

# International Association of Hydrological Sciences -IAHS

## Report on Activities in Italy (2015)

### Summary

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. The most relevant initiative carried out in 2015 can be identified by:

- a) the contribution of Italian scientists in drawing up the IAHS statement, released in June 2015, entitled “*Prague Statement on A Need for Action to Develop Water Resources Management Systems*”. The statement calls on the government, scientific community, and research funding agencies to develop a more efficient water management system capable of addressing the challenges presented by the global water crisis. The statement is going to be published in a peer-review journal;
- b) the activities of the International Commission on Water Resource (ICWR/IAHS), presided by Prof. Alberto Montanari, aimed to promote research development on the integration of all phases of water resource protection, planning, design, management, operation and utilization;
- c) the activities related to the International Commission on Statistical Hydrology of (ICSH/IAHS, which is presided by Dr. Salvatore Grimaldi (University of Tuscia). The activities of the commission are focused on the development of new statistical methods and tools for hydrological applications and described in detail at the web site [www.stahy.org](http://www.stahy.org);
- d) the activities related to the MOXXI Working Group (Measurements & Observations in XXI Century), 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) the activities of International Commission on Continental Erosion/International Association of Hydrological Sciences (ICCE/IAHS) whose secretary is the Dr. Paolo Porto (University Mediterranea of Reggio Calabria)

Moreover, 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

### Organization of conferences, workshops 2015

- a) 26th IUGG General Assembly 2015, Prague 22 June-2 July, 2015
  - a.1) HS01 Changes in Flood Risk and Perception in Catchments and Cities
  - a.2) HW03 Multivariate Analysis in Hydrological Modelling
  - a.3) HW07 Control of Water Resource Systems
  - a.4) HW10 The Role of Sediment as an Indicator of Hydrological and Societal Change
  - a.5) HW11 Fingerprinting Techniques: Evaluating Methodological Approaches, Problems and Uncertainty
  - a.6) HW17 Hydrological Forecasting and Predictive Uncertainty: Advances and Challenges of Transferring Science into Operational Practice
  - a.7) U6 Data Assimilation and Inverse Problems in Geophysical Sciences
- b) EGU - General Assembly 2015, Vienna April 12-17, 2015
  - b.1) HS7.7/NP3.8 Hydroclimatic and hydrometeorologic stochastics: Extremes, scales, probabilities
  - b.2) HS3.3 Open Source Computing in Hydrology.

- c) 10th Alexander von Humboldt Conference 2015  
Water-Food-Energy River and Society in the Tropics  
EGU Topical Conference Series, Addis Ababa, Ethiopia, 18–20 November 2015
- d) Giornate dell'Idrologia 2015, Hydrology Days Conference, Perugia 6-8 October 2015,  
Sponsored by IAHS

### **Organization of scientific initiatives 2015**

- a) Chairmanship of the IAHS scientific decade 2013-2022 for the period 2013-2015.  
Presidency of the International Commission on Water Resources Systems and Presidency of the International Commission on Statistical Hydrology.
- b) The ICSH Commission organized several initiatives and the main ones are summarized in the following:
  - Reference Collection about specific statistical hydrology topics. This collection is monthly updated and offers an useful overview for the scientific community.
  - Scientific sessions during the main General Assemblies and International conferences.
  - Short courses (one week of duration) on innovative topics.
  - Annual Commission Conferences.
  - STAHY Best Paper Award 2015. The STAHY Best Paper is the result of evaluation of 20 papers, selected among the 332 papers (published in 2011-2012-2013) present in ICSH website and ordered by citations (SCOPUS database, excluding self citations). The STAHY Best Paper Award 2015 was assigned to Italian colleagues:  
*Gianfausto Salvadori, Università del Salento, Italy*  
*Carlo De Michele, Politecnico di Milano, Italy,*  
*Fabrizio Durante, Libera Università di Bolzano, Italy*  
for the paper:  
Salvadori, G., De Michele, C., Durante, F. On the return period and design in a multivariate framework (2011), *Hydrology and Earth System Sciences*, 15 (11), pp. 3293-3305.
  - Short Course "Copulas for hydrology and environmental sciences", Université de Pau et des Pays de l'Adour, Pau, France, July 6-10, 2015, <http://lma-umr5142.univ-pau.fr/copula/>
- c) Setup of MOXXI Working Group's website <http://iahs.info/Commissions--W-Groups/Working-Groups/MOXXI.do>
- d) Publication of the book "*Advances in Watershed Hydrology*". Editors: Tommaso Moramarco, Silvia Barbetta and Luca Brocca. Publisher: *Water Resources Publications, LLC*  
The book collects a selection of the contributions presented by Italian and international scholars in occasion of the *Florisa Melone Memorial Conference* organized by IRPI CNR and co-sponsored by *IAHS*. The book gives different and useful insights on current advancements in hydrology, which will be of interest to anyone concerned with problems such as global warming and extreme events that are facing the world today.

### **Editorial Board Participation**

#### *IAHS Hydrological Sciences Journal*

- Attilio Castellarin: Co-Editor, University of Bologna, Italy
- Elena Toth: Associate Editor, University of Bologna, Italy
- Elena Volpi: Associate Editor, Università Roma Tre, Italy

## Goals, priorities and plans for future Scientific Initiative

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

- 1) Short Course "Copulas for hydrology and environmental sciences"  
July 24-30, 2016, Centro Studi Alpino - Pieve Tesino, Italy  
website:<http://www.stahy.org/Events/2016CopulaShortCourse/tabid/120/Default.aspx>
- 2) STAHY'16 WORKSHOP  
September 26-27, 2016, INRS - Institut National de la Recherche Scientifique - Quebec City, Canada, <http://stahy2016.ca>
- 3) Summer school MOXXI 2016, Applied Course on UAVs for Environmental Monitoring, Potenza
- 4) MOXXI's FIRST TOPICAL CONFERENCE, 2016. European Space Agency (ESA) - ESRIN Centre for Earth Observation in Frascati (RM), Italy, November 21, 2016

## Institutions involved in research activity

An extended set of Italian universities is involved in the IAHS activities, as well as several institutes of the National Research Council. Some are listed in the sequel:

National Research Council:

Research Institute for Geo-Hydrological Protection ( Dr. Tommaso Moramarco)

Universities:

- Polytechnic of Turin (Prof. Pierluigi Claps)
- University of Bologna (Prof. Alberto Montanari)
- University of Tuscia (Prof. Salvatore Grimaldi)
- University Mediterranea of Reggio Calabria (Prof. Paolo Porto)

## Scientific Publications (*peer-reviewed papers*)

- Volpi, E., Fiori, A., Grimaldi, S., Lombardo, F., Koutsoyiannis D., (2015) One hundred years of return period: Strengths and limitations *Water Resources Research*, 51 (10), pp. 8570-8585.
- Tauro, F., Pagano, C., Phamduy, P., Grimaldi, S., Porfiri, M., (2015) Large-Scale Particle Image Velocimetry from an Unmanned Aerial Vehicle *IEEE/ASME Transactions on Mechatronics*, 20 (6), art. no. 7206598, pp. 3269-3275.
- Crochemore, L., Perrin, C., Andréassian, V., Ehret, U., Seibert, S. P., Grimaldi, S., Gupta, H. and Paturel, J.E., (2015) Comparing expert judgement and numerical criteria for hydrograph evaluation. *Hydrological Sciences Journal*, 60(3), 402-423.
- Moramarco, T., Termini, D. Entropic approach to estimate the mean flow velocity: experimental investigation in laboratory flumes (2015) *Environmental Fluid Mechanics*, 15 (6), pp. 1163-1179.
- Maccioni, P., Kossida, M., Brocca, L., Moramarco, T. (2015) Assessment of the drought hazard in the Tiber River basin in central Italy and a comparison of new and commonly used meteorological indicators. *Journal of Hydrologic Engineering*, 20 (8)
- Farina, G., Alvisi, S., Franchini, M., Corato, G., Moramarco, T. (2015). Estimation of bathymetry (and discharge) in natural river cross-sections by using an entropy approach. *Journal of Hydrology*, 527, pp. 20-29.

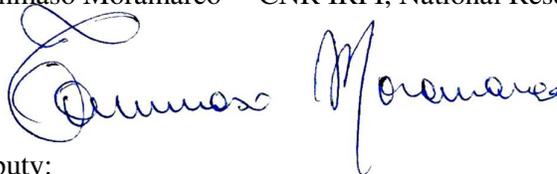
- Domeneghetti, A., Castellarin, A., Tarpanelli, A., Moramarco, T. (2015) Investigating the uncertainty of satellite altimetry products for hydrodynamic modelling. *Hydrological Processes*, 29 (23), pp. 4908-4918.
- Zucco, G., Tayfur, G., Moramarco, T. (2015). Reverse Flood Routing in Natural Channels using Genetic Algorithm. *Water Resources Management*, 29 (12), pp. 4241-4267.
- Ciabatta, L., Brocca, L., Massari, C., Moramarco, T., Puca, S., Rinollo, A., Gabellani, S., Wagner, W. (2015) Integration of satellite soil moisture and rainfall observations over the Italian territory. *Journal of Hydrometeorology*, 16 (3), pp. 1341-1355
- Massari, C., Tarpanelli, A., Moramarco, T. (2015). A fast simplified model for predicting river flood inundation probabilities in poorly gauged areas, *Hydrological Processes*, 29 (10), pp. 2275-2289.
- Massari, C., Brocca, L., Tarpanelli, A., Moramarco, T. (2015), Data assimilation of satellite soil moisture into rainfall-runoff modelling: A complex recipe?, *Remote Sensing*, 7 (9), pp. 11403-11433
- Tarpanelli, A., Brocca, L., Barbeta, S., Faruolo, M., Lacava, T., Moramarco, T. (2015). Coupling MODIS and radar altimetry data for discharge estimation in poorly gauged river basins. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 8 (1), art. no. 6815632, pp. 141-148
- Brocca, L., Massari, C., Ciabatta, L., Moramarco, T., Penna, D., Zuecco, G., Pianezzola, L., Borga, M., Matgen, P., Martínez-Fernández, J. (2015) Rainfall estimation from in situ soil moisture observations at several sites in Europe: An evaluation of the SM2RAIN algorithm. *Journal of Hydrology and Hydromechanics*, 63 (3), pp. 201-209.
- Yan, K., Tarpanelli, A., Balint, G., Moramarco, T., Baldassarre, G.D. (2015). Exploring the potential of SRTM topography and radar altimetry to support flood propagation modeling: Danube case study. *Journal of Hydrologic Engineering*, 20 (2)
- Porto P., Callegari, G., Cogliandro, V., La Spada, C. (2015). Misura e previsione dell'erosione idrica superficiale mediante la tecnica del 7Be. Il caso del bacino sperimentale W2 in provincia di Crotone. *Quaderni di Idronomia Montana* 32/2, 97-108.
- Porto P., Walling D.E. (2015). Use of Caesium-137 Measurements and Long-Term Records of Sediment Load to Calibrate the Sediment Delivery Component of the SEDD Model and Explore Scale Effect: Examples from Southern Italy. *Journal of Hydrologic Engineering* 20(6)
- Porto P., Walling D.E., La Spada C., Callegari, G. (2015). Validating the use of 137Cs measurements to derive the slope component of the sediment budget of a small catchment in southern Italy. *Land Degradation & Development* DOI: 10.1002/ldr.2388.
- Capra A, Porto P., La Spada C. (2015). Long-term variation of rainfall erosivity in Calabria (Southern Italy). *Theoretical and Applied Climatology* DOI 10.1007/s00704-015-1697-2.
- Porto P. (2015). Exploring the effect of different time resolutions to calculate the rainfall erosivity factor R in Calabria, southern Italy. *Hydrological Processes* DOI: 10.1002/hyp.10737.
- Libertino, A., P. Allamano, P. Claps, R. Cremonini, F. Laio, (2015) Radar Estimation of Intense Rainfall Rates through Adaptive Calibration of the Z-R Relation, *Atmosphere*, vol. 2015, n.6, pp. 1559-1577; doi:10.3390/atmos61015592015
- Qamar, M.U.; D. Ganora, P. Claps (2015) Monthly Runoff Regime Regionalization Through Dissimilarity-Based Methods. *Water Resources Management*, vol. 29 n. 13, pp. 4735-4751. ISSN 0920-4741

- Hall, J., Arheimer, B., Aronica, G. T., Bilibashi, A., Boháč, M., Bonacci, O., Borga, M., Burlando, P., Castellarin, A., Chirico, G. B., Claps, P., Fiala, K., Gaillard, L., Gorbachova, L., G. A., Hannaford, J., Kiss, A., Kjeldsen, T., Kohnová, S., Koskela, J. J., Macdonald, N., Mavrova-Guirguinova, M., Ledvinka, O., Mediero, L., Merz, B., Merz, R., Molnar, P., Montanari, A., Osuch, M., Parajka, J., Perdigao, R. A. P., Radevski, I., Renard, B., Rogger, M., Salinas, J. L., Sauquet, E., Šraj, M., Szolgay, J., Viglione, A., Volpi, E., Wilson, D., Zaimi, K., and Blöschl, G. (2015) A European Flood Database: facilitating comprehensive flood research beyond administrative boundaries, Proc. IAHS, 370, 89-95
- Allamano P., Claps P., D’Odorico P., Laio F., Ridolfi L., Tamea S. (2015) “Water in Food” Group, Politecnico di Torino, The Globalisation of Food and Water: The Italian Case, in: M. Antonelli and F. Greco (eds.), The Water We Eat, 145-158, Springer Water
- Ceola, S., Arheimer, B., Baratti, E., Blöschl, G., Capell, R., Castellarin, A., Freer, J., Han, D., Hrachowitz, M., Hundecha, Y., (2015) Virtual laboratories: new opportunities for collaborative water science, Hydrology and Earth System Sciences, 19, 2101-2117
- Ceola, S., Laio, F., Montanari, A., (2015) Human-impacted waters: New perspectives from global high-resolution monitoring, Water Resources Research, 51, 7064-7079
- Montanari, A., Bahr, J., Blöschl, G., Cai, X., Mackay, D.S., Michalak, A., Rajaram, H., Sander, G., (2015) Fifty years of Water Resources Research: Legacy and perspectives for the science of hydrology, Water Resources Research, 51, 6797-6803
- Baratti, E., Pajola, M., Rossato, S., Mangili, C., Coradini, M., Montanari, A., McBride, K., (2015) Hydraulic modeling of the tributary and the outlet of a Martian paleolake located in the Memnonia quadrangle, Journal of Geophysical Research: Planets, 120, 1597-1619
- O’Connell, P.E., Koutsoyiannis, D., Lins, H.F., Markonis, Y., Montanari, A., Cohn, T., (2015) The scientific legacy of Harold Edwin Hurst (1880-1978), Hydrological Sciences Journal
- Sikorska, A.E., Montanari, A., Koutsoyiannis, D., (2015) Estimating the Uncertainty of Hydrological Predictions through Data-Driven Resampling Techniques, Journal of Hydrologic Engineering, 20

Perugia, April 29 2016

National Correspondent:

Tommaso Moramarco – CNR IRPI, National Research Council



Deputy:

Alberto Montanari - University of Bologna

