

# LAURA MARIOTTI

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## PERSONAL DETAILS

Date of birth: 8th January 1978

Place of birth: L'Aquila AQ – Italy

Spoken languages: Italian (native), English

## WORK

**Mar 2016**

**Current position**

Post-Doc (Assegno di ricerca) c/o **Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS)** Borgo Grotta Gigante 42/C - 34010 - Sgonico (TS) - Italy

Assimilation of chlorophyll Biogeochemical-Argo float for the ocean into a biogeochemical model of the Mediterranean Sea

Earth System Regional Climate Model (RegCM-ES) between RegCM4 with the ocean model MITgcm over the north Adriatic and Mediterranean regions

Four publications: Cossarini et al. 2018, Nikulin et al.2018, Sitz et al.2017, Querin et al.2016

**Aug 2010-Feb 2016**

Post-Doc c/o **The Abdus Salam International Centre for Theoretical Physics (ICTP)**, Trieste Italy

Studies of the climate change over the Africa and other different regions. Completion and analysis of CORDEX simulations (as documented in a few paper submitted to international journals)

Coupling RegCM4 with the ocean model MITgcm over the Mediterranean basin

Few publications, please see sections PUBLICATIONS below.

**Jan 2008 - Jul 2010** Fellowship c/o The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste Italy  
Collaboration with the University of L'Aquila for the PhD thesis: "Assessment of the impact of climate change on water resources in the African countries by means of a coupled regional climate model (RegCM3) and hydrological model (CHyM) scenario simulation"

**2007** One year of research grant of Abruzzo Region, with a stay of three months of research c/o Earth System Physics Section of The Abdus Salam International Centre for Theoretical Physics (ICTP).

**Feb - May 2006** three months research contract c/o CETEMPS (Center of Excellence for integration of remote sensing techniques and modelling for the forecast of severe weather), Physics Department, University of L'Aquila

## EDUCATION

**08 July 2010** PhD in Physics at L'Aquila University in collaboration with the ICTP of Trieste (Italy)  
PhD thesis: "*Assessment of the impact of climate change on water resources in the African countries by means of a coupled regional climate model (RegCM3) and hydrological model (CHyM) scenario simulation*"

**21 December 2005** Degree in Physics at L'Aquila University  
Graduation thesis: "*Parametrization of potential evapotranspiration phenomena in a distributed grid based hydrological model*"

## SCIENTIFIC AND TECHNICAL SKILLS

- Regional Climate modeling
- Hydrological modeling

- Data Assimilation
- Programming languages: Fortran, C, Pascal, Python
- Environments: Windows, Unix, Linux
- Other: Microsoft Office, Matlab, Grads.
- Word Processors: Latex

## RESEARCH

- Climate change impact studies in different countries
- Water resources studies
- Calibration and modeling of the regional climate model REGCM
- Calibration and modeling of the CETEMPS Hydrological Model CHyM

## PROJECTS

- **MASSIMILI**: development of a multi-data assimilation scheme to integrate Bio-Argo floats data with Ocean Colour satellite data into the biogeochemical modelling systems of the CMEMS Monitoring and Forecasting Centres.
- **CORDEX**: climate simulations over Africa and South Asia
- **NEXTDATA**: climate scenario simulations over different domains; census of climate simulations
- **ACQWA**: climate scenario simulations and hydrology simulations over the Alps
- **EU-INDIA GRID**: scientific collaborations to address new e-Infrastructure for Climate Change from Europe to India
- **ENSEMBLE**: climate simulations over Africa
- **WATCH**: Land-use change experiment over the Sahel Region

## COLLABORATIONS

**2008-present** Prof. Filippo Giorgi from the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste Italy

- 2006–present** Dott. Erika Coppola from The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste Italy
- 2010-present** Prof. Soroosh Sorooshian from UCI Distinguished, Professor and Director Center for Hydrometeorology and Remote Sensing (CHRS), University of California, Irvine (USA)
- 2010-present** Professor Sushil Kumar Dash, Professor and Head of the Centre for Atmospheric Sciences IIT Delhi, Hauz Khas, New Delhi, India
- 2009-present** Laboratory on Climate Modeling and Impacts at ENEA research agency, head Dott. Paolo Ruti, Italy
- 2009; 2011** Dr. Richard Anyah from Atmospheric Science Dept. of Natural Resources and the Environment, University of Connecticut (USA)

## **POSTGRADUATE TEACHING**

- 2011- 2016** ICTP Diploma courses, teaching Numerical Method I and II
- 2008** - Many teaching experiences during Workshops and Schools of RegCM3-4, CHyM hydrological model and computer graphic packages

## **STUDENT Helping-Graduated**

- 2012– 2013** **Rita Nogherotto**, Master student-University of Trieste, “Modeling studies of the effects of surface characteristics on the African monsoon”  
 Publication: Nogherotto R., E. Coppola, F. Giorgi and L. Mariotti, 2013: “*Impact of deforestation of the Congo Basin on the African monsoon climates*”. Atmospheric Science Letters. 14: 45–51 DOI: 10.1002/asl.416

## PUBLICATIONS [HI Scopus 16, HI Google Scholar 18]

- Cossarini G., **L. Mariotti**, L. Feudale, A Mignot, S. Salon, V. Taillandier, A. Teruzzi, F. D'Ortenzio, 2018 "*Towards operational 3D-Var assimilation of chlorophyll Biogeochemical-Argo float data into a biogeochemical model of the Mediterranean Sea*" **Ocean Modelling** <https://doi.org/10.1016/j.ocemod.2018.11.005>
- Nikulin, G., C. Lennard, A. Dosio, E. Kjellström, Y. Chen, A. Hänsler, M. Kupiainen, R. Laprise, **L. Mariotti**, C. Fox Maule, E. van Meijgaard, Panitz, Hans-Jürgen, J. Scinocca, S. Somot, 2018 "*The effects of 1.5 and 2 degrees of global warming on Africa in the CORDEX ensemble*" Special Issue in **Environmental Research Letters**
- Sitz LE, F Di Sante, R Farneti, R Fuentes-Franco, E Coppola, **L Mariotti**, M Reale, G Sannino, M Barreiro, R Nogherotto, G Giuliani, G Graffino, C Solidoro, G Cossarini, F Giorgi, 2017: "*Description and evaluation of the Earth System Regional Climate Model (RegCM-ES)*" **J. of Advances in Modeling Earth Systems**, 9, 1863–1886, DOI: 10.1002/2017MS000933
- Querin, S., M. Bensi, V. Cardin, C. Solidoro, S. Bacer, L. Mariotti, F. Stel, and V. Malac'ic', 2016: "*Saw-tooth modulation of the deep-water thermohaline properties in the southern Adriatic Sea*", **J. Geophys. Res. Oceans**, 121, doi:10.1002/2015JC011522.
- Diallo I., Giorgi F., Dème A., Mariotti L., Sylla MB., Tall M., Gaye AT, 2016: "*Projected changes of summer monsoon extremes and hydroclimatic regimes over West Africa for the twenty-first century*", **Climate Dynamics**, pp 1-24, DOI 10.1007/s00382-016-3052-4
- Sushil K. Dash, Saroj K. Mishra, Kanhu Charan Pattnayak, Ashu Mamgain, Laura Mariotti, Erika Coppola, Filippo Giorgi, Graziano Giuliani, 2014: "*Projected seasonal mean summer monsoon over India and adjoining regions for the twenty-first century*". **Theoretical and Applied Climatology**, 11/2014, DOI: DOI 10.1007/s00704-014-1310-0

- L. Mariotti, I. Diallo, E. Coppola, F. Giorgi, 2013: “*Seasonal and intraseasonal changes of African monsoon climates in 21st century CORDEX projections*”. **Climatic Change** July 2014, Volume 125, Issue 1, DOI: 10.1007/s10584-014-1097-0
- E. Coppola, F. Giorgi, F. Raffaele, R. Fuentes-Franco, G. Giuliani, M. Llopert-Pereira, Ashu Mangain, L. Mariotti, G. Tefera Diro and C. Torma, 2013: “*The bias and climate change signal in the Phase I CREMA experiment*”. **Climatic Change** July 2014, Volume 125, Issue 1, DOI: 10.1007/s10584-014-1137-9
- F. Giorgi, E. Coppola, F. Raffaele, G. Tefera Diro, R. Fuentes-Franco, G. Giuliani, A. Mangain, M. Llopert-Pereira, L. Mariotti and C. Torma, 2013: “*Changes in extremes and hydroclimatic regimes in the CREMA ensemble projections*”. **Climatic Change** July 2014, Volume 125, Issue 1, DOI: 10.1007/s10584-014-1117-0
- P. Brandmayr, Giorgi F., Casale A., Colombetta G., Mariotti L., Vigna Taglianti A., Weber F. and Pizzolotto R., 2013: “Hypogean carabid beetles as indicators of global warming?” **Environ. Res. Lett.** 8 (2013) DOI: 10.1088/1748-9326/8/4/044047
- Nogherotto R., E. Coppola, F. Giorgi and L. Mariotti, 2013: “*Impact of deforestation of the Congo Basin on the African monsoon climates*”. **Atmospheric Science Letters**. 14: 45–51 DOI: 10.1002/asl.416
- M.B. Sylla, F. Giorgi, E. Coppola, L. Mariotti, 2012: “*Uncertainties in daily rainfall over Africa: assessment of gridded observation products and evaluation of a regional climate model simulation*”. **International Journal of Climatology** DOI: 10.1002/joc.3551
- E. Coppola, F. Giorgi, L. Mariotti, X. Bi, 2012: “*RegT-Band: a tropical band version of RegCM4*”. **Climate Research**, vol.52. DOI: 10.3354/cr01018
- V.S. Nair, F. Solmon, F. Giorgi, L. Mariotti, S. Suresh Babu and K. Krishna Moorthy, 2012: “*Simulation of South Asian aerosols for regional climate studies*”. **Journal of Geophysical Research**, VOL. 117, D04209, 17 PP., DOI:10.1029/2011JD016711

- Giorgi F., E.Coppola, F.Solmon, L.Mariotti, et al., 2012: "RegCM4: Model description and preliminary tests over CORDEX domains". **Climate Research**, vol.52 DOI: 10.3354/cr01018
- Mariotti L., E. Coppola, M.B.Sylla, F.Giorgi and C.Piani, 2011:"Regional climate model simulation of projected 21st century climate change over an all Africa domain: Comparison analysis of nested and driving model results". **Journal of Geophysical Research**, Vol.116, D15111, DOI:10.1029/2010JD015068
- F. Giorgi, E.-S. Im, E. Coppola, N.S. Diffenbaugh, X.J. Gao, L. Mariotti, Y. Shi: "Higher hydroclimate intensity with global warming.", **Journal of Climate**, vol.24. DOI: 10.1175/2011JCLI3979.1
- Sylla M.B, E.Coppola, L. Mariotti, F. Giorgi, P.M.Ruti, A.Dell'Aquila and X. Bi, 2010: "Multiyear simulation of the African climate using a regional climate model (RegCM3) with the high resolution ERA-Interim reanalysis." **Climate Dynamics**, vol. 35, pp231-247, DOI: 10.1007/s00382-009-0613-9.
- E. Coppola, B. Tomassetti, L. Mariotti, M. Verdecchia and G. Visconti, *Cellular automata algorithms for drainage network extraction and rainfall data assimilation*, **Hydrological Science Journal**, June 2007. **Vol. 52**, N.3 pp. 579-592.

### CO-ORGANIZER of the Workshop

- April-May 2015 - **3rd Workshop on Water Resources in Developing Countries: Planning and Management in Face of Hydroclimatological Extremes and Variability: "CHyM around the world " (talk)** Gave tutorial: the CETEMPS Hydrological Model CHyM and the graphical tools.
- May 2013 - **CO-ORGANIZER Conference 2nd Workshop on Water Resources in Developing Countries: Planning and Management in a Climate Change Scenarios: "Climate change impact on water resources for several river basins: a European, Asian and African case study" (talk)** Gave tutorial of: the CETEMPS Hydrological Model CHyM and the graphical tools.

### SEMINAR/WORKSHOP/CONFERENCE TALKS

- November 5-6, 2015 - HyMex-Baltic Earth Workshop - Joint regional climate system modelling for the European sea regions Rome: *"The Regional Earth System Model (RegESM) using RegCM4 coupled with the MITgcm ocean model: First assessments over the MED-CORDEX domain"*
- EGU 2015 - Vienna: *"Assessment of the performance of CORDEX Regional Climate Models in Africa"* (poster)
- November 2014 - Ensenada (Mexico) First Workshop on Climate Change, Variability and Modeling over Central America and Mexico (talk)  
Gave tutorial of: *Using the Regional climate model RegCM4*
- EGU 2014 - Vienna: *"A new regional climate simulation using RegCM4 over the CORDEX South Asia domain"* (poster)
- Participant WCRP International Conference on Regional Climate CORDEX , November 2013 - Bruxelles : *"Seasonal and intraseasonal changes of African monsoon climates in 21st century CORDEX projections"* (poster)
- EGU 2013 - Vienna: *"Introductory note to the Climatic Change Special Issue on "The Phase I CORDEX REgCM4 hyper-Matrix (CREMA) experiment"* (poster)
- Sixth ICTP Workshop on the Theory and Use of Regional Climate Models , May 2012: *"CORDEX experiment over Africa domain using the new Regional Climate Model RegCM4.3"* (talk)  
Gave tutorial of: *Using the Regional climate model RegCM4*
- EGU 2012 - Vienna: *"CORDEX experiment over West Asia domain using the new Regional Climate Model RegCM4.2"* (poster)
- Participant of **WCRP Open Science Conference: Climate Research in Service to Society** on 24-28 October 2011 in Denver, Colorado, USA. Poster: *"Regional climate simulations over Africa and India using the new Regional Climate Model RegCM4"*
- September 2011 – Summer School on Climate Impacts Modelling for Developing Countries: Water, Agriculture and Health. Gave lectures *"Hydrological modelling at ICTP. Western African case study"* and tutorial of the CETEMPS Hydrological model CHyM.



- Speakers at the Summer School ICTP-TWAS-ICPAC Regional Climate Change Modelling in support of adaptation in the agriculture and water resources sectors in Nairobi- Kenya, 20-24 June 2011. Gave “RegCM4 Tutorial”.
- EGU 2011 - Vienna two posters "*Regional climate model simulation of projected 21st century climate change over an all-Africa domain: Comparison analysis of nested and driving model results*" and "*Regional climate simulations over Africa and India using the new Regional Climate Model RegCM4*"
- Gave tutorial of “*Regional Climate model RegCM4 to use on EU-India Grid*” during International EU-IndiaGRID2 for Material Science, Climate Change and Interoperability Workshop December 13-16, 2010. Indian Institute of Technology, Delhi, India
- Gave lectures on “*Land surface models*” and “*Regional climate models RegCM4*” at the summer school in climate science. August, 2010, Turunc, Turkey.
- Fifth ICTP Workshop on the Theory and Use of Regional Climate Models: “*21st century transient climate scenario simulation over Africa*” (talk)
- EGU 2010 – Vienna: “*Climate change and land-use change impact on Western African river basins*” (talks)
- AGU 2009 – San Francisco: “*Dynamical Downscaling of Climate Change Projection over the African Region using the Regional Climate Model(RegCM3)*” (poster)
- Speakers at the “*First regional climate and impact modelling workshop for eastern Africa*” Addis Ababa University, October 26-31, 2009, Addis Ababa, Ethiopia.
- 2009 Conference - **Water resources in developing countries:** “*Dynamical downscaling of Climate Change Projection over Africa: impact on the western African river basins*” (talks)
- EGU 2009 – Vienna: “*Dynamical Downscaling of Climate Change Projection over the African Region using the Regional Climate Model(RegCM3)*” e “*Climate change impact on water resources for several river basins: a European, Asian and African case study*” (talks)
- AGU 2008 – San Francisco: “*Dynamical Downscaling of climate Change Projection over the African Region using the Regional Climate Model (RegCM3)*” (Poster)

- General Assembly EU-WATCH Project – Bratislava 2008: “*Dynamical Downscaling of Climate Change Projection over the African Region using the Regional Climate Model (RegCM3)*” and “*RegCM3 experiment for the West Africa Region: landuse change and wetland*” (talks)
- WATCH-International Summer School on Hydrological Drought & Global Change: “*Effects of Saharan Dust on the West African Monsoon and the Niger and Volta River Basin*” (poster)
- EGU (European Geosciences Union) 2008 Vienna: “*Effects of Saharan Dust on the West African Monsoon and the Niger River Basin*” (talks)

Date