



THE ORIENTGATE NETWORK



# A data platform for SEE climate scenarios and indicators



The use of climate scenarios and impact indicators is an important aspect of cooperation between the research community and decision makers.

The OrientGate project focused on mapping the various methodologies, tools and indicators used by meteorological services across SEE. The results were used to create the OrientGate Data Platform, which provides a single point of entry for a wide range of users, including scientists, external experts and policy makers.

## Climate indicators and scenarios

Activities were led by the Euro-Mediterranean Centre on Climate Change (CMCC) and the Republic Hydrometeorological Service of Serbia (RHMSS), acting host of the South East European Virtual Climate Change Center (SEEVCCC).

### Gathering data

The task of the RHMSS was to collect information on the availability, accessibility and handling of meteorological data across the SEE region, using a custom-developed questionnaire. Partner countries were asked to provide information about their meteorological stations as well as climate indicators and climate model results. All these data were compiled into a single document, providing a valuable overview of the current situation in the region.

### Analysing data

The statistical analysis of the data collected from the partners revealed that the project area contains a sufficient number of meteorological and hydrological stations ensuring reliable measurements, and that most countries have experience in using climate indicators and applying climate model results.

### Mapping and revising climate change and impact indicators

A first survey was carried out among project partners to map currently used indicators based on temperature, precipitation and other, mostly meteorological, variables, concentrating on those most appropriate to support activities in the pilot areas in relation to agriculture, forestry, hydrology and health.

The survey was then expanded to cover additional indicators adopted or newly formulated in the OrientGate project for the quantification of physical impacts and their biophysical and socioeconomic consequences. To facilitate the gathering and classification of information on both the original and additional indicators, exchanges among partners were promoted. This made it possible to clarify the existing concepts and components related to vulnerability and risk frameworks, as widely adopted by the climate change adaptation and disaster risk reduction scientific communities, and to use a common terminology, making the pilot analyses more comparable and enabling effective project interaction and result integration.

## Creating climate scenarios

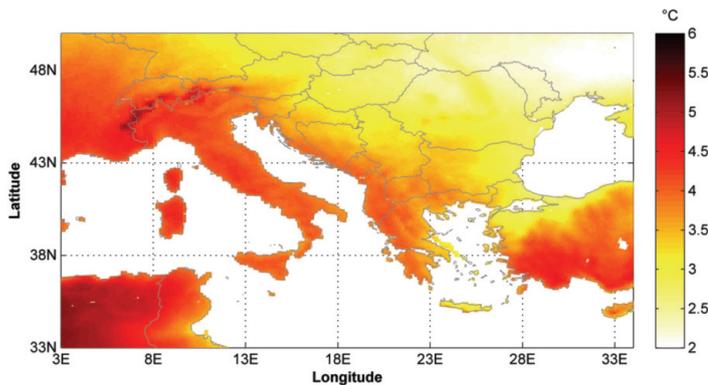
The RHMSS and CMCC used two regional climate models (RCMs) and several climate change scenarios in order to test the relevance of common climate change indicators and to assess biases and other errors for each type of data in order to limit uncertainties regarding climate projections for the SEE region.

The RHMSS/SEEVCCC applied the NMMB RCM to obtain climate projections with a high spatio-temporal resolution. The dynamic downscaling of data from the global circulation model CMCC-CM was carried out. In addition, results from the fully coupled atmosphere-ocean RCM (RCM-SEEVCCC) were made available to project partners.

At CMCC, climate projections are produced using a dynamic downscaling procedure based on the nesting of the RCM COSMO-CLM into the CMCC global circulation model.

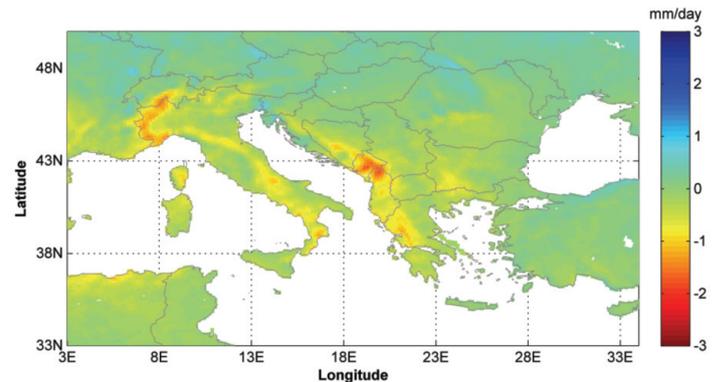
In order to consider a representative range of future climate outlooks, project partners agreed to use A1B as the intermediate emission scenario, RCP4.5 as the low-emission scenario, and RCP8.5 as the high-emission scenario to force climate simulations.

### Temperature anomaly



In the two-metre air temperature anomaly (2072–2100 vs. 1972–2000) under scenario A1B a general warming is reported in the summer period ranging from 2°C to 5.5°C.

### Precipitation anomaly



The precipitation anomaly (2072–2100 vs. 1972–2000) under scenario A1B shows a general decrease during the autumn.

## The OrientGate Data Platform

The data platform is a key outcome of the OrientGate project, representing a single entry point to the data and indicators produced by project partners. The heterogeneity of the data produced by the partners was a challenging aspect of platform design. A virtual machine-based environment, hosted at the Super Computing Center of CMCC, was designed, deployed and tested. The system provides a wide set of data and metadata management functionalities through the official project website.

The platform provides:

- the efficient, scalable and transparent management of large volumes of scientific data;
- an integrated view of data and indicators;
- harmonised metadata management; and
- user-friendly data access, browsing and downloading capabilities.

The data platform structure is consistent with the data and indicators produced in OrientGate. One of the two main sections hosts the outputs of climate simulations, and the other stores further indicators calculated for impact evaluations within pilot studies, covering the current baseline period and multiple future projections (short to long term, under low- to high-emission scenarios).

This latter section reflects the attributes of indicators in terms of their complexity (e.g. single indicators or compound indices) and their classification into vulnerability or risk-based frameworks.

To enable the standardised sharing, publication, exploration and retrieving of data, guidelines on dataset naming conventions and metadata compilation were defined, providing additional information in terms of spatio-temporal scale and coverage.

The results of the six pilot studies have been integrated into the European Commission's Climate-ADAPT platform, which contains significant EU research findings, in particular from INTERREG and ESPON projects that have strengthened the adaptation knowledge base in Europe.

The data platform is accessible from the OrientGate website: **[www.orientgateproject.org](http://www.orientgateproject.org)**



This map is based on the map published on the SEE Transnational Programme website.

[www.orientgateproject.org](http://www.orientgateproject.org)

## Contacts

**Euro-Mediterranean Centre on Climate Change (CMCC),**  
lead partner

Via Augusto Imperatore 16 • 73100 Lecce • Italy • [www.cmcc.it](http://www.cmcc.it)

**Antonio Navarra**

Email: [antonio.navarra@cmcc.it](mailto:antonio.navarra@cmcc.it)

**Giulia Galluccio**

Email: [giulia.galluccio@cmcc.it](mailto:giulia.galluccio@cmcc.it)

**Alessandra Nuzzo**

Email: [alessandra.nuzzo@cmcc.it](mailto:alessandra.nuzzo@cmcc.it)

**Monia Santini**

Email: [monia.santini@cmcc.it](mailto:monia.santini@cmcc.it)

**Paola Mercogliano**

Email: [paola.mercogliano@cmcc.it](mailto:paola.mercogliano@cmcc.it)

**Republic Hydrometeorological Service of Serbia (RHMSS)**

Kneza Višeslava 66 • 11030 Belgrade • Serbia • [www.hidmet.gov.rs](http://www.hidmet.gov.rs)

**Ariel Milošević**

Email: [ariel.milosevic@hidmet.gov.rs](mailto:ariel.milosevic@hidmet.gov.rs)

**Aleksandra Kržič**

Email: [aleksandra.krzic@hidmet.gov.rs](mailto:aleksandra.krzic@hidmet.gov.rs)

**Biljana Milić-Petrović**

Email: [biljana.milic-petrovic@hidmet.gov.rs](mailto:biljana.milic-petrovic@hidmet.gov.rs)

**Vladimir Djurdjević**

Institute of Meteorology (SEEVCCC) Email: [vdj@ff.bg.ac.rs](mailto:vdj@ff.bg.ac.rs)