

Marine Environment and Security for the European Area

MERSEA overall objective is to facilitate the visibility, understanding and exchange of the ocean modelling data, output products for users and **evaluate the strengths and weaknesses of the European Capacity for Ocean Monitoring and Forecasting.**

	SYS1= TOPAZ (Norway)	SYS2=MERCATOR (France)	SYS3=FOAM (UK Met Office)	SYS4=MFS (Italy)
About the model	Hybrid Coordinate Ocean Model (HYCOM)	Primitive Equations rigid-lid model (OPA 8.1)	Hadley Centre ocean & sea-ice model	Modular Ocean Model (MOM_1)
About assimilation <small>(cf. key inputs & data assimilation setup)</small>	Ensemble Kalman Filter (EnKF) / SEEK	SOFA, multivariate optimal interpolation (SAM1) then SEEK (SAM2)	'Analyses correction' by Lorenc et al. (1991)	SOFA, reduced order optimal interpolation
Areas <small>(cf. model configuration and served products for MERSEA)</small>	North Atlantic Nordic Seas and Arctic ocean	(Global) North Atlantic, Azores and Mediterranean sea	Global, North Atlantic, Arctic ocean and Shelf seas	Mediterranean sea
Outputs	weekly bulletin 1 nowcast, 3-week forecasts	weekly bulletin 2-week daily hindcast-nowcast, 2-week daily forecasts	daily bulletin (5-day forecasts)	weekly bulletin 7-day daily hindcast-nowcast 10-day daily forecasts

SEEK= Singular Evolutive Extended Kalman Filter

Parameters to be considered

Period of interest, July 2003 – July 2004

- **Class 1** standard products (primary products): 2D and 3D interpolated fields (regular grid) on a standard grid with horizontal resolution: $1/8^\circ$ for MED and for NAT, and standard depth levels (8 levels for MED, 12 levels for NAT)
- **Class 2** other model outputs, 2D higher resolution gridded interpolated fields along sections (every 10 km) and 1D tables at point locations
- **Class 3** derived quantities computed on a daily basis
- **Class 4** derived quantities computed on a weekly basis, useful to assess model performance

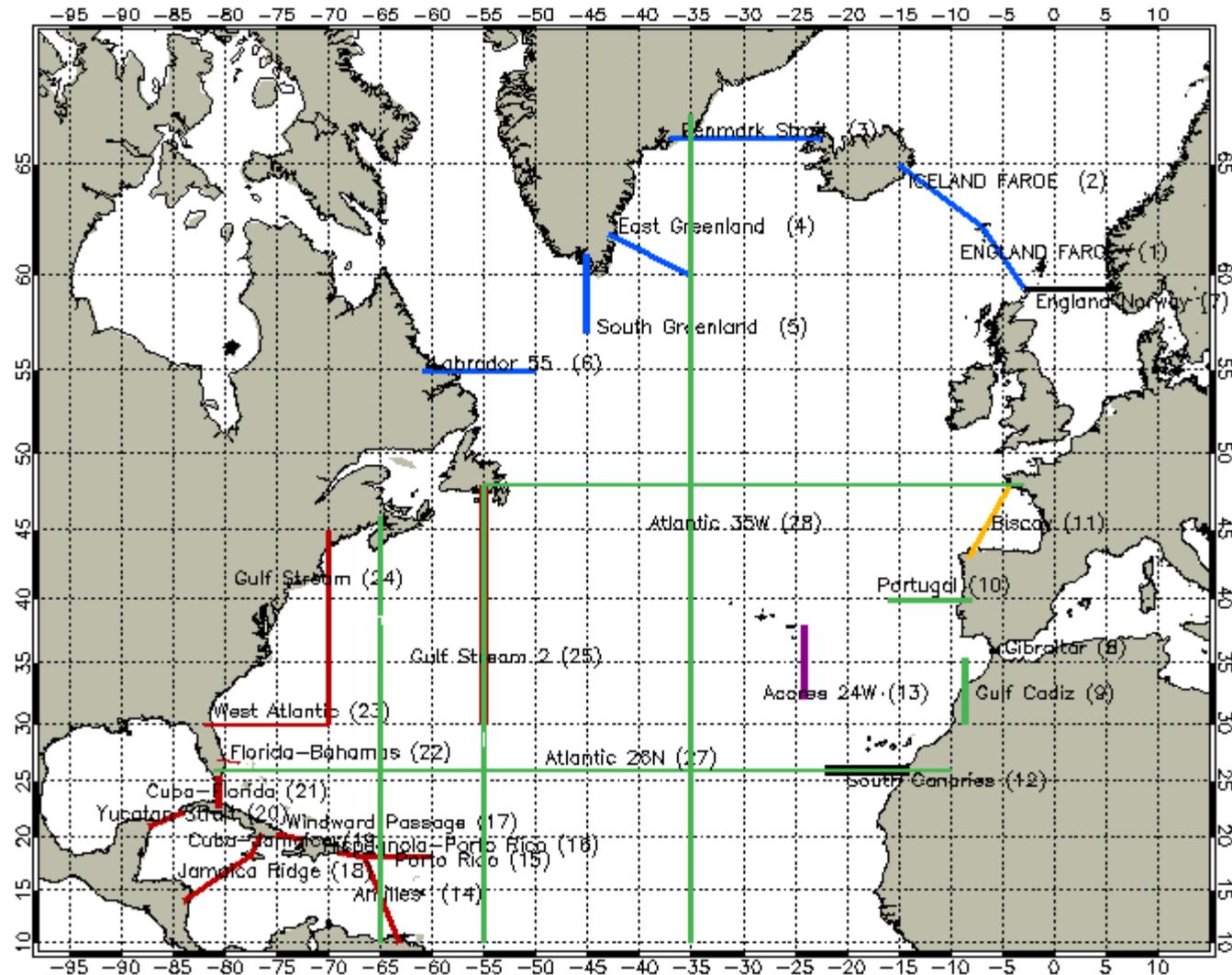
HYCOM and MERSEA

- Provide class I and II products for NAT
- Provide MED later when we have better vertical
- MERSEA compatible NetCDF ready to go
Add them to RSMAS LAS server
- Problems:
 - No time axis (aggregate via LAS)
 - No SST or SSS (top level at 5m)
 - No SSH in class II

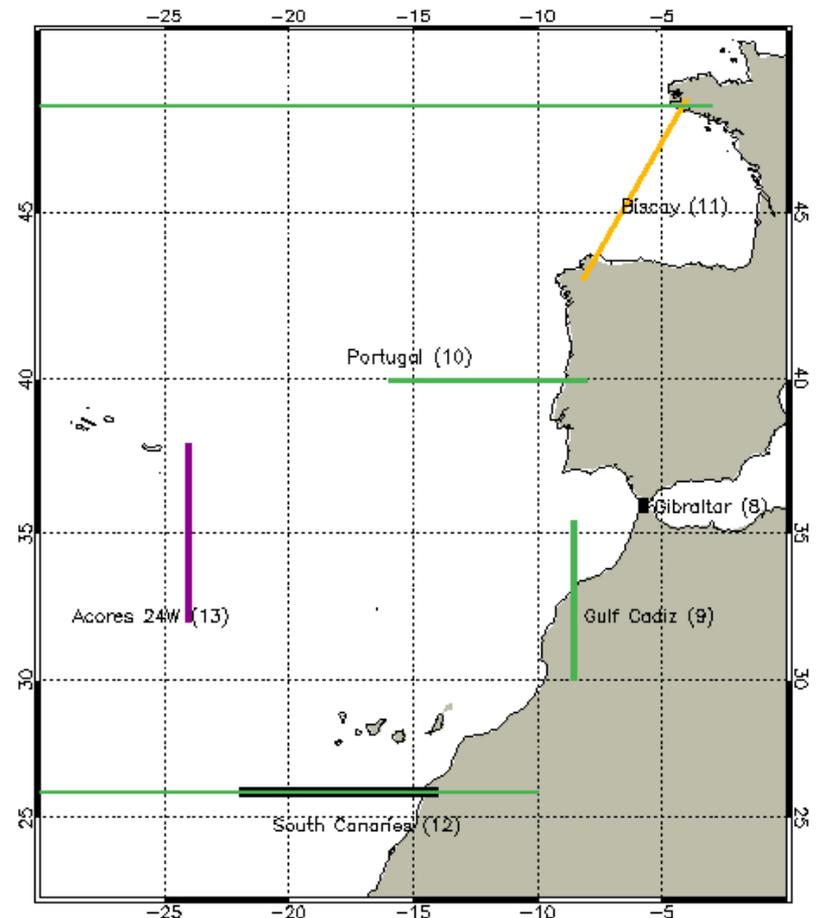
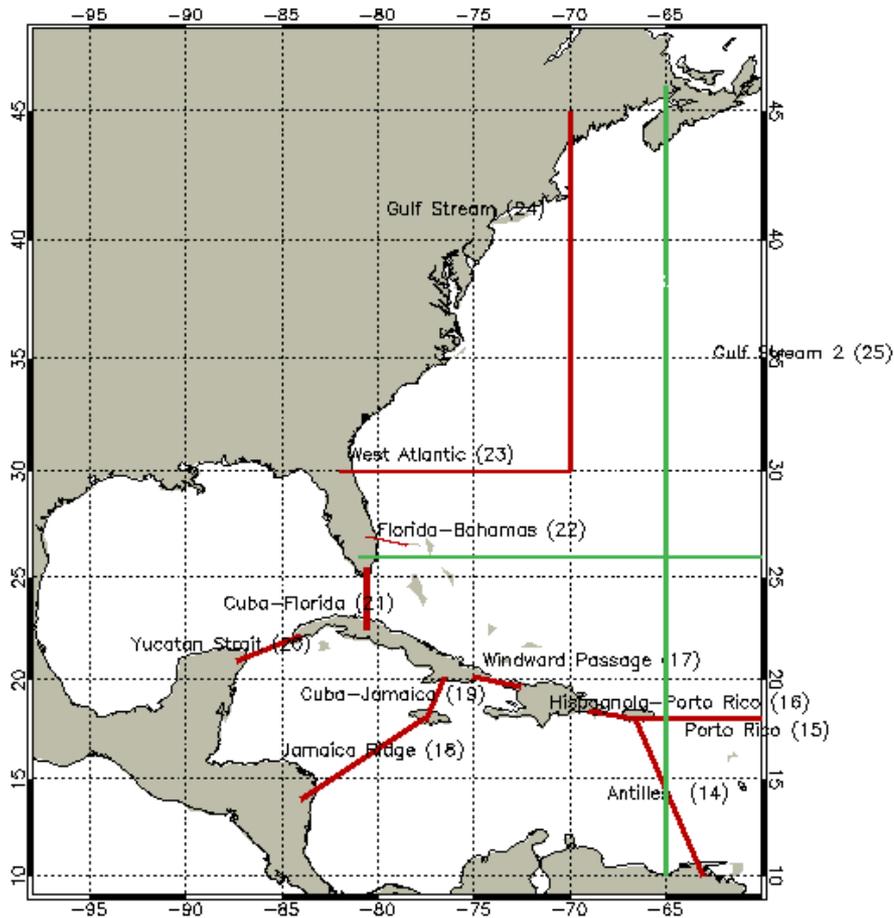
Class 1: 2D and 3D interpolated fields

3D daily fields (x, y, z)	T,S,U,V (best estimates)
2D daily fields (x, y)	of surface boundary fields (quantities as seen by the model) τ_{wind} (τ_x , τ_y), total net heat fluxes, water flux (E-P-R)
2D daily fields (x, y)	SSH, Barotropic STRMF, MLD ($\Delta\theta$ and $\Delta\rho$)
3D external fields	(on the same grid as the standard model outputs) monthly Levitus and Reynaud climatology (T,S) for NAT monthly MEDatlas climatology (T,S) for MED
2D external fields	2D bottom bathymetry (on the same grid as the standard model outputs)

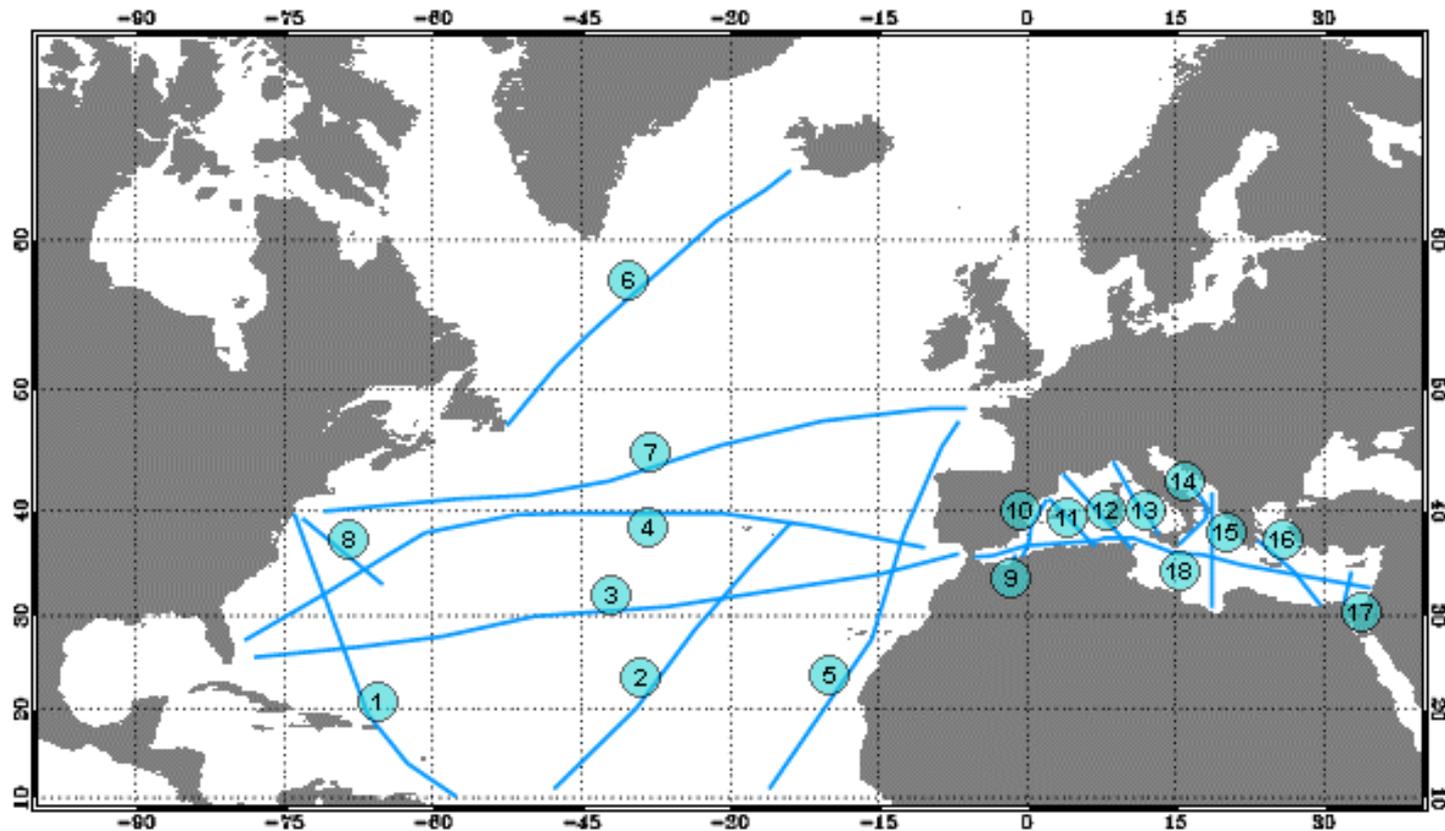
Position of vertical sections



Position of vertical sections

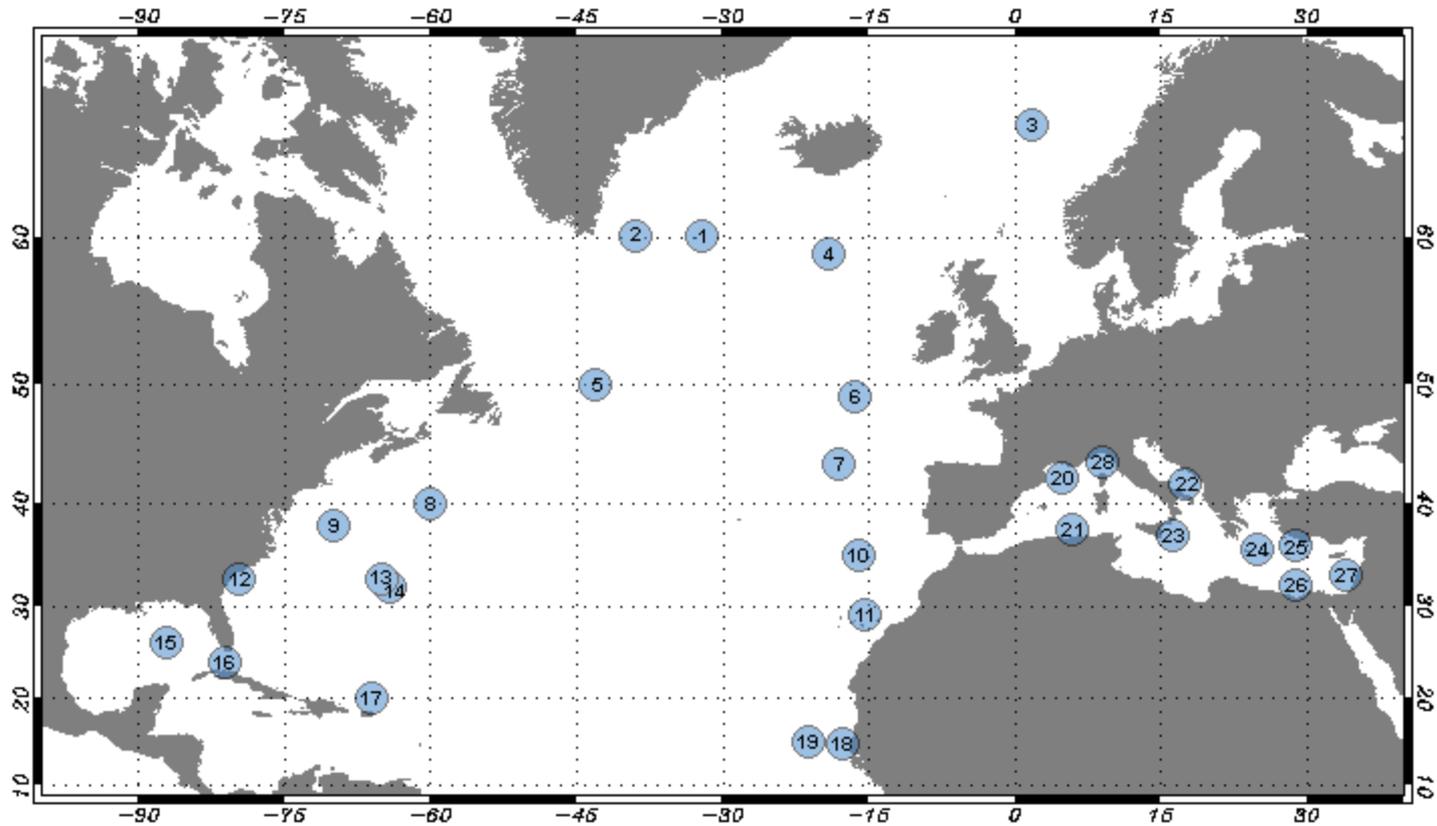


Sections for comparison to XBT line data



Position of moorings

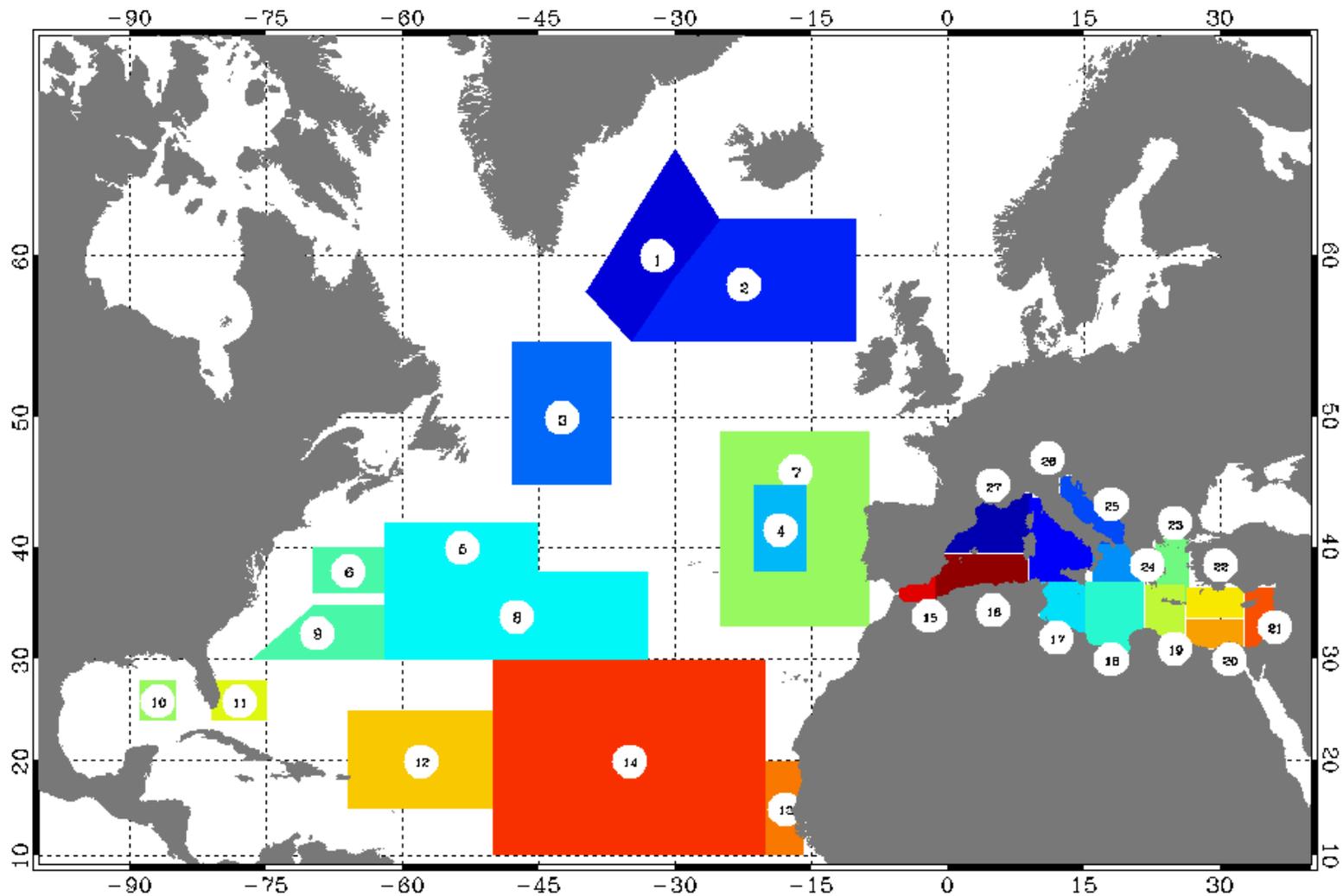
Mouillages MERSEA



MERSEA version v4 26 June 2003

mooring	Longitude	Latitude	Rational
1	32° W	60° N	Deep mixed layer
2	39° W	60° N	CIS Animate
3	2° E	66° N	Station Mike
4	19° W	59° N	Iceland basin “mooring”
5	43° W	50° N	Newfoundland Iceland / North Atlantic drift
6	16° 30 W	49° N	PAP Animate
7	18° W	43.5 ° N	Pomme Area
8	60° W	40° N	Gulf Stream extension
9	70° W	38° N	Gulf Stream
10	16° W	35° N	North Madeira / Azores current
11	15° 30 W	29° 10 N	ESTOC Animate
12 TG	79.56 ° W	32.78 N	Charleston Tide Gauge
13 TG	64.65° W	32.28° N	Bermuda tide gauge
14	64° 30 W	32° 10 N	BATS HydroS
15	87° W	26° N	Gulf of Mexico
16	81° W	24° N	Florida Strait
17	66° W		Puerto Rico XBT line
18 TG	17.63° W	14.71° N	Dakar Tide Gauge /upwelling
19 TG	21° W	15° N	Cape Verde Tide Gauge

Regions MERCATOR PSY2



NAT	Lon 1	Lat 1	Lon 2	Lat 2	Lon 3	Lat 3	Lon 4	Lat 4
1 Irminger sea	40°W	58.5°N	30°W	65.5°N	25°W	62°N	35°W	55°N
2 Iceland Basin	35°W	55°N	25°W	62°N	10°W	62°N	10°W	55°N
3 Newfoundland	48°W	45°N	48°W	55°N	37°W	55°N	37°W	45°N
4 Pomme	21.33°W	38°N	21.33°W	45°N	15.55°W	45°N	15.55°W	38°N
5 Gulf Stream	62°W	38°N	62°W	55°N	37°W	55°N	37°W	38°N
6 Gulf Stream XBT	70°W	36°N	70°W	40°N	62°W	40°N	62°W	36°N
7 North Madeira XBT	25°W	33°N	25°W	49°N	8.5°W	49°N	8.5°W	33°N
8 Sub Tropical Gyre	62°W	30°N	62°W	38°N	33°W	38°N	33°W	30°N
9 Bermuda tide	77°W	30°N	70°W	35°N	62°W	35°N	62°W	30°N
10 Gulf of Mexico	89°W	24°N	89°W	28°N	85°W	28°N	85°W	24°N
11 Florida strait XBT	81°W	24°N	81°W	28°N	75°W	28°N	75°W	24°N
12 Puerto Rico	66°W	15°N	66°W	25°N	50°W	25°N	50°W	15°N
13 Dakar	20°W	10°N	20°W	20°N	16°W	20°N	16°W	10°N
14 Cape Verde	50°W	10°N	50°W	30°N	20°W	30°N	20°W	10°N

END