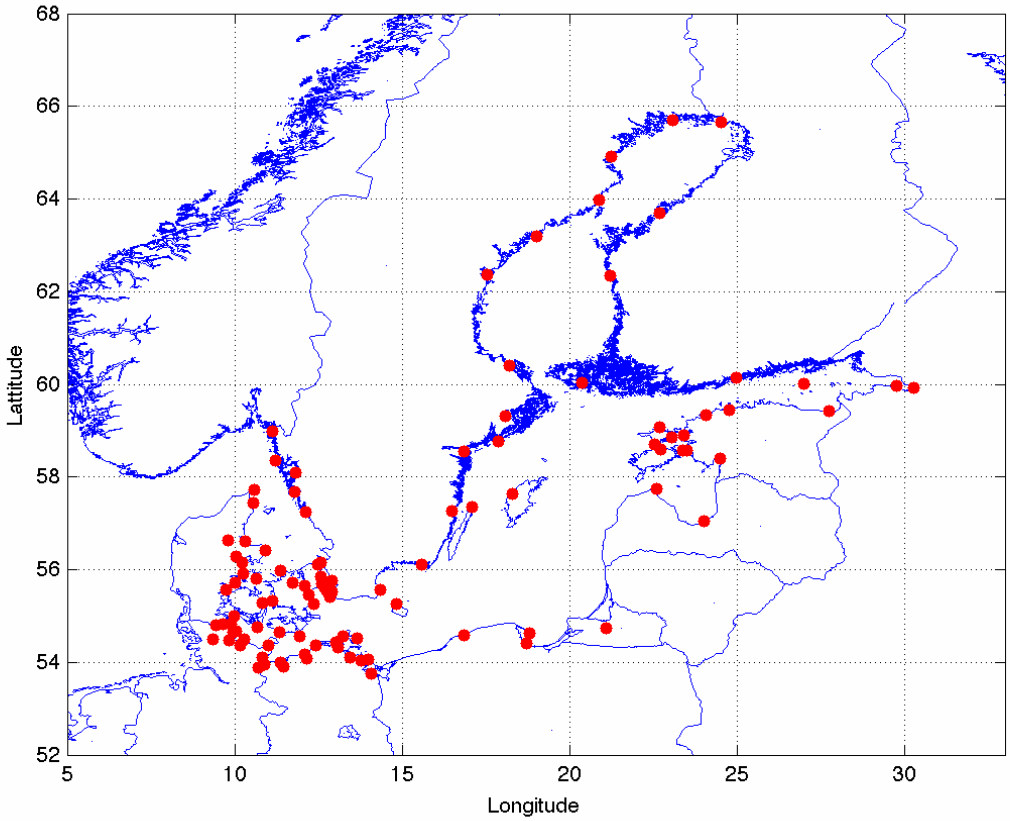

Figure 6.3: Positions of observational sealevel data from Coastal Observatories provided for temperature for the BOOS region.

Table 6.3 Overview of the available high frequently measured sealevel data from Coastal observatory systems for the BOOS region.

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
BSH	Ueckermuende	Sealevel	14,066	53,750
BSH	Luebeck	Sealevel	10,703	53,893
BSH	Wismar	Sealevel	11,458	53,899
BSH	Travemuende	Sealevel	10,872	53,958
BSH	TimmendorfPoel	Sealevel	11,376	53,992
BSH	Wolgast	Sealevel	13,770	54,042
BSH	Koserow	Sealevel	14,001	54,060
BSH	Rostock	Sealevel	12,155	54,083
BSH	Greifswald	Sealevel	13,446	54,093
BSH	Neustadt	Sealevel	10,813	54,097
BSH	Warnemuende	Sealevel	12,103	54,170
BSH	Stralsund	Sealevel	13,099	54,315
BSH	Kiel_Holtenau	Sealevel	10,157	54,372
BSH	Heiligenhafen	Sealevel	11,006	54,373
BSH	Barhoeft	Sealevel	13,033	54,440
BSH	Eckernfoerde	Sealevel	9,836	54,475
BSH	Sassnitz	Sealevel	13,643	54,511
BSH	Schleimuende	Sealevel	10,037	54,673
BSH	Flensburg	Sealevel	9,433	54,795
BSH	Langballigau	Sealevel	9,654	54,823
BSH	Kalkgrund	Sealevel	9,888	54,825
BSH	Schleswig	Sealevel	9,350	54,506
BSH	Kappeln	Sealevel	9,940	54,656
BSH	Althagen	Sealevel	12,420	54,373
BSH	Wittower Faehre	Sealevel	13,241	54,554
BSH	KielLT	Sealevel	10,273	54,500
CMR	Klaipeda	Sealevel	21,083	54,733
DMI	Korsor	Sealevel	11,133	55,333
DMI	Tejn	Sealevel	14,833	55,250

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Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
DMI	Skagen	Sealevel	10,583	57,718
DMI	Grenå	Sealevel	10,925	56,406
DMI	Sjælands Odde	Sealevel	11,370	55,971
DMI	Juelsminde	Sealevel	10,016	55,716
DMI	Nordre Røse	Sealevel	12,692	55,639
DMI	Røvik	Sealevel	12,370	55,252
DMI	Ballen	Sealevel	10,640	55,801
DMI	Bagenkop	Sealevel	10,673	54,756
DMI	Vedbæk	Sealevel	12,566	55,850
DMI	Hobro	Sealevel	9,800	56,633
DMI	Udbyhøj	Sealevel	10,300	56,600
DMI	Randers	Sealevel	10,050	56,283
DMI	Hov	Sealevel	10,266	55,916
DMI	Holbæk	Sealevel	11,716	55,716
DMI	Dragør	Sealevel	12,683	55,600
DMI	Roskilde	Sealevel	12,083	55,650
DMI	Køge	Sealevel	12,200	55,450
DMI	Drogden	Sealevel	12,742	55,535
DMI	Aarhus	Sealevel	10,217	56,150
DMI	Fredericia	Sealevel	9,750	55,567
DMI	Frederikshavn	Sealevel	10,567	57,433
DMI	Fynshav	Sealevel	9,983	55,000
DMI	Gedser	Sealevel	11,933	54,567
DMI	Hornbaek	Sealevel	12,467	56,100
DMI	Kobenhavn	Sealevel	12,600	55,700
DMI	Rodby	Sealevel	11,350	54,650
DMI	Slipshavn	Sealevel	10,833	55,283
FMI	Degerby	Sealevel	20,383	60,033
FMI	Helsinki	Sealevel	24,967	60,150
FMI	Kaskinen	Sealevel	21,217	62,333
FMI	Kemi	Sealevel	24,517	65,667

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
FMI	Pietarsaari	Sealevel	22,700	63,700
IMWM	Ustka	Sealevel	16,850	54,580
IMWN	Gdansk	Sealevel	18,700	54,400
LEGMA	Daugavgriva	Sealevel	24,017	57,050
LEGMA	Kolka	Sealevel	22,583	57,733
MIG	Hel	Sealevel	18,800	54,616
MSI	Kuivastu	Sealevel	23,394	58,574
MSI	Lehtma	Sealevel	22,697	59,069
MSI	Paldiski	Sealevel	24,080	59,335
MSI	Sillamae	Sealevel	27,740	59,423
MSI	Soru	Sealevel	22,523	58,694
MSI	Virtsu	Sealevel	23,508	58,576
MSI	Tallinn	Sealevel	24,764	59,444
MSI	Rohukula	Sealevel	23,425	58,905
MSI	Triigi	Sealevel	22,717	58,591
MSI	Paernu	Sealevel	24,485	58,388
MSI	Heltermaa	Sealevel	23,041	58,859
NWAHEM	St Petersburg	Sealevel	30,266	59,933
NWAHEM	Kronstadt	Sealevel	29,750	59,966
RUMS	Hogland	Sealevel	27,000	60,016
SMHI	Furugrund	Sealevel	21,231	64,916
SMHI	Kungsvik	Sealevel	11,127	58,997
SMHI	LandsortNorra	Sealevel	17,859	58,769
SMHI	Oskarshamn	Sealevel	16,478	57,275
SMHI	Ratan	Sealevel	20,895	63,986
SMHI	Ringhals	Sealevel	12,113	57,250
SMHI	Simrishamn	Sealevel	14,358	55,558
SMHI	Skanor	Sealevel	12,829	55,417
SMHI	Smogen	Sealevel	11,218	58,354
SMHI	Spikarna	Sealevel	17,531	62,363
SMHI	Stockholm	Sealevel	18,082	59,324

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
SMHI	Viken	Sealevel	12,579	56,142
SMHI	Kalix	Sealevel	23,091	65,691
SMHI	Skagsudde	Sealevel	19,000	63,187
SMHI	Visby	Sealevel	18,283	57,633
SMHI	Ölands norra udde	Sealevel	17,091	57,359
SMHI	Barsebæk	Sealevel	12,902	55,753
SMHI	Stenungsund	Sealevel	11,826	58,089
SMHI	Forsmark	Sealevel	18,211	60,409
SMHI	GoteborgTorshamnen	Sealevel	11,791	57,685
SMHI	Klagshamn	Sealevel	12,894	55,522
SMHI	Kungsholmsfort	Sealevel	15,589	56,105
SMHI	Marviken	Sealevel	16,837	58,554

The Glider activities have become stronger also within the BOOS region within the last years, nevertheless also here is no operational monitoring conducted for the reggion up til now. An overview over the European activities is given in Deliverable D-3-2 from the Jerico project and the reader is reffered to that.

In addition to these data in real time mode, the BOOS observational system provides updated ice charts for the Baltic Sea and gives maps on algal blooms in the different regions within the Baltic Sea. Figure 6.4 displays the distribution of Ferrybox lines running within the European waters. Table 6.4 summarises the Ferrybox activities ongoing on the six ferrybox routes established in the BOOS region.

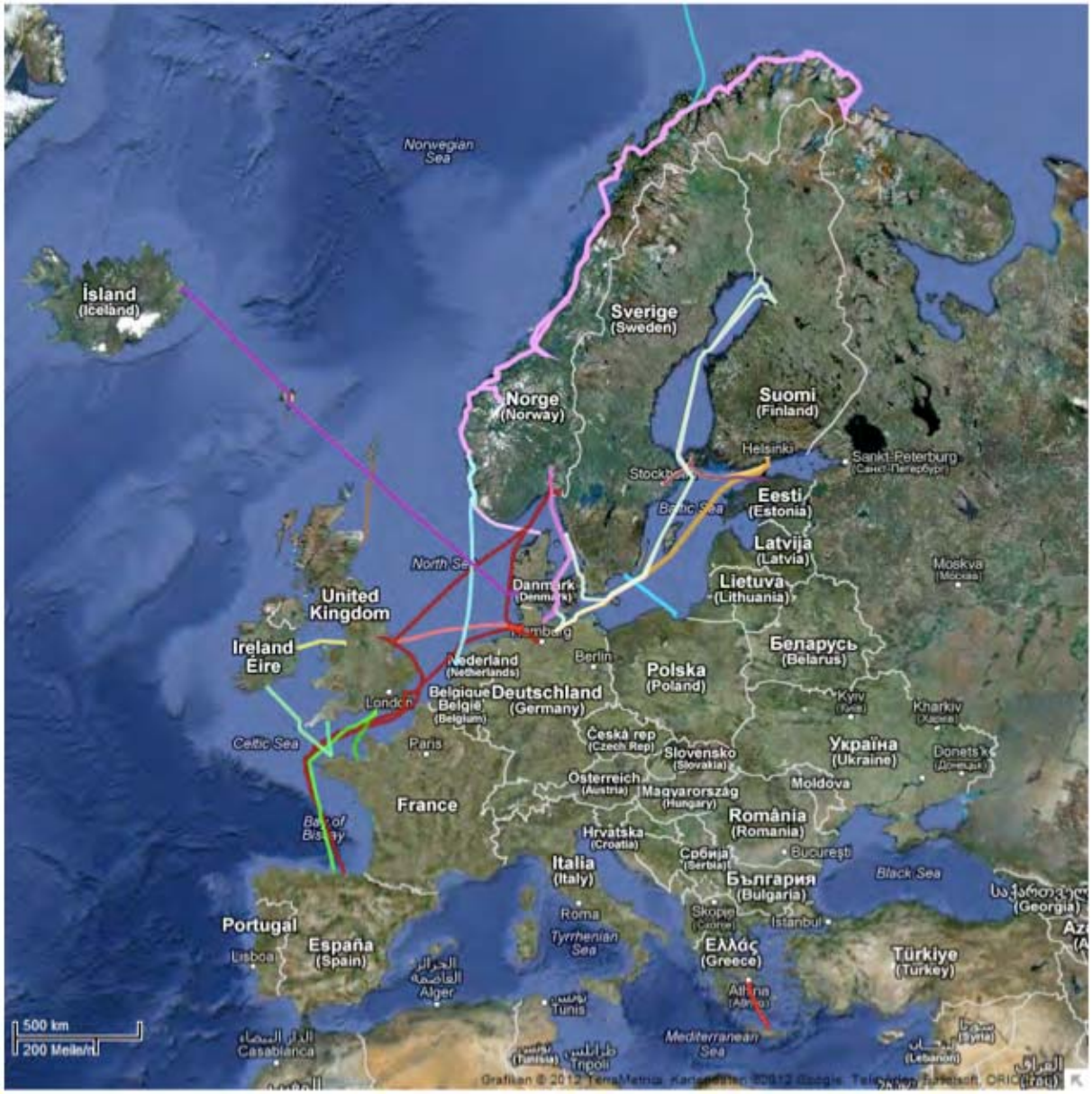

Figure 6.4: Distribution of Ferryboxes running within European waters. Within the BOOS region there are six Ferryboxes running. Figure taken from Jerico deliverable D 3.1 Report on the current status of Ferrybox ´

Table 6.4 : Ferrybox lines running in the BOOS area.

Name of the Ship	**Route**	**Dataprovider**	**Variables covered**
Stena Baltica	Gdynia (PL) - Karlskrona (S)	IMGW	T, S, Turbidity, Diss Oxygen, Fluorescence
MS Romantica	Tallinn(ES)- Stockholm (S)	LOMI	T, S, Turbidity, Fluorescence,
MS Colour Fantasy	Oslo (N)-Kiel (G)	NIVA	T,S,CDOM, cyanob., Turbidity,Fluorescence, nutrients, Oxygen, irradiance
TRANSPAPER	Gothenburg-Kemi-Oulu_Luebeck	SMHI+SYKE	T, S, Turbidity, Fluorescences,CDOM Phycocyanin, Oxygen, PAR, airpress, airtemp,
Silja Serenade	Helsinki-Stockholm	SYKE	T,S,Fluorescences, Phycocyan, nutrienst, phytoplankton
MS Baltic Princess	Tallinn- Helsinki	TTU	T,S,Fluorescence, phycocyan, nutrients

7. Coastal observing systems in the IBIROOS region

The IBIOOS region covers the Irish Sea and the Biscay as well as the Iberian region. The observational system consists of multiplatform real time observing system that is composed mainly by Drifters, Tidgauges/Moorings and Argo observations. A number of 9 Vessels is delivering data in real time mode. Observations provided by Ferryboxes, Gliders and Fishing vessels as well as now 7 HF radar systems are complementing the observational program.

The actual available systems providing data on a high frequently basis are displayed in the Figures 7.1-7.3. The tables 7.1-7.3 provide informations on data provider and positioning of the Coastal observatory system

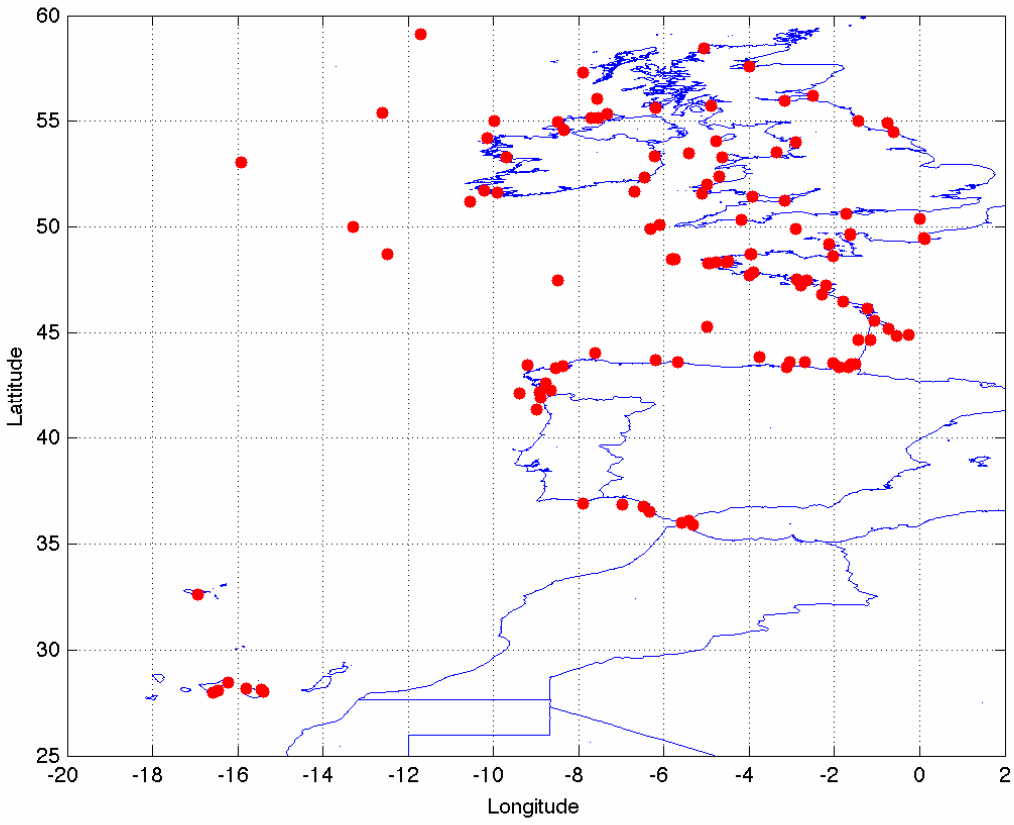

Figure 7.1: Positions of observational temperature data from Coastal Observatories provided for temperature for the IBIROOS region.

Table 7.1 Overview of the available high frequently measured temperature data from Coastal observatory systems for the IBIROOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
CEFAS	Poole Bay	Temperature	-1,720	50,630
CEFAS	Hinkley point	Temperature	-3,160	51,230
CEFAS	Scarweather	Temperature	-3,930	51,430
CEFAS	Liverpool Bay	Temperature	-3,350	53,530
CEFAS	LiverpoolBay	Temperature	-3,362	53,533
CEFAS	Tyne	Temperature	-0,750	54,920
CEFAS	Blackstones	Temperature	-7,570	56,060
CEFAS	Firth of Forth	Temperature	-2,500	56,190
CEFAS	West of Hebrides	Temperature	-7,910	57,290
CETMEF	62066	Temperature	-1,614	43,530
CETMEF	62064	Temperature	-1,448	44,650
CETMEF	62067	Temperature	-2,295	46,833
CETMEF	62070	Temperature	-2,787	47,239
CETMEF	62069	Temperature	-4,968	48,290
CETMEF	62068	Temperature	-3,961	48,717

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
CETMEF	62059	Temperature	-1,620	49,695
Euskalmet	Donostia_buoy	Temperature	-2,023	43,563
Euskalmet	Matxitxako_buoy	Temperature	-2,693	43,632
IFREMER	IF000548	Temperature	-4,003	47,715
IEO	6201030	Temperature	-3,770	43,840
IEO	Santander-AGL_buoy	Temperature	-3,770	43,840
Ifremer	62309	Temperature	-0,546	44,863
Ifremer	62307	Temperature	-0,249	44,914
Ifremer	62306	Temperature	-0,743	45,198
Ifremer	62021	Temperature	-2,657	47,460
Ifremer	62450	Temperature	-4,552	48,358
IH	Leixões	Temperature	-8,980	41,320
IH	Faro	Temperature	-16,940	32,620
IH	Sines	Temperature	-7,900	36,900
Marine Inst.	M3	Temperature	-10,550	51,220
Marine Inst.	Castletownbere	Temperature	-9,900	51,650
Marine Inst.	M5	Temperature	-6,700	51,690

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Marine Inst.	Wexford	Temperature	-6,460	52,340
Marine Inst.	M6	Temperature	-15,920	53,060
Marine Inst.	DublinPort	Temperature	-6,222	53,346
Marine Inst.	Dublin_Port	Temperature	-6,220	53,350
Marine Inst.	M2	Temperature	-5,420	53,470
Marine Inst.	Aranmore	Temperature	-8,500	54,990
Marine Inst.	M4	Temperature	-9,992	54,998
Marine Inst.	Kenmare	Temperature	-10,212	51,740
Marine Inst.	Kilkieran	Temperature	-9,702	53,291
Marine Inst.	Malin Head	Temperature	-7,334	55,372
Marine Inst.	Lough	Temperature	-7,550	55,159
Marine Inst.	Mulroy	Temperature	-7,710	55,170
Marine Inst.	Donegal	Temperature	-8,353	54,610
Marine Inst.	Belmulet	Temperature	-10,146	54,230
Meteo France	62052	Temperature	-5,800	48,500
NOC	Jersey	Temperature	-2,117	49,183
NOC	St Mary's	Temperature	-6,316	49,918

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
NOC	Devonport	Temperature	-4,184	50,368
NOC	Fishguard	Temperature	-4,983	52,013
NOC	Holyhead	Temperature	-4,631	53,309
NOC	Heysham	Temperature	-2,912	54,034
NOC	Port Erin	Temperature	-4,767	54,085
NOC	Whitby	Temperature	-0,613	54,490
NOC	North Shields	Temperature	-1,438	55,007
NOC	Port Ellen	Temperature	-6,189	55,628
NOC	Millport	Temperature	-4,905	55,750
NOC	Leith	Temperature	-3,180	55,990
NOC	Moray Firth	Temperature	-4,001	57,600
NOC	Kinlochbervie	Temperature	-5,050	58,457
NOC	Lerwick	Temperature	-1,138	60,155
Puertos del Estado	Tenerife_buoy	Temperature	-16,580	28,000
Puertos del Estado	LasPalmasEste_cost	Temperature	-15,390	28,050
Puertos del Estado	Granadilla_cost	Temperature	-16,470	28,090
Puertos del Estado	LasPalmasConfital_cost	Temperature	-15,455	28,138

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Puertos del Estado	Gran_Canaria_buoy	Temperature	-15,810	28,190
Puertos del Estado	SantaCruzTenerife_cost	Temperature	-16,230	28,460
Puertos del Estado	Ceuta_cost	Temperature	-5,330	35,903
Puertos del Estado	Tarifa_cost	Temperature	-5,590	36,000
Puertos del Estado	Algeciras_cost	Temperature	-5,416	36,066
Puertos del Estado	Cadiz_cost	Temperature	-6,330	36,500
Puertos del Estado	Sevilla_cost	Temperature	-6,475	36,738
Puertos del Estado	Cadiz_buoy	Temperature	-6,980	36,840
Puertos del Estado	Silleiro_buoy	Temperature	-9,400	42,120
Puertos del Estado	Langosteira_cost	Temperature	-8,533	43,355
Puertos del Estado	Pasajes_cost	Temperature	-1,890	43,370
Puertos del Estado	Bilbao_cost	Temperature	-3,130	43,397
Puertos del Estado	LaCoruna_cost	Temperature	-8,383	43,413
Puertos del Estado	Villano-Sisargas_buoy	Temperature	-9,210	43,490
Puertos del Estado	Gijon_cost	Temperature	-5,667	43,612
Puertos del Estado	Bilbao_buoy	Temperature	-3,040	43,640
Puertos del Estado	Cabo_de_Penas_buoy	Temperature	-6,190	43,730

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Puertos del Estado	Estaca_de_Bares_buoy	Temperature	-7,620	44,060
RWS	LesPierresNoires	Temperature	-4,915	48,310
RWS	Ouessantlarge	Temperature	-5,750	48,500
SHOM	EXSH0031	Temperature	-1,682	43,395
SHOM	EXSH0030	Temperature	-1,515	43,527
SHOM	EXSH0016	Temperature	-1,164	44,665
SHOM	EXSH0024	Temperature	-1,062	45,569
SHOM	EXSH0021	Temperature	-1,221	46,159
SHOM	EXSH0020	Temperature	-1,794	46,498
SHOM	EXSH0003	Temperature	-2,200	47,260
SHOM	EXSH0018	Temperature	-2,895	47,543
SHOM	EXSH0017	Temperature	-3,907	47,874
SHOM	EXSH0001	Temperature	-4,780	48,360
SHOM	Le_Conquet	Temperature	-4,780	48,360
SHOM	EXSH0002	Temperature	-4,500	48,380
SHOM	EXSH0014	Temperature	-2,028	48,642
SHOM	EXSH0012	Temperature	-3,966	48,716

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
SHOM	Le_Havre	Temperature	0,110	49,440
SHOM	EXSH0006	Temperature	0,106	49,482
SHOM	EXSH0004	Temperature	-1,630	49,650
SHOM	Cherbourg	Temperature	-1,636	49,652
SHOM	Cherbourg	Temperature	-1,620	49,690
UKMO/MeteoFrance	Gascogne_buoy	Temperature	-5,000	45,300
UKMO/MeteoFrance	Brittany_buoy	Temperature	-8,500	47,500
UKMO/MeteoFrance	62052_buoy	Temperature	-5,830	48,500
UKMO/MeteoFrance	K1_buoy	Temperature	-12,500	48,700
UKMO/MeteoFrance	Channel_Lightship	Temperature	-2,900	49,900
UKMO/MeteoFrance	K2_buoy	Temperature	-13,300	50,000
UKMO/MeteoFrance	Seven_Stones_Lightship	Temperature	-6,100	50,100
UKMO/MeteoFrance	Greenwich_Lightship	Temperature	0,000	50,400
UKMO/MeteoFrance	Turbot_Bank_buoy	Temperature	-5,100	51,600
UKMO/MeteoFrance	Aberporth_buoy	Temperature	-4,700	52,400
UKMO/MeteoFrance	K4_buoy	Temperature	-12,600	55,400
UKMO/MeteoFrance	K5_buoy	Temperature	-11,700	59,100

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
UKMO/MF	62001	Temperature	-5,000	45,300
UKMO/MF	62163	Temperature	-8,500	47,500
UKMO/MF	62029	Temperature	-12,500	48,700
UKMO/MF	62103	Temperature	-2,900	49,900
UKMO/MF	62081	Temperature	-13,300	50,000
UKMO/MF	62107	Temperature	-6,100	50,100
UKMO/MF	62305	Temperature	0,000	50,400
UKMO/MF	62303	Temperature	-5,100	51,600
UKMO/MF	62301	Temperature	-4,700	52,400
UKMO/MF	62105	Temperature	-12,600	55,400
UKMO/MF	64045	Temperature	-11,700	59,100
Xunta Galicia	6201040	Temperature	-8,910	42,170
Xunta Galicia	6201039	Temperature	-8,660	42,290
Xunta Galicia	6201038	Temperature	-8,780	42,630
Xunta Galicia/MG/IM	AGuarda_buoy	Temperature	-8,900	41,900
Xunta Galicia/MG/IM	Illas_Cies_buoy	Temperature	-8,910	42,170

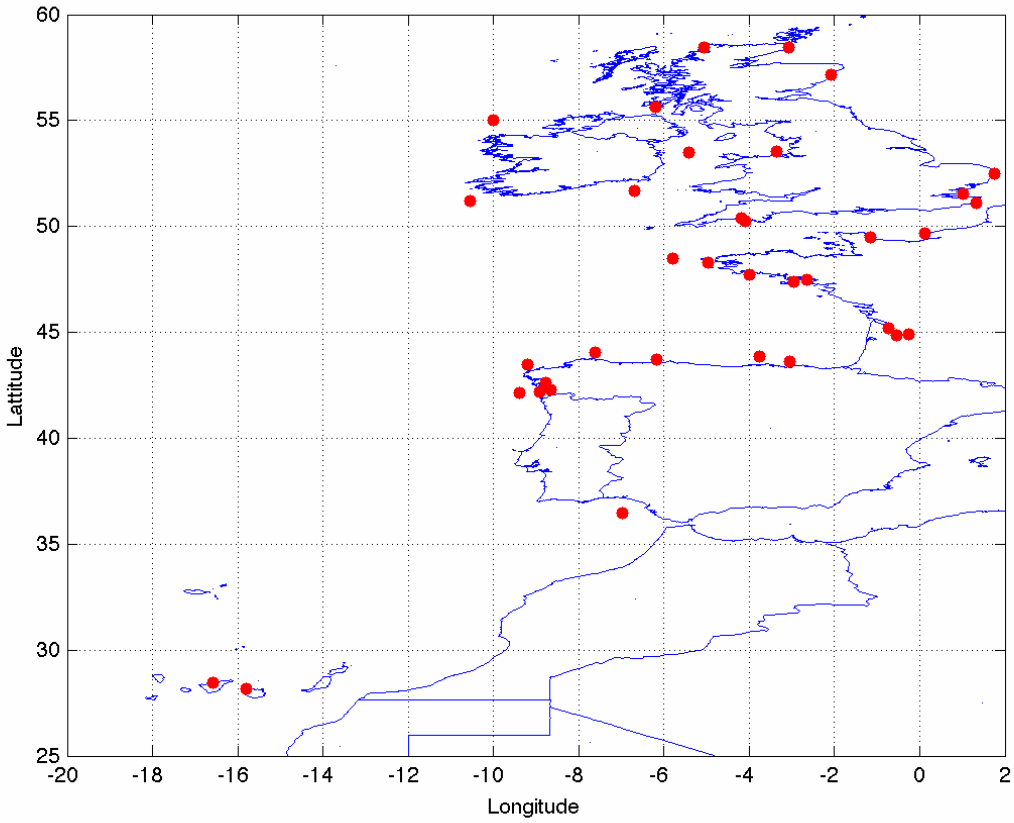

Figure 7.2: Positions of observational salinity data from Coastal Observatories provided for temperature for the IBIROOS region.

Table 7.2 Overview of the available high frequently measured salinity data from Coastal observatory systems for the IBIOOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
CEFAS	Warp-TH1-	Salinity	1,026	51,526
CEFAS	LiverpoolBay	Salinity	-3,362	53,533
CETMEF	62069	Salinity	-4,968	48,290
IEO	Santander-AGL (IEO)	Salinity	-3,770	43,850
IFREMER	62309	Salinity	-0,546	44,863
IFREMER	62307	Salinity	-0,249	44,914
IFREMER	62306	Salinity	-0,743	45,198
IFREMER	IF000549	Salinity	-2,958	47,394
IFREMER	62021	Salinity	-2,657	47,460
IFREMER	62021	Salinity	-2,657	47,460
IFREMER	IF000548	Salinity	-4,003	47,715
IFREMER	IF000550	Salinity	-1,157	49,492
IFREMER	IF000562	Salinity	0,123	49,669
Marine Inst.	M3	Salinity	-10,550	51,217
Marine Inst.	M5	Salinity	-6,704	51,690
Marine Inst.	M2	Salinity	-5,425	53,480
Marine Inst.	M4	Salinity	-10,000	55,000
METEO FRANCE	IF000548	Salinity	-4,003	47,715
METEO FRANCE	IF000548	Salinity	-4,003	47,715
METEO FRANCE	62052	Salinity	-5,800	48,500
METEO FRANCE	IF000550	Salinity	-1,157	49,492
METEO FRANCE	IF000562	Salinity	0,123	49,669
NOC	Plymouth	Salinity	-4,083	50,233
NOC	Devonport	Salinity	-4,184	50,368
NOC	Dover	Salinity	1,317	51,117
NOC	Lowestoft	Salinity	1,752	52,473
NOC	Port Ellen	Salinity	-6,189	55,628
NOC	Aberdeen	Salinity	-2,083	57,150

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
NOC	Wick	Salinity	-3,083	58,433
NOC	Kinlochbervie	Salinity	-5,050	58,457
NOC	Lerwick	Salinity	-1,138	60,155
Puertos del Estado	Gran Canaria	Salinity	-15,810	28,190
Puertos del Estado	Tenerife	Salinity	-16,580	28,460
Puertos del Estado	Cadiz	Salinity	-6,980	36,480
Puertos del Estado	Cabo Silleiro	Salinity	-9,400	42,120
Puertos del Estado	Villano-Sisargas	Salinity	-9,210	43,490
Puertos del Estado	Bilbao	Salinity	-3,042	43,640
Puertos del Estado	Cabo de Penas	Salinity	-6,170	43,730
Puertos del Estado	Estaca de Bares	Salinity	-7,620	44,060
Xunta de Galicia	Illas Cíes	Salinity	-8,911	42,169
Xunta de Galicia	Rande	Salinity	-8,659	42,288
Xunta de Galicia	Cortegada	Salinity	-8,782	42,627

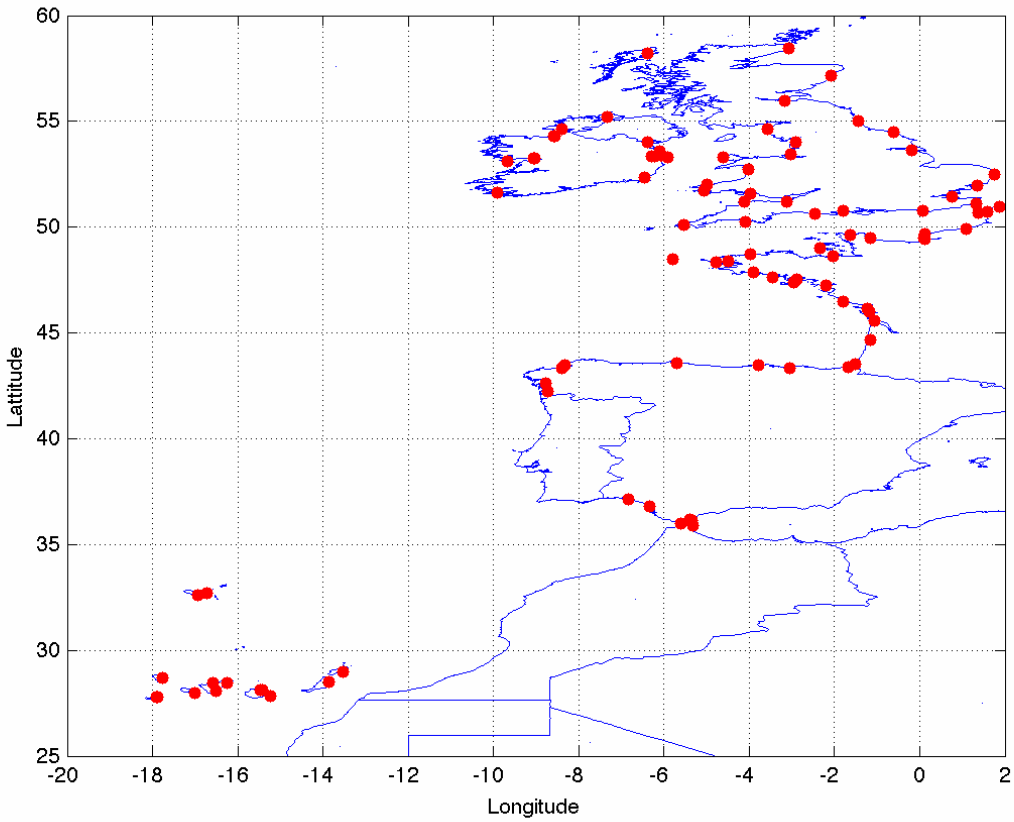

Figure 7.3: Positions of observational sealevel data from Coastal Observatories provided for temperature for the IBIROOS region.

Table 7.3 Overview of the available high frequently measured sealevel data from Coastal observatory systems for the IBIROOS region.

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
IH	Funchal	Sealevel	-16,942	32,618
IH	Canical	Sealevel	-16,730	32,720
Marine Inst.	Wexford	Sealevel	-6,450	52,330
Marine Inst.	GalwayPort	Sealevel	-9,040	53,260
Marine Inst.	Howth	Sealevel	-6,060	53,390
Marine Inst.	Dundalk	Sealevel	-6,380	54,000
Marine Inst.	Sligo	Sealevel	-8,580	54,300
Marine Inst.	Sligo	Sealevel	-8,570	54,300
Marine Inst.	Killybegs	Sealevel	-8,390	54,630
Marine Inst.	Killybegs	Sealevel	-8,390	54,640
Marine Inst.	Castletownber	Sealevel	-9,903	51,650
Marine Inst.	Wexford	Sealevel	-6,459	52,339
Marine Inst.	Inishmore	Sealevel	-9,667	53,118
Marine Inst.	Galway Port	Sealevel	-9,048	53,269
Marine Inst.	Kish	Sealevel	-5,922	53,312
Marine Inst.	River Dodder	Sealevel	-6,230	53,331

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Marine Inst.	Dublin Port	Sealevel	-6,222	53,346
Marine Inst.	River Liffey	Sealevel	-6,284	53,347
Marine Inst.	Howth Harbour	Sealevel	-6,068	53,392
Marine Inst.	Skerries Harbour	Sealevel	-6,108	53,585
Marine Inst.	Dundalk	Sealevel	-6,386	54,008
Marine Inst.	Killybegs Port	Sealevel	-8,395	54,636
Marine Inst.	Malin Head	Sealevel	-7,334	55,205
MedGLOSS	Ceuta	Sealevel	-5,317	35,900
MedGLOSS	Gibraltar	Sealevel	-5,350	36,117
Meteo France	IF000549	Sealevel	-2,958	47,394
Meteo France	62052	Sealevel	-5,800	48,500
Meteo France	62061	Sealevel	-2,343	48,988
Meteo France	IF000550	Sealevel	-1,157	49,492
Meteo France	IF000562	Sealevel	0,123	49,669
Meteo France	62072	Sealevel	1,370	50,659
NOC	Newlyn	Sealevel	-5,530	50,100
NOC	Plymouth	Sealevel	-4,080	50,230
NOC	Weymouth	Sealevel	-2,450	50,620
NOC	Bournemouth	Sealevel	-1,800	50,770
NOC	Newhaven	Sealevel	0,070	50,780

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
NOC	Dover	Sealevel	1,320	51,120
NOC	Ilfracombe	Sealevel	-4,120	51,220
NOC	Hinkley Point	Sealevel	-3,130	51,220
NOC	Sheerness	Sealevel	0,750	51,450
NOC	Mumbles	Sealevel	-3,980	51,570
NOC	Milford haven	Sealevel	-5,050	51,720
NOC	Felixstowe	Sealevel	1,350	51,970
NOC	Fishguard	Sealevel	-4,980	52,020
NOC	Lowestoft	Sealevel	1,750	52,470
NOC	Barmouth	Sealevel	-4,030	52,720
NOC	Holyhead	Sealevel	-4,620	53,320
NOC	Liverpool	Sealevel	-3,020	53,450
NOC	Immingham	Sealevel	-0,180	53,630
NOC	Heysham	Sealevel	-2,920	54,030
NOC	Whitby	Sealevel	-0,620	54,480
NOC	Workington	Sealevel	-3,570	54,650
NOC	North Shields	Sealevel	-1,440	55,000
NOC	Aberdeen	Sealevel	-2,080	57,150
NOC	Stornoway	Sealevel	-6,380	58,220
NOC	Wick	Sealevel	-3,080	58,430
Puertos del Estado	ElHierroTG	Sealevel	-17,900	27,780
Puertos del Estado	GomeraTG	Sealevel	-17,000	28,000
Puertos del Estado	LasPalmasTG	Sealevel	-15,412	28,141
Puertos del Estado	TenerifeTG	Sealevel	-16,240	28,480
Puertos del Estado	FuerteventuraTG	Sealevel	-13,850	28,500

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Puertos del Estado	LaPalmaTG	Sealevel	-17,768	28,678
Puertos del Estado	ArrecifeTG	Sealevel	-13,530	28,967
Puertos del Estado	TarifaTG	Sealevel	-5,604	36,006
Puertos del Estado	AlgecirasTG	Sealevel	-5,398	36,177
Puertos del Estado	BonanzaTG	Sealevel	-6,340	36,800
Puertos del Estado	HuelvaTG	Sealevel	-6,834	37,132
Puertos del Estado	VigoTG	Sealevel	-8,726	42,243
Puertos del Estado	VillagarciaTG	Sealevel	-8,770	42,601
Puertos del Estado	CorunaTG	Sealevel	-8,389	43,357
Puertos del Estado	BilbaoTG	Sealevel	-3,050	43,357
Puertos del Estado	SantanderTG	Sealevel	-3,791	43,461

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Puertos del Estado	FerrolTG	Sealevel	-8,326	43,463
Puertos del Estado	GijonTG	Sealevel	-5,698	43,558
Puertos del Estado	Hierro	Sealevel	-17,883	27,800
Puertos del Estado	Arinaga	Sealevel	-15,240	27,850
Puertos del Estado	Granadilla	Sealevel	-16,500	28,080
Puertos del Estado	Las Palmas	Sealevel	-15,458	28,142
Puertos del Estado	Tenerife	Sealevel	-16,580	28,460
Puertos del Estado	Fuerteventura	Sealevel	-13,850	28,500
RWS	Leith	Sealevel	-3,167	55,985
SHOM	SocoaTG	Sealevel	-1,682	43,395
SHOM	BayonneBoucauTG	Sealevel	-1,516	43,527
SHOM	ArcachonEyracTG	Sealevel	-1,164	44,665
SHOM	PortBlocTG	Sealevel	-1,062	45,568
SHOM	IleDAixTG	Sealevel	-1,174	46,007
SHOM	LaRochelleTG	Sealevel	-1,221	46,159

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
SHOM	LesSablesDOlonneTG	Sealevel	-1,794	46,497
SHOM	SaintNazaireTG	Sealevel	-2,202	47,267
SHOM	LeCrouestyTG	Sealevel	-2,895	47,543
SHOM	PortTudyTG	Sealevel	-3,446	47,644
SHOM	ConcarneauTG	Sealevel	-3,907	47,874
SHOM	LeConquetTG	Sealevel	-4,781	48,359
SHOM	BrestTG	Sealevel	-4,495	48,383
SHOM	SaintMaloTG	Sealevel	-2,028	48,641
SHOM	RoscoffTG	Sealevel	-3,966	48,718
SHOM	LeHavreTG	Sealevel	0,106	49,482
SHOM	CherbourgTG	Sealevel	-1,636	49,651
SHOM	DieppeTG	Sealevel	1,085	49,929
SHOM	BoulogneSurMerTG	Sealevel	1,577	50,728
SHOM	CalaisTG	Sealevel	1,868	50,969
SHOM	DunkerqueTG	Sealevel	2,367	51,048
SHOM	Le Havre	Sealevel	0,120	49,430
SHOM	Cherbourg	Sealevel	-1,630	49,650
UKMO/MF	62052	Sealevel	-5,800	48,500

The real time data for the IBIROOS region is available via the IBIROOS data protal (http://www.ibi-roos.eu/). Figure 7.4 displays the status of real time data provided via the data delivery system is displayed. A temperature salinity climatology for the 1990-actual period is available via the MyOcean project efforts.

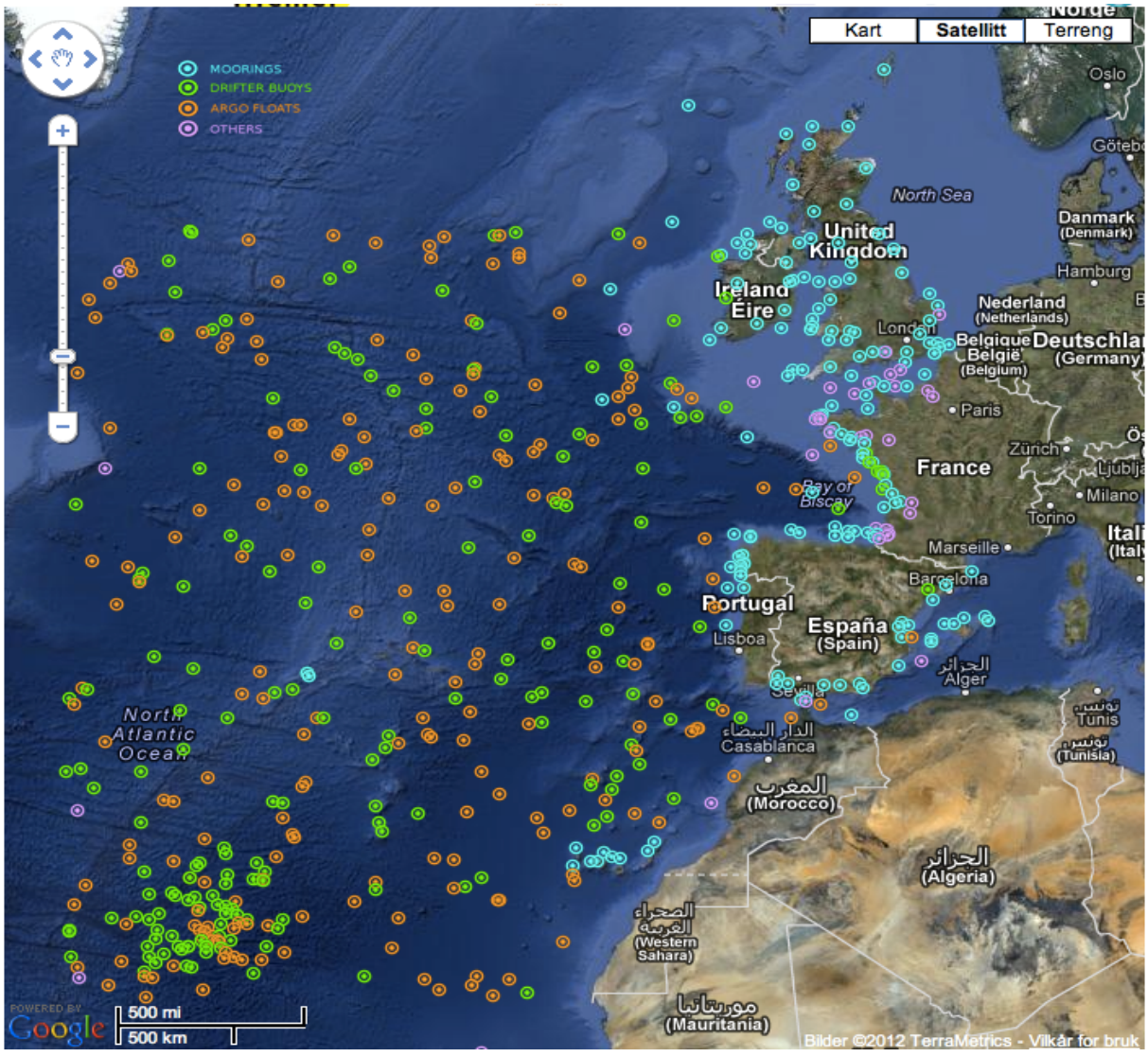

Figure 7.4: Location of latest position of measurements provided to the IBIROOS observational data platform.

The IBIROOS community provides information on additional variables via the NOOS web portal. Waves data information is also provided as real time service for use. The positioning of the additional data provided by the IBIROOS region will be included within the updated version of the Deliverable.

The Glider activities have become stronger also within the IBIROOS region within the last years, nevertheless also here is no operational monitoring conducted for the reggion up til now. An overview over the European activities is given in Deliverable D-3-2 from the Jerico project and the reader is reffered to that.

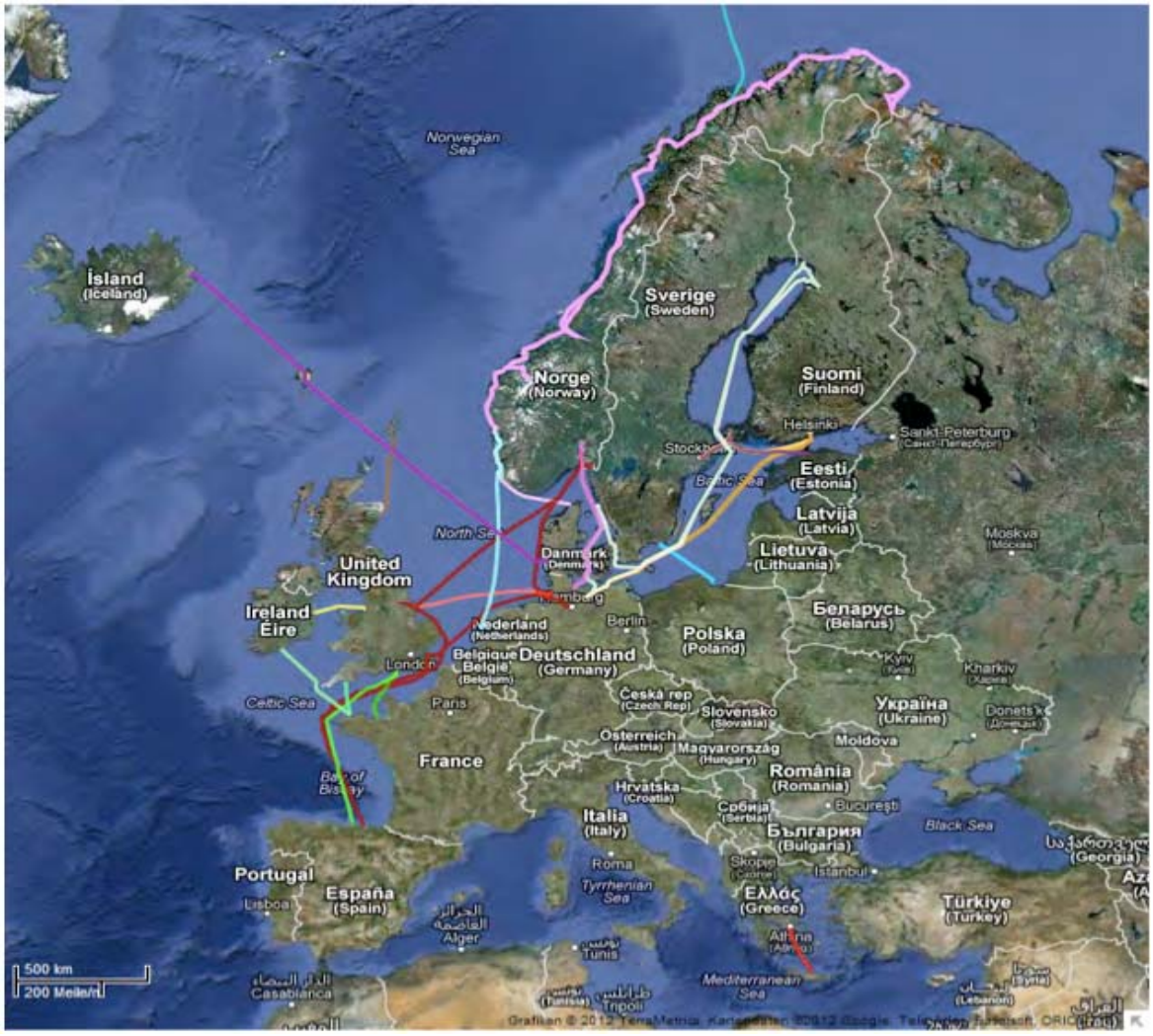

Figure 7.5: Distribution of Ferryboxes running within European waters. Within the IBIROOS region there are three Ferryboxes running, for two additional are historical data available. Figure taken from Jerico deliverable D 3.1 Report on the current status of Ferrybox ´

Figure 7.5 displays the distribution of Ferrybox lines running within the European waters. Table 7.4 summarises the Ferrybox activities ongoing on the five ferrybox routes established in the IBIROOS region.

Table 7.4: Ferrybox lines running in the IBIROOS area.

Name of the Ship	**Route**	**Dataprovider**	**Variables covered**
Lysbris	Moss (N)-Cuxhaven(G)-Chatham(GB)- Bilbao (S)- Immingham	HZG	T, S, Diss Oxygen, Fluorescence, pH, Turbidity, nutrients
Pont Aven	Portsmouth(GB)-Santander(S)- Roscoff (F)- Cork (I)	IFREMER	T, S, Diss. Oxygen, Fluorescence, Turbidity, CDOM
NIOLON	Marseille Algier	IFREMER	T,S
Lagan Viking Stopped service	Birkenhead Belfast	NOCL	T, S, Fluorescence, Turbidity
Pride of Bilbao Stopped service	Portsmouth Bilbao	NOCS	T, S, Fluorescences, Oxigen, PCO2, Nutrients, irradiance, radiance

8. Coastal observing systems in the MONGOOS region

The MONGOOS region covers the whole Mediterranean Sea. The observational system consists of multiplatform real time observing system that is composed by a Ship Of Opportunity Programme, moored buoys, so-called Mediterranean Multi- sensor Moored Array, ARGO buoys, Gliders and an EMSO multiparametric deep seafloor observation node. These system is complemented by the near coastal national monitoring arrays that are mainly providing wave, surface meteorological parameters, sea level monitoring completed by coastal mooring providing meteorological measurements and physical-chemical-biological data in coastal areas and HF-radars. The actual report focusses on the high frequently sampled stations and fixed platforms as well as the ferrybox observations ongoing on regular transects as well as unregular cruises.

The actual available systems providing data on a high frequently basis are displayed in the Figures 8.1-8.3. The tables 8.1-8.3 provide informations on data provider and positioning of the Coastal observatory system

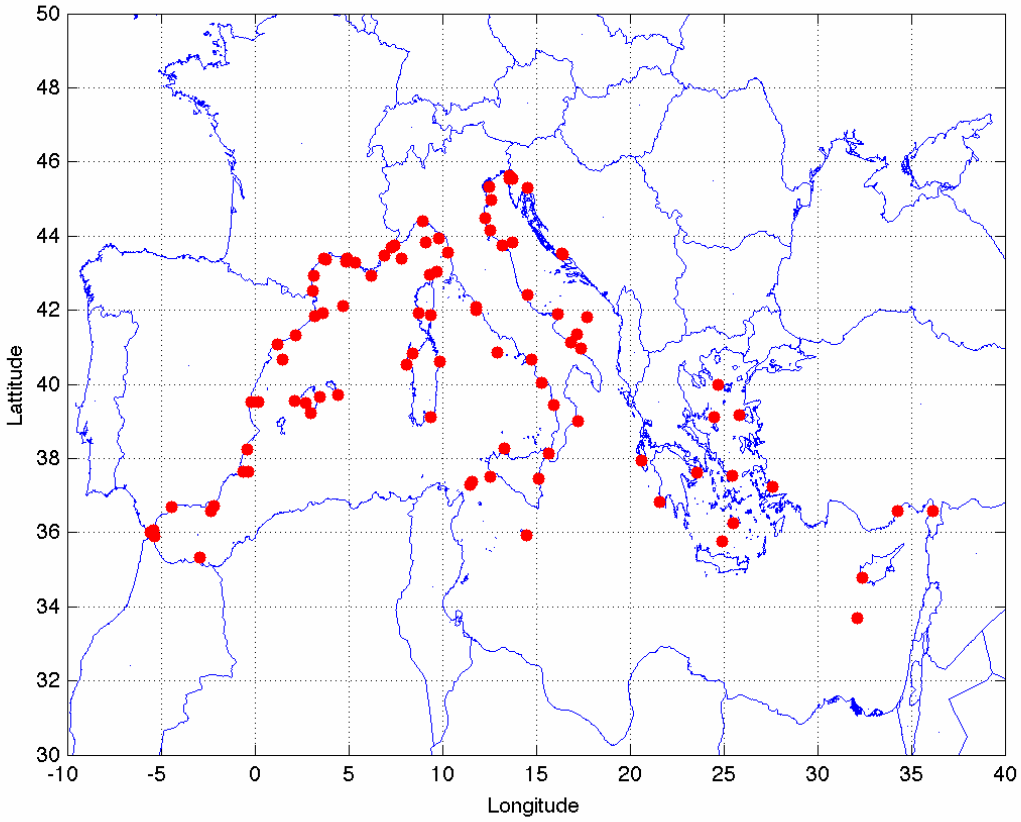

Figure 8.1: Positions of observational temperature data from Coastal Observatories provided for temperature for the MONGOOS region.

Table 8.1 Overview of the available high frequently measured temperature data from Coastal observatory systems for the MONGOOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
AMGI	Bakar_II	Temperature	14,540	45,305
CETMEF	61191	Temperature	3,125	42,916
CETMEF	61190	Temperature	3,780	43,372
CETMEF	61004	Temperature	6,207	42,930
CNR-ISMAR	COR	Temperature	9,683	43,025
CNR-ISMAR	C02	Temperature	11,500	37,286
CNR-ISMAR	C01	Temperature	11,592	37,383
CNR-ISMAR	PTF Acqua Alta	Temperature	12,508	45,314
CNR-ISMAR	E1	Temperature	12,570	44,143
CNR-ISMAR	Meda Senigallia	Temperature	13,219	43,737
CNR-ISMAR	PALOMA	Temperature	13,565	45,618
CNR-ISMAR	B2012	Temperature	17,194	41,341
CNR-ISSIA	ODAS (W1M3A)	Temperature	9,107	43,823
CSIC	Cabrera	Temperature	2,960	39,221
Dpt Fish& Mar. Res.	Paphos	Temperature	32,400	34,783

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
EARS	Koper	Temperature	13,729	45,549
HCMR	ZAKYN	Temperature	20,604	37,956
HCMR	Pylos	Temperature	21,591	36,822
HCMR	SARON	Temperature	23,569	37,610
HCMR	SKYRO	Temperature	24,464	39,113
HCMR	ATHOS	Temperature	24,724	39,974
HCMR	E1-M3A	Temperature	24,919	35,774
HCMR	Mykon	Temperature	25,462	37,523
HCMR	SANTO	Temperature	25,501	36,262
HCMR	Lesvo	Temperature	25,815	39,159
Hydr. Inst. Croatia	Split	Temperature	16,440	43,507
Ifremer	61284	Temperature	4,866	43,319
Inst. of Oceanograhpy and Fisheries, Croatia	Kastela Bay	Temperature	16,384	43,522
IOI	Malta MedGLOSS (Portomaso)	Temperature	14,503	35,917

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
ISPRA	Alghero	Temperature	8,100	40,535
ISPRA	Alghero	Temperature	08,104	40,5423
ISPRA	Porto Torres	Temperature	8,404	40,842
ISPRA	Genova	Temperature	8,925	44,410
ISPRA	Cagliari	Temperature	9,405	39,113
ISPRA	La Spezia	Temperature	9,827	43,928
ISPRA	Siniscola	Temperature	9,892	40,617
ISPRA	Livorno	Temperature	10,299	43,546
ISPRA	Civitavecchia	Temperature	11,777	42,000
ISPRA	Ravenna	Temperature	12,283	44,492
ISPRA	Mazara del Vallo	Temperature	12,533	37,517
ISPRA	Venezia	Temperature	12,633	44,967
ISPRA	Ponza	Temperature	12,950	40,867
ISPRA	Palermo	Temperature	13,333	38,258
ISPRA	Ancona	Temperature	13,7181	43,8216
ISPRA	Ortona	Temperature	14,537	42,407

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
ISPRA	Salerno	Temperature	14,768	40,672
ISPRA	Catania	Temperature	15,147	37,440
ISPRA	Palinuro	Temperature	15,275	40,031
ISPRA	Reggio Calabria	Temperature	15,649	38,121
ISPRA	Cetraro	Temperature	15,918	39,453
ISPRA	Vieste	Temperature	16,179	41,887
ISPRA	Bari	Temperature	16,861	41,137
ISPRA	Crotone	Temperature	17,217	39,018
ISPRA	Monopoli	Temperature	17,377	40,975
Meteo-France	61002	Temperature	4,700	42,100
Meteo-France	61001	Temperature	7,800	43,400
NIB	Vida	Temperature	13,552	45,543
OGS	E2M3A	Temperature	17,720	41,800
Puertos del Estado	Tarifa_cost	Temperature	-5,590	36,000
Puertos del Estado	Algeciras_cost	Temperature	-5,416	36,066
Puertos del Estado	Ceuta_cost	Temperature	-5,330	35,903

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Puertos del Estado	Malaga_cost	Temperature	-4,415	36,692
Puertos del Estado	Melilla_cost	Temperature	-2,944	35,327
Puertos del Estado	Cabo_de_Gata_buoy	Temperature	-2,320	36,570
Puertos del Estado	Cabo_de_Gata_cost	Temperature	-2,203	36,713
Puertos del Estado	Cabo_de_Palos_cost	Temperature	-0,638	37,654
Puertos del Estado	Alicante_cost	Temperature	-0,410	38,250
Puertos del Estado	Cabo_de_Palos_buoy	Temperature	-0,330	37,650
Puertos del Estado	Valencia_cost	Temperature	-0,200	39,510
Puertos del Estado	Valencia_buoy	Temperature	0,200	39,520
Puertos del Estado	Tarragona_cost	Temperature	1,190	41,070
Puertos del Estado	Tarragona_buoy	Temperature	1,470	40,680

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Puertos del Estado	Dragonera_buoy	Temperature	2,100	39,560
Puertos del Estado	Barcelona_cost	Temperature	2,200	41,320
Puertos del Estado	Palamos_cost	Temperature	3,187	41,830
Puertos del Estado	Capdepera_cost	Temperature	3,485	39,651
Puertos del Estado	Cabo_Begur_buoy	Temperature	3,640	41,920
Puertos del Estado	Mahon_buoy	Temperature	4,440	39,720
SHOM	EXSH0028	Temperature	3,107	42,520
SHOM	EXSH0033	Temperature	3,699	43,398
SHOM	EXSH0022	Temperature	4,893	43,405
SHOM	EXSH0011	Temperature	5,356	43,291
SHOM	EXSH0032	Temperature	6,934	43,484
SHOM	EXSH0007	Temperature	7,285	43,696
SHOM	EXSH0027	Temperature	7,424	43,733
SHOM	EXSH0010	Temperature	8,760	41,920

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
SHOM	EXSH0026	Temperature	9,350	42,967
SHOM	EXSH0025	Temperature	9,404	41,857
Socib	Boya Bahía de Palma	Temperature	2,700	39,493
TUDES	Bodrum	Temperature	27,595	37,240
TUDES	Erdemly	Temperature	34,250	36,567
TUDES	Iskenderun	Temperature	36,167	36,583
UCY OC	MedGOOS 3	Temperature	32,134	33,699
UniTuscia-CNR	Civitavecchia	Temperature	11,778	42,083

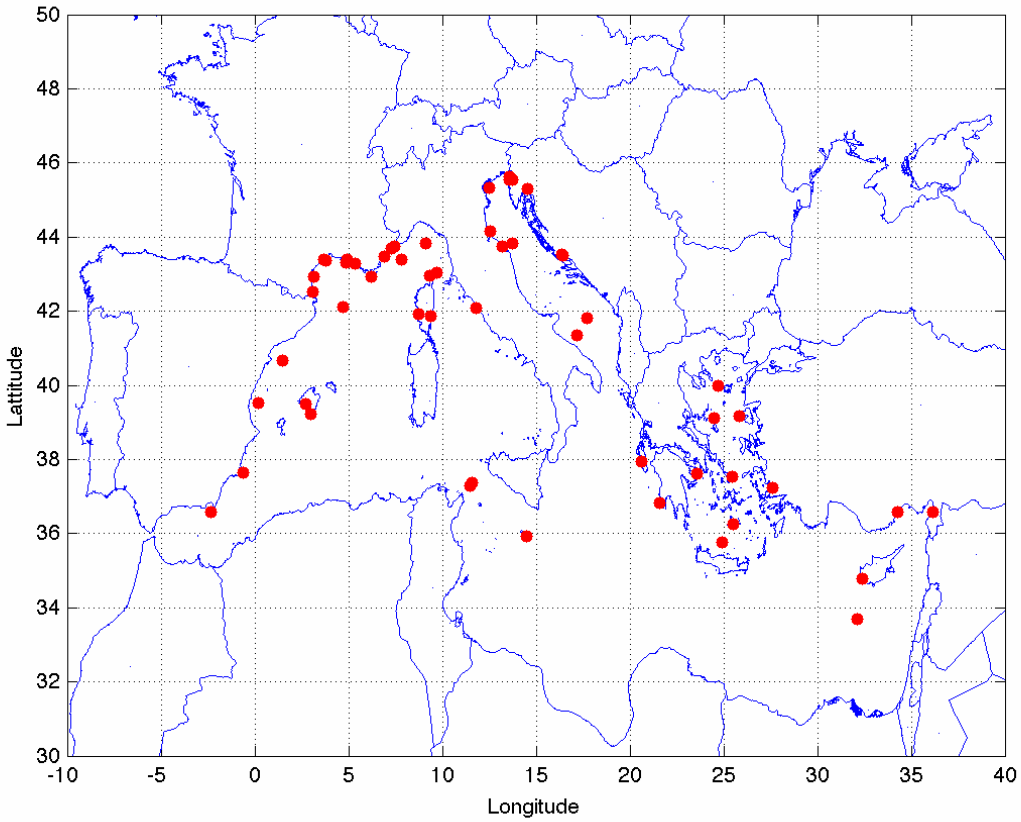

Figure 8.2: Positions of observational salinity data from Coastal Observatories provided for temperature for the MONGOOS region.

Table 8.2 Overview of the available high frequently measured salinity data from Coastal observatory systems for the MONGOOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
AMGI	Bakar_II	Salinity	14,540	45,305
CETMEF	61191	Salinity	3,125	42,916
CETMEF	61190	Salinity	3,780	43,372
CETMEF	61004	Salinity	6,207	42,930
CNR-ISMAR	COR	Salinity	9,683	43,025
CNR-ISMAR	C02	Salinity	11,500	37,286
CNR-ISMAR	C01	Salinity	11,592	37,383
CNR-ISMAR	PTF Acqua Alta	Salinity	12,508	45,314
CNR-ISMAR	E1	Salinity	12,570	44,143
CNR-ISMAR	Meda Senigallia	Salinity	13,219	43,737
CNR-ISMAR	PALOMA	Salinity	13,565	45,618
CNR-ISMAR	B2012	Salinity	17,194	41,341
CNR-ISSIA	ODAS (W1M3A)	Salinity	9,107	43,823
CSIC	Cabrera	Salinity	2,960	39,221
Dpt Fish& Mar. Res.	Paphos	Salinity	32,400	34,783
EARS	Koper	Salinity	13,729	45,549
HCMR	ZAKYN	Salinity	20,604	37,956
HCMR	Pylos	Salinity	21,591	36,822
HCMR	SARON	Salinity	23,569	37,610
HCMR	SKYRO	Salinity	24,464	39,113
HCMR	ATHOS	Salinity	24,724	39,974
HCMR	E1-M3A	Salinity	24,919	35,774

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
HCMR	Mykon	Salinity	25,462	37,523
HCMR	SANTO	Salinity	25,501	36,262
HCMR	Lesvo	Salinity	25,815	39,159
Hydr. Inst. Croatia	Split	Salinity	16,440	43,507
Ifremer	61284	Salinity	4,866	43,319
Inst. of Oceanograhpy and Fisheries, Croatia	Kastela Bay	Salinity	16,384	43,522
IOI	Malta MedGLOSS (Portomaso)	Salinity	14,503	35,917
ISPRA	Ancona	Salinity	13,7181	43,8216
Meteo-France	61002	Salinity	4,700	42,100
Meteo-France	61001	Salinity	7,800	43,400
NIB	Vida	Salinity	13,552	45,543
OGS	E2M3A	Salinity	17,720	41,800
Puertos del Estado	Cabo_de_Gata_buoy	Salinity	-2,320	36,570
Puertos del Estado	Valencia_buoy	Salinity	0,200	39,520
Puertos del Estado	Tarragona_buoy	Salinity	1,470	40,680
Puertos del Estado	Cabo_de_Palos_cost	Salinity	-0,638	37,654
SHOM	EXSH0028	Salinity	3,107	42,520
SHOM	EXSH0033	Salinity	3,699	43,398
SHOM	EXSH0022	Salinity	4,893	43,405
SHOM	EXSH0011	Salinity	5,356	43,291
SHOM	EXSH0032	Salinity	6,934	43,484
SHOM	EXSH0007	Salinity	7,285	43,696

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
SHOM	EXSH0027	Salinity	7,424	43,733
SHOM	EXSH0010	Salinity	8,760	41,920
SHOM	EXSH0026	Salinity	9,350	42,967
SHOM	EXSH0025	Salinity	9,404	41,857
Socib	Boya Bahía de Palma	Salinity	2,700	39,493
TUDES	Bodrum	Salinity	27,595	37,240
TUDES	Erdemly	Salinity	34,250	36,567
TUDES	Iskenderun	Salinity	36,167	36,583
UCY OC	MedGOOS 3	Salinity	32,134	33,699
UniTuscia-CNR	Civitavecchia	Salinity	11,778	42,083

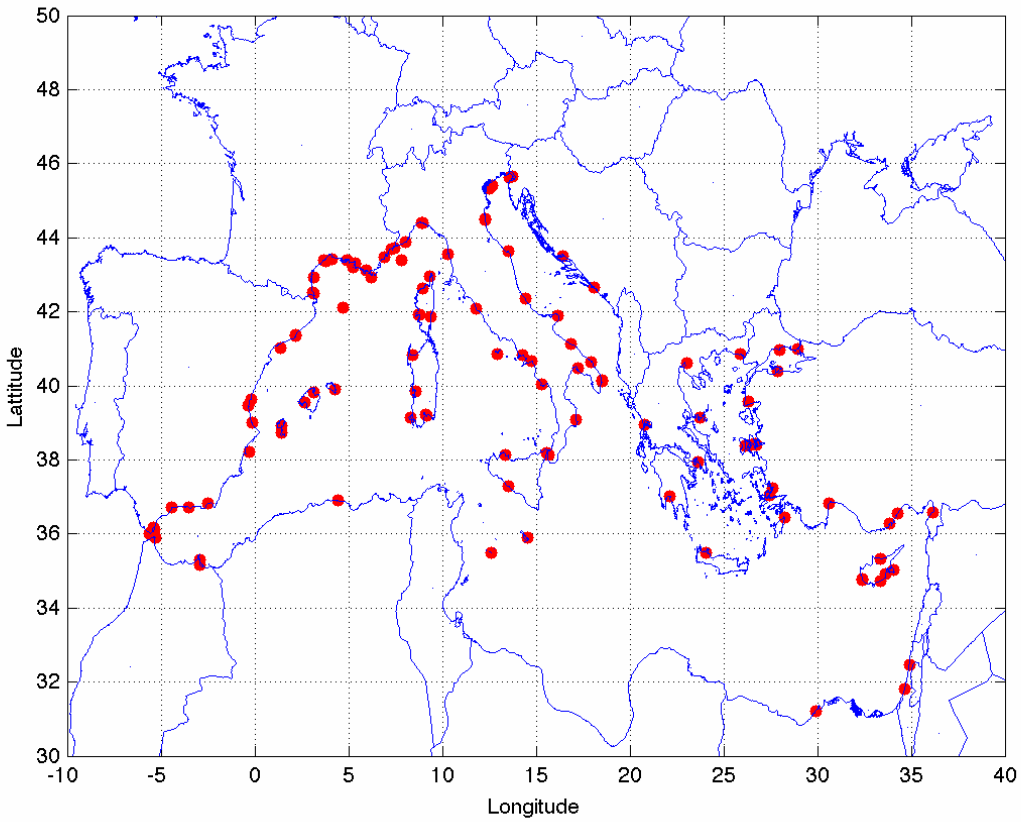

Figure 8.3: Positions of observational sealevel data from Coastal Observatories provided for temperature for the MONGOOS region.

Table 8.3 Overview of the available high frequently measured sealevel data from Coastal observatory systems for the MONGOOS region.

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
CETMEF	61191	Sealevel	3,125	42,916
CETMEF	61190	Sealevel	3,780	43,372
CETMEF	61004	Sealevel	6,207	42,930
CNR-IAMC	Oristano	Sealevel	8,553	39,862
CNR-ISMAR	PTF Acqua Alta	Sealevel	12,508	45,314
CNR-ISMAR	PALOMA	Sealevel	13,565	45,618
CNR-ISMAR	MOLO FRATELLI BANDIERA	Sealevel	13,752	45,649
IMS-METU	Tasucu	Sealevel	33,835	36,276
IMS-METU	Girne	Sealevel	33,334	35,338
IMS-METU	Tasucu	Sealevel	33,835	36,276
ISPRA	Lampedusa	Sealevel	12,604	35,500
ISPRA	Porto Empedocle	Sealevel	13,527	37,286
ISPRA	Reggio Calabria	Sealevel	15,649	38,121
ISPRA	Palermo	Sealevel	13,371	38,121
ISPRA	Messina	Sealevel	15,563	38,196
ISPRA	Crotone	Sealevel	17,137	39,081
ISPRA	Carloforte	Sealevel	8,309	39,148
ISPRA	Cagliari	Sealevel	9,114	39,210
ISPRA	Palinuro	Sealevel	15,275	40,031
ISPRA	Otranto	Sealevel	18,497	40,147
ISPRA	Taranto	Sealevel	17,225	40,475
ISPRA	Salerno	Sealevel	14,768	40,672
ISPRA	Napoli	Sealevel	14,269	40,841

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
ISPRA	Porto Torres	Sealevel	8,404	40,842
ISPRA	Bari	Sealevel	16,861	41,137
ISPRA	Vieste	Sealevel	16,179	41,887
ISPRA	Civitavecchia	Sealevel	11,789	42,094
ISPRA	Ortona	Sealevel	14,415	42,356
ISPRA	Livorno	Sealevel	10,299	43,546
ISPRA	Ancona	Sealevel	13,506	43,624
ISPRA	Imperia	Sealevel	8,019	43,878
ISPRA	Genova	Sealevel	8,925	44,410
ISPRA	Ravenna	Sealevel	12,283	44,492
ISPRA	Venezia	Sealevel	12,649	45,419
ISPRA	Trieste	Sealevel	13,759	45,649
ISPRA	Ponza	Sealevel	40,866	12,943
MedGLOSS	Alexandria	Sealevel	29,917	31,217
MedGLOSS	Ashdod	Sealevel	34,635	31,811
MedGLOSS	Hadera	Sealevel	34,917	32,467
MedGLOSS	Paphos	Sealevel	32,401	34,783
MedGLOSS	Nador	Sealevel	-2,950	35,167
MedGLOSS	Souda	Sealevel	24,050	35,500
MedGLOSS	Ceuta	Sealevel	-5,317	35,900
MedGLOSS	Porto Maso	Sealevel	14,519	35,909
MedGLOSS	Gibraltar	Sealevel	-5,350	36,117
MedGLOSS	Rhodos	Sealevel	28,233	36,433
MedGLOSS	Antalya	Sealevel	30,617	36,833
MedGLOSS	Malaga	Sealevel	4,433	36,900
MedGLOSS	Kalamata	Sealevel	22,133	37,017
MedGLOSS	Bodrum	Sealevel	27,429	37,036

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
MedGLOSS	Porto Empedocle	Sealevel	13,533	37,283
MedGLOSS	Piraieus	Sealevel	23,639	37,940
MedGLOSS	Alicante	Sealevel	-0,290	38,210
MedGLOSS	Chios	Sealevel	26,140	38,376
MedGLOSS	Mentes	Sealevel	26,732	38,414
MedGLOSS	Preveza	Sealevel	20,767	38,950
MedGLOSS	Skopelos	Sealevel	23,723	39,132
MedGLOSS	Cagliari	Sealevel	9,167	39,200
MedGLOSS	Palma	Sealevel	26,330	39,583
MedGLOSS	Otranto	Sealevel	18,500	40,133
MedGLOSS	Erdek	Sealevel	27,850	40,383
MedGLOSS	Thessaloniki	Sealevel	23,033	40,617
MedGLOSS	Brindisi	Sealevel	17,933	40,633
MedGLOSS	Napoli	Sealevel	14,250	40,833
MedGLOSS	Alexandropoulis	Sealevel	25,883	40,850
MedGLOSS	Istanbul	Sealevel	28,976	41,004
MedGLOSS	Barcelona	Sealevel	2,177	41,385
MedGLOSS	Aspretto	Sealevel	8,817	41,933
MedGLOSS	Dubrovnik	Sealevel	18,067	42,667
MedGLOSS	Marseille	Sealevel	5,350	43,300
MedGLOSS	Split	Sealevel	16,442	43,507
MedGLOSS	Genova	Sealevel	8,900	44,400
MedGLOSS	Ravenna	Sealevel	12,283	44,500
MedGLOSS	Trieste	Sealevel	13,750	45,650
Meteo France	61002	Sealevel	4,700	42,100
Meteo France	61188	Sealevel	3,168	42,488

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Meteo France	6100292	Sealevel	5,230	43,208
Meteo France	61001	Sealevel	7,800	43,400
Meteo France	61431	Sealevel	4,133	43,425
OC-UCY	Zygi	Sealevel	33,336	34,723
OC-UCY	Larnaca	Sealevel	33,638	34,910
OC-UCY	Paralimni	Sealevel	34,035	35,036
OC-UCY	Paphos	Sealevel	32,405	34,753
Puertos del Estado	MelillaTG	Sealevel	-2,918	35,291
Puertos del Estado	TarifaTG	Sealevel	-5,604	36,006
Puertos del Estado	AlgecirasTG	Sealevel	-5,398	36,177
Puertos del Estado	MalagaTG	Sealevel	-4,417	36,712
Puertos del Estado	MotrilTG	Sealevel	-3,524	36,720
Puertos del Estado	AlmeriaTG	Sealevel	-2,478	36,830
Puertos del Estado	FormenteraTG	Sealevel	1,419	38,735
Puertos del Estado	IbizaTG	Sealevel	1,450	38,911
Puertos del Estado	GandiaTG	Sealevel	-0,152	38,995
Puertos del Estado	ValenciaTG	Sealevel	-0,330	39,460

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Puertos del Estado	PalmadeMallorcaTG	Sealevel	2,638	39,560
Puertos del Estado	SaguntoTG	Sealevel	-0,206	39,634
Puertos del Estado	AlcudiaTG	Sealevel	3,139	39,835
Puertos del Estado	MahonTG	Sealevel	4,271	39,893
Puertos del Estado	BarcelonaTG	Sealevel	2,163	41,342
Puertos del Estado	Tarragona	Sealevel	1,350	41,013
SHOM	SolenzaraTG	Sealevel	9,404	41,857
SHOM	AjaccioTG	Sealevel	8,763	41,923
SHOM	PortVendresTG	Sealevel	3,107	42,520
SHOM	LaFigueiretteTG	Sealevel	8,935	42,640
SHOM	CenturiTG	Sealevel	9,350	42,966
SHOM	ToulonTG	Sealevel	5,914	43,123
SHOM	MarseilleTG	Sealevel	5,354	43,279
SHOM	SeteTG	Sealevel	3,699	43,398
SHOM	FosSurMerTG	Sealevel	4,893	43,405
SHOM	IleRousseTG	Sealevel	6,935	43,484
SHOM	NiceTG	Sealevel	7,285	43,696
SHOM	MonacoTG	Sealevel	7,421	43,729
TUDES	Erdemly	Sealevel	34,250	36,567
TUDES	Iskenderun	Sealevel	36,167	36,583
TUDES	Antalya	Sealevel	30,617	36,833

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
TUDES	Bodrum	Sealevel	27,595	37,240
TUDES	Izmir	Sealevel	26,500	38,417
TUDES	Mentes	Sealevel	26,717	38,433
TUDES	Erdek	Sealevel	27,850	40,383
TUDES	Ereglisi	Sealevel	27,967	40,967

A SOOP program is established providing profiles of 700 m depth. The MONGOOS community operates a of a varying number of Gliders, operating within the whole Mediterranean Sea and a number of actually 116 Argo profiles per month. The observational activities are complimented by the application 292 surface drifters and four HF radar stations.

Figure 8.4: Distribution of Ferryboxes running within European waters. Within the MONGOOS region there is one Ferrybox running. Taken from Jerico deliverable D 3.1 Report on the current status of Ferrybox ´

Figure 8.4 displays the distribution of Ferrybox lines running within the European waters. Table 8.4 summarises the Ferrybox activities ongoing on the Med sea.

Table 8.4: Ferrybox lines running in the MONGOOS area.

Name of the Ship	**Route**	**Data provider**	**Variables covered**
Olympic Champion	Piraeus (GR) – Heraklion(GR)	HCMR	T, S, Turbidity, Fluorescence, Diss. Oxygen pH Oxygen, Fluorescence, pH, Turbidity, nutrients

9. Coastal observing systems in the BLACK SEA GOOS region

Within the Black Sea region the main focus for monitoring the status of the marine environment was laid on collecting data from mainly coastal stations and through scientific cruises. Most of these data are included in databases and are available on. The historical temperature and salinity data set covering the period 1990-2011 will be available in integrated form at the end of January 2013 via the efforts undertaken within the InSitu Thematic Assembly center from the EC supported project MyOcean II.

The actual available systems providing data on a high frequently basis are displayed in the Figures 9.1-9.3. The tables 9.1-9.3 provide informations on data provider and positioning of the Coastal observatory system

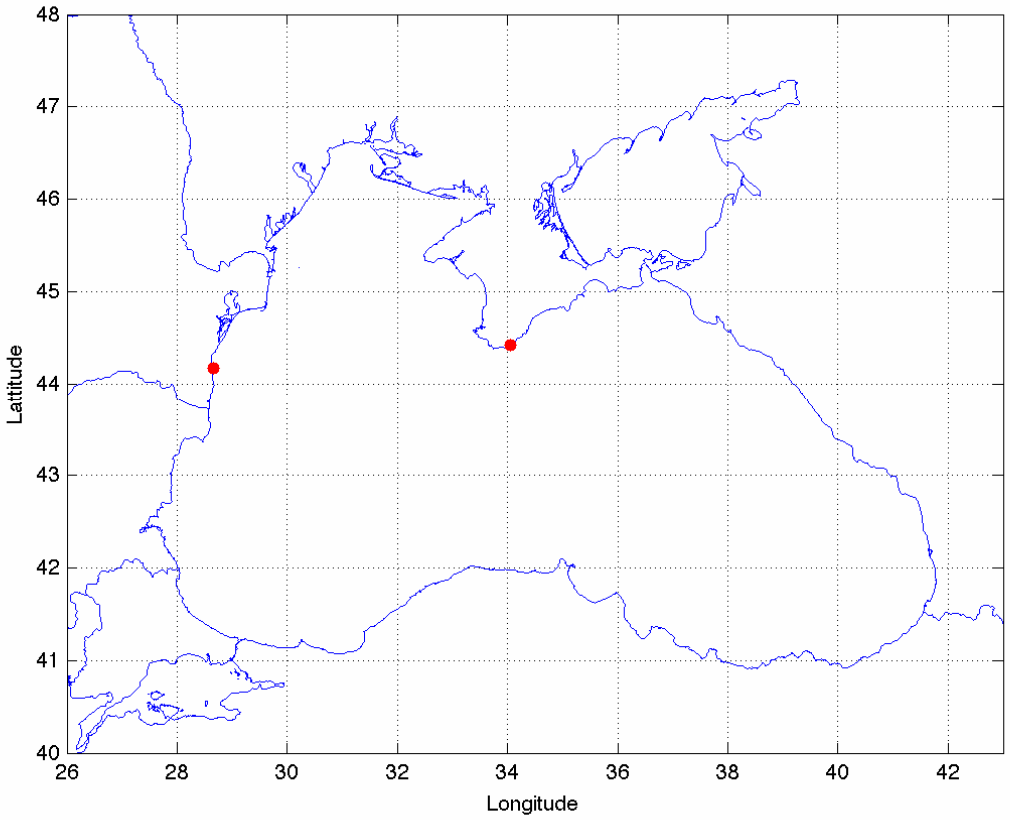

Figure 9.1: Positions of observational temperature data from Coastal Observatories provided for temperature for the Black Sea ROOS region.

Table 9.1 Overview of the available high frequently measured temperature data from Coastal observatory systems for the Black Sea GOOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Ntl Inst Mar. Res.	Constantza	Temperature	28,670	44,167
Mar. Hydro. Inst Ukraine	Kaciveli	Temperature	34,050	44,416

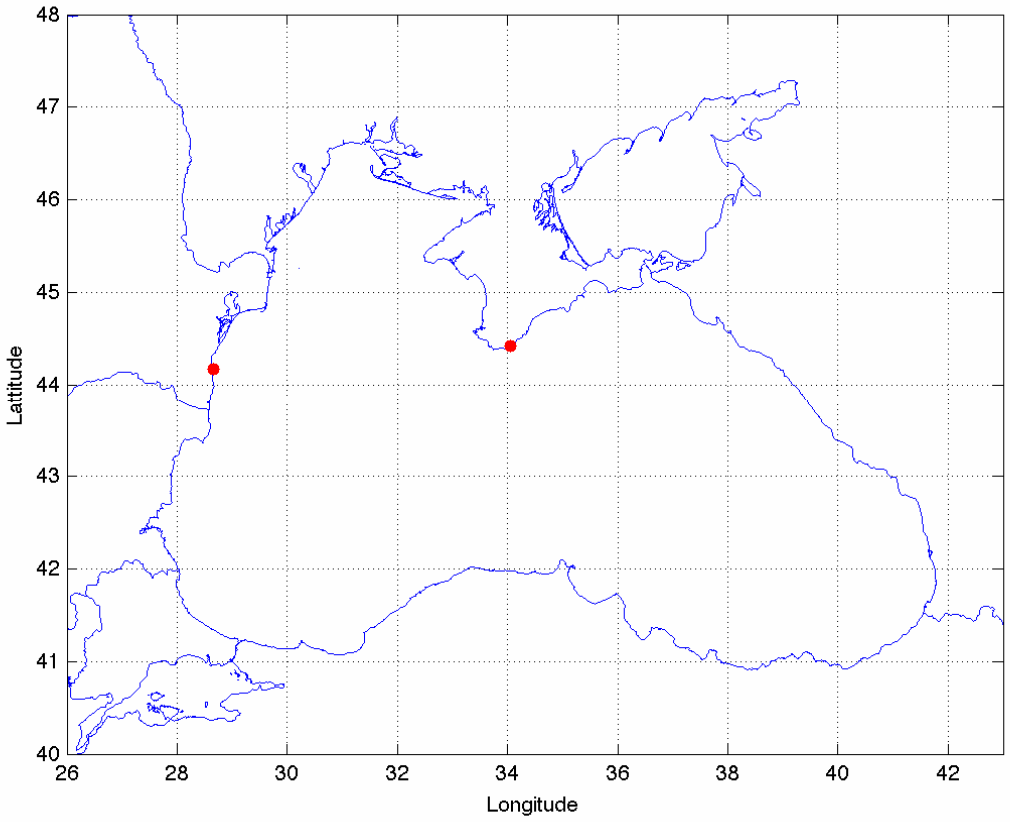

Figure 9.2: Positions of observational salinity data from Coastal Observatories provided for temperature for the Black Sea GOOS region.

Table 9.2 Overview of the available high frequently measured salinity data from Coastal observatory systems for the Black Sea GOOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
Ntl Inst Mar. Res.	Constantza	Salinity	28,670	44,167
Mar. Hydro. Inst Ukraine	Kaciveli	Salinity	34,050	44,416

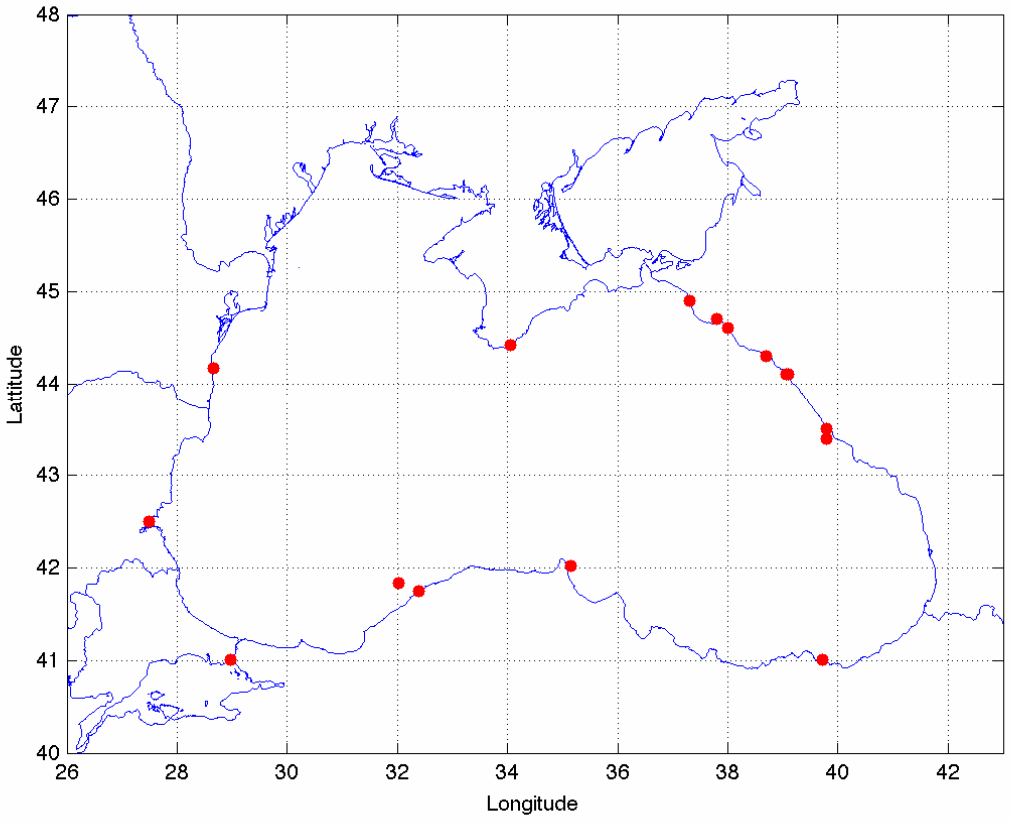

Figure 9.3: Positions of observational sealevel data from Coastal Observatories provided for temperature for the Black Sea GOOS region.

Table 9.3 Overview of the available high frequently measured sealevel data from Coastal observatory systems for the Black Sea GOOS region

Data provider	Station	Type	Longitude [degrees_east]	Latitude [degrees_north]
MedGLOSS	Istanbul	Sealevel	28,976	41,004
TUDES	Trabzon	Sealevel	39,727	41,005
TUDES	Amasra	Sealevel	32,385	41,749
TUDES	Igneada	Sealevel	32,017	41,833
TUDES	Sinop	Sealevel	35,158	42,027
MedGLOSS	Burgas	Sealevel	27,487	42,501
Hydrometeocenter of Russia	Adler	Sealevel	39,800	43,400
Hydrometeocenter of Russia	Sochi	Sealevel	39,800	43,500
Hydrometeocenter of Russia	Tuapse	Sealevel	39,100	44,100
MedGLOSS	Constantza	Sealevel	28,667	44,167
Hydrometeocenter of Russia	Dzhugba	Sealevel	38,700	44,300
MHI	Katsiveli	Sealevel	34,050	44,417
Hydrometeocenter of Russia	Gelendzhik	Sealevel	38,000	44,600
Hydrometeocenter of Russia	Novorossiysk	Sealevel	37,800	44,700
Hydrometeocenter of Russia	Anapa	Sealevel	37,300	44,900

The general goal is to build and maintain Basin scale in-situ observing system, which will consist of coastal, shelf and deep sea components. These observing systems should consist of:

- Coastal observatories: meteorological stations, oceanographic stations, sea level stations; HF radar systems
- Shelf moored or fixed platforms and deep sea observatories;
- Vessels: Research vessels, small vessels, SOOP, VOS, FerryBox;
- Coordinated basin-scale multi-national surveys by research vessels.
- Autonomous instruments: Argo buoys, Drifters, Gliders

The installation of the same costal observatory which will consist of a Weather station, oceanographic station and sea level station in each Black Sea country is reasonable. The resulting network of six observatories will be equipped with the same instruments and connected to In-situ TAC to provide real time data.
Near future aim for the improvement of the observational system is to:
Install Ferrybox systems equipped with physical and biogeochemical sensors on at least two lines crossing the open Black Sea and establishing an XBT measurement program for these two lines
Deployment of annually 5 Argo Buoys to monitor the vertical structure of the Black Sea region. These Buoys should be equipped with biogeochemical sensors improving the very large scarcity of biogeochemical measurements and complementary 5 surface drifters should be launched every year to cover upper layer dynamics.
Evolvement of two Glider sections through the Black Sea is highly desirable.
Establishment of seasonal multidisciplinary basin-scale surveys covering the whole Black Sea region
Installation of HF radar systems to improve the knowledge of the circulation pattern is highly desirable