

Regional perspective: Previous analysis ORIENTGATE survey and analysis report

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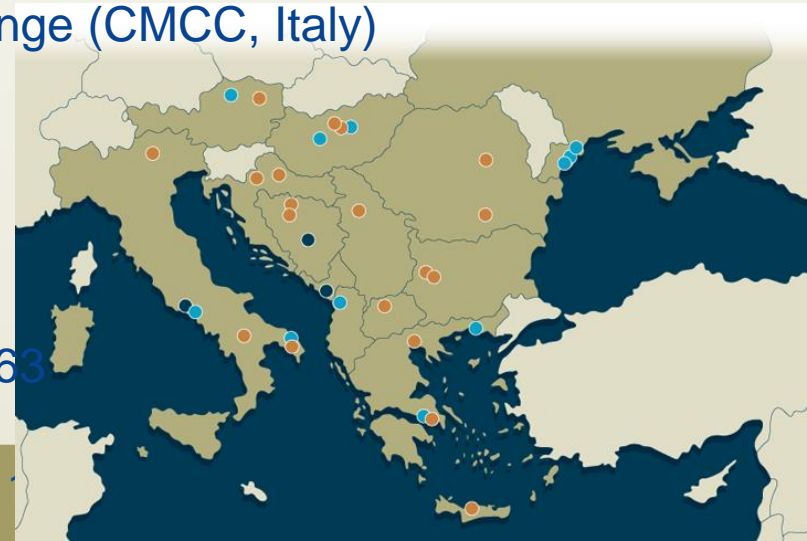
Republic Hydrometeorological Service of Serbia



ORIENTGATE A structured network for integration of climate knowledge into policy and territorial planning

- **South East Europe Transnational Cooperation Programme**
- **Priority Axis:** Protection and improvement of the environment
- **Area of Intervention:** Improve prevention of environmental risks
- **Terms of Reference:** Climate Change Adaptation - assessing vulnerabilities and risks and translating them to implementation actions at the regional and local levels
- 13 participating countries and 34 project partners
- **Project Lead Partner:** Euro-Mediterranean center for Climate Change (CMCC, Italy)
- **Total project budget:** 4,777,800.00 EUR
- **Project duration:** July 2012 - December 2014

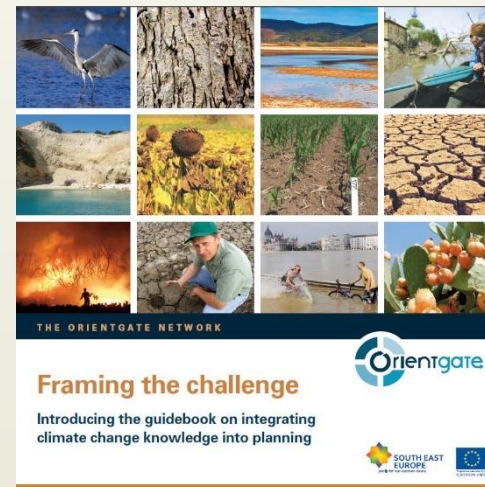
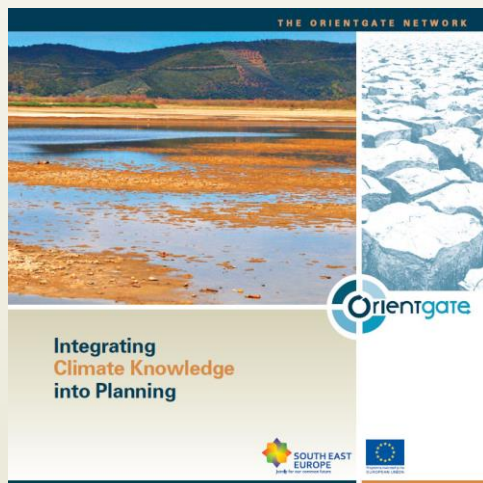
http://www.southeast-europe.net/en/projects/approved_projects/?id=163





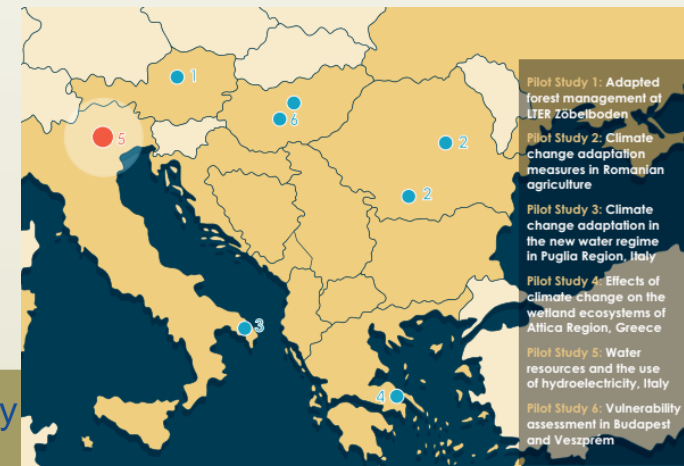
ORIENTGATE project

- Foster concerted and coordinated climate adaptation actions across the SEE region
- Connect climate change policy planners and decision makers with communities that produce climate knowledge
- Explore climate risks faced by coastal, rural and urban communities
- Contribute to a better understanding of the impact of climate variability and change on water regimes, forests and agro-ecosystems
- Analyze specific adaptation needs in the hydroelectricity, agro-alimentary and tourism sectors



Thematic Centers & Pilot Studies

- Thematic Centre 1 - **Forest and Agriculture**
 - Pilot study 1 “Adapted forest management at LTER Zobelboden” - LTER Zöbelboden, Austria
 - Pilot study 2 “Climate change adaptation measures in Romanian agriculture field” - Caracal and Covasna county, Romania
- Thematic Centre 2 - **Drought, Water and Coasts**
 - Pilot study 3 “Climate change adaptation in new water regime in Puglia region” - Puglia Region, Italy
 - Pilot study 4 “Effects of climate change on wetlands ecosystem of Attica Region of Greece” - Attica Region, Greece
 - Pilot study 5 “Water resources and hydroelectric use” – Trentino, Autonomous Province of Trento, Italy
- Thematic Centre 3 - **Urban adaptation and health**
 - Pilot study 6 “Vulnerability Assessment at Budapest and Veszprem” – Veszprem and XIII district of Budapest, Hungary
- Overview of climate change mitigation and adaptation policies in the Orientgate countries – to support the implementation of climate change adaptation plans in SEE areas.



Thematic Centers & Pilot Studies - context

Aims

- Demonstrating benefits of data and indicators
- Designing specific climate adaptation policies and measures

Steps

- Historical impact assessment
- Future projections
- Vulnerability & (Multi)Risk analysis
- Adaptation strategies



Strategies for integration of results

- Pilot study in cooperation with municipalities
- Local features included
- Local stakeholders involved

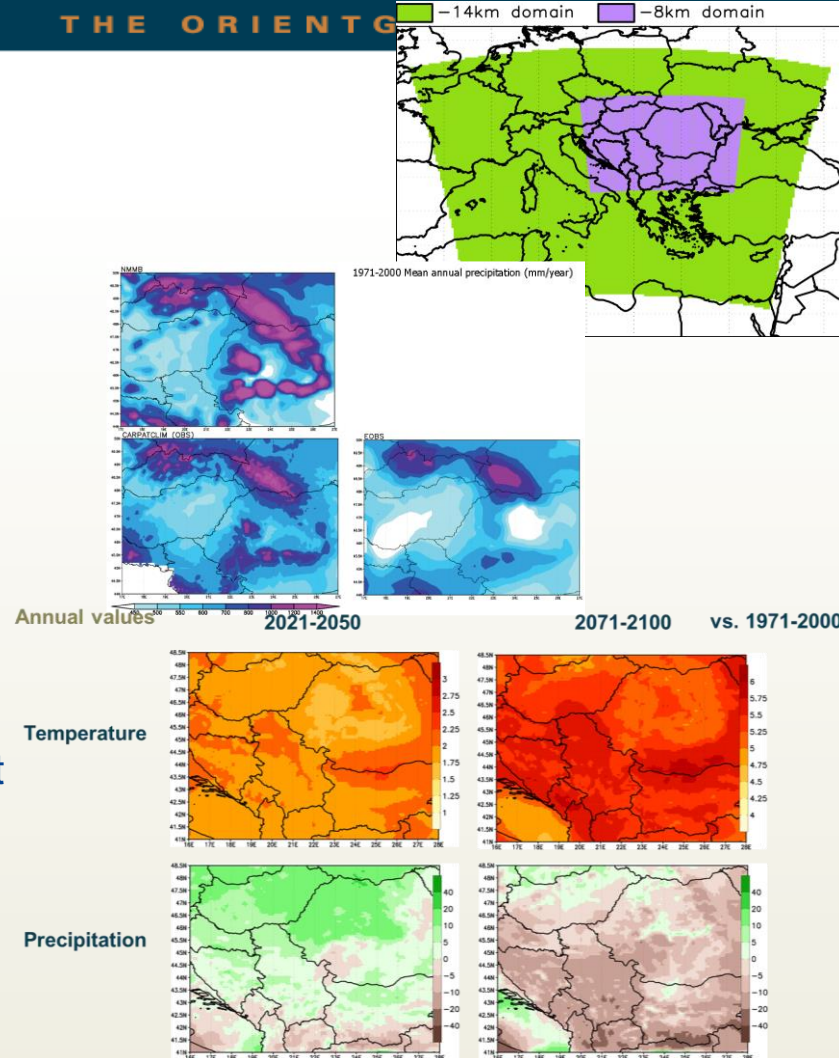
- Review of existing studies -> knowledge gaps
- Review of relevant policies (considering cc adaptation and mitigation)
- Test studies: impact modelling and scenario development
- Assessment of Adaptive Capacity through Questionnaires and Surveys
- Defining adaptation options and recommendations
- Workshops with local stakeholders & training seminars

The Strategy for Wetlands in Attica region

<https://climate-adapt.eea.europa.eu/metadata/case-studies/wetland-adaptation-in-attica-region-greece-1>

Development of downscaling scenarios

- Regional models:
 - RHMSS - **NMMB (Nonhydrostatic Multiscale Model)**
 - CMCC - **COSMO CLM**
- Initial and lateral boundary data for NMMB model:
 - **ERA40 reanalysis** - Horizontal resolution: ~250 km
 - Downscaled period: 1971-2000
 - Horizontal resolution: **14 km** and **8 km** experiment
 - **CMCC-CM** - Horizontal resolution: ~75 km
 - Downscaled period: 1971-2005; 2010-2100
 - Horizontal resolution: **8 km** experiment
 - IPCC scenario: **RCP8.5**
- Data used for verification of NMMB model
 - Observations from RHMSS station network
 - E-OBS, gridded climatology for EU, 25 km resolution
 - ERA40 surface fields, 250 km resolution
 - CARPATCLIM, gridded climatology for Carpathian region, 10km resolution



(Djurdjevic and Krzic; 2013, 2014)
(Davidovic et al, 2014)

Mapping and harmonizing data

- 1. Review of the currently used indicators of climate risks** - Checking status quo and best practices while gathering information and creating the indicators map
- 2. Proposal for the cross-harmonized set of indicators and guidance documents for their calculation and potential use** - Developing a set of indicators, statistical analysis, guidance documents to be used in the 6 pilot areas
- 3. Revised set of indicators and update of relevant subregional data information** - Gathering and reviewing information from 6 pilot studies

Activities 1&2 – results from year 2013

Activity 3 – year 2014



Review of the currently used indicators of climate risks

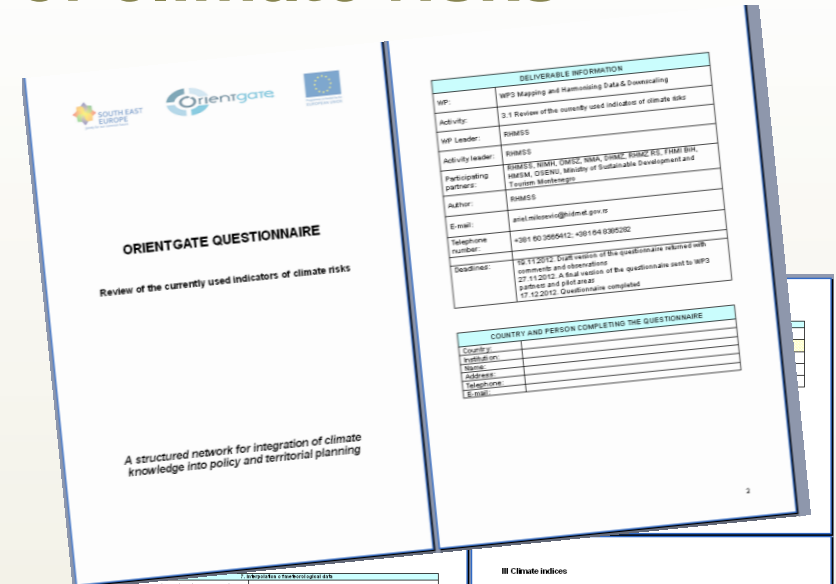
- ORIENTGATE Questionnaire**

Set of 11 tables grouped into three sections:

1. *Information about stations and data*
2. *Climate indices*
3. *Climate models results*

- ORIENTGATE Questionnaire – MANUAL**

- Responses from 12 partners



Review of the currently used indicators of climate risks

- **Statistical analysis of collected information**

1. *Information about stations and data*

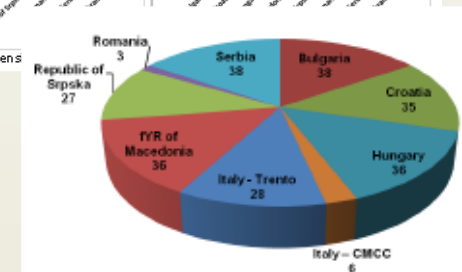
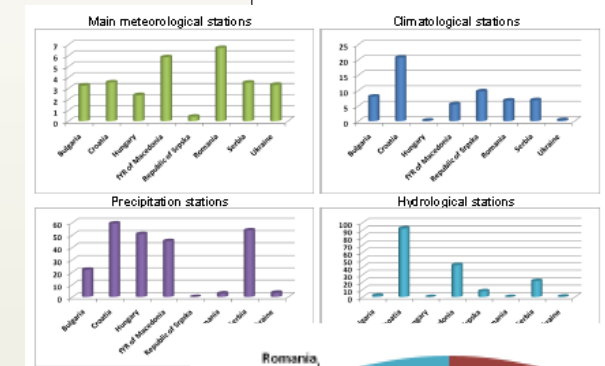
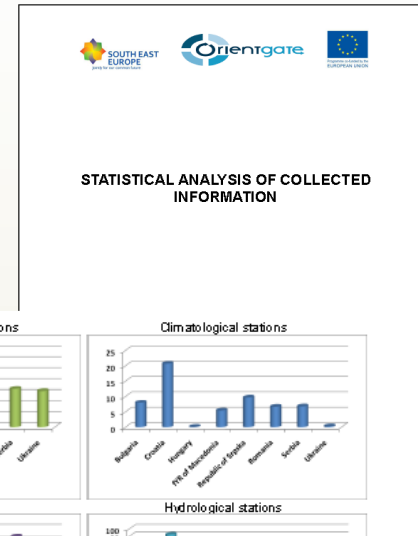
- Sufficiently dense station networks, reliable measurements and long enough time series
- Variety in interpolation and visualization methods and used software
- Output is developed according to the end-user needs

2. *Climate indices*

- ETCCDI indices and user requested
- Mainly custom developed programs for indices calculation
- GIS applications
- Impact studies and national strategic documents

3. *Climate models results*

- 8 out of 12 partners have experience working with climate model data
- 6 out of 8 partners have independently run the model



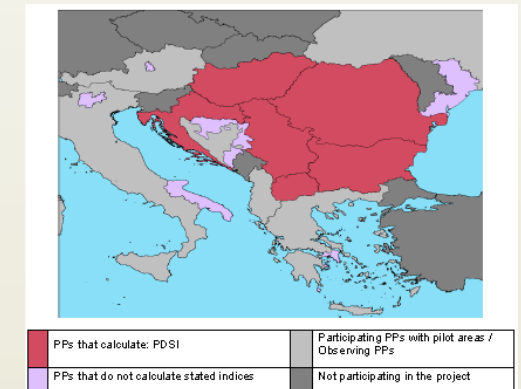
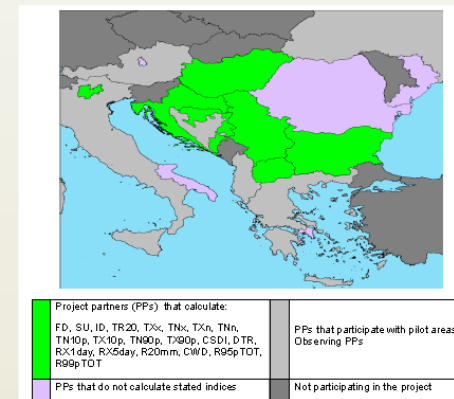
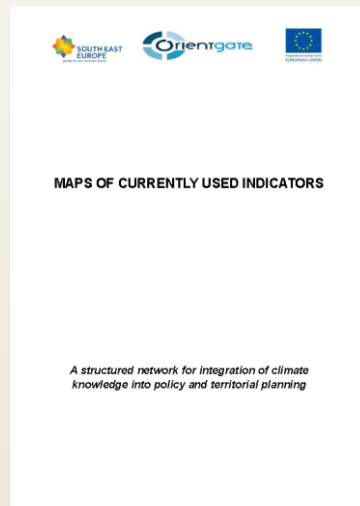
Review of the currently used indicators of climate risks

- **Maps of currently used indicators**

1. *Maps of indices based on temperature and precipitation amount*

- Maps of indices that are proposed by ETCCDI
- Maps of indices that are not proposed by ETCCDI

2. *Maps of indices based on other parameters in addition to temperature and precipitation amount*



Boundaries do not reflect country boundaries but boundaries of pilot areas/area for which PP is responsible!

Proposal for the set of indicators and guidance documents

- Four thematic groups: Agriculture, Forests, Hydrology and Health
- Proposed indices based on temperature and precipitation as well as indices that require other variables

Index	Name	Index	Name
FD	Frost Days	SDII	Simple Daily Intensity Index
TD	Tropical Days	R5mm	n° of days with RR ≥ 5mm
CTD	Consecutive Tropical Days	CDD	Consecutive Dry Days
GSL	Growing Season Length	CWD	Consecutive Wet Days
GDD	Growing Degree Days	R99pTOT	Precipitation due to extremely wet days (> 99th percentile)
WSDI	Warm Spell Duration Index	PRCPTOT	Total precipitation in wet days
CSDI	Cold Spell Duration Index	WD	Warm/Dry
PaDI	Palfai Drought Index	SPI3	Standardized Precipitation Index
PET-Th	Thornthwaite Potential EvapoTranspiration	SPEI3	Standardized Precipitation-Evapotranspiration Index
PET-Ha	Hargreaves Potential EvapoTranspiration	AI	Aridity Index

Revised set of indicators

- Sensitivity, exposure and vulnerability indicators
- Simple to complex and user specific indicators
- Satellite based indicators

Index	Definition
SPI3	Standardized Precipitation Index 3 months
SM	Soil Moisture
HS	Heat Stress
AI	Aridity Index
fAPAR	Fraction of Absorbed Photosynthetically Active Radiation Index
NDVI	Normalized Difference Vegetation Index
NDDI	Normalized Difference Drought Index
NDWI	Normalized Difference Water Index

Thank you for your attention!

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