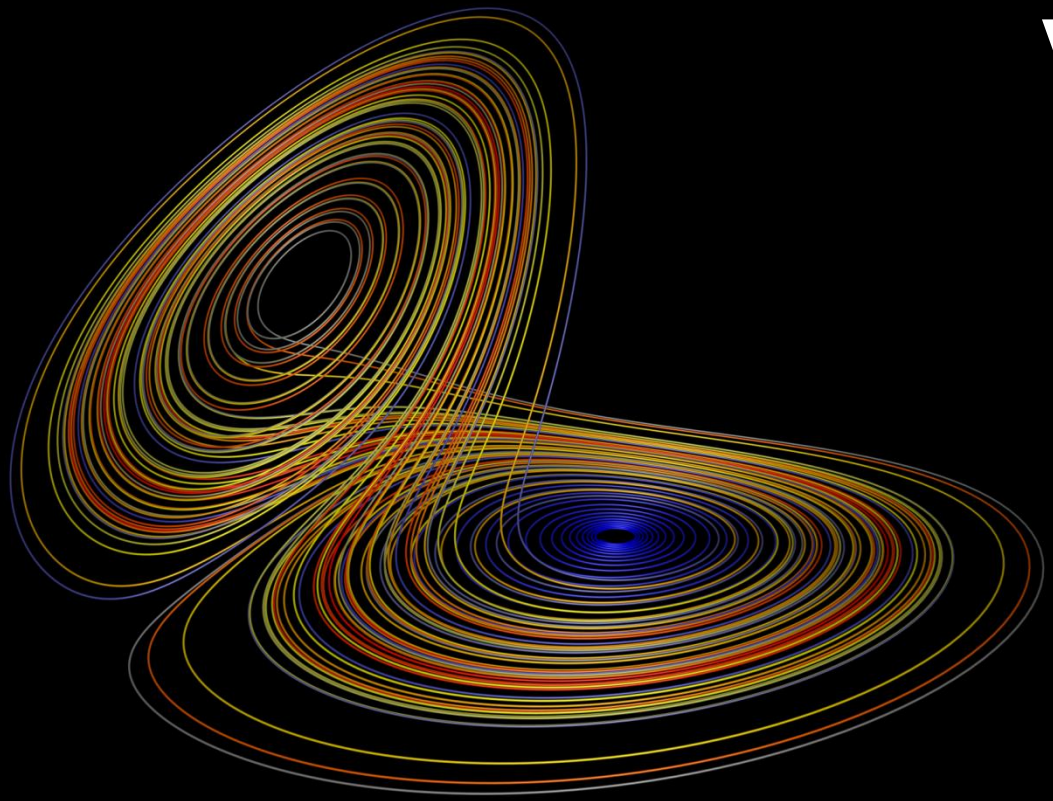
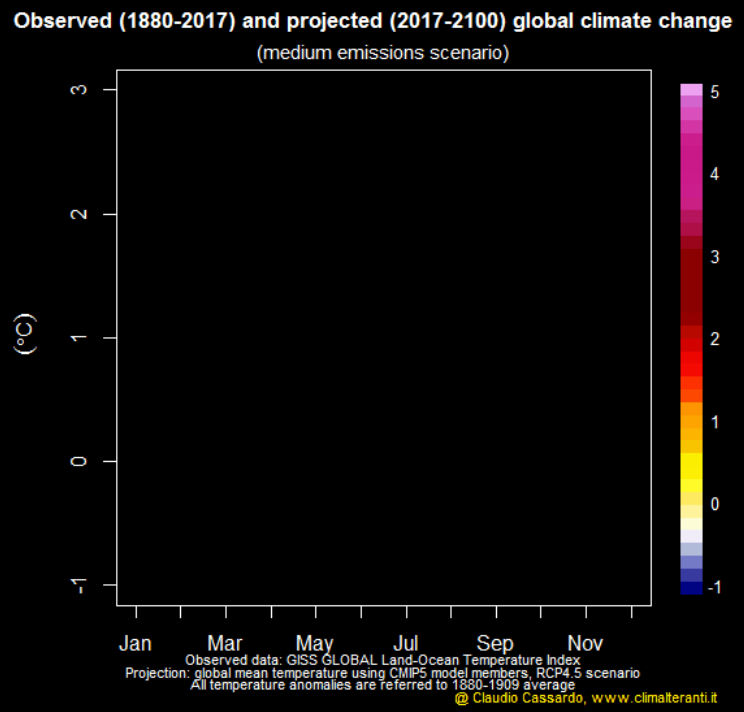


VÝZNAMNÉ ZMENY REŽIMU KLÍMY

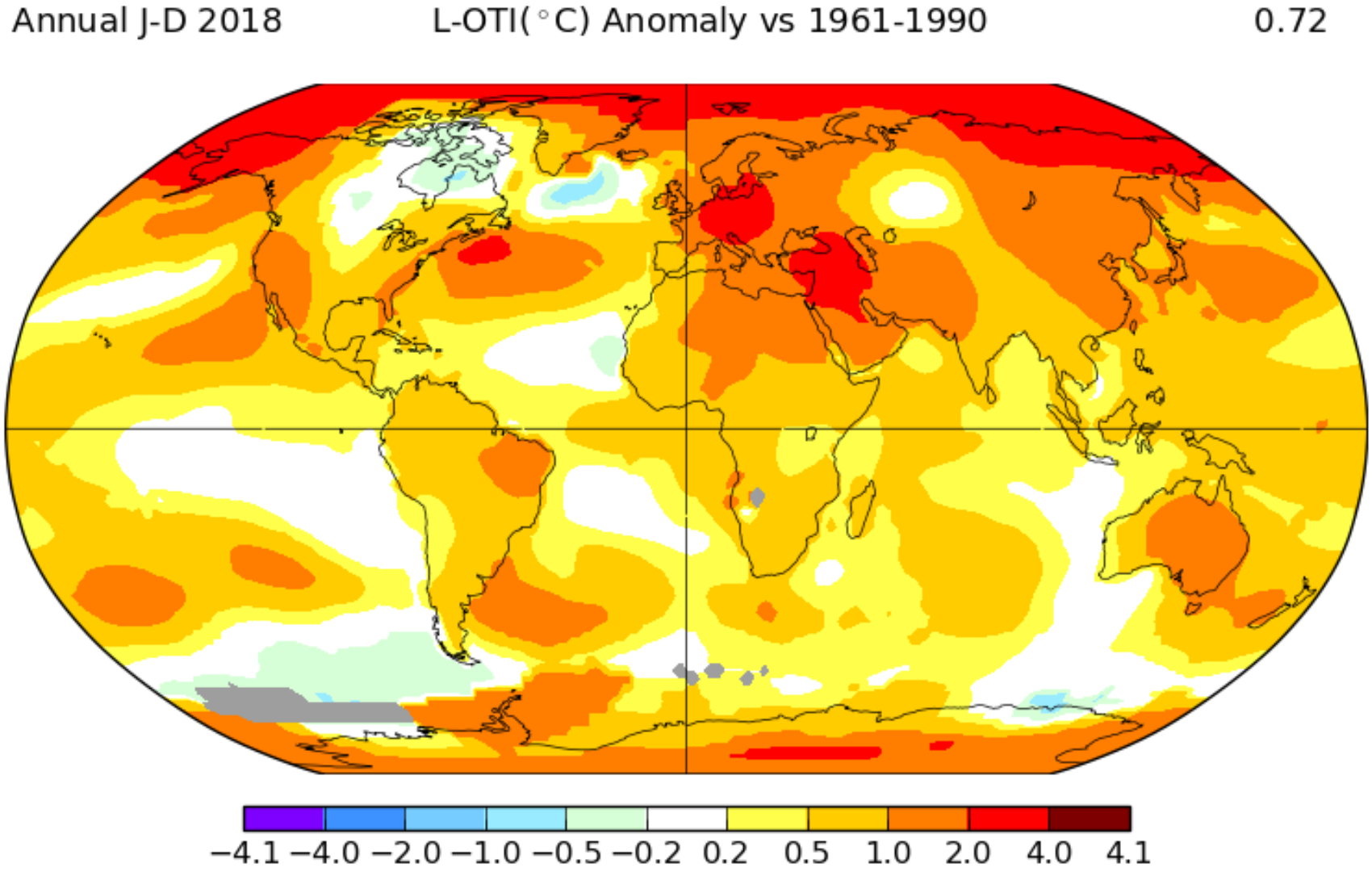
A čo nás čaká ďalej ...



JOZEF PECHO
Slovenský hydrometeorologický ústav, Bratislava
Oddelenie meteorológie a klimatológie, KAFZM FMFI UK Bratislava

ZVYKAJME SI NA NOVÝ NORMÁL POČASIA A KLÍMY

VEĽA MALÝCH „PREKVAPENÍ“ – ROK 2018



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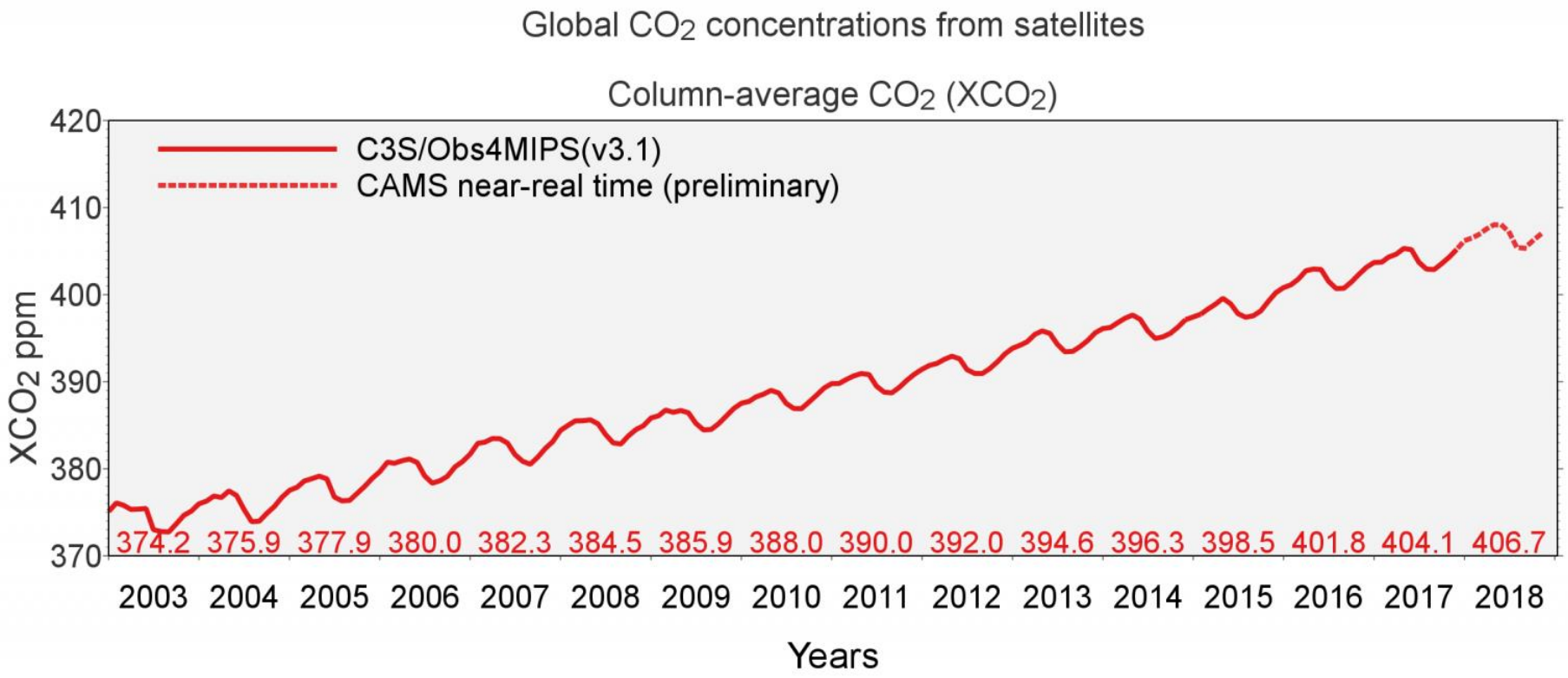


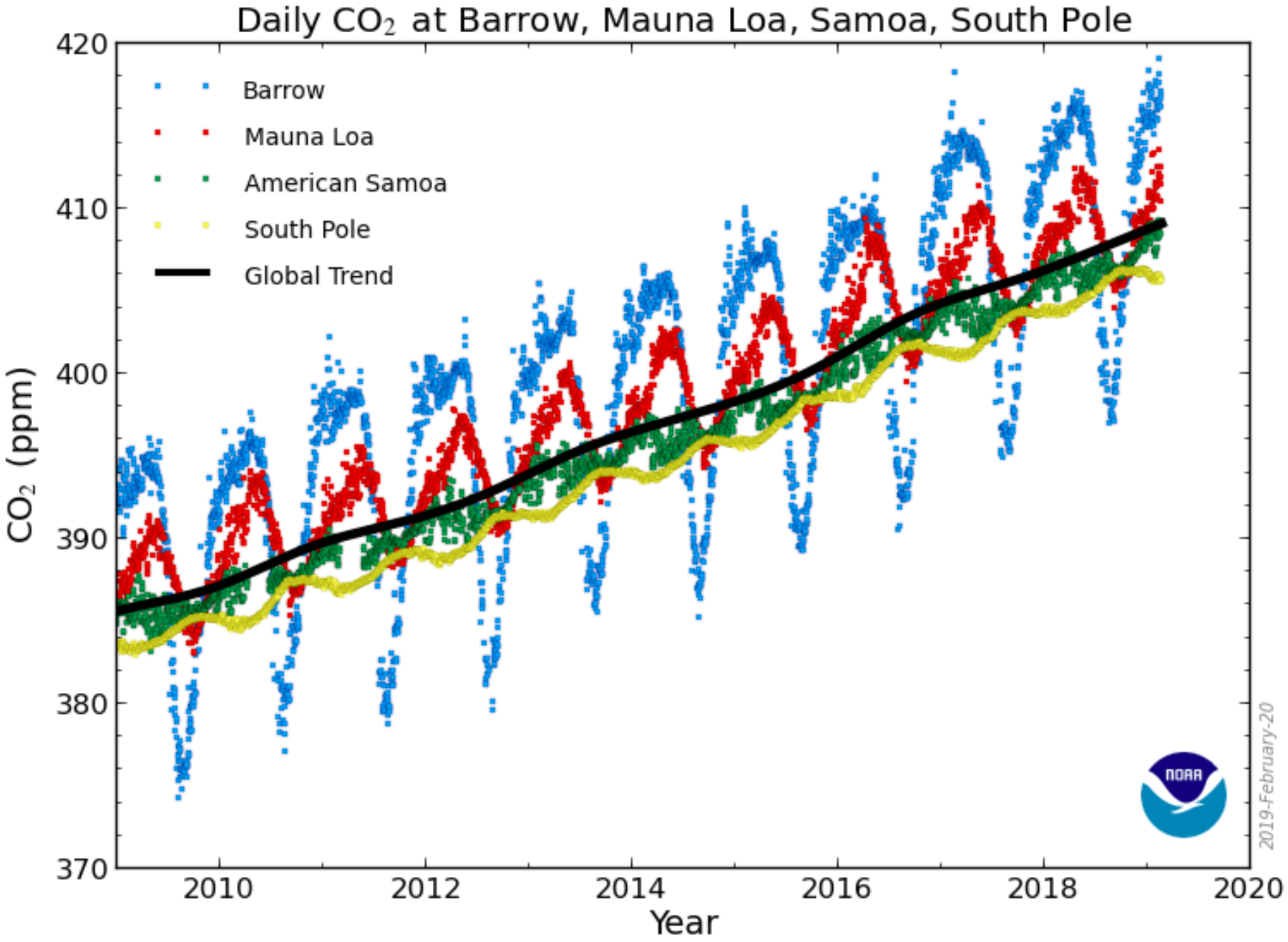
European Commission

opernicus Europe's eyes on Earth

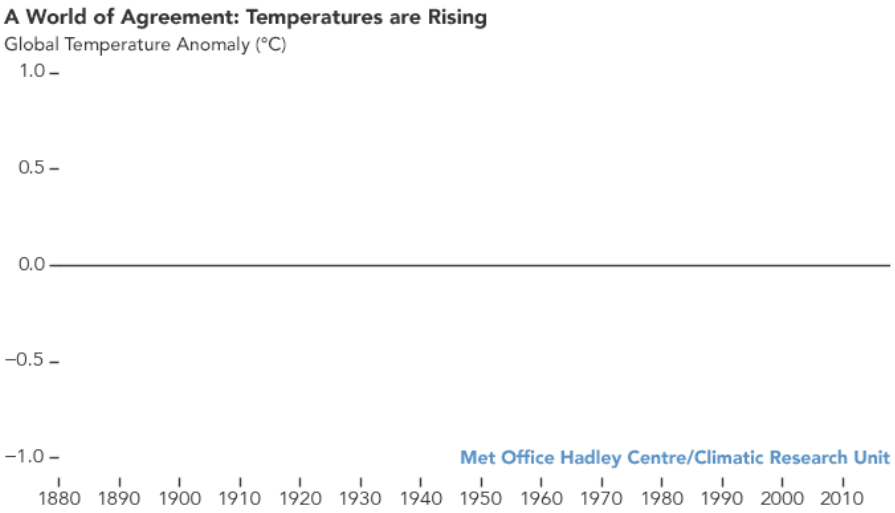
Climate Change Service climate.copernicus.eu

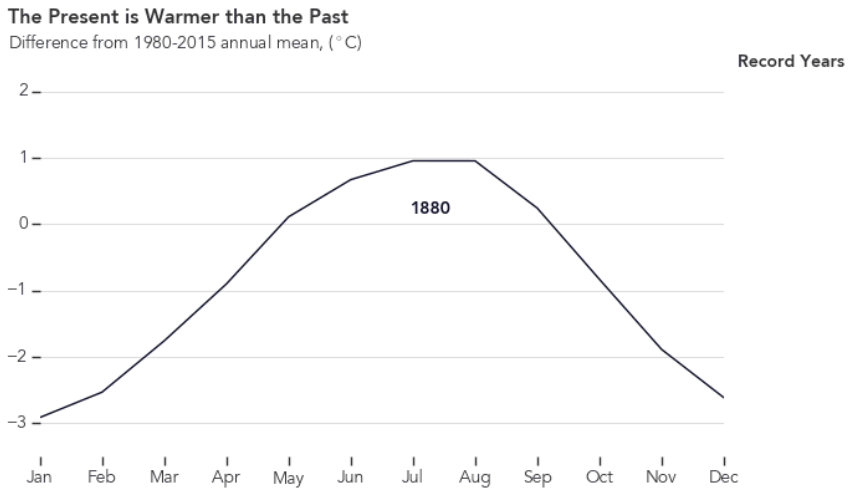
Atmosphere Monitoring Service atmosphere.copernicus.eu

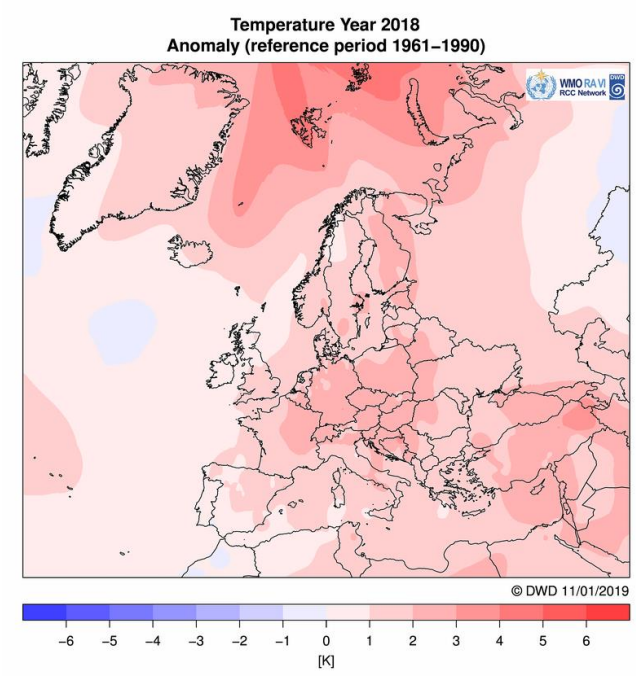
IMPLEMENTED BY ECMWF

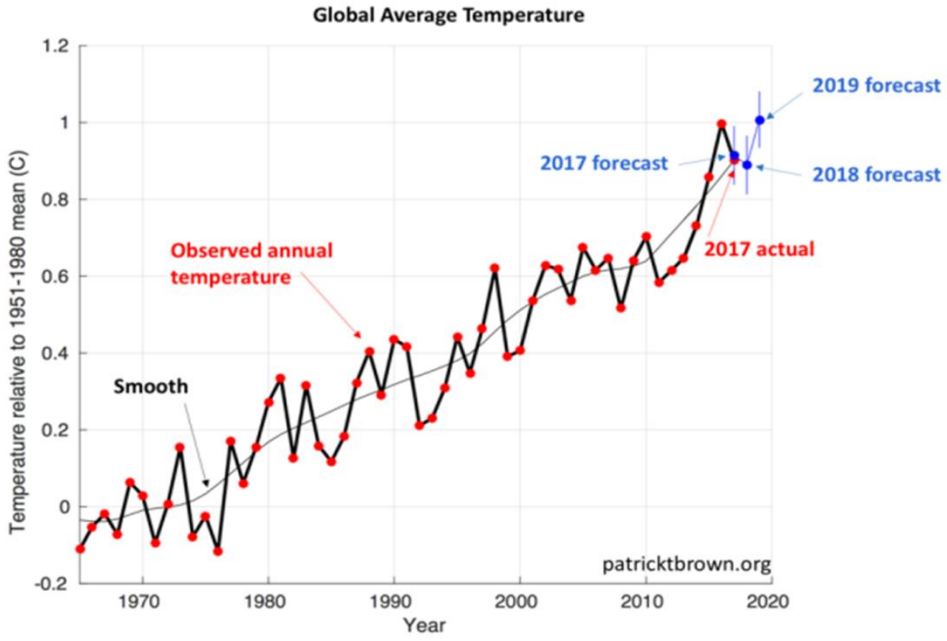

Daily CO_2 at Barrow, Mauna Loa, Samoa, South Pole
Barrow
Mauna Loa
American Samoa
South Pole
Global Trend
CO_2 (ppm)
420
410
400
390
380
370
2010
2012
2014
2016
2018
2020
Year
NOAA
2019-February-20

VEĽA MALÝCH „PREKVAPENÍ“ – ROK 2018









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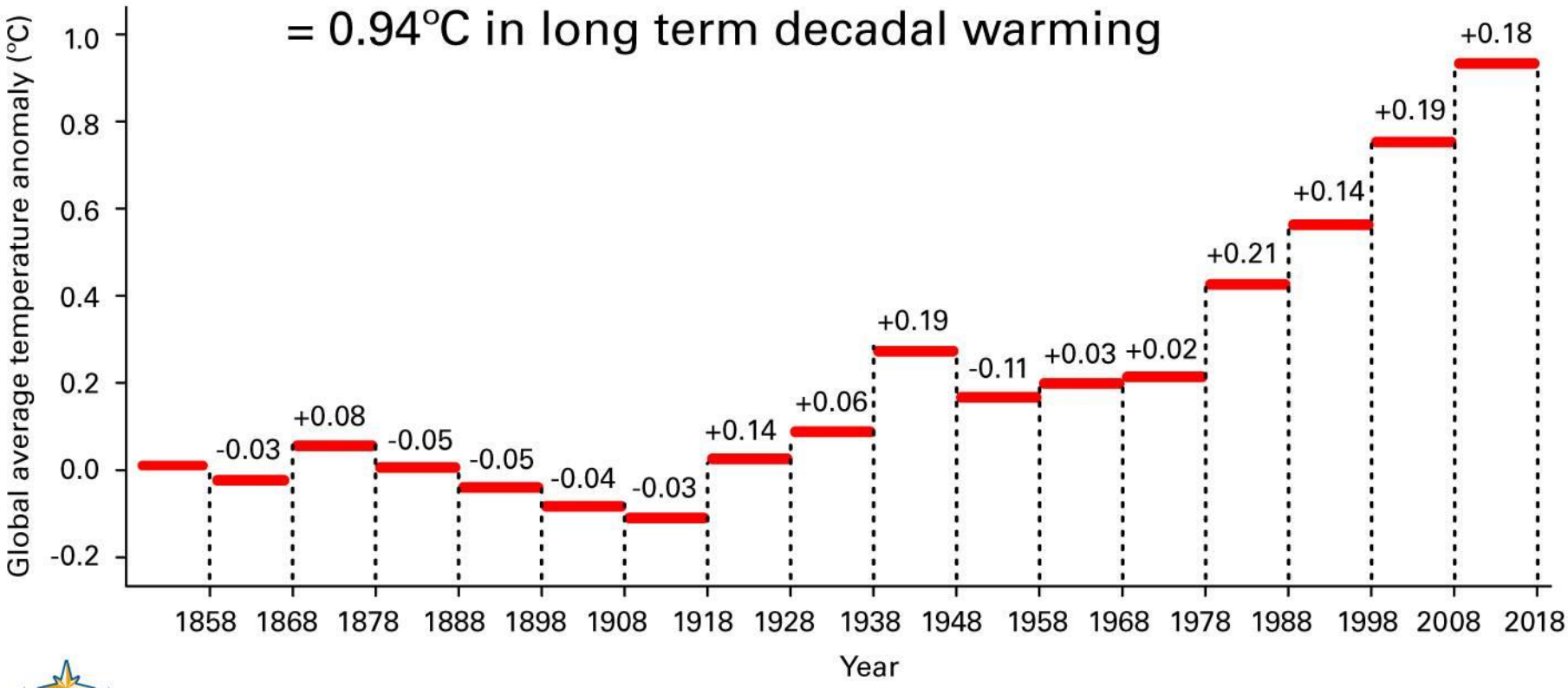
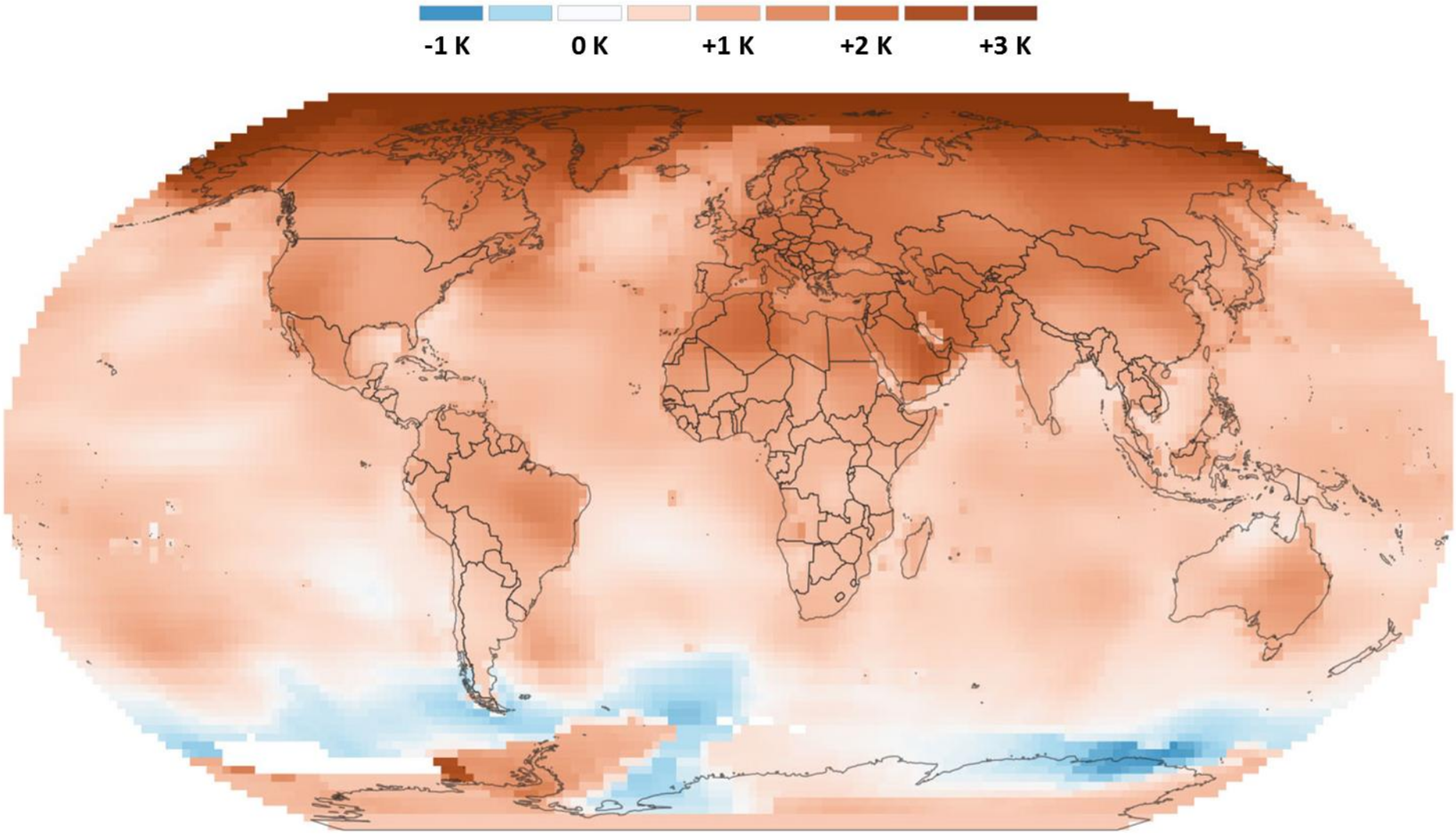


WORLD METEOROLOGICAL ORGANIZATION

WEATHER CLIMATE WATER

Trendy teploty: 1970 – 2018 (NASA GISS)

VEĽA MALÝCH „PREKVAPENÍ“ – ROK 2018



Trendy teploty: 1970 – 2018 (NASA GISS)

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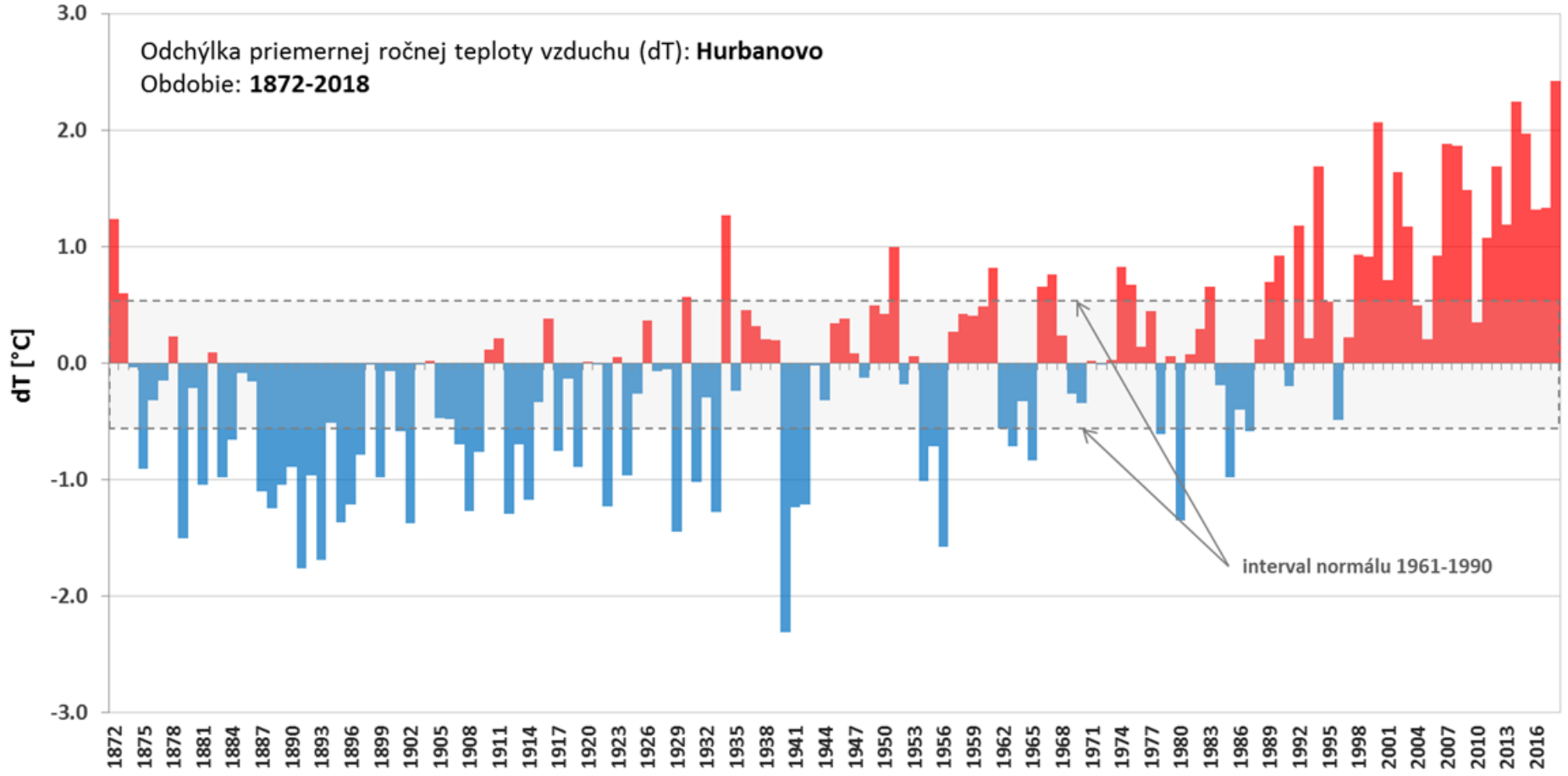

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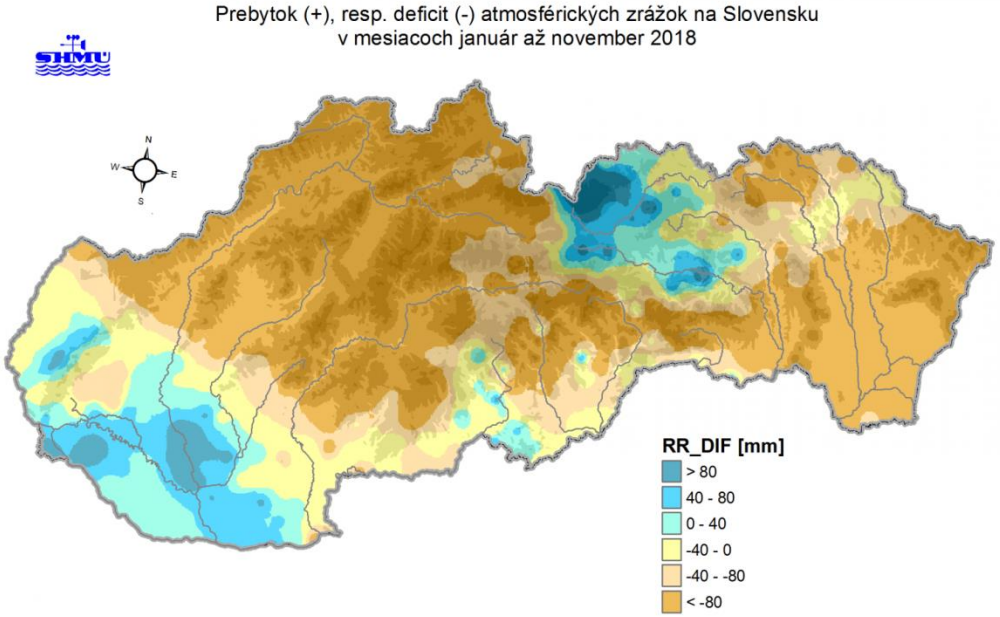
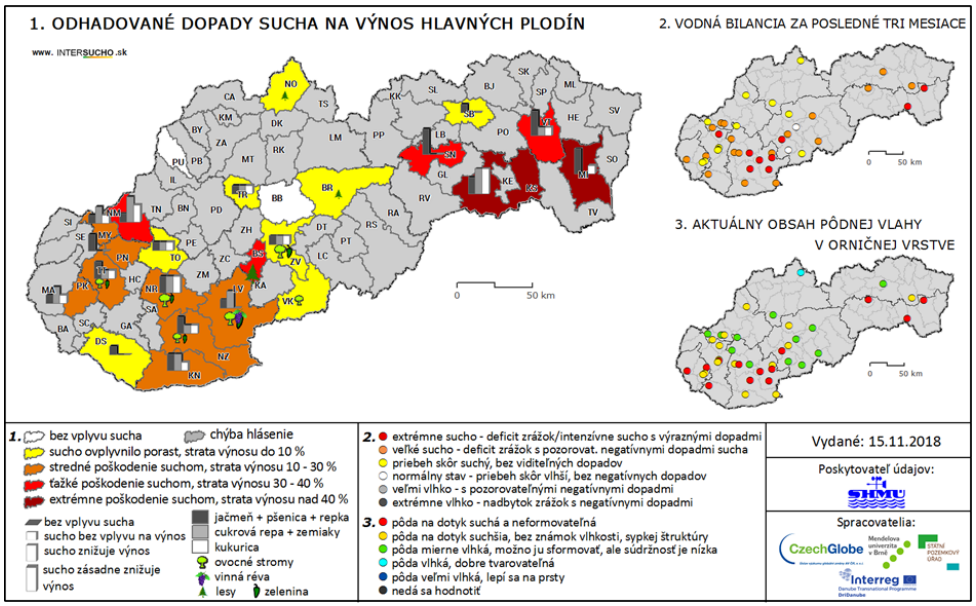
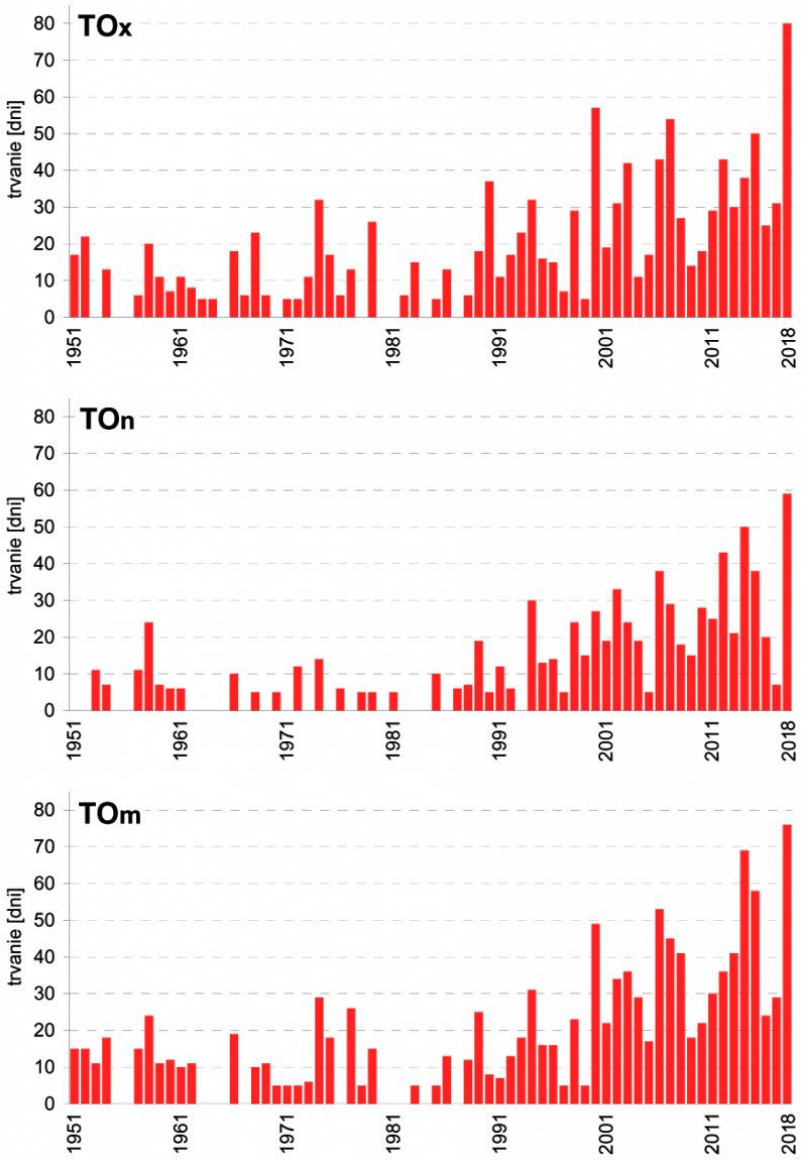
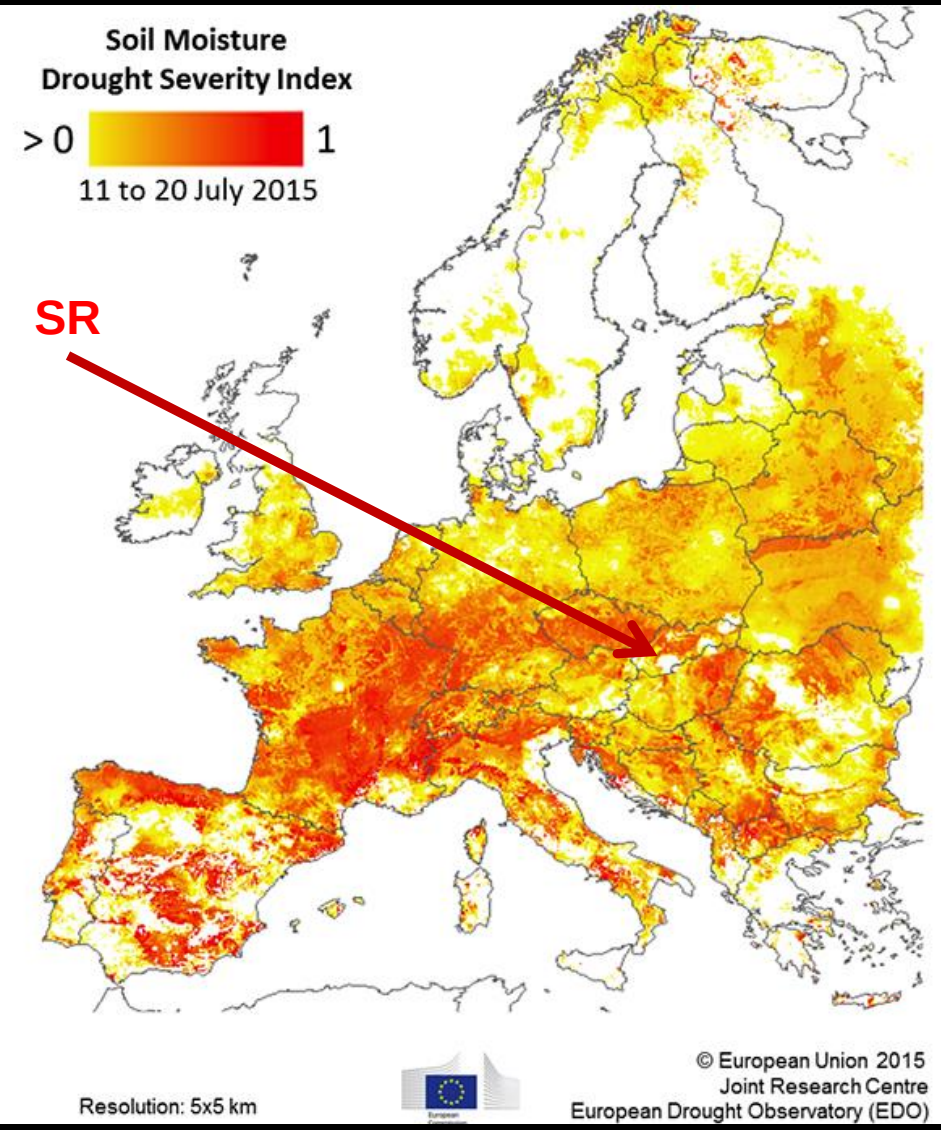
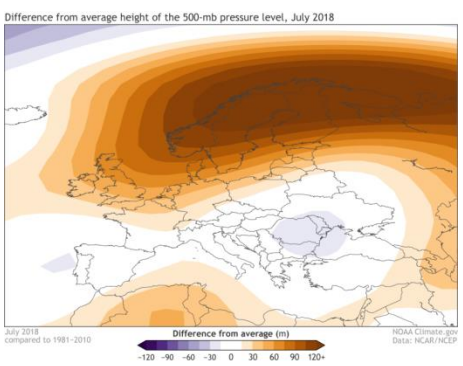


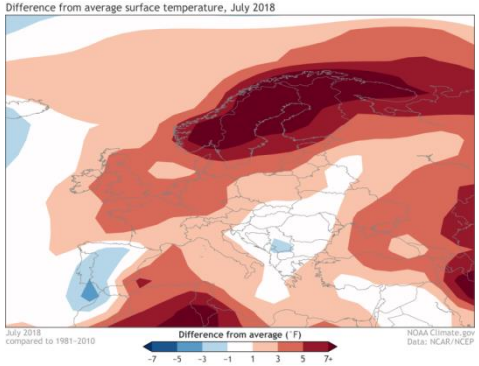


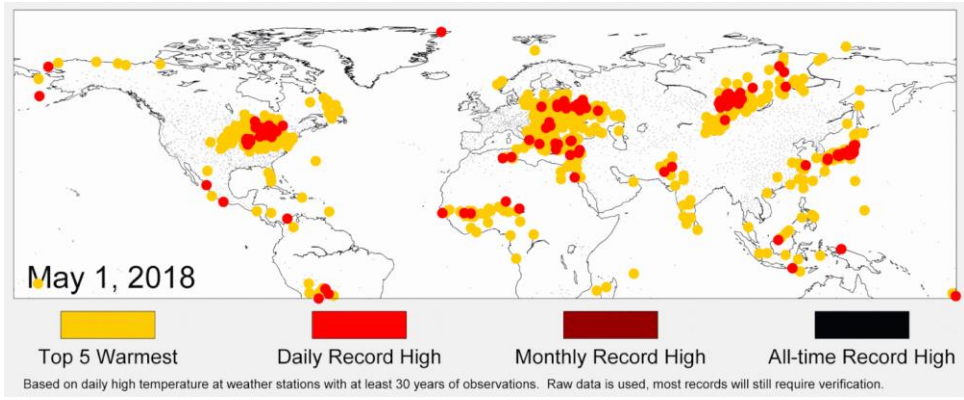


PROBLÉMY S VODOU AJ V EURÓPE ?



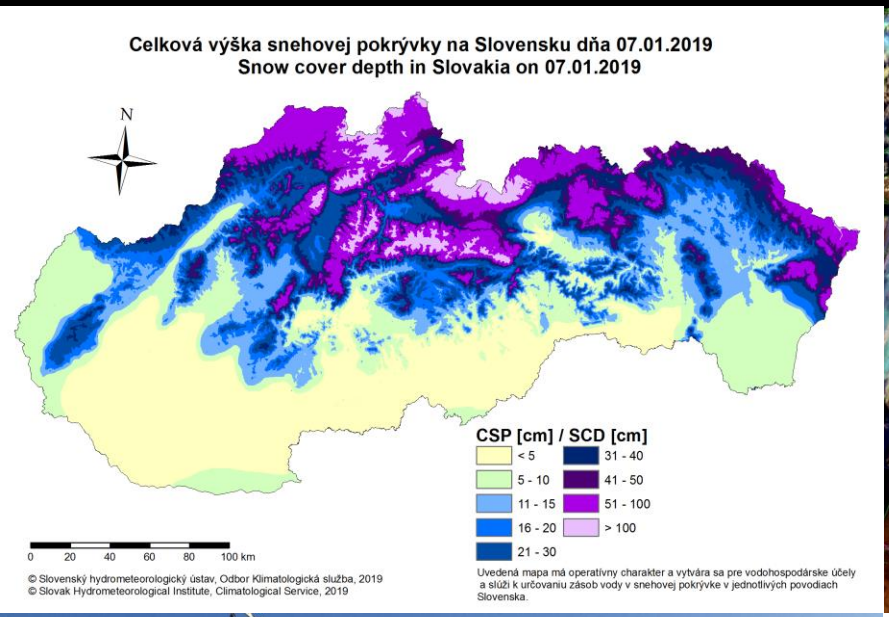


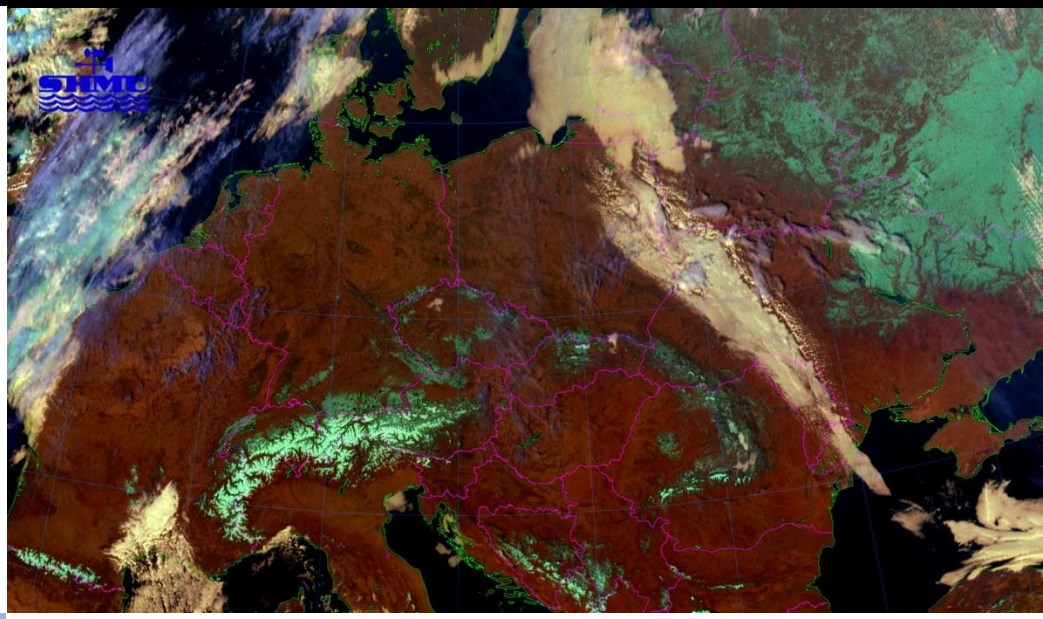


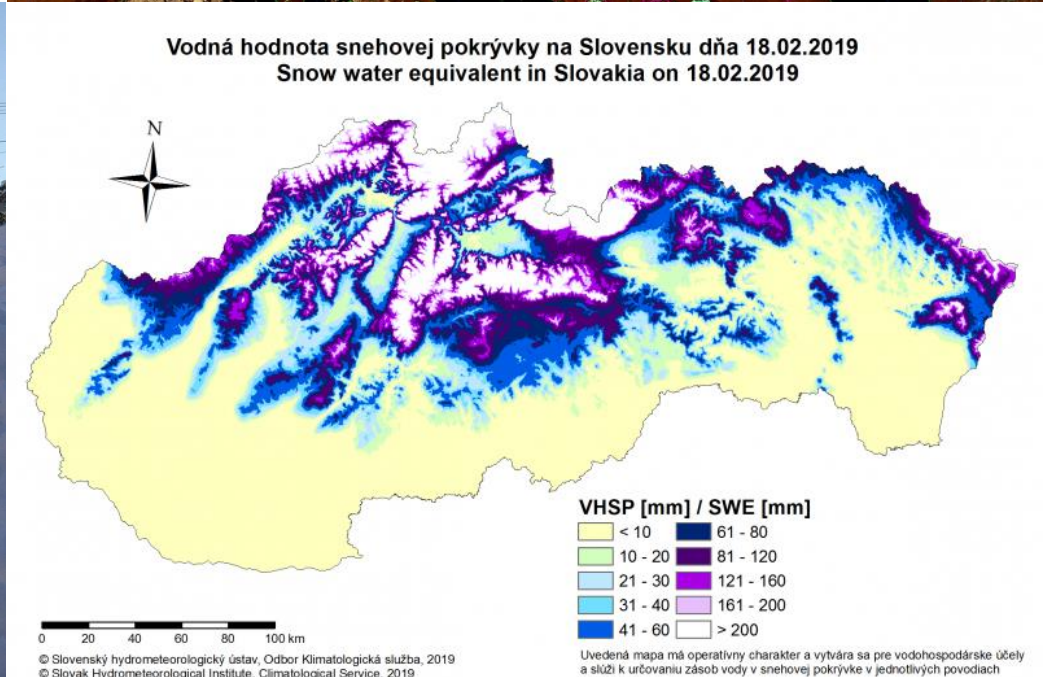


PROBLÉMY S VODOU AJ V EURÓPE ?

ZIMA 2018/2018







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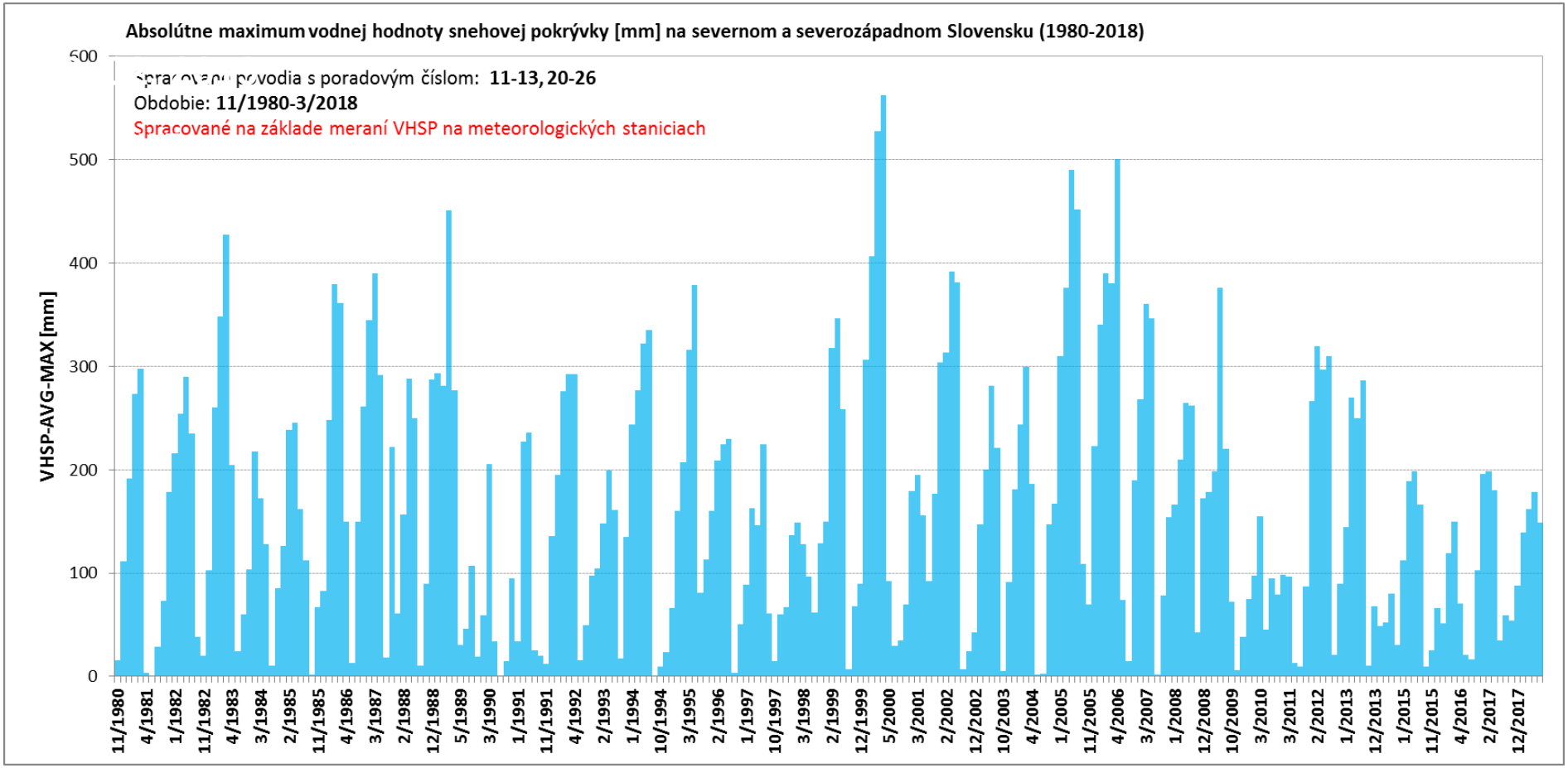


18. 02. 2019
Zdroj: SWE

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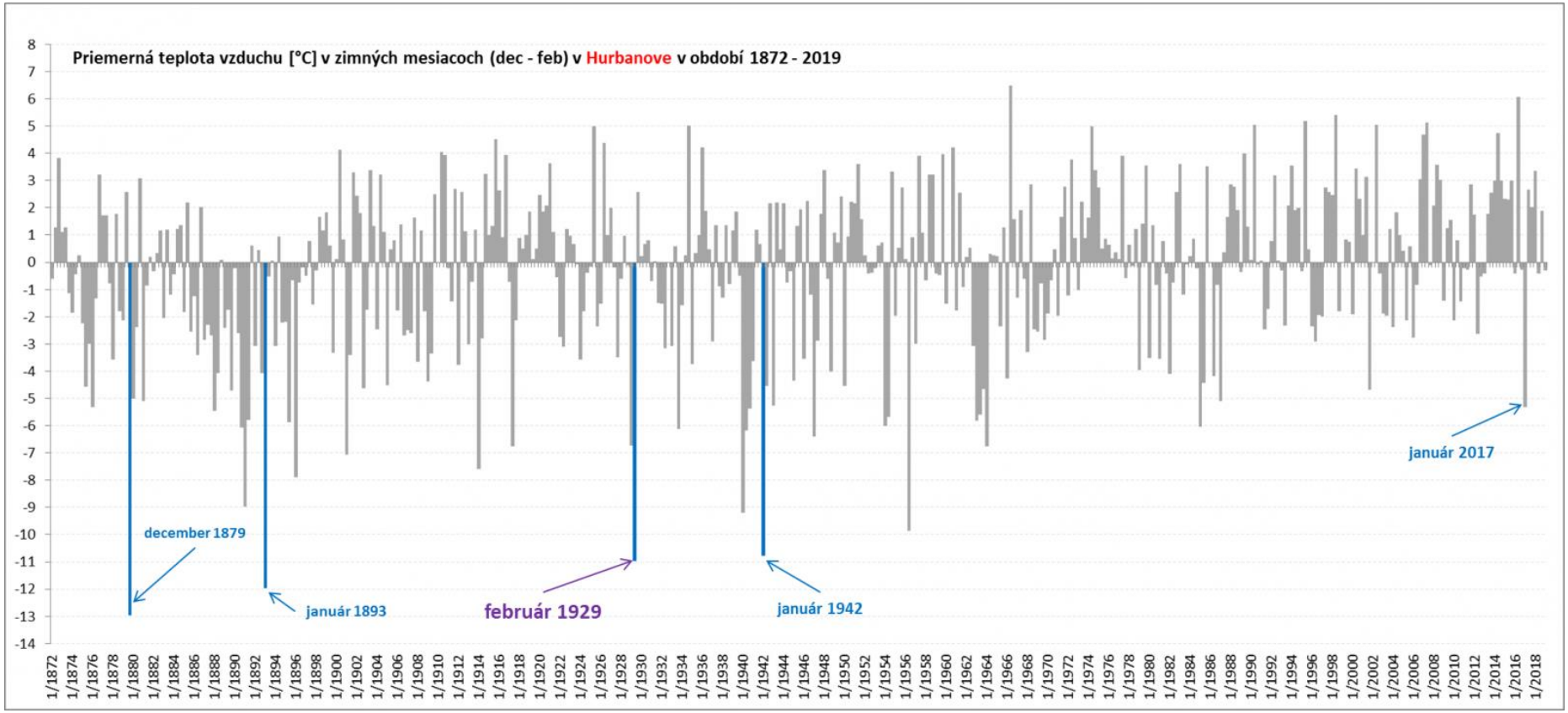

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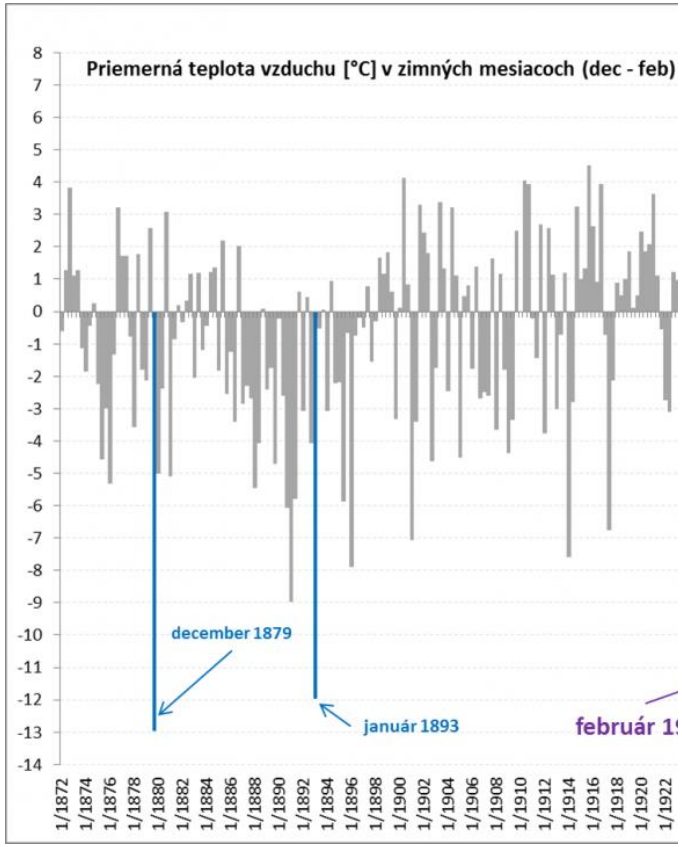

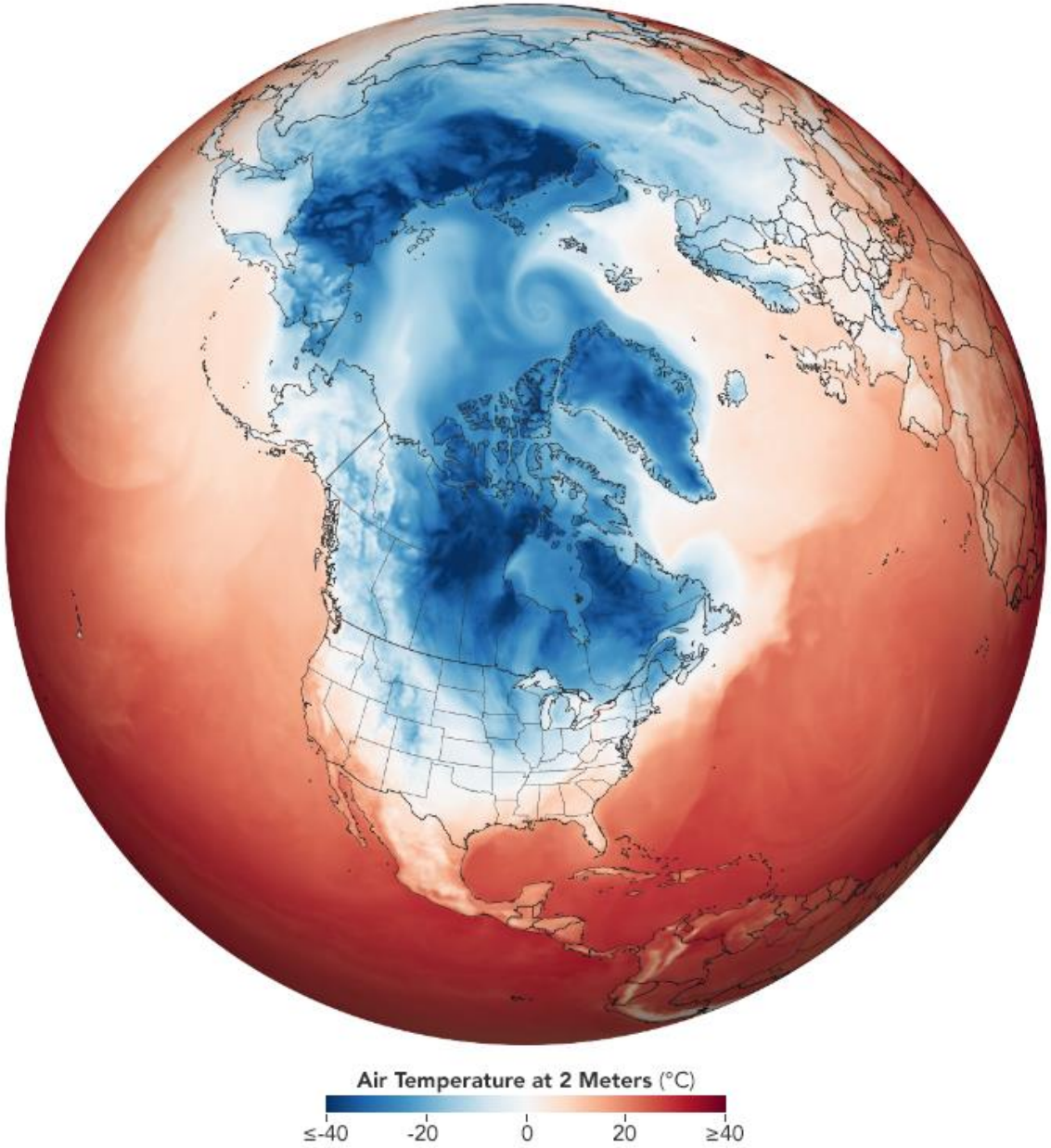

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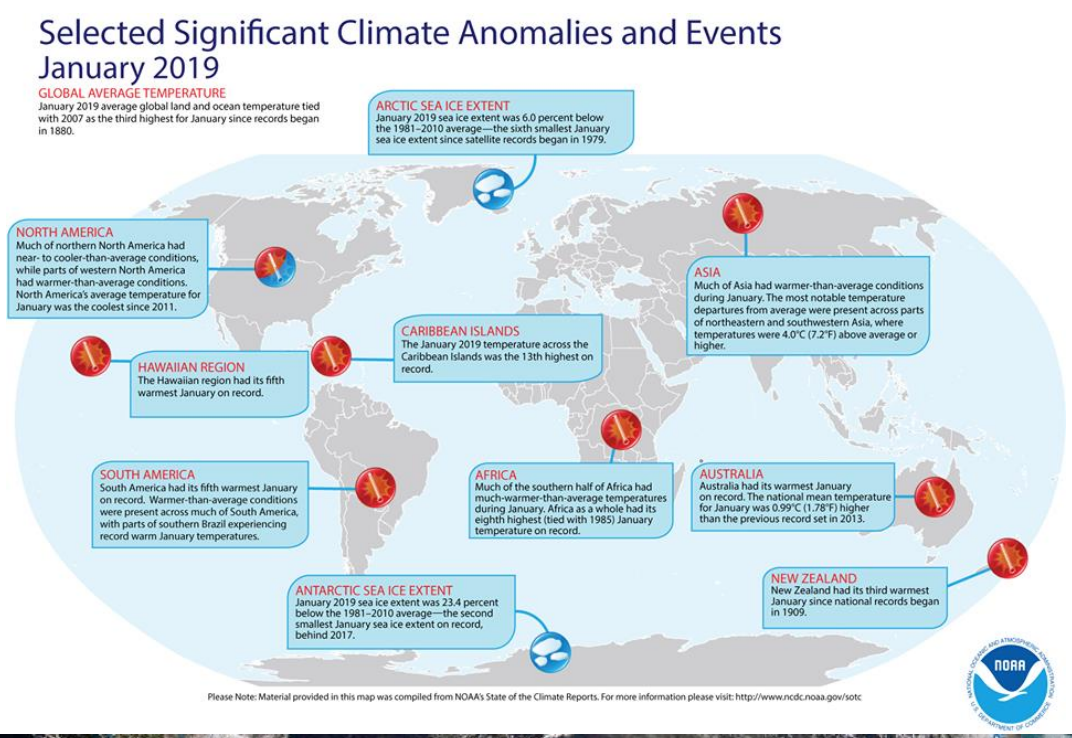
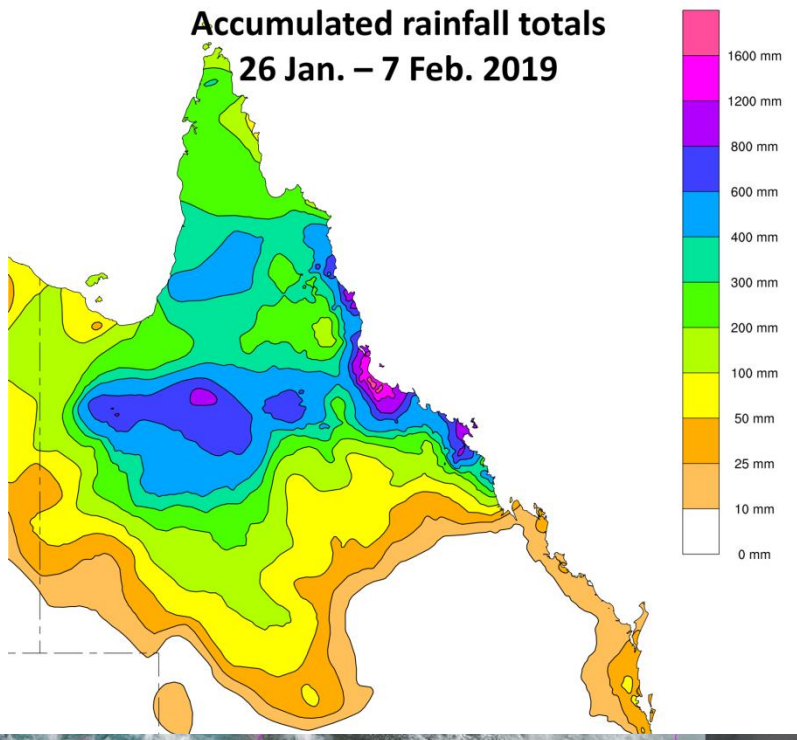
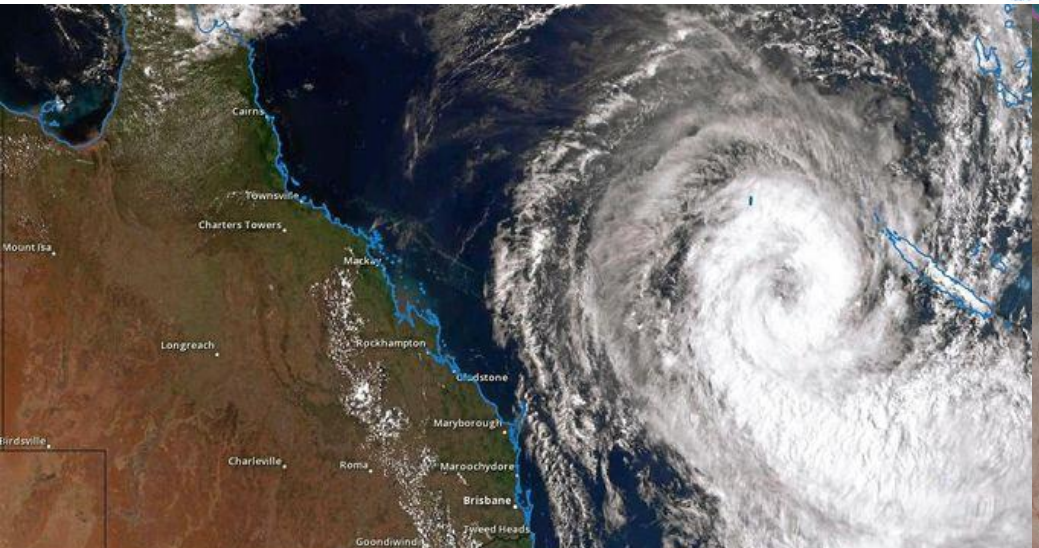
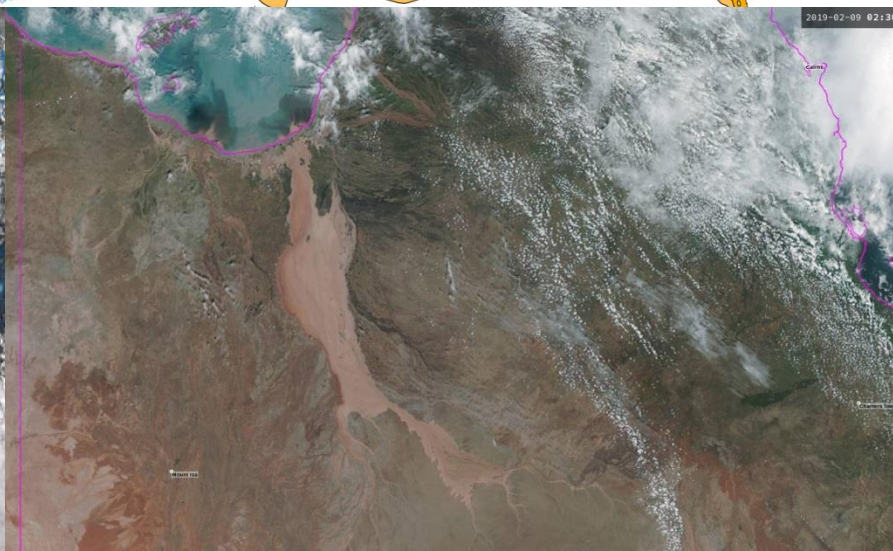








„BIG PICTURE“

ČASTO KLADENÉ OTÁZKY (FAQ)

Je súčasné otepľovanie spôsobené výhradne ľudskými aktivitami?

Ide o najrýchlejšiu klimatickú zmenu v známej geologickej histórii?

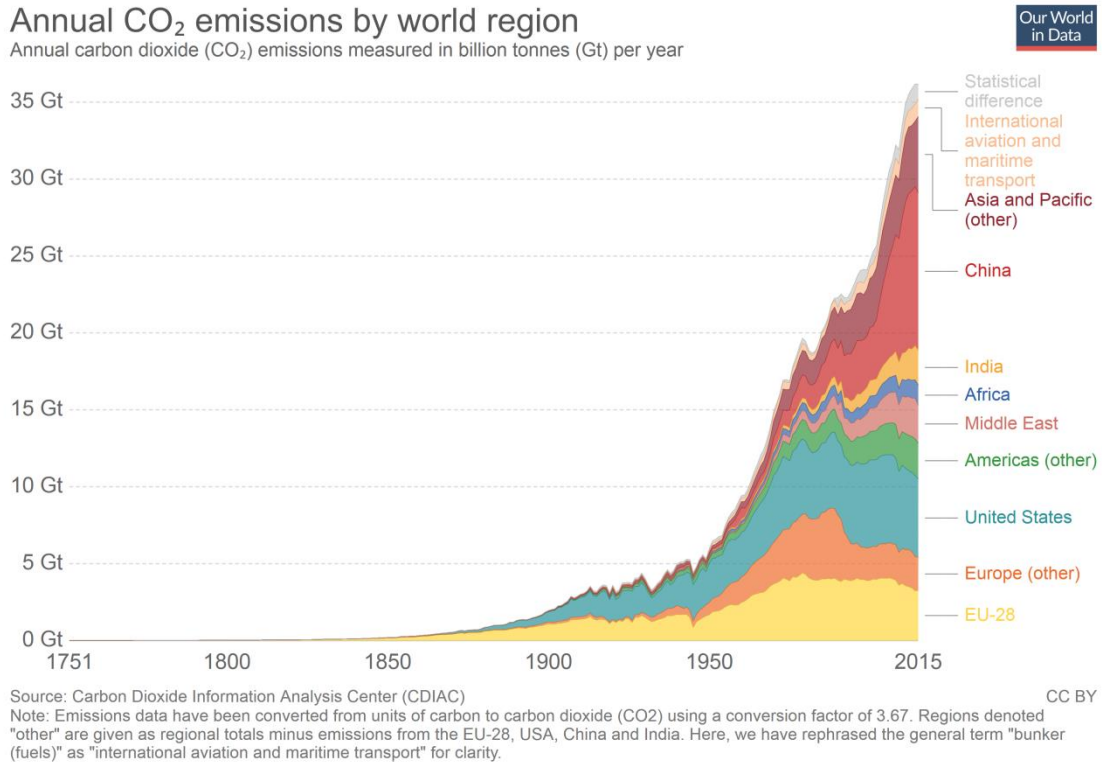
Ako sa súčasné otepľovanie (a klimatická zmena) už stihlo prejaviť na celoplanetárnej úrovni?

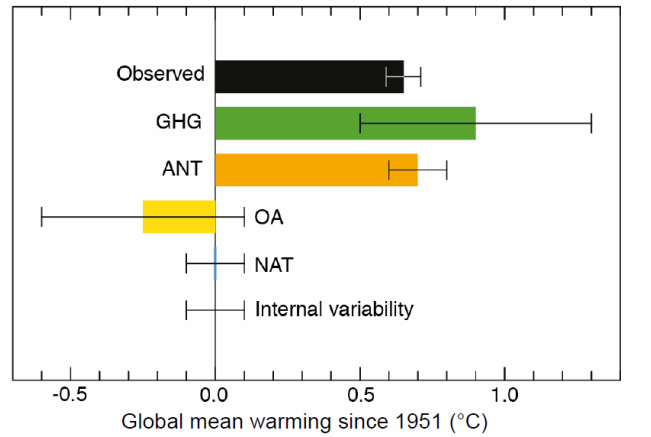
Je rýchlosť klimatickej zmeny pre ľudí a civilizáciu nebezpečná?

Sú projekcie budúcej klímy príliš konzervatívne?

Môže dôjsť v najbližšom období k tzv. náhlej klimatickej zmeny (zlomu)?

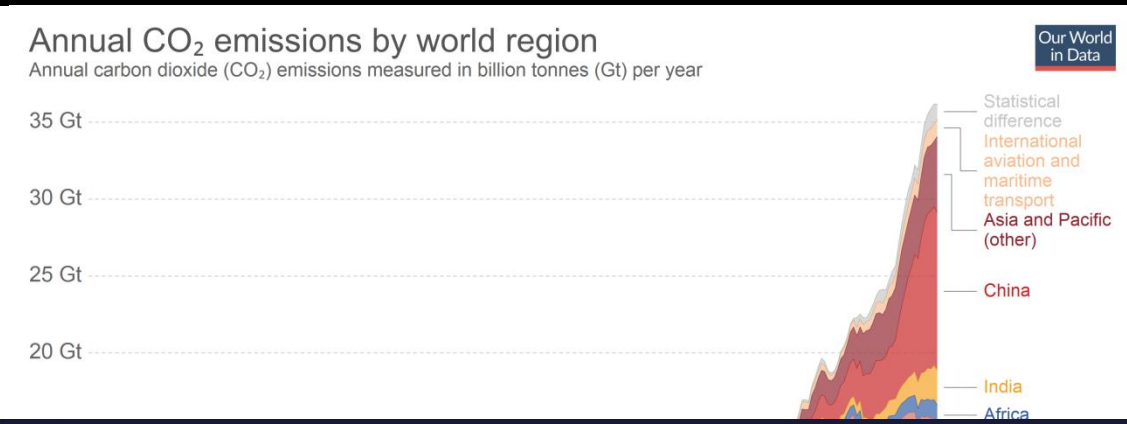
ČLOVEK: HLAVNÝ VINNÍK ?

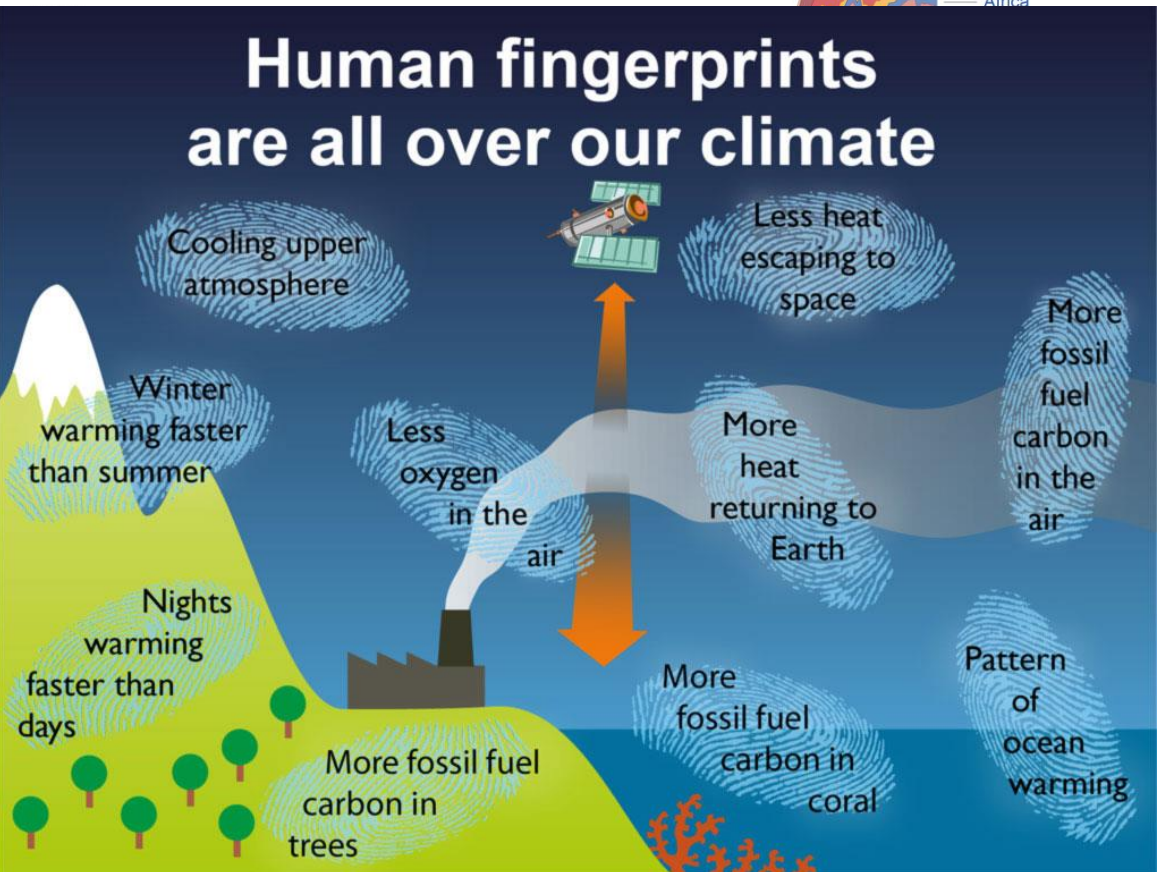


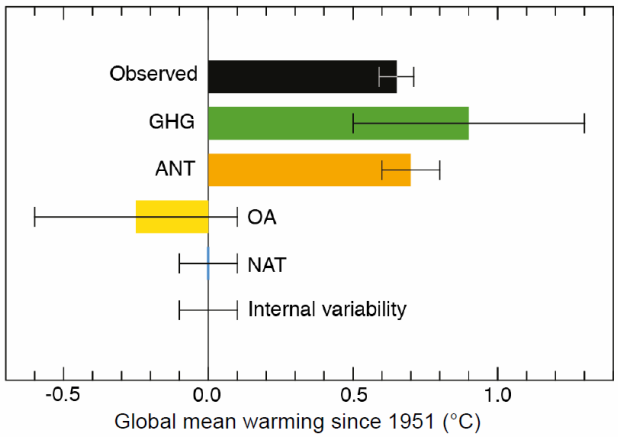


It is *extremely likely* that **more than 50% of the warming since 1951** is due to the increase in greenhouse gases and other anthropogenic forcings together

ČLOVEK: HLAVNÝ VINNÍK ?







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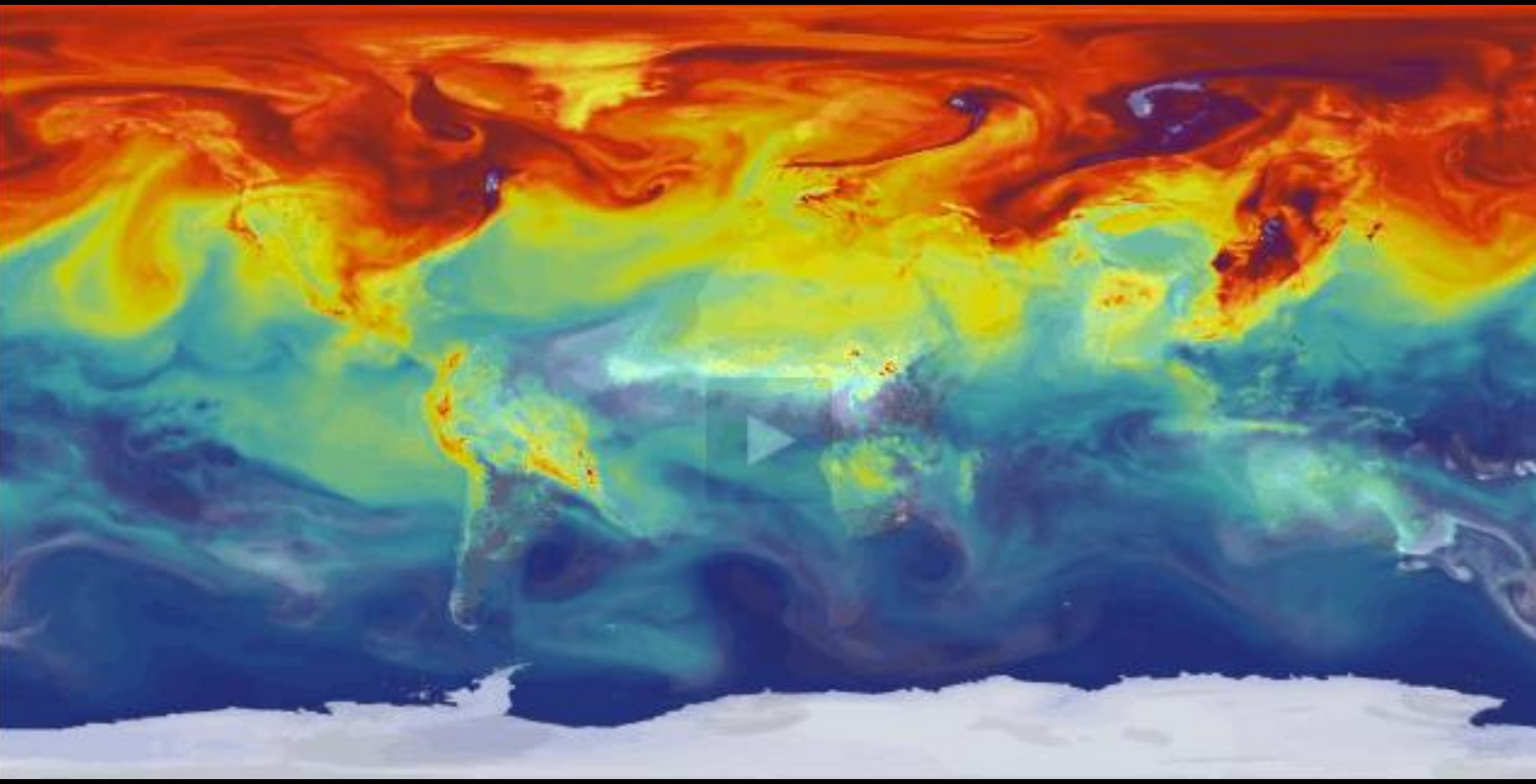
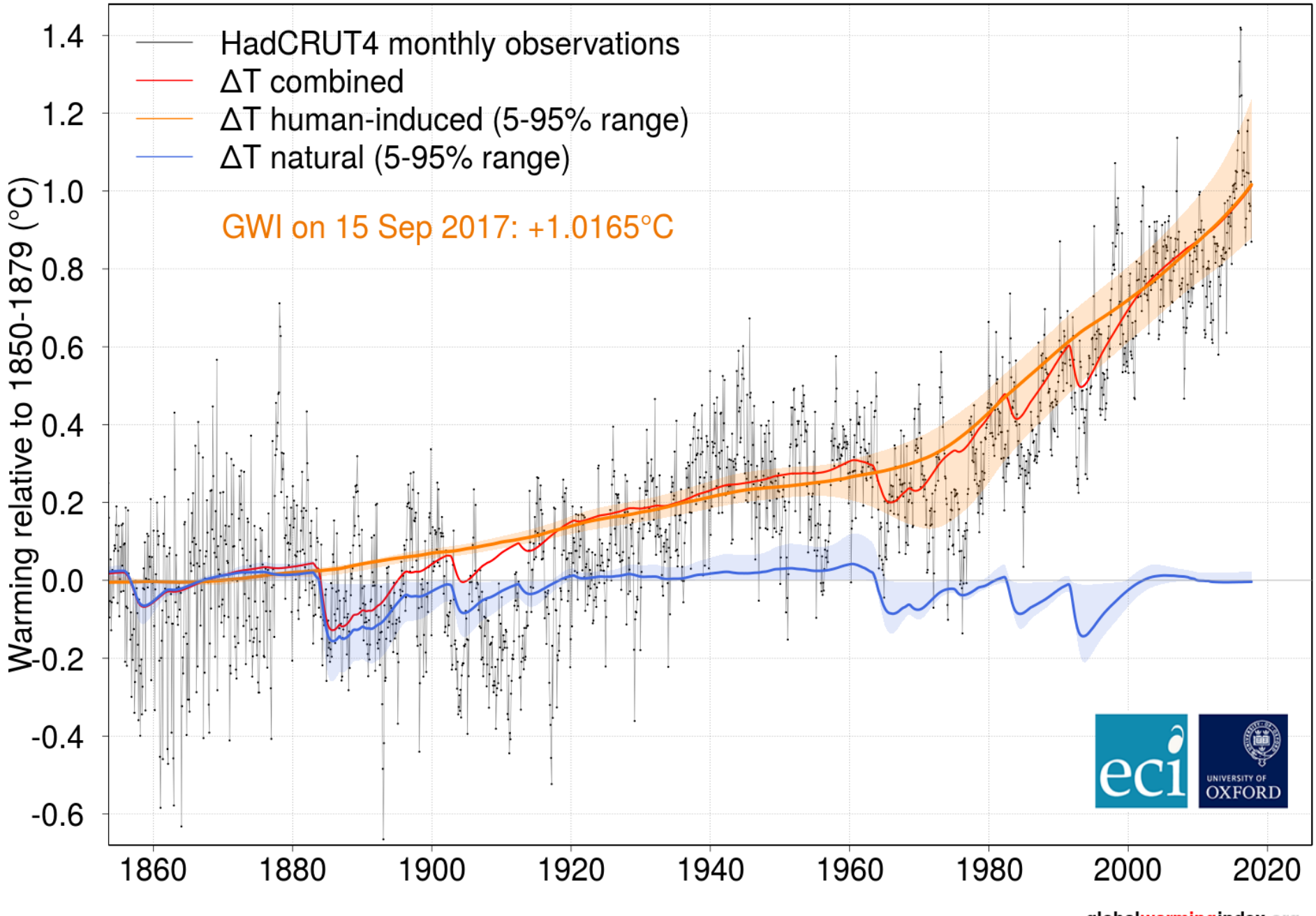
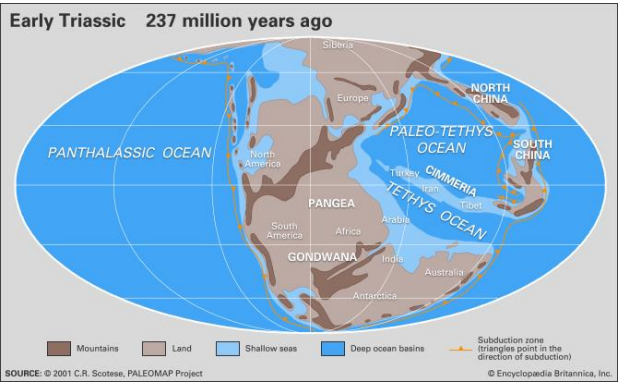
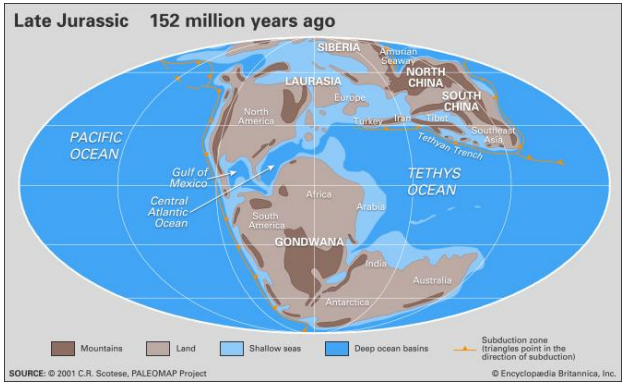


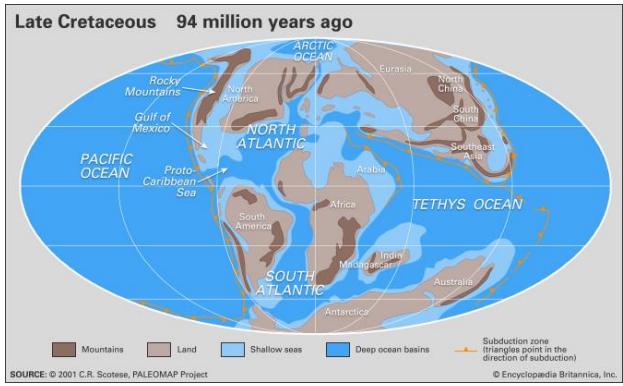
Global Warming Index based on HadCRUT4 - updated to Sep 2017

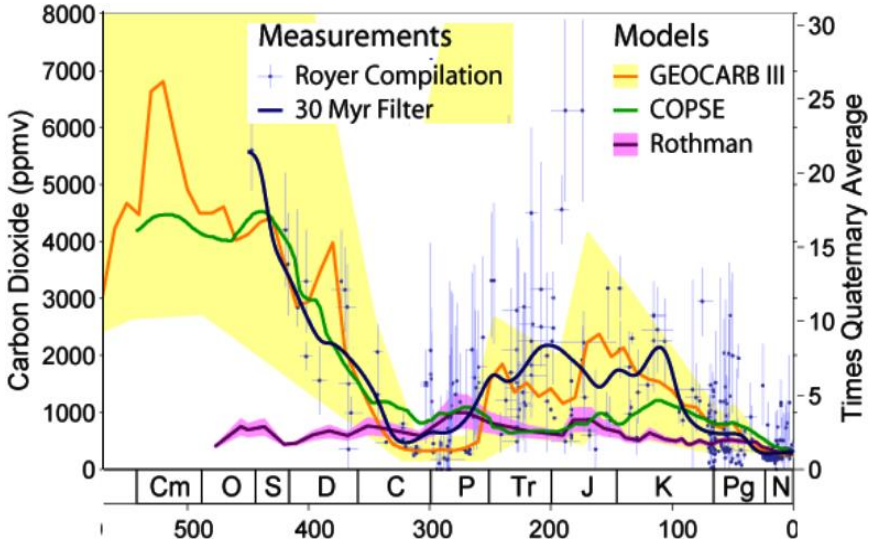


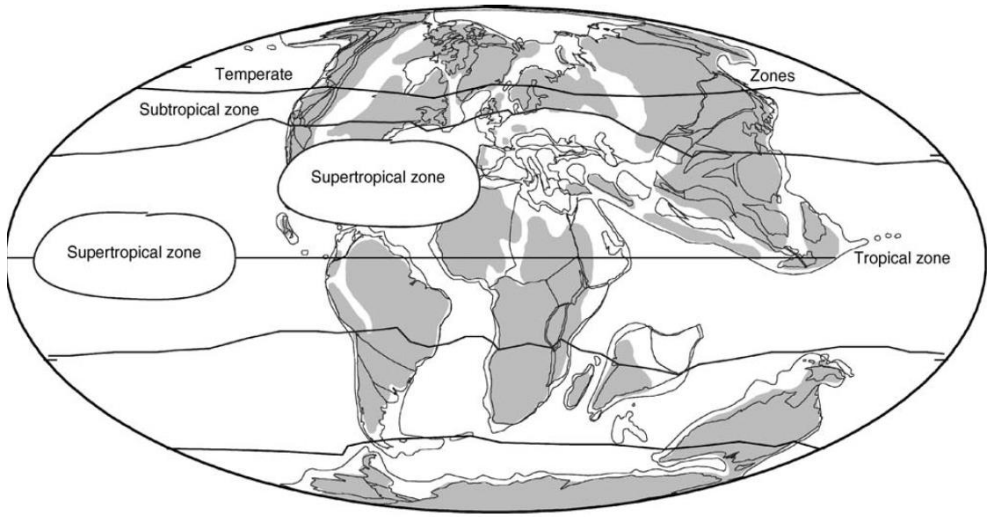
PLANETÁRNY „HOTHOUSE“











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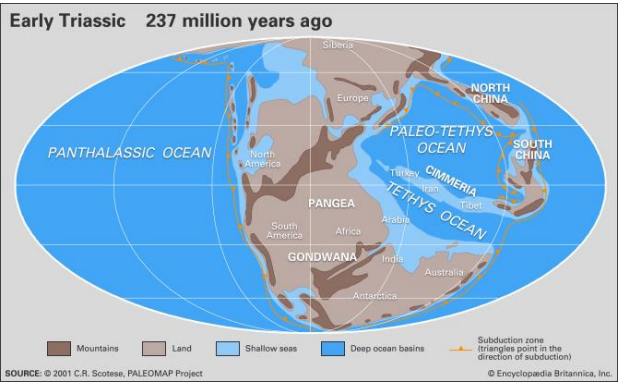

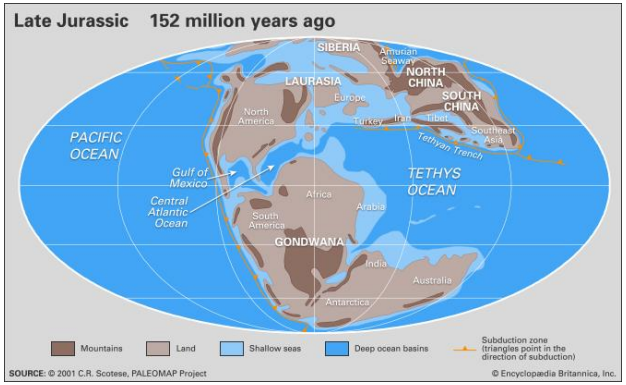

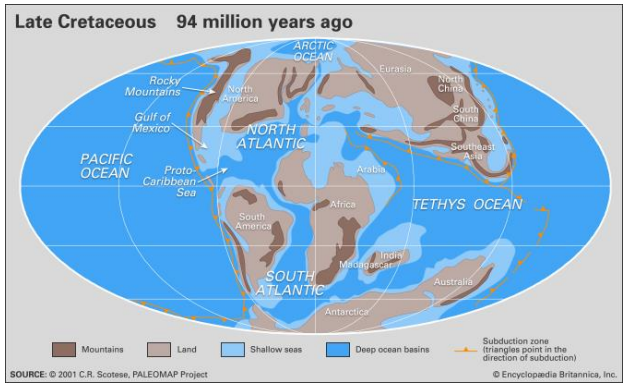

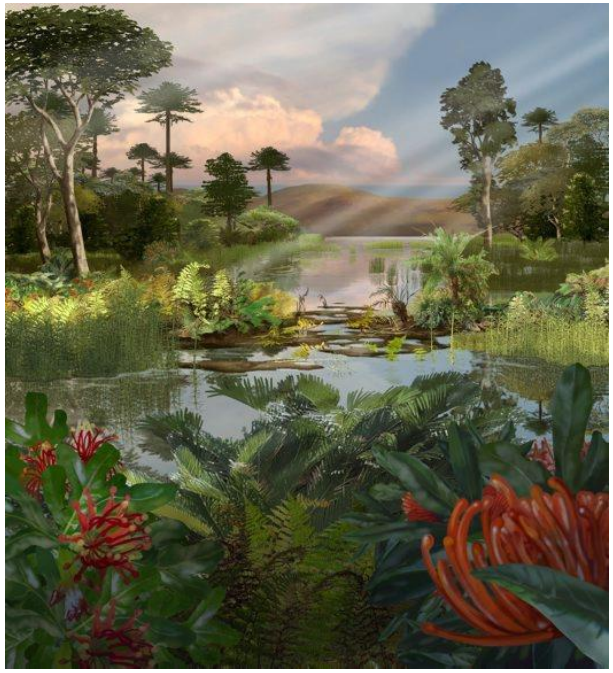

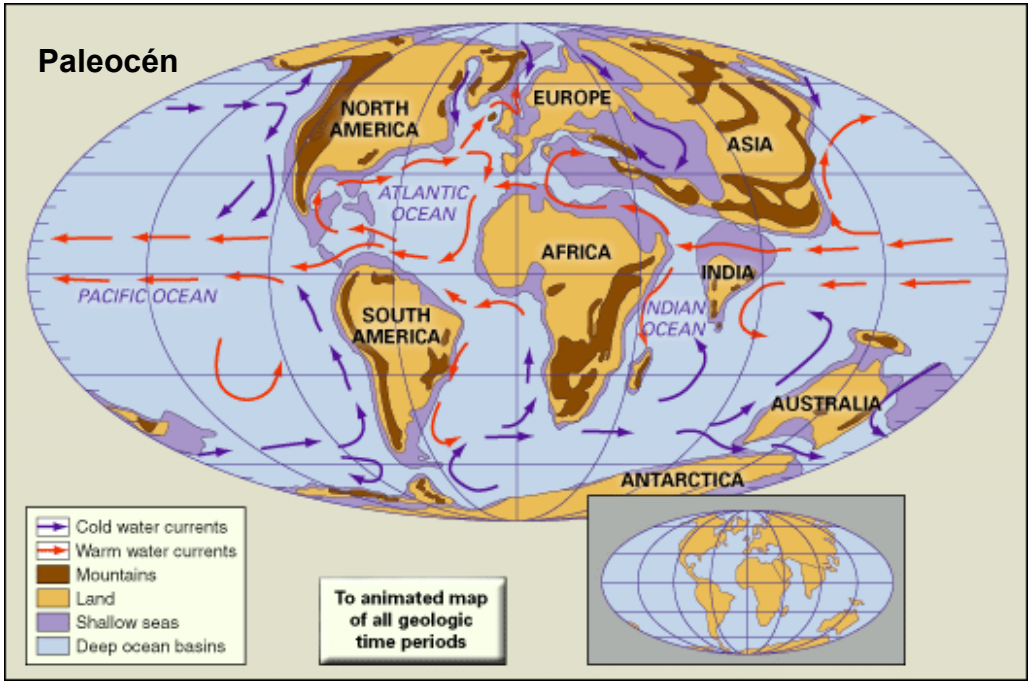

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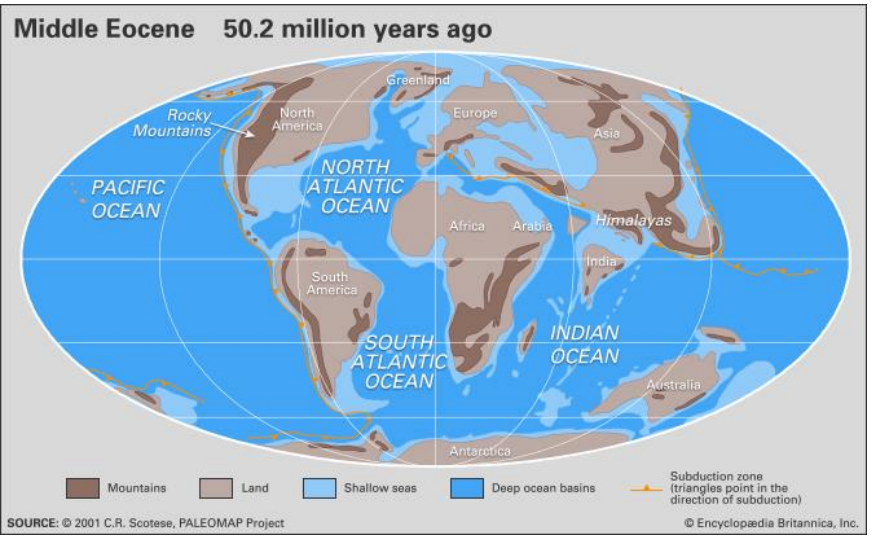
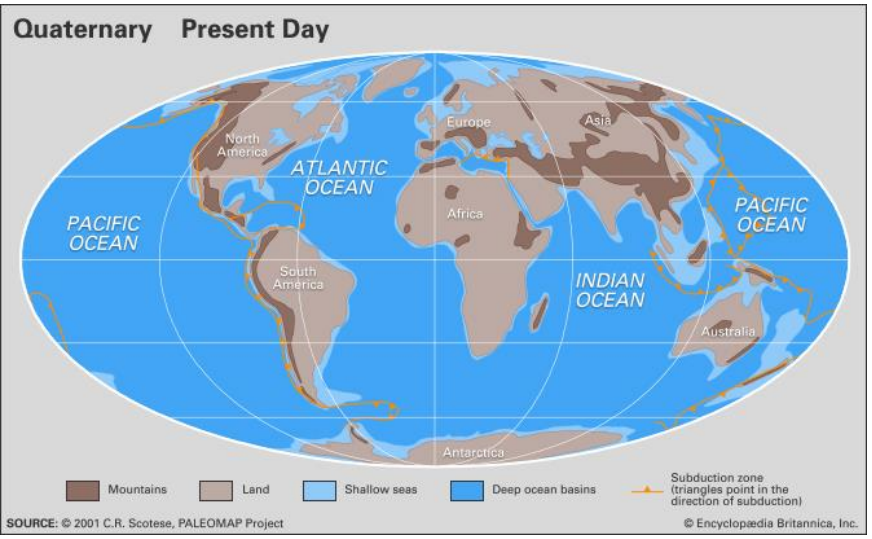
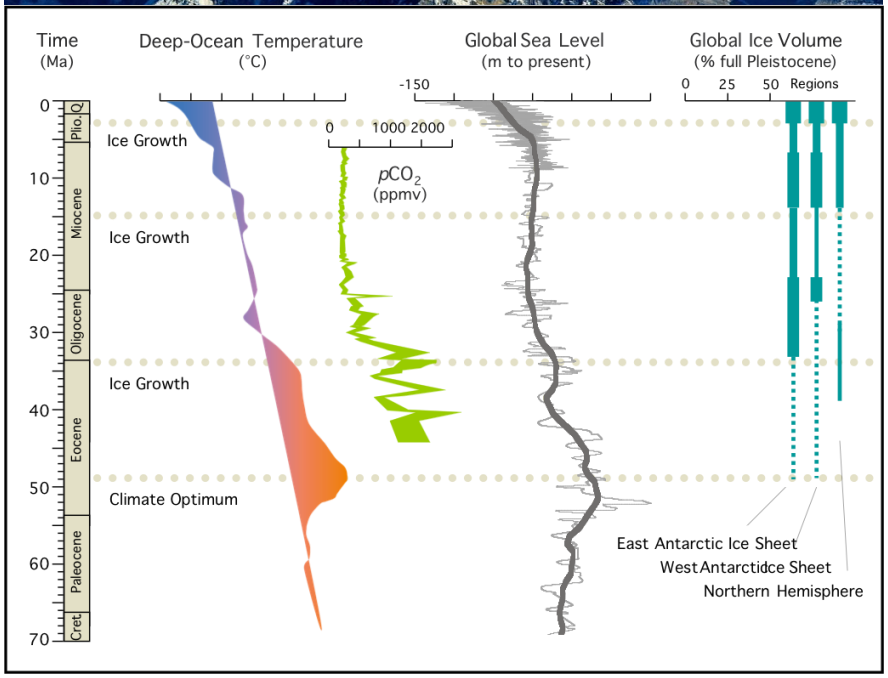
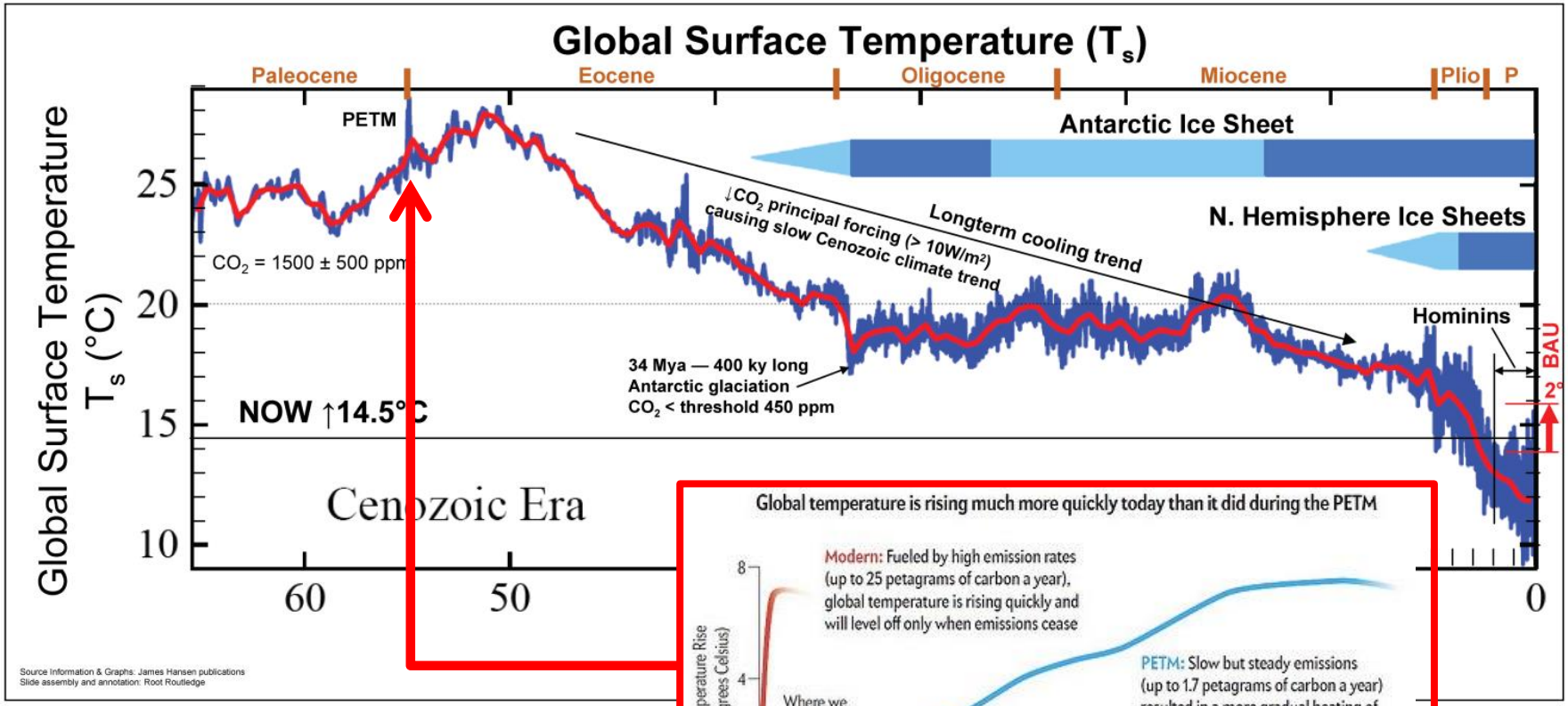




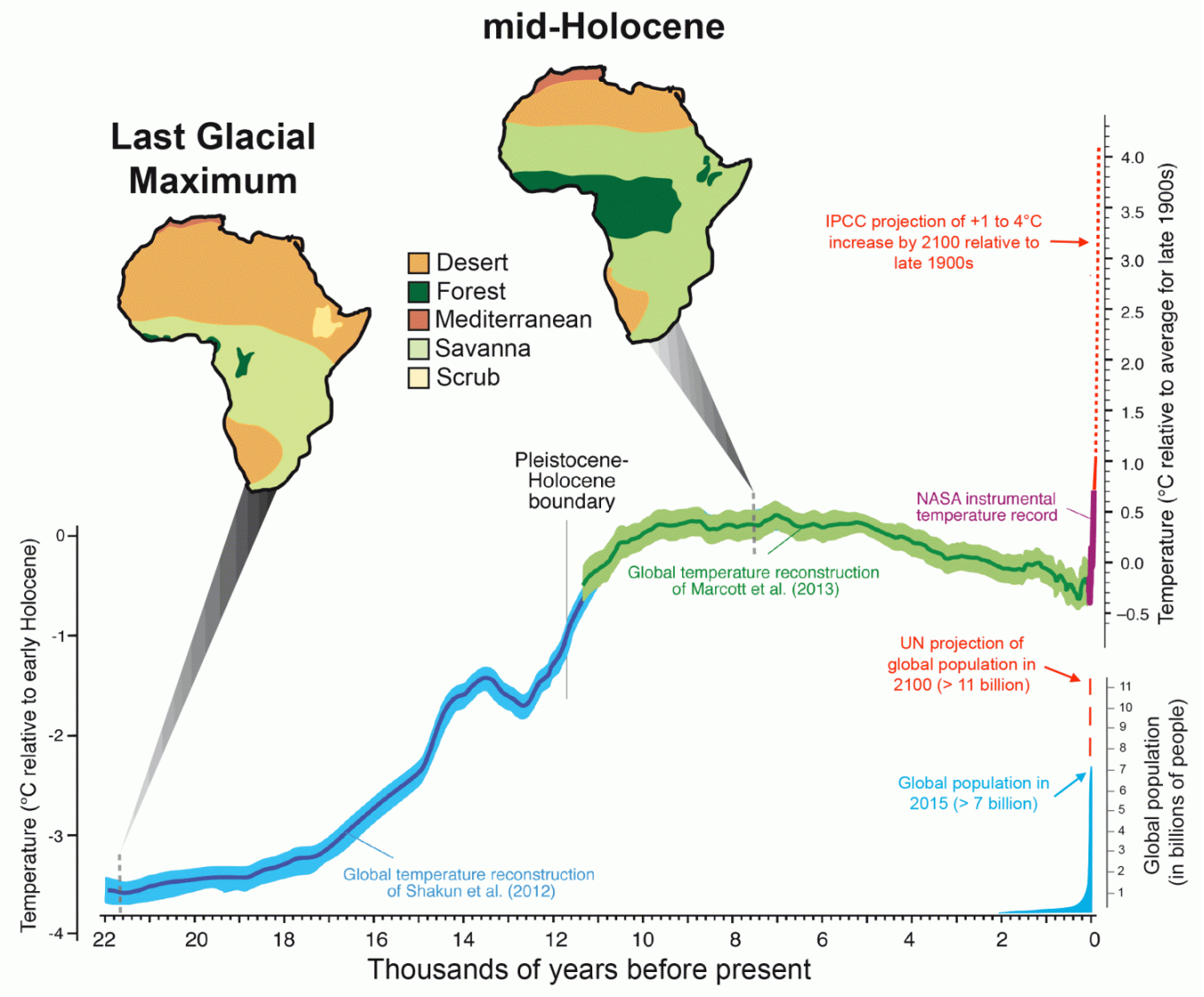


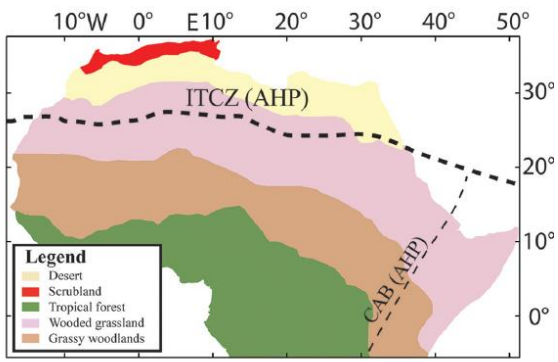
RÝCHLA ZMENA KLÍMY

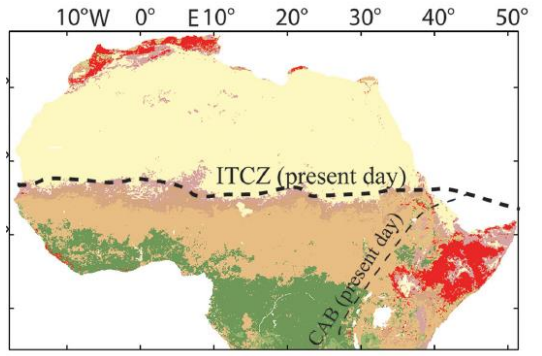
Zdroj: Goudie (1992) " Environmental Change", Oxford. U.P



RÝCHLA ZMENA KLÍMY







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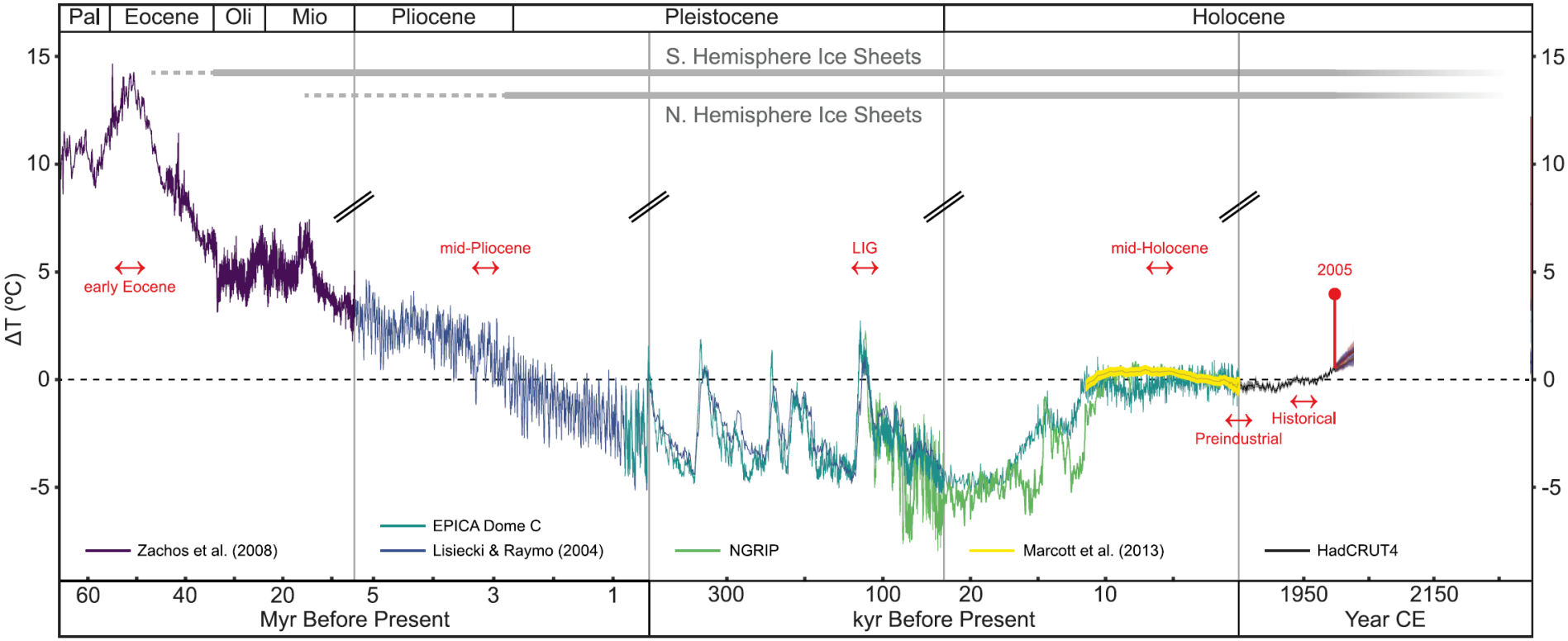
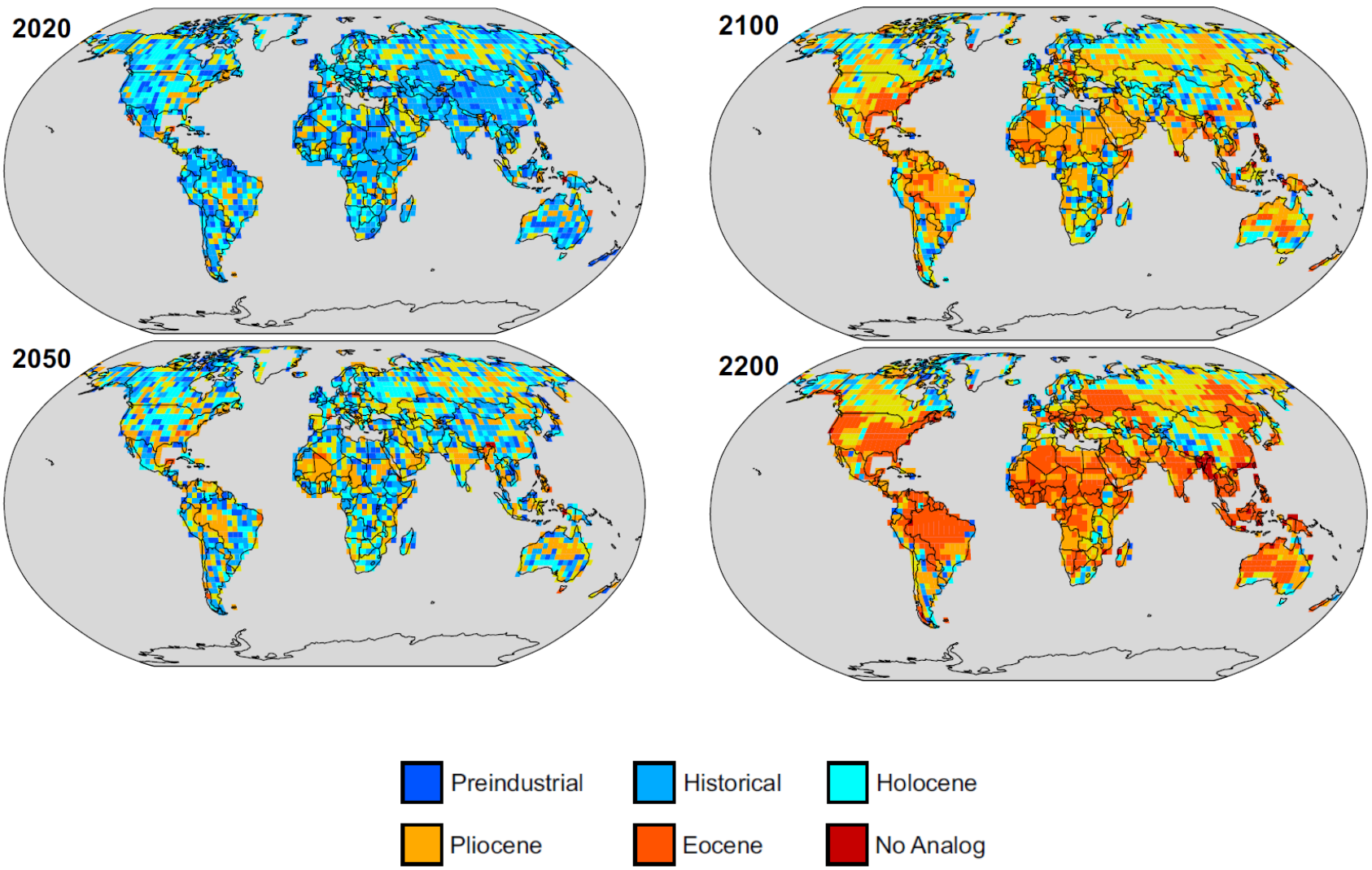


SPÄŤ DO EOCÉNU ?



Zdroj: Burke et al. 2019

Eocén na Slovensku

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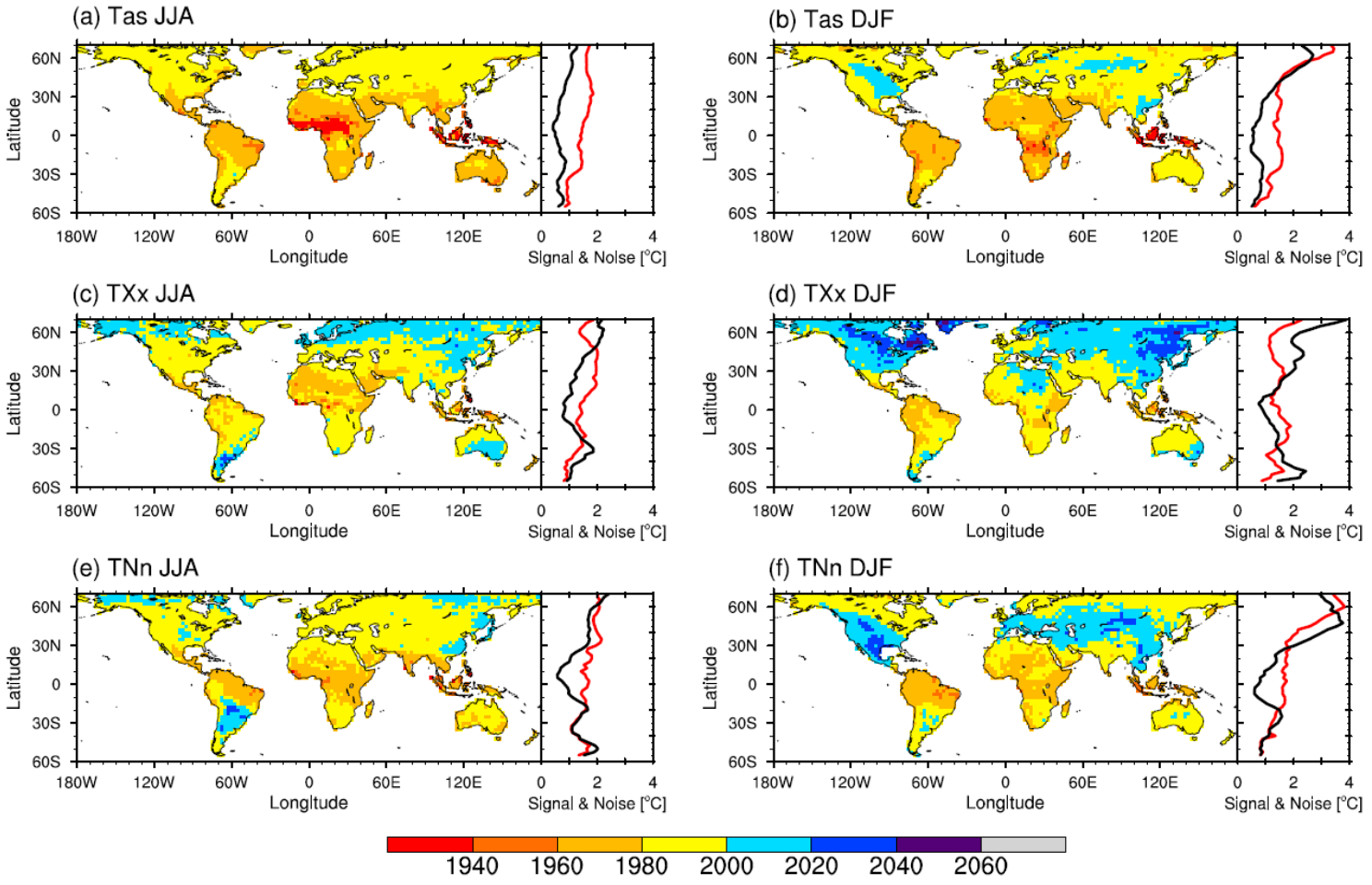

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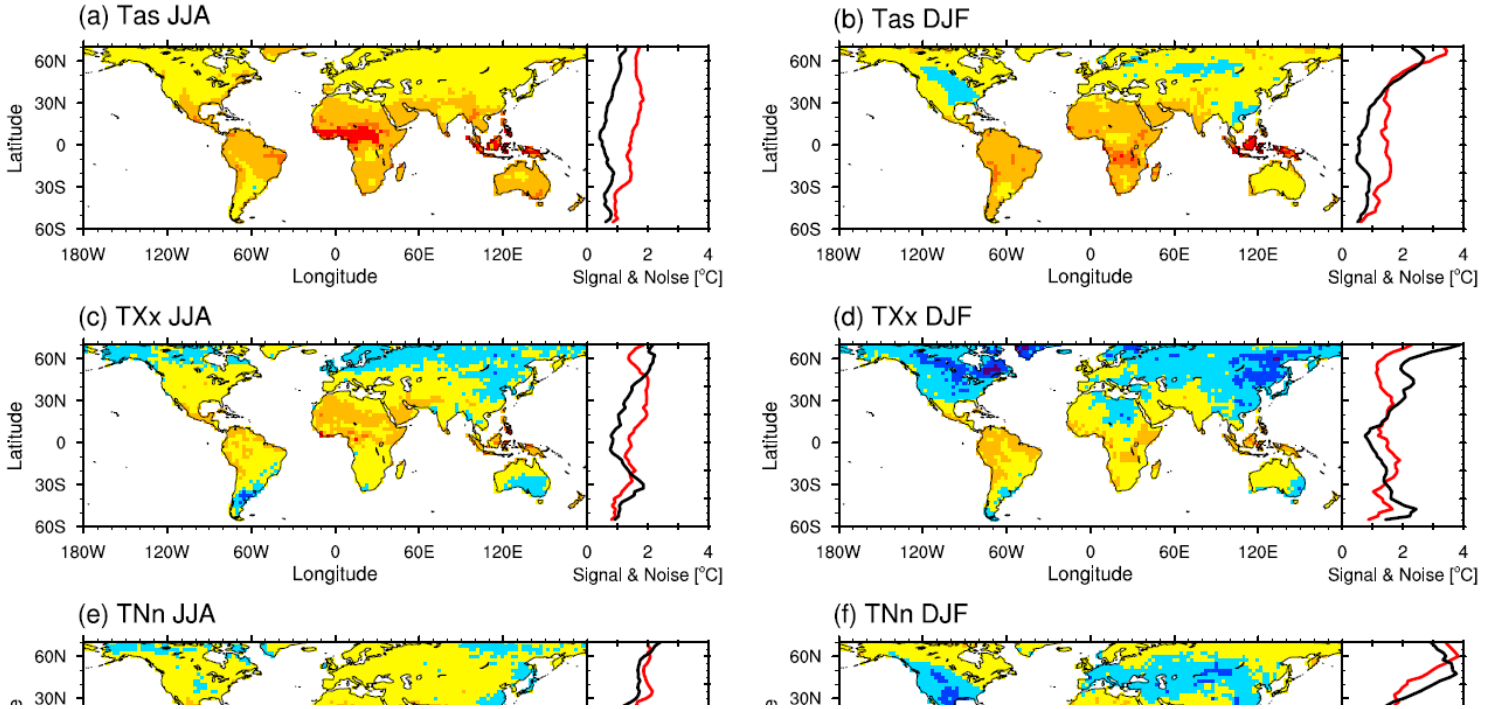

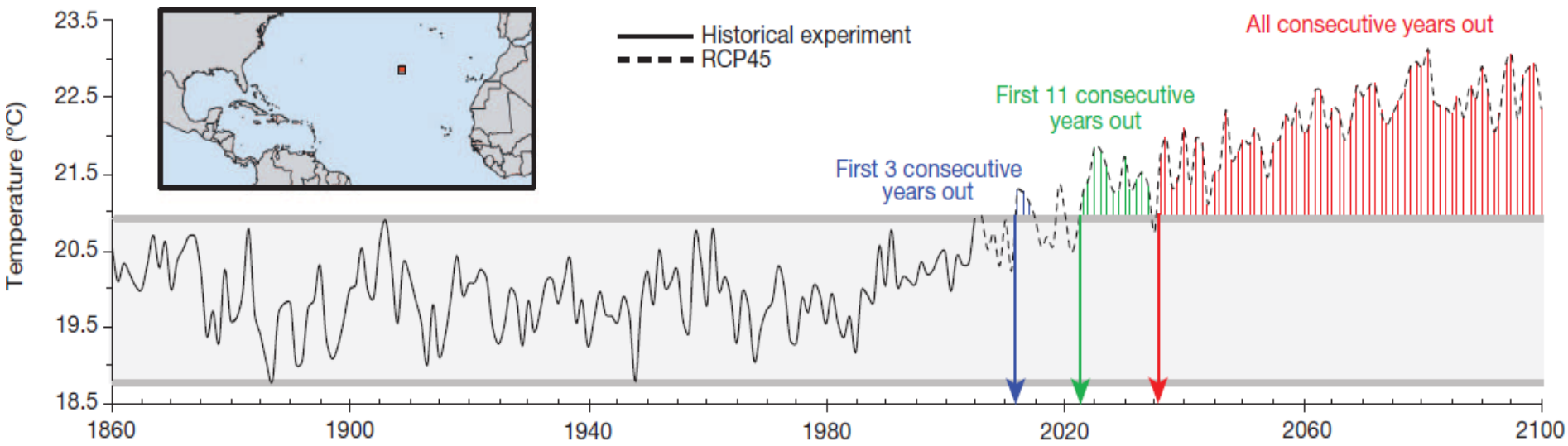

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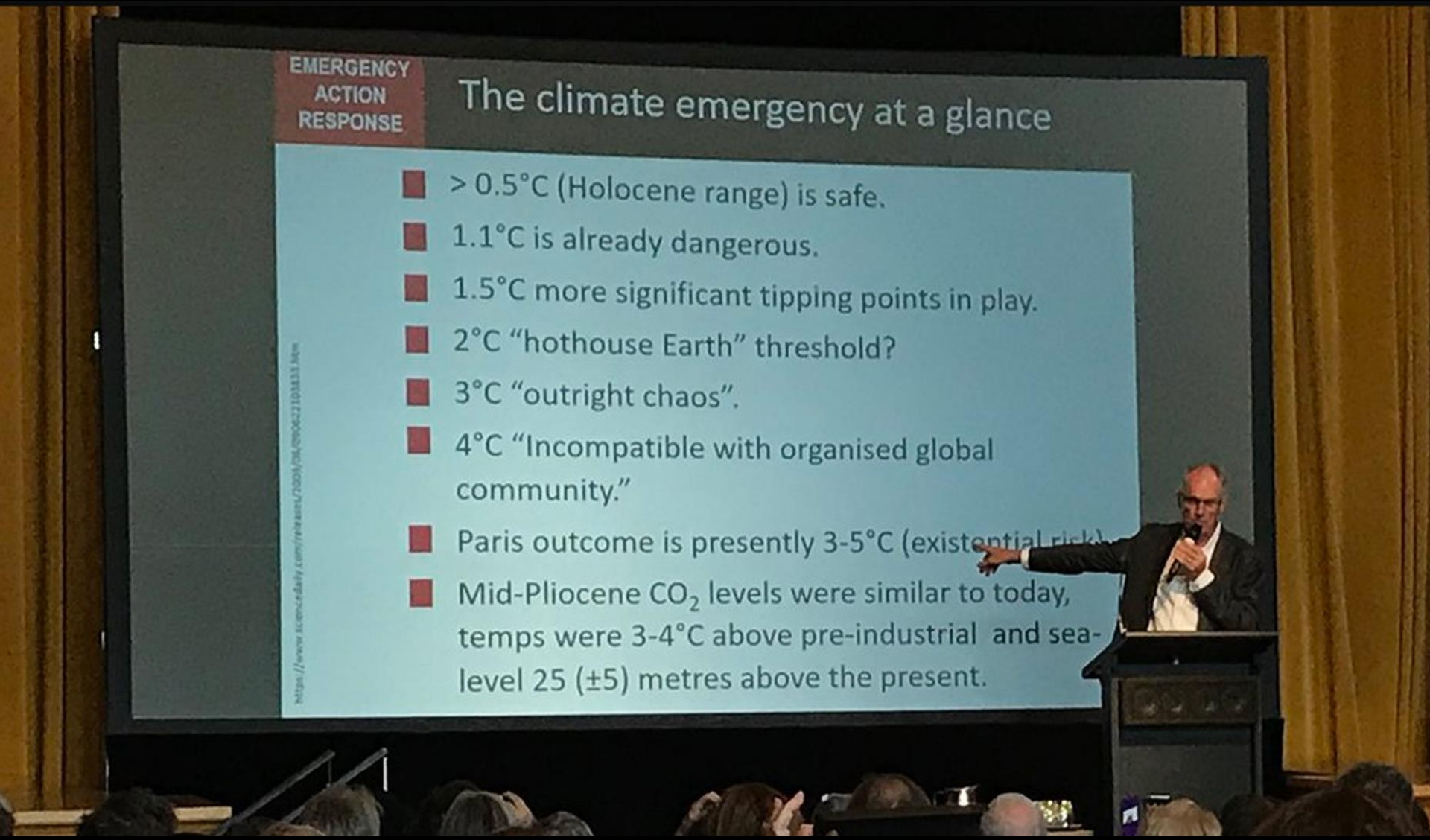
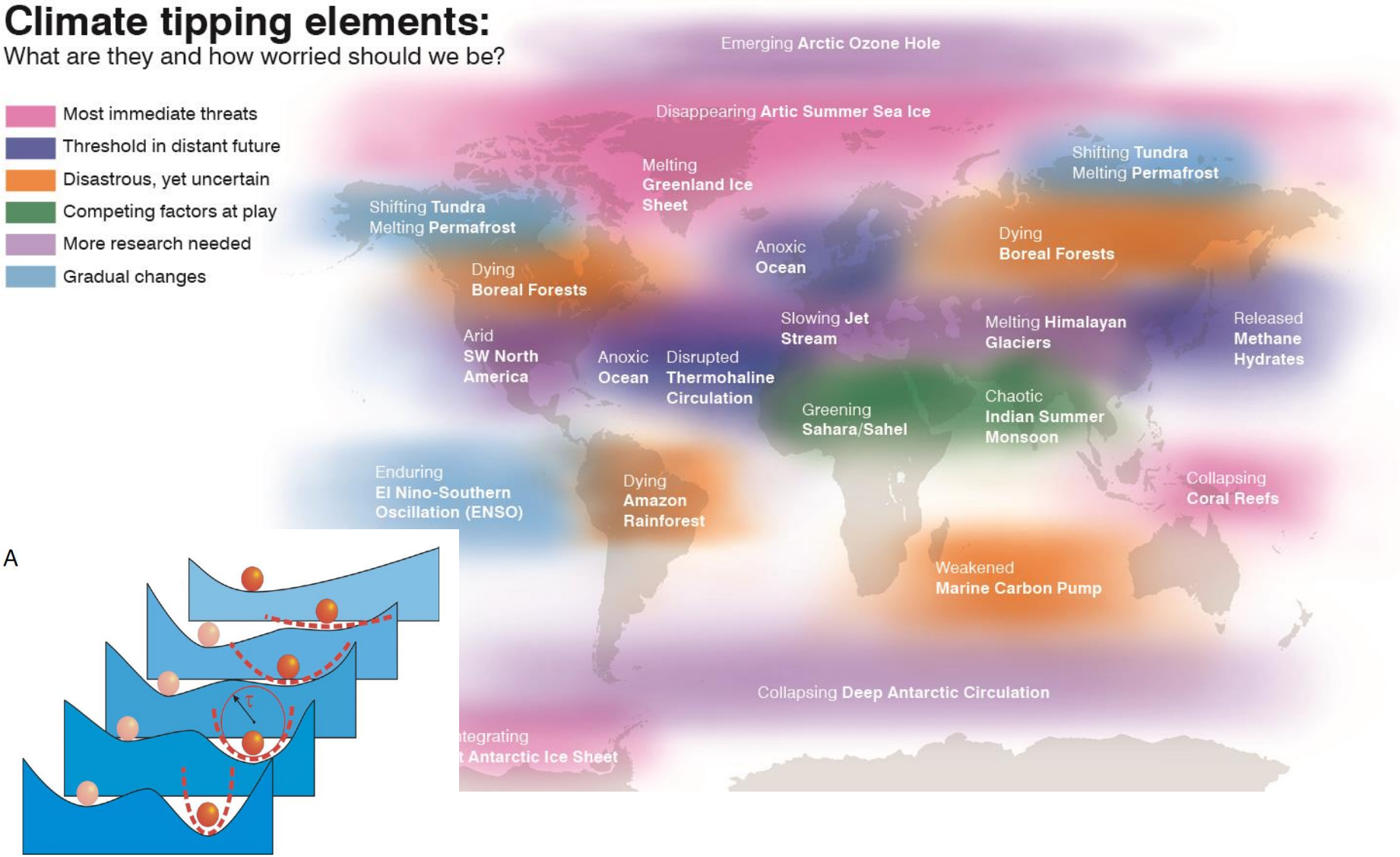


KLIMATICKÝ ZLOM?



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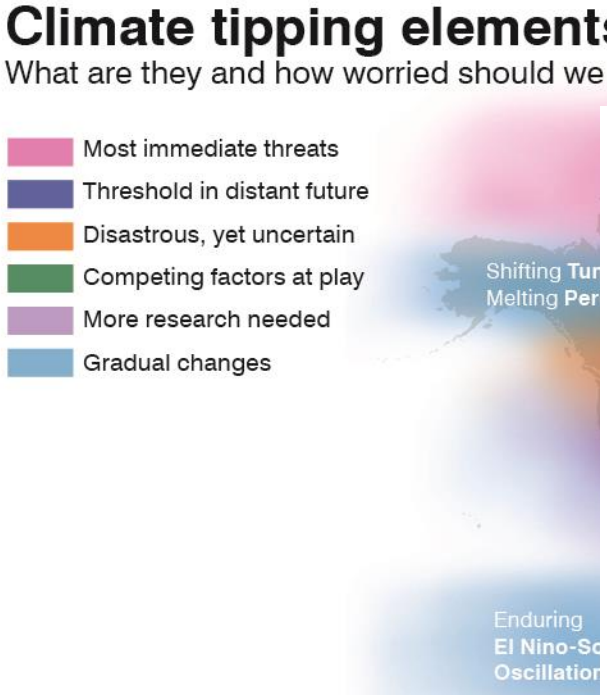

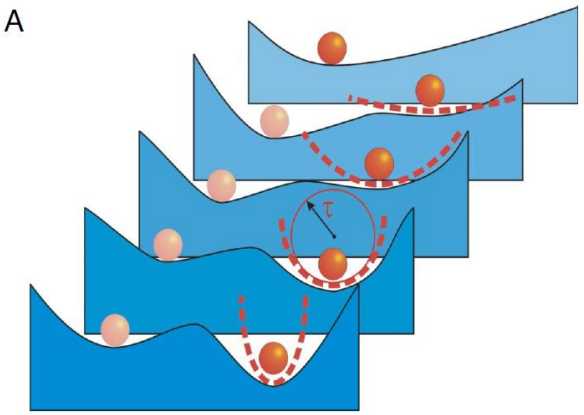

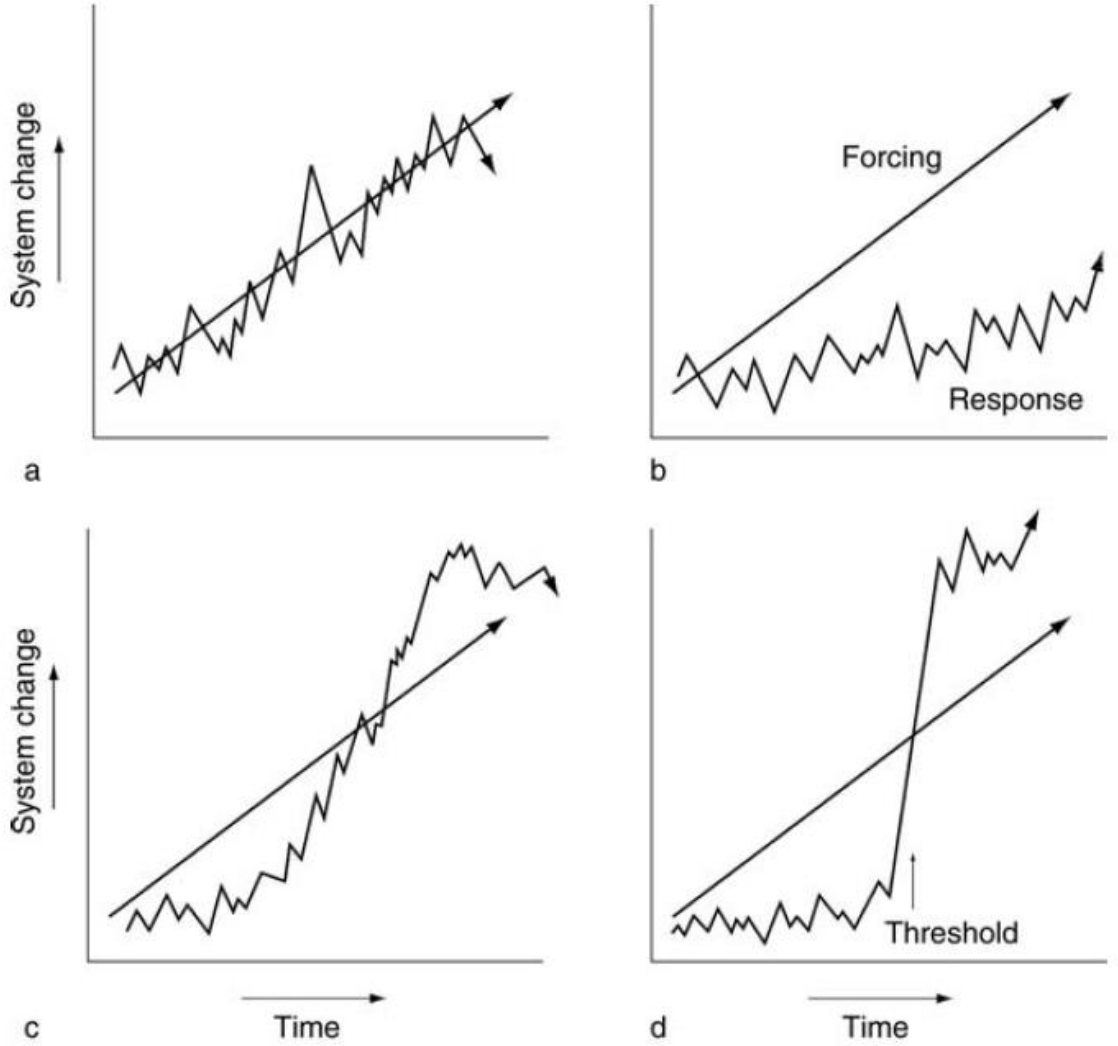

ZMENA REŽIMU KLÍMY NA SLOVENSKU

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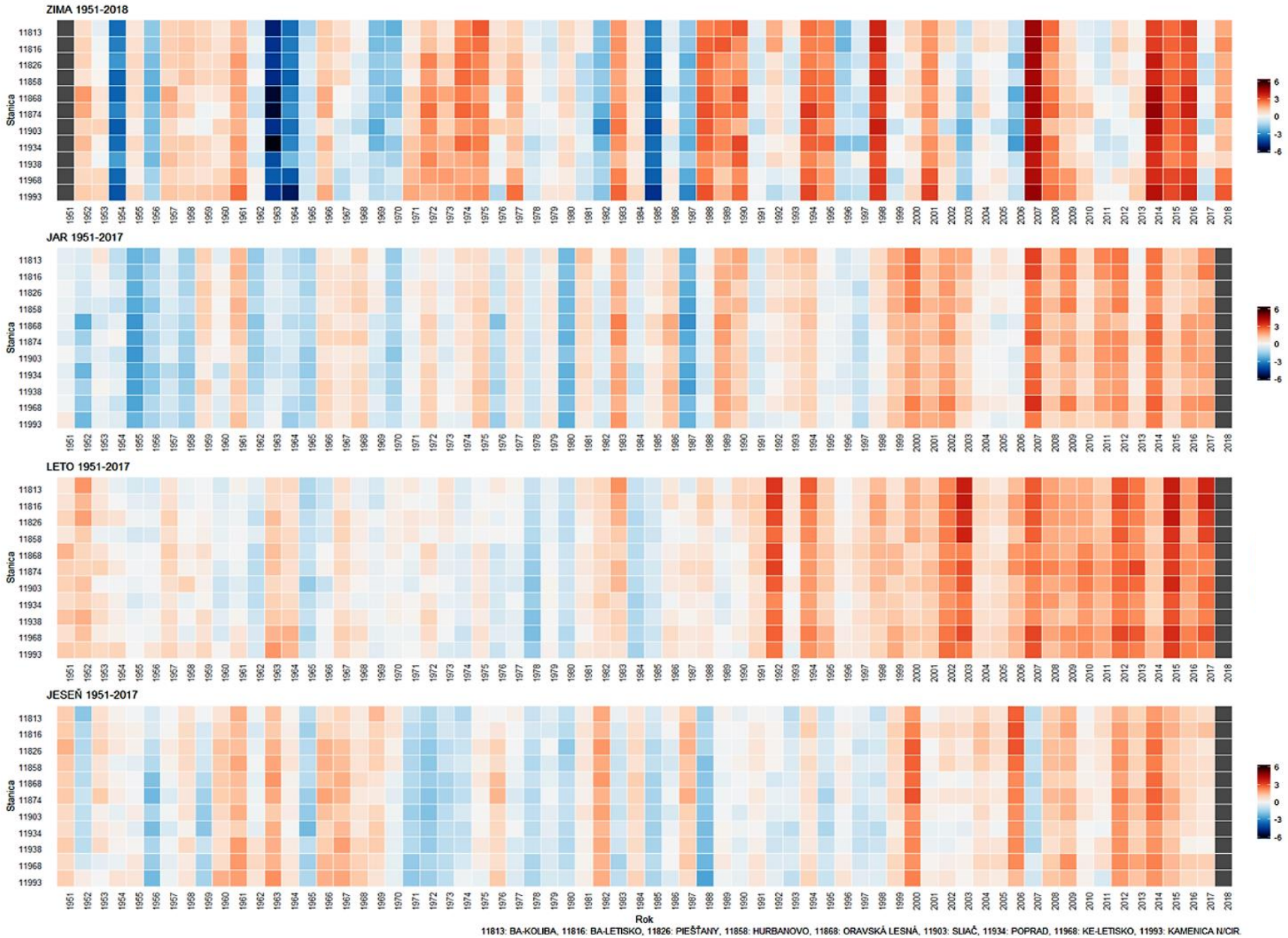

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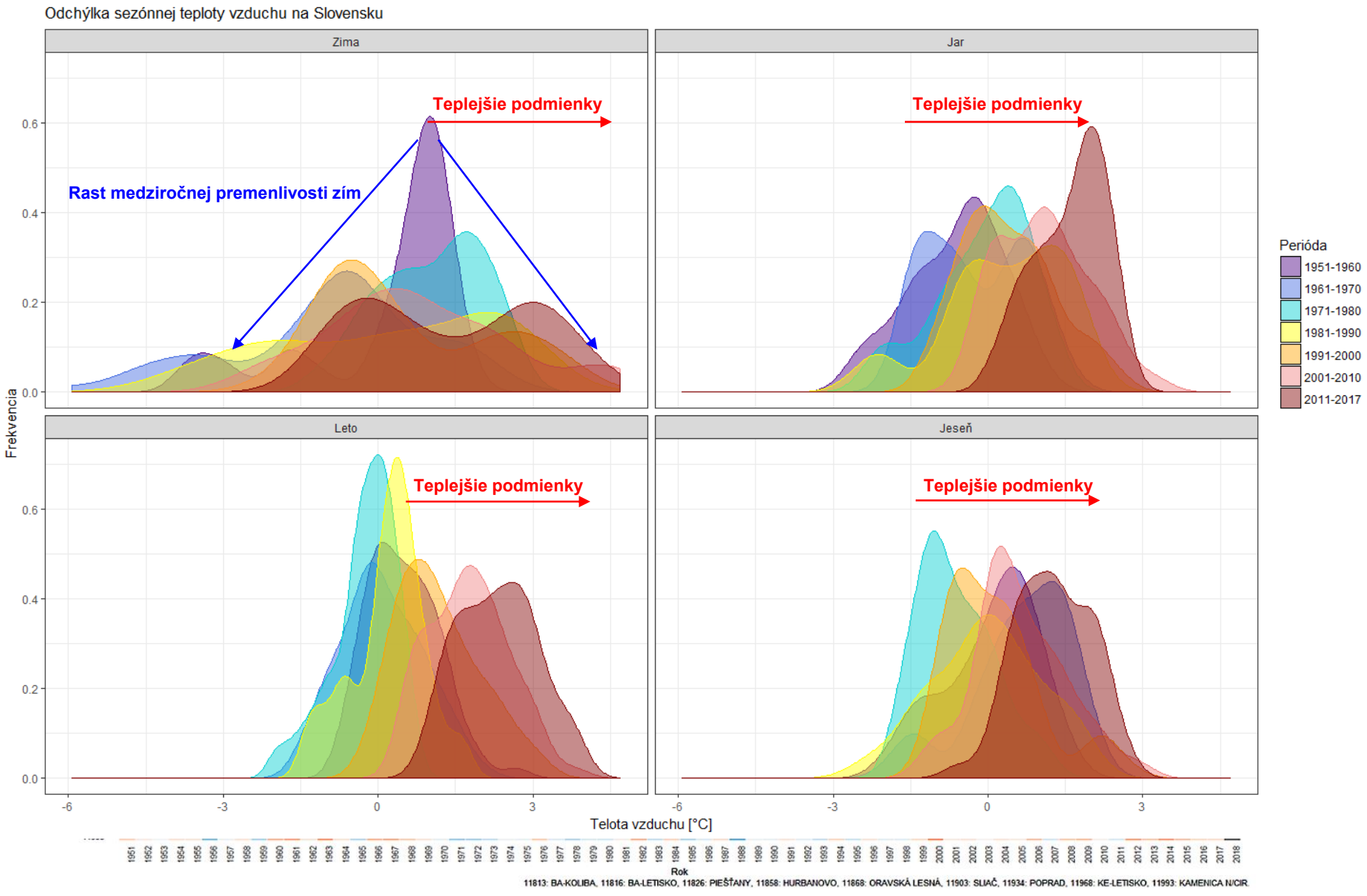

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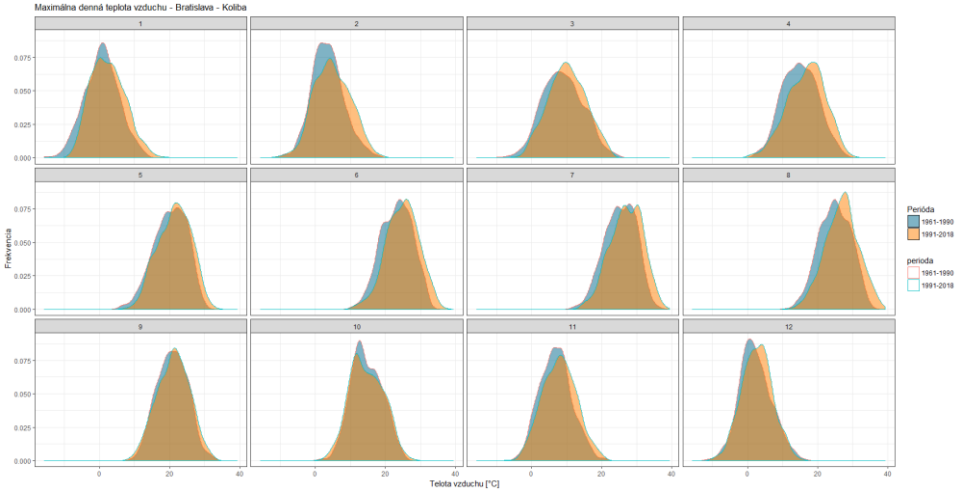
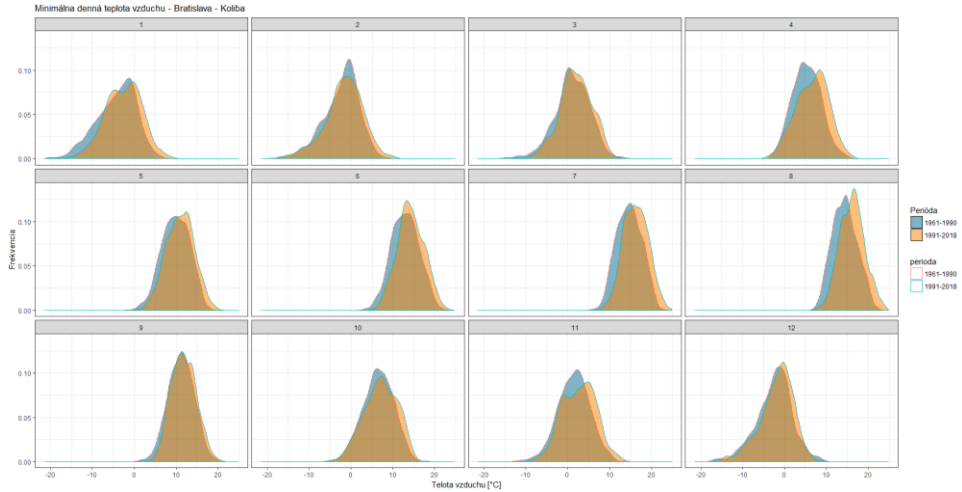
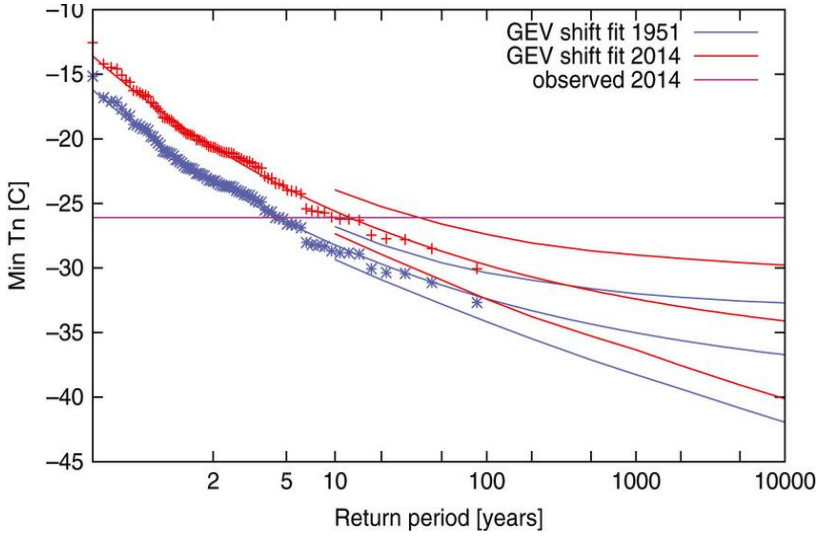
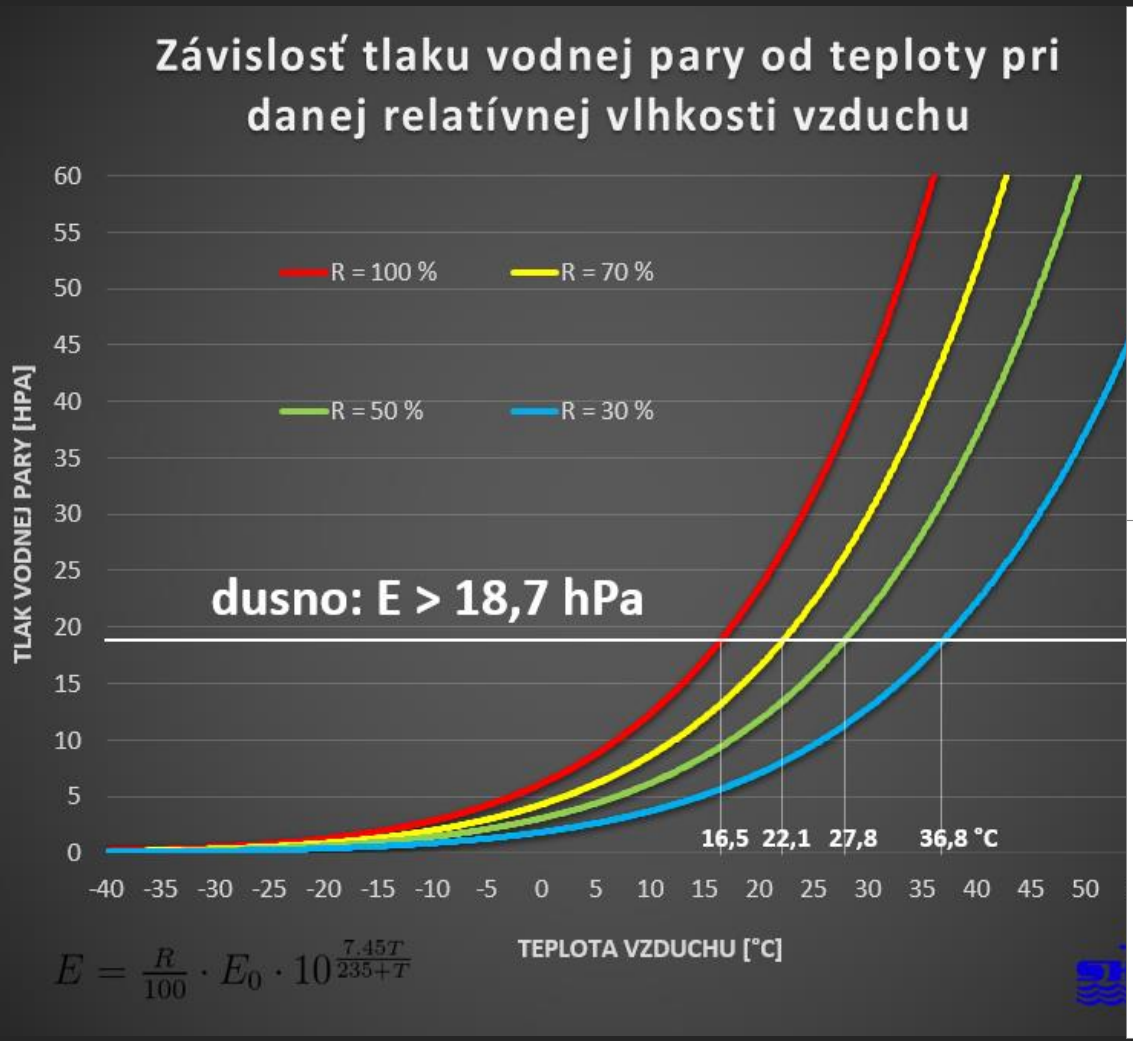
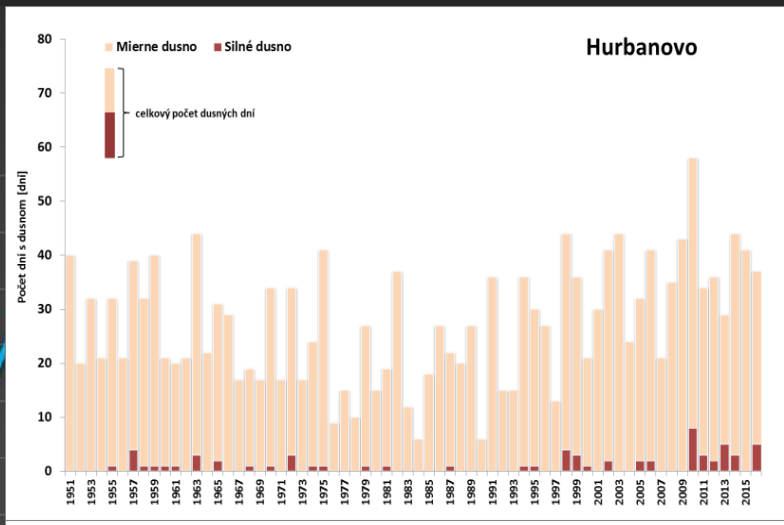


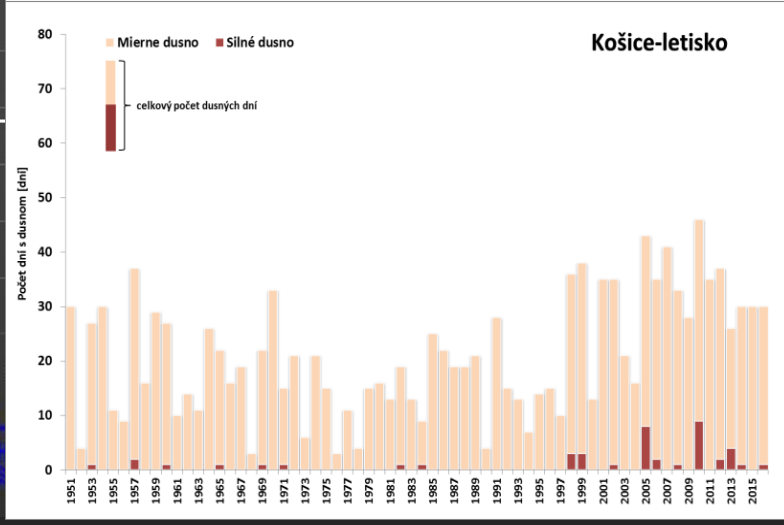




JE NA SLOVENSKU ČASTEJŠIE „DUSNO“





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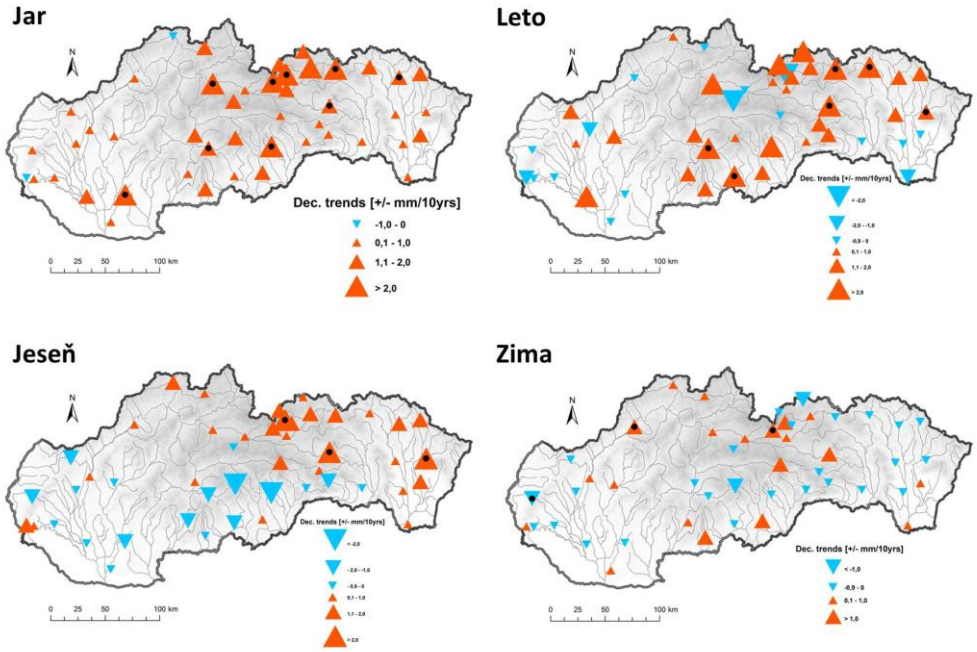

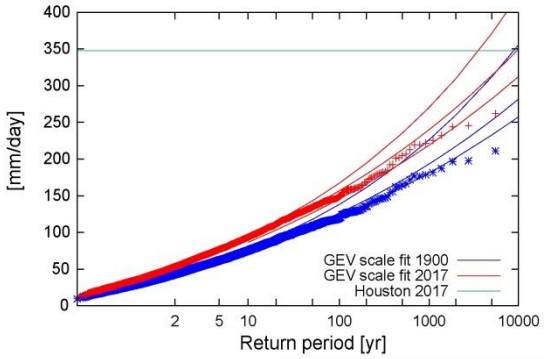

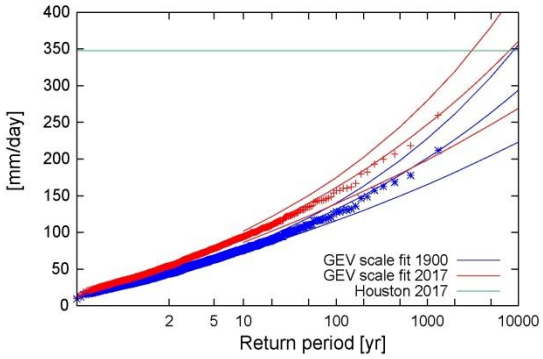

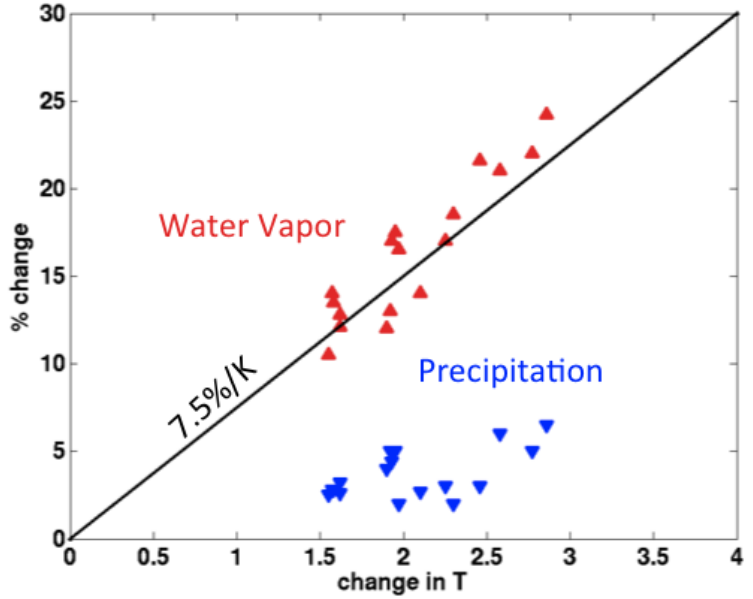

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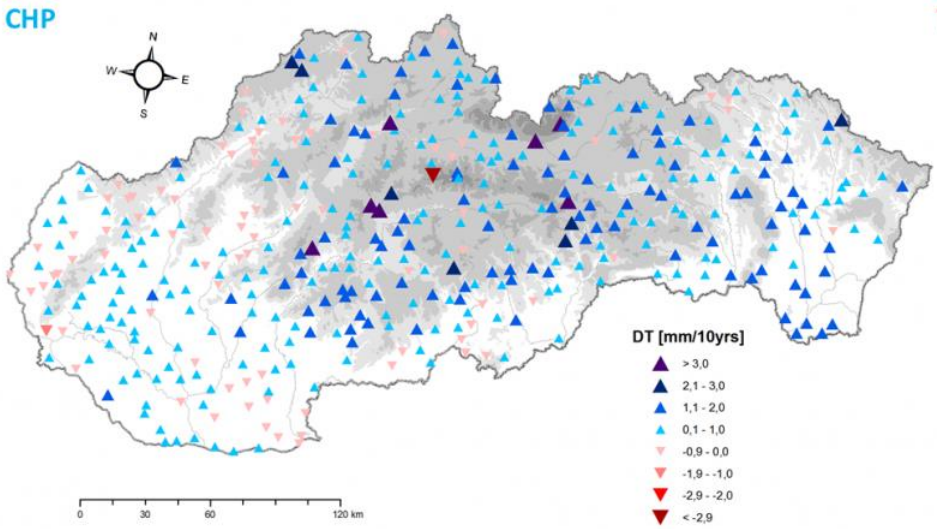

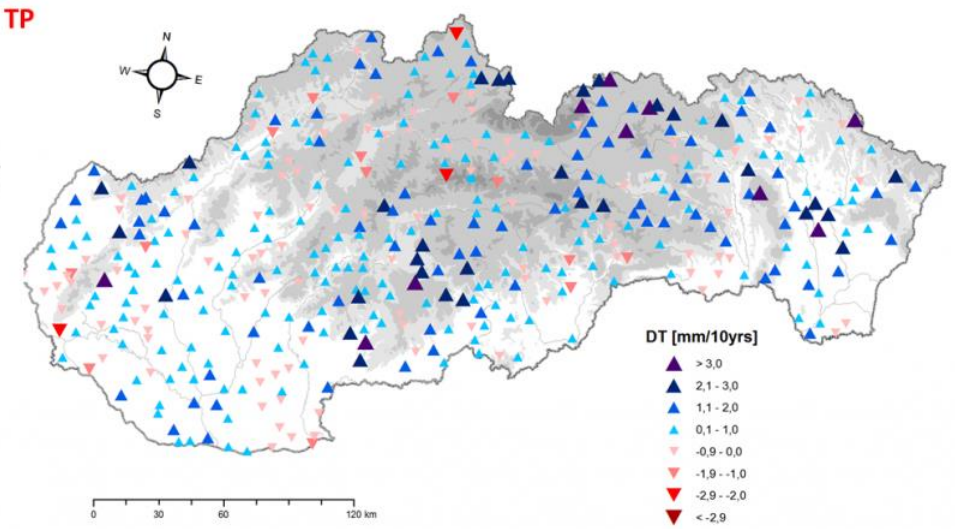

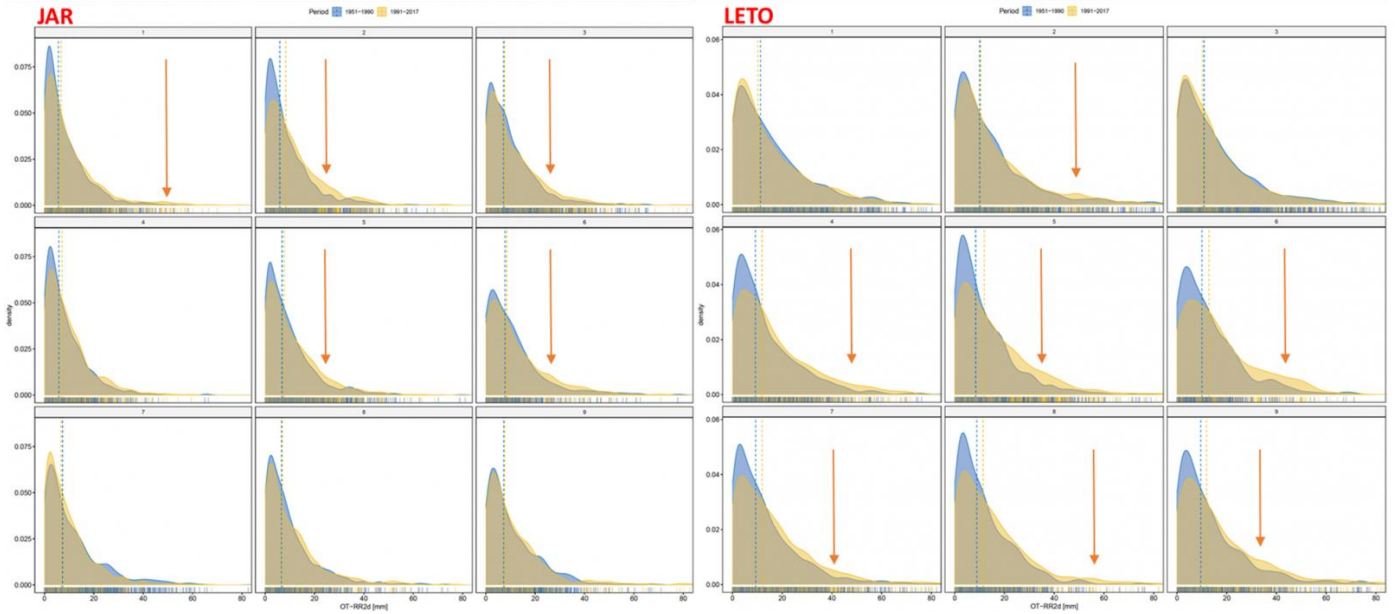

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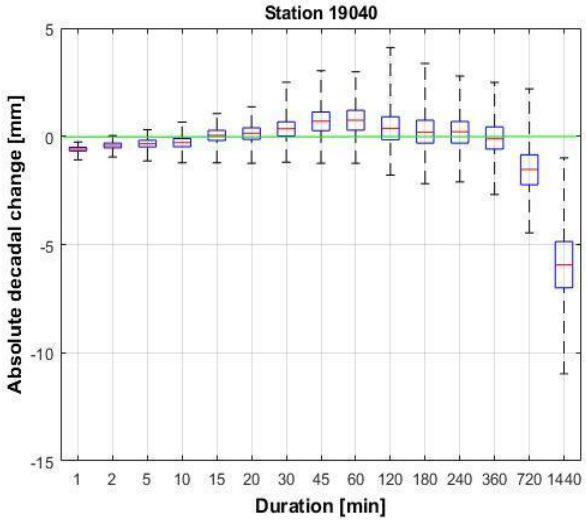
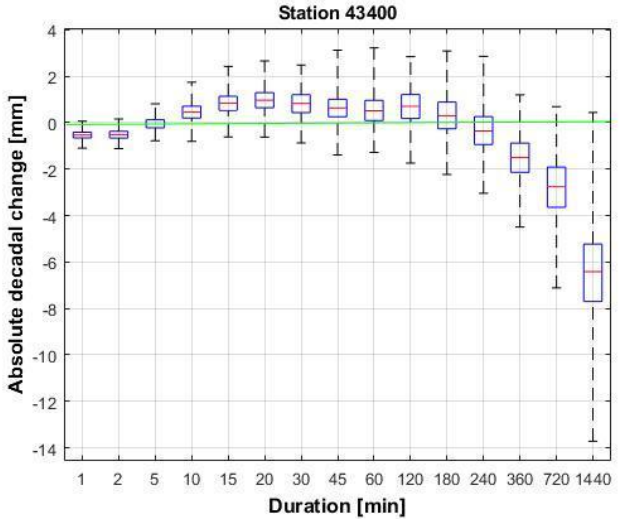
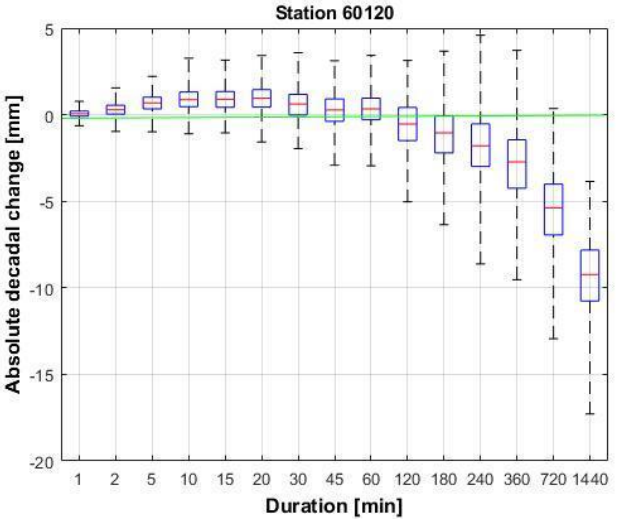
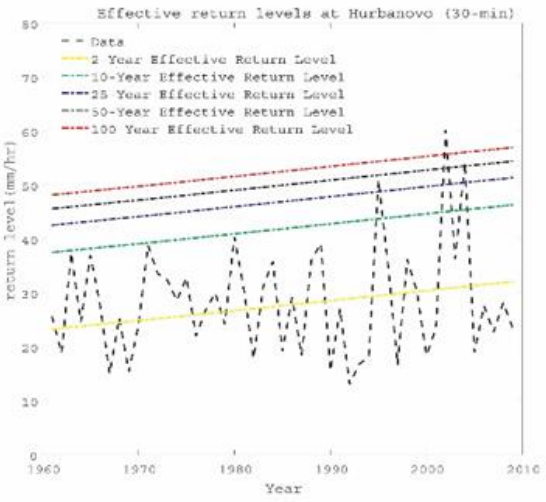
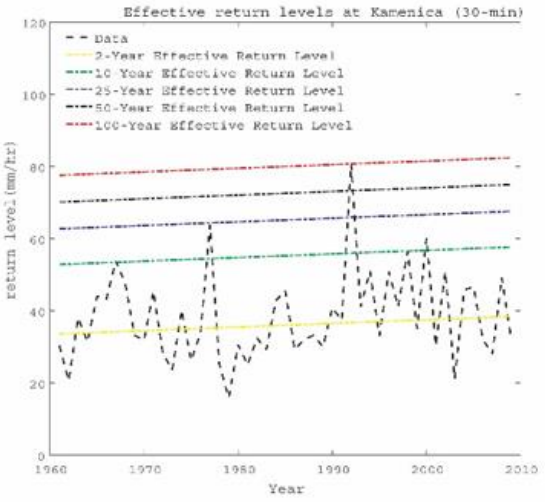


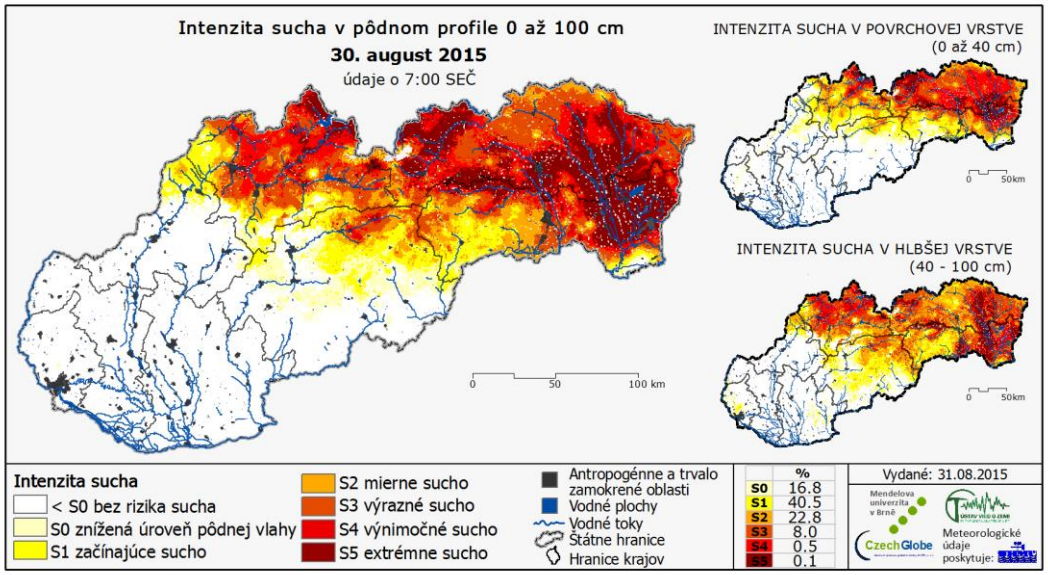


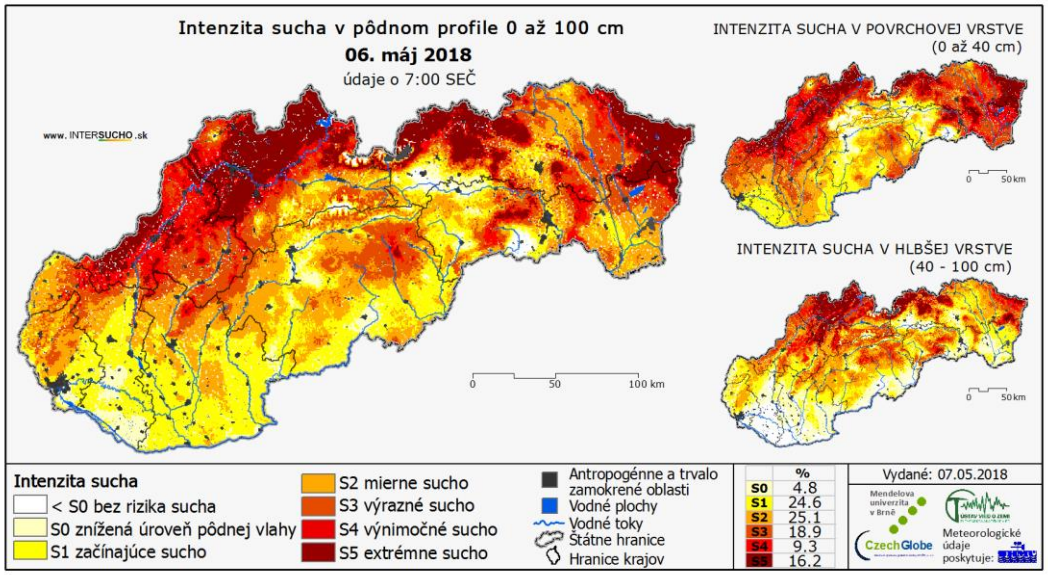


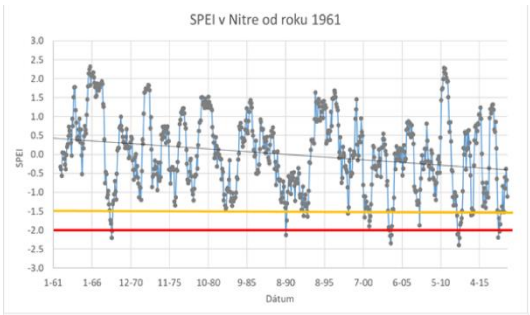


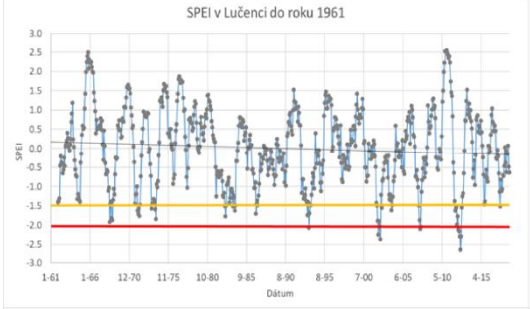


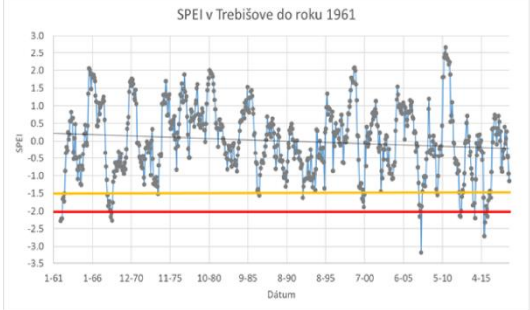
NÁRAST SUCHA ?

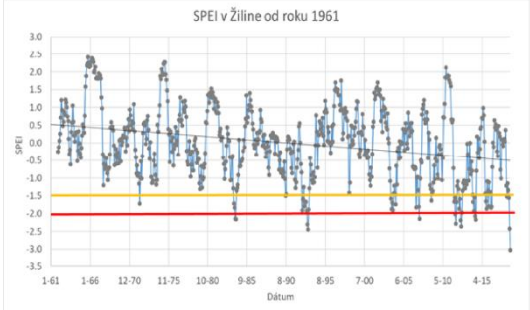








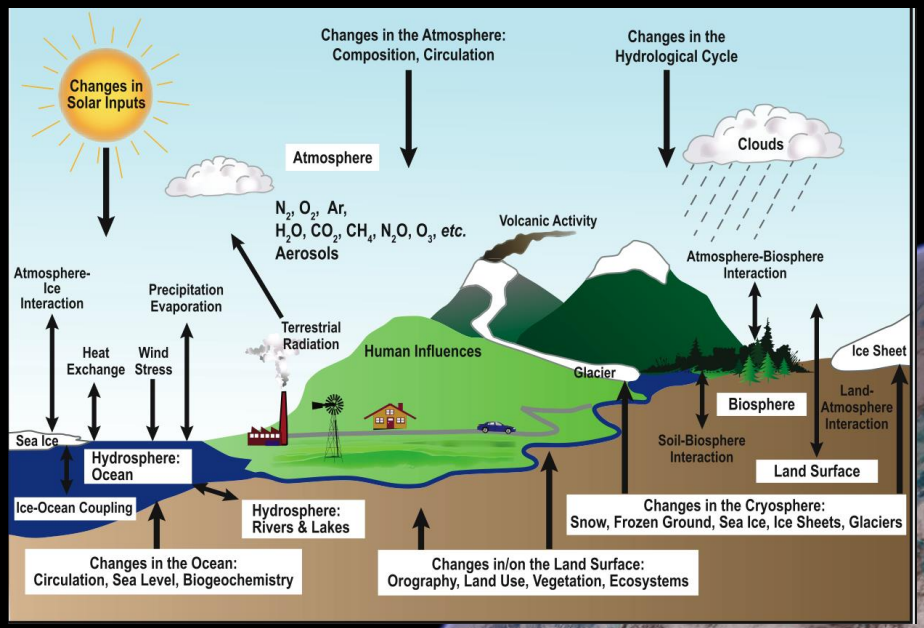




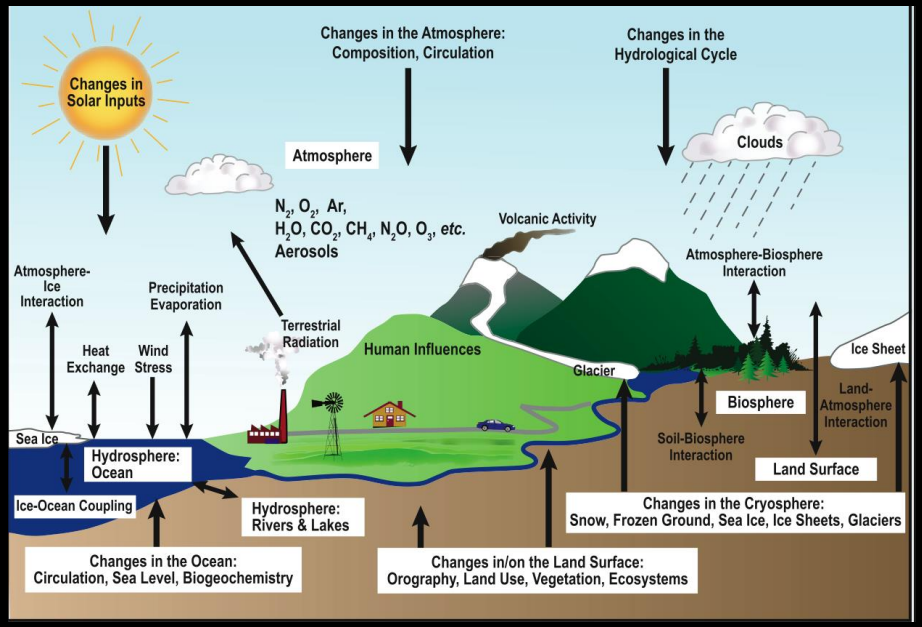
ČO NÁS ČAKÁ ?

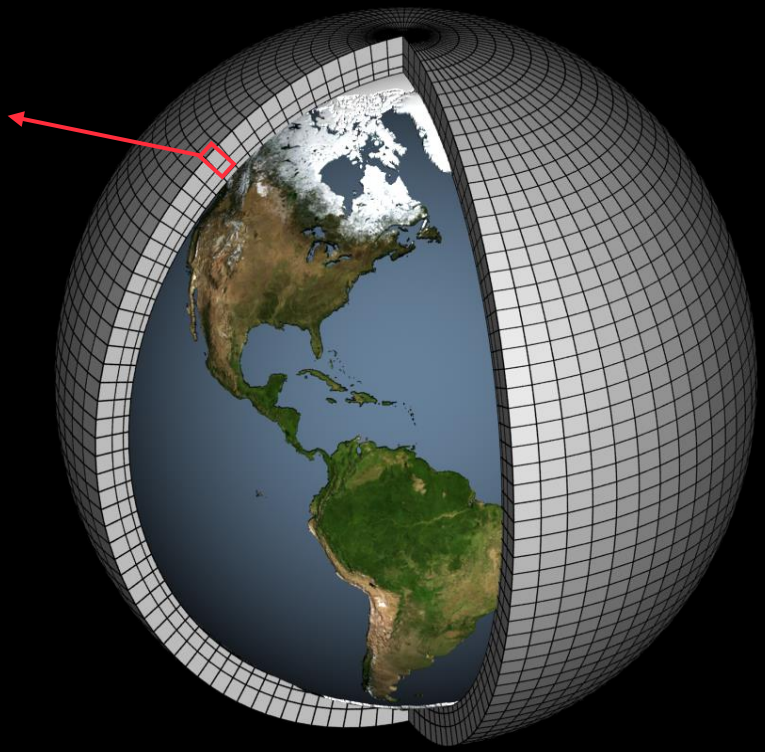
PREDIKTABILITA KLIMATICKÝCH MODELOV

Veľká komplexnosť klimatického systému



Globálne cirkulačné modely





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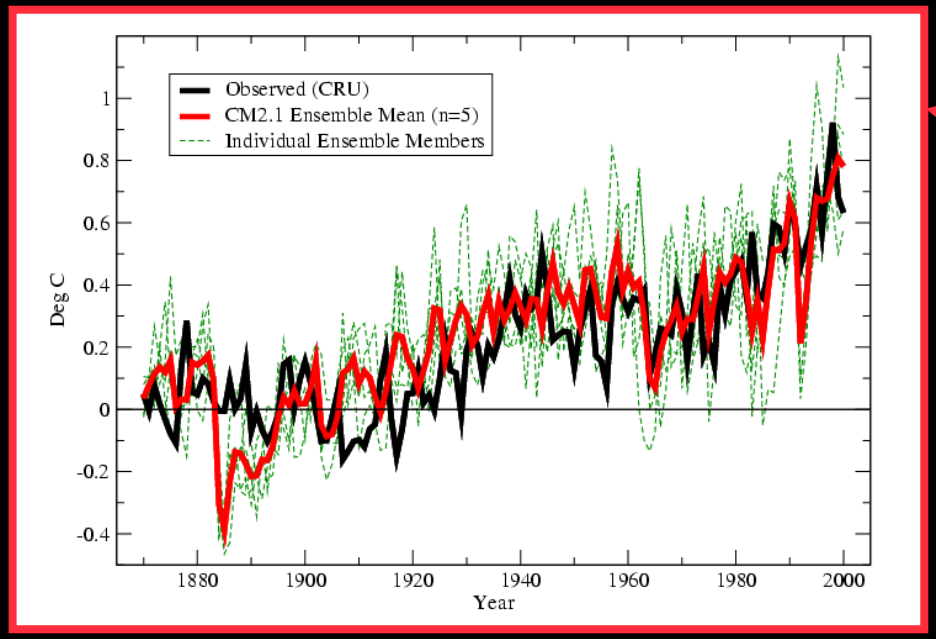
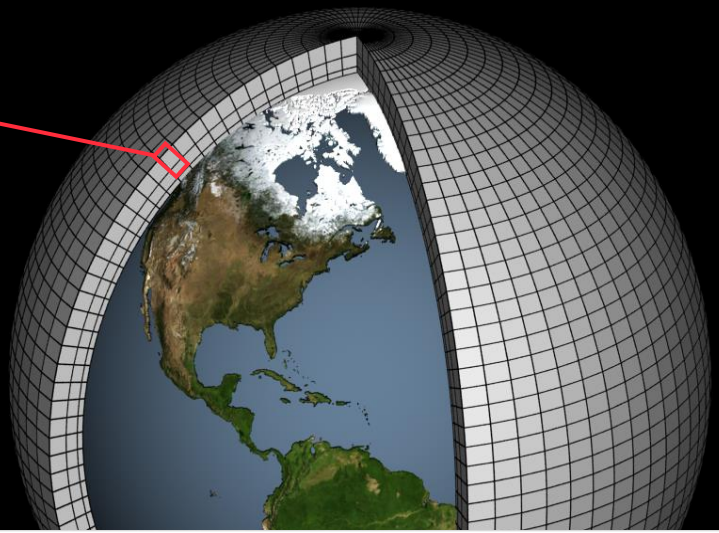
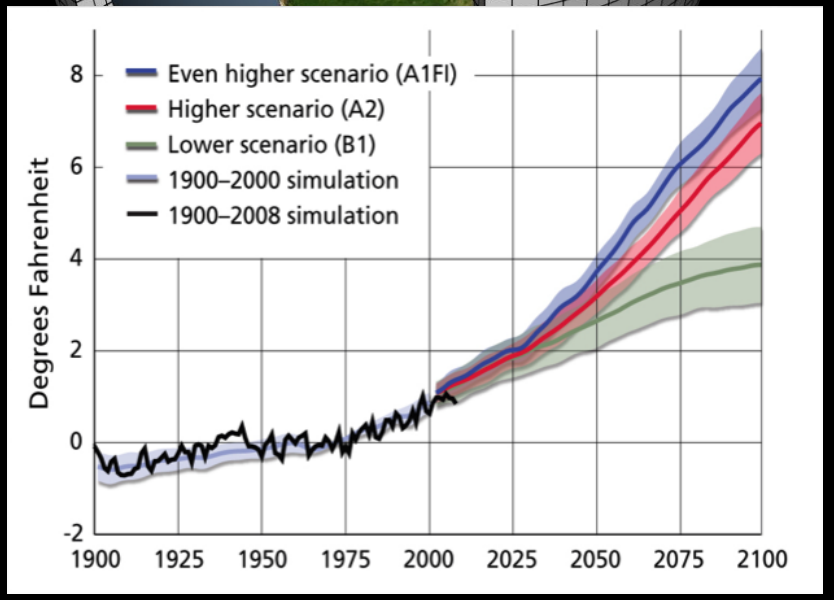
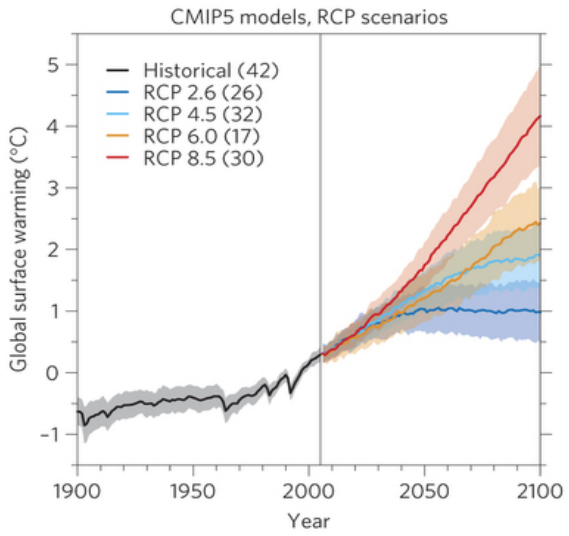
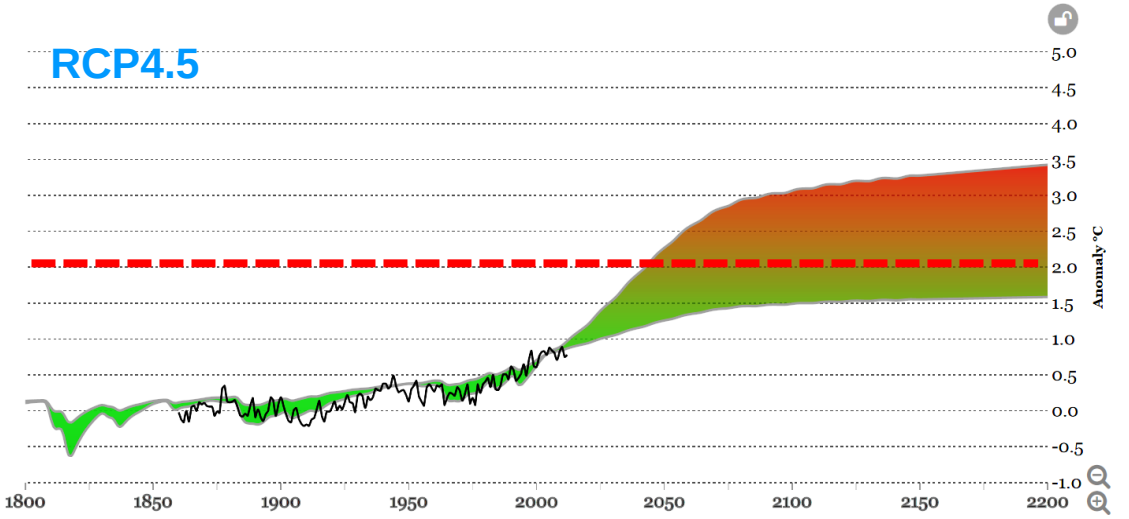


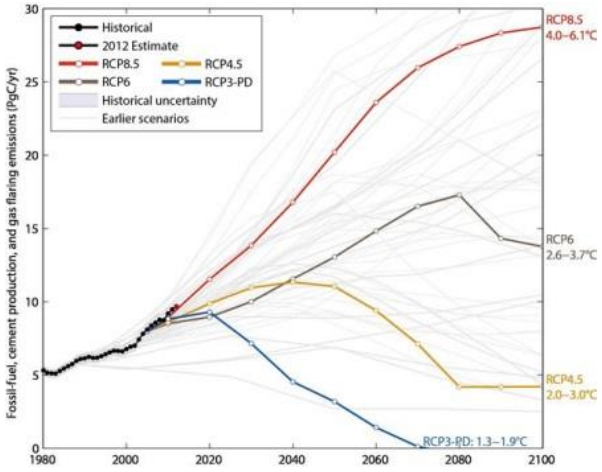


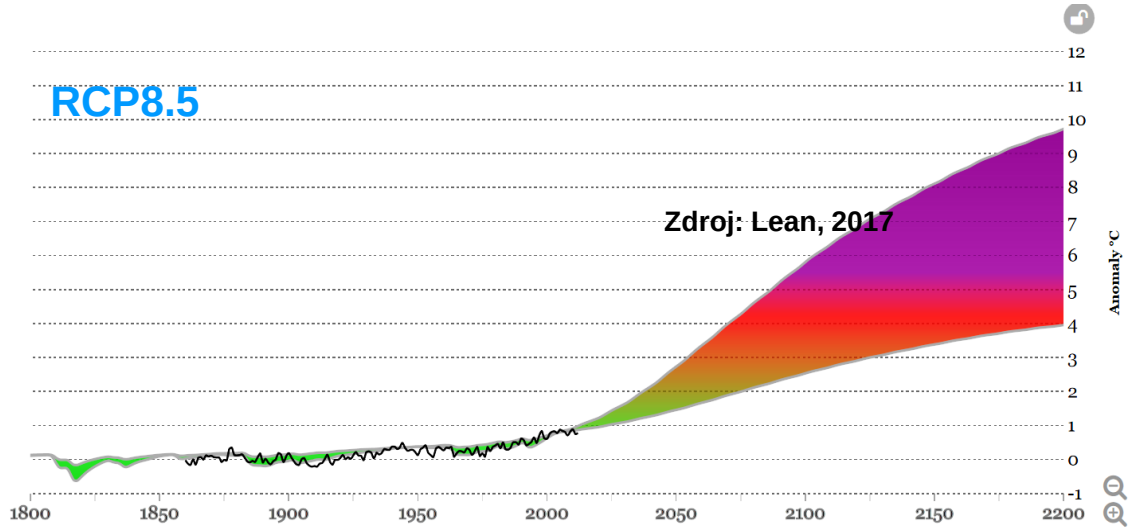


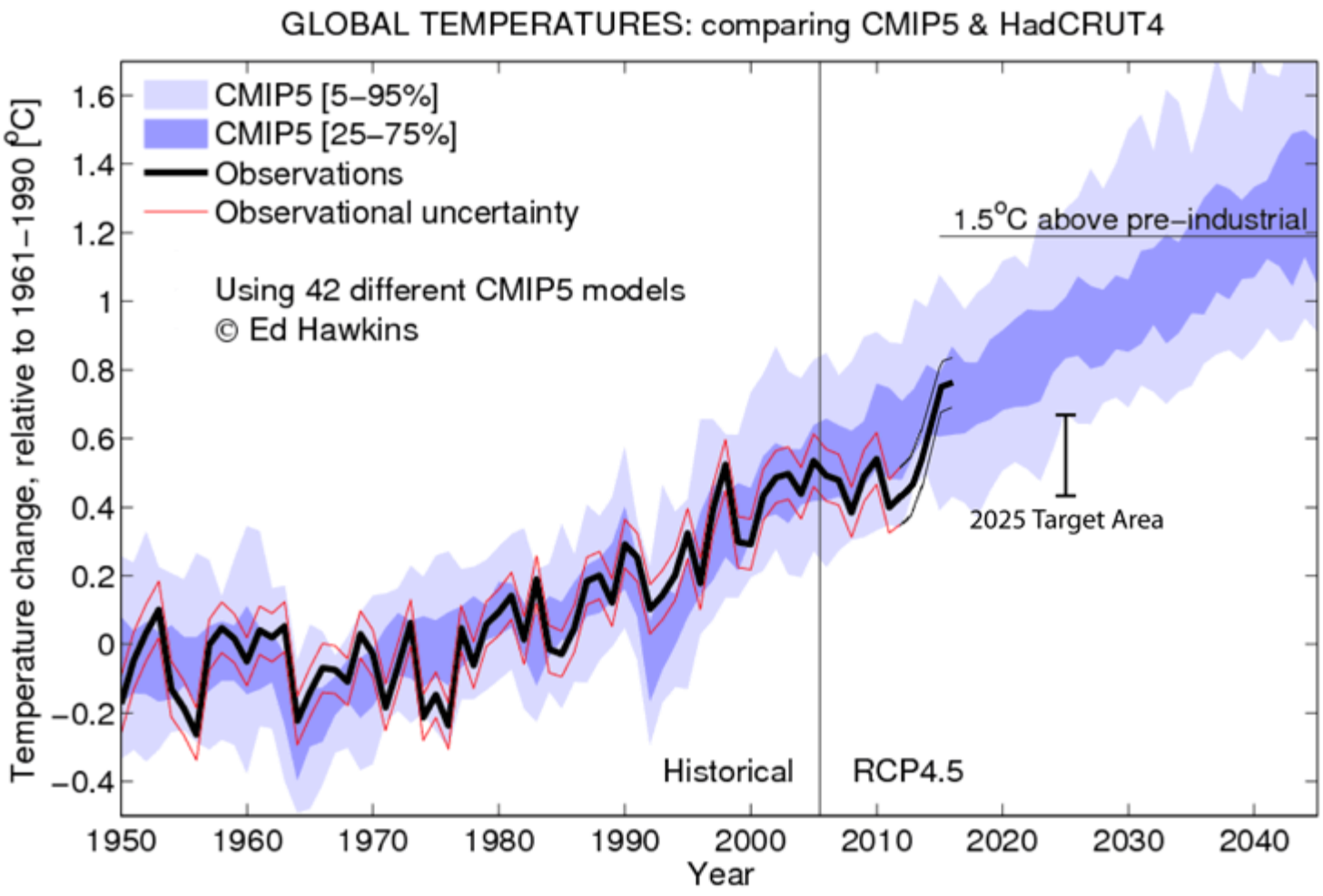
SCENÁRE KLIMATICKEJ ZMENY



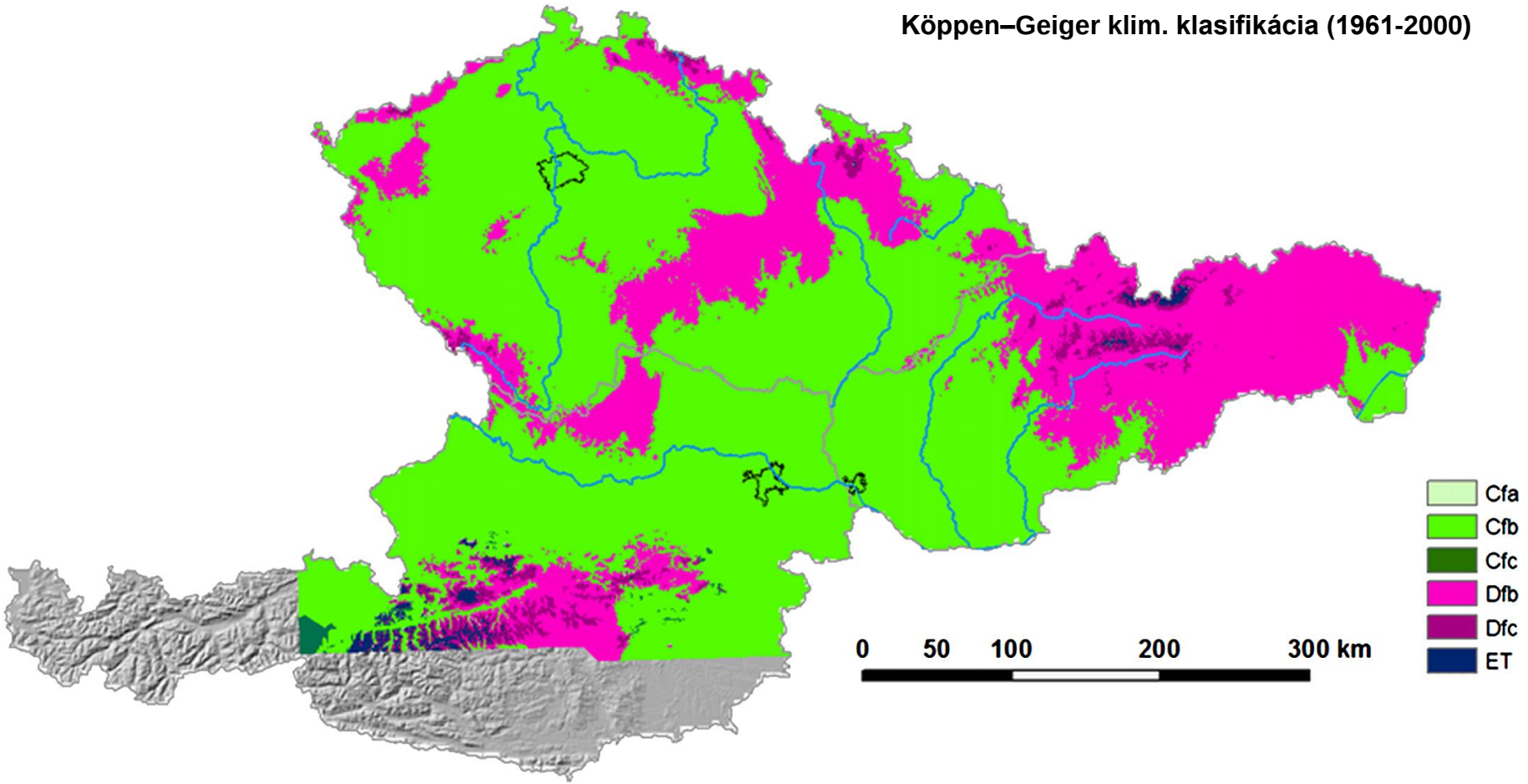






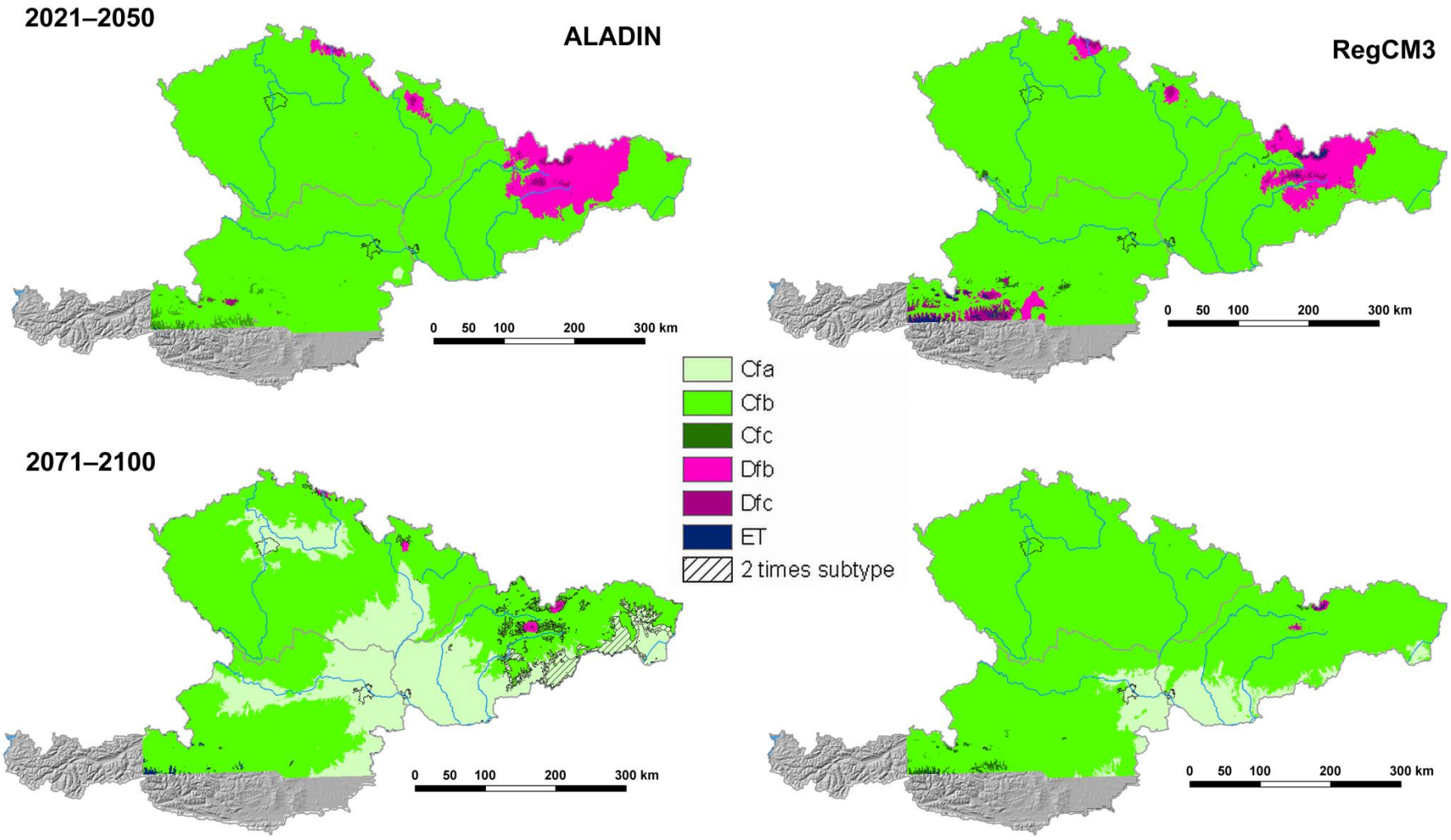

GLOBAL TEMPERATURES: comparing CMIP5 & HadCRUT4
CMIP5 [5–95%]
CMIP5 [25–75%]
Observations
Observational uncertainty
Using 42 different CMIP5 models
© Ed Hawkins
1.5°C above pre–industrial
2025 Target Area
Historical
RCP4.5
Temperature change, relative to 1961–1990 [°C]
Year
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
−0.2
−0.4
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040

POSUN DO „STREDOMORSKEJ“ KLÍMY?



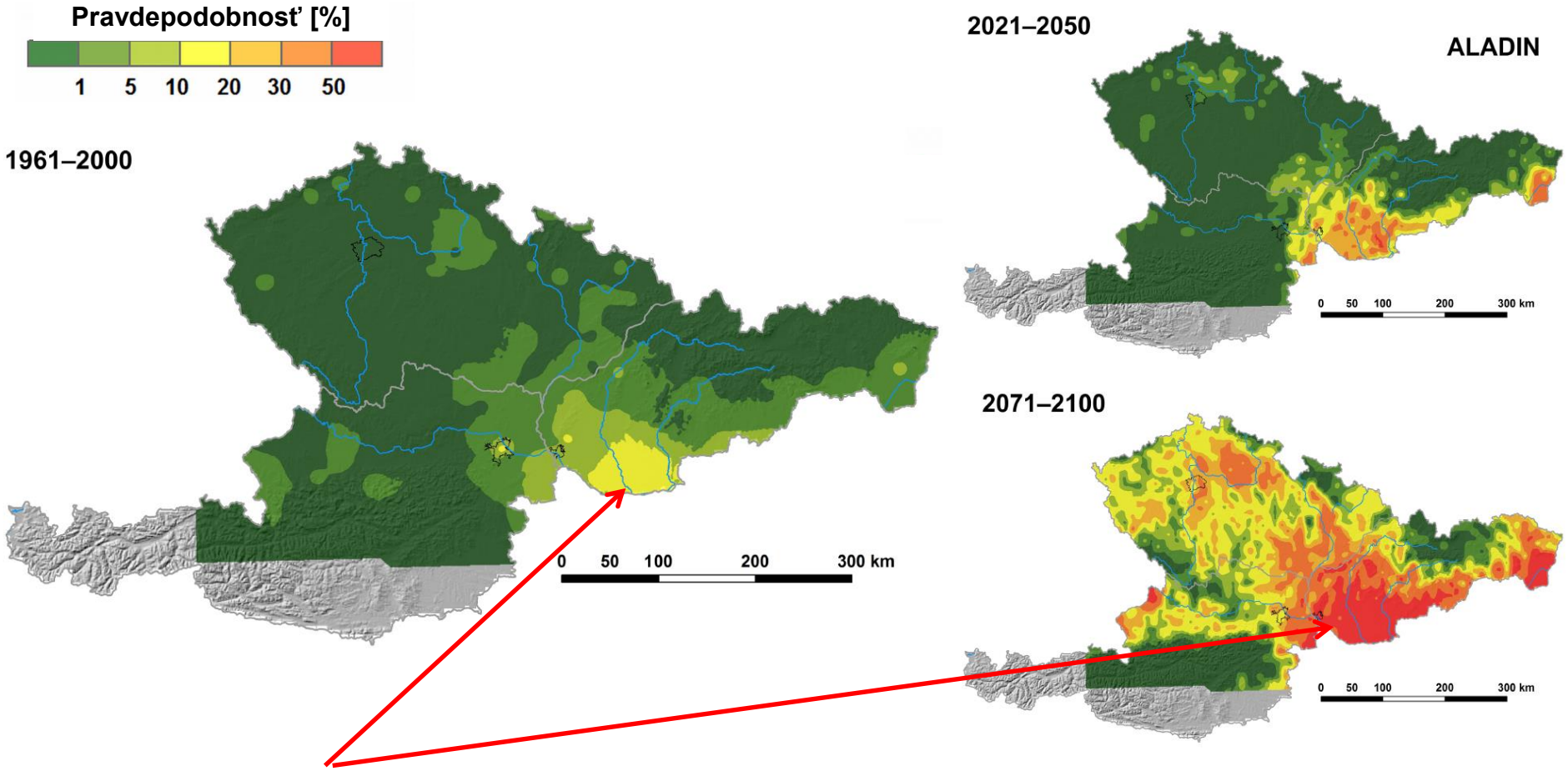
Skalák et al., 2018

POSUN DO „STREDOMORSKEJ“ KLÍMY?



Skalák et al., 2018

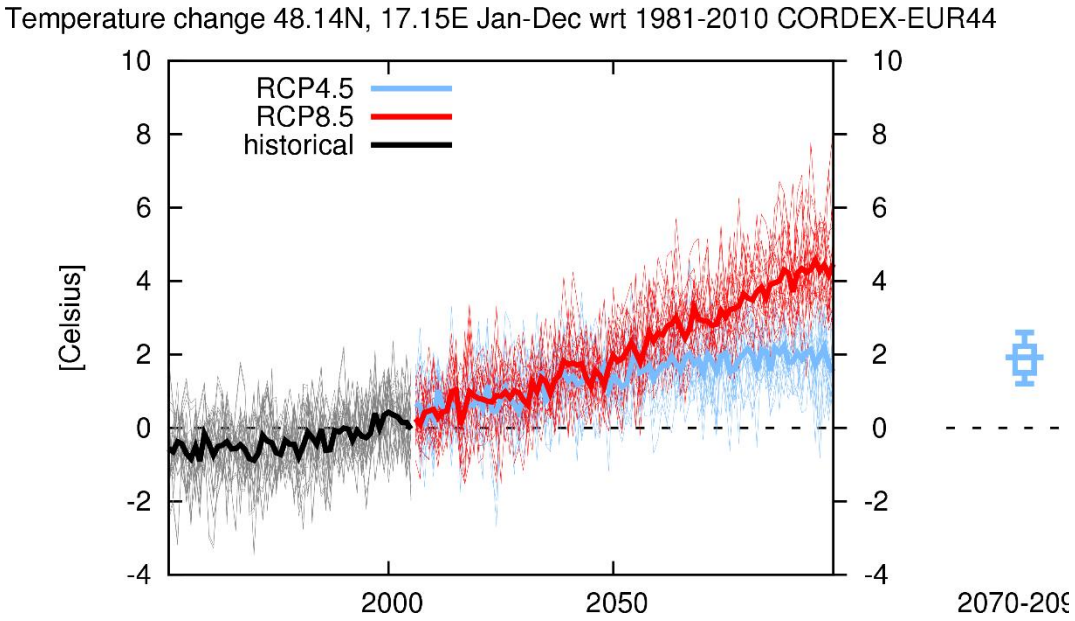
POSUN DO „STREDOMORSKEJ“ KLÍMY?

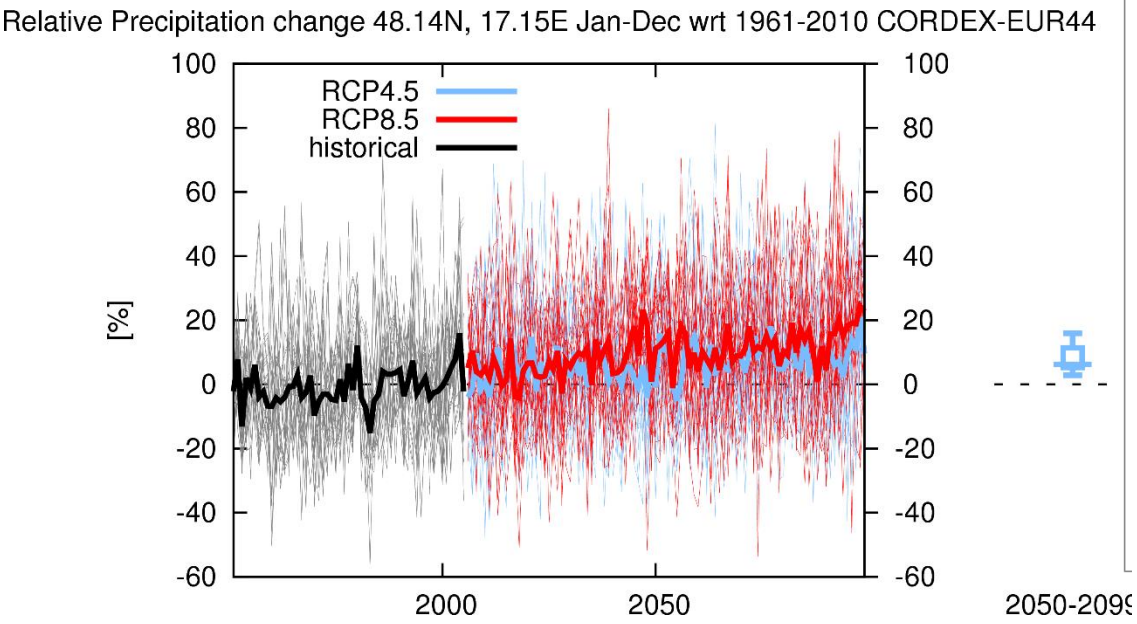


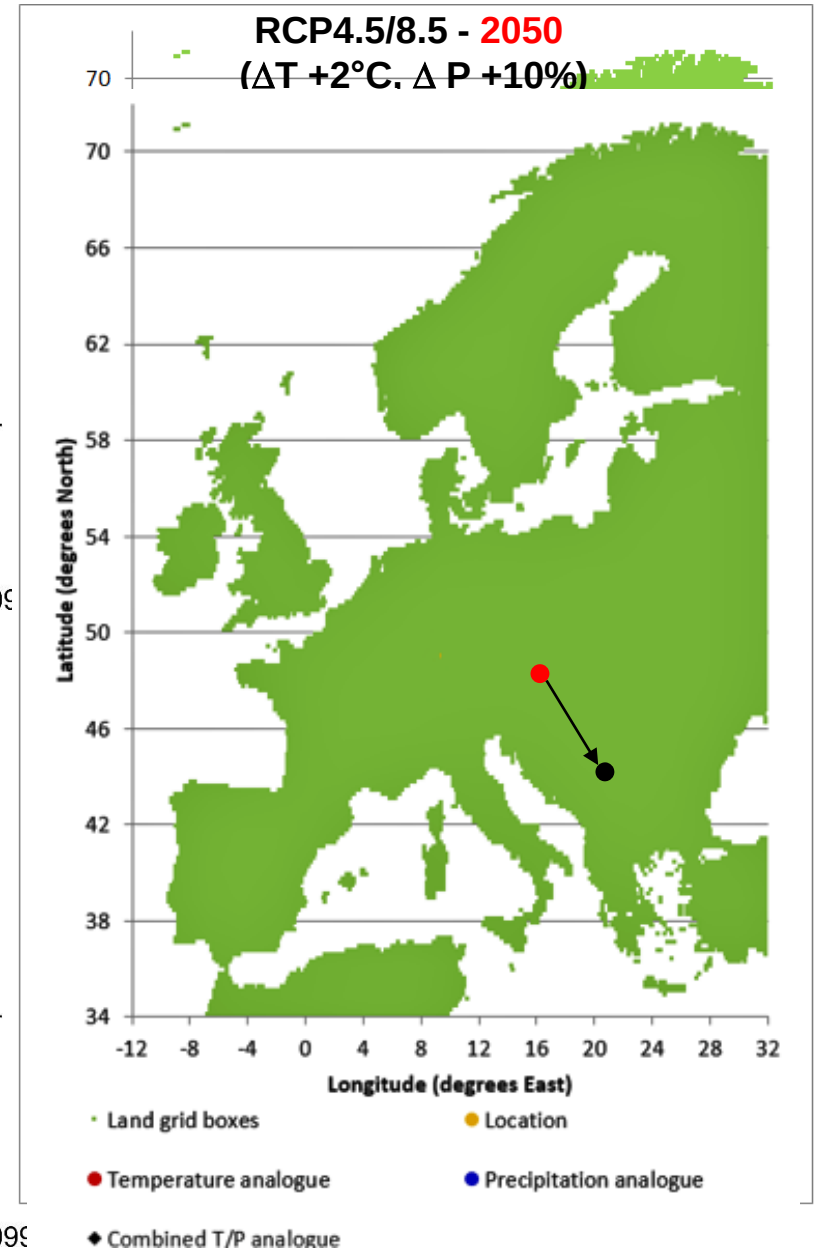
Csa klíma (substrapická suchá)

Skalák et al., 2018

POSUN DO „STREDOMORSKEJ“ KLÍMY?

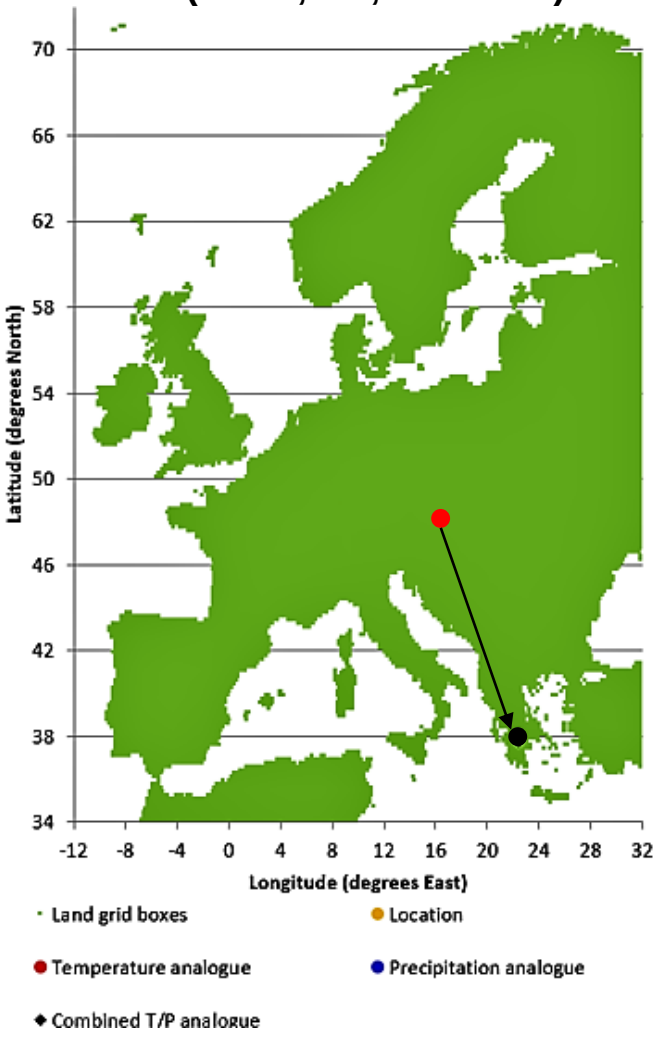




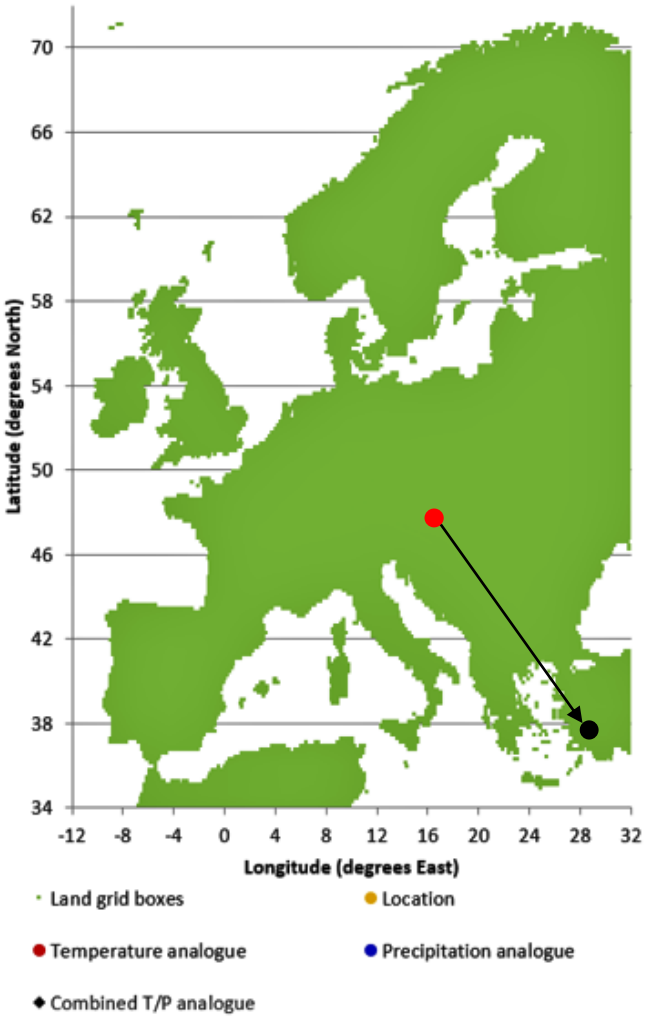


POSUN DO „STREDOMORSKEJ“ KLÍMY?

RCP4.5 - 2080
(ΔT +2,5°C, Δ P +15%)

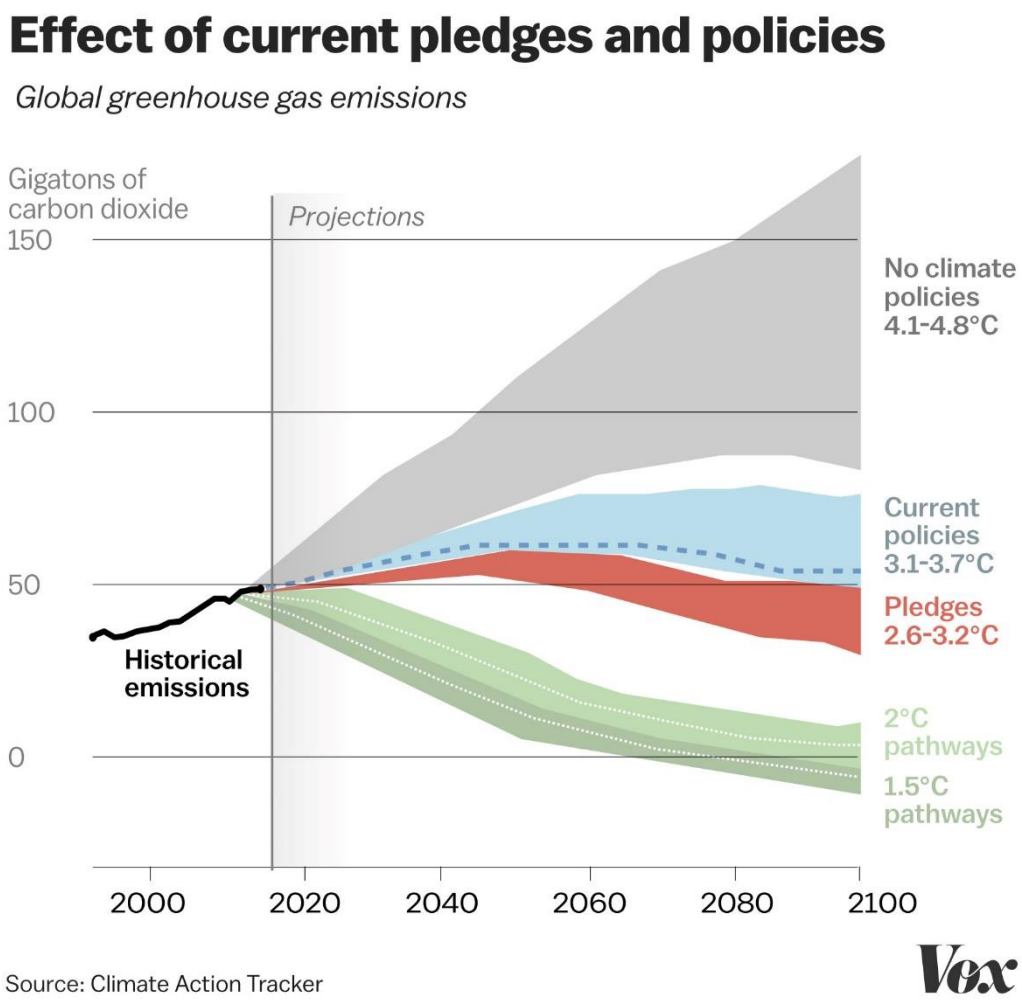


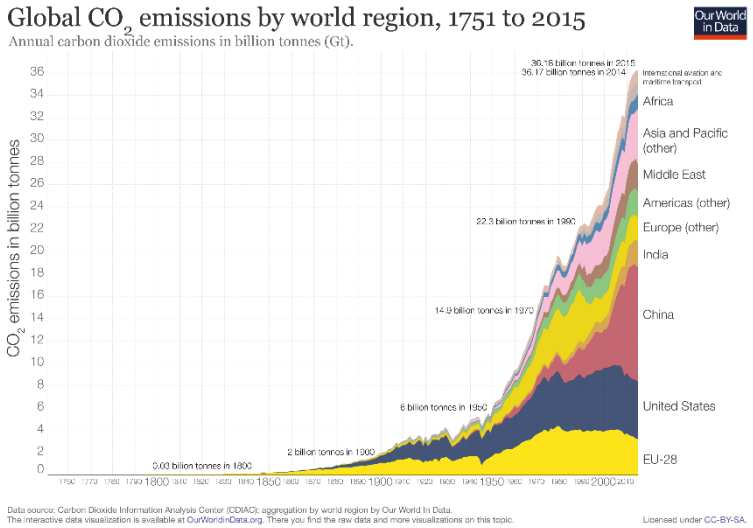
RCP8.5 - 2080
(ΔT +4,5°C, Δ P +25%)



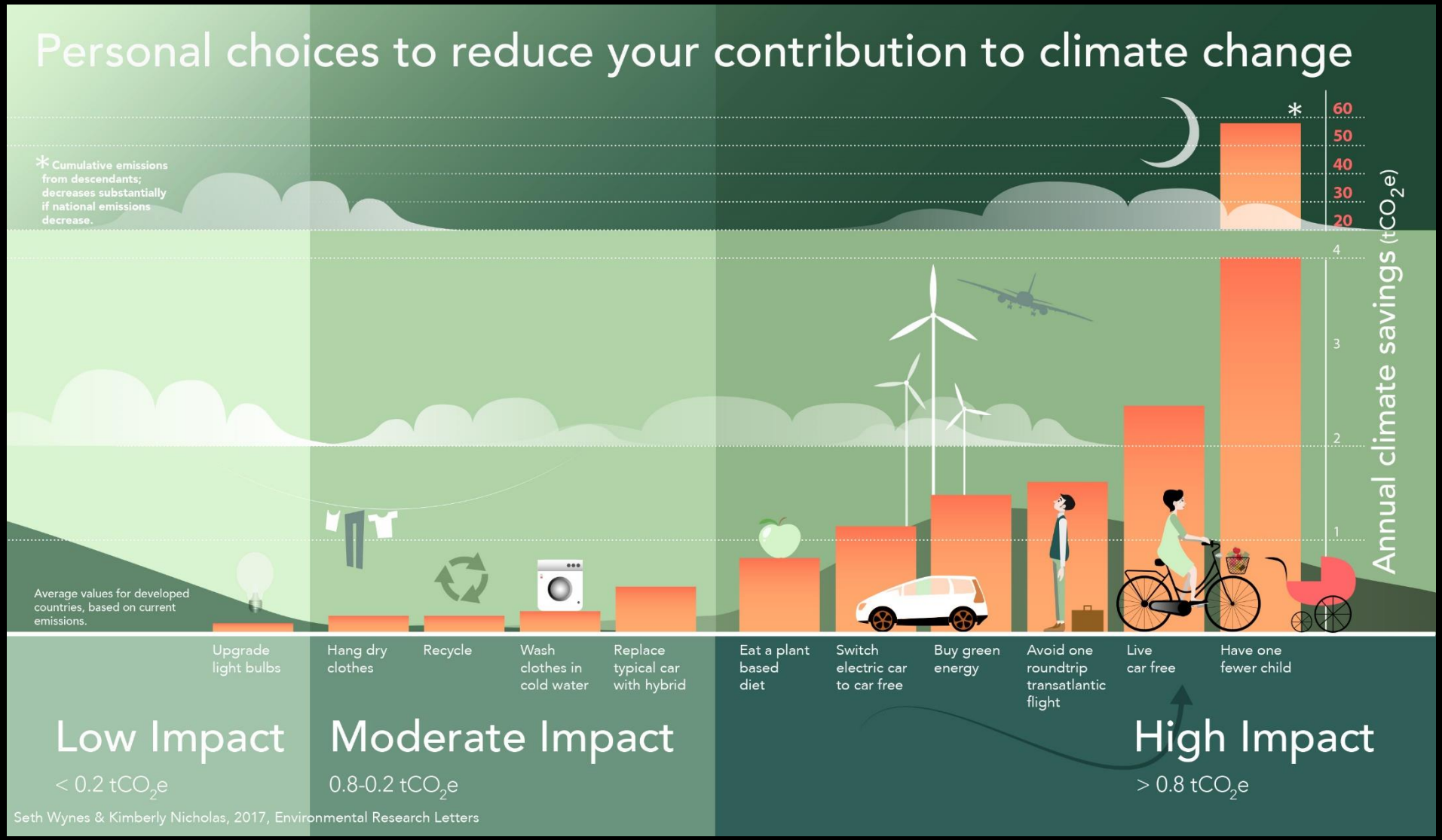
JE UŽ VŠETKO STRATENÉ ?

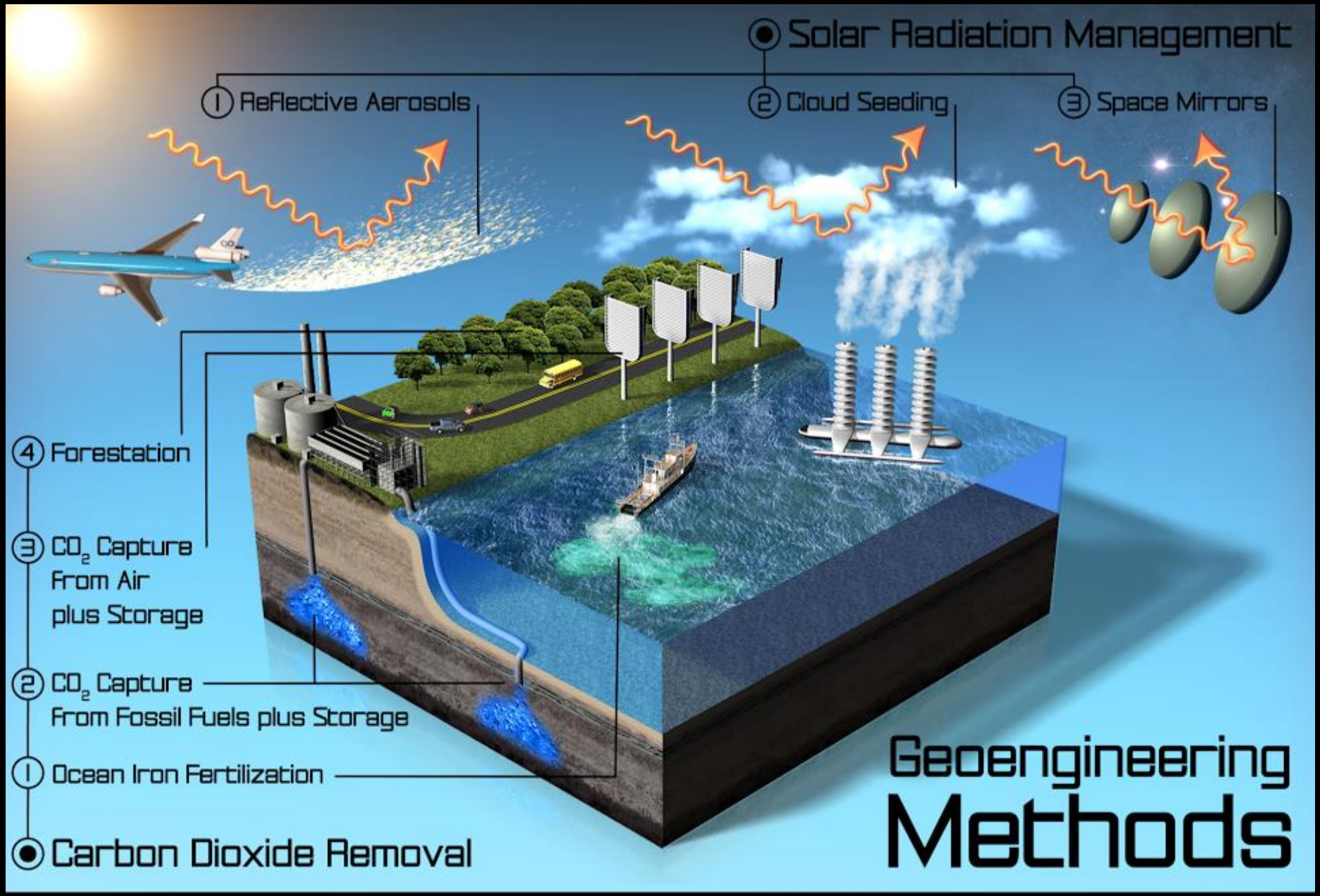
JE UŽ VŠETKO STRATENÉ ?





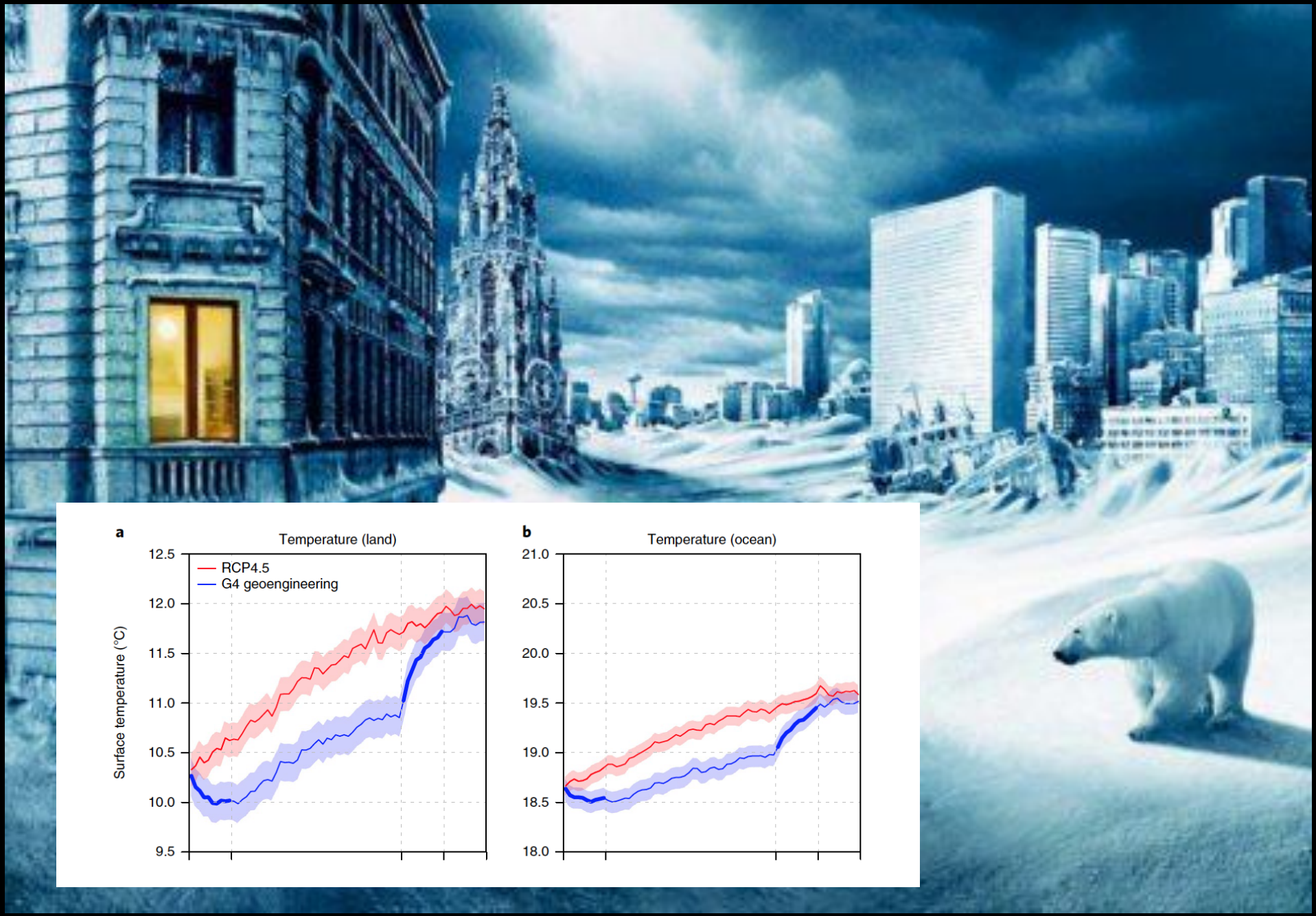
OSOBNÁ UHLÍKOVÁ STOPA





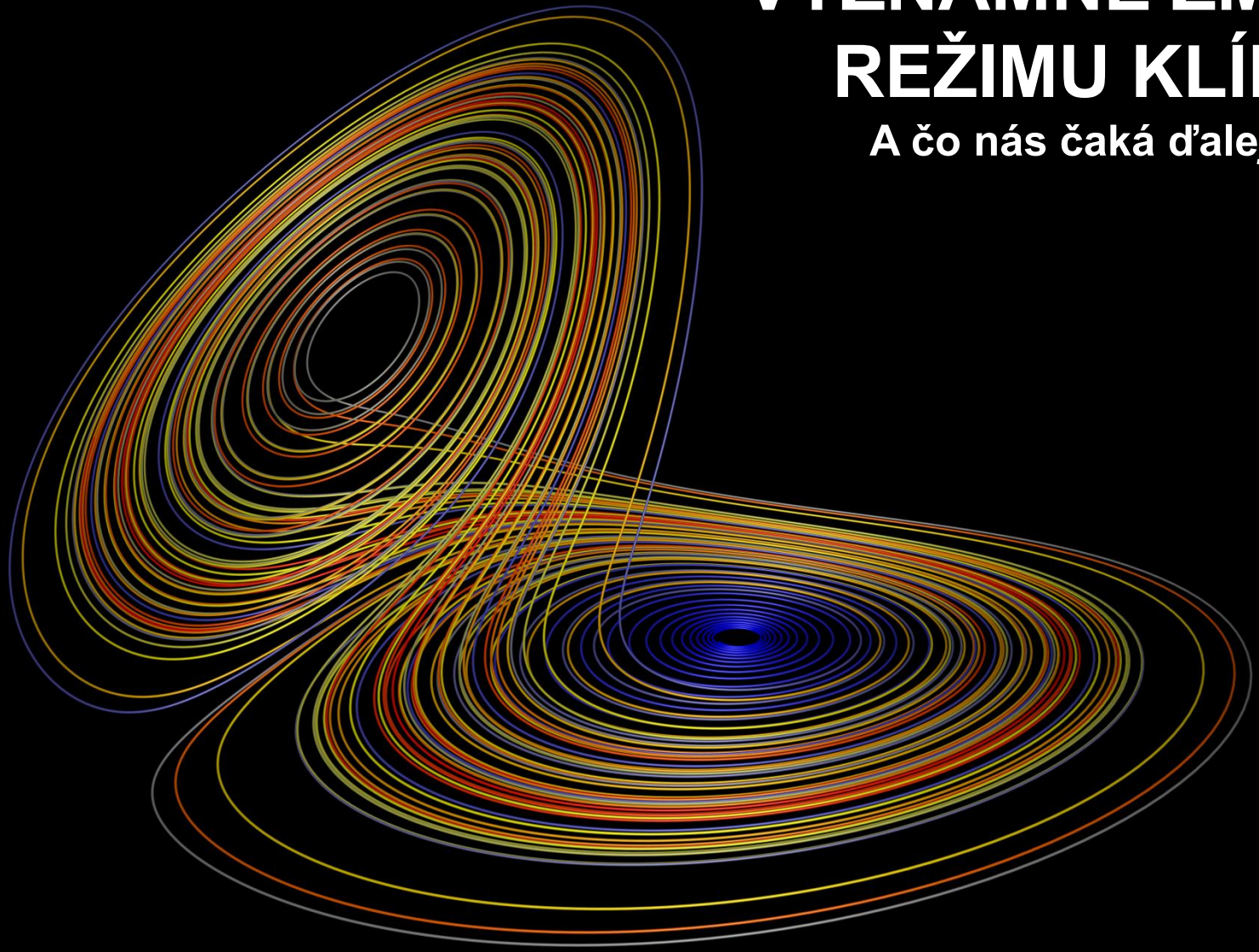
Sources: IPCC / Royal Society | More info: www.get2.cc/5e

climatecentral.org


a
Temperature (land)
RCP4.5
G4 geoengineering
Surface temperature (°C)
12.5
12.0
11.5
11.0
10.5
10.0
9.5
b
Temperature (ocean)
21.0
20.5
20.0
19.5
19.0
18.5
18.0

VÝZNAMNÉ ZMENY REŽIMU KLÍMY

A čo nás čaká ďalej ...



ĎAKUJEM ZA POZORNOSŤ