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Hörsaal Fahnenbergplatz, Friedrichstr. 39

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Nature-based solutions in water and hydraulic engineering: opportunities and challenges

Seeking optimal solutions for engineering problems often leads to adopting processes that nature has refined over its long evolution. These solutions offer additional socio-ecological benefits (e.g., enhanced social and environmental connectivity, carbon sequestration, reduced operational emissions, creation of new habitats, economic support, etc.), making them valuable for remediation and compensation efforts to restore degraded environments.

In this talk, we will explore three examples:

- i) afforestation to reduce flood risk from saturation-excess hydrological dynamics in coastal cities with hot-dry climate,
- ii) river ecomorphodynamics and bank stabilization to reduce erosion, and
- iii) dynamic flow releases in impounded water systems using hydrodynamic solutions with zero operational costs.

All three examples stem from research projects at PL-LCH, and their practical application is either forthcoming or, when already in use, reveals an urgent need for improvements. These examples will help us identify opportunities and challenges for future studies aimed at expanding the use of such techniques in applied water and hydraulic engineering.