Earth System Modelling and Climate Change

Rita M. Cardoso

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RG1 - Climate change, atmosphere-land-ocean processes and extremes
RG1: Climate change: atmosphere-land-ocean processes and extremes

**Members (35)**

Alexandre Ramos  
Alvaro Peliz  
Ana Pires  
Ana Navarro  
Ana Russo  
Ana Teles-Machado  
Pedro Viterbo  
Antonio Tome  
Carlos Pires  
Carlos da Camara  
Cathy Besson  
Célia Gouveia  
Emanuel Dutra  
Isabel Trigo  
Joana Freire  
Joao Catalão  
Joao Martins  
Jose Alves  
Margarida Liberato  
Antónia Valente  
Teresa Calado  
Miguel Nogueira  
Pedro Miranda  
Pedro Mateus  
Pedro Soares (PI)  
Pedro Benevides  
Pedro Sousa  
Ricardo Trigo  
Ricardo Tomé  
Rita Cardoso  
Rui Caldeira  
Sandra Mogo  
Sandra Plecha  
Sofia Ermida  
Virgilio Bento

**PhDs (19)**

Andreia Ribeiro  
David Stevens  
Catarina Guerreiro  
Daniela Lima  
Diogo Martins  
Federico Ienna  
Gil Lemos  
Javier Cano  
Manuel Nascimento  
Maria João Chinita  
Miguel Pinto  
Pedro Guerreiro  
Riccardo Henin  
Silvia Almeida Nunes  
Vasco Ribeiro Conde  
Ana Caldeirinha  
João Careto  
Susana Silva  
Teresa Costa
Major research topics

Climate variability and climate change scenarios
- Global Climate Modeling
- Regional Modeling and Climate Services
- Land-atmosphere interactions
- Natural hazards and extremes

Atmosphere-ocean processes and dynamics
- Ocean circulation and climate
- Remote sensing applications

Regional Modeling and Climate Services
**Natural hazards and extremes**


Large Scale Synoptic Features

Atmospheric Rivers

Ramos A et al. 2018 - Impacts of Atmospheric Rivers in Extreme Precipitation on the European Macaronesian Islands, Atmosphere


Predictability of Atmospheric Rivers in Europe
Alexandre Ramos
Surface anomalies in Europe

Winter rainfall

Sousa PM et al. 2017 - Responses of European precipitation distributions and regimes to different blocking locations. Climate Dynamics

Sousa P et al. 2018 - European temperature responses to blocking and ridge regional patterns, Clim. Dynamics
Lima et al. 2018 - A Global View of Coastal Low-Level Wind Jets Using an Ensemble of Reanalyses (Journal of Climate)

Semedo et al. 2016 - The impact of climate change on the global coastal low-level wind jets, EC-Earth simulations (Global and Planetary Change)
Regional Climate Modelling – Continental Scale
EURO-CORDEX

Regional Climate Modelling - Continental Scale
CORDEX - Africa

Regional Climate Modelling

Maximum Temperature

Minimum Temperature

Precipitation

Cardoso RM et al. 2013 - WRF high resolution simulation of Iberian mean and extreme precipitation climate. International Journal of Climatology

Soares PMM et al. 2012 - WRF High Resolution Dynamical Downscaling of ERA-Interim for Portugal. Climate Dynamics
Regional Climate Modelling

Climate Change


Soares PMM et al. 2017 - Western Iberian offshore wind resources: More or less in a global warming climate? Applied Energy

Cardoso RM et al. 2018 - Mean and extreme temperatures in a warming climate: EURO CORDEX and WRF regional climate high-resolution projections for Portugal. Climate Dynamics

Nogueira M et al. 2018 - High-resolution multi-model projections of onshore wind resources over Portugal under a changing climate. Theoretical and Applied Climatology
Cardoso RM et al. 2018 - Mean and extreme temperatures in a warming climate: EURO CORDEX and WRF regional climate high-resolution projections for Portugal. Climate Dynamics

Martins JPA et al. 2016 - The diurnal cycle of coastal cloudiness over west Iberia using Meteosat/SEVIRI and a WRF regional climate model simulation. International Journal of Climatology
**Iberian Peninsula**

**JJA – WRF**

Soares et al. 2014 - Climatology of the Iberia coastal low-level wind jet

weather research forecasting model high-resolution results (Tellus A)

and

Soares et al. 2017 - High resolution projections for the western Iberian coastal low level jet in a changing climate (Tellus A)

**North Africa**

**JJA – ROM**

Lima et al. 2018 - A Climatological Analysis of the Benguela Coastal Low-Level Jet (JGR-Atmospheres)

and

Lima et al. - How will a warming climate affect the North African coastal low level wind jet? A high resolution view (Climate Dynamics)

and

Soares et al. - The climate change impact on the North African offshore surface wind and coastal low-level jet: coupled and uncoupled regional climate simulations under RCP8.5 emission scenario (In revision to Climate Dynamics)
**Ocean Circulation Modelling**

Interannual simulations with nested grids on the Iberian Margin

Teles-Machado et al. 2015 - On the year-to-year changes of the Iberian Poleward Current. *Journal of Geophysical Research Oceans*

Peliz A et al. 2013 - The Gulf of Cadiz-Alboran Sea sub-basin: Model setup, exchange and seasonal variability. *Ocean Modelling*

**Lagrangian Modelling**

Particle dispersion studies with different applications (fish larvae, trace metals, water masses, etc)

**Eddy Tracking**

Automatic eddy detection and tracking from ocean models and satellite altimetry

**Storm Surge Modelling**

Xynthia 2010

Intense cyclone moving from SW to NE
Daily Ensemble Forecast
Thank you
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