

Christian Massari

Senior Research Scientist

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Personal Information

- **Family Name:** Massari
- **First Name:** Christian
- **Date of Birth:** 22 July 1981
- **Nationality:** Italian

Researcher Unique Identifiers

- ORCID: [0000-0003-0983-1276](#)
- Scopus ID: [36773560600](#)
H-index (Scopus): 41 Citations: 5366
- Google Scholar: [Profile](#)
H-index (Scholar): 45 Citations: 6931
- Website: <https://cnr-eco-hydrology-lab.org/>

Education

- 2008–2011: **Ph.D.** in Hydraulics (Excellent *cum laude*), University of Perugia, Italy
- 2005–2007: **M.Sc.** in Civil and Environmental Engineering (110/110 *cum laude*), University of Perugia, Italy
- 2001–2005: **B.Sc.** in Civil Engineering (110/110 *cum laude*), University of Perugia, Italy

Current Position

- 2023–present: **Senior Scientist**, Research Institute for the Geo-Hydrological Protection, National Research Council, Italy

Previous Positions

- 2017–2022: **Researcher** — Research Institute for the Geo-Hydrological Protection, National Research Council (Italy)
- 2015–2016: **Fixed term researcher** — Research Institute for the Geo-Hydrological Protection, National Research Council (Italy)
- 2013–2015: **Postdoctoral Researcher** — Research Institute for the Geo-Hydrological Protection, National Research Council (Italy)
- 2012–2013: **Research Fellow** — Department of Civil and Environmental Engineering, University of Perugia (Italy)

- 2010–2012: **Visiting Fellow** — University of Arizona, Hydrology and Water Resources Institute, Arizona, USA

Fellowships

- 2018 — **Winner of the CNR Short Mobility Program Fellowship** — Hydrology and Remote Sensing Laboratory, USDA (USA), Beltsville, Maryland, USA. Contact Person: Wade Crow
- 2016 — **Winner of the CNR Short Mobility Program Fellowship** - Dept. of Civil, Environmental & Infrastructure - George Mason University, Virginia, USA. Contact Person: Viviana Maggioni

Supervision of Graduate Students; PhD & PostDoc Students

- **2018–2025 — Postdocs (4)** Research Institute for Geo-Hydrological Protection, National Research Council (CNR), Perugia, Italy
- **2018–2025 — PhD Students (6)** KU Leuven (Belgium); University of Florence (DAGRI, Italy); University of Perugia (Italy); University of Trento (Italy); University of Campania “Luigi Vanvitelli” (Italy)
- **2010–2013 — Master Students (4)** University of Perugia, Department of Civil and Environmental Engineering (Italy)

Teaching Activities

- 2024 — **Lecturer**. Third Summer School of the International Association for Engineering Geology and the Environment (IAEG), Aosta, Italy.
- 2021–2022 — **Lecturer** for more than 20 hours of lectures on application of remote sensing for hydrology for the Italian Civil Protection Department and for EUMETSAT.
- 2019 — **Lecturer**. Use of Earth Observation data in hydrology. University of California, Berkeley, USA.
- 2009–2012 — **Co-lecturer**. Hydraulics. University of Perugia, Italy.

Organisation of Scientific Meetings

- 2026 — **Primary convener** of the European Geophysical General Assembly 2026. Session: *Advancements in monitoring and modeling water and carbon cycles in agroforestry systems (accepted)*.
- 2024 — **Co-convener** of the American Geophysical Union Fall Meeting 2024. Session: *Advancements in Monitoring and Modeling the Water Cycle in Agroforestry Systems*, Washington DC, USA.
- 2022, 2024 — **Co-convener** of the *IEEE International Workshop on Metrology for Agriculture and Forestry*. Perugia, 2–5 November 2022; Padova, 29–31 October 2024.
- 2021 — **Primary convener** of the American Geophysical Union Fall Meeting 2021. Session: *Remote Sensing, Modelling, and Data Assimilation of the Terrestrial Water Cycle*.
- 2021 — **Organiser** of the *6th Satellite Soil Moisture Validation and Application Workshop* (International Conference), Perugia, Italy.
- 2015 — **Member of the Organising Committee** of *Le Giornate dell’Idrologia*, Perugia, 6–8 October 2015. Italian Hydrological Society, Perugia, Italy.

Institutional Responsibilities

- 2025 — **Member of the Committee** for the European Space Agency Earth Observation Excellence Award.

- 2024–present — **Board Member** of the European Space Sciences Committee (ESSC) – Earth Science, <https://www.essc.esf.org>, Strasbourg, France.
- 2023–present — **Advisor Member**, International Society for Photogrammetry and Remote Sensing (ISPRS).
- 2023–2024 — **Technical Member**, *WATer isotopeS in the critical zONe: from groundwater recharge to plant transpiration (WATSON) WG1&2*, Europe.
- 2023–present — **Member** of the Working Group in Commission 3: Hydrologic signature in geodetic observations, International Association of Geodesy.
- 2022–present — **Secretary & Member** of the directive committee of the Italian Hydrological Society, Bologna, Italy.
- 2020–present — **Member of the Committee** for the Hydrology Outstanding Student Presentation Awards (OSPA), American Geophysical Union (AGU).
- 2019–2023 — **Member** of the American Geophysical Union Technical Committee on Precipitation, San Francisco, California, USA.

Commissions of Trust

- 2019, 2025 — Member of the **Scientific Committee** of the European Space Agency *Living Planet Symposium* (Milano, Italy; Vienna, Austria).
- 2024, 2025 — Member of the **Scientific Committee** of *Le Giornate dell'Idrologia* (Udine; Bari).
- 2022–2025 — **Reviewer for proposals**: Netherlands Space Office; National Fund for Scientific and Technological Development of Government of Chile (FONDECYT); European Commission ERC Starting Grant proposals.
- 2018–present — **Associate Editor**, *Journal of Hydrology* (Elsevier).
- 2019–2022 — **Associate Editor**, *Remote Sensing* (MDPI).
- 2021 — Member of the **Review Board** of the German Science Foundation (DFG) *Cosmic Sense*, grant no. FOR 2694, University of Potsdam, Germany.
- 2017, 2018–2020 — Member of the **Scientific Committee**, IEEE *International Geoscience and Remote Sensing Symposium (IGARSS)* (Fort Worth, Texas, USA; France; Valencia, Spain; Virtual Symposium, Hawaii).
- 2018 — Member of the **Scientific Advisory Board** of Committee for Earth Observations Satellite, Delft, the Netherlands.
- 2018 — Member of the **Scientific Committee** of the European Geophysical Union (EGU), *16th Plinius Conference on Mediterranean Risks*, Montpellier, France.
- 2018 — **Editor** (with Dr. Viviana Maggioni) of the book *Extreme Hydroclimatic Events and Multivariate Hazards in a Changing Climate*, Elsevier.
- 2009–on — **Reviewer** of more than 160 manuscripts in international scientific journals, certified by Publons–Web of Science.

Membership of Scientific Societies

- 2024–present — Member of the International Association of Hydrological Sciences (**IAHS**), working groups *Drought in Mountain Regions* and *Drought in the Anthropocene*.
- 2022 — Board Member of the International Society for Photogrammetry and Remote Sensing (**ISPRS**).

- 2013–on — Member of the Italian Hydrological Society (**SIH**), the Italian Group of Hydraulics (**GII**), the European Geophysical Union (**EGU**), and the American Geophysical Union (**AGU**).

Major Collaborations

- **Gabriëlle De Lannoy** (KU Leuven, Belgium) *Land data assimilation*
- **Daniele Penna** (University of Florence, Italy) *Runoff generation & vegetation response in forested catchments, Stable water isotope analysis*
- **Riccardo Rigon** (University of Trento, Italy) *Eco-hydrological modelling*
- **Manuela Girotto** (University of California, Berkeley, USA) *Snow data assimilation; regional groundwater dynamics & recharge*
- **Alessio Collalti** (CNR–ISAFOM, Italy) *Forest modelling*
- **Viviana Maggioni** (George Mason University, USA) *Remote sensing of precipitation & crop modelling*
- **Francesco Avanzi** (CIMA Research Foundation, Italy) *Snow dynamics and hydrological droughts*
- **Lucio di Matteo** (University of Perugia, Italy) *Surface–Groundwater interactions*
- **Wade Crow** (United States Department of Agriculture, USDA, USA) *Remote sensing of soil moisture and Land surface model diagnosis*
- **Josie Geris** (University of Aberdeen, Scotland) *Stable water isotope analysis and water temperature*

Prizes, Awards and Academy Memberships

- 2024 — Selected among the **Top 20 Best Rising Stars of Science in Italy** (Research.com, 2023 Ranking).
- 2023 — **ERC Consolidator Grant proposal evaluated as “Excellent”** (ranked A, above threshold but not funded for budget limitations).
- 2023, 2024 — Listed among the **Top 2% most influential scientists worldwide** (Stanford University global ranking, both career-long and single-year impact).
- 2022 — **European Space Agency (ESA) – European Geophysical Union (EGU) Earth Observation Excellence Award** for contributions of Earth Observation in Hydrology (as a team).
- 2022 — Selected as **Highlighted Paper in Hydrology and Earth System Sciences** (Copernicus) for the article *Evaporation enhancement drives the European water-budget deficit during multi-year droughts*.
- 2021 — **Award Copernicus Masters competition**: BayWa Smart Farming Challenge, Copernicus Masters, Europe (as a team)
- 2023 & 2019 — **Web of Science Highly Cited Paper recognition** for multiple contributions in remote sensing and hydrology.
- 2016 — **Winner (1st place, >300 candidates) of the National Research Council of Italy competition** for 82 excellent young researchers in Natural and Anthropogenic Risks and Environmental Technologies.

Selected Invited Presentations to Peer-Reviewed, Internationally Established Conferences and Advanced Schools

- “*Remote Sensing for Water Management and Droughts*”, Webinar for the **International Society for Photogrammetry and Remote Sensing**, September 2024, Online.
- “*Floods and flash floods: monitoring, modelling and forecasting using new Earth Observation data*”, **Third Summer School of the International Association for Engineering Geology and the Environment (IAEG)**, July 2024, Aosta, Italy.
- “*On the role of the evaporation and basin storage in driving water balance dynamics during long dry periods: land surface modelling challenges and opportunity from Earth observations*”, **European Geophysical Union (EGU) General Assembly**, Vienna, Austria, April 2024.
- “*Data assimilation of remote sensing observations into hydrological models: challenges and perspectives*”, **EGU GALILEO Conference: A European Vision for Hydrological Observations and Experimentation**, Naples, Italy, 2023.
- “*Mechanisms of meteorological drought propagation into hydrological systems: seeking feedbacks from WATSON community*”, **WATSON COST Action Meeting and Workshop**, Dubrovnik, Croatia, 2023.
- “Remote sensing applications in hydrology”, **University of California, Berkeley**, California, USA, October, 2022 (Online).
- “*Antecedent wetness conditions of European floods: a comprehensive study*”, **International Geoscience and Remote Sensing Symposium (IGARSS)**, Waikoloa, Hawaii, 2020 (online).
- “*Soil moisture products: Quality assessment and hydro-validation*”, **Satellite Inspired Hydrology in an Uncertain Future: a H SAF and HEPEX Workshop**, ECMWF, Reading (UK), November, 2019.

Organization of International Conferences in the Applicant’s Field

- 2021 — **Organiser** of the *6th Satellite Soil Moisture Validation and Application Workshop*, Perugia, Italy.

Major Contributions to the Early Careers of Excellent Researchers

- 2020 — **Member of the Committee** for the Hydrology Outstanding Student Presentation Awards (OSPA), American Geophysical Union (AGU) 2020.

Valorization activities, and/or societal impact

- 2025 — Contribution as **Author** for the Brochure: Earth Observation: Groundbreaking Discoveries <https://www.essc.esf.org/2025/01/21/news-eo-brochure/>
- 2017 — Help of populations and local administrations for the assessment and mitigation of the hydraulic risk of the settlements impacted by the 2016 Umbria-Marche region earthquake.

All on-going and submitted grants and funding of the applicant

Project Title	Short description	Funding source	Amount (Total)	Amount (Own)	Period	Role of the PI
DRY-MED	Modelling droughts in the coupled human eco-hydrological systems in the Mediterranean region	CINECA	Projects for HPC re-sources	–	2025–2026	CO-Investigator
BRIDGES	Bridging remote sensing and in situ data for groundwater storage in the Southern Mediterranean	Joint Bilateral Agreement CNE/MHSER (Tunisia)	12k€	–	2025–2026	PI
ESA CCI Land Evaporation	Reconstructing long-term land evaporation estimates over land using satellite observations	ESA Contract No. 4000147355/25/I-LR	1M€	200k€	2024–2027	Partner PI
GLANCE	Agricultural Land Abandonment and Climate Change	ESA Contract No. 4000145543/24/I-LR	500k€	115k€	2023–2026	Partner PI, Science leader
Tech4you	Technologies for climate change adaptation and quality of life improvement	European Commission Next Generation EU (MUR)	119M€	809k€	2022–2025	Sub-project and action responsible
CCI-AWU	Estimating and detecting long-term irrigation water using CCI variables	ESA Contract No. 4000142449/23/I-NB	500k€	25k€	2023–2024	Co-investigator (WP leader)
DEMETRAS	River discharge estimation from satellites in North Africa	ESA Contract N. 4000136272/21/I-EF	190k€	60k€	2023–2024	Co-investigator (WP leader)
SLAINTE	Sub-daily Land Atmosphere INTERactions	ESA n. 4000139242/22/NL/SD	200k€	35k€	2022–2023	Partner PI
4DMED-Hydrology	Reconstructing the water cycle of the Mediterranean using ESA EO data	ESA n. 4000136272/21/IEF	999k€	220k€	2021–2023	PI
FLOSET	Probabilistic FLOods and SEdiment Transport forecasting in the Himalayas during the extreme events	Italian Ministry of Education (DTA.AD004.327)	190k€	30k€	2022–2024	Co-investigator (WP leader)

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WATERSTEM	Unraveling interactions between WATER and carbon cycles during drought and their impact on water resources and forest and grassland ecosySTEMs in the Mediterranean climate	Italian Ministry of Education (Prot. 20202WF53Z)	477k€	190k€	2022–2025	PI
WAFER	Carbon and water cycles interactions during drought and their impact on Water and ForEst Resources in the Mediterranean region	CNR (@CNR-WAFER)	137k€	137k€	2021–2025	PI
AQUIGROW	Sustainable AQUIfier recharge to enhance resilience of GROundWater services under increased drought risk	Water4all (EC - MUR)	449k€	114k€	2024–2025	Partner PI
COACH-WAT	Control-based Optimization of the Anthropogenic Hydrological cycle for a sustainable WATER management	Italian Ministry of Education (Prot. 2022FXJ3NN)	269k€	21k€	2024–2025	WP leader
ACQUACENTRO	Understanding future water availability of Central Italy water reservoirs	Autorità di distretto dell'Appennino Centrale	150k€	70k€	2022–2024	Co-investigator, WP leader
FLOWCAMP	Developing River Discharge Rating Curve using Field Measurements	Umbria Region authority	150k€	150k€	2021–2024	Co-PI
REVOLUTION	Resilience and vulnerability of water resources under drought conditions – new insights from integrated in-situ and remote sensing approaches revolution	Royal Meteorological Society - CNR	12k€	6k€	2024–2025	PI (Italian part)
Irrigation+	Using ESA Remote sensing Observation to estimate irrigation	ESA contract n. 4000129870/20/INB	450k€	114k€	2020–2022	Co-investigator (WP leader)

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MUHA	MULTIHAZARD FRAMEWORK for WATER RELATED RISKS MANAGEMENT	Programme 2014 - 2020 INTER-REG VB Adriatic - Ionian	2169k€	114k€	2020–2023	Participant
DTE and DTE Evolution	Digital reconstruction of the water cycle using models and ESA Earth Observation data	ESA n. 4000129870/20/INB-CCN1	400k€	135k€	2022–2023	Co-investigator (WP leader)
STREAM	SaTellite based Runoff Evaluation And Mapping	ESA AO/1-9101/17/I-NB	148k€	110k€	2019	Co-investigator (WP leader)
RIMA	Ricostruzione MARche (Analysis of the Hydraulic Risk of Lands impacted by the 2016 Earthquake)	Marche Region	100k€	100k€	2019-2020	CO-PI
SMOS+RAINFALL II	Ingesting satellite soil moisture information into satellite rainfall retrievals to enhance rainfall observation accuracy over land	ESA Contract No. 4000114738/15/I-SBo	100k€	47k€	2018	Science Leader
WACMOS IRRIGATION	Exploring the potential of Earth Observation Data to estimate Irrigation in the Mediterranean Region	ESA ESRIN/4000119632/17/I-NB STSE	70k€	70k€	2017	Co-investigator (WP responsible)

References

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- [6] J. Kabala, C. Massari, F. Niccoli, M. Natali, F. Avanzi, and G. Battipaglia. “Reconstruction of the dynamics of sap-flow timeseries of a beech forest using a machine learning approach”. In: *Agricultural and Forest Meteorology* 362 (2025). DOI: [10.1016/j.agrformet.2024.110379](https://doi.org/10.1016/j.agrformet.2024.110379).
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