

Climate information system to support the climate change adaptation in Hungary



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HUNGARIAN
METEOROLOGICAL
SERVICE

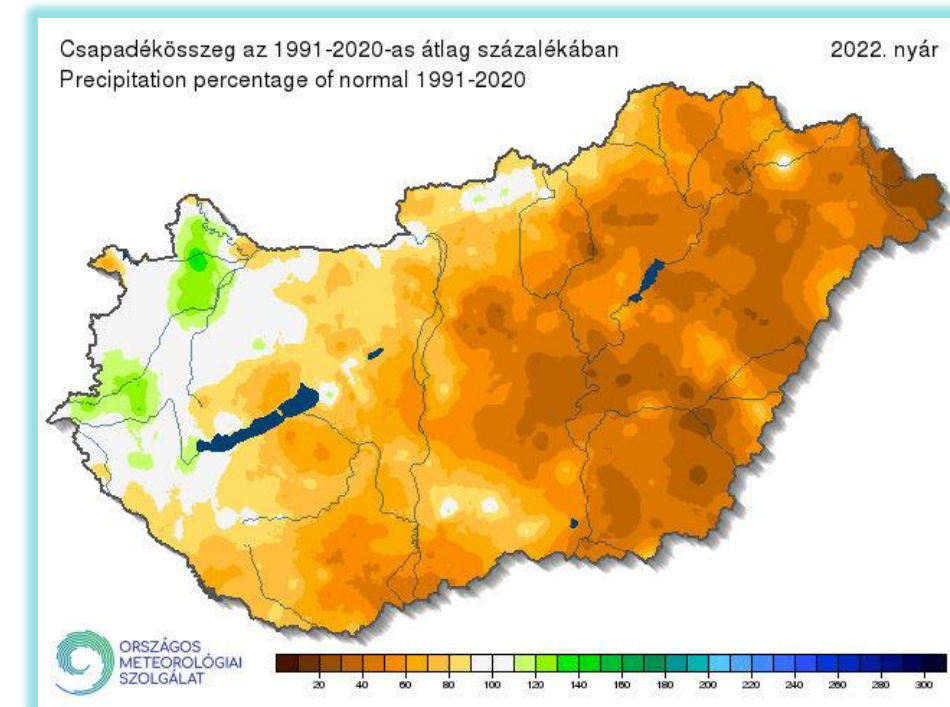


Motivation

- Investigation of climate change in Hungary using measurements and model data
- Continuous development of the meteorological data and the applied methods
- Impact assessments in cooperation with other disciplines and sectors
- Delivering automatic and tailored climate services
- Enhancement of communication

Developments based on measurements

- Homogenized (MASH) and gridded (MISH) time series over the Carpathian Basin, Hungary for multiple meteorological variables (odp.met.hu):
 - 0,1° horizontal resolution, daily data
 - From 1971: temperature, precipitation, r. humidity, pressure; from 2001: wind, radiation
- Assessment of mean change, climate indices, extreme events
- Development of time series for climate impact studies:
 - Finer resolution grid: 0.1 → 0.05 degree
 - Integration of further time series via recording paper-based data
 - Regular update of the already available datasets
 - Analysis of sub-daily data

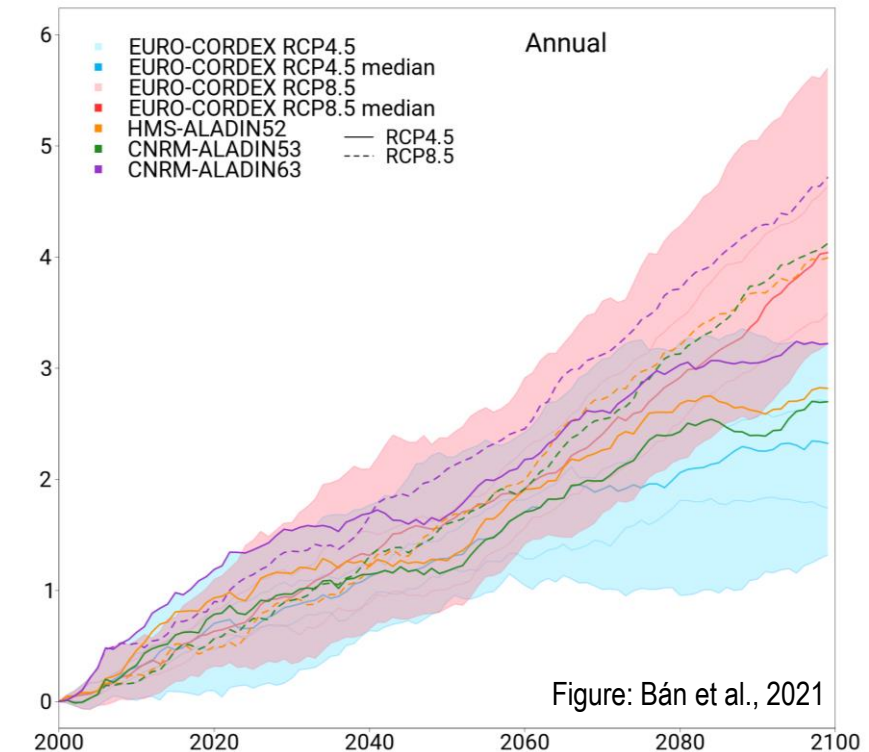


Regional climate modelling

- Simulations with 2 RCMs and 2 RCP scenarios up to 2100 at OMSZ
- Evaluation of the EURO-CORDEX RCM outputs
- Future changes and bias-adjusted values
- Target periods:
 - Validation: 1981–2000, 1971–2000
 - Projection: 2021–2050 (2041–2070), 2071–2100
- Ongoing: **km scale** regional climate modelling (HARMONIE-Climate)

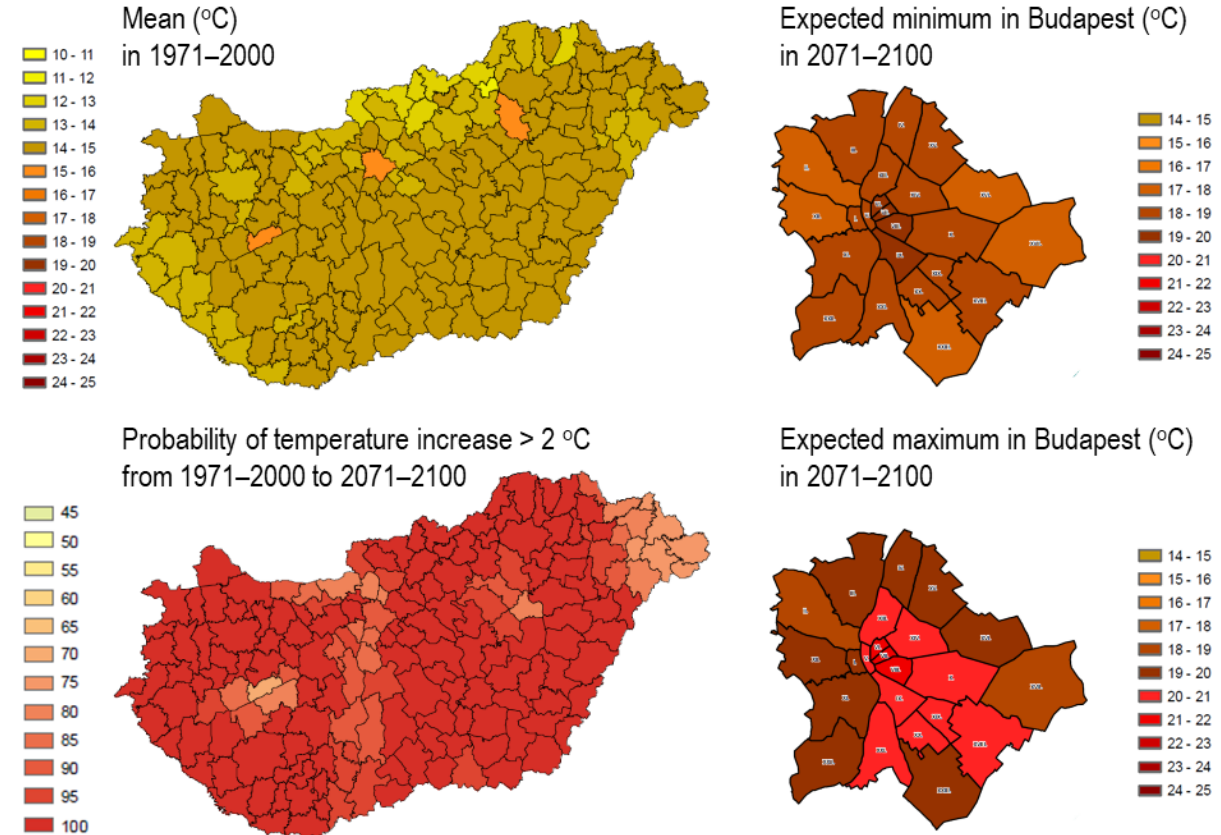
Model	Resolution	Scenario	Area
ALADIN	10 km	RCP4.5, RCP8.5	Central-Eastern Europe
REMO	10 km	RCP4.5, RCP8.5	Central-Eastern Europe

Annual temperature change (°C)
Hungary, reference: 1981–2000



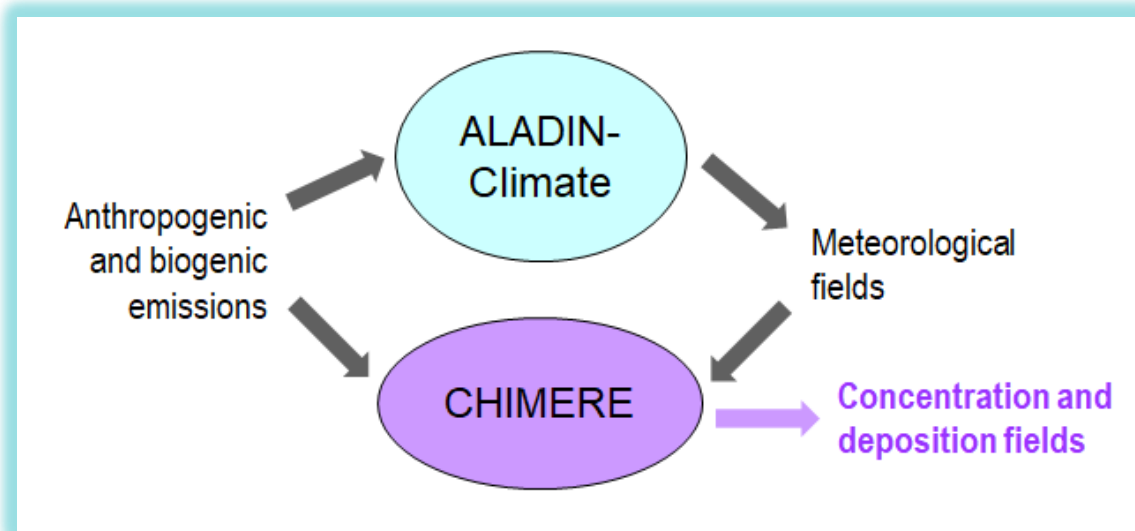
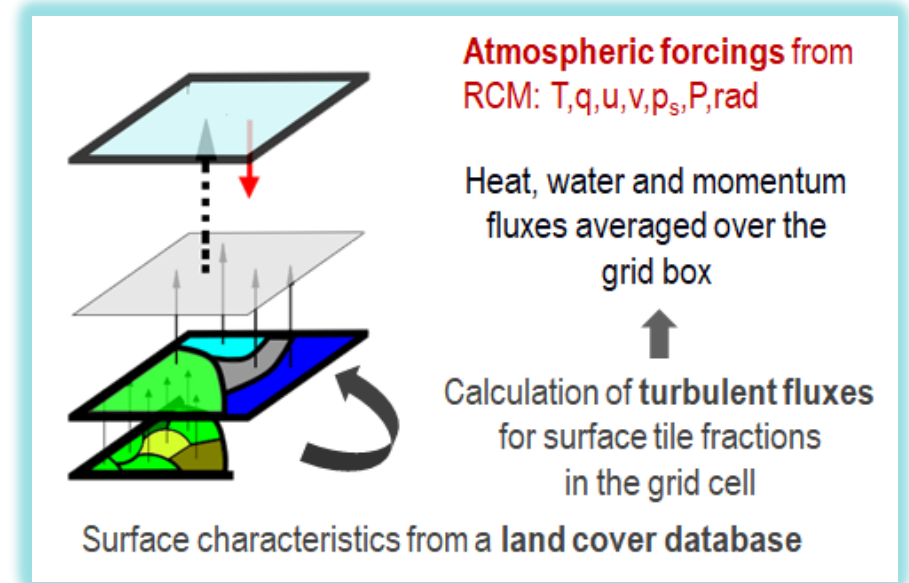
- Maps, graphs and data of climate indicators for climate impact studies, strategy making, media, private interests
- Detailed information on changes in Hungary: good quality **observations** + **simulations**
- Publicly available interface (in Hungarian): klimadat.met.hu
- Period: 1971–2100
- 1 and 10 km resolution
- Projection uncertainties in form of probability maps, quantile maps
- Continuous update and extension

Daily minimum temperature in July



In-house impact studies at OMSZ

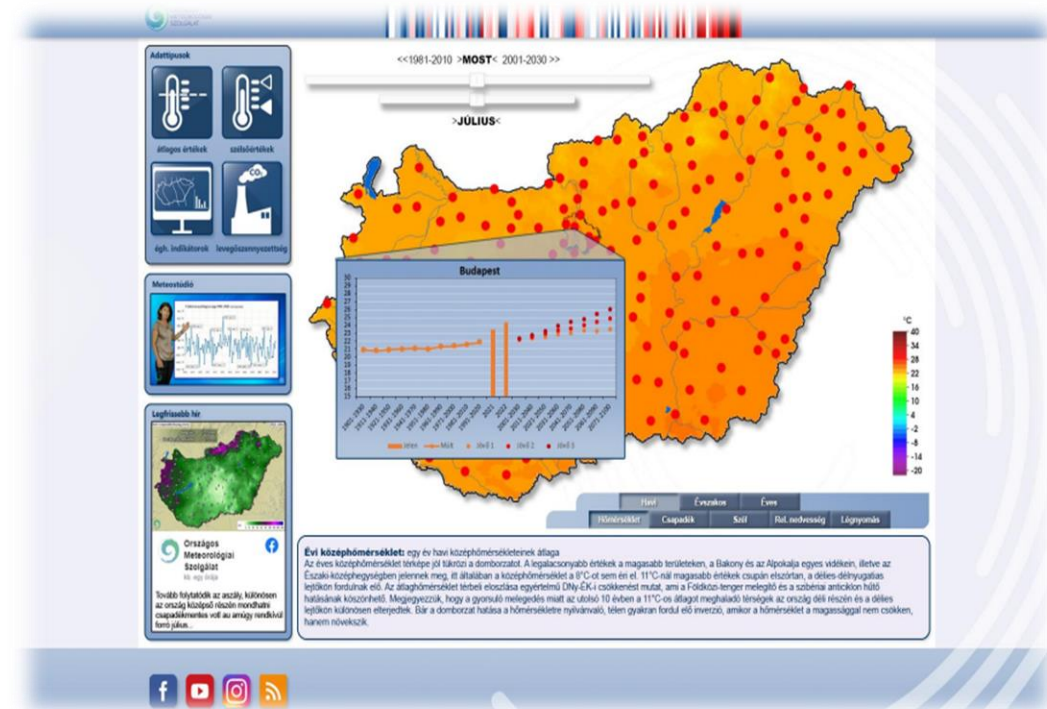
- Impacts of climate and land use changes in **Hungarian cities** (Budapest, Szeged)
- 1 km resolution experiments with the SURFEX surface model – atmospheric forcings from the ALADIN and REMO RCM outputs
- Period: 1971–2100



- Impacts of climate change on **air quality**
- 10 km resolution experiments with the CHIMERE chemical transport model – atmospheric forcings from ALADIN, EMEP emission data
- Period: 2000–2050

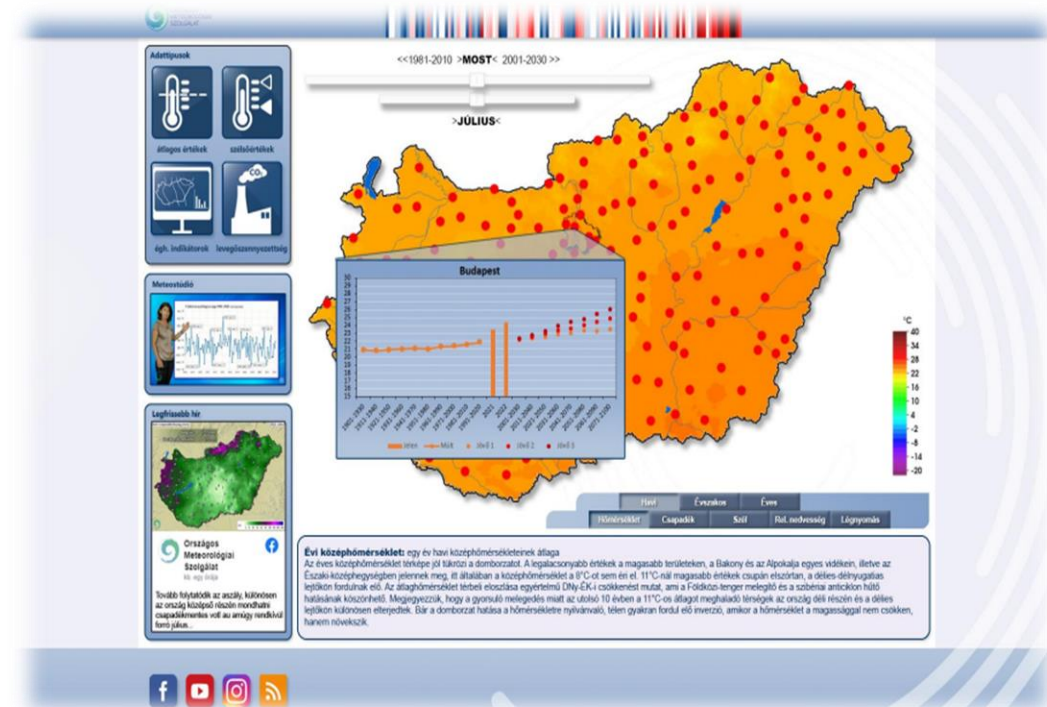
Climate service and communication

- Tools for effective information provision and communication:
 - **Database** composed of measurements and model data
 - **Web page** about climate change in Hungary (digital atlas)
 - Presentation of scientific results in national and international **events, publications**
 - **Support of users** and decision makers, organization of workshops



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Thank you for your attention!

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