Homogenised data series, monthly temperature grids and climate monitoring products for Croatia

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11th Seminar for Homogenization and Quality Control in Climatological Databases and 6th Interpolation Conference jointly organized with the 14th EUMETNET Data Management Workshop, 9-12 May 2023

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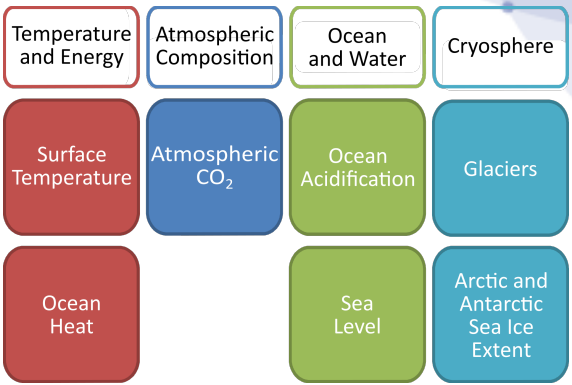
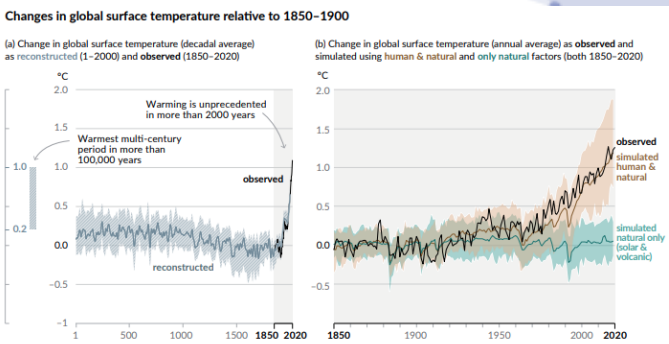
Global climate indicators - WMO GCOS



IPCC's Summary for Policymakers (2021)



Changes in global surface temperature over the past 170 years (black line) relative to 1850–1900 and annually averaged, compared to Coupled Model Intercomparison Project Phase 6 (CMIP6) climate model simulations.

Climate monitoring products - to be created

Surface climatological stations, 2022

locations	grids
homogenised M series	M maps with error estimates
MY normals 1981-2010	MY maps for 1981-2010 normal
MY anomalies	MY maps of MY anomalies
-	WMO NCMP, MY country anomalies
MY trends	maps of MY trends

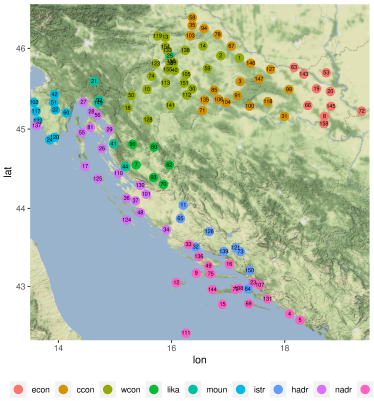
Nonhomogenised data

Zagreb-Maksimir, 2022

Data are not free from non-climatic influences like:

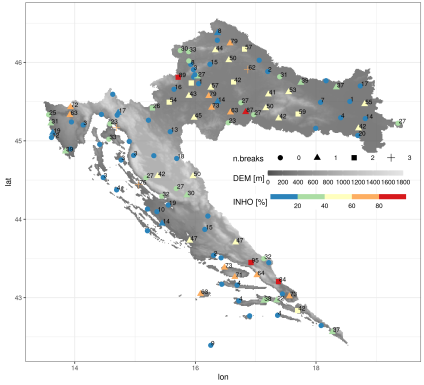
- relocation of the stations - Karlovac 1992
- changes in the local environment - Zagreb Maksimir 1990's building
- changes in observation practice - manual to automatic measurement
- changes in the data processing - new QC procedures
- digitization and database errors

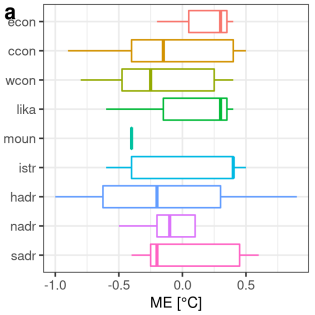
Climate regions



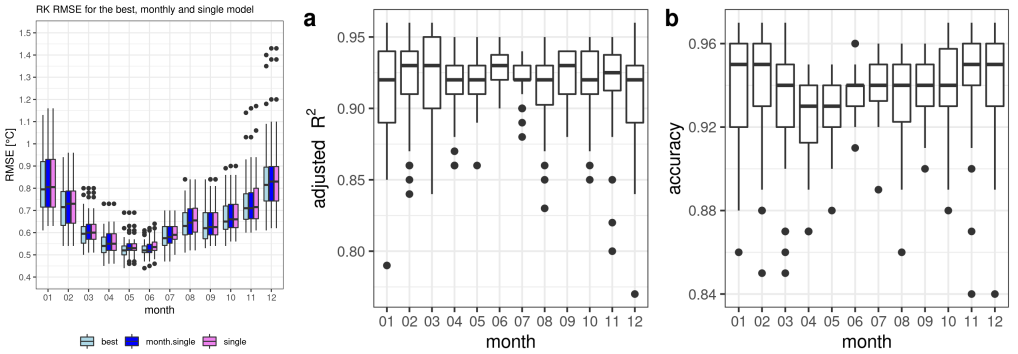
- SNHT, Standard normal homogeneity test was optimized
  - allows for the break detection on candidate series by comparison to
  - composite reference series build from several nearby stations from the same climate region
- clustering algorithm based on the temperature differences of the successive months was applied to define climate regions
- new homogenised data series are build

Detected breaks and the adjustments

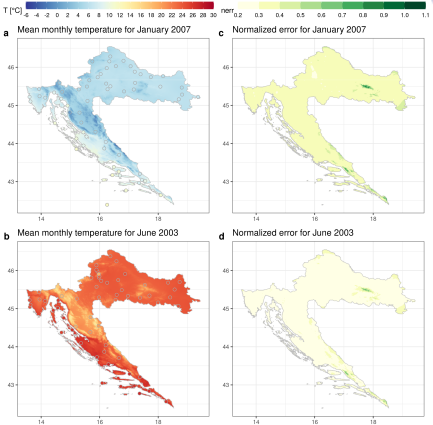




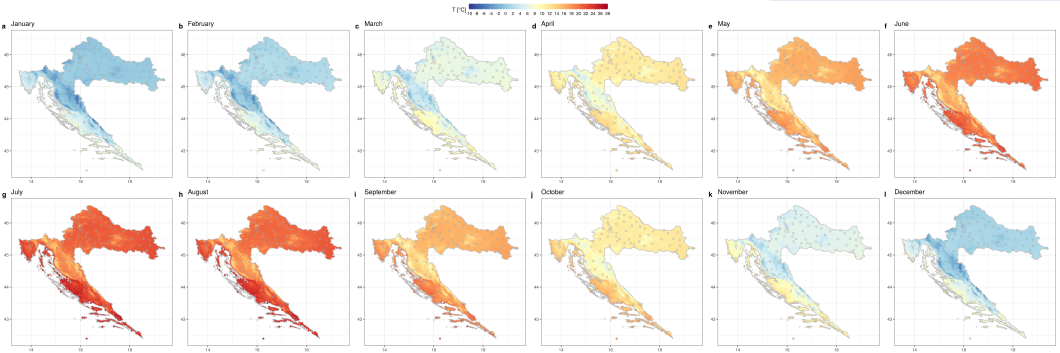
Leave-one-out cross-validation



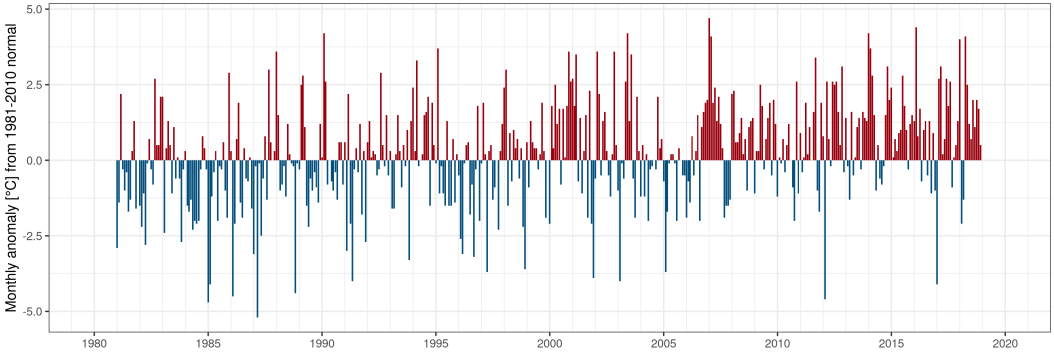
Monthly gridded data set - prediction and normalised error maps



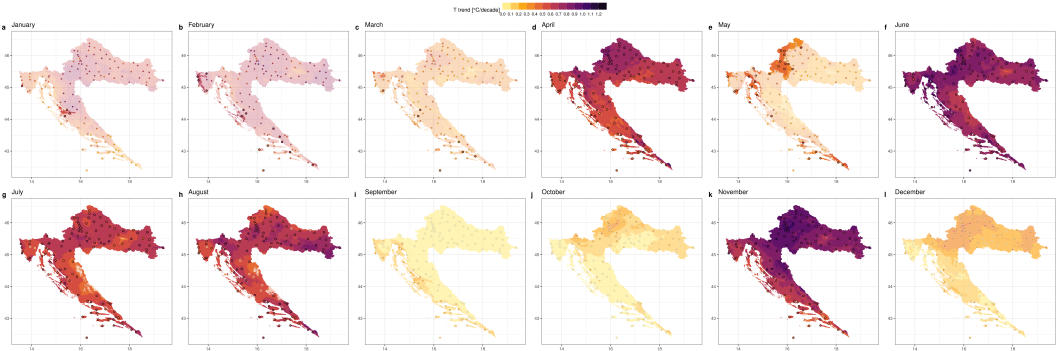
Monthly climate normals 1981-2010



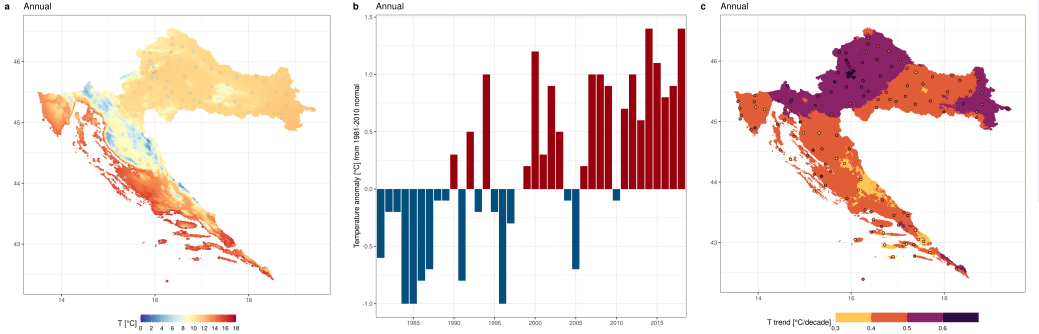
WMO NCMP - anomalies averaged over the country



Monthly trend maps



Annual climate and climate change



Concern and hope

- the positive temperature trends are strong and significant and
- suggest that our region will face consequences such as devastating heatwaves, water shortages, loss of biodiversity, risks to food production and human health (IPCC 2021
- we are part of a Mediterranean where it seems that the observed trends are 2-2.5 times stronger than the global mean warming especially during summer (van Oldenborgh et al. 2009)
- we hope that some of the presented climate monitoring products can help in assessing the vulnerability and the risk from climate change and
- help with the mitigation of the potentially affected sectors like forestry, agronomy, tourism, water management, energy production or consumption, health or others

Thank you for the attention!

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