Effective modeling for Integrated Water Resource Management: A guide to contextual practices by phases and steps and future opportunities

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Abstract

on the quality of practices employed through the process, starting from early problem definition all the way through to using the model in a way that serves its intended purpose. The adoption and implementation of effective modeling practices need to be guided by a practical understanding of the variety of decisions that modelers make, and the information considered in making these choices. There is still limited documented knowledge on the modeling workflow, and the role of contextual factors in determining this workflow and which practices to employ. This paper attempts to contribute to this knowledge gap by providing systematic guidance of the modeling practices through the phases (Planning, Development, Application, and Perpetuation) and steps that comprise the modeling process, positing questions that should be addressed. Practice-focused guidance helps explain the detailed process of conducting IWRM modeling, including the role of contextual factors in shaping practices. We draw on findings from literature and the authors' collective experience to articulate what and how contextual factors play out in employing those practices. In order to accelerate our learning about how to improve IWRM modeling, the paper concludes with five key areas for future practice-related research: knowledge sharing, overcoming data limitations, informed stakeholder involvement, social equity and management of uncertainty.

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