

International Association of Hydrological Sciences -IAHS

Activities' Report - Year 2020

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1. Introduction

The Italian research activity referring to the International Association of Hydrological Sciences (IAHS) has been carried out by the scientific community that refers to hydrological sciences, hydraulics and hydraulic works. In this context, the most relevant initiative carried out in 2020 can be identified by the activities of:

- a) *International Commission on Water Resource (ICWR/IAHS)*, <https://iahs.info/Commissions--W-Groups/ICWR-Water-Resources-Systems.do>. ICWR/IAHS is aimed to promote research development on the integration of all phases of water resource protection, planning, design, management, operation and utilization. Alberto Montanari is past president of the Commission.
- b) *International Commission for Ground Water (ICGW)*, <https://iahs.info/Commissions--W-Groups/ICGW-Groundwater.do>, chaired by Prof Aldo Fiori (Università Roma Tre), addressed to the advancement of the science of groundwater hydrology, including the scientific basis for groundwater resource assessment and groundwater management. It is also responsible for helping to bridge the gap between science and practice
- c) *International Commission on Statistical Hydrology (ICSH/IAHS)*, <https://iahs.info/Commissions--W-Groups/ICSH-Statistical-Hydrology.do>, and past-secretary Prof. Elena Volpi. In July 2019 the Prof. Elena Volpi has been elected president-elect and Dr. Ilaria Prosdocimi (University of Venice Ca' Foscari) has been elected Secretary. The activities of the commission are focused on the development of new statistical methods and tools for hydrological applications.
- d) *MOXXI Working Group (Measurements & Observations in XXI Century)*, <https://iahs.info/Commissions--W-Groups/Working-Groups/MOXXI.do>, chaired by Dr. Flavia Tauro (University of Tuscia), with the task to promote the advancement of novel observational techniques that leads to new sources of information to help better understand the hydrological cycle.
- e) *International Commission on Continental Erosion/International Association of Hydrological Sciences (ICCE/IAHS)*, <https://iahs.info/Commissions--W-Groups/ICCE-Continental-Erosion.do>, of which Prof. Porto (University Mediterranea of Reggio Calabria, Italy) was Secretary from 2011 to 2019 (2 terms). Prof. Porto was elected President-elect of ICCE in July 2019 within the 27th IUGG General Assembly held in Montreal, Canada. The activity of the Commission deals with problems related to soil erosion and deposition at both hillslope and catchment scale, fingerprinting techniques, sediment transport and the use of tracers techniques to establish the sediment budget of large areas.
- f) *International Commission on Surface Hydrology (ICSW)*, <https://iahs.info/Commissions--W-Groups/ICSW-Surface-Water.do>. The activities of the commission are focused at promoting research into surface hydrology and its interaction with other aspects of the hydrological cycle."
- g) *Citizen AND HYdrology Working Group (CandHy WG)*, <https://iahs.info/Commissions--W-Groups/Working-Groups/Candhy.do>, presided by Dr. Fernando Nardi, aims to stimulate discussion, sharing of knowledge, information, data, ideas fostering scientific and professional exchange of academic, institutional and citizen communities interested in the "Citizen AND HYdrology" topic. CandHy seeks to discover the potential of citizen involvement and crowd sourced data for advancing hydrologic research in water resource and risk management, hydro-climatic risk mitigation and disaster preparedness.
- h) *Società Idrologica Italiana (SII)*, www.sii-ihs.it, belonging to the international network of IAHS's scientific associations, <https://iahs.info/Links/National-and-Regional-Hydrological->

[Associations.do](#), Chaired by Dr. Tommaso Moramarco (alternate National IAHS Representative), SII aims to advance knowledge in scientific and applied aspects of hydrology and foster members involvement in relevant national and international professional activities.

- i) Young Hydrological Society-IT (YHS-IT), founded by SII, aims to stimulate the interaction and active participation of young hydrologists within the Italian hydrological community, fostering the synergy between research grant holders, PhD students and postdocs and professionals working in the private and public sector.
- j) *Vice-President of IAHS*. Prof. Salvatore Grimaldi, Università degli Studi della Tuscia, is the Vice-President of IAHS and his activities are strictly connected to the MOXXI and CANDHY Working Groups e to the ICSH Commission.
- k) *IUGG Union Commission on Mathematical Geophysics (CMG)*. Prof. Salvatore Grimaldi, Università degli Studi della Tuscia is the Commission member for the IAHS.

Finally, there has been a very relevant research activity carried out by Italian institutions within IAHS and in particular within IAHS research initiatives. The Italian community also played an important role in the consultation process that is leading to the preparation of the new IAHS Decade 2013-2022 “Panta Rhei – Everything Flows”.

2. Main activities carried on by IAHS during 2020 relevant for Italy and for CNR

The most relevant activity developed in the period 2020 is related to the activities mentioned in section 1. Specifically, the main actions can be identified as follows.

2.1 Organization of conferences, workshops 2020

- 2020 EGU General Assembly: HS3.6: Spatio-temporal and/or (geo) statistical analysis of hydrological events, floods, extremes, and related hazards, co-sponsored by ICSH-STAHY (IAHS), Convener: Gerald A Corzo P | Co-conveners: A.B. Bardossy, Panayiotis Dimitriadis, Svenja Fischer, Ross Woods
- 2020 EGU General Assembly: HS1.2.1 - Pathways & society transdisciplinary approaches towards solving the Unsolved Problems in Hydrology (UPH), co-sponsored by AGU, IAHS, and IAH
The EGU blog post summarising the session discussion is available at:
<https://blogs.egu.eu/divisions/hs/2020/07/01/pathways-towards-solving-the-unsolved-problems-in-hydrology-uph-feedback-from-the-egu-sgo-chat-session/>
- 2020 EGU General Assembly: HS7.10: Spatial extremes in the hydro- and atmosphere: understanding and modelling, Co-organized by NH1, co-sponsored by ICSH-STAHY (IAHS), Convener: Manuela Irene Brunner | Co-conveners: A.B. Bardossy, Philippe Naveau, Simon Michael Papalexiou, Elena Volpi
- 2020 EGU General Assembly: HS7.6: Precipitation small scale variability, hydrometeorologic extremes, and land-use feedbacks in the atmospheric water cycle, and beyond, Co-organized by AS4/CL2/NH1/NP3, co-sponsored by ICSH-STAHY (IAHS), Convener: Auguste Gires | Co-conveners: Jose Luis Salinas, Ruud van der Ent, Hannes Müller-Thomy, Lan Wang-Erlandsson, Remko Uijlenhoet, Katharina Lengfeld
- 2020 EGU General Assembly: CANDHY co-organized the session Session H3.2 - Innovative sensing techniques for water monitoring, modelling, and management: Satellites, gauges and citizens Vienna (Convener: Fernando Nardi; Co-conveners: Thaine H. Assumpção, Wouter Buytaert, Serena Ceola, Maurizio Mazzoleni)
- 2020 EGU General Assembly: MOXXI has co-organized session HS1.1.1 - The MacGyver session for innovative and/or self made tools to observe the geosphere (Convener: Rolf Hut; Co-conveners: Theresa Blume, Elisa Coraggio, Flavia Tauro, Andrew Wickert)
- Delft International Conference on Sociohydrology (Delft, Netherlands - 07/09/2020 - 09/09/2020), supported by IAHS and “Panta Rhei” is co-organized by the Warredoc Università per Stranieri di Perugia (Conference post-poned due to COVID-19 to 6-8 september 2021) <https://delft2021sh.org/>
- Webinar Hydrology Days 2020. Due to the Covid-19 health emergency, the Italian Hydrological Society (SII) organized the 2020 Hydrology Days articulated in a cycle of three different webinars: 13th and 27th November with Invited Speakers, and 11th December with SII’s Honorary Member Award, Final Report of the Florisa Melone Prize, Presentation of the Young Hydrological Society-IT and Round

Table on hydrological practice. The webinar is available on the SII website: http://www.sii-ihs.it/meeting-nazionali.php?p=giornate_dellidrologia_2020_-_webinar

2.2 Organization of scientific initiatives 2020

- Training programme on *River Discharge Estimation Using Non-Contact Hydrometric Techniques* sponsored by the National Hydrology Project (NHP) and Indian Institute of Technology of Roorkee with the collaboration of the deputy representative IAHS, Tommaso Moramarco, Roorkee, February 2020
- Florisa Melone Award 2020 promoted by the Italian Hydrological Society to a research project developed by young Italian researchers. The Award is dedicated to the memory of Florisa Melone, CNR Head Researcher of the Research Institute for Geo-Hydrological Protection. The award consists of 5,000 € and Dr. Elena Cristiano and Dr. Antonio Annis were bestowed for the project " SMART-UP: Sustainable Multilayer Climate-Adaptive Roofs To Support Urban Drainage Planning ".
- IAHS initiative inside the EGU community promoted by Elena Toth, past President of the EGU Hydrological Sciences division (EGU HS): "23 Unsolved Problems in Hydrology" (UPH). The Chairs of the EGU-HS nine SubDivisions (SD) were invited to: i) present the initiative to their members and discuss by email exchanges, contributing to the IAHS LinkedIn forum. The paper " Twenty Three Unsolved Problems in Hydrology – a Community Perspective" by Blöschl et al., 2019 was published on Hydrological Science Journal (<https://www.tandfonline.com/doi/full/10.1080/02626667.2019.1620507>).
- CANDHY working group activities has developed since its 2017 july inception by increased participation and involvement in thematic conferences and workshops involving experts through person-to-person invitations (currently, CANDHY includes 40+ "friends" from more than 10 countries). The first CANHDY community paper was published on IAHS Hydrological Sciences Journal led by CANDHY Chair Fernando Nardi

2.3 Editorial Board Participation

IAHS Hydrological Sciences Journal

- Attilio Castellarin: Editor in Chief dal 2017 (Co-Editor dal 2015), Università di Bologna
- Aldo Fiori, Co-Editor, Università Roma Tre
- Marco Borga, Guest Editor, Università di Padova
- Alessio Domeneghetti, Associate Editor, Università di Bologna
- Daniele Penna, Università di Firenze
- Andrea Petroselli: Associate Editor, University of Tuscia
- Ilaria Prosdocimi: Associate Editor, Università di Padova
- Flavia Tauro: Associate Editor, University of Tuscia
- Elena Volpi: Associate Editor, Università Roma Tre
- Fernando Nardi: Guest Editor of the Special Issue "Virtual Special Issue: Advancing socio-hydrology: a synthesis of coupled human–water systems across disciplines" focusing on the theme "Big data/citizen science".

Journal of Soil and Sediments (Springer)

- Paolo Porto: Associate Editor since 2019

Pedosphere (Elsevier)

- Paolo Porto: Editorial Board Member Participation since 2015

Featured Articles of HSJ:

- Annis, A. F. Nardi, E. Volpi & A. Fiori (2020) Quantifying the relative impact of hydrological and hydraulic modelling parameterizations on uncertainty of inundation maps, *Hydrological Sciences Journal*, DOI: 10.1080/02626667.2019.1709640
- Nardi, F., Cudennec, C., Abrate, T., Allouch, C., Annis, A., Herman Assumpção, T., ... & Grimaldi, S. (2020). Citizens AND Hydrology (CANDHY): conceptualizing a

transdisciplinary framework for citizen science addressing hydrological challenges. *Hydrological Sciences Journal* (in press)

- Alonso Vicario, S., Mazzoleni, M., Bhamidipati, S., Gharesifard, M., Ridolfi, E., Pandolfo, C. & Alfonso, L. (2020). Unravelling the influence of human behaviour on reducing casualties during flood evacuation, doi.org/10.1080/02626667.2020.1810254
- Hundecha, Y., Parajka, J. & Viglione, A. (2020). Assessment of past flood changes across Europe based on flood-generating processes, doi.org/10.1080/02626667.2020.1782413

Tison Award 2020:

- Michailidi, E.M., Antoniadis, S., Koukouvinos, A., **Baldassare B.** & Efstratiadis, A. (2018) Timing the time of concentration: shedding light on a paradox, doi.org/10.1080/02626667.2018.1450985

2.4 Goals, priorities and plans for future Scientific Initiative

For 2020 the plan is to continue to actively participate to IAHS initiatives through targeted activities. To date, various initiatives are being planned, among which:

- Conferences:
 - 19-30 Aprile, 2021, at the EGU General Assembly
 - HS1.2.4**
Panta Rhei (hydrology, society, environmental change) and Unsolved Problems in Hydrology (UPH) - Co-sponsored by IAHS
Convener: Fuqiang Tian | Co-conveners: Berit Arheimer, Günter Blöschl, Christophe Cudennec, Giuliano Di Baldassarre, Heidi Kreibich, Elena Toth, Jing WeiECS
 - HS1.2.1**
Role of hydrology in policy, society and interdisciplinary collaborations: across disciplines and beyond scientists
Convener: Maria-Helena Ramos | Co-conveners: Gemma Carr, Sharlene L. GomesECS, Britta HöllermannECS, Thomas ThalerECS, Jutta Thielen-del Pozo, Elena Toth, Micha Werner
 - HS2.3.7**
Multi-dataset, multi-variable, and multi-objective techniques to improve prediction of hydrological and water quality models and their Bayesian applications
Convener: Anna E. Sikorska-SenonerECS | Co-conveners: Miriam GlendelleECS, David C. Finger, Alberto Montanari, Ibrahim Alameddine, Lorenz AmmannECS, James E. Sample
 - HS7.4**
Hydroclimatic change and unchange: exploring the mysteries of variability, nature and human impact
Co-sponsored by IAHS and WMO
Convener: Serena CeolaECS | Co-conveners: Christophe Cudennec, Theano IliopoulouECS, Harry Lins, Alberto Montanari
 - 2021 STAHY Workshop September 16–17, Valencia, Spain (local organizer Felix Frances); as for the previous edition, a Short Course will be held dedicated to the Early Career Scientists; furthermore, the STAHY Best Paper Award 2020 will be assigned to Francesco Serinaldi e Chris G. Kilsby, School of Engineering, Newcastle University, UK, and Federico Lombardo, Corpo Nazionale dei Vigili del Fuoco, Ministero dell'Interno, Italy, for the paper Serinaldi, F., Kilsby, C.G, Lombardo, F. (2018). Untenable nonstationarity: An assessment of the fitness for purpose of trend tests in hydrology. *Advances in Water Resources* 111: 132-155, doi: 10.1016/j.advwatres.2017.10.015, e 2021, and 2021, whose assignment is in progress.
 - International stand-alone Symposium on: River sediment quality and quantity: environmental, geochemical and ecological perspectives - (<http://ICCE2020.ukw.edu.pl>). The conference, to be held at Bydgoszcz, Poland was initially scheduled in June 1-5, 2020, but due to covid-19 problems, it was postponed on 2022.

- Submission to Hydrological Sciences Journal of a Community paper on statistical hydrology.
- Sponsorship of the 2020 Summer School on Extremes in Water Science organized by WARREDOC, University for Foreign Students in Perugia, at Villa La Colombella (PERUGIA, ITALY), 12th – 17th July 2021.

2.5 Scientific Publications (*peer-reviewed papers*)

1. Alimenti F., Bonafoni S., Gallo E., Palazzi V., Vincenti Gatti R., Mezzanotte P., Roselli L., Zito D., Barbetta S., Corradini C., Termini D. and Moramarco T. (2020). Non-Contact Measurement of River Surface Velocity and Discharge Estimation with a Low-Cost Doppler Radar Sensor. *IEEE Transactions on Geoscience and Remote Sensing*. 10.1109/TGRS.2020.2974185
2. Bjerklie D. M., Fulton J. W., Dingman S. L., Canova M. G., Minear Justin T. & Moramarco T., (2020). Fundamental Hydraulics of Cross-sections in Natural Rivers: Preliminary Analysis of a Large Data Set of Acoustic Doppler Flow Measurements. *Water Resources Research*, <https://doi.org/10.1029/2019WR025986>
3. Fulton J.W., Mason C., Eggleston J., Nicotra M., Chiu C.L., Henneberg M. , Best H., Cederberg J., Holnbeck S., Lotspeich R., Laveau C., Moramarco T., Jones M., Gourley J., Wasielewski D. (2020). Remote Sensing of Surface Velocity and River Discharge Using Radars and the Probability Concept at 10 USGS Streamgages. *Remote Sensing*. 2020, 12(8), 1296;
4. Manfreda S., Pizarro A., Moramarco T., Cimorelli L., Pianese D., Barbetta S. (2020) ‘Is it really advantageous the adoption of the flow-area rating curve?’, *Journal of Hydrology*, <https://doi.org/10.1016/j.jhydrol.2020.124752>.
5. Romeo F., Porto P., Keiblinger K., Mentler A., Muscolo A. (2020). Soil biological indicators and caesium-137 to estimate soil erosion in areas with different forest system management. *European Journal of Forest Research* 139: 67-81.
6. Gharibreza, M., Zaman, M., Porto, P., Fulajtar, E., Parsaei, L., Eisaei, H. (2020). Assessment of deforestation impact on soil erosion in loess formation using 137Cs method (case study: Golestan Province, Iran). *International Soil and Water Conservation Research*, 8(4): 393-405.
7. Khodadadi, M., Zaman, M., Mabit, L., Blake, W.H., Gorji, M., Bahrami, A.S., Meftahi, M., Porto, P. (2020). Exploring the potential of using 7Be measurements to estimate soil redistribution rates in semi-arid areas: results from Western Iran and Southern Italy. *Journal of Soils and Sediments*, 20(9): 3524-3536.
8. Neri M.; Parajka J.; Toth E., Importance of the informative content in the study area when regionalising rainfall-runoff model parameters: The role of nested catchments and gauging station density, «HYDROLOGY AND EARTH SYSTEM SCIENCES», 2020, 24, pp. 5149 – 5171. The work was developed within the framework of the Panta Rhei Research Initiative of the International Association of Hydrological Sciences (IAHS) Working Group on “Data-driven Hydrology”.

3. Scientific activities carried on during 2020 and impact on the Italian scientific community

The activity can be identified, first, in the dissemination among Italian Universities and Research Institutions of the IAHS/IUGG programs. Moreover, it has been promoting a direct cooperation between IAHS and the Hydrological Sciences Division of the European Geosciences Union (EGU) so that the Italian community may benefit of exchange of information and possible joint activities concerning educational opportunities, student programs, and professional services for members of both organizations. In addition, through the Italian Hydrological Society, initiatives are addressed to foster the synergy among the Italian scientific community, the national authorities and firms for activities linked to water resources management and natural hazards. Details of activities are summarized as in the sequel.

- Participation to the CNR-IUGG Commission.
- Dissemination of activities of IUGG among Italian Universities and Research Institutions for the meetings participation and IUGG Research Grant applications

4. Evaluation of the participation in terms of benefits and membership cost

The benefits of the participation in the Union are certainly positive for the Italian Scientific Community both for the resources made available by IUGG for the various initiatives promoted and which foster the attendance to Congresses and Research Grant applications and for the activities developed by the various groups operating in IAHS/IUGG and chaired by Italian researchers, as can be also inferred from the Section2 of the document.

5. Evaluation of Italians' attendance and how to improve interest and involvement

The participation of Italian scientists to initiatives organized under the IAHS umbrella is already significant as proved from different Courses, Conference and Meetings organized by the Groups/Commissions led by Italian scientists. However, the interest towards the IAHS activities can be improved if more financial resources are made available from IUGG, and it would be great from CNR as well, for international activities in the field of hydrological sciences, involving Italian scientist and in particular the youngest ones.

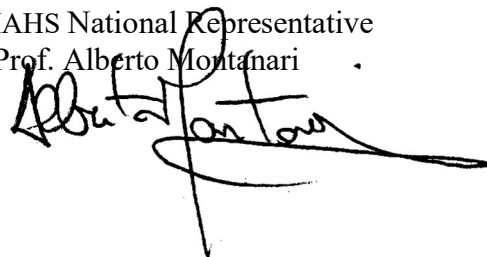
6. Italian experts with important roles within the Union or within related Commissions and Programs

- *Dr. Tommaso Moramarco*. Alternate National Representative IAHS/IUGG and President of Italian Hydrological Society.
- *Prof. Alberto Montanari*. National Representative IAHS/IUGG, member of the CNR/IUGG Commission. Alberto Montanari is also president of EGU for the term 2019 – 2021 and was bestowed the Dooge Medal by IAHS in 2019.
- *Prof. Attilio Castellarin*. Editor in Chief of *IAHS Hydrological Sciences Journal*
- *Prof. Aldo Fiori*. President International Commission for Ground Water (ICGW)
- *Prof. Salvatore Grimaldi*. Vice-President of IAHS.
- *Dr. Fernando Nardi*. President Citizen AND Hydrology Working Group (CandHy WG)
- *Prof. Paolo Porto*. President-elect of the International Commission on Continental Erosion/International Association of Hydrological Sciences (ICCE/IAHS). Secretary of IASWS (International Association for Sediment Water Science) from 2017.
- *Dr. Flavia Tauro*. Chair MOXXI Working Group (Measurements & Observations in XXI Century);
- *Prof. Elena Toth*, Vice Presidente of the Italian Hydrological Society.
- *Dr. Elena Volpi*. President-elect of the International Commission on Statistical Hydrology of (ICSH/IAHS).

Acknowledgments

I would like to thank the Italian experts above listed for their enthusiastic and constant activities under the IAHS umbrella. Moreover, their contribution to this report is highly acknowledged.

IAHS National Representative
Prof. Alberto Montanari



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