

Prof. Dr. Daniela Jacob, Dr. Lola Kotova and Dr. Christopher Moseley
Climate Service Center • Fischertwiete 1 • D-20095 Hamburg, daniela.jacob@hzg.de

IMPACT2C: Quantifying projected impacts under 2°C warming



Coordinator	Prof. Dr. Daniela Jacob
Partners	29 Partners from 17 Countries
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Homepage	www.impact2c.eu

IMPACT2C enhances knowledge, quantifies climate change impacts; adopts a clear and logical structure with climate and impacts modelling, vulnerabilities, risks and economic costs, as well as potential responses within a pan-European sector based analysis. The project utilises a range of models within a multi-disciplinary international expert team and assesses effects on water, energy, infrastructure, coasts, tourism, forestry, agriculture, ecosystem services, health and air quality-climate interactions.

IMPACT2C introduces key innovations. First, harmonised socio-economic assumptions/scenarios are used, to ensure that both individual and cross-sector assessments are aligned to the 2°C scenario for both impacts and adaptation, e.g. in relation to land-use pressures between agriculture and forestry. Second, it has a core theme of uncertainty, and will develop a methodological framework integrating the uncertainties within and across the different sectors, in a consistent way. In doing so, analysis of adaptation responses under uncertainty is enhanced.

Finally, **a cross-sectoral perspective is adopted to complement the sector analysis.** A number of case studies will be developed for particularly vulnerable areas, subject to multiple impacts (e.g., the Mediterranean), with the focus being on cross-sectoral interactions (e.g., land use competition) and cross-cutting themes (e.g., cities).

The project also assesses climate change impacts in some of the world's most vulnerable regions: Bangladesh, Nile & Niger river basins and the Maldives.

Case study: the Maldives

Partners involved:

Ministry Environment and Energy (MHE) Maldives; University of Southampton (SOTON); Global Climate Forum (GCF); MetOffice; HZG

Focus:

on climate change impact, vulnerability and adaptation due to a global average surface temperature change of 2°C from pre-industrial level

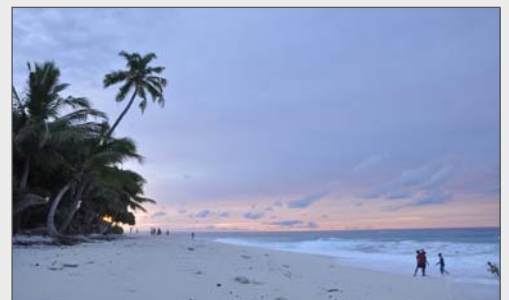
The small regional extend of the about 1190 small islands which are all collated to the Maldives requires very high resolution climate change information for impact assessment. Several regional models are applied within the IMPACT2C project. The climate simulations with the regional climate model REMO are performed under the project bc0792 at the German Climate Computing Center (DKRZ). A double nesting approach is used. First, the ERA-interim reanalysis data are downscaled to about 10x10km for a larger region around the Maldives; these results were compared with the CRU observations. While the shapes of annual cycles of 2m temperature and total precipitation are captured quite well by the REMO model; their magnitudes are not satisfactory. This might be caused not only by quality of the observations, but also by deficiency of the model resolution. Only 4 grid boxes are defined over the Maldives. Further downscaling to a ~1x1km resolution for the Maldives is planned.



Malé, © Wikimedia Commons

Maldives Overview

- 1192 islands
- 200 inhabited and 100 resorts
- Population ~300,000 (2006 census), with 1/3 living in the capital, Malé (population density 50,000 people/km²)
- Total land area for entire country ~ 298 km²
- Economy highly reliant on tourism and fisheries



The beaches of Maldives. © Ahmed Shan, EPA, Maldives

Threats to the Maldives:

Population pressure, particularly migration to Malé which can impact upon well-being; Sea-level rise contributing to coastal erosion and flooding; Other long term climate change, such as rising temperatures