



The Implications of Global Warming on Critical Infrastructure, the Probable Maximum Precipitation and Flood Design Extremes

Across Europe and beyond, discussions about rising temperatures and shifting rainfall patterns are becoming increasingly central to infrastructure planning. Yet many of our most critical and precious assets — dams, reservoirs, energy facilities, transport corridors — still rely on design assumptions about the upper limits of extreme precipitation that may no longer hold.

This presentation shares the findings of a major industry supported study from Australia examining how **probable maximum precipitation (PMP)** and **probable maximum flood (PMF)** values are evolving under projected climate change. The analysis revisits long standing PMP estimation guidelines used internationally and evaluates how these benchmarks have already shifted.

The results point to a clear trend:

By the end of the century, PMP values are expected to increase by at least 33% across a wide range of climates and terrains, with PMFs increasing more, putting existing infrastructure at risk.

This raises several troubling questions:

- Is flood-proofing existing infrastructure (especially dams) even possible (without the world becoming bankrupt)?
- Can lessons from the past offer us guidance on the path to follow?
- Is this an apocalypse in the making or an opportunity for engineers, scientists, policy makers and society to think and find ways forward?

The presentation offers a grounded, evidence based overview of the challenges ahead and provides a platform for discussing how we can proactively adapt infrastructure planning to a rapidly changing risk landscape.



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UNSW SYDNEY



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15:30



Aula G. Capità

Presidenza del Dipartimento di Ingegneria, Ed. 7 Viale delle Scienze, Palermo

Programme

15:30 - 15:35

Welcome and greetings:

Prof. Livan Fratini,
DI Director

15:35 - 15:45

Introduction:

Prof. Antonello Miranda
A.S.CENT Director
Prof. Leonardo Noto,
Head of HYCLIC Lab

15:45 - 17:00

Lecture

Prof. Ashish Sharma

Short Biography

Prof. Sharma is a Professor of Civil and Environmental Engineering at the University of New South Wales, Sydney, Australia. He is an engineering hydrologist whose research focuses on hydrological uncertainty, particularly the impacts of climate change and variability on hydrological practice. His work also includes remote sensing applications, stochastic approaches, hydrological modelling, design flood estimation, and water resources management. He has supervised 45 PhD graduates and is an Australian Research Council Future Fellow, a Fellow of the Royal Society of New South Wales, and a Fellow of the American Geophysical Union. He is a past President of the IAHS Commission on Statistical Hydrology and Editor-in-Chief of Journal of Hydrology-X. More details on his research and software are available at <https://www.hydrology.unsw.edu.au/download>



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