

AMOS: Advanced Meteo-Oceanographic Services for Sea







AMOS Project



- AMOS is focused in the implementation of High Resolution Services for Integrated and Advanced Meteo-Oceanographic forecasts with emphasis on Early Warning.
- AMOS provides new tools which enable to fully exploit the synergies between forecasts and data acquired through different sources, different platforms and at different scales.
- AMOS is partially funded by EEA Grants program (http://www.eeagrants.gov.pt/) and it is being developed by Hidromod and Navtor





a step forward



AMOS represents a step forward in the universalization of high resolution sea services, setting up a single service to the whole Portuguese territory (continent and islands), with the possibility to be extended at a global level

AMOS provides **onboard**, **web and mobile clients** capable to deliver proper information to a wide number of potential users

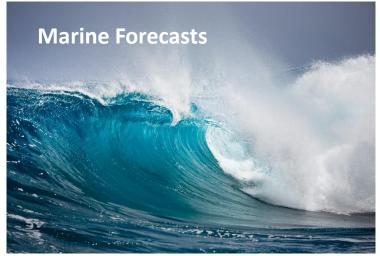
Move from general information to services focused on specific users needs





a full integrated service













Purpose

- Optimize shipping logistics
 - Support Pilotage operations
 - Disseminate information within port operations
 - Disseminate information within port terminals
- Support shipping disputes
 - Share information easily and quickly
 - Generate reports based on historic information
- Emergencies
 - Oil Spill Simulator
 - Search and rescue





Components

AQUASAFE Server

- · Historic, real time and forecast data management (Models, Satellite, In situ)
- Manages download and format differences;
- Synchronize time, space and units
- Data access protection
- Manage triggers for alerts

Control over the information chain

- Detect and register failures;
- Provides hierarchical data flow methodologies, mainly for initial and boundary conditions;
- Redundancy: provide access to different sources of information

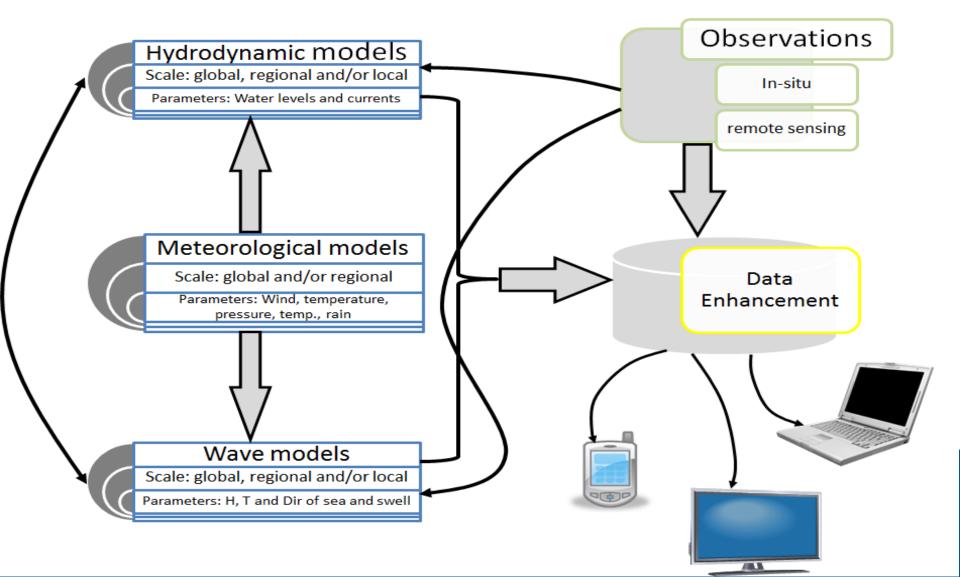
Dissemination

- Web services (SOAP, REST)
- Desktop, Videowall
- Web pages
- Mobile Apps
- Reports over email



Information flux

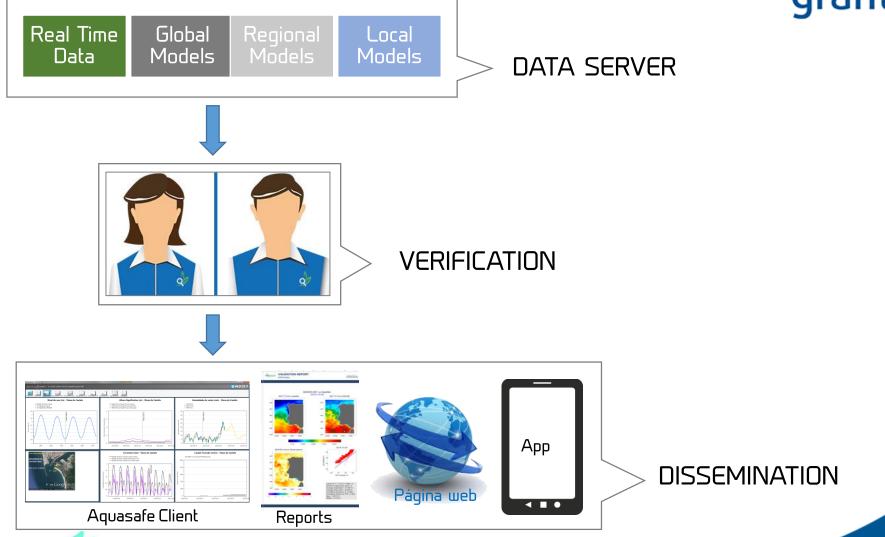




Service chain

HIDROMOD



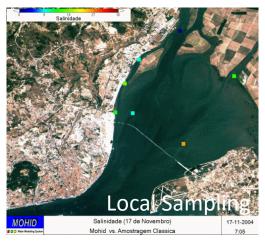


real time data

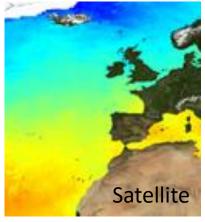


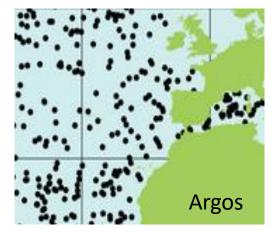


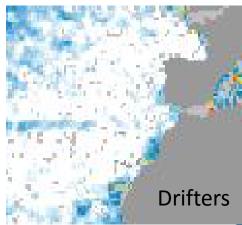










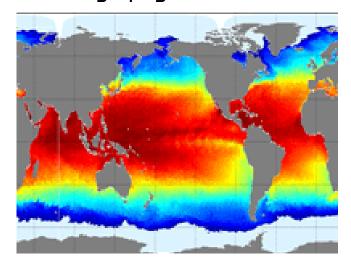


global models

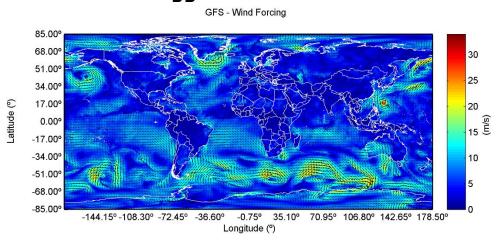




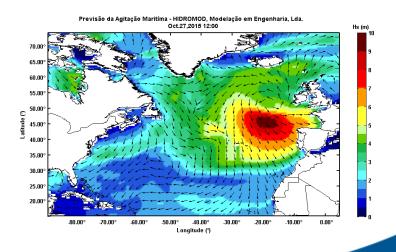
Oceanography



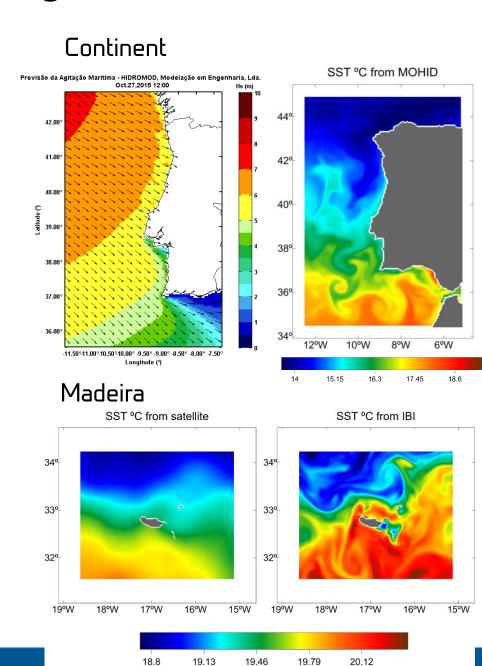
Meteorology

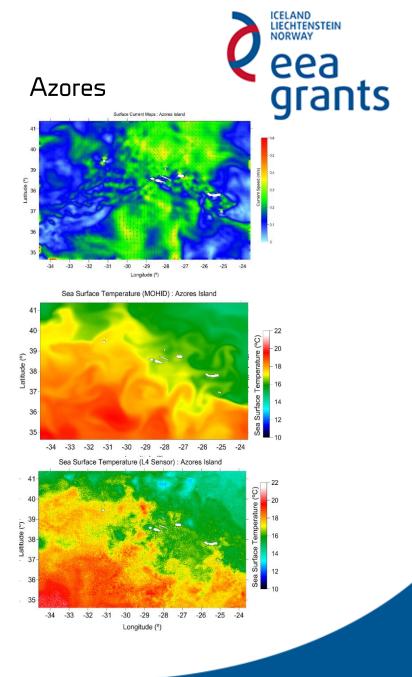


Waves



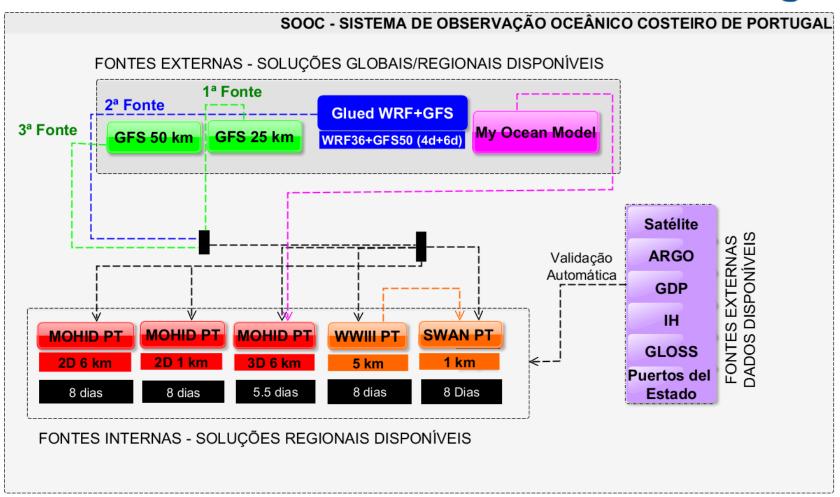
regional models





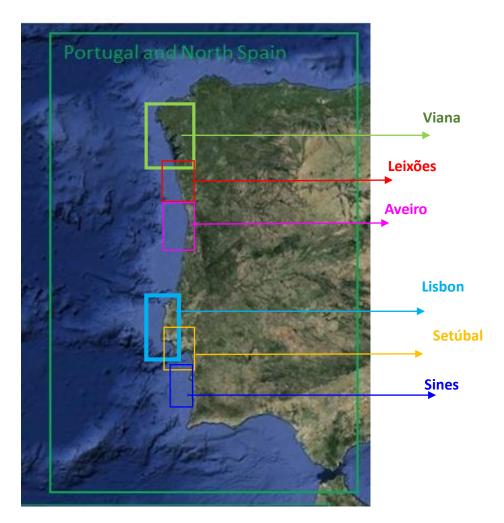
Portugal mainland regional solution

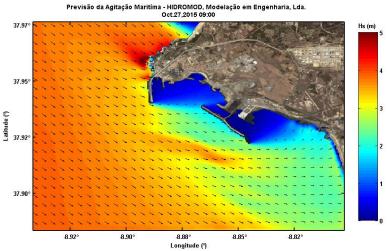




local models

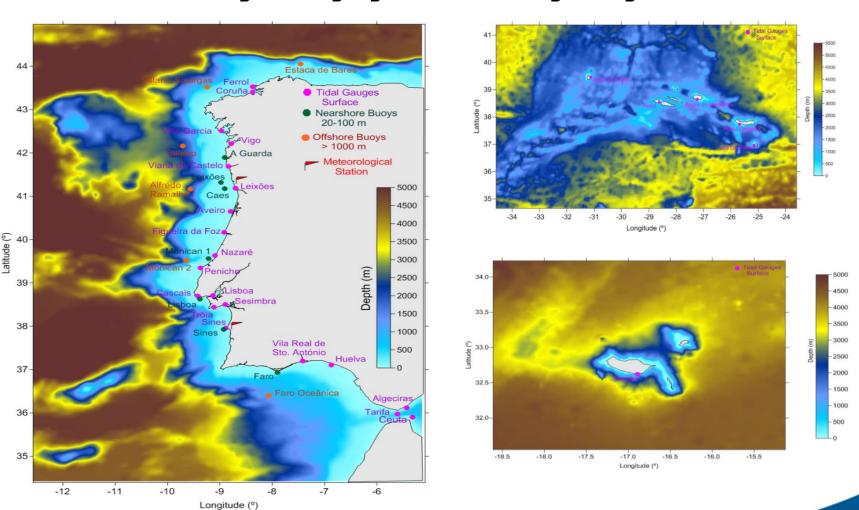




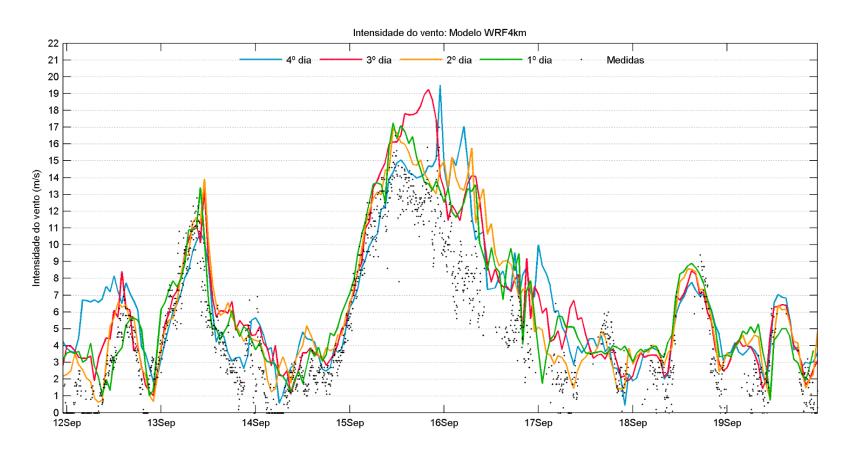




Data : coastal buoys, tidal gauges , satellite, argo buoys, drifters

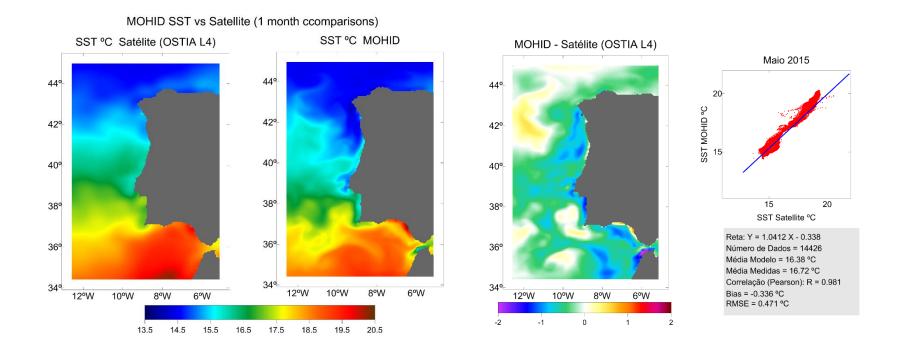






WRF 4km velocity in Sep 2015 – APDL's Meteo station

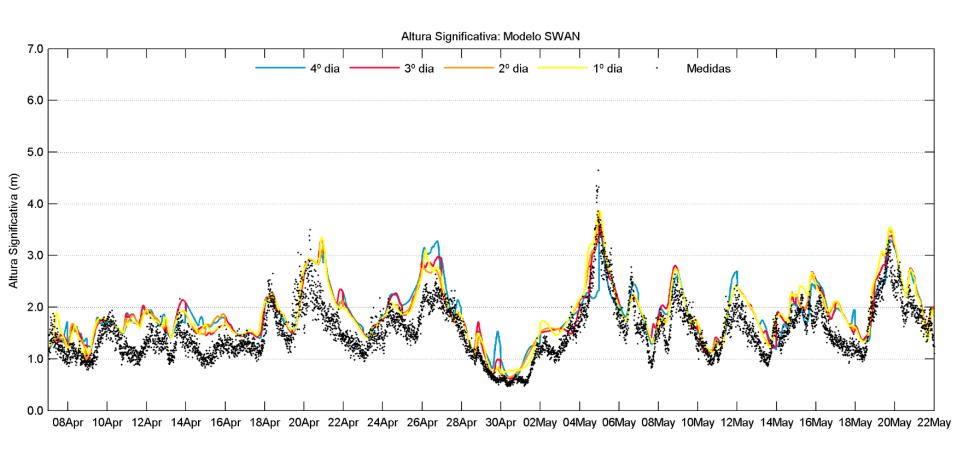




RMSE around 0.5 °C and correlation at 0.98

SST May 2015

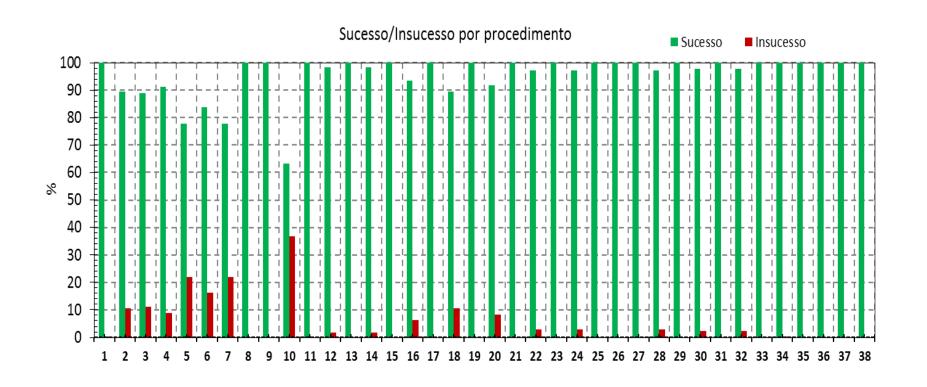




Validation – Hs at Sines in Apr-May 2015

Audits





Automatic reports



TABELA DE ALERTAS | Porto de Sines

QUASAFE



LIECHTENSTEIN NORWAY eea grants

ICELAND

Tabela de níveis de alerta nos pontos de referência para a navegação no Porto de Sines

Início: 22-06-2016 07:00 Fim: 28-06-2016 07:00

AQUASAFE

TABELA DE ALERTAS | Porto de Sines



Hora legal

(Sines) WRF 36 km (Sines) GFS 50 km (Sines)

Tabela de maré* (Marégrafo) MOHID (Marégrafo)

wwiii (Boia ondógrafo)

SWAN (Boia ondógrafo)

(P1 - Aproximação de Sines)

SWAN

SWAN (P3 - Molhe Sul de Sines)

Vel. e Dir. Vento - Velocidade e direct Hs - Altura significativa da ondulação Tp - Período de pico da ondulação Dir. Ondas - Direção da ondulação

Hora N Hora legal 21/06/2016 21/06/2016 16:05 21/06/2016 22:17 22/06/2016 04:27 22/06/2016 10:25 22/06/2016 16:42 22/06/2016 22:54 23/06/2016 05:06 23/06/2016 11:04 23/06/2016 17:22 23/06/2016 23:35 24/06/2016 24/06/2016 11:45 24/06/2016 18:05 25/06/2016 00:19

25/06/2016

25/06/2016

25/06/2016

26/06/2016

26/06/2016

26/06/2016 13:24 26/06/2016 19:47 27/06/2016 02:04 27/06/2016 08:25 27/06/2016 14:26 27/06/2016

06:34

12:31

18:53

01:08

07:25

* Valores fornecidos pelo Instituto Hidrográfico para 20: 1. Análise harmónica: Efetuada a partir de um ano de ot 2. Alturas de maré: Referidas ao nível do zero hidrográfi 3. Localização: Latitude 37.951° N; Longitude 8.887° W (TABELA DE ALERTAS | Porto de Sines



	Noite, crepúsculo e dia de terça-feira, 21 junho 2016												
	*												
00:00	02:00	04:00	06:00	08:00	10:00	12:00	14:00	16:00	18:00	20:00	22:00	00:0	

Horas de transição de crepúsculos, nascer e pôr do sol												
Data	Astronómico	Náutico	Civil	Nascer do sol	Meridiano	Pôr do sol	Civil	Náutico	Astronómico			
21/06/2016	4:18	5:03	5:42	6:13	13:37	21:01	21:33	22:12	22:57			
22/06/2016	4:18	5:03	5:42	6:14	13:38	21:02	21:33	22:13	22:57			
23/06/2016	4:18	5:03	5:42	6:14	13:38	21:02	21:33	22:13	22:57			
24/06/2016	4:19	5:03	5:43	6:14	13:38	21:02	21:33	22:13	22:57			
25/06/2016	4:19	5:04	5:43	6:15	13:38	21:02	21:33	22:13	22:57			
26/06/2016	4:19	5:04	5:43	6:15	13:39	21:02	21:33	22:13	22:57			
27/06/2016	4:20	5:05	5:44	6:15	13:39	21:02		NUMBER OF STREET	196300			

Fases da lua

6:16



28/06/2016



5:05



13:39

21:02

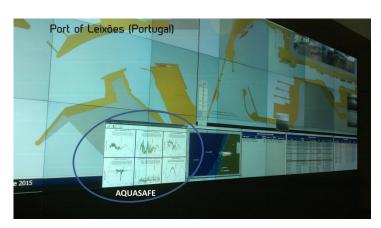




Real time operation









Flexible output

eea grants

Instant value (e.g. Mobile app - last value measured Hs measured)



Time Series (e.g. web page - sea level forecast)

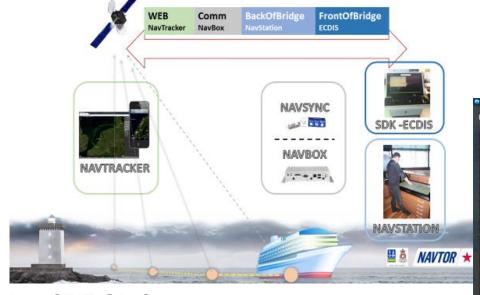




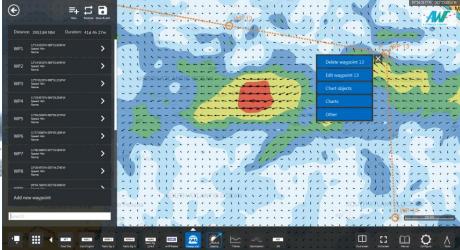
Along a trajectory (e.g. operation room - currents, waves and water column along a trajectory)

NAVSTATION on-board integration





NAVSTATION Concept





on-board global/regional forecasts

Final remarks



- A high resolution meteo-oceanographic operational system has been implemented for the Portuguese coast.
- The system has been designed to allow an easy and comprehensive deployment of new high resolution domains, new models or new data sources.
- Through the system the users may get automatically or have access to:
 - forecasts in specific locations;
 - comparisons between measured and computed values;
 - comparisons between different forecasts;
 - advanced data analysis;
 - personalised alerts;
 -
- The Navstation platform is making available on-board these high resolution forecasts.
- The system is subject to periodic audits to assess and assure the service accuracy and reliability.



Aditional Information



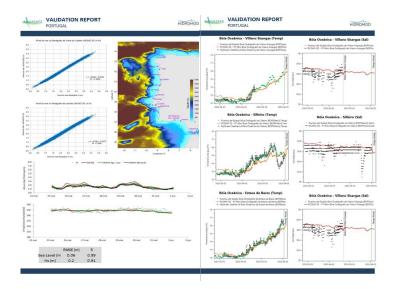
www.hidromod.com

http://amos.hidromod.com/

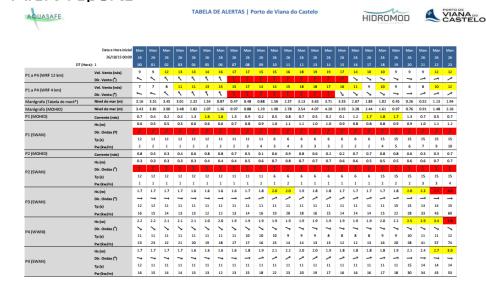
AMOS services



Forecast reports

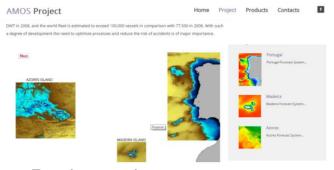


Alert reports









Products showcase