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Politecnico di Milano, DEIB (ed. 20)

Friday, Nov. 10th, 14:30, Seminar Room

Floodplains

Processes and Management for Ecosystem Services

Abstract In the past two months, the world has witnessed tragic images of floods, from Houston to Niger to south Asia. Floods are among the most costly natural disasters worldwide and the recent loss of life and property, from Houston to Mumbai, gives a very human face to the impersonal statistics: in recent years, global damages have ranged between \$30 and 60 billion and more than 100 million people have been displaced by flooding. These events are also warnings about a likely future because, in a warming world, many regions will experience more frequent and intense flooding. Confronted with these rising risks, governments must invest in measures to improve safety for people and reduce damages. Resilient and sustainable flood systems will move beyond a primary focus on the structural measures—dams and levees—that strive to contain floods, and toward a “diversified portfolio” approach. Nonstructural measures—such as zoning, building codes and insurance—are key to keeping people out of harm’s way. Another critical strategy is to integrate green infrastructure—natural features such as wetlands and floodplains—into flood-management systems. In river basins around the world, from the Mississippi to the Sacramento to the Rhine, managers have moved away from a strict reliance on engineered levees. Instead, they have moved towards reconnecting rivers to parts of their historic floodplains. On these reconnected floodplains, floodwaters can spread out and reduce risks to communities and farmland in other areas. We have documented this trend, and reasons why green infrastructure can be so effective, in our book, *Floodplains: Processes and Management for Ecosystem Services*. A hallmark of green infrastructure is that these features can provide multiple benefits beyond flood-risk reduction. For floodplains, these benefits include habitat for fish and wildlife, groundwater recharge, carbon sequestration, and open space and recreation. In this talk I’ll examine how achieving the full potential of green infrastructure will require understanding both the biophysical processes that shape floodplain ecosystems and the socioeconomic drivers that shape floodplain management and land use – and then integrating these disciplines to design and manage resilient flood defense strategies that keep people safe and promote healthy freshwater habitats.



Jeff Opperman is global freshwater lead scientist at the WWF. He was previously lead scientist for The Nature Conservancy’s Great Rivers Partnership and the director of the Conservancy’s global strategy on sustainable hydropower. His scientific and policy research has been published in journals such as *Science*, *BioScience* and *Ecological Applications*. Jeff strives to communicate the challenges and opportunities of protecting fresh water through articles and blog posts in such places as *The New York Times* and *The Guardian*.

