Critical limits to environmental change for the Mediterranean Region

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Abstract

While human society and its environment have co-evolved in the Mediterranean basin, several current trends are assumed to represent near-term significant risks for biodiversity, ecosystem function, socio-economic development and human well-being. Climate change is best known among these trends, notably the warming of the atmosphere and the ocean, changes in rainfall, drought risk, ocean acidity, coastal submersion and extreme storm events. Other forms of environmental change occur, including pollution of atmosphere and waters, soil degradation and urban sprawl. Assessing these risks for the growing population in the region requires an integrated assessment of trends in environmental change, as well as of human susceptibility to damage. For five major areas of interaction between the environment and people (freshwater, other natural resources, human health, food security and human security), we identify indicators for recent and expected environmental change impacts. We identify critical limits of environmental change for all five areas. We then analyse the significant uncertainties associated with such limits, from limited process understanding, the combined impacts of several drivers, and from the breadth of different mitigation policies that are available. For most impacts, the risks associated with warming of two degrees above pre-industrial are significant, including irreversible loss of biodiversity and ecosystem function, and economic losses in coastal areas. Such a multi-factor analysis of change is novel for the region. When refined through a broader review process (currently planned by the MedECC network), it should be useful for policy-makers, notably for the conservation of marine and terrestrial biodiversity and ecosystem function.

Keywords: Multifactorial analysis, biodiversity loss, climate change, ecosystem degradation

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