



POTSDAM INSTITUTE FOR
CLIMATE IMPACT RESEARCH

Daten und Prognosen zum Klimawandel in Brandenburg

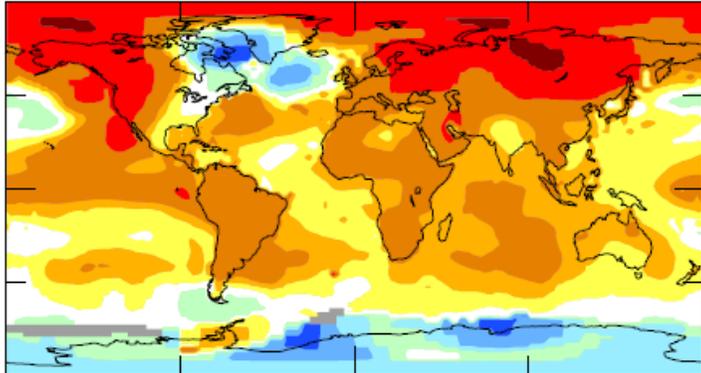
Dr. Christopher Reyer, reyer@pik-potsdam.de

Globale Klimarekorde

January-September Surface Temperature Relative to 1951-1980 Mean (°C)

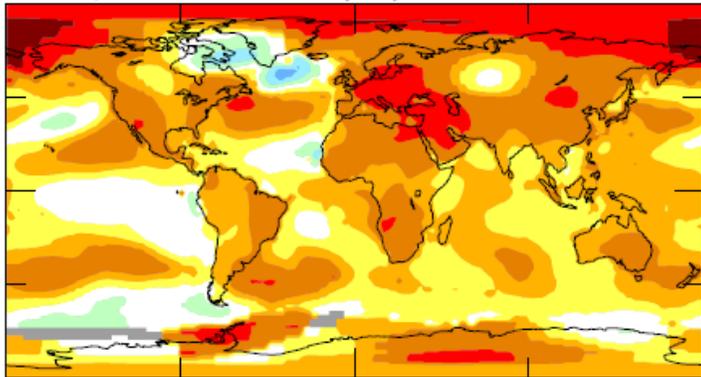
2015, 5th warmest (tie)

0.83



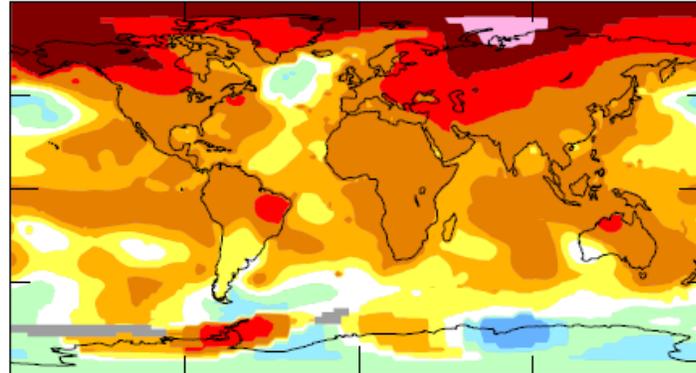
2018, 5th warmest (tie)

0.83



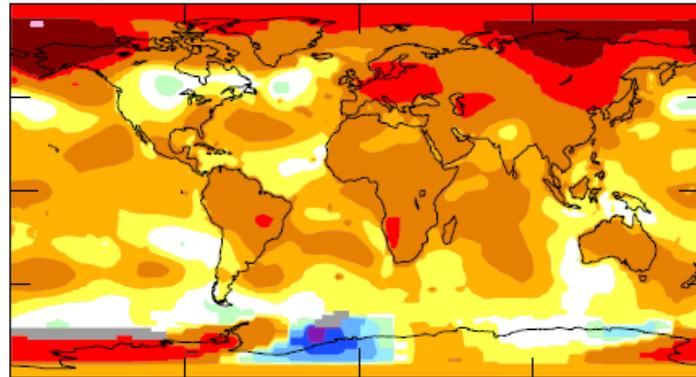
2016, the warmest

1.06



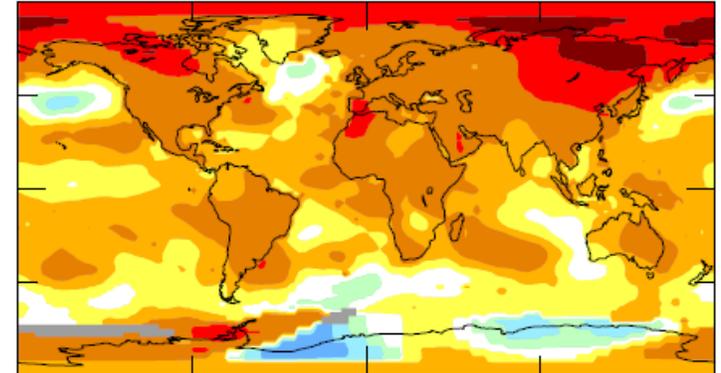
2019, 3rd warmest

0.97



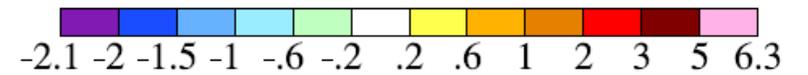
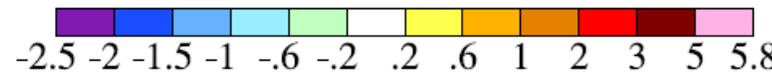
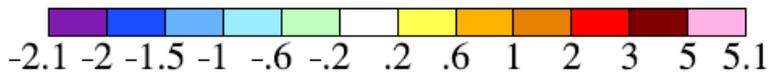
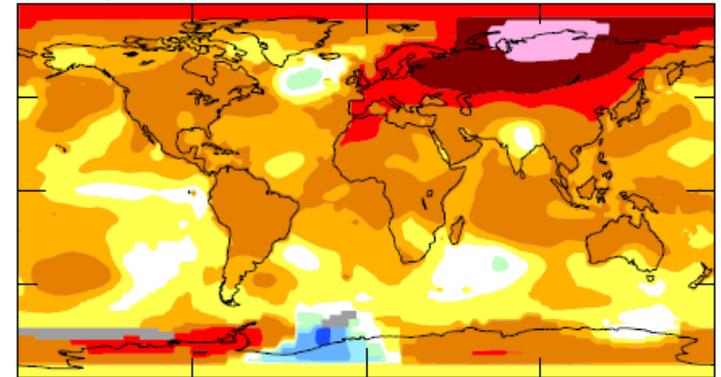
2017, 4th warmest

0.93

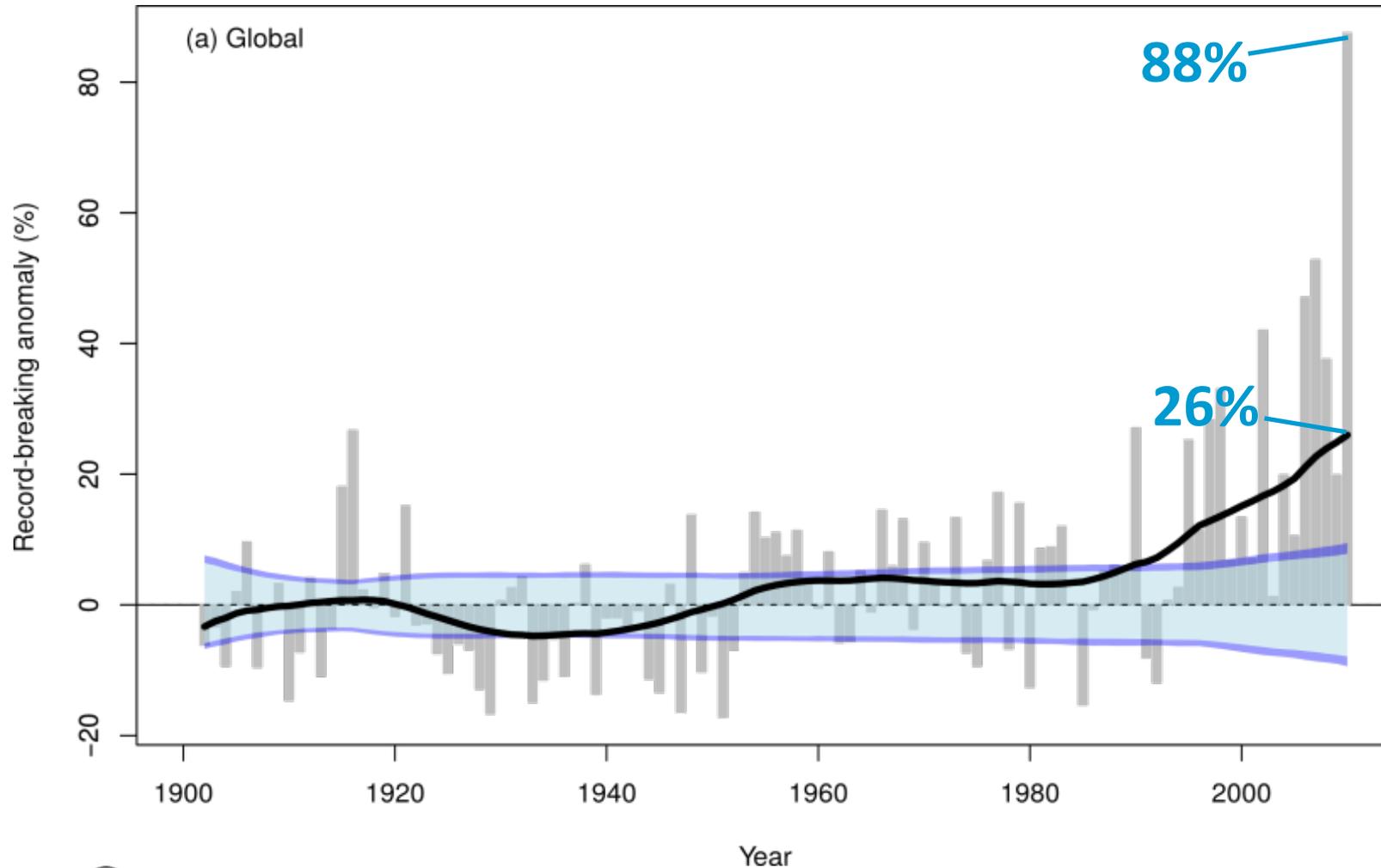


2020, 2nd warmest

1.05

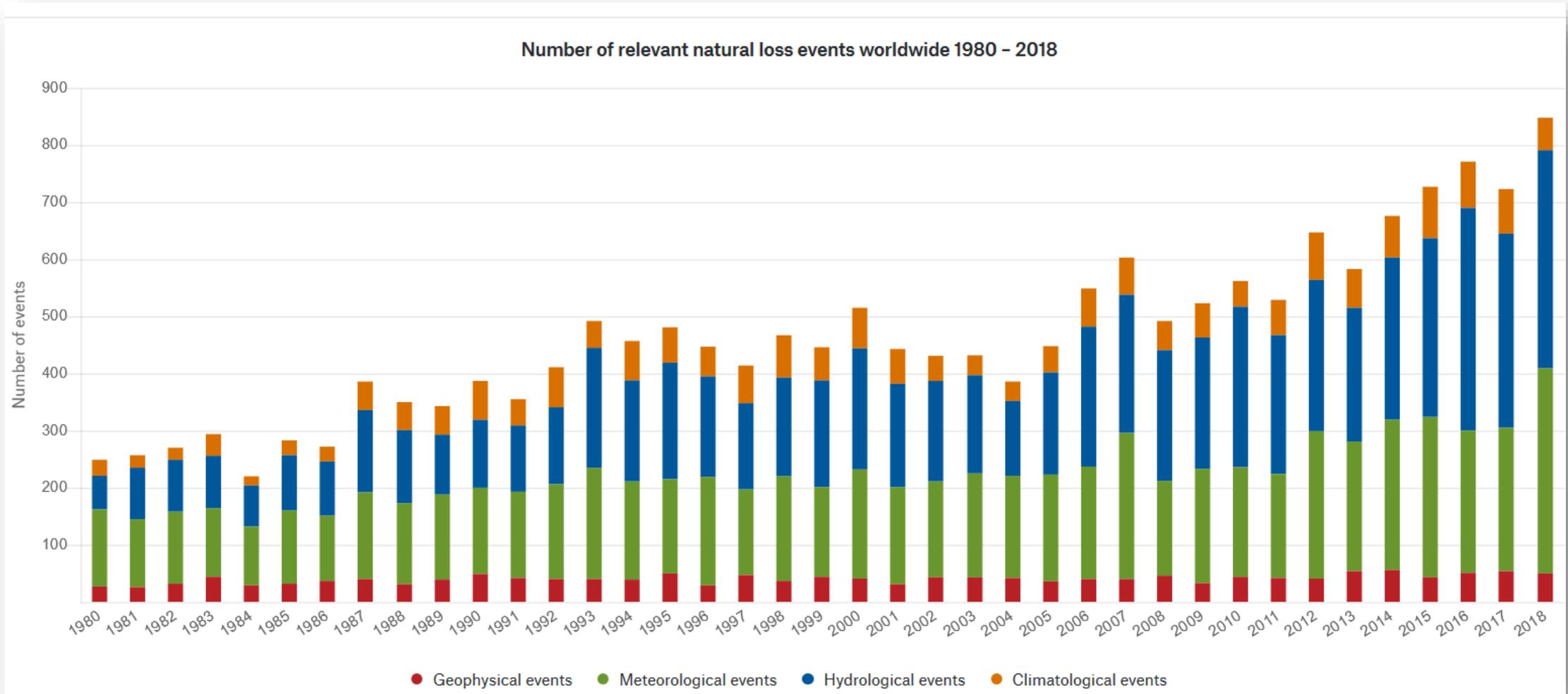


Tägliche Niederschlagsrekorde steigen weltweit



- Jahr 2010: +88% mehr Rekordniederschläge als unter stationärem Klima erwartet
- Der nichtlineare Langzeitrend der globalen Rekordniederschlagsanomalie steigt um 26% bis 2010

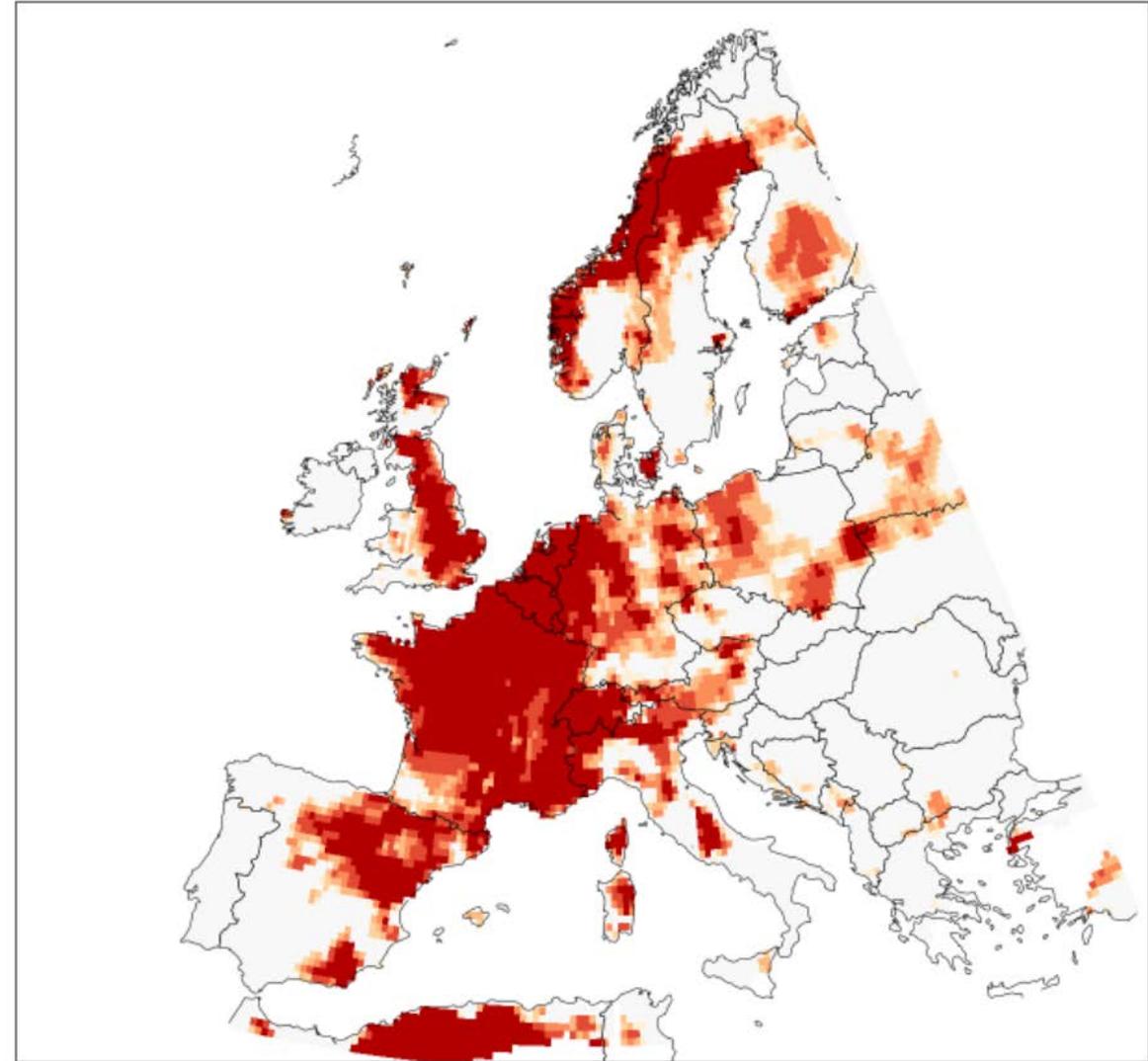
Anzahl Naturkatastrophen weltweit steigt



Extremereignisse wären ohne menschengemachten Klimawandel weniger extrem

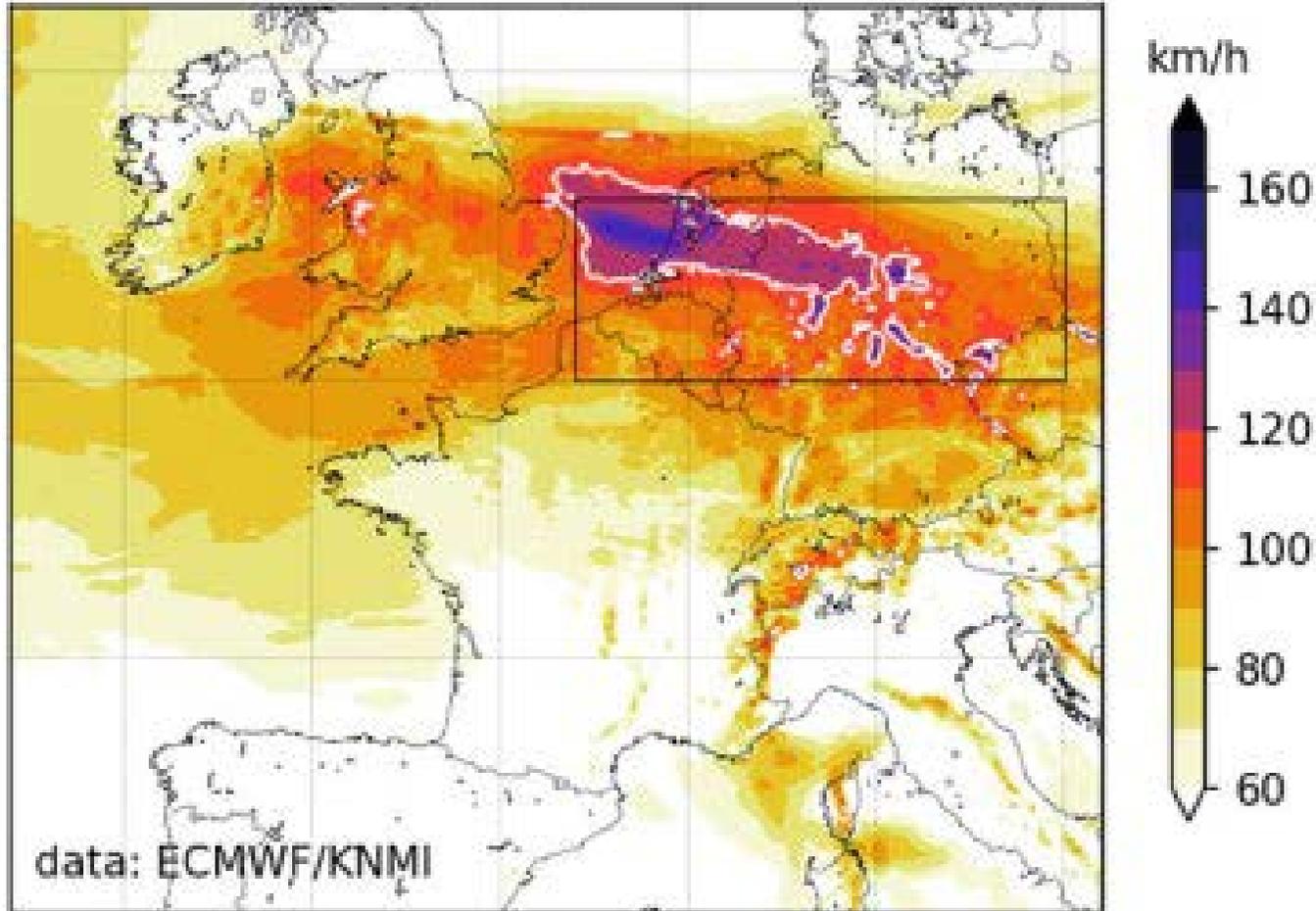
Hitzewellen in Deutschland und Europa 2019 sind

- durch den menschengemachten Klimawandel mindestens drei Mal wahrscheinlicher geworden
- wären ohne den menschlichen Einfluss 1,5-3°C kälter gewesen



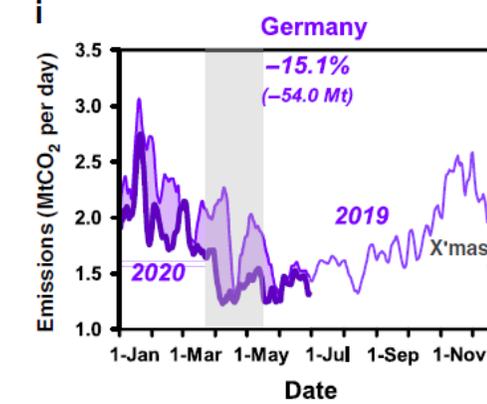
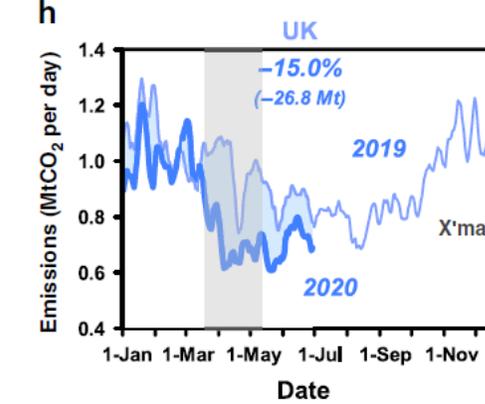
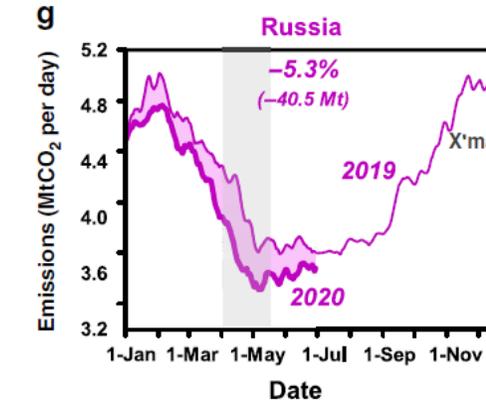
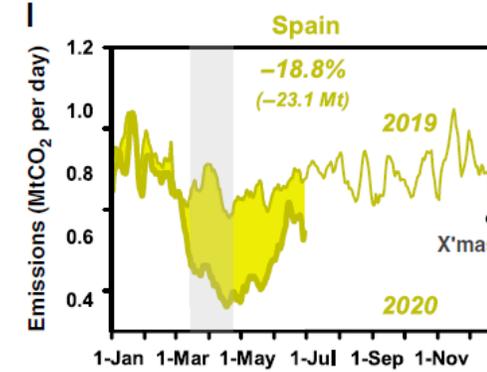
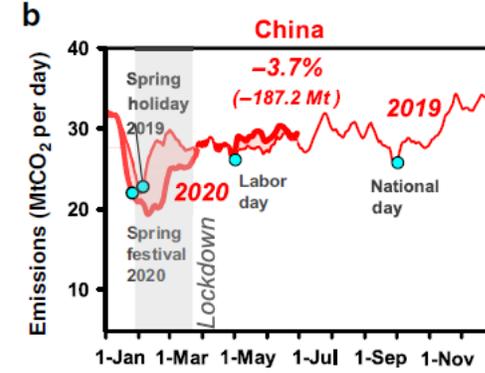
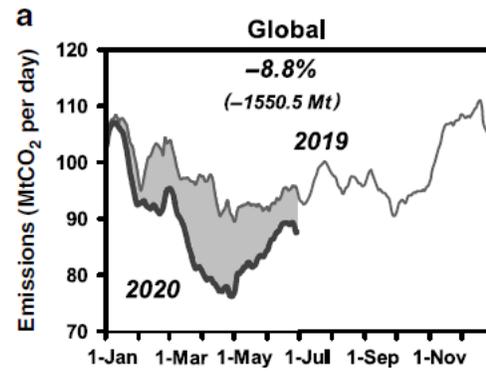
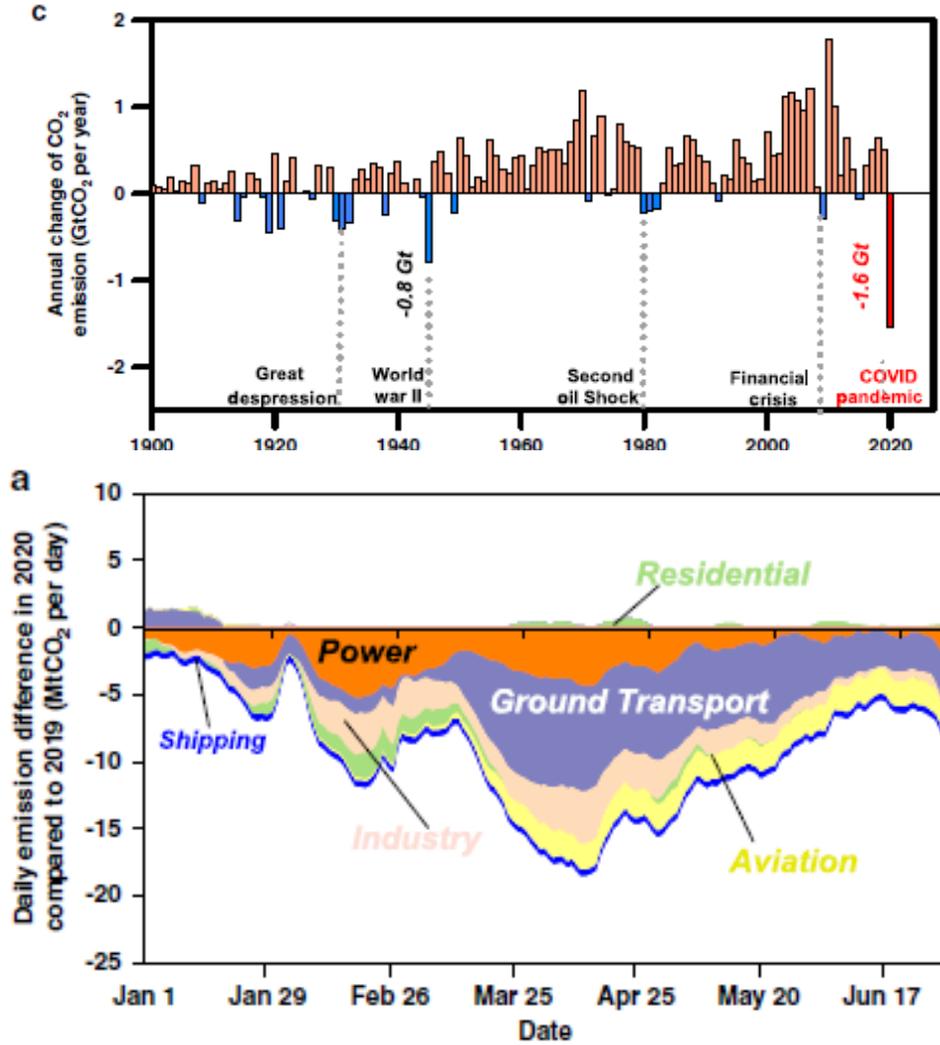
Aber nicht immer... Sturm Friederike

Friederike Daily max. wind gust (2018-01-18)
ECMWF det.forecast. analysis: 2018-01-18 00UTC



- Windgeschwindigkeiten haben abgenommen, evtl. Leichte Zunahme in der Zukunft
- Kein Einfluß des Klimawandels auf Friederike nachweisbar

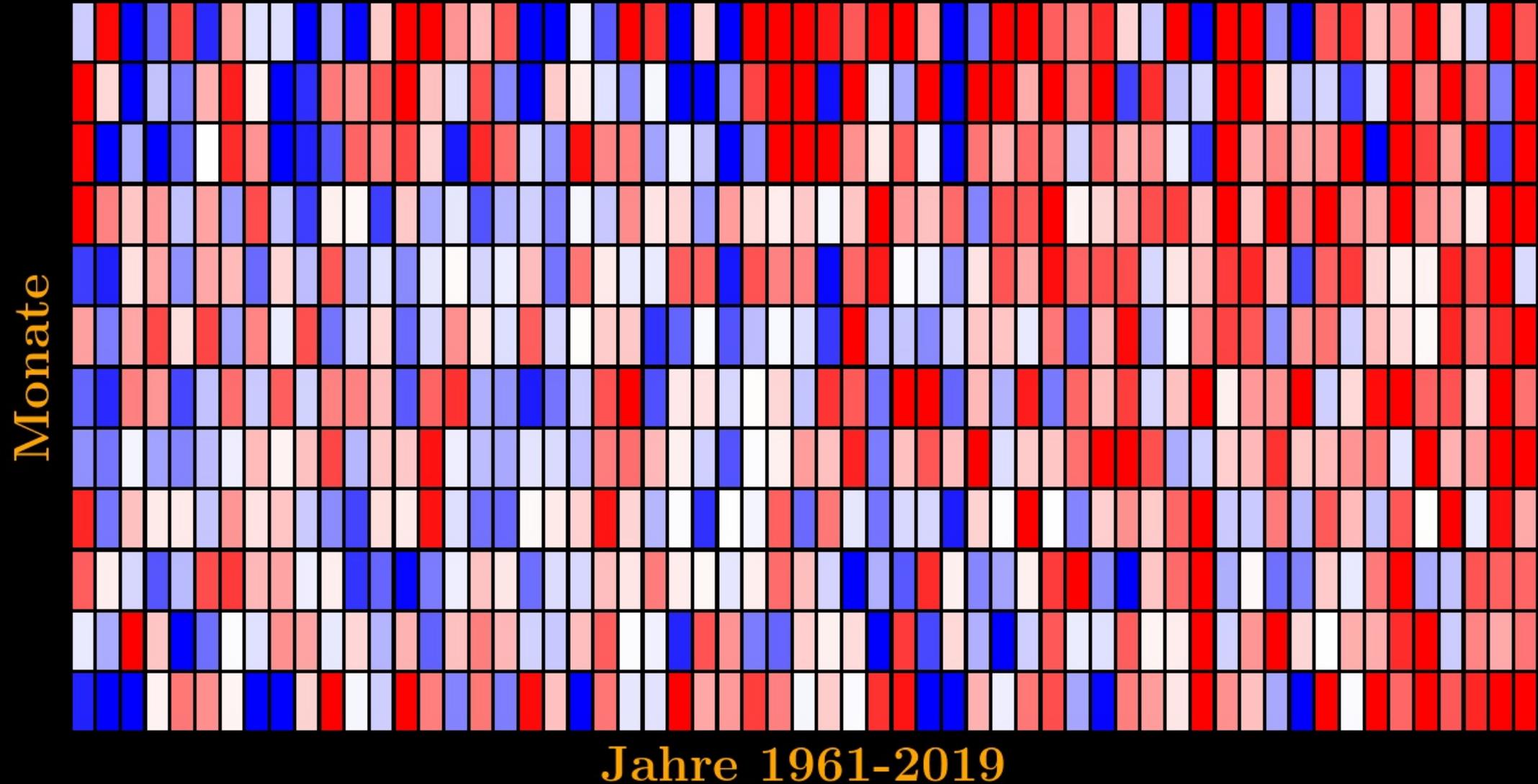
Emissionen & COVID-19



Zwischenfazit

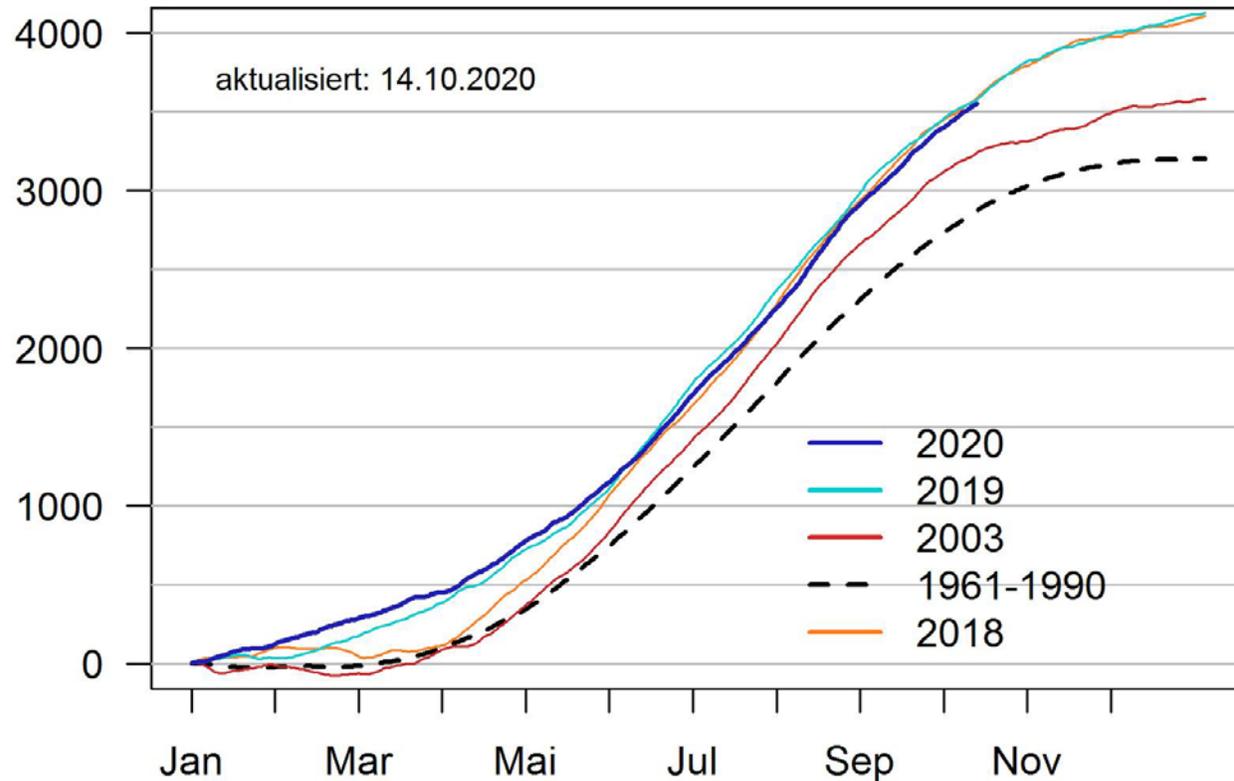
Grundsätzliche Folgen der globalen Klimakrise sind klar
Was bedeutet das für Brandenburg?

Zeitreihe Potsdam: $T - \bar{T}$

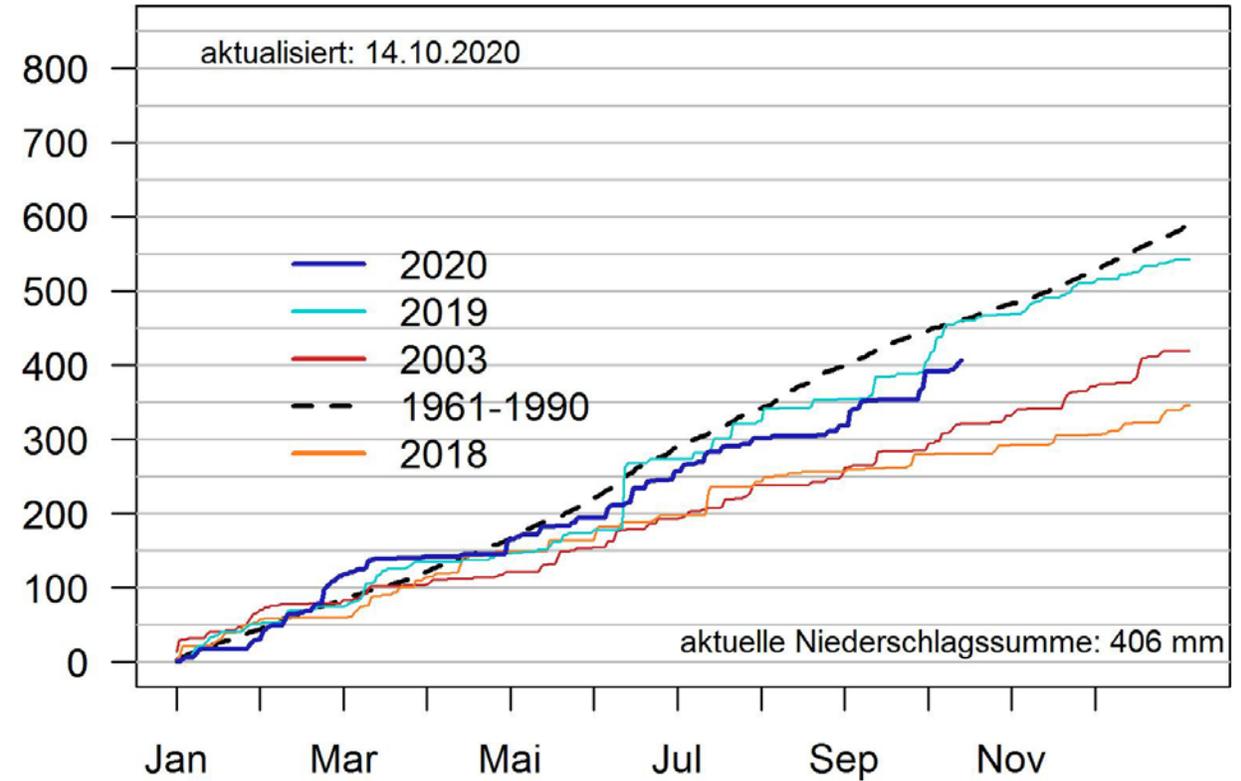


Temperatur und Niederschlag in Potsdam

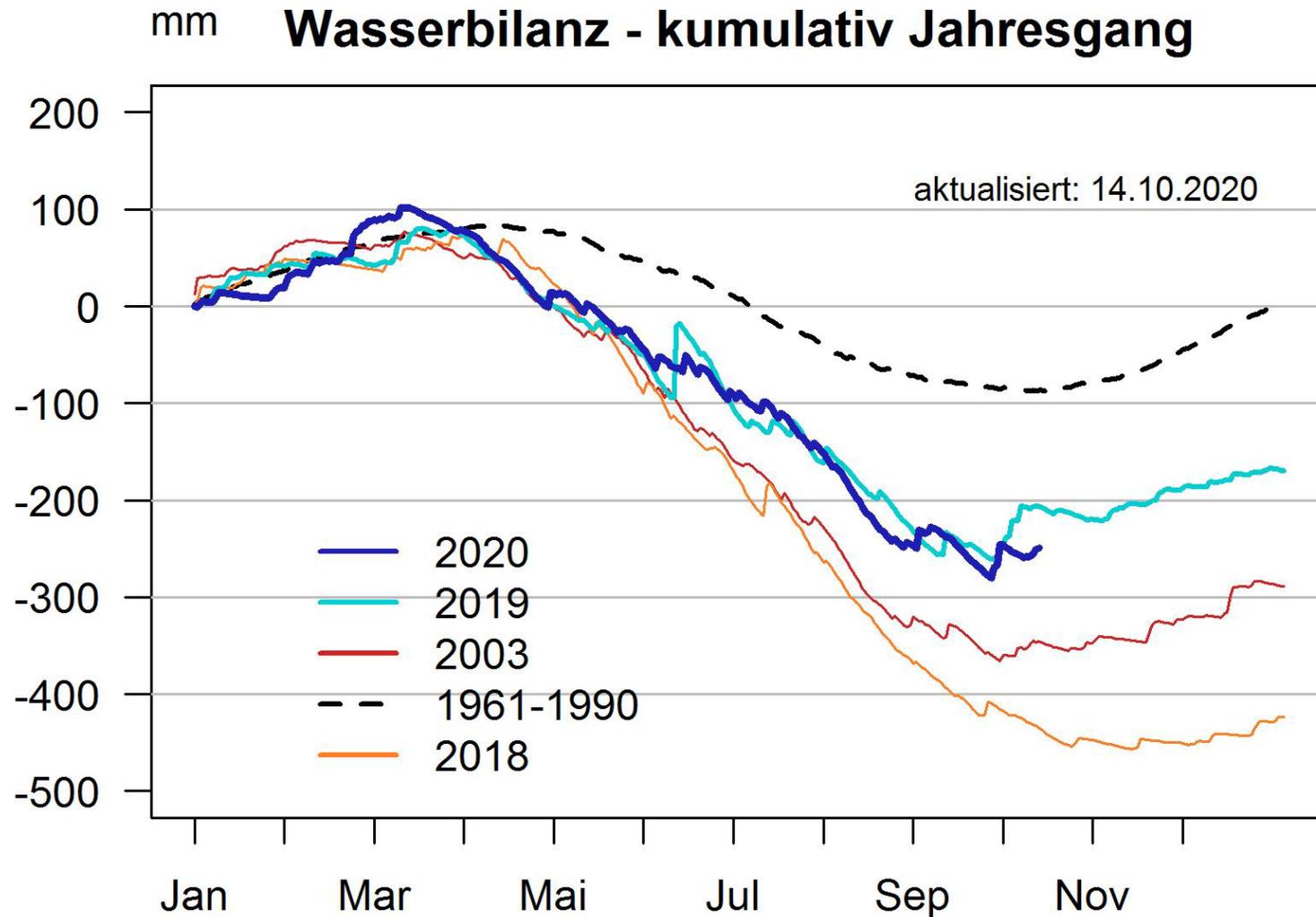
°C Tagesmitteltemperatur - kumulativ Jahrgang



mm Niederschlag - kumulativ Jahrgang

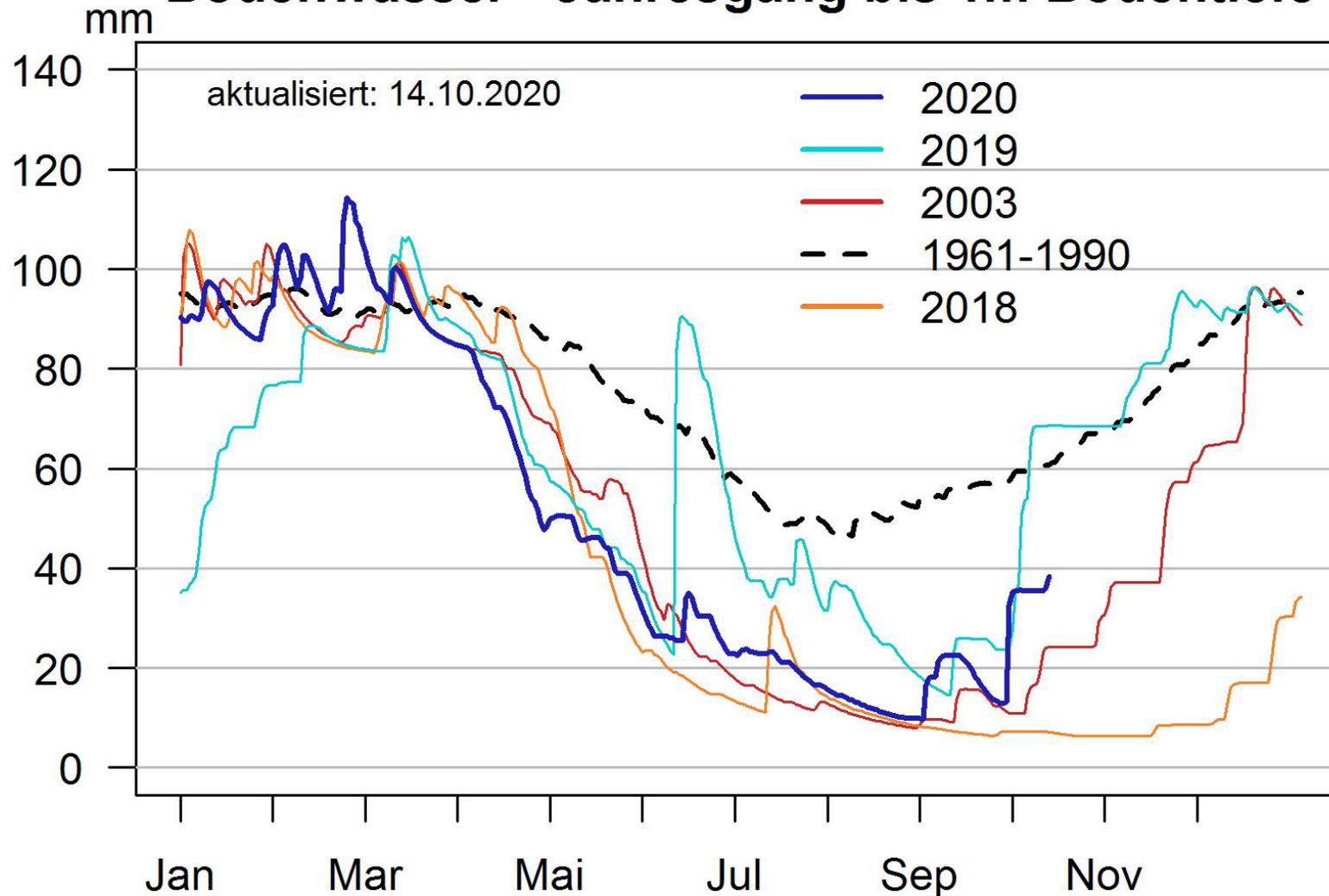


Klimatische Wasserbilanz – (Niederschlag – potentielle Evapotranspiration)



Bodenfeuchte

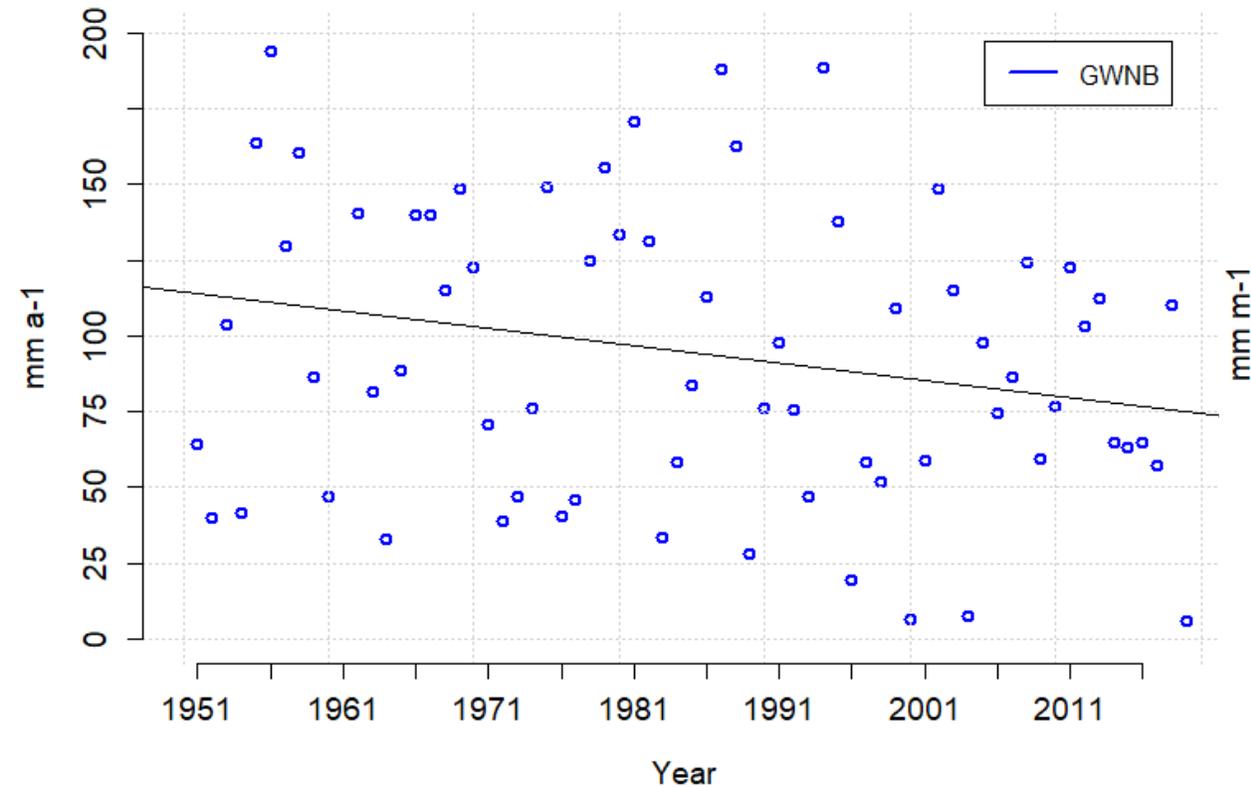
Bodenwasser - Jahresgang bis 1m Bodentiefe



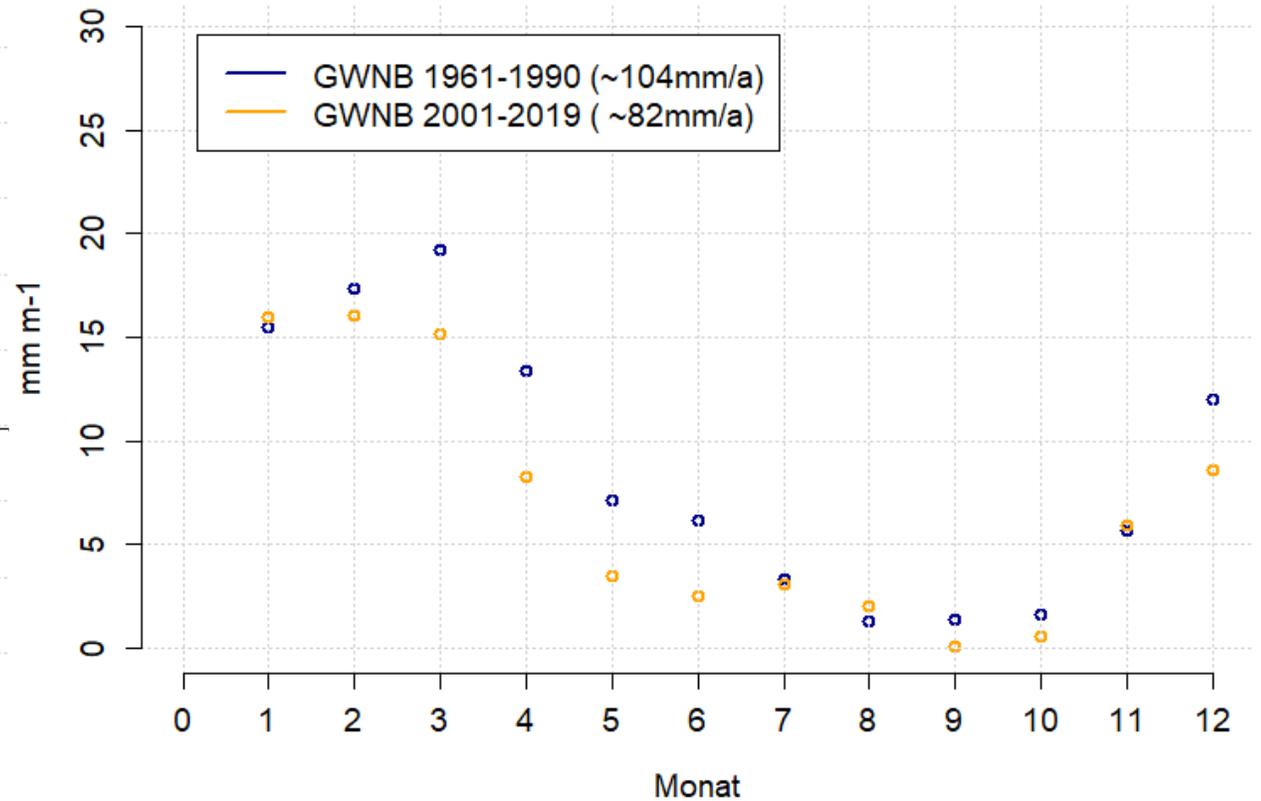
Trends in der Grundwasserneubildung 1951-2019

DWD-Station Potsdam

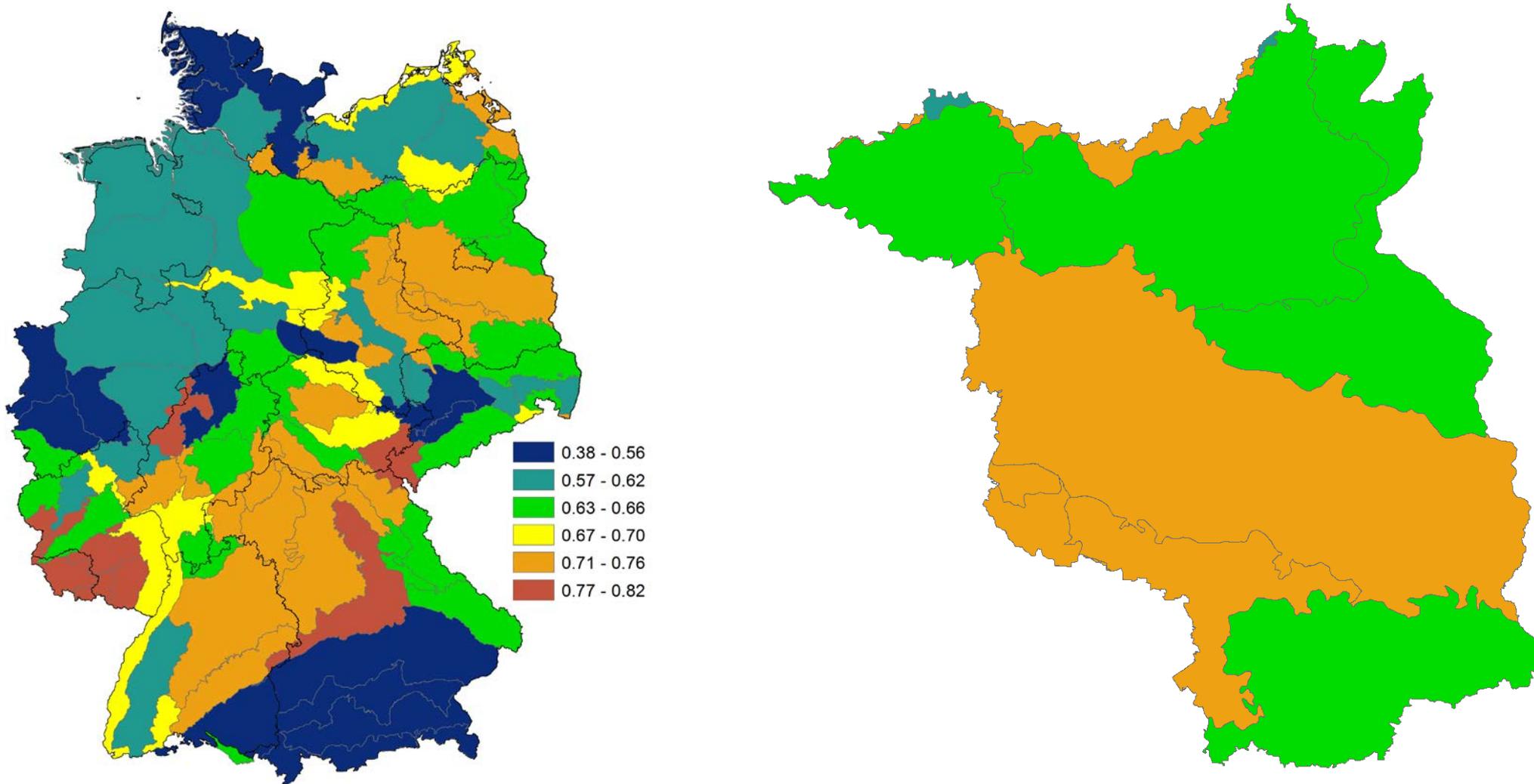
Jährliche Grundwasserneubildung Station Potsdam



Monatliche Grundwasserneubildung

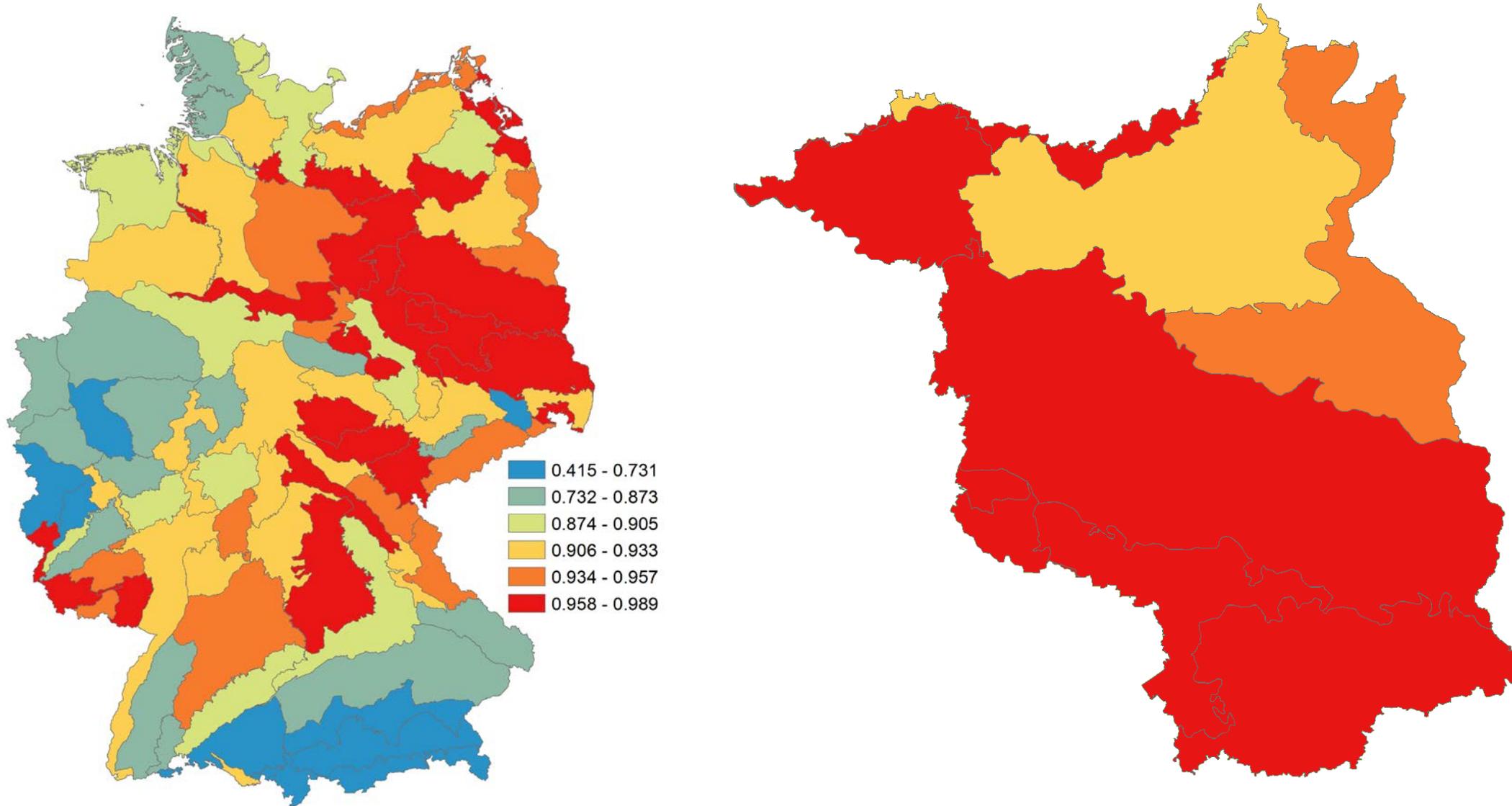


Mittleres Jahresminimum Bodenwasserdefizit [%] 1961-2019

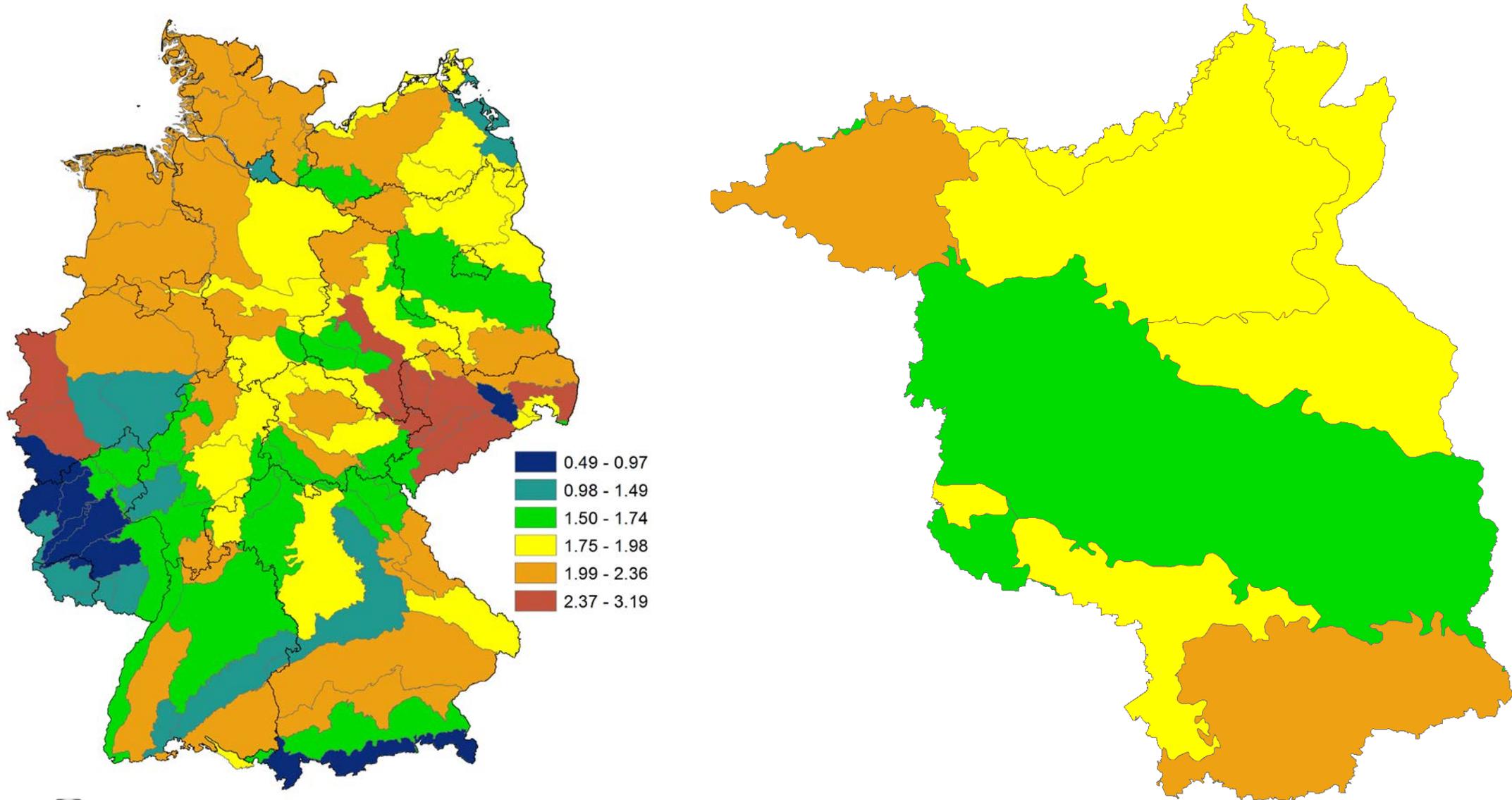


hohe werte = tiefes minimum = wenig wasser für die pflanzen

Jahresminimum Bodenwasserdefizit [%] 2018



Anzahl Standardabweichungen des 2018-Bodenwasserdefizits

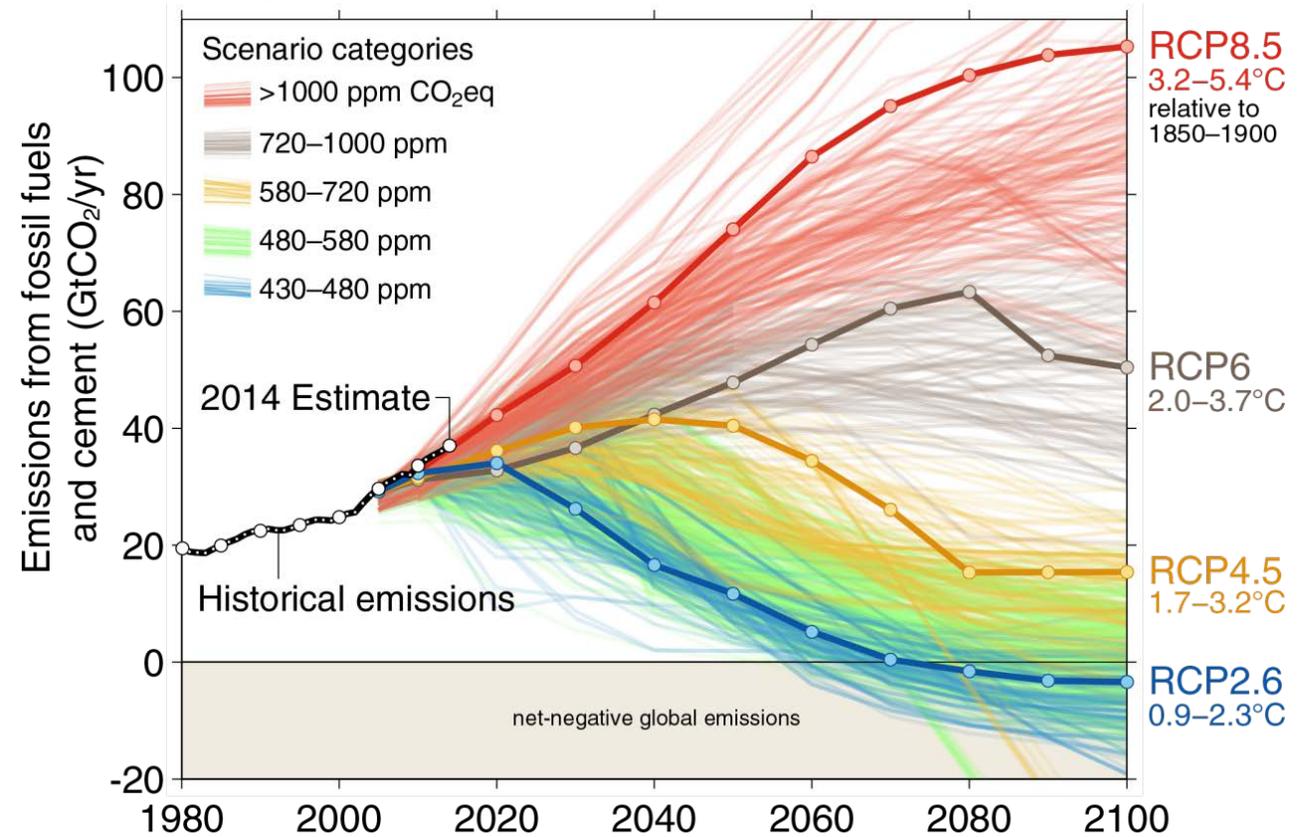


Zwischenfazit

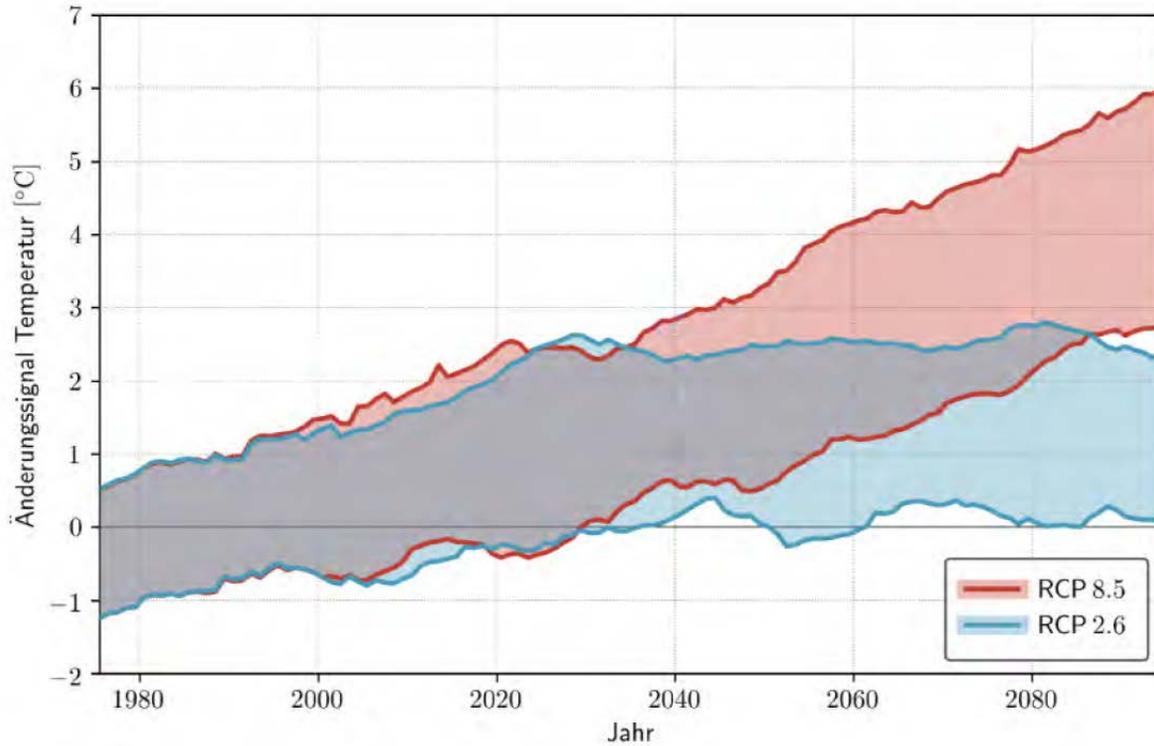
Grundsätzliche Folgen der globalen Klimakrise sind klar

Daten für Brandenburg zeigen deutliche Klimafolgen

Was sagen die Zukunftsszenarien?

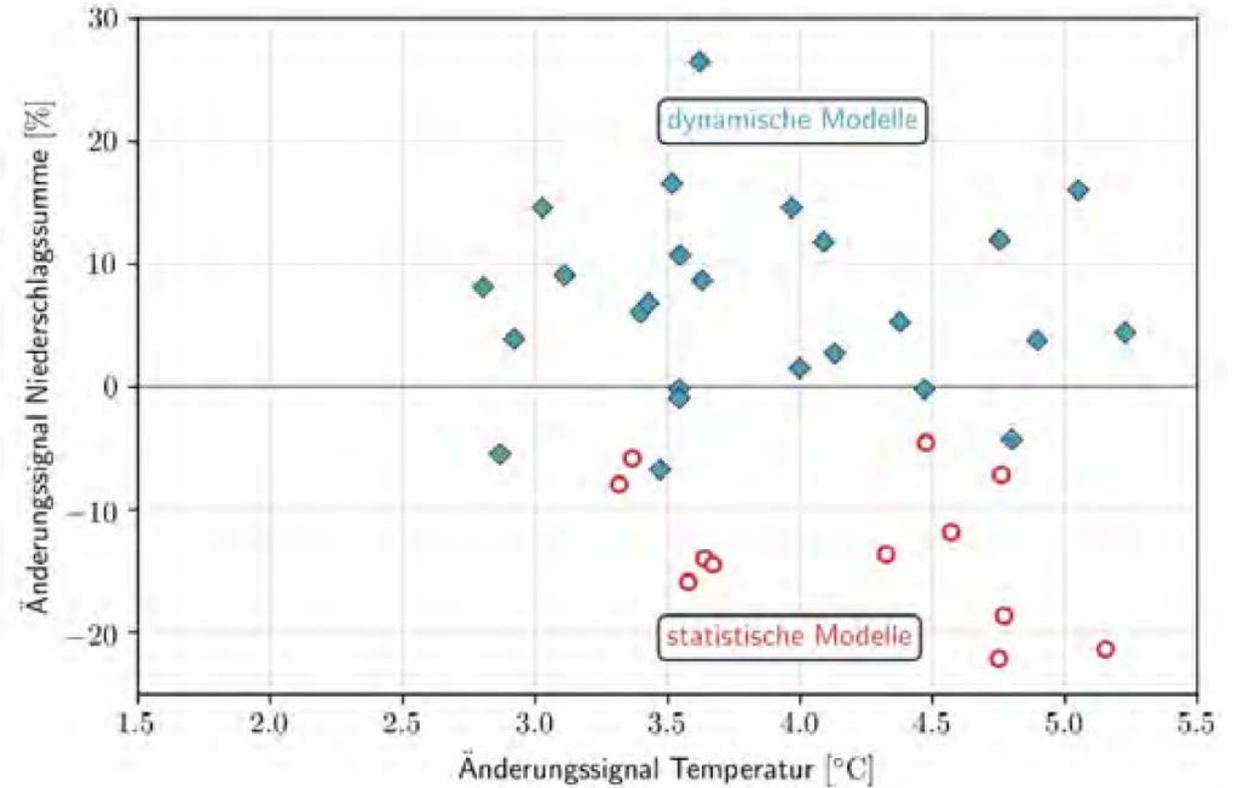


Klimaszenarien Deutschland



Jahresmitteltemperatur RCP8.5 = 4°C (2.8-5.2°C)

RCP2.6 = 1°C (0.7-2.4°C)



Abnahme Sommerniederschläge (unsicher)

Zunahme Winterniederschläge

Jahresmitteltemperatur: 18 Euro-Cordex Läufe (RCP8.5)

OBS:1961-1990

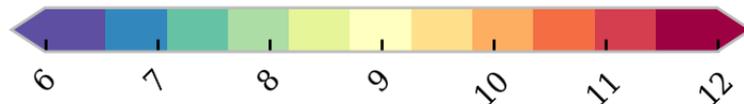
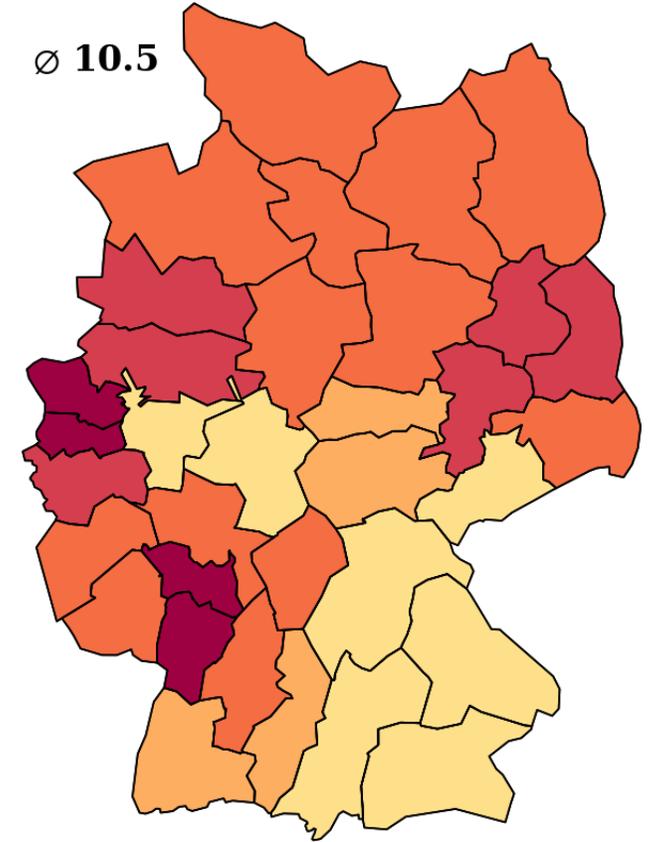
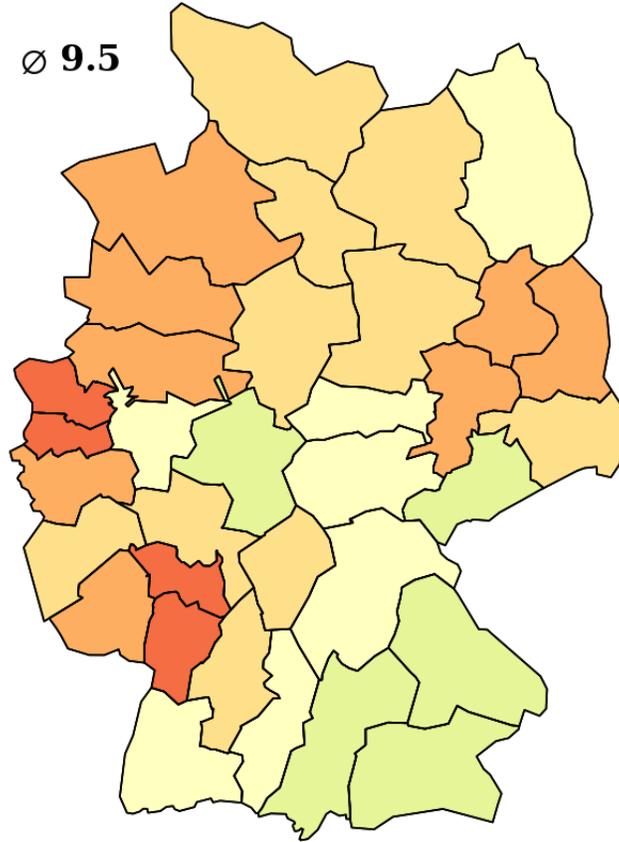
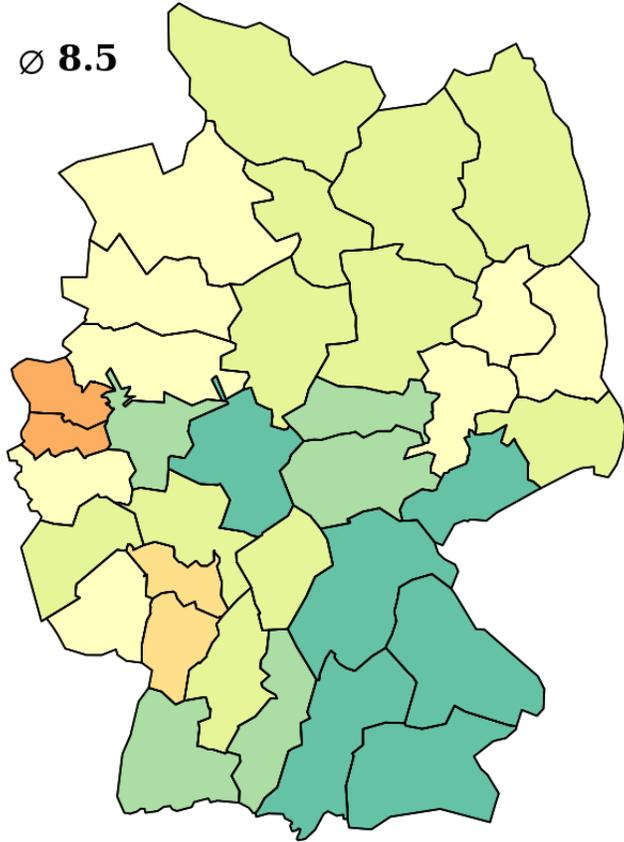
OBS:1991-2020

RCP85:2031-2060

Ø 8.5

Ø 9.5

Ø 10.5



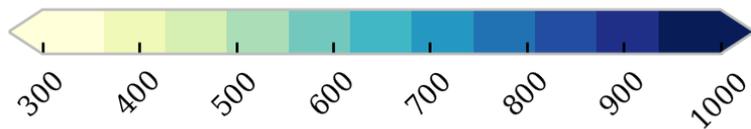
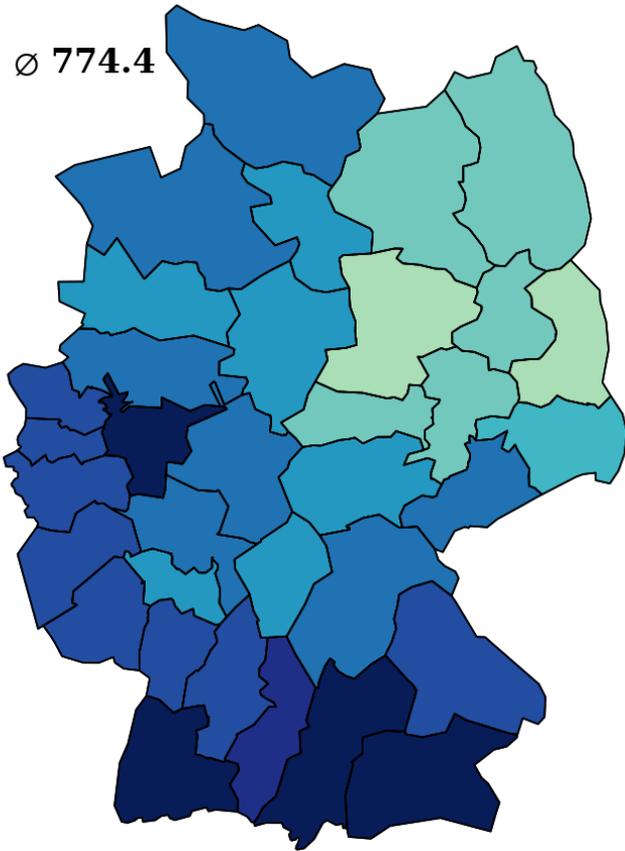
Jahresmitteltemperatur [GradC]

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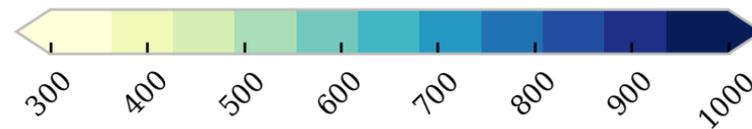
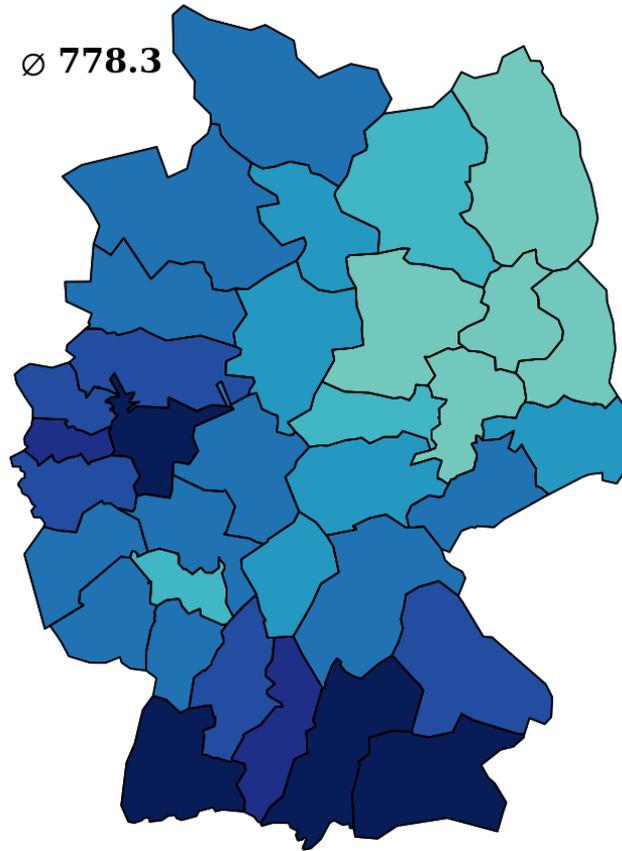
Jahresniederschlag: 18 Euro-Cordex Läufe (RCP8.5)

OBS:1961-1990



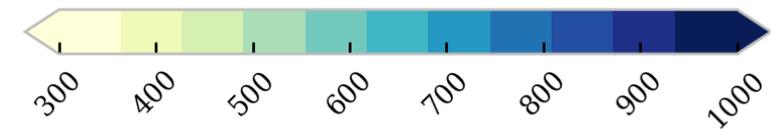
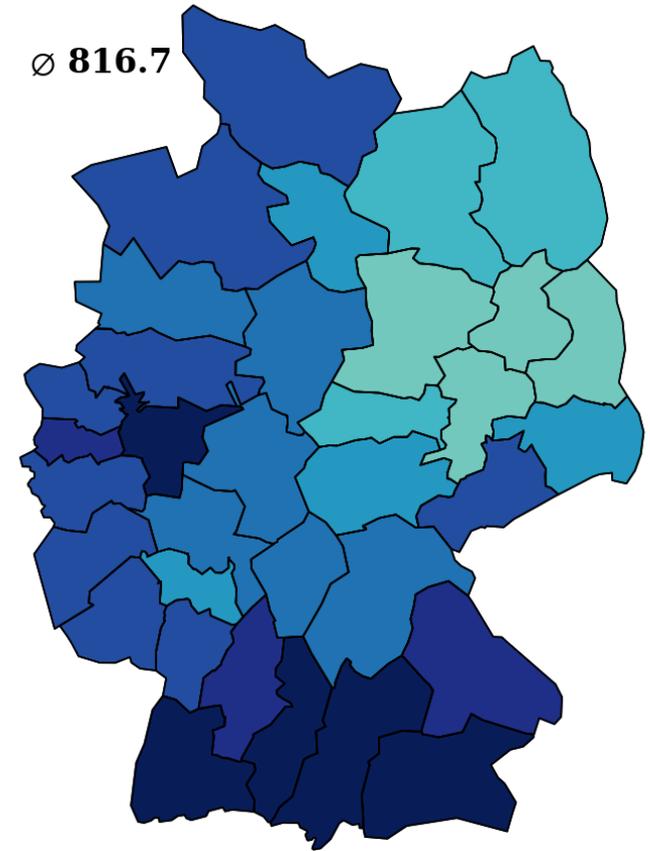
Jahresniederschlag [mm]

OBS:1991-2020



Jahresniederschlag [mm]

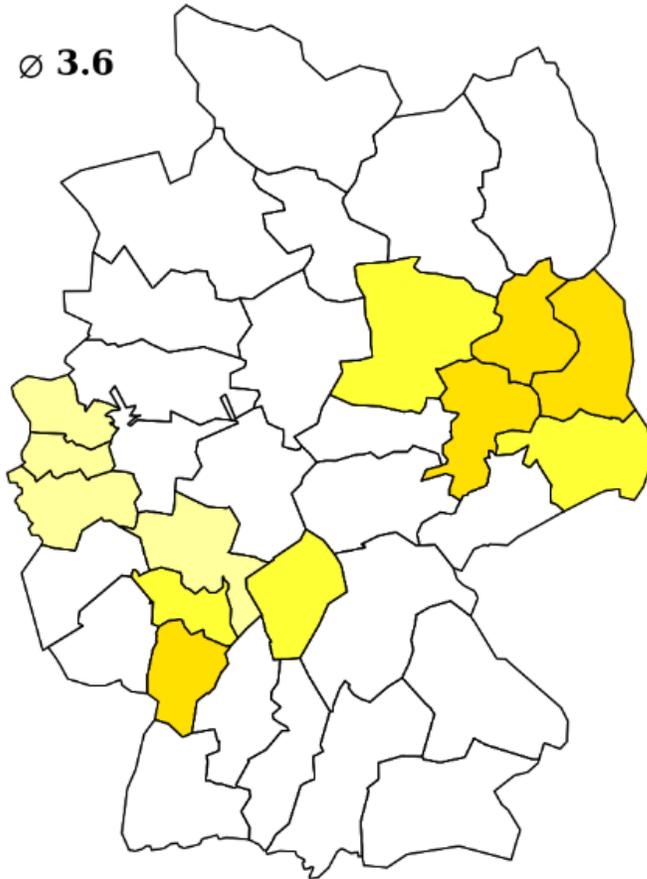
RCP85:2031-2060



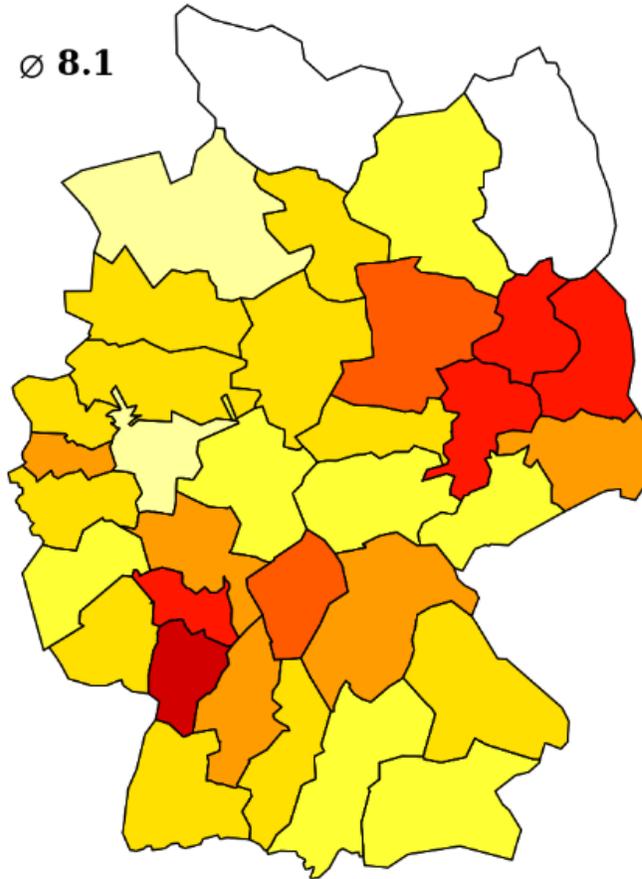
Jahresniederschlag [mm]

Hitzetage (Tage >30°C): 18 Euro-Cordex Läufe (RCP8.5)

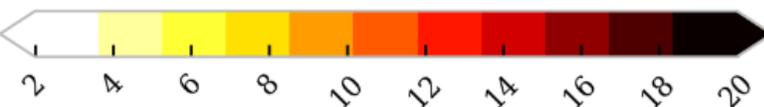
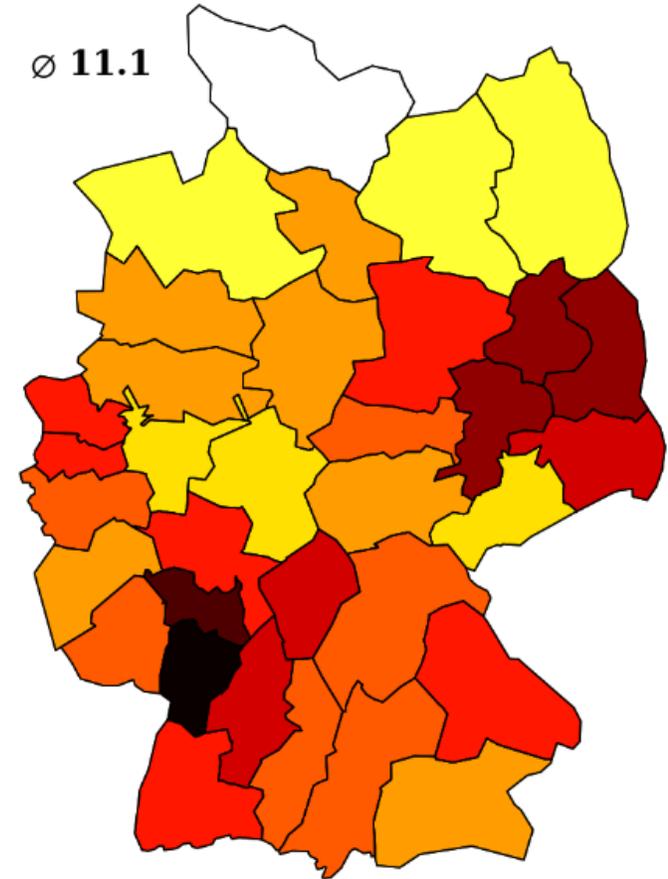
OBS:1961-1990



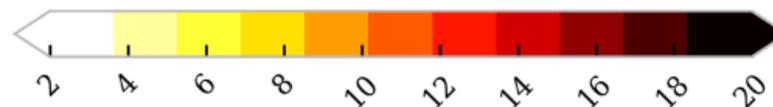
OBS:1991-2020



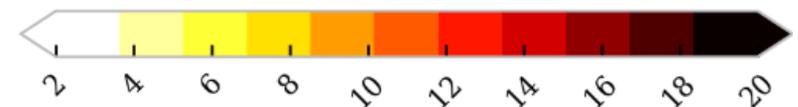
RCP85:2031-2060



Hitzetage [Tage]



Hitzetage [Tage]



Hitzetage [Tage]

Fazit

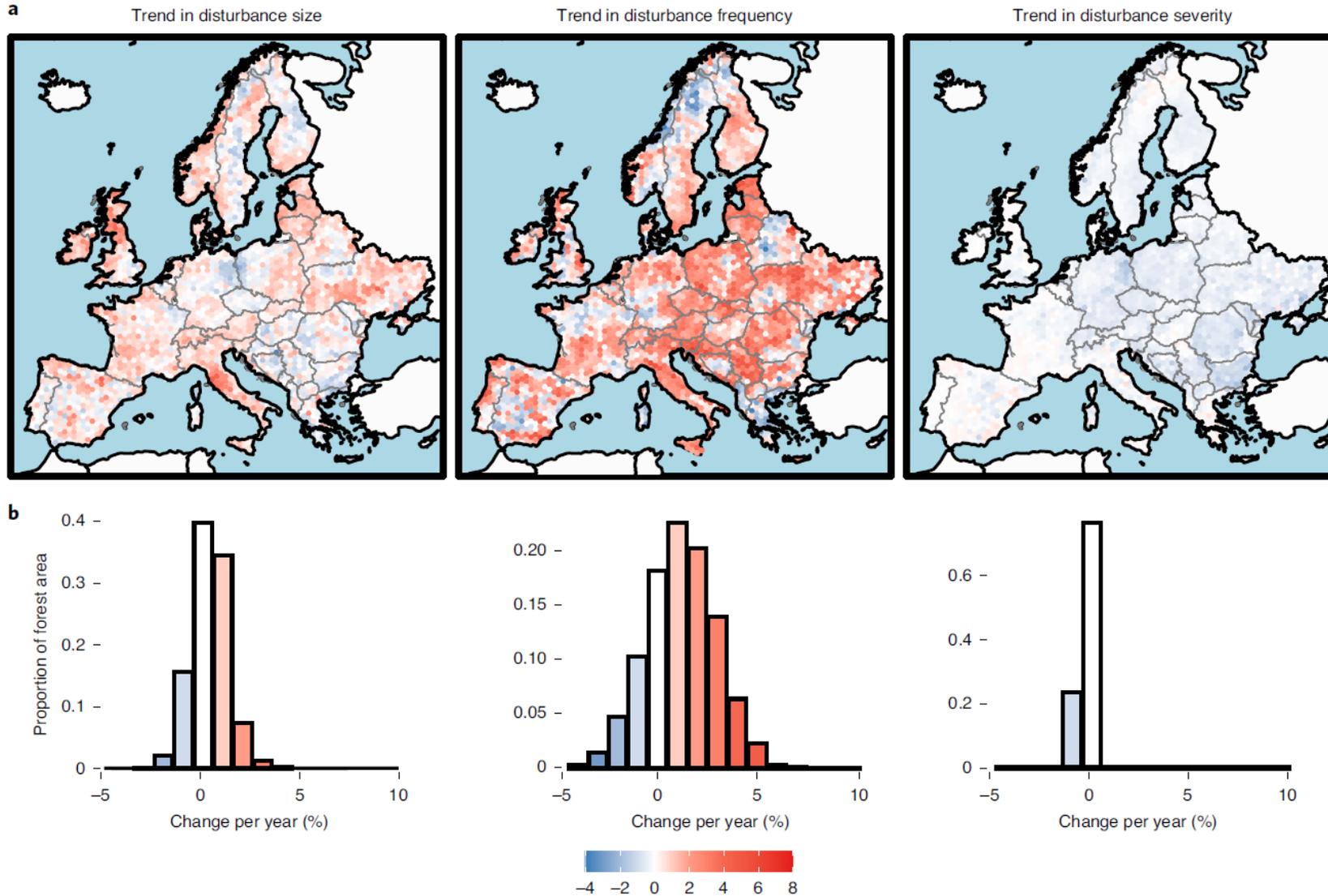
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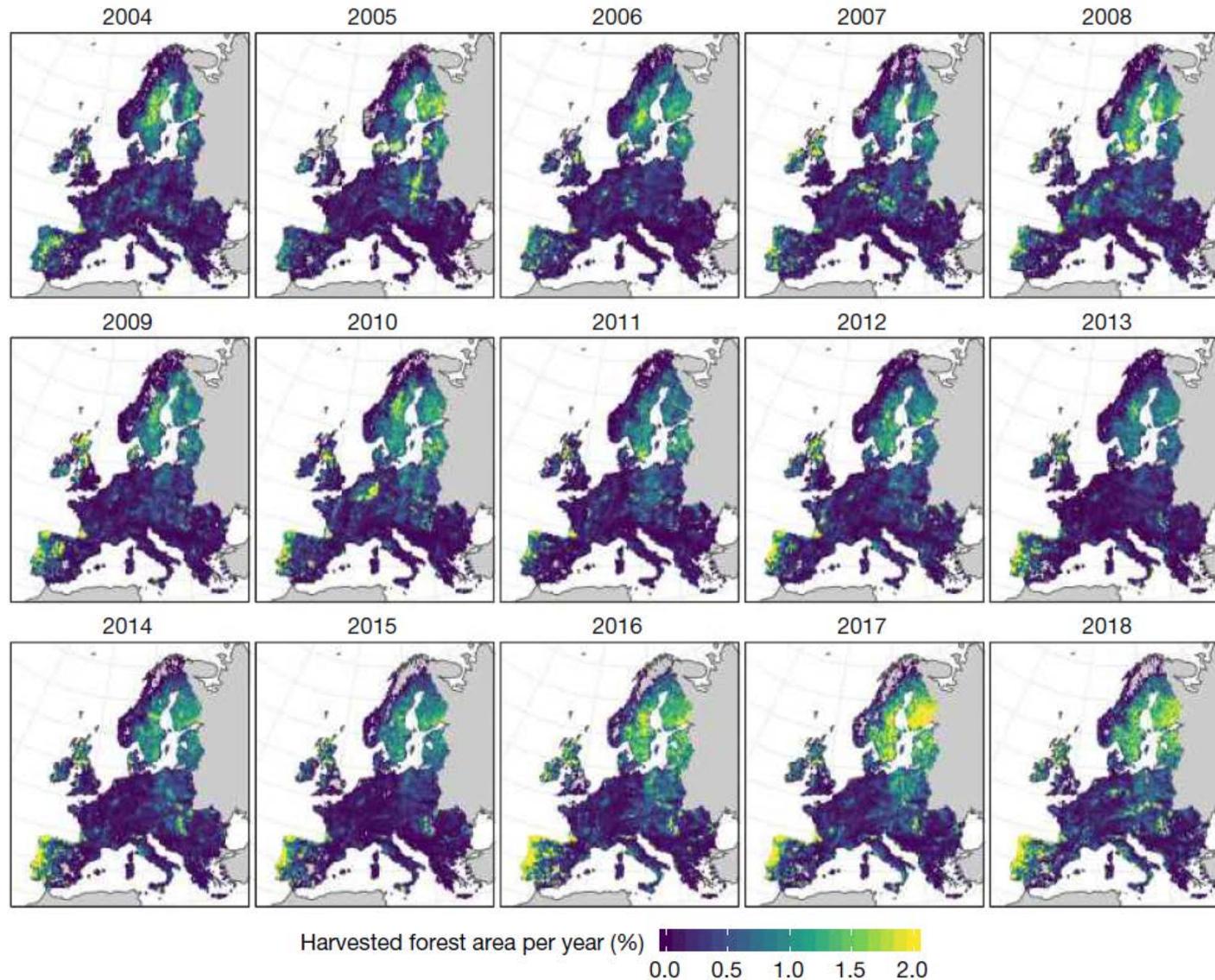
Was sagen die Zukunftsszenarien?

- Weitere Erwärmung
- Verschärfung der Wassersituation im Sommer
- Extremereignisse / Wiederholung von 2018-2019?

Ausblick: Waldstörungen

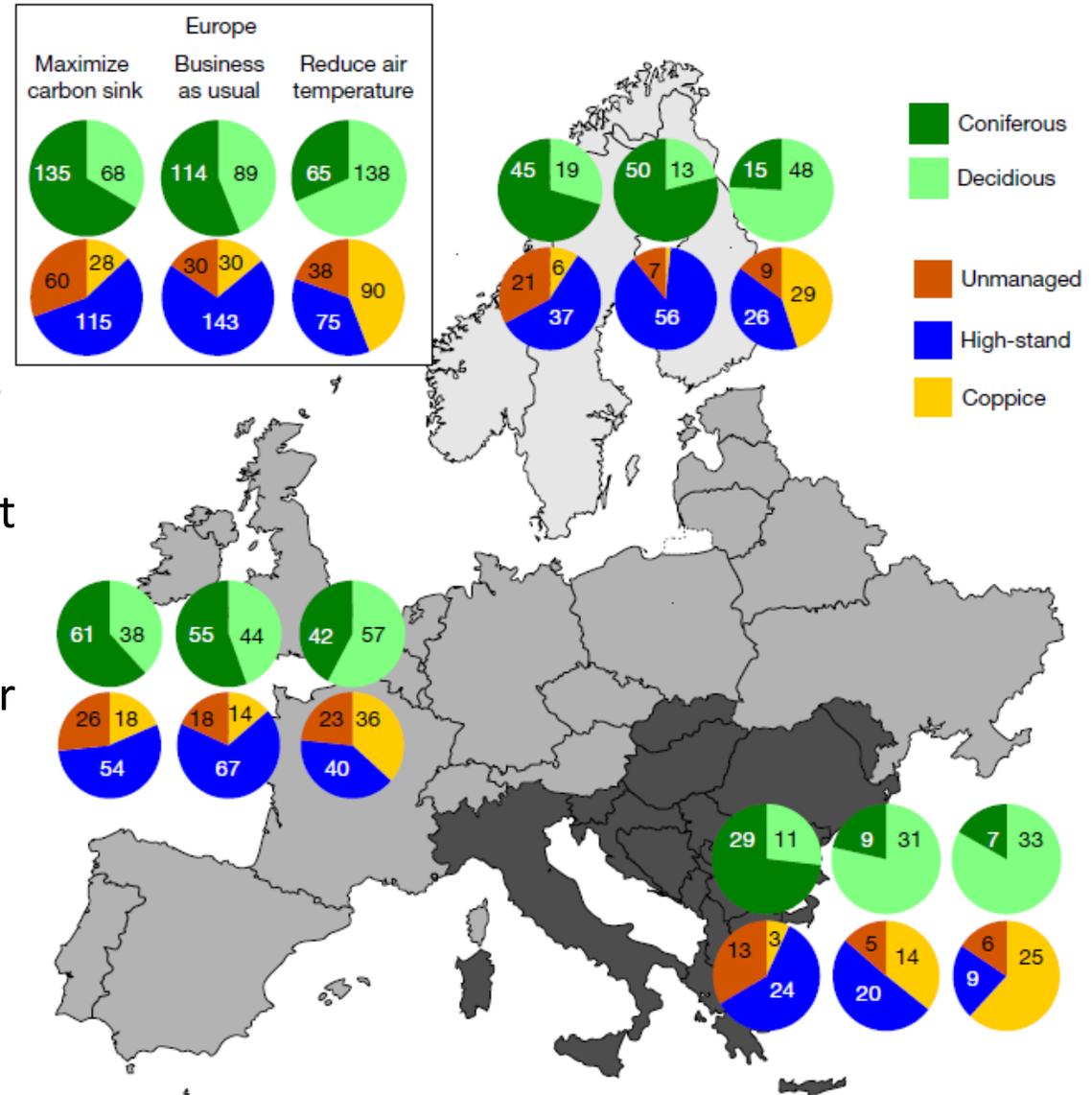


Ausblick: Wird zuviel geerntet?



Ausblick: Wechselwirkungen zwischen Klimaschutzfunktionen der Wälder

- “climate benefits from forest management are modest and local”
- “Europe should not rely on forest management to mitigate climate change”
- “forests could be adapted (species composition, silvicultural systems) with neither positive nor negative climate effects”



Vielen Dank!



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