

For our Environment

TAIEX Workshop
AIR QUALITY POLICY IMPLEMENTATION
RELATED TO OZONE
Madrid, 21/22 November 2018

The Ozone Challenge in Germany

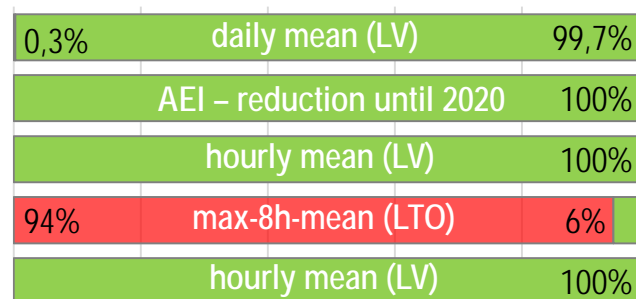
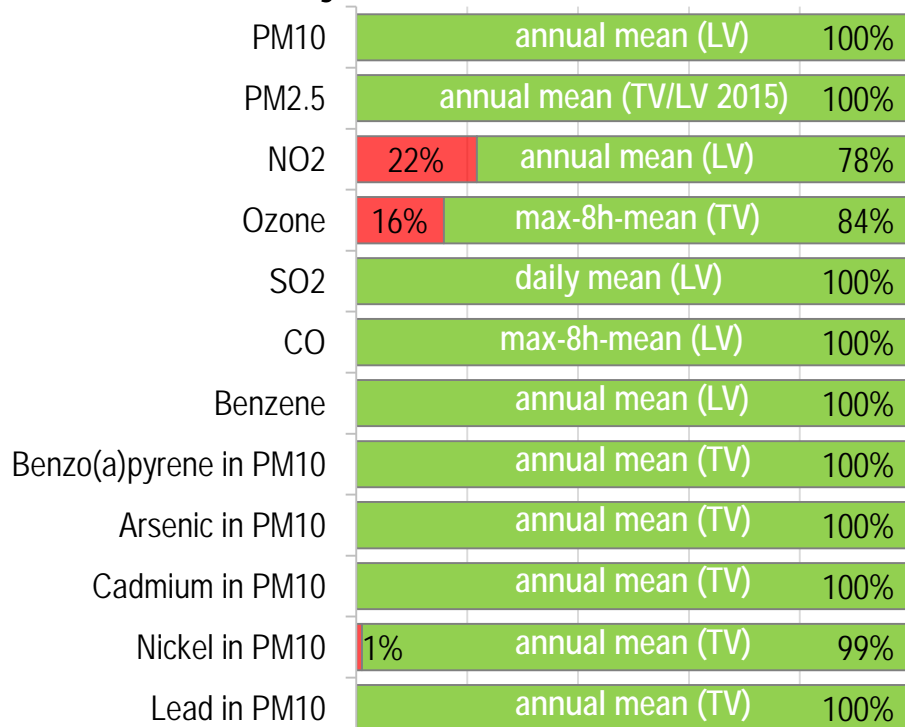
Marion Wichmann-Fiebig
Head of Unit II 4 „Air Quality“
Federal Environment Agency, Germany

Ozone Situation in Germany

- **RISK TO HUMAN HEALTH AND VEGETATION**
- **CONCENTRATION TRENDS**
- **FORMATION UNDER EXTREME WEATHER CONDITIONS**

Exceedance of EU limit and target values at German monitoring sites in 2017

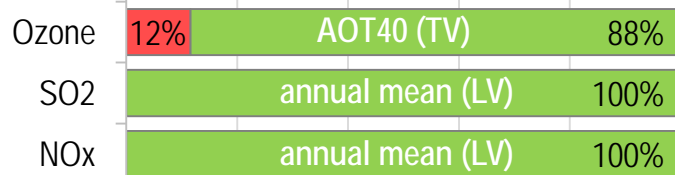
Environmental objective: Human health



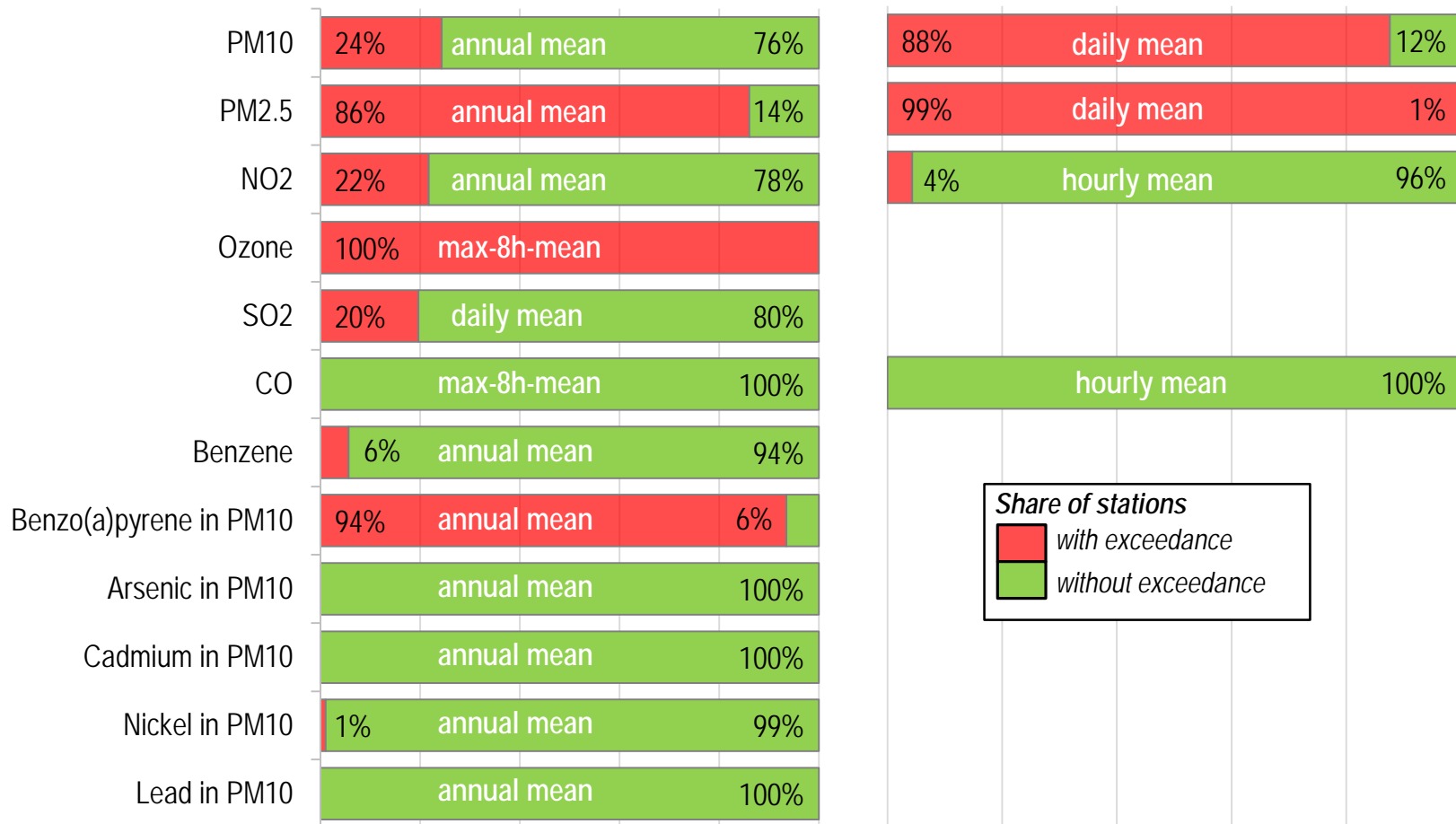
LV ... limit value
TV ... target value
LTO ... long term objective

Share of stations
■ with exceedance
■ without exceedance

Environmental objective: vegetation / ecosystem

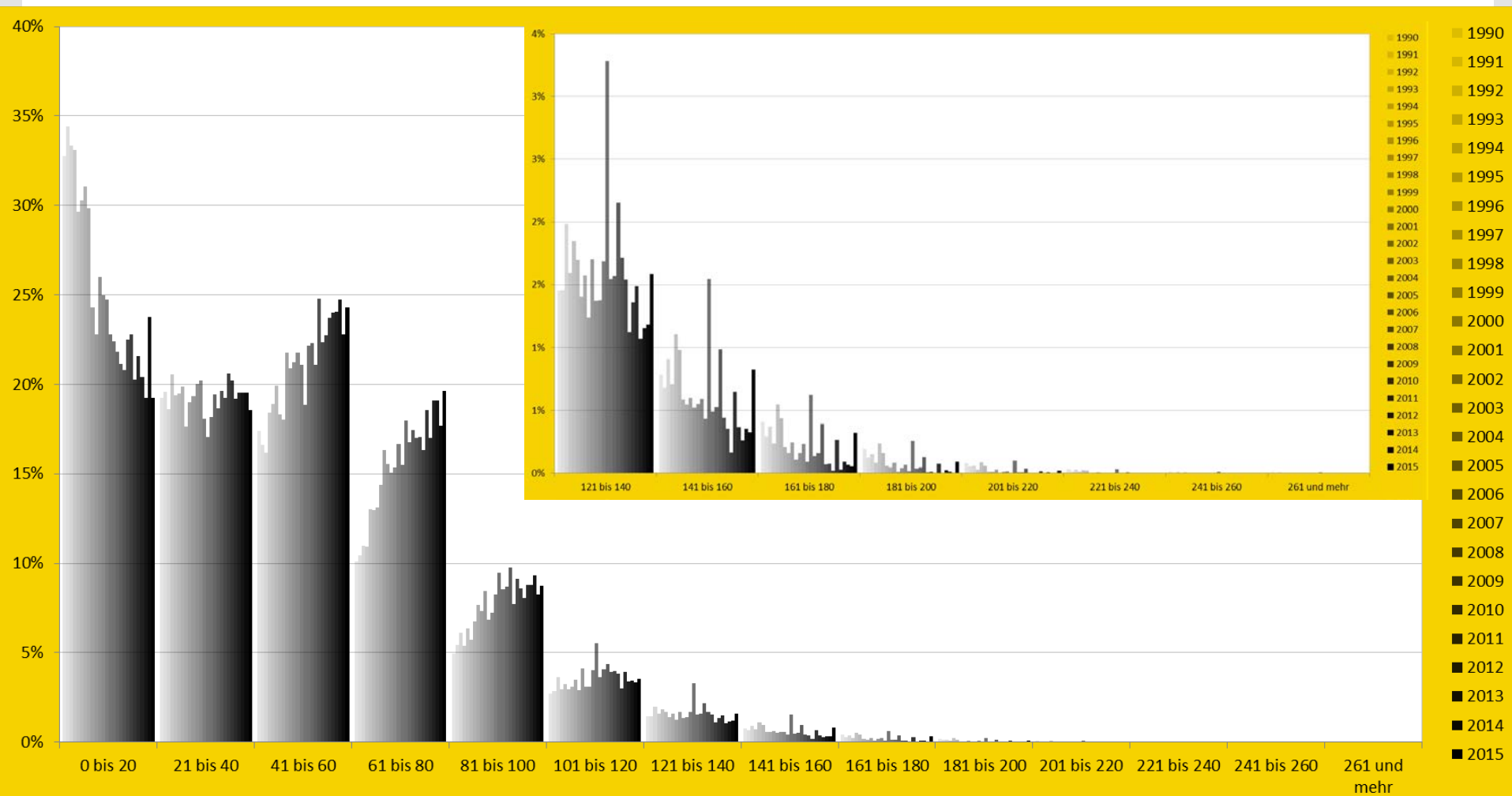


Exceedance of WHO-Guideline Values at German monitoring sites in 2017



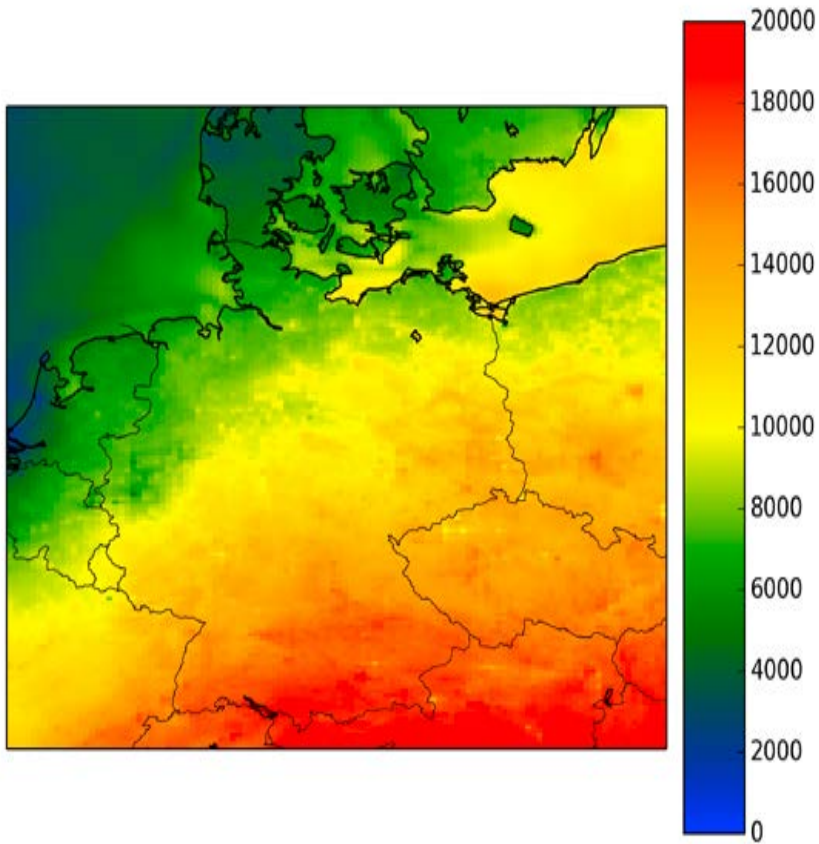
Trend of Ozone Concentrations from 1990 to 2015

- frequency of occurrence of hourly concentrations in specified intervals
- peak values decrease; medium range values increase

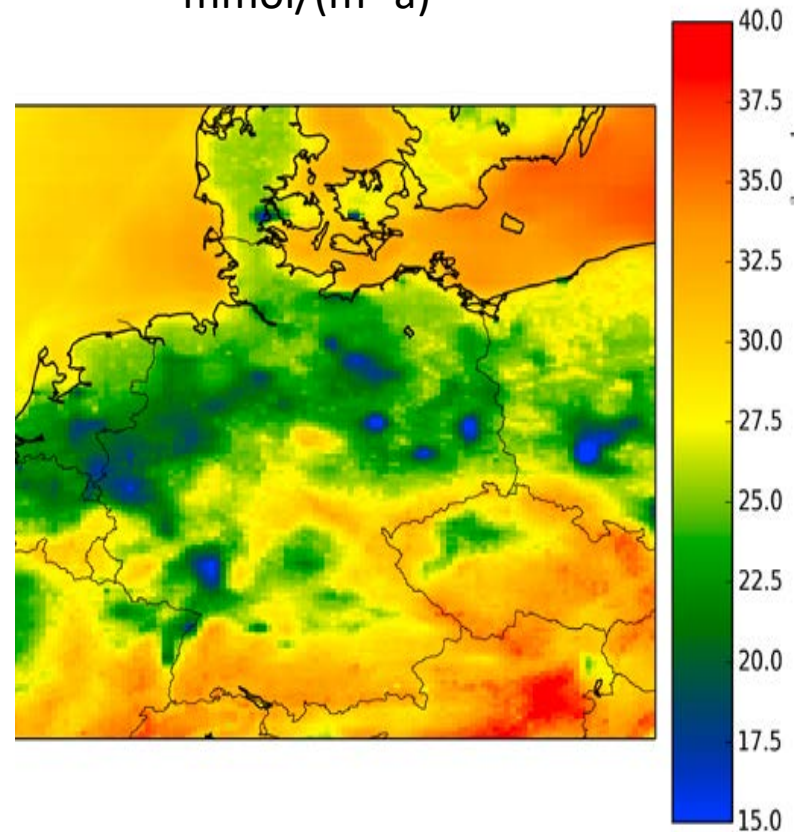


Risk of limited growth for beech trees in 2010

AOT 40 in ppb h



POD
mmol/(m² a)



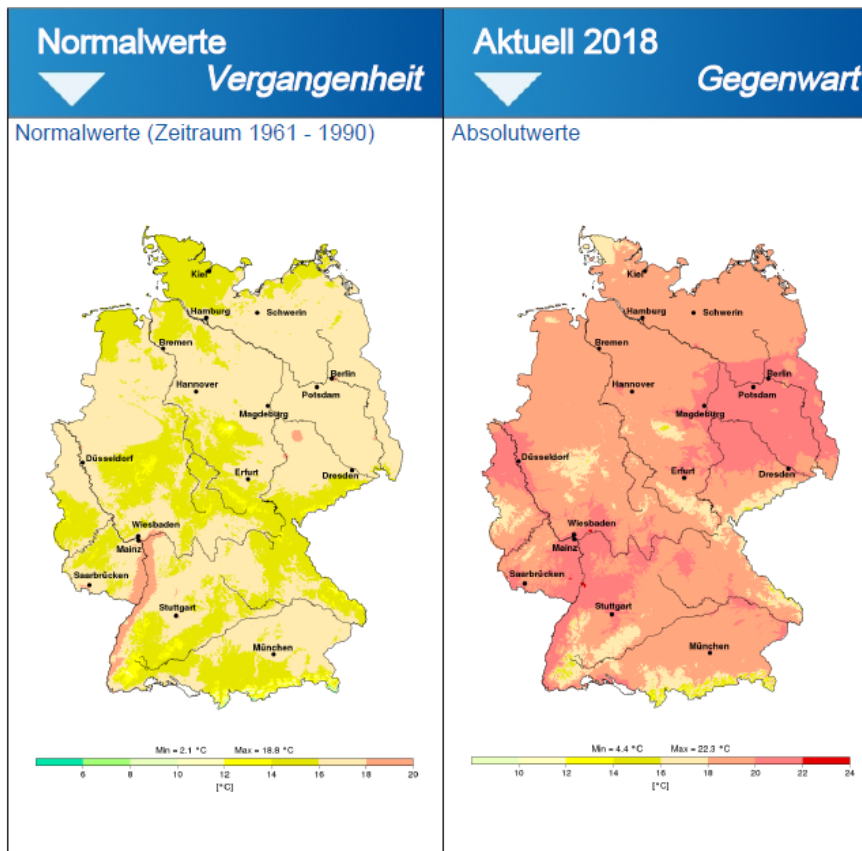
Ozone formation in the extreme year 2018: Temperature

Deutscher Klimaatlas

Deutschland

Lufttemperatur

Sommer 2018

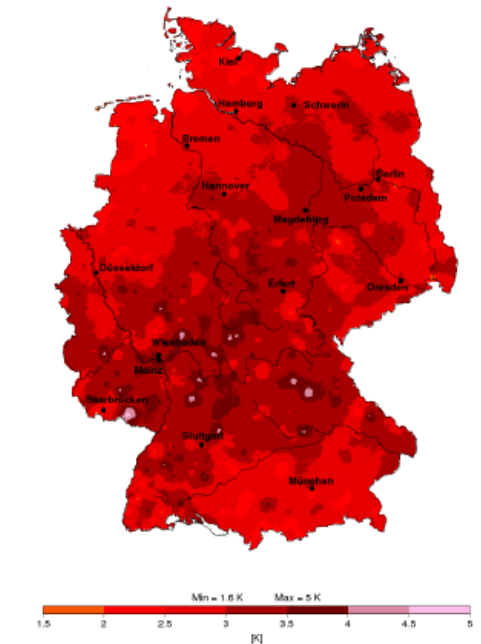


Aktuell 2018



Gegenwart

Abweichung



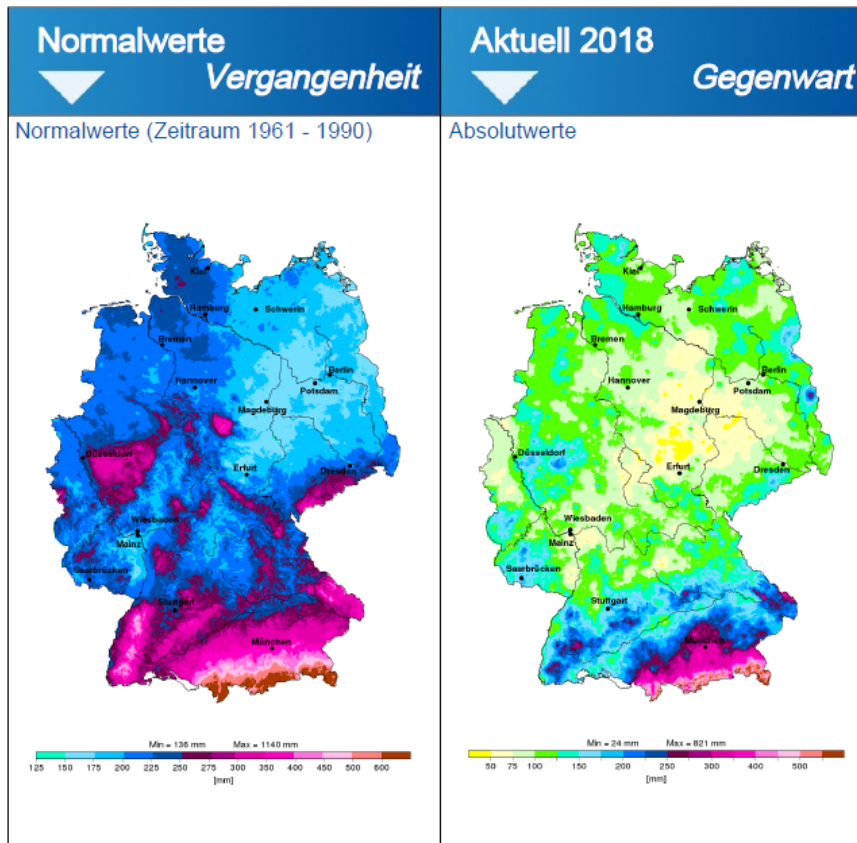
Ozone formation in the extreme year 2018: Precipitation

Deutscher Klimaatlas

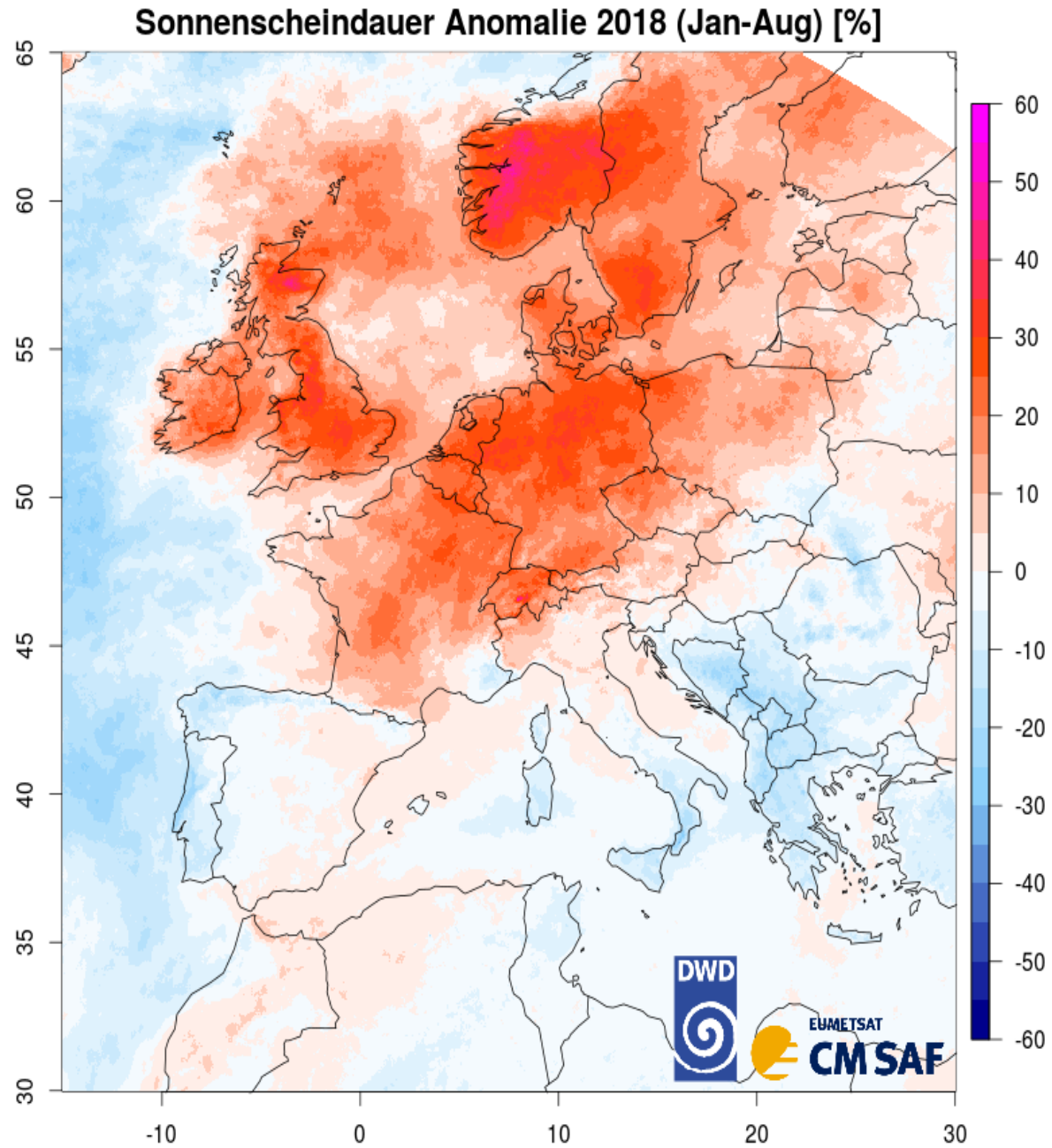
Deutschland

Niederschlag

Sommer 2018



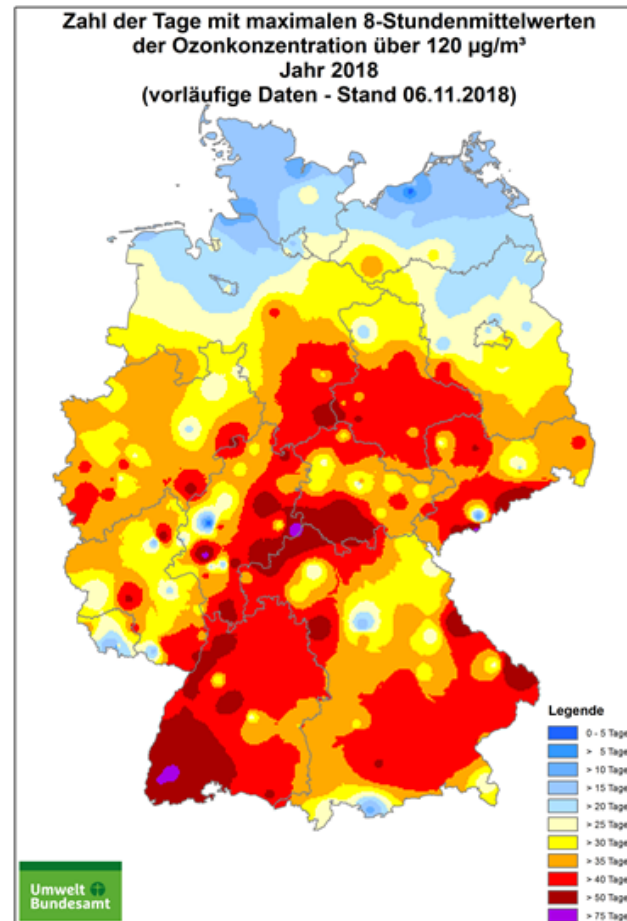
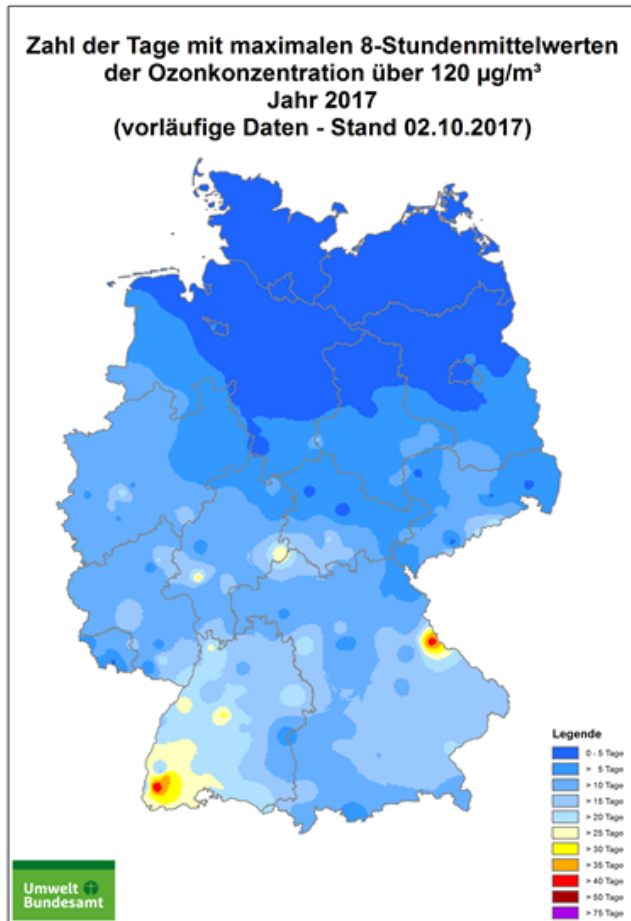
Anomalie of sunshine- hours



Status: 31. August 2018

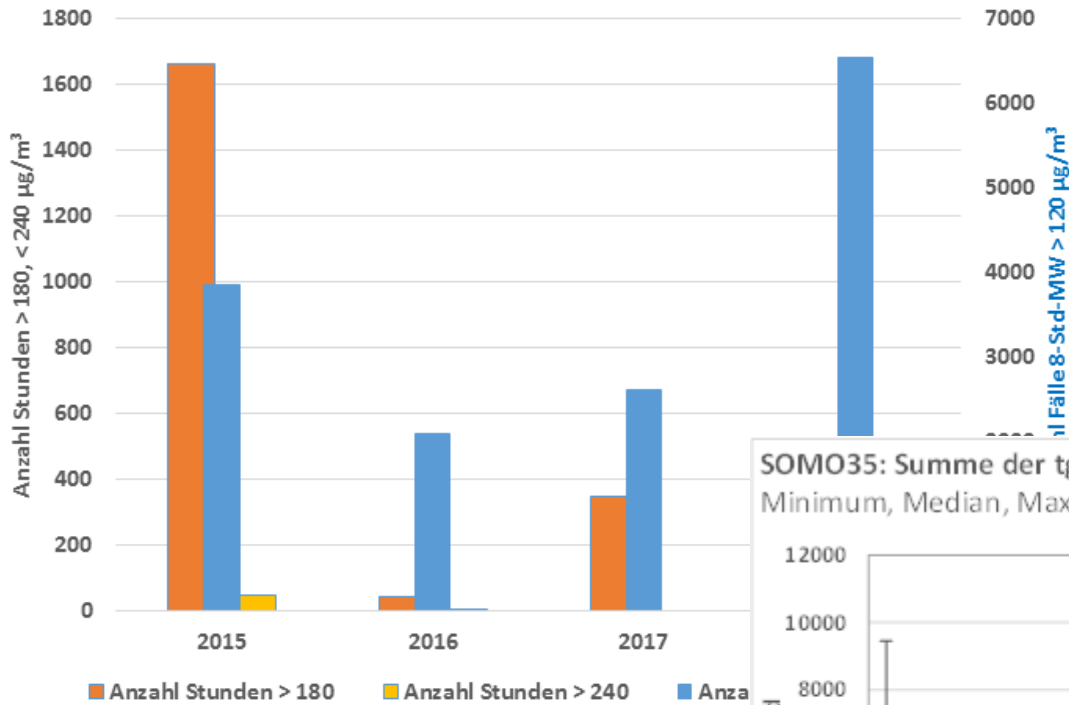
What does this mean for ozone?

Days with max 8h-mean $> 120 \mu\text{g}/\text{m}^3$

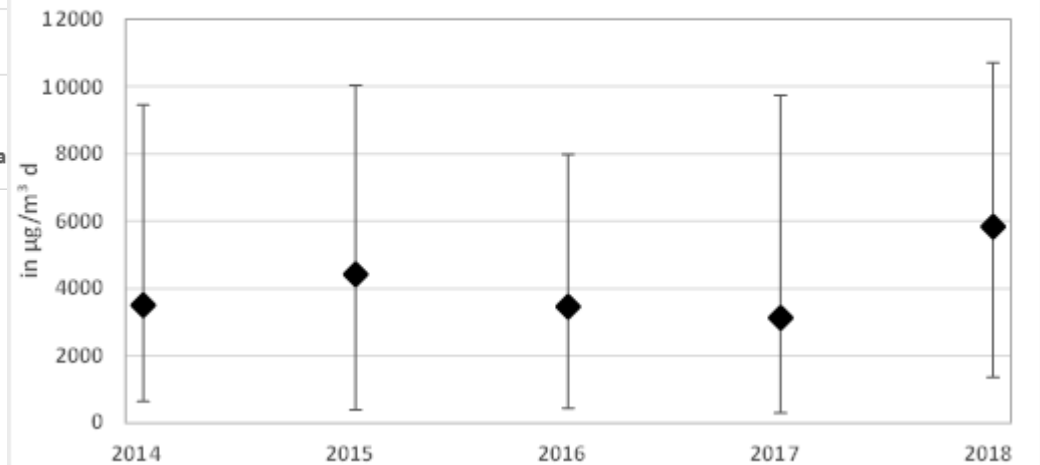


What does it mean for ozone?

Ozonüberschreitungen - April bis Juli

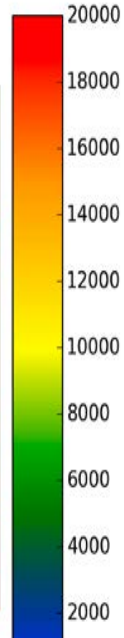
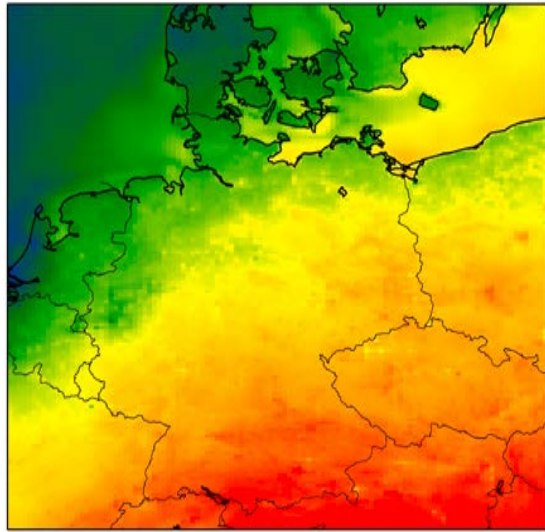


SOMO35: Summe der tgl. max. 8h-Mittel über 35ppb
Minimum, Median, Maximum

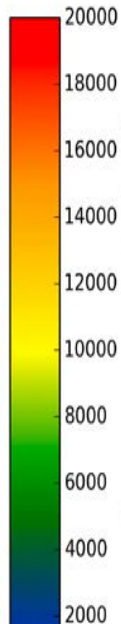
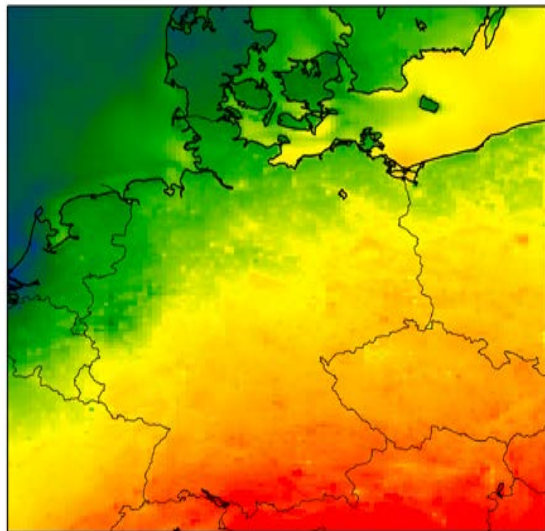
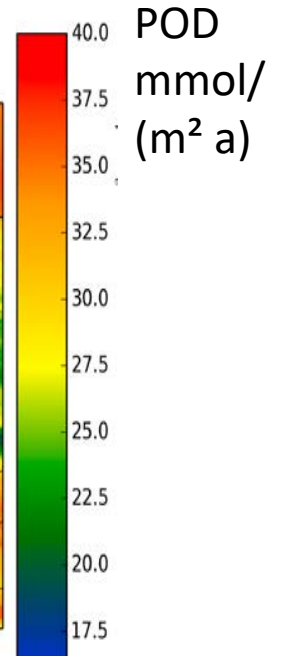
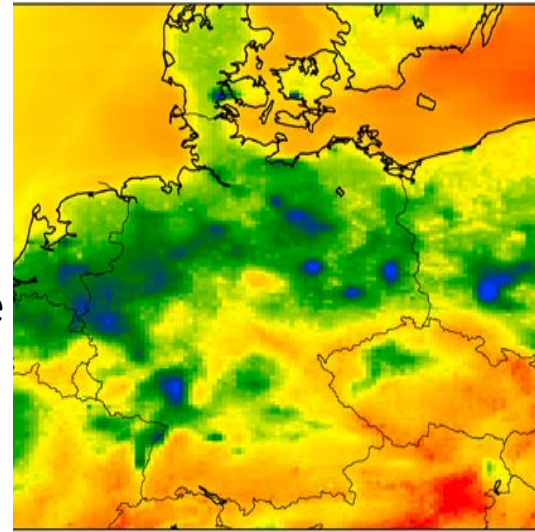


Risk of limited growth for beech trees in 2010

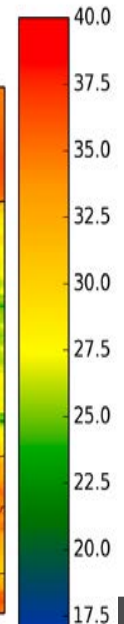
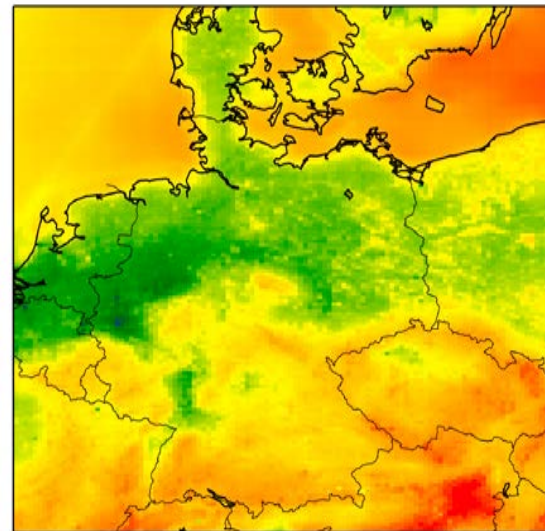
AOT 40 in ppb h



considering
soil moisture

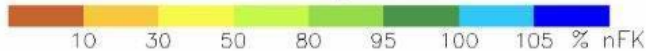
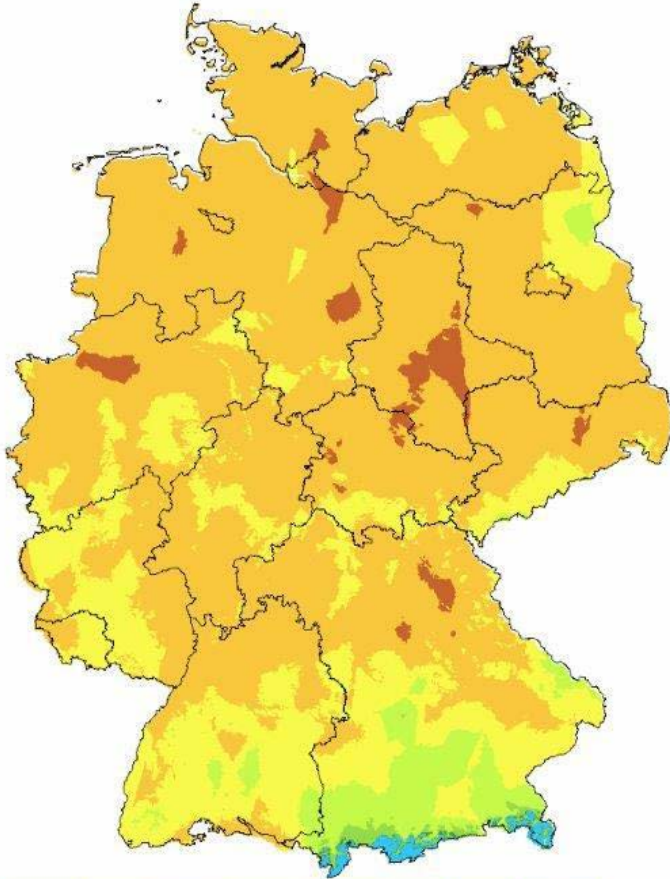


no impact of
soil moisture



Soil moisture anomalies in July and August 2018

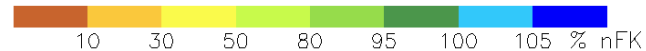
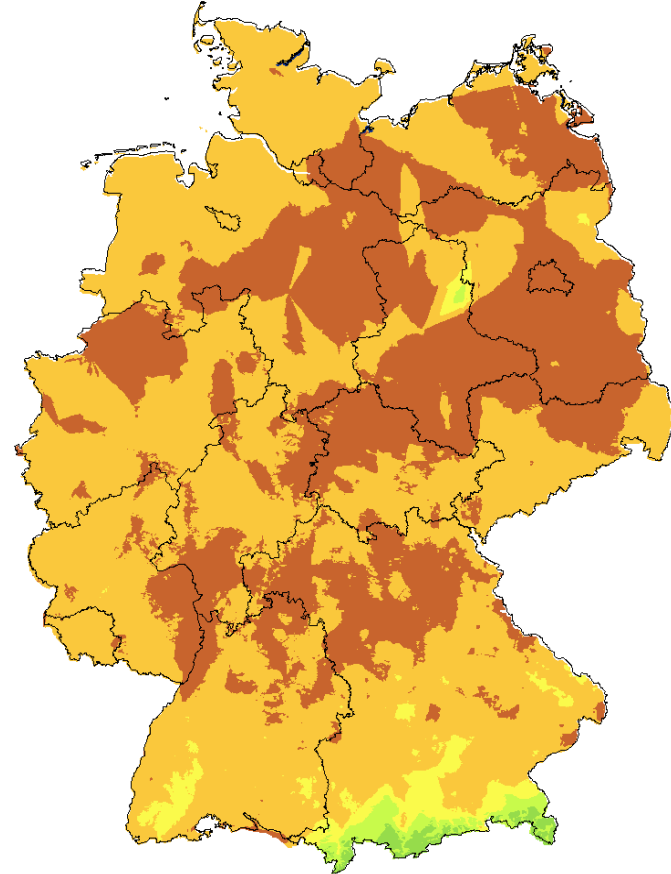
mittlere Bodenfeuchte unter Zuckerrüben (0 – 60 cm)
Juli 2018



Deutscher Wetterdienst (erstellt 1.8.2018 14:05 UTC)
Geobasisdaten © Bundesamt für Kartographie und Geodäsie (www.bkg.bund.de)



mittlere Bodenfeuchte unter Zuckerrüben (0 – 60 cm)
August 2018



Deutscher Wetterdienst (erstellt 4.9.2018 8:32 UTC)
Geobasisdaten © Bundesamt für Kartographie und Geodäsie (www.bkg.bund.de)



Hypothesis:

- **LACK OF SOIL MOISTURE RESULTED IN AN EXTREME REDUCTION OF BIOGENIC VOC**
- **LOCAL TO REGIONAL OZONE FORMATION REDUCED -> NO EXTREME PEAK CONCENTRATIONS**
- **MEDIUM RANGE CONCENTRATIONS NOT AFFECTED BY BIOGENIC VOC -> HIGH NUMBER OF EXCEEDANCE DAYS**

**Thanks
for your attention!**

Marion Wichmann-Fiebig

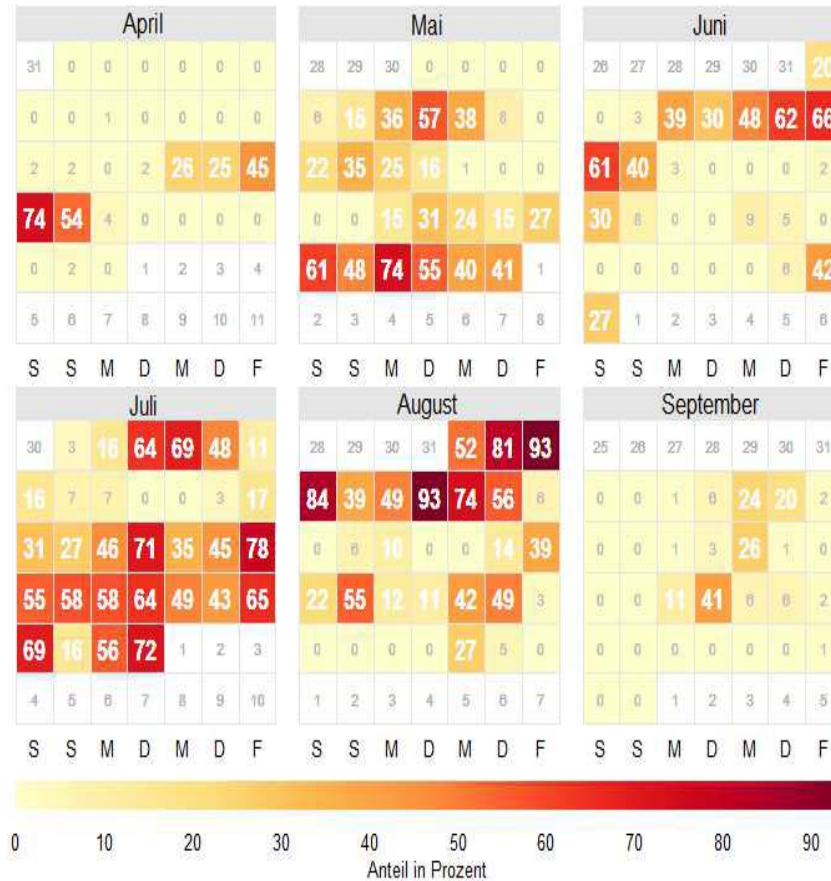
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<http://www.umweltbundesamt.de/en/topics/air>

Ozon im Sommer 2018

Anteil der Stationen mit höchstem täglichen 8-SMW über 120 µg/m³



Standardisierter Niederschlagsindex (SPI)

Tab. 1: Wahrscheinlichkeit unterschiedlicher SPI-Bereiche und Kategorien der Feuchtigkeitsverhältnisse

Wahrscheinlichkeit in %	SPI	Stärke der Anomalie
2.3	≥ 2.0	Extrem zu feucht
4.4	1.5 bis 2.0	Deutlich zu feucht
9.2	1.0 bis 1.5	Mäßig zu feucht
34.1	0.0 bis 1.0	Fast normal (etwas zu feucht)
34.1	-1.0 bis 0.0	Fast normal (leichte Dürre)
9.2	-1.5 bis -1.0	Mäßige Dürre
4.4	-2.0 bis -1.5	Schwere Dürre
2.3	≤ -2.0	Extreme Dürre

