



Deliverable T1.4.3 Data Catalogue

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<i>Deliverable authors:</i>	Christian Ferrarin, Michol Ghezzi, Marco Bajo, Stefano Menegon, Amedeo Faldini
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<i>Submitted by:</i>	CNR-ISMAR





TABLE OF CONTENTS

Table of Contents.....	1
Executive summary.....	2
Monitoring networks.....	3
Forecasting systems.....	15
Data infrastructures.....	28





EXECUTIVE SUMMARY

The present document reports all information collected from partners with the Metadata questionnaire. The aim of this survey was to identify existing networks, forecast systems and data infrastructures to design the Integrated Web System tool (I-STORMS IWS). The material is organized in a catalogue with the aim to help the design of the web system architecture in WPT2. This deliverable represents the first attempt to organize this kind of information at ADRION area scale. The catalogue is structured in three subsections, regarding the monitoring networks, the forecasting systems and the data infrastructures, respectively.



MONITORING NETWORKS

The questionnaires' responses received from the project partners revealed that the Adriatic-Ionian region is monitored by 56 tide gauges and 20 wave buoys. The location of all reported monitoring stations is illustrated in Figure 1, and the general characteristics of them are summarized in Error: Reference source not found.

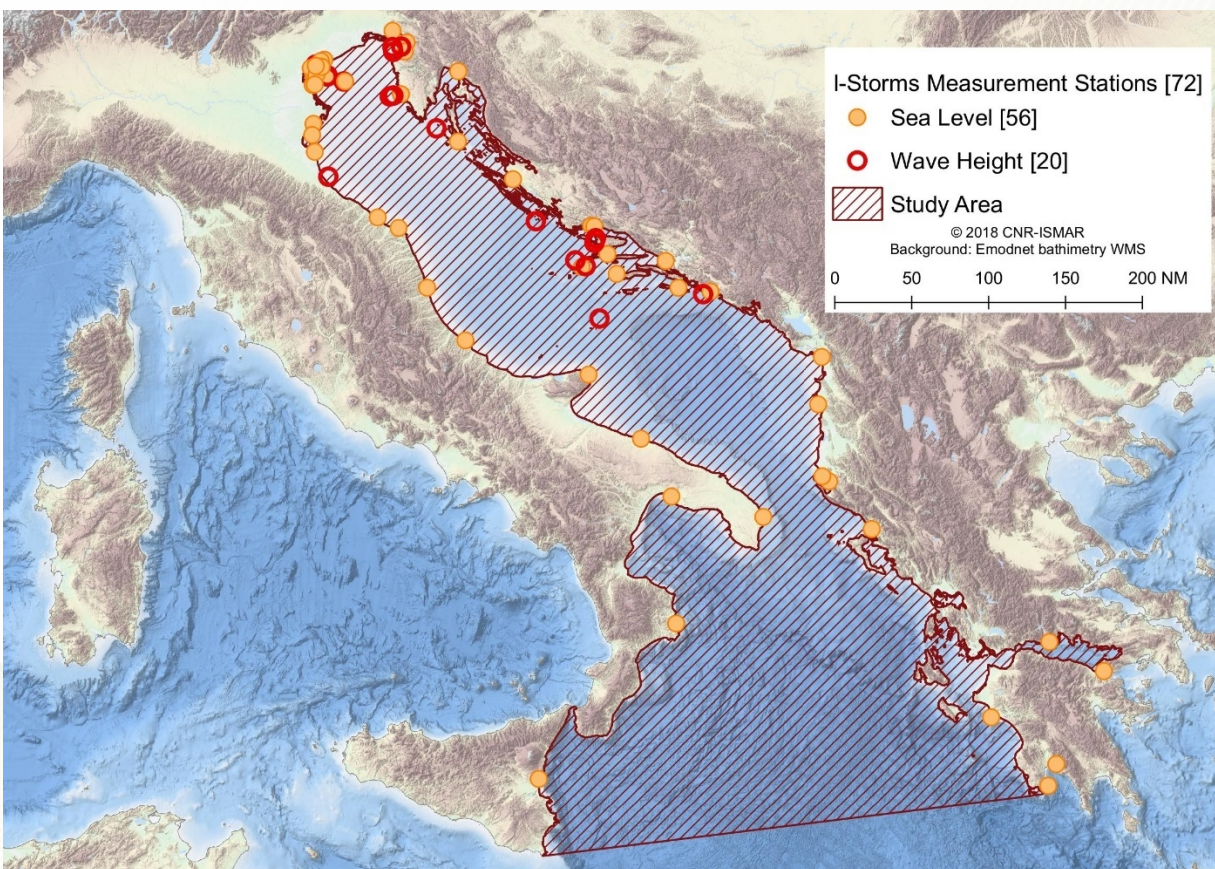


Figure 1: Monitoring stations over the Adriatic-Ionian region. Yellow and red dots identify water level (tide gauge) and wave stations, respectively.





Table 1: Overview of the questionnaires' responses related to the monitoring networks.

MONITORING NETWORK	
Number of stations	72 (56 tide gauges and 20 wave buoys)
Data formats	txt, CSV, JSON, HTML table, XML, SQL, XLS, PDF, BUFR
Output frequency	1, 5, 10, 30, 60 minutes
Download facilities	e-mail, HTTP download area, FTP server
Data licenses	public domain, dedicated agreement, CC-BY-NC

From the survey it emerges that the Adriatic Sea is well covered by monitoring stations for both water level (47 stations) and wave characteristics (20 stations), while 9 tide gauges and no wave buoys are present in the Ionian Sea. The highest concentration of monitoring stations is found in the Northern Adriatic Sea, which is one of the places with the highest tidal range and sea level extremes in the Mediterranean Sea. The main dissimilarities for the monitoring networks were found in data models and formats, download facilities and data licenses.

In the following tables, the details of the monitoring stations recording sea surface height or wave parameters are presented and grouped by project partner. To be noted that in several cases the station is also equipped with sensors for monitoring meteorological (wind speed and direction, sea surface pressure, air temperature, relative humidity and precipitation) or oceanographic parameters (sea water temperature, salinity, current speed and direction).





Table 2: Details of the monitoring stations retrieved by City of Venice (PP1, Italy).

Managing authority	Station name	Longitude	Latitude	Parameters collected	Acquisition frequency (min)
City of Venice	Diga Sud Lido	12.4266	45.4182	sea_surface_height	60;5
City of Venice	Diga Nord Malamocco	12.3414	45.3344	sea_surface_height	60;5
City of Venice	Diga Sud Chioggia	12.3128	45.2286	sea_surface_height; wind_speed; wind_direction	60;5
City of Venice	Punta Salute Canal Grande	12.3364	45.4311	sea_surface_height; sea_water_temperature	5
City of Venice	Laguna Nord Saline	12.4719	45.4956	sea_surface_height; wind_speed; wind_direction	5
City of Venice	Misericordia	12.3361	45.4453	sea_surface_height; wave_significant_height	5
City of Venice	Burano	12.4175	45.4828	sea_surface_height	5
City of Venice	Malamocco Porto	12.2919	45.3397	sea_surface_height; wind_speed;	5





				wind_direction	
City of Venice	Chioggia Porto	12.2806	45.2325	sea_surface_height; wind_speed; wind_direction	5
City of Venice	Chioggia Vigo	12.2803	45.2231	sea_surface_height	5
City of Venice	Fusina	12.2569	45.4089	sea_surface_height	5
City of Venice	Punta Salute Giudecca	12.3367	45.4306	sea_surface_height	CoV

Table 3: Details of the monitoring stations retrieved by CNR-ISMAR (PP2, Italy).

Managing authority	Station name	Longitude	Latitude	Parameters collected	Acquisition frequency (min)
CNR-ISMAR	VE-PTF	12.5100	45.3100	sea_surface_height; wind_direction; wind_speed; wave_significant_height; wave_direction; wave_mean_period; wave_peak_period sea_surface_pressure; air_temperature; sea_water_temperature;	30



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				sea_water_salinity; sea_water_speed; sea_water_direction; relative_humidity; precipitation	
CNR-ISMAR	VE-ABT	12.7800	45.2500	sea_surface_height; sea_surface_pressure; air_temperature; sea_water_temperature; relative_humidity; wind_direction; wind_speed;	30
CNR-ISMAR	AN-SNG	13.2000	43.7500	sea_surface_height; wind_direction; wind_speed; sea_surface_pressure; air_temperature; relative_humidity; sea_water_temperature; sea_water_salinity	10
ISPRA	Monfalcone	13.5486	45.7814	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10
ISPRA	Ravenna	12.2828	44.4921	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10



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ISPRA	Ancona	13.5060	43.6246	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10
ISPRA	San Benedetto del Tronto	13.8898	42.9551	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10
ISPRA	Ortona	14.4149	42.3560	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10
ISPRA	Vieste	16.1786	41.8872	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10
ISPRA	Bari	16.8615	41.1372	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10
ISPRA	Otranto	18.4972	40.1473	sea_surface_height; sea_water_temperature; air_temperature; wind_speed;	10





				wind_direction	
ISPRA	Taranto	17.2248	40.4753	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10
ISPRA	Crotone	17.1368	39.0816	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10
ISPRA	Catania	15.0939	37.4980	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10
ISPRA	Monfalcone	13.5486	45.7814	sea_surface_height; sea_water_temperature; air_temperature; wind_speed; wind_direction	10

Table 4: Details of the monitoring stations retrieved by ARPAE (PP3, Italy).

Managing authority	Station name	Longitude	Latitude	Parameters collected	Acquisition frequency (min)
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Arpae	Nausicaa	12.4766	44.2155	wave_significant_height; wave_direction; wave_mean_period; wave_peak_period; sea_water_temperature	30
Arpae	Porto Garibaldi	12.2494	44.6767	sea_surface_height	10
Arpae	Volano	12.2742	44.7979	sea_surface_height	n/a





Table 5: Details of the monitoring stations retrieved by ARSO (PP4, Slovenia).

Managing authority	Station name	Longitude	Latitude	Parameters collected	Acquisition frequency (min)
National Institute of Biology	Vida	13.5454	45.5508	air_temperature 2m; sea_surface_pressure; wind_speed; wind_direction; relative_humidity; wave_significant_height; wave_direction; wave_mean_period; wave_peak_period; sea_water_temperature; sea_water_salinity; sea_water_speed; sea_water_direction	30
ARSO	Zora	13.6717	45.6033	wave_significant_height; wave_direction; wave_mean_period; wave_peak_period; sea_water_temperature; sea_water_speed; sea_water_direction	60
ARSO	Zarja	13.5354	45.6016	wave_significant_height; wave_direction; wave_mean_period; wave_peak_period; sea_water_temperature;	60





				sea_water_speed; sea_water_direction	
ARSO	Mareograf Koper	13.7245	45.5481	sea_surface_height; sea_water_temperature	10

Table 6: Details of the monitoring stations retrieved by PED-EPIRUS (PP7, Greece).

Managing authority	Station name	Longitude	Latitude	Parameters collected	Acquisition frequency (min)
Hellenic Navy Hydrographic Service	Katakolo	21.3192	37.6405	sea_surface_height	1
Hellenic Navy Hydrographic Service	Kalamata	22.1098	37.0215	sea_surface_height	1
Hellenic Navy Hydrographic Service	Peiraias	23.6212	37.9347	sea_surface_height	1
Hellenic Navy Hydrographic Service	Syros	24.9411	37.4380	sea_surface_height	1
National	Koroni	21.9600	36.8000	sea_surface_height	1





Observatory of Athens					
National Observatory of Athens	Kapsali	23.0000	36.1400	sea_surface_height	1
National Observatory of Athens	Corinth	22.9365	37.9452	sea_surface_height	1
National Observatory of Athens	Paleochora	23.6800	35.2200	sea_surface_height	1
National Observatory of Athens	Panormos	22.2539	38.3600	sea_surface_height	1

Table 7: Details of the monitoring stations retrieved by IGWEW (PP8, Albania).

Managing authority	Station name	Longitude	Latitude	Parameters collected	Acquisition frequency (min)
Institute of GeoSciences	Vlore Triport	19.3936	40.5144	wind_speed; wind_direction; air_temperature; relative_humidity; sea_surface_height	2 per day



I-STORMS



Institute of GeoSciences	Durres	19.4526	41.3025	wind_speed; wind_direction; air_temperature; relative_humidity; sea_surface_height	120
Institute of GeoSciences	Vlore	19.4810	40.4501	wind_speed; wind_direction; air_temperature; relative_humidity; sea_surface_height	120
Institute of GeoSciences	Sarande	20.0035	39.8705	wind_speed; wind_direction; air_temperature; relative_humidity; sea_surface_height	120
Institute of GeoSciences	Shengjin	19.5854	41.8124	wind_speed; wind_direction; air_temperature; relative_humidity; sea_surface_height	120





Table 8: Details of the monitoring stations retrieved by DHMZ (PP9, Croatia). The stations marked with a * will start to operate in 2019.

Managing authority	Station name	Longitude	Latitude	Parameters collected	Acquisition frequency (min)
HHI	Rovinj	13.6333	45.0833	sea_surface_height	60
HHI	Mali Lošinj	14.4667	44.5333	sea_surface_height	60
HHI	Zadar	15.2667	44.0833	sea_surface_height	60
HHI	Split	16.4333	43.5000	sea_surface_height	60
HHI	Vis	16.2000	43.0667	sea_surface_height	60
HHI	Ploče	17.4500	43.0500	sea_surface_height	60
HHI	Dubrovnik	18.0667	42.6667	sea_surface_height	60
PMF Zagreb	Bakar	14.5333	45.3000	sea_surface_height	60
HHI	Dubrovnik Sv Andija	17.9550	42.6467	wave_significant_height; wave_direction; wave_mean_period; wave_peak_period	n/a
HHI	Sutivan 1	16.4414	43.368	wave_significant_height	n/a



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			9	ht; wave_direction; wave_mean_period; wave_peak_period	
HHI	Sutivan 2	16.4397	43.363 1	wave_significant_heig ht; wave_direction; wave_mean_period; wave_peak_period	n/a
HHI	Umag port	13.4600	45.065 6	wave_significant_heig ht; wave_direction; wave_mean_period; wave_peak_period	n/a
HHI	Rovinj	13.5156	45.073 6	wave_significant_heig ht; wave_direction; wave_mean_period; wave_peak_period	n/a
IZOR	Cape Ražanj; Brač	16.4150	43.320 0	wave_significant_heig ht; wave_direction; wave_mean_period; wave_peak_period	10
IZOR	Cape Stončica; Vis	16.2600	43.073 3	wave_significant_heig ht; wave_direction; wave_mean_period; wave_peak_period	10
IZOR	IZOR -Kaštelan ski zaljev	16.3875	43.509 4	sea_surface_height; sea_surface_pressure; wind_speed; wind_direction	10
IZOR	Vela	16.7078	42.959	sea_surface_height;	10



I-STORMS



	Luka; Korčula		7	sea_surface_pressure; wind_speed; wind_direction	
IZOR	Starigrad; Hvar	16.5956	43.184 4	sea_surface_height; sea_surface_pressure; wind_speed; wind_direction	10
IZOR	Sobra; Mljet	17.6006	42.744 4	sea_surface_height	10
DHMZ*	P2 Kvarner	14.1517	44.691 4	wave_significant_height; wave_direction; wave_mean_period; wave_peak_period; sea_surface_pressure; wind_speed; wind_direction	30
DHMZ*	P4 Blitvenica	15.5667	43.606 4	wave_significant_height; wave_direction; wave_mean_period; wave_peak_period; sea_surface_pressure; wind_speed; wind_direction	30
DHMZ*	P5 Vis chanell	16.1125	43.146 1	wave_significant_height; wave_direction; wave_mean_period; wave_peak_period; sea_surface_pressure; wind_speed;	30





				wind_direction	
DHMZ*	P3-a- (Palagruža)	16.4014	42.489 4	wave_significant_height; wave_direction; wave_mean_period; wave_peak_period; sea_surface_pressure; wind_speed; wind_direction	30
DHMZ*	Buoy 5- TBD	n/a	n/a	wave_significant_height; wave_direction; wave_mean_period; wave_peak_period; sea_surface_pressure; wind_speed; wind_direction	30

The updated list of monitoring stations is available at the following link:
<https://docs.google.com/spreadsheets/d/1gcxoSKOKsDRNxp9JhjpFhtepGXVMTxpW9Xf09cfoS6U/edit#gid=109425120>





FORECASTING SYSTEMS

The questionnaires' responses received from the project partners revealed a variety of operational forecasting systems in the Adriatic-Ionian region. Table 9 summarizes the questionnaires' responses received from the project partners and related to the existing sea level height and wave forecasting systems.

Table 9: Overview of the questionnaires' responses related to the forecasting systems.

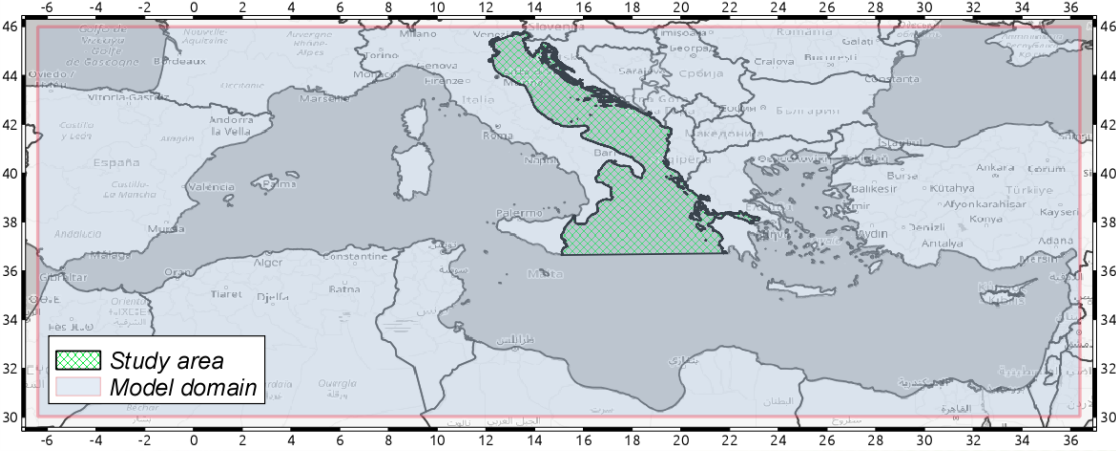
FORECASTING SYSTEMS	
Number of forecasting systems	12 (7 of sea level height and 7 of waves)
Geographic domain	Mediterranean, Adriatic, North-Adriatic
Horizontal resolution	1, 2, 4 km
Vertical discretization	1, 18, 20, 31 layers
Output format	netCDF, GRIB, txt, JSON
Download facilities	e-mail, HTTP and FTP download areas
Licenses	CC-BY, CC-BY-NC, dedicated agreements

There are 12 forecasting systems operating on the study area and managed directly by the project partners, with 7 predicting sea level height and 7 predicting the wave characteristics. There is some variability in model outputs in term of temporal and spatial resolution, spatial scale, spatial domain (e.g. Mediterranean Sea, Adriatic Sea, local areas), grid arrangement (e.g. structured or unstructured) and data format (e.g. netCDF, GRIB).





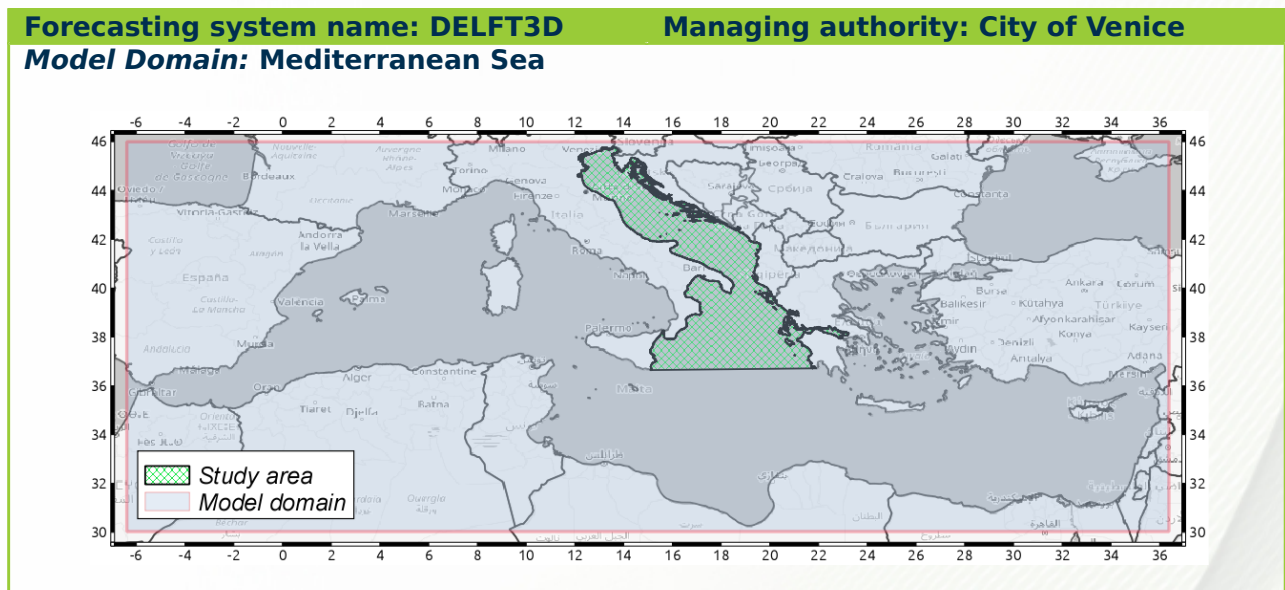
It follows the description of the reported forecasting systems.

Forecasting system name: SHYFEM		Managing authority: City of Venice	
Model Domain: Mediterranean Sea			
			
Simulated variables	sea level height	Core model engine:	SHYFEM
Spatial Resolution:	Variable, min. 1 km	Vertical discretization	1 layer
Open sea boundary conditions:	Sea level from GLO model at Gibraltar Strait	Atmosphere boundary forcing:	ECMWF (25 and 12.5 km)
Baroclinic forcing:	ignored	Tides:	ignored
Model coupling:	ignored	Data Assimilation:	none
Length of forecast:	10 days	Output frequency:	1 h
Output format:	txt, json	Metadata conventions:	Climate and Forecast





Download facilities:	FTP; HTTP; e-mail	Forecast license:	Creative Commons
Website:	https://www.comune.venezia.it/it/content/la-previsione		



Simulated variables	sea level height	Core model engine:	DELFT3D
Spatial Resolution:	Variable, min. 1 km	Vertical discretization	1 layer
Open sea boundary conditions:	Sea level from GLO model at Gibraltar Strait	Atmosphere boundary forcing:	ECMWF (25 and 12.5 km)
Baroclinic forcing:	ignored	Tides:	ignored
Model coupling:	ignored	Data Assimilation:	None
Length of forecast:	10 days	Output frequency:	1 h





Output format:	txt, json	Metadata conventions:	Climate and Forecast
Download facilities:	FTP; HTTP; e-mail	Forecast license:	Creative Commons
Website:	https://www.comune.venezia.it/it/content/la-previsione		

Forecasting system name: KASSANDRA **Managing authority: CNR-ISMAR**

Model Domain: Mediterranean Sea



Simulated variables	sea level height, wave characteristics	Core model engine:	SHYFEM/WWM3
Spatial Resolution:	Variable, min. 1 km	Vertical discretization	18 zeta layers
Open sea boundary conditions:	Sea level from IBI model at Gibraltar Strait	Atmosphere boundary forcing:	MOLOCH (1.25 km) BOLAM (8.3 km), GFS (40 km)
Baroclinic forcing:	ignored	Tides:	considered





Model coupling:	Wave-current	Data Assimilation:	none
Length of forecast:	4 days	Output frequency:	3 h
Output format:	txt, netCDF	Metadata conventions:	Climate and Forecast
Download facilities:	on request via e-mail	Forecast license:	use for research
Website:	http://www.ismar.cnr.it/kassandra		

Forecasting system name: ISSOS **Managing authority: CNR-ISMAR**
Model Domain: Mediterranean Sea



Simulated variables	sea level height	Core model engine:	SHYFEM
Spatial Resolution:	Variable, min. 1 km	Vertical discretization	1 layer





Open sea boundary conditions:	Sea level from IBI model at Gibraltar Strait	Atmosphere boundary forcing:	BOLAM (8.3 km)
Baroclinic forcing:	ignored	Tides:	ignored
Model coupling:	ignored	Data Assimilation:	none
Length of forecast:	3 days	Output frequency:	1 h
Output format:	txt, netCDF	Metadata conventions:	Climate and Forecast
Download facilities:	on request via e-mail	Forecast license:	use for research
Website:	http://cigno.ve.ismar.cnr.it/		

Forecasting system name: NETTUNO **Managing authority: CNR-ISMAR**

Model Domain: Mediterranean Sea



Simulated variables	Wave characteristics	Core model engine:	WAM
Spatial	4.5 km	Vertical	1 layer

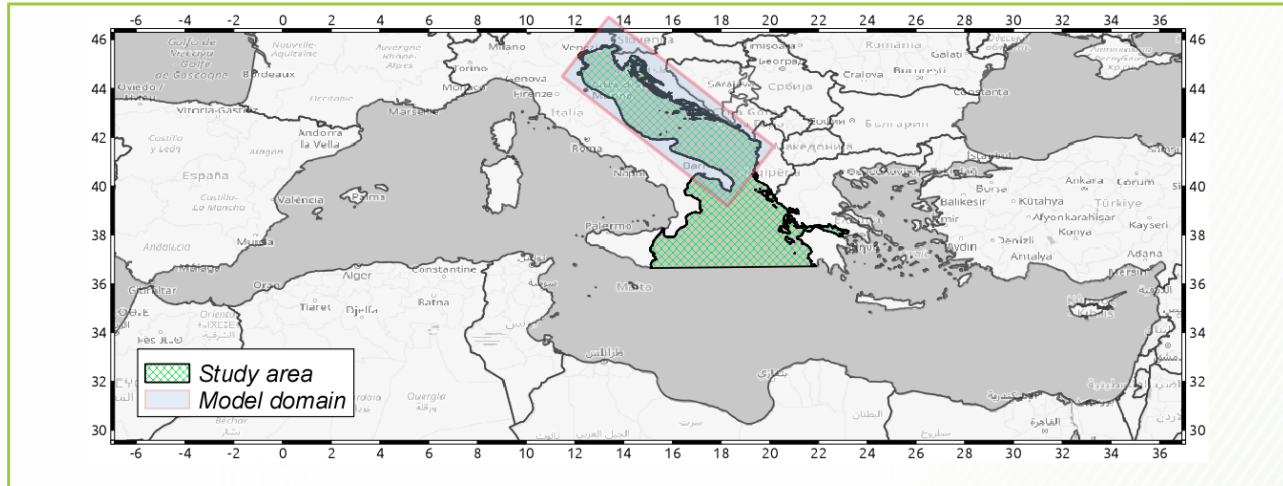




Resolution:		discretization	
Open sea boundary conditions:	none	Atmosphere boundary forcing:	COSMO-ME (5 km)
Baroclinic forcing:	ignored	Tides:	ignored
Model coupling:	ignored	Data Assimilation:	none
Length of forecast:	3 days	Output frequency:	3 h
Output format:	GRIB	Metadata conventions:	Climate and Forecast
Download facilities:	on request via e-mail	Forecast license:	use for research
Website:	http://ricerca.ismar.cnr.it/modelli/onde_med_italia/onde_med_italia.php		

Forecasting system name: HENETUS **Managing authority: CNR-ISMAR**
Model Domain: Adriatic Sea





Simulated variables	Wave characteristics	Core model engine:	WAM
Spatial Resolution:	1/12 degree	Vertical discretization	1 layer
Open sea boundary conditions:	none	Atmosphere boundary forcing:	ECMWF (16 km)
Baroclinic forcing:	ignored	Tides:	ignored
Model coupling:	ignored	Data Assimilation:	none
Length of forecast:	10 days	Output frequency:	1 h
Output format:	GRIB	Metadata conventions:	Climate and Forecast
Download facilities:	on request via e-mail	Forecast license:	use for research
Website:	http://ricerca.ismar.cnr.it/MODELLI/ONDE_HENETUS/ONDE_HENETUS.php		





Forecasting system name: SWAN **Managing authority: ARPAE**
Model Domain: Mediterranean Sea, Italian Seas, Emilia-Romagna coast



Simulated variables	Wave characteristics	Core model engine:	SWAN
Spatial Resolution:	3 nested domains: 25, 8, 0.8 km	Vertical discretization	1 layer
Open sea boundary conditions:	none	Atmosphere boundary forcing:	COSMO-17 (7 km)
Baroclinic forcing:	ignored	Tides:	ignored
Model coupling:	ignored	Data Assimilation:	none
Length of forecast:	3 days	Output frequency:	1 h
Output format:	GRIB	Metadata conventions:	none

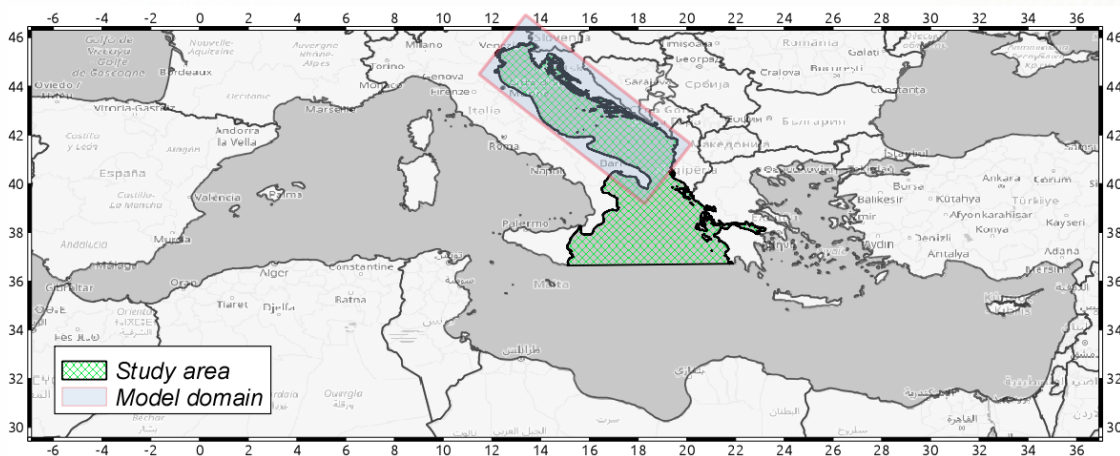




Download facilities:	FTP; HTTP; e-mail	Forecast license:	cooperation agreement
Website:	https://www.arpae.it/dettaglio_generale.asp?id=93&idlivello=160		

Forecasting system name: ADRIAROMS Managing authority: ARPAE

Model Domain: Adriatic Sea



Simulated variables	sea level height	Core model engine:	ROMS
Spatial Resolution:	3 km	Vertical discretization	20 sigma layers
Open sea boundary conditions:	MFS at Otranto Strait	Atmosphere boundary forcing:	COSMO-17 (7 km)
Baroclinic forcing:	considered	Tides:	considered
Model coupling:	ignored	Data Assimilation:	none
Length of forecast:	3 days	Output frequency:	1 h
Output format:	GRIB	Metadata	none

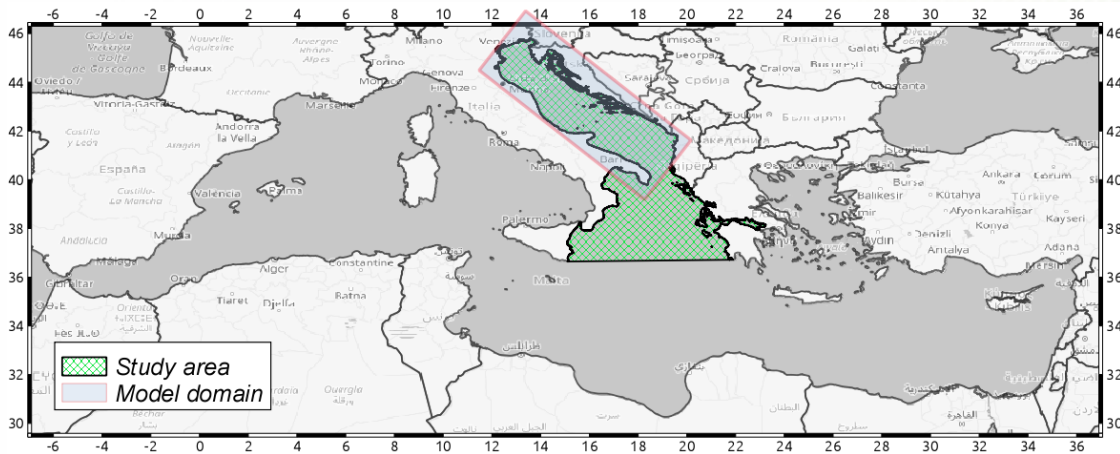




		conventions:	
Download facilities:	FTP; HTTP; e-mail	Forecast license:	cooperation agreement
Website:	https://www.arpae.it/dettaglio_generale.asp?id=93&idlivello=160		

Forecasting system name: COAWST **Managing authority: ARPAE**

Model Domain: Adriatic Sea



Simulated variables	Sea level height, wave characteristics	Core model engine:	ROMS/SWAN
Spatial Resolution:	2 km	Vertical discretization	20 sigma layers
Open sea boundary conditions:	MFS at Otranto Strait	Atmosphere boundary forcing:	COSMO-17 (7 km)
Baroclinic forcing:	considered	Tides:	considered
Model coupling:	Wave-current	Data Assimilation:	none

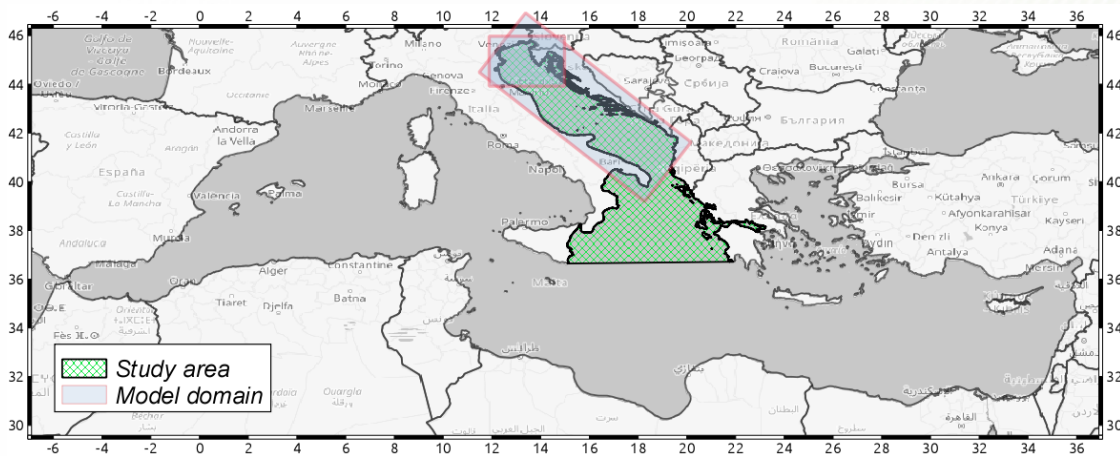




Length of forecast:	3 days	Output frequency:	1 h
Output format:	GRIB	Metadata conventions:	none
Download facilities:	FTP; HTTP; e-mail	Forecast license:	cooperation agreement
Website:	https://www.arpae.it/dettaglio_generale.asp?id=93&idlivello=160		

Forecasting system name: SMMO-NEMO Managing authority: ARSO

Model Domain: Adriatic Sea and North Adriatic Sea



Simulated variables	sea level height	Core model engine:	NEMO
Spatial Resolution:	2 nested domains: 1/72 and 1/216 degree	Vertical discretization	31 and 21 layers
Open sea boundary conditions:	MFS at Otranto Strait	Atmosphere boundary forcing:	ALADIN (1.5 km)

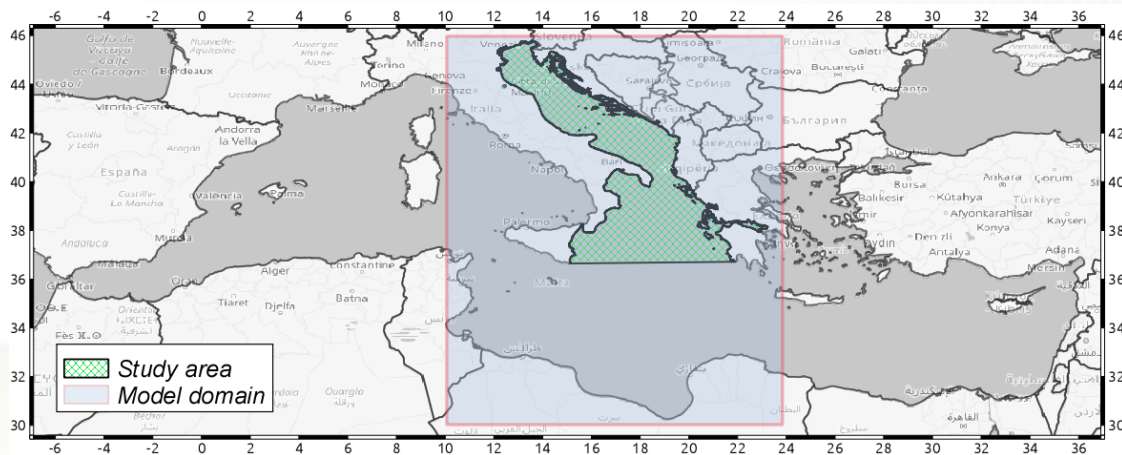




Baroclinic forcing:	considered	Tides:	considered
Model coupling:	ignored	Data Assimilation:	none
Length of forecast:	3 days	Output frequency:	1 h
Output format:	netCDF	Metadata conventions:	none
Download facilities:	FTP	Forecast license:	agreement
Website:			

Forecasting system name: SMMO-WAM **Managing authority: ARSO**

Model Domain: Central Mediterranean Sea



Simulated variables	wave characteristics	Core model engine:	WAM
Spatial Resolution:	1.5 km	Vertical discretization	1 layer
Open sea boundary	none	Atmosphere	ALADIN (1.5 km)



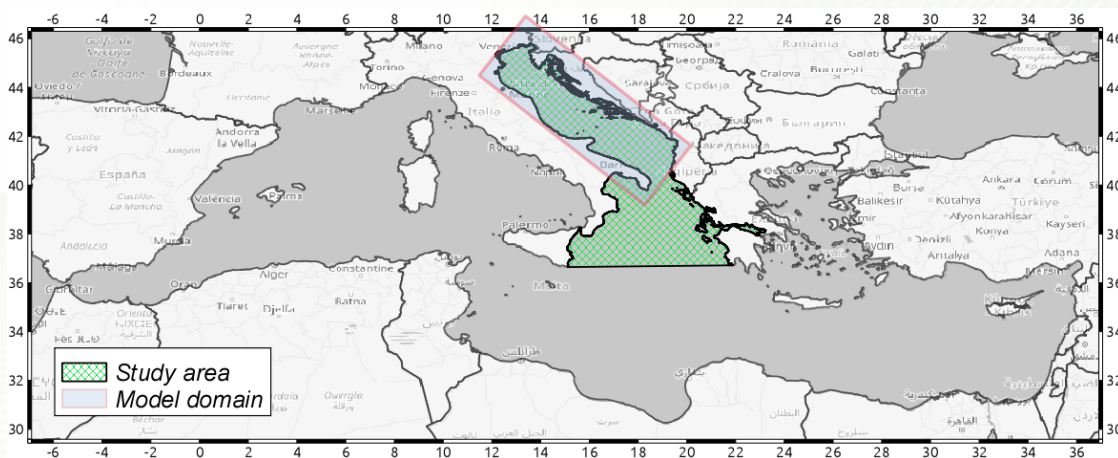


conditions:		boundary forcing:	
Baroclinic forcing:	ignored	Tides:	ignored
Model coupling:	ignored	Data Assimilation:	none
Length of forecast:	3 days	Output frequency:	1 h
Output format:	netCDF	Metadata conventions:	none
Download facilities:	FTP	Forecast license:	agreement
Website:			

Forecasting system name: ALADIN-WWM

Managing authority: DHMZ

Model Domain: Adriatic Sea



Simulated variables

Wave characteristics

Core model engine:

WWM





Spatial Resolution:	Variable, min. 1 km	Vertical discretization	1 layer
Open sea boundary conditions:	Waves from WAM-Global at Otranto Strait	Atmosphere boundary forcing:	ALADIN (4 km)
Baroclinic forcing:	ignored	Tides:	ignored
Model coupling:	ignored	Data Assimilation:	no
Length of forecast:	1.5 days	Output frequency:	1 h
Output format:	netCDF, GRIB	Metadata conventions:	WIS, INSPIRE
Download facilities:	FTP	Forecast license:	non-commercial use, dedicated agreement
Website:	http://www.meteo.hr		

DATA INFRASTRUCTURES

The responses pointed out a high level of heterogeneity between partners' capabilities, data sharing practices and implemented infrastructures. In general, there is a lack of interoperable services and spatial data infrastructures (SDI) implementations able to support the data sharing. Table 10 summarizes the questionnaires' responses received from the project partners and related to the existing data infrastructures.

Table 10: Overview of the questionnaires' responses related to the data infrastructures.

DATA INFRASTRUCTURES	
Dedicated sharing infrastructure	WCS, DAP, custom API





Information shared	Spatial dataset, observations, forecasts
Graphical user interface	Web mapping, meta-data search
Service software	GeoServer, GeoNode, ESRI
Licenses	CC-BY, CC-BY-NC, dedicated agreements

The are 4 data infrastructures managed by the project partners, sharing environmental spatial layer, observations and model forecasts. The detailed description of the recorded data infrastructures is reported in the following tables.

Data infrastructure: CoV		Managing authority: City of Venice	
Description	OPEN DATA Platform		
Information shared	Model forecasts and observations		
Services	custom API, open data	Services software	
Geographical user interface	none	Use of standard code list	none
Data access	Free access	Data license	Creative





<i>description</i>			Commons
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Data infrastructure: CIGNo		Managing authority: CNR-ISMAR	
<i>Description</i>	Collaborative Interoperable Geographic Node		
<i>Information shared</i>	Environmental geospatial datasets (raster, vector), hydrodynamic model outputs, historical cartography and bathymetry		
<i>Services</i>	WMS, WFS, WCS	<i>Services software</i>	GeoServer, GeoNode
<i>Geographical user interface</i>	Web mapping, Catalogue search	<i>Use of standard</i>	INSPIRE topica categories, ISO





	and Metadata info pages	code list	19115 metadata code list
Data access description	Many of the resource are free accessible, alternatively, a registration procedure is present to access protected layers.	Data license	CC BY

Data infrastructure: Dext3r		Managing authority: ARPAE	
Description	Dext3r is the web interface for autonomous and completely free extraction of the meteo and marine data stored into the regional DB of Arpae-Simc. It can be reached at https://simc.arpae.it/dext3r/		
Information shared	Observations		
Services		Services software	





Geographical user interface	Web interface	Use of standard code list	
Data access description	Upon registration	Data license	

Data infrastructure: DHMZ		Managing authority: DHMZ	
Description	ESRI geoportal old, new under constructions		
Information shared	observations, ALADIN meteorological forecasts		
Services	custom API, Meta data discovery catalogue Service for Web (CSW)	Services software	ESRI
Geographical user interface	search meta-data	Use of standard code list	



I-STORMS



Data access description	new portal under construction	Data license	research, dedicated agreements

