CIVIL AND ENVIRONMENTAL ENGINEERING

Verification of weather-climate modelling

Funded By	ARPA PIEMONTE - AGENZIA REGIONALE PROTEZIONE AMBIENTALE [P.iva/CF:07176380017]

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Context of the research activity	The objectives of the reserach activity include: - development of algorithms for verification of numerical modelling - increasingly specific methods and techniques for the study of the behaviour of very high resolution modelling chains - development of post-processing algorithms for the formulation of quantitative forecasts - validation of numerical modelling for the production of historical analysis with high spatial resolution - use of high resolution climate analysis and numerical scenario climate simulations for the production of climate services
	The specific objectives of the research are those included in the Arpa Piemonte collaboration with the National Civil Protection Department and the Agency's commitment in the project HIGHLANDER 2018-IT-IA-0084, Connecting Europe Facility (CEF), Telecommunications Sector. They can be summarized: - development of algorithms for objective, spatial and punctual verification of

Objectives	numerical modelling - increasingly specific methods and techniques for the study of the behaviour of very high resolution modelling chains, including fuzzy type verification systems and cost/benefit methodologies - development of post-processing algorithms for the formulation of quantitative forecasts, including multimodel and ensemble approaches - validation of numerical modelling for the production of historical analysis with high spatial resolution - use of high resolution climate analysis and numerical scenario climate simulations for the production of climate services, in particular for the agricultural and forestry sector The overall objective of the research is to explore the potential of the innovative weather-climate model high resolution simulations to provide information content to improve the operational services for the natural risk forecasting and prevention.
Skills and competencies for the development of the activity	Physics: meteorological and climate processes, climate change scenarios Statistics: data analysis, also using machine learning technique application, weather and climate data format managing and visualization Information Technology: good knowledge of Python and software R for meteo and climate data processing (e.g. grib, grib2 and netcdf format reading and writing; interpolation algorithms), good knowledge of html, css, javascript and libraries for data visualization on interactive maps (e.g. leaflet) Soft skills: teamwork, problem-solving, self-time management, critical thinking, curious personality.