



Societal Impacts and Adaptive Responses to Mid-20th Century Flood Events in Carinthia and Calabria

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The analysis of societal impacts from natural hazards has gained increasing importance, especially with climate change intensifying the frequency of extreme events. Studying community responses to past extreme events provides valuable insights into local risk management evolution. This study examines the immediate impacts and long-term societal responses to two significant mid-20th century flood events in Carinthia (Austria) and Calabria (Italy). The two study areas differ considerably with respect to climatic, geomorphologic, demographic and social conditions. Carinthia is an alpine region in the South of Austria, while Calabria represents a typical Mediterranean region, located at the southernmost peninsular extremity of Italy. Despite differences, they both experienced transformative floods that led to major adaptation measures. In Calabria, the catastrophic floods of 1951 and 1953 resulted in 150 fatalities and widespread infrastructure damage, prompting a mass emigration in America and the enactment of Law N. 938/1953 by the Italian government. In Carinthia, the floods of 1965 and 1966 caused 22 fatalities and extensive economic damage, leading to comprehensive river regulation measures. For each region and event, we assessed indicators such as rainfall intensity, flood discharge, affected areas, damage types, population impact, fatalities, injuries, homelessness, economic damage, and post-event countermeasures. We furthermore use historical maps to delineate the extent of the damage and show the morphological impact of flood protection and river regulation measures introduced to reduce future risk. Our analysis reveals that both regions, despite differing socio-economic contexts, predominantly relied on structural interventions for flood protection, according to a typical approach of the XX century. However, these measures also had adverse hydrological and economic consequences, including groundwater lowering, base penetration threats, and sediment entrapment. This study underscores the importance of multi-dimensional risk management strategies and the need for adaptive measures that account for both immediate and long-term impacts. By comparing these historical events, we highlight the evolution of flood management practices and the ongoing necessity for balanced, sustainable approaches to hazard mitigation.