



water



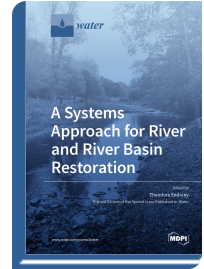
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A Systems Approach for River and River Basin Restoration

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Communities increasingly find that the water quality, water levels, or some other resource indicator in their river basins do not meet their expectations. This discrepancy between the desired and actual state of the resource leads to efforts in river basin restoration. River basins are complex systems, and too often, restoration efforts are ineffective due to a lack of understanding of the purpose of the system, defined by the system structure and function. The river basin structure includes stocks (e.g., water level or quality), inflows (e.g., precipitation or fertilization), outflows (e.g., evaporation or runoff), and positive and negative feedback loops with delays in responsiveness, all of which function to change or stabilize the state of the system (e.g., the stock of interest, such as water level or quality). External drivers on this structure, together with goals and rules, contribute to how a river basin functions. This book reviews several new research projects to identify and rank the twelve most effective leverage points to address discrepancies between the desired and actual state of the river basin system. This book demonstrates that river basin restoration is most likely to succeed when we change paradigms rather than try to change the system elements, as the paradigm will establish the system goals, structure, rules, delays, and parameters.



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