

**Coastal Hydrology and Surface Processes linked to Air/Sea Modeling:
1st community of users workshop**
(as of 26 September 2017)

26-27 September 2017

Organizers:

Rui Caldeira (Oceanic Observatory of Madeira), Julie Pullen (Stevens Institute of Technology), David Gochis (NCAR), Nadia Pinardi & Giorgia Verri (Euro-Mediterranean Center on Climate Change), Sue Chen & Teddy Holt (Naval Research Laboratory)

Held at:

[Royal Orchid](#)/Rocamar hotel complex (Falésia Room)
Travessa Vista da Praia, nº 2
9125-039 Caniço, Madeira
Portugal
+351 291 934 600

Related Activities: 25 and 28 September, Madeira Island Testbed discussions
10:00AM – 5:00PM

Held at: Oceanic Observatory of Madeira
(OOM: <http://oom.arditi.pt/>)
Edifício Madeira Tecnopolo
Caminho da Penteadá
9020-105 Funchal, Madeira
(+351) 291 721 216

Background/Motivation

An emerging field of earth system research is the application of coupled hydrology, meteorology and oceanography models to coastal regions. Motivated by the need to predict coastal river flooding and associated hazards and impacts, several groups have undertaken the integration of hydrology models such as WRF-Hydro (NCAR) and HEC-HMS (Army Corps) into meteorological and coupled ocean/atmosphere prediction systems. Groups at NCAR and NRL are integrating their models (COAMPS/WRF-Hydro/LIS/NOAH), and teams in the U.S., Europe and the Middle East are applying linked models to the U.S. east coast, Italian coast, west Africa, Germany, Turkey and Israel, among others. Related current efforts include the enhancement of land surface/soil moisture treatment, the representation of storm-water flows in urban settings and their effects, together with river runoff, on the marine ecosystem health. The projects cover diverse geographical settings (cities, mountains, deserts, tropics, highlands, islands) - each with distinguishing characteristics.

Given recent developments outlined above, we are conducting a 2-day workshop to gather developers and practitioners of coupled air/sea/hydrology/land surface models and land assimilation system. Features of existing and developing systems include unstructured grids, global relocatability, ensembles, data assimilation, and multi-model visualization. We will also include focused discussions to develop a community approach for advancing the applications and seamless integration of increasingly sophisticated models covering the coastal air/sea/land interface. These advanced models include embedded estuary models and sewer/storm-water models.

We anticipate as an outcome a workshop summary for publication in *Eos* or *Bulletin of the American Meteorological Society*. The publication will describe the research to date and stimulate further advances in high-priority areas.

Agenda

26 September



- 8:30-9:00 AM **Coffee**
- 9:00-9:15 AM **Introductory Remarks / OOM Introduction**
- 9:15-11:15AM **Met-Hydro Research Applications (Sue Chen)**
- 9:15-9:45AM David Gochis (NCAR) *“Exploring the role soil moisture feedback in the North American Monsoon region”*
- 9:45-10:15AM Alfonso Senatore (University of Calabria) *“Linking SST representation to the forecast of small Mediterranean catchments hydrological response to extreme precipitation”*
- 10:15-10:45AM Pedro Miranda (University of Lisbon) *“Improving WRF simulations of coastal storms with better water vapour initial fields from InSAR interferometry”*
- 10:45-11:15AM Shaowu Bao (Coastal Carolina University) *“Hydrological response of a S.C. river basin to an extreme rainfall event”*
- 11:15-11:30AM **Break**
- 11:30-01:00PM **Met-Ocean Research Applications 1 (Nadia Pinardi)**
- 11:30-12:00PM Rui Caldeira (Oceanic Observatory of Madeira) *“Madeira forecasting systems: Operational & Research perspectives”*
- 12:00-12:30PM Petros Katsafados (Harokopio University of Athens) *“The impact of rain on ocean wave evolution and the feedback to the atmosphere”*
- 12:30-2:00PM **Lunch**
- 2:00-3:00PM **Met-Ocean Research Applications 2 (Nadia Pinardi)**
- 2:00-2:30PM Julie Pullen (Stevens Institute of Technology) *“Coupled air-sea modeling in island regions”*
- 2:30-3:00PM Sue Chen (NRL) *“Convective Initiation Sensitivity to the Presence of An Oceanic Barrier Layer”*
- 3:00-3:15PM **Break**
- 3:15-5:15PM **Hydro-Ocean Research Applications (Rui Caldeira)**
- 3:15-3:45PM Firas Saleh (Stevens Institute of Technology) *“A Multi-Scale Ensemble-based Framework for Predicting Compound Coastal-Riverine Flooding”*
- 3:45-4:15PM Nadia Pinardi (CMCC) *“The Coupling of river flows with regional ocean models”*

4:15-4:45PM Emil Stanev (Helmholtz Zentrum Geesthacht) *“Physical processes in straits and estuaries: Results from unstructured numerical modeling”*

6:00-8:00PM **Group Dinner**

27 September

8:30-9:00AM **Coffee**

9:00-10:45AM **Operational Systems (Julie Pullen)**

9:00-9:30AM David Gochis (NCAR) *“WRF-Hydro and National Water Model”*

9:30-10:00AM Sue Chen & Aubrey Dugger (NRL & NCAR) *“Air-sea-hydro-land model integration: COAMPS/ LIS/ WRF-Hydro”*

10:00-10:45AM Cheryl Ann Blain (NRL) *“Moving Freshwater to the Ocean: Hydrology-Ocean Model Coupling”*

10:45-11:00AM **Break**

11:00-11:45AM Vincent Fortin (Environment and Climate Change Canada) *“Water Cycle Prediction System for the Great Lakes and St. Lawrence River”*

11:45-12:15PM Huw Lewis (UK Met Office) *“Towards integrated coupled predictions for the UK at convective scale”*

12:15-2:00PM **Lunch**

2:00-2:30PM Linus Magnusson (ECMWF) *“Components in the ECMWF earth model system applicable for coastal flooding”*

2:30-3:00PM Alfonso Senatore (University of Calabria) *“European Wide collaboration on ocean/atmosphere hydrology models”*

3:00-4:00PM **Guided Discussion (Breakout):**

- I. Operational Needs & Challenges (David, Sue, Rui)
- II. Research Needs & Challenges (Nadia, Rui, Julie)

4:00-5:00PM **Group Discussion/Reporting**