



The Anthropocene and islands: vulnerability, adaptation and resilience to natural hazards and climate change

Miquel Grimalt Gelabert, Anton Micallef, Joan Rossello Geli (Eds.)

Impacts of climate change on the evolution of water resources in the context of the Mediterranean islands using as an example two Aegean Sea islands: consequences for touristic activities in the future

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Abstract

The ecological and economic stakes of the climate change impacts are posed in particular terms on islands, especially in the Mediterranean, where summer tourism is one of the pillars of the activity of island communities. The climate scenarios for the Mediterranean islands up to 2050 make it possible to better identify, at the scale of each island, the modifications that Climate Change (CC) is likely to imply on the water balance.

The results for 360 islands (104,263 km²) over the whole basin give an average temperature evolution of +2.3°C with values between +1.8 and

+2.9°C. This means a rise of potential evapotranspiration of the order of 135 mm/year with local values varying between 110 mm/year and 170 mm/year. The change in relative annual precipitation varies between -11.6% and +2.9% with an average of -6.5%. The regional analysis shows that the water balance should be more impacted in the eastern part especially in the Aegean Sea and along the southern shore of the Mediterranean.

The rainfall deficit coupled with the increase in evapotranspiration would result locally in a significant reduction of surface runoff and underground water recharges, which could be of the order of 40% on average over the year. On top of interannual variations, there is a high degree of uncertainty about water resources in 2050.

At the same time, mass tourism and other forms of tourism have become the backbone of the economies of many Mediterranean islands and the trend is expected to strengthen. The water demand of this sector during the summer dry season only complicates the problem and is at the expense of other sectors of activity, including agriculture. Case studies are presented on the islands of Rhodes and Samos comparing the evolution of water resources and demand from the tourism sector. Results suggest that foreseeable lowering of water resources in close future should be tackled with a more efficient Integrated Water Resources Management (IWRM) especially on Mediterranean islands whose economy is based on mass tourism. An alternative would be to lesser water consumption per capita combined with a more effective recycling of sewage.

Keywords: Climate Change, Mediterranean islands, Aegean Sea, Integrated Water Resources Management, Tourism, Ecology.



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