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Do Drought Management Plans Reduce Drought Risk? A Risk Assessment Model for a Mediterranean River Basin

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Groundwater resources are traditionally overexploited in arid and drought-prone regions with profitable irrigated agriculture, and the depletion of this groundwater results from a combination of the physical scarcity of surface sources and the lack of effective control of use rights on the part of water authorities. This is the case in the Segura River Basin of southern Spain. As a result, drought risks and structural deficits have steadily increased over the last 50 years. The Drought Management Plan recently approved by the Segura River Basin Authority aims to enforce more stringent water supply restrictions from surface sources, but the plan does not include any explicit policy to handle illegal groundwater abstraction. By using a stochastic risk assessment model, this paper shows that the implementation of the drought plan will increase the expected irrigation deficits of surface water and can, paradoxically, lead to higher drought and aquifer depletion risks than the traditional rules that the new plan replaces