

PERSONAL INFORMATION

Alessandra Lucia Zollo



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POSITION

Researcher

WORK EXPERIENCE

01/04/2014–Present

Researcher

Italian Aerospace Research Centre (C.I.R.A.), Meteorological Laboratory, Capua (Italy)

Scientific affiliation with CMCC (*Euro-Mediterranean Center on Climate Change*) and leader of "Statistical Downscaling and CLIME" unit of REMHI (Regional Models and geo-Hydrological Impacts) division.

Development of **post processing tools** for the regional climate model COSMO-CLM and for the numerical weather prediction model COSMO LM, for the analyses of the weather extreme events and for the evaluation of the **weather hazards indicators**.

Development of tools based on **satellite data** for **monitoring** and prediction of weather hazards (**nowcasting**) at very short term.

Responsible for the management of CIRA meteorological instrumentation outputs, through the development of automatic procedures for the acquisition and homogenization of meteorological data coming from different sources.

Implementation of different **bias correction** techniques for climate data.

Drafting of technical reports and paper regarding to the research activity treated into the framework of **meteorology and climatology**.

Involved into the INTACT european project, developing analytical activities of climate data with focus for the identification of **climate indicators** useful to evaluate **the impact of climate change on the infrastructures**

01/12/2011–31/03/2014

Researcher

Euro-Mediterranean Centre on Climate Change (CMCC) - Impacts on Soil and Coasts (ISC) Division, at SUMA laboratory (Meteo System & Instrumentation Laboratory) of the Italian Aerospace Research Centre (CIRA), Capua (Italy), Capua (Italy)

Development of the scientific research activity and drafting of technical reports relating to the research activity treated into the framework of climatology and analysis of hydrogeological risk related to climate change.

Researcher in the framework of several european projects, such as ADAPTALP, CLUVA, DDR MAURITIUS, GEMINA, PERSEUS, ORIENTGATE ad NEXTDATA developing validation activities of climate simulations performed by COSMO-CLM model.

Capability to analyse statistical features of weather and climate data provided by different platforms (satellite and in situ), through the implementation of codes for post processing (graphical representation, correlation, trend analyses)

Development of tools for the implementation of different **bias correction** techniques for climate data, such as linear scaling and quantile mapping. Comparison of the results obtained using different **downscaling techniques**.

Analyses of different climate observational dataset and **development of statistical tools** for the evaluation of their reliability and for the study of their features, whose knowledge is necessary for the validation of the climate model performances.

Partnership with SUMA group of CIRA to study **satellite products and platforms** available for monitoring weather hazards with focus for **Meteosat** products for the rain identification.

EDUCATION AND TRAINING

05/03/2009–10/11/2011

Master Degree in Telecommunications Engineering

University of Sannio, Benevento (Italy)

Telecommunications system. Statistical signal processing. Remote sensing system. Functional Analysis, Algebra and numerical methods. Digital electronics. Electromagnetic field. Antennas.

Thesis held at Telecommunications laboratory of the University of Sannio in partnership with CIRA (Italian Aerospace Research Centre). The work is related to the application of **satellite data of the EUMETSAT platform** for the implementation of **nowcasting** techniques for the precipitation.

Thesis work entitled: "Techniques for the precipitation forecast into the nowcasting range: an application based on satellite data". Mentors: Prof. Carmela Galdi, Dr. Galdi, Dr. Paola Mercogliano. Assistant supervisor: Prof. Maurizio di Bisceglie-

Grade: **110/110 with honours and special mention.**

26/09/2005–26/02/2009

Bachelor Degree in Telecommunications Engineering

University of Sannio, Benevento (Italy)

Mathematics, Physics, Electrotechnics and electronics. Programming, Signal Theory of random events.

Internship and thesis held at communications and remote sensing laboratory of the University of Sannio, working on the validation of results of a CFAR Algorithm (Constant False Alarm Rate) of **fire direction** based on the application of satellite data provided by **MODIS** sensor.

Thesis work entitled: "CFAR Techniques for Fire Detection: temporal validation and analysis of the results". Mentor: Prof. Carmela Galdi

Grade: **110/110 with honours**

09/2000–07/2005

Scientific High School Diploma

Liceo Scientifico "G. Rummo", Benevento (Italy)

Italian expression, mathematics, science, foreign language (english, french).

Synthesis ability and conceptualisation.

Ability in the construction of multidisciplinary courses

Grade: **100/100.**

PERSONAL SKILLS

Mother tongue(s)

Italian

Foreign language(s)

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken interaction	Spoken production	
English	B2	B2	B2	B2	B2
French	A2	A2	A2	A2	A2

Levels: A1 and A2: Basic user - B1 and B2: Independent user - C1 and C2: Proficient user
Common European Framework of Reference for Languages

Communication skills

Excellent attitude to work in team and under pressure.

Good capability to draft descriptive documents of the performed research activities.

Organisational / managerial skills

Ability in data and information collection in research contexts.

Good capability in problem solving.
 Excellent attitude to work with several projects at the same time.
 Excellent capability to achieve the targets.

Job-related skills	<p>Excellent knowledge of the climatological model COSMO-CLM and numerical weather prediction model COSMO-LM</p> <p>Post processing analysis of climate and weather simulations and implementation of statistical downscaling and bias correction techniques.</p> <p>Knowledge of ArcGIS software.</p> <p>Good knowledge of the satellite data and platform and capability to use software for processing of satellite and weather/climate data:wgrib, wgrib2, ilwis, CDO</p> <p>Capability to manage GRIB and NetCDF data.</p> <p>Implementation of Matlab codes for the processing of weather and climate data and for the study of their statistical properties (pdf, recurrence interval,Taylor diagrams).</p> <p>Development of precipitation nowcasting techniques using satellite data.</p> <p>Study of meteorological phenomena useful for the aviation, to develop a system of weather awareness.</p>
Digital skills	<p>Operating systems: Windows (98, 2000, XP, Vista), Unix and Linux</p> <p>Software: Office, MatLab, LaTeX, CDO, R.</p> <p>Programming languages: Fortran90, C, Java</p>
Driving licence	B

ADDITIONAL INFORMATION

Publications

- M. Turco, A.L. Zollo, C. Ronchi, C. de Luigi, P. Mercogliano, "Assessing gridded observations for daily precipitation extremes in the Alps with a focus on northwest Italy". *Natural Hazards and Earth System Sciences*, Vol. 13 (6), pp. 1457-1468 (2013).
- M. Montesarchio, A.L. Zollo, E. Bucchignani, P. Mercogliano, S. Castellari, "Performance evaluation of high-resolution regional climate simulations in the Alpine space and analysis of extreme events". *Journal of Geophysical Research – Atmospheres*, Vol. 119, pp. 3222-3237 (2014).
- V. Villani, G. Rianna, P. Mercogliano, A.L. Zollo, "Statistical approaches versus weather generator to downscale RCM outputs to slope scale for stability assessment: a comparison of performances". *Electronic Journal of Geotechnical Engineering*, Vol.20.4, pp 1495-1515 (2015).
- E. Bucchignani, M. Montesarchio, A.L. Zollo, P. Mercogliano, "High resolution climate simulations with COSMO-CLM over Italy: performance evaluation and climate projections for the XXI century". *International Journal of Climatology*, doi:10.1002/joc.4379 (2015).
- R. Vezzoli, P. Mercogliano, S. Pecora, A.L. Zollo, C. Cacciamani, "Hydrological simulation of Po River (North Italy) discharge under climate change scenarios using the RCM COSMO-CLM". *Science of The Total Environment*, vol.521-522, pp 346-358 (2015).
- A. L. Zollo, V. Rillo, E. Bucchignani, M. Montesarchio, and P. Mercogliano, "Temperature and precipitation extreme events over Italy: assessment of high resolution simulations with COSMO-CLM and future scenarios". *International Journal of Climatology*, doi:10.1002/joc.4401 (2015).
- G. Rianna, A.L. Zollo, P. Mercogliano, "Scenari Climatici sull'Italia per valori estremi". *ECOSCIENZA- Sostenibilità e controllo ambientale*, n°3, Anno VI, pp. 40-41(2015).
- E. Bucchignani, A.L. Zollo, L. Cattaneo, M. Montesarchio, P. Mercogliano, "Extreme weather events over China: assessment of COSMO CLM simulations and future scenarios". *International Journal of Climatology* (2016).
- E. Eccel, A.L. Zollo, P. Mercogliano, R. Zorer, "Simulations of quantitative shift in bioclimatic indices in the viticultural areas of Trentino (Italian Alps) by an open source R package". *Computers and Electronics in Agriculture* 127 pp 92–100 DOI: <http://dx.doi.org/10.1016/j.compag.2016.05.019> (2016).

- P. Ronco, F. Zennaro, S. Torresan, A. Critto, M. Santini, A. Trabucco, A.L. Zollo, G. Galluccio, A. Marcomini, "A risk assessment framework for irrigated agriculture under climate change". *Advances in Water Resources* (2017)
- Hochman, A., Bucchignani, E., Gershtein, G., Krichak, S. O., Alpert, P., Levi, Y., Yosef, Y., Carmona, Y., Breitgand, J., Mercogliano, P. and Zollo, A. L., "Evaluation of regional COSMO-CLM climate simulations over the Eastern Mediterranean for the period 1979–2011". *International Journal of Climatology* (2017)
- Bucchignani E, Mercogliano P, Montesarchio M, Zollo AL, "Numerical simulation of the period 1971-2100 over the Mediterranean area with a regional model, scenario SRES-A1B", DOI: 10.3390/su9122192, *Sustainability*, Vol. 9 Issue 12, 2017, pp. 2192

Conference Proceedings

- M. Turco, A.L. Zollo, R. Vezzoli, C. Ronchi, P. Mercogliano, "Daily precipitation statistics over the Po Basin: observation and post-processed RCM results". *Proceedings of SISC (Società Italiana per le Scienze del Clima) First Annual Conference, Climate change and its implications on ecosystem and society*, Lecce, September 23-24, 2013.
- E. Bucchignani, P. Mercogliano, M. Montesarchio, M.P. Manzi, A.L. Zollo, "Performance evaluation of COSMO-CLM over Italy and climate projections for the XXI century". *Proceedings of SISC (Società Italiana per le Scienze del Clima) First Annual Conference, Climate change and its implications on ecosystem and society*; Lecce, September 23-24, 2013.
- A.L. Zollo, M. Turco, P. Mercogliano, "Assessment of hybrid downscaling techniques for precipitation over the Po river basin". *Engineering Geology for Society and Territory*, Vol. 1, pp. 193-197 (2015).
- A.L. Zollo, G. Rianna, P. Mercogliano, P. Tommasi, L. Comegna, "Validation of a simulation chain to assess climate change impact on precipitation induced landslides". *Landslide Science for a Safer Geoenvironment*, pp. 287-292 (2014).
- R. Vezzoli, M. Del Longo, P. Mercogliano, M. Montesarchio, S. Pecora, F. Tonelli, A.L. Zollo, "Hydrological simulations driven by RCM climate scenarios at basin scale in the Po River, Italy". In A. Castellarin, S. Creola, E. Toth, A. Montanari (Ed.), *Book title: Evolving Water Resources Systems: Understanding, Predicting and Managing Water–Society Interactions Proceedings of ICWRS2014*, Bologna, Italy, June 2014 (IAHS Publ. 364, 2014), pp 128-133 (2014).
- E. Bucchignani, M. Montesarchio, A.L. Zollo, P. Mercogliano, "Regional climate simulations with COSMO-CLM over the Mediterranean area". *Proceedings of SISC (Società Italiana per le Scienze del Clima) Second Annual Conference, Climate Change: Scenarios, impacts and policy*; Venice, September 29-30, 2014 – pp 338-351 (2014).
- G. Rianna, A.L. Zollo, P. Tommasi, M. Paciucci, L. Comegna, P. Mercogliano, "Evaluation of the effects of climate changes on landslide activity of Orvieto clayey slope". *Procedia Earth and Planetary Science* vol 9, pp 54-63 (2014).
- V. Rillo, A. L. Zollo, P. Mercogliano, "MATISSE: an ArcGIS tool monitoring and nowcasting meteorological hazards". Submitted to *Advances in Science and Research*, special Issue on EMS 2014 (2015).
- A. L. Zollo, M.P. Manzi, P. Mercogliano, C. Galdi, "Precipitation nowcasting using the satellite product Multi-Sensor Precipitation Estimate". Submitted to *2nd IEEE International Workshop on Metrology for Aerospace* (2015).
- M.P. Manzi, A. L. Zollo, P. Mercogliano, C. Galdi, "Aviation weather awareness: development of algorithms for the detection of weather hazard through the use of EUMETSAT products". Submitted to *2nd IEEE International Workshop on Metrology for Aerospace* (2015).
- V. Rillo, A. L. Zollo, P. Mercogliano, C. Galdi, "Detection and forecast of convective clouds using MSG data for aviation support". Submitted to *2nd IEEE International Workshop on Metrology for Aerospace* (2015).
- V. Rillo, A. L. Zollo, P. Mercogliano, "MATISSE: an ArcGIS tool monitoring and nowcasting meteorological hazards". *Advances in Science and Research - Open access Proceedings*, vol.12 pp.163-169 DOI:10.5194/asr-12-163-2015 (2015).
- Barbato G., Zollo A.L., Mercogliano P. - "Analysis of the Planetary Boundary Layer using CS135 Ceilometer". *Proceedings of 3rd IEEE International Workshop on Metrology for Aerospace IEEE International Workshop on Metrology for Aerospace*. DOI: 10.1109/MetroAeroSpace.2016.7573198 (2016).
- Zollo AL, Montesarchio M, Bucchignani E, Mercogliano P, Beran J, "An Advanced Weather Awareness System For Small Aircraft". *Proceedings of 7th EASN 2017 International*

Conference on Innovation in European Aeronautics Research, Warsaw, 26-29 September 2017. ISSN 2523- 5052

- Zollo A, Biron, Melfi D, Mercogliano P, Zauli F, “Aviation Meteorology: An Icing Detection Product Based On EUMETSAT Data”, Proceedings of 2017 EUMETSAT Meteorological Satellite Conference. 2-6 October 2017, Rome.

Research Papers (CMCC)

- A.L. Zollo, P. Mercogliano, M. Turco, R. Vezzoli, G. Rianna, E. Bucchignani, M.P. Manzi, M. Montesarchio, “Architectures and tools to analyse the impact of climate change on hydrogeological risk on Mediterranean area” (marzo 2012).
- E. Bucchignani, P. Mercogliano, M. Montesarchio, A.L. Zollo, M.P. Manzi, “Prearrangement of the COSMO-CLM Model on the Chinese region and sensitivity analysis” (luglio 2012).
- L. Cattaneo, A.L. Zollo, E. Bucchignani, M. Montesarchio, M.P. Manzi, P. Mercogliano, “Assessment of COSMO-CLM performances over Mediterranean Area” (novembre 2012).
- A.L. Zollo, M. Montesarchio, M.P. Manzi, L. Cattaneo, E. Bucchignani, P. Mercogliano, “Assessment of COSMO-CLM performances in simulating the past climate of Italy” (novembre 2012).
- M. Turco, A.L. Zollo, G. Rianna, R. Vezzoli, L. Cattaneo, P. Mercogliano, “Post-processing methods for COSMO-CLM precipitation over Italy” (aprile 2013).
- M. Turco, A.L. Zollo, V. Rillo, P. Mercogliano, “GCM driven COSMO-CLM post-processed precipitation over Italy: control and future scenarios” (settembre 2013).
- R. Vezzoli, P. Mercogliano, S. Pecora, M. Montesarchio, A.L. Zollo, M. Del Longo, F. Tonelli, “Evaluation of climate driven simulations of Po river flow from 1971 to 2000 through flow-duration curve indices: preliminary results” (dicembre 2013).
- V. Rillo, R. Vezzoli, M.P. Manzi, A.L. Zollo, L. Cattaneo, P. Mercogliano, “Analysis of the Christmas Storm over Northern Italy” (gennaio 2014).
- Mercogliano P., Montesarchio M., Rianna G., Vezzoli R., Zollo A.L., Schiano P. - RP0233 – “High resolution climate scenarios on Mediterranean test case areas for the hydro-climate integrated system” (2014).
- Villani V., Cattaneo L., Zollo A.L., Mercogliano P. – RP0262 - “Climate data processing with GIS support: description of Bias Correction and Temporal Downscaling tools implemented in Clime software” (2015).

Deliverables

- A.L. Zollo, M. Montesarchio, E. Bucchignani, P. Mercogliano, “Black Sea atmospheric surface forcing function data (Deliverable Nr. 4.2)”. Approved by internal proof readers of the PERSEUS project and European Communion
- M. Montesarchio, A.L. Zollo, P. Mercogliano, “Climate simulations over the Orientgate area with the RCM COSMO-CLM”. Approved by internal proof readers of the ORIENTGATE project and European Communion

Courses

- “ENVI-IDL Training Course”, course on the software for the processing and analysis of geospatial imaging (ENVI) and on the programming language (IDL) at Italian Aerospace Research Centre(CIRA), Capua (December 2011).
- “COSMO-CLM Training Course”, at DWD, Langen (Germany) (February 2012).
- TEMPS-C2SM workshop on “Regional climate model data for climate impact research” (February 2013) at ETH (Zurich)
- ECMWF Training course on “Predictability, diagnostics and extended-range forecasting” (April 2013) at CMWF(Reading)
- ECMWF Training course on “Numerical methods, adiabatic formulation of models and ocean wave forecasting” (May 2013), at ECMWF(Reading)
- 10th EUMETNET Data Management Workshop (October 2015), at St. Gallen (Switzerland).
- Space Weather Course, organized by NATO (February 2016), at Pratica di Mare (AM), Pomezia (Rome).
- Summer school CNR/ISAC: “Advances in severe weatheranalysis: models and observations” (June 2016), at Lecce.
- R statistic software (March 2017), at CIRA.

Presentations

- Presentation at “CMCC- Annual Meeting 2012” (giugno 2012), Ugento (Italy), of two posters
 - 1) Assessing relevant climate data for extremes precipitation analysis in alpine areas. (Authors: A.L. Zollo, M. Turco, C. Ronchi, C. de Luigi, P. Mercogliano)
 - 2) MOS downscaling for hydrological application. (Authors: M. Turco, A.L. Zollo, P. Mercogliano)
- Oral presentation at “CLM Community Assembly 2012” (September 2012), Leuven (Belgium), of the work entitled:

Assessment of temperature and precipitation over Mediterranean Area and Black Sea with COSMO-CLM. (Authors: A.L. Zollo, E. Bucchignani, P. Mercogliano, M. Montesarchio, G. Quattrocchi)
- Presentation at “CMCC- Annual Meeting 2013” (June 2013), Ugento (Italy) of a poster entitled:

Comparison of post-processing techniques for COSMO-CLM precipitation over the Po basin. (Autori: A.L. Zollo, M. Turco, P. Mercogliano)
- Oral presentation at Training Seminar “Analysis of the expected impact on the hydroelectric sector Guidelines, methodology, indicators” (September 2014), Trento (Italy) of the work entitled:

Climate model and bias correction. (Authors: A.L. Zollo, M. Montesarchio, N.C. Zollo, V. Villani, L. Cattaneo, P. Mercogliano)
- Oral presentation at the event “The consequences of climate change in the management of water resources for hydroelectric use. The results of the project ORIENTGATE” (September 2014), Trento (Italy), of the work entitled:

Climate Change in Trentino: future scenarios. (Authors: M. Montesarchio, A.L. Zollo, N.C. Zollo, V. Villani, L. Cattaneo, P. Mercogliano)
- Oral presentation at “14th EMS Annual Meeting & 10th European Conference on Applied Climatology (ECAC)” (October 2014), Praha (Czech Republic) of the work entitled:

MATISSE: an ArcGIS tool monitoring and nowcasting meteorological hazards. (Authors: V. Rillo, A.L. Zollo, P. Mercogliano)
- Oral presentation at “IEEE International Workshop on Metrology for Aerospace” (June 2015), Benevento (Italy), of the work entitled:

Precipitation nowcasting using the satellite product Multi-Sensor Precipitation Estimate. (Autors: A.L. Zollo, M.P. Manzi, P. Mercogliano, C. Galdi)
- Oral presentation at “EUMETSAT Meteorological Satellite Conference 2017” (October 2017), Rome, of the work entitled:

Aviation meteorology: An icing detection product based on EUMETSAT data
- Oral presentation at “EMS annual meeting 2018” (September 2018), Budapest, of the work entitled:

A weather awareness system supporting detection and forecasting of aviation hazards (Authors: A.L. Zollo, M. Montesarchio, P. Mercogliano)

Lectures

- Lecture on “Bias Correction and downscaling techniques” in the framework of the course “Methodologies of evaluation of the impacts of climate change and land planning”, for ISAC-CNR in Lamezia Terme (March 2013)
- Lecture on “Statistical downscaling” and exercise with R software in the framework of CLIMASOUTH project. Lecce (March 2015)