



Antonello A. Squintu

Curriculum Vitae

Climate Scientist. Background in Physics and Atmospheric Physics. PhD obtained analyzing climatological trends of temperature observations in Europe after a statistical removal of human-induced biases. Experience in verification and post-processing of weather models with Machine Learning techniques. High interest in topics related to geophysics, climate policies, sport, music, history and politics.

Work Experience

2023–present **Scientist**, *CMCC, Centro Euro-Mediterraneo sui Cambiamenti Climatici*, Bolgona, Italy.

Detection of extreme events in future climate projections making use of Machine Learning (ML) algorithms.

Currently working on:

- Verification on re-analysis of algorithms of detection of extreme events;
- Interpretation and scientific evaluation of the results obtained with ML processes.

2020–2023 **Scientist**, *KNMI, Koninklijk Nederlands Meteorologisch Instituut*, De Bilt, Netherlands.

Verification and post-processing of probabilistic weather forecasts with ML techniques, aimed at improving the Early Warning Center of KNMI

Achieved tasks:

- Analysis of outputs of weather forecasts and their verification against in-situ observations, focusing on extreme events;
- Application of Machine Learning algorithms (in R and Python) aimed at the post-processing of probabilistic forecasts;
- Visualization on maps of forecasts of extreme events and communication of their scientific relevance to operational meteorologists.

Bologna – Italy

✉ antonello.squintu@cmcc.it • [in Antonello Squintu](https://www.linkedin.com/in/AntonelloSquintu) • [🌐 AntoSq](https://github.com/AnToSq)

1/4

- 2015–2020 **PhD**, *KNMI, Koninklijk Nederlands Meteorologisch Instituut*, De Bilt, Netherlands. Joint PhD programme focused on Climatology and Climate Statistics, in partnership with Wageningen University. Promotor: Pr. A. Klein Tank. Supervisor: Dr. G. van der Schrier. Achieved tasks:
- Development of an R software to homogenize a large datasets of temperature records and comparison of the results with existing methods;
 - Assessment and analysis of climate trends in temperature over Europe;
 - Validation of climate simulations developed in the HighResMIP;
 - Participation to important conferences and meetings and active role in international projects: EUSTACE, PRIMAVERA, Copernicus C3Surf.
- 2015–2015 **Research assistant**, *ISAC-CNR, Istituto di Scienze dell'Atmosfera e del Clima - Consiglio Nazionale delle Ricerche*, Bologna, Italy. Collaboration with the team of Dr. M. Brunetti for the quality check, homogenization and analysis of temperature series in the region of Trentino Alto Adige, Italy.

Education

- 2012–2015 **M. Sc. - Earth System Physics**, *ALMA MATER - UNIVERSITY OF BOLOGNA*, Bologna, Italy.
- Climatology;
 - Synoptical and Dynamic Meteorology;
 - Radiative balance of the Atmosphere and Radiative Transfer;
 - Planetary Boundary Layer;
 - Chemistry of the Atmosphere;
 - Elements of Geophysics and Numerical Geophysics.
- 2008–2012 **B. Sc. - General Physics**, *UNIVERSITY OF PISA*, Pisa, Italy.
- Mathematical Analysis and Calculus;
 - Classical, Mechanical, Statistical Physics and Thermodynamics
 - Electromagnetism and elements of Electronics
 - Quantum Mechanics, Nuclear and Subnuclear Physics;
 - Matter Physics;
 - Astrophysics;
 - Chemistry;
 - Elements of C++ programming.

PhD thesis

- title Pan-European homogenization of daily multi-decadal temperatures series from station-based observation
- university Wageningen University, KNMI
- date 16/10/2020
- supervisors Albert Klein Tank, Gerard van der Schrier

description Relocation of measuring stations affect the temporal consistency of temperature records, affecting the reliability of climatological analyses. This thesis has included the development and application of an automatic homogenization algorithm that has been applied to the European Climate Assessment and Dataset (ECA&D) using the quantile matching technique. The method has been validated against widely-known homogenization methods. Resulting series have been analysed in their trends on yearly indices, focusing on extreme values and have been used to assess the accuracy of climate simulations of the HighResMIP initiative in reproducing temperature trends.

Master thesis

title Daily temperature trends in Trentino Alto Adige over the last century
university *Alma Mater University of Bologna* date 27/03/2015

supervisors Michele Brunetti

description Long series of minimum and maximum temperatures in the mountain region of Trentino Alto Adige have been collected, checked in their quality and homogenized. The series have been interpolated on a grid and analyses in their trends. This work allowed to detect a clear warming trend, with particularly high values for maximum temperatures in spring and summer.

Publications

Int. J. of Climate Squintu et al., 2018 - Homogenization of daily temperature series in the European Climate Assessment and Dataset - <https://doi.org/10.1002/joc.5874>

J. of Applied Meteorology and Clim. Squintu et al., 2020 - Building long homogeneous temperature series across Europe: a new approach for the blending of neighboring series - <https://doi.org/10.1175/JAMC-D-19-0033.1>

Theoretical and Applied Climatology Squintu et al., 2020 - Comparison of homogenization methods for daily temperature series against an observation-based benchmark dataset <https://doi.org/10.1007/s00704-019-03018-0>

Climate Dynamics Squintu et al., 2021 - Evaluation of trends in extreme temperatures simulated by HighResMIP models across Europe - <https://doi.org/10.1007/s00382-020-05596-6>

Conferences and Meetings

2023 European Geophysical Union, Vienna, Austria
Oral presentation about the use of EMOS and QRF techniques on ECMWF probabilistic forecasts of wind-gusts

2019 1st National Conference on Meteorological and Climatic Forecasts, Bologna, Italy
Poster presentation about the evaluation of gridded temperature dataset over Italy

2018 European Meteorological Society, Budapest, Hungary
Oral presentation about the homogenization of blended temperature series

2018 European Geophysical Union, Vienna, Austria

Bologna – Italy

- Oral presentation about the comparison of homogenization methods
- 2017 EUMETNET Data Management Workshop, Zagreb, Croatia
Oral presentation about the homogenization of temperature series without metadata
- 2017 9th Seminar for homogenization and quality check, Budapest, Hungary
Oral presentation about break detection and homogenization
- 2016 European Meteorological Society, Trieste, Italy
Oral presentation about the homogenization of temperature series
- 2016 Swiss Climate Summer School, Grindelwald, Switzerland
Poster Presentation about the first results and the outlook of the PhD project
- 2016 12th ACRE Workshop, Maynooth, Ireland
Poster presentation on the preliminary results in the homogenization of temperatures

Computer skills

- operative systems Macintosh, Linux, Windows
- programming languages R, Python, BASH, MATLAB, C++
- dataset managing MySql, CDO, R (dataframes, dplyr,...), Python(pandas dataframes, xarray, scikit-learn, ...)

Languages

- Italian native
- English (business) proficiency
- Spanish intermediate
- French intermediate
- Dutch intermediate