

## SHORT CURRICULUM VITAE of ALFONSO SENATORE

### • PERSONAL INFORMATION

Name: Senatore Alfonso

Date of birth: February 20, 1977

Nationality: Italian

Researcher unique identifier: 0000-0001-9716-3532 (<https://orcid.org/0000-0001-9716-3532>)

URL for the website: <https://cesmma.unical.it/alfonso-senatore/>

### • EDUCATION

2006 PhD in Environmental Hydraulic Engineering

University of Calabria, Italy (PhD Supervisors: Prof. G. Mendicino, Prof. S. Straface)

2001 MSc (5 years) Degree in Environmental Engineering

Faculty of Engineering, University of Calabria, Italy

### • CURRENT POSITION

2019 - present Associate Professor (Professore Associato SSD ICAR/02), Department of Environmental Engineering, University of Calabria, Italy - Qualified for tenure as a Full Professor (Abilitazione Scientifica Nazionale – ASN)

### • PREVIOUS POSITIONS

2016 – 2019 Tenure-Track Researcher (RTD-B), Department of Environmental and Chemical Engineering, University of Calabria, Italy

### • FELLOWSHIPS

2014 – 2015 Post-doctoral fellow, Department of Environmental and Chemical Engineering, University of Calabria, Italy

2011 – 2014 Post-doctoral fellow, Department of Soil Conservation, University of Calabria, Italy in collaboration with KIT Institute of Meteorology and Climate Research - Atmospheric Environmental Research (KIT – Campus Alpin, Germany)

2006 – 2011 Post-doctoral fellow, Department of Soil Conservation, University of Calabria, Italy

### • SUPERVISION OF GRADUATE and PHD STUDENTS

Supervision of >80 Bachelor and Master Students in Environmental Engineering; Supervision/co-supervision of 4 PhD Students and 2 type A researchers.

### • TEACHING ACTIVITIES (lecturer)

Master's programme in Environmental Engineering, University of Calabria, Italy, since AY 2016-17: Multi-Risk Forecasting Systems; since AY 2022-23: Operational tools for hydraulic-environmental studies;

Bachelor's programme in Environmental and Chemical Engineering, University of Calabria, Italy, AY 2021-22: Hydraulic Constructions; AY 2019-20: Geographic Information Systems;

Bachelor's programme in Natural Hazards Management, University of Calabria, Italy, AYs from 2006-07 to 2009-10: Numerical Cartography and GIS Applications;

Doctoral School in Science and Engineering of the Environment, Constructions and Energy, University of Calabria, Italy, since AY 2016-17: Dynamically Coupled Atmospheric-Hydrological Modeling Systems.

### • BIBLIOMETRY

Over 50 published papers in major peer-reviewed international journals including BAMS, Science of the Total Environment, Hydrology and Earth System Sciences, Climate Dynamics, Journal of

Advances in Modeling Earth Systems, Water Resources Research, Journal of Hydrometeorology, Scientific Reports, Advances in Water Resources, Hydrological Processes, and in ISI/Scopus indexed conferences. Google Scholar H index = 21 (ca. 1600 citations), Scopus h-index = 19 (ca. 1100 citations).

#### • RESEARCH PROJECTS (selected)

I have been involved as PI or co-PI in several national/international research projects funded by private companies, the Italian Ministry for University and Research and the European Community, including the following:

- ScaleX experiment, in the context of the TERENO (TERrestrial ENvironmental Observatories) initiative promoted by the Helmholtz Association Co-responsible of WP4 “Closing the Regional Water and Energy Balance by Modeling and Observation” (2015-16);
- Framework Agreement between the Dept. of Environmental and Chemical Engineering, University of Calabria, and the company CAE SpA for technical and scientific assistance for software and systems development, aimed at the estimation of fire risk and fire propagation, PI and responsible (2018);
- PON (Programma Operativo Nazionale) 2014-2020 Project ComESto (Community Energy Storage), Action Manager (2018-21);
- MAITAN Project (CUP J21B14000550005) “Monitoraggio Integrato Targeti Antropici e Naturali per la gestione emergenze idrogeologiche e del patrimonio storico culturale” POR Calabria 2014-2020, PI (2019-21);
- Interreg Italy-Croatia ADRIACLIM project, concerning Climate change information, monitoring and management tools for adaptation strategies in Adriatic coastal areas, consulting contract with the Euro-Mediterranean Center on Climate Change (CMCC), PI and responsible (2021-2023);
- RILIES Project (CUP J69J21007570005) “Sistema sperimentale di monitoraggio e preannuncio a supporto delle decisioni per il rischio alluvioni” POR Calabria 2014-2020, PI and responsible (2022-2023);
- ESTUARIO Project : “Estuarine box model for Interfacing rivers and Ocean”, funded by Mercator Ocean, PI and Local Unit responsible (2022-2024);
- PNRR Ecosistemi dell’Innovazione Tech4You Project: responsible for the Pilot Project “System for monitoring, forecasting, warning and drought risk management” (Spoke 1 - Goal 1.2 PP5 – Spoke 1) (2023-2025);
- Team Member of the ERC Consolidator Grant 2017 “Dynamical river NETWORKS: climatic controls and biogeochemical function” (DyNET) (PI Prof. G. Botter), responsible for the Turbolo Creek monitoring site (2018-23);
- FLAME (Future Coastal Ocean Climates, <https://projects.noc.ac.uk/flame/>), an endorsed UN Ocean Decade Action and a core project of the CoastPredict Programme, member of the Steering Committee and co-organizer of the 1<sup>st</sup> FLAME workshop (2023-2030).

#### • COMMISSIONS OF TRUST

2020-21: Guest Editor, Special Issue “Coupled atmosphere-hydrological processes: novel system developments and cross-compartment evaluations”, Hydrological Processes, Wiley, USA;  
2021-onwards: Expert appointed to assist with tasks in the context of managing of EU funding programmes by the European Commission Research Executive Agency (REA);  
2017, 2019-21: Review Panel Member, Ministry of Higher Education and Research, Romania and Research & Innovation Foundation of the Republic of Cyprus;  
2010: Drought and water shortage expert within the Integrated Water Resource Management Network (IWRM-NET).

#### • MEMBERSHIPS OF SCIENTIFIC SOCIETIES

Member of the European Geosciences Union (EGU), the American Geophysical Union (AGU), the International Association of Hydrological Sciences (IAHS), the Hydraulics Italian Association

(GII).

- MAJOR INTERNATIONAL COLLABORATIONS

Prof. Harald Kunstmann and Dr. Gerhard Smiatek (Karlsruhe Institute of Technology – KIT, Campus Alpin, Garmisch-Partenkirchen, Germany), Hydrological impact of climate change;  
Dr David Gochis (NCAR, Boulder, USA), Prof. Harald Kunstmann and Dr Benjamin Fersch (KIT, Campus Alpin), Fully coupled atmosphere-hydrological modelling;  
Dr Linus Magnusson (ECMWF, Reading, UK), Medium-range predictability of extreme hydrometeorological events;  
Dr Lu Li and Prof. Stefan Sobolowski (Norwegian Research Centre – NORCE, Bergen, Norway), impact of initial conditions on meteo-hydrological modelling chains;  
Javier Almorox (Universidad Politécnica de Madrid, Spain), Simplified methods for reference evapotranspiration estimate;  
Dr Somayeh Hejabi and Prof. Parviz Irannejad (University of Tehran), Climate change impact on drought conditions in Iran;  
Dr Giovanni Coppini and Dr Giorgia Verri (CMCC - Euro-Mediterranean Center on Climate Change), Fully coupled atmosphere-hydrological modelling on the Adriatic Basin.

- PRIZES/AWARDS/QUALIFICATIONS

2021: National Academic Qualification as Full Professor (Abilitazione Scientifica Nazionale);  
2021: Affiliated to the Euromediterranean Center on Climate Change (CMCC) concerning coupled atmosphere-hydrological modelling in the Adriatic Basin;  
2020: winner of the “Förderpreis der Verein der Freunde und Förderer des Instituts für Meteorologie und Klimaforschung (IMK-IFU)” with the paper “High-resolution fully coupled atmospheric–hydrological modeling: a cross-compartment regional water and energy cycle evaluation” (Fersch B., Senatore A. et al., Hydrol. Earth Syst. Sci., 24, 2457–2481);  
2015: Scholarship for a Research Stay for University Academics and Scientists awarded by the German Academic Exchange Service (DAAD);  
2011: Certificate of Appreciation awarded by the University of Nebraska Kearney for Great Contribution of Knowledge to James E. Smith Midwest Conference on World Affairs.

- MAJOR BREAKTHROUGHS and RESEARCH IMPACT

My research activities are predominantly developed in hydrology, ecohydrology and hydrometeorology, with theoretical, numeric and experimental research.

A significant achievement of the research activity concerns the development of a widely applied groundwater resource index (GRI) for drought monitoring and forecasting.

Another breakthrough concerns the topic of fully-coupled atmosphere-hydrological modelling for both flooding early warning and climate change studies. I collaborated on developing the WRF-Hydro fully-coupled system, authored the paper showing its first long-range application and developed operational outcomes (e.g., the real-time weather forecast of the University of Calabria: <https://cesmma.unical.it/cesmma-weather-forecasting/>).

Other original contributions include developing hillslope-to-basin-scale hydrological and eco-hydrological models based on the computational paradigm of Cellular Automata, spatially-distributed hydrological models for assessing the hydrological impact of climate change, simplified methods for reference ET estimate. Finally, I developed space-time models of drainage network dynamics for intermittent headwater catchments.

- INVITED SEMINARS (selected)

March 7-8, 2011: James E. Smith Midwest Conference on World Affairs “Water and Survival: from the Platte to the Nile”, the University of Nebraska at Kearney;

July 7, 2011: KIT Campus Alpin, Garmisch-Partenkirchen (Germany), seminar on “Future water availability and drought risks in Southern Italy”;

November 21, 2014: CIMA Research Foundation (International Centre on Environmental Monitoring), Savona (Italy), seminar on “One-way and fully-coupled WRF-Hydro atmospheric-hydrological modelling in the Crati catchment, Southern Italy”;

February 5, 2015: KIT Campus Alpin, seminar on “Precipitation, soil moisture and heat fluxes modelling in a Mediterranean catchment with a fully-coupled atmosphere-hydrology model system: preliminary results from short- and long-range simulations”;

July 21, 2015: CMCC (Lecce, Italy), seminar on “Impact of enhanced hydrological parameterization in WRF mesoscale model for short- and long-timescales”;

June 23, 2017: Hydrology days 2017 (Favignana, TP, Italy), seminar on “Drought and water scarcity in a changing environment”;

September 26, 2017: “Coastal Hydrology and Surface Processes linked to Air/Sea Modeling: 1st community of users workshop” (Madeira, Portugal) organized by the Oceanic Observatory of Madeira;

November 20-22, 2018: HiWeather workshop on increasing the value of weather-related warnings (WMO-WWRP), Beijing, China;

March 15, 2022: “Remote sensing applications for a better understanding of the water cycle under climate change adaptation”; in the context of the MSc program in Satellite Data for Sustainable Development, Strathclyde University (Glasgow, UK).

February 20, 2023: “How to deal with a climate change hotspot: Forecasting severe precipitation events and their hydrological impact in the central Mediterranean”, UK MetOffice (Exeter, UK).

February 24, 2023: “How to deal with a climate change hotspot: Forecasting severe precipitation events and their hydrological impact in the central Mediterranean”, ECMWF (Reading, UK).