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WATER, CLIMATE AND SOCIETY: HOW HYDROLOGY HELPS US UNDERSTAND A CHANGING WORLD

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CISM, Palazzo del Torso | Piazza G. Garibaldi 18, Udine

In collaborazione con FONDAZIONE FRIULI

Con il contributo di UDINE

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Abstract:

Water is both a reflection of changes in climate and a crucial link between the natural environment and human society. Changes in precipitation and temperature affect water availability, droughts and floods, while human activities, such as land use and river engineering, modify the way catchments respond. Understanding these interactions is a central challenge for hydrology, particularly because their effects vary greatly between regions, seasons and spatial scales. Drawing on observations and modelling studies from Europe and other parts of the world, this lecture explores how hydrology can help disentangle these changes. Droughts illustrate how the combined effects of precipitation, evaporation and water storage produce contrasting trends in river low flows, from the Mediterranean to colder regions. Floods reveal an even more complex interplay between climate and human activities. While land use changes tend to have their greatest effects in small catchments and river engineering becomes important at larger scales, climate change influences flood regimes across a wide range of scales. Regional differences in rainfall, soil moisture and snow processes explain why flood trends can differ markedly, even under a common warming climate. These examples demonstrate that understanding a changing world requires more than identifying trends in climate or river flows. It requires understanding the hydrological processes through which climatic and human influences interact. This process-based perspective is essential for interpreting the past, anticipating future changes and informing society's decisions about water.

Biography:

Prof. Günter Blöschl is the Head of the Institute of Hydraulic Engineering and Hydrology at Vienna University of Technology and Professor at the University of Bologna. His work has made major contributions to understanding how climate change influences flood hazards and droughts in Europe. By building a Europe-wide flood database, he was able to show that the past few decades rank among the most flood-rich of the last five centuries, and he identified the regional climatic causes of these changes. In Austria, he developed strategies for adapting water management to climate change and initiated projects to improve flood preparedness and hazard mapping. For his scientific achievements, which have received worldwide recognition, he has been awarded, among others, an ERC Advanced Grant and the Horton Medal of the American Geophysical Union. Recently, King Carl XVI Gustaf of Sweden presented him with the prestigious Stockholm Water Prize.