CORDEX.be II

COmbining Regional Downscaling EXpertise in Belgium II

DURATION
1/09/2022 – 1/12/2026

BUDGET
950 919 €

PROJECT DESCRIPTION

Context

National climate scenarios are the basis for climate policy, both for mitigation measures and for the design and implementation of adaptation measures. A former CORDEX.be project produced Belgian climate scenarios based on three convection-permitting models (CPMs) by four Belgian climate modeling groups (Figure 1). These scenarios were used for several impact studies. Computing climate scenarios was one of the actions in the Belgian national adaptation plan (2017-2020) and is proposed as an action for the next adaptation plan.

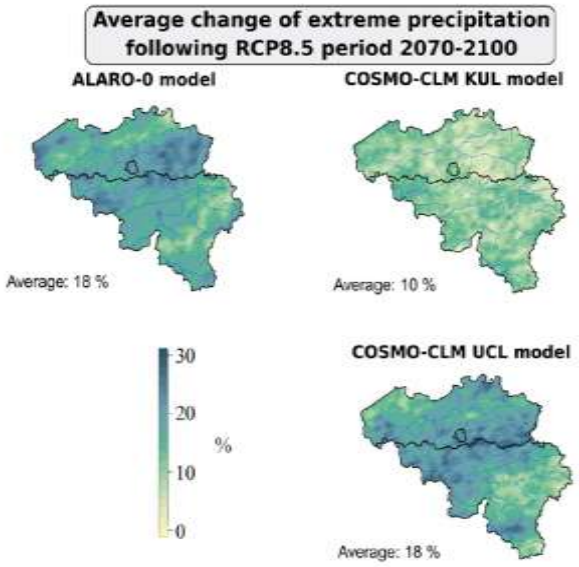

Figure 1: Average change of extreme precipitation following RCP8.5 period 2070-2100 for three regional climate models of the CORDEX.be project.

Research objectives

The scenarios of the CORDEX.be project have to be updated for the following reasons: (i) the CPMs are being further developed, by implementing new science and better comparison with observations, (ii) the scenarios should be adapted to follow the outcomes of the latest (6th) IPCC Assessment Report (2021), (iii) there is a growing need for very detailed spatial and temporal climate information and more specifically, climate data regarding extreme weather events for various stakeholders linked to sectors sensitive to climate change (e.g. health, infrastructure, transport, energy), and finally, (iv) the data management of the climate scenarios could be better organized among the Belgian climate modeling community.

The CORDEX.be II project is addressing these needs while maintaining a close dialogue with climate-change stakeholders. A number of climate-change impact studies will be included to demonstrate that the climate scenarios address the stakeholders' needs. This will include assessments of climate risks based on critical extreme weather indicators. Some case studies of extreme weather events will be performed.

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Methodology

In the former BRAIN-be CORDEX.be project, the main Belgian regional climate modeling groups of KU Leuven, RMI, UCLouvain and ULiège computed high-resolution climate scenarios for Belgium following the Representative Concentration Pathway (RCP) scenarios. Three regional climate models were used: ALARO, COSMO-CLM and MAR. It was found that the convection-permitting models (CPMs) of this project improved precipitation extremes on the short time scales and improved the representation of the urban heat island with respect to the (lower-resolution) models of the international EURO-CORDEX project. The aim of CORDEX.be II is to scientifically advance the models of CORDEX.be and produce Belgian climate scenarios in line with the new SSP (Shared Socioeconomic Pathways) scenarios of the Sixth IPCC Assessment Report (AR6). Contrary to CORDEX.be, this follow-up project will focus on past and future extreme events and will develop a storyline approach to facilitate the climate stakeholders dialogue.

Impact

Climate scenarios are needed for policy making. CORDEX.be II will provide climate information for the National Adaptation Plan and will focus on the very high resolution to improve the description of climate extremes within the context of international research programmes (CORDEX, ACCORD, COSMO, ...). The project will further develop the climate models and develop techniques for data treatment. The outcomes of this project will be made available for developing climate services and providing material for climate outreach, citizen science and climate attribution studies. Furthermore, the project results will be used in the educational programmes of the participating universities. This project will maintain a close stakeholders dialogue with stakeholders from public administrations (Flanders Environment Agency, Service public de Wallonie - mobilité infrastructures, National Crisis Center, Federal Climate Change Department of Federal Public Service (FPS) Health, Dienst Milieu en Klimaat, city of Ghent) (Figure 2). Finally, this project will contribute to the activities of the new Belgian Climate Centre.

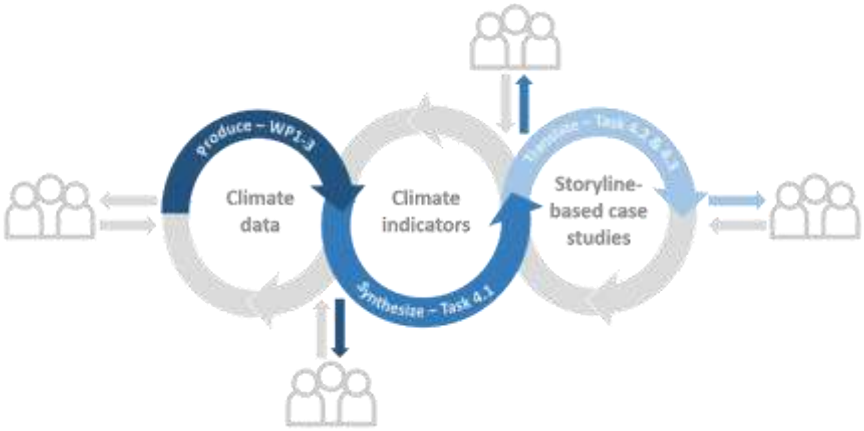

Figure 2: CORDEX.be II generates climate data and indicators, which are used for the development of climate services to support climate policy, climate action, outreach and citizen science. It will actively engage in ongoing dialogue with stakeholders from public administrations. Additionally, it will spearhead new initiatives aimed at transforming model output data into compelling storylines.

Expected outcomes

This project will improve the convection-permitting models in Belgium and initiate new activities on the development of climate storylines. The project will produce high-resolution data of climate change scenarios and extreme past and future climate events. The results will be finalized in a final report. The results will be published in international peer reviewed journals. It is expected that three young scientists (PhD students) will become active in the international climate modeling programs.

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LINKS

https://cordex.meteo.be/