# EFAS Annual Meeting 2022

## EFASNext

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Emergency Management

Copernicus Europe's eyes on Earth

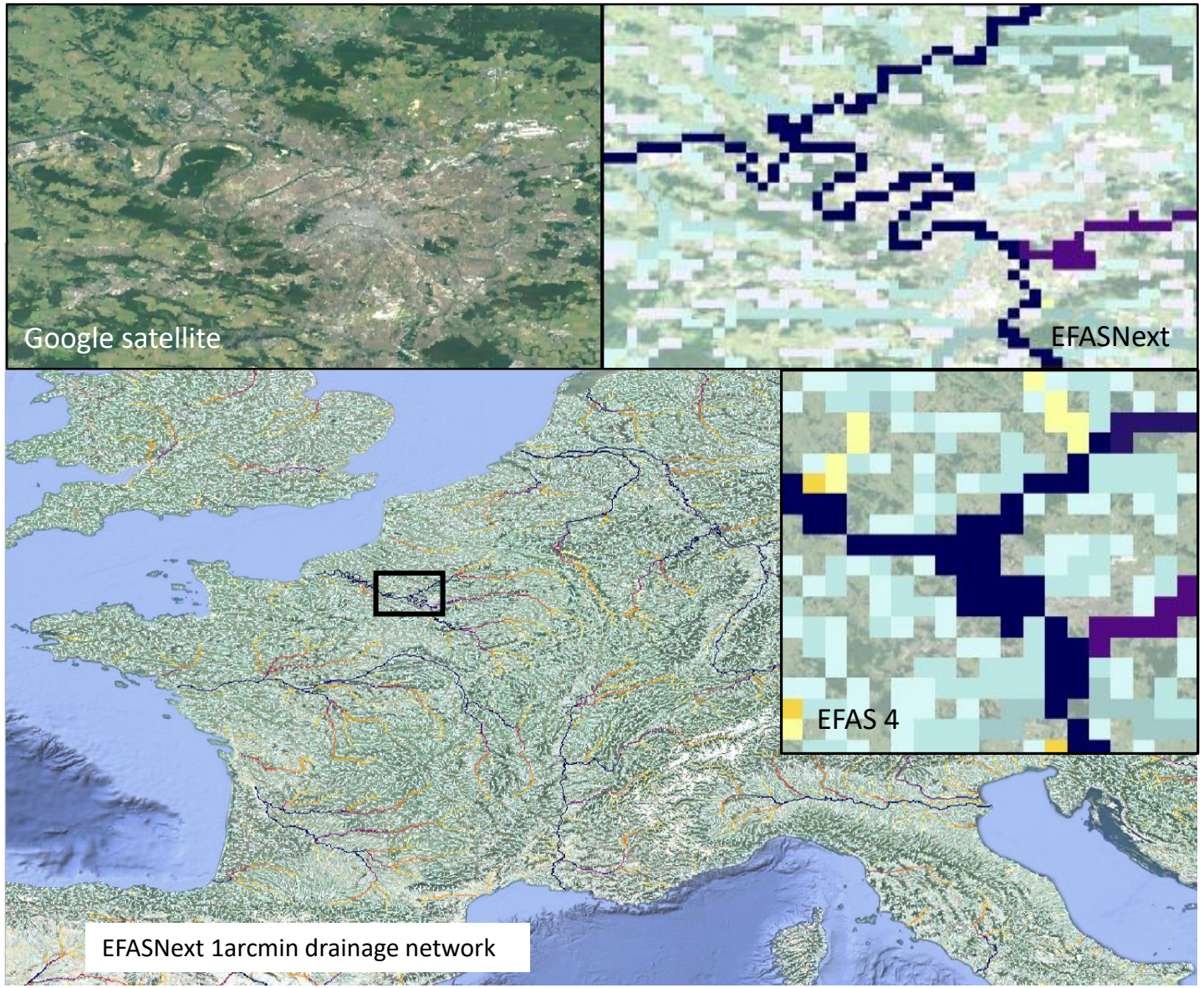
European Commission

Emergency Management

# WHAT'S EFASNext?

- 1 arcmin spatial resolution
- Soil hydraulic properties
- Drainage network
- Static maps
- New datasets
- Improving small basins

**x 14**
model grid cells



# A KM-SCALE EFAS CALIBRATION

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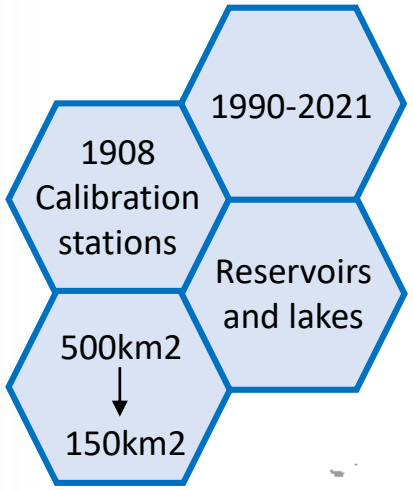
Location of EFASNext calibration stations

- Station was calibrated in **EFASNext only**
- Station was calibrated in **EFASNext and EFAS4**
- Station was calibrated in **EFAS 4 only**
- EFAS 4 calibration area
- EFASNext additional calibration area



# LISFLOOD AND THE CALIBRATION SUITE

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Open Source LISFLOD and calibration tools

DEAP (evolution algorithm)

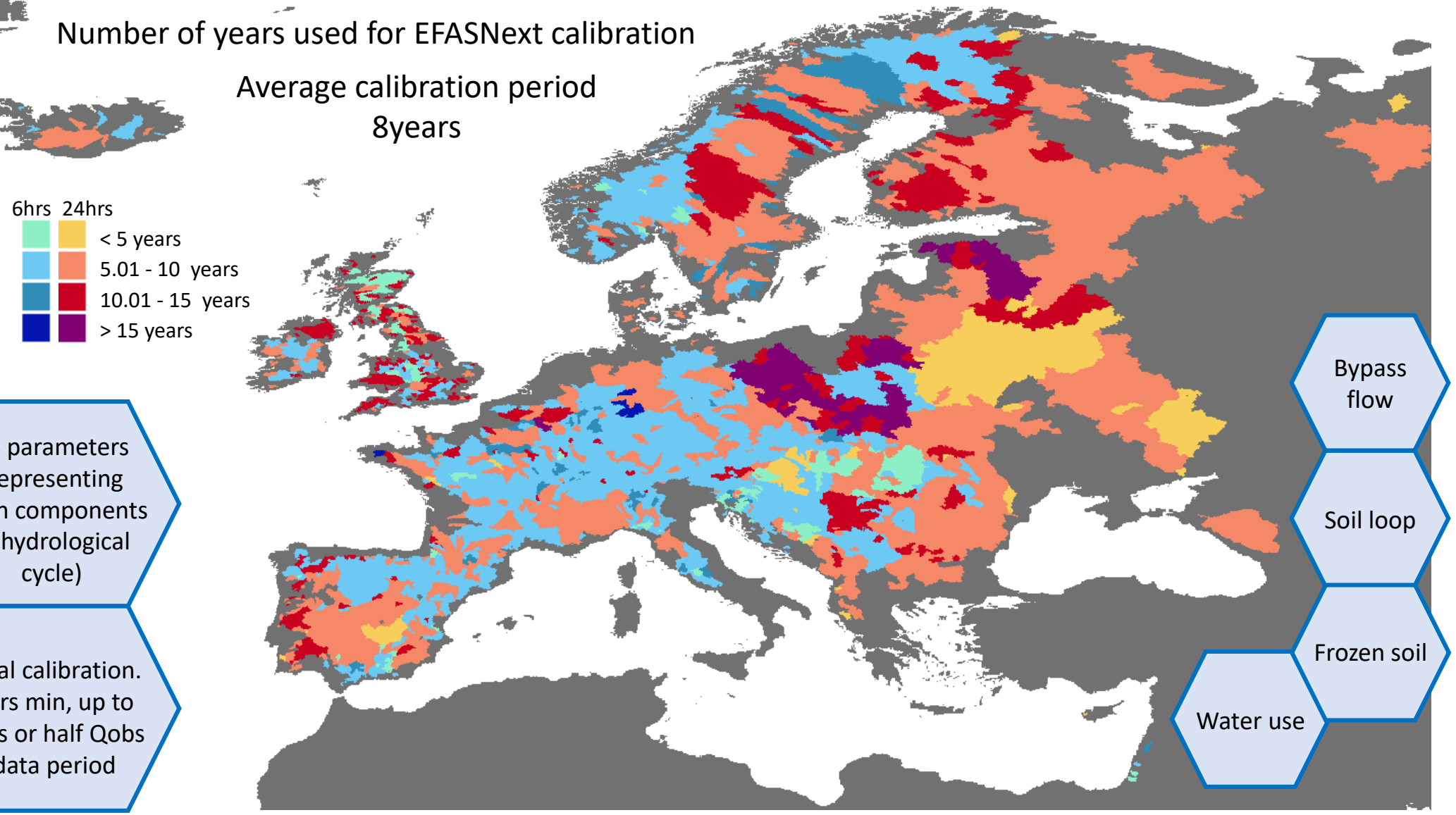
14 parameters (representing main components of hydrological cycle)

Calibration based on discharge only (KGE)

Dual calibration. 4yrs min, up to 8yrs or half Qobs data period

Number of years used for EFASNext calibration

Average calibration period
8years




Bypass flow

Soil loop

Frozen soil

Water use

# HYDROLOGICAL MODEL PERFORMANCE (Long Term Run)

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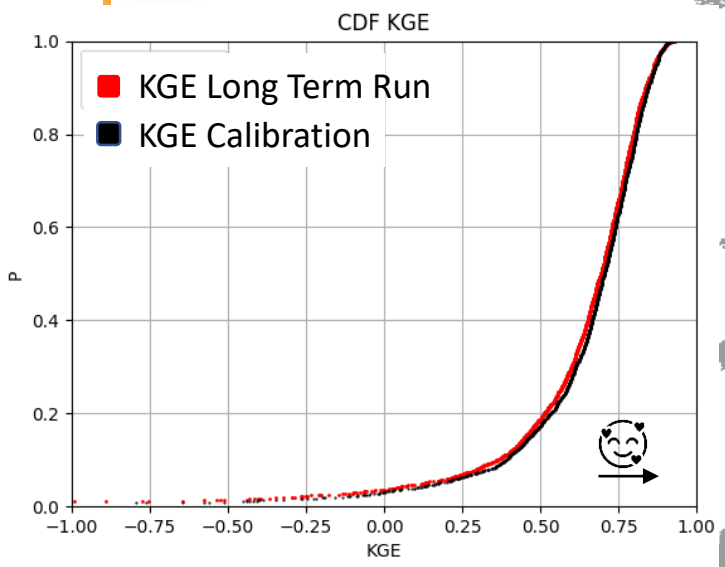
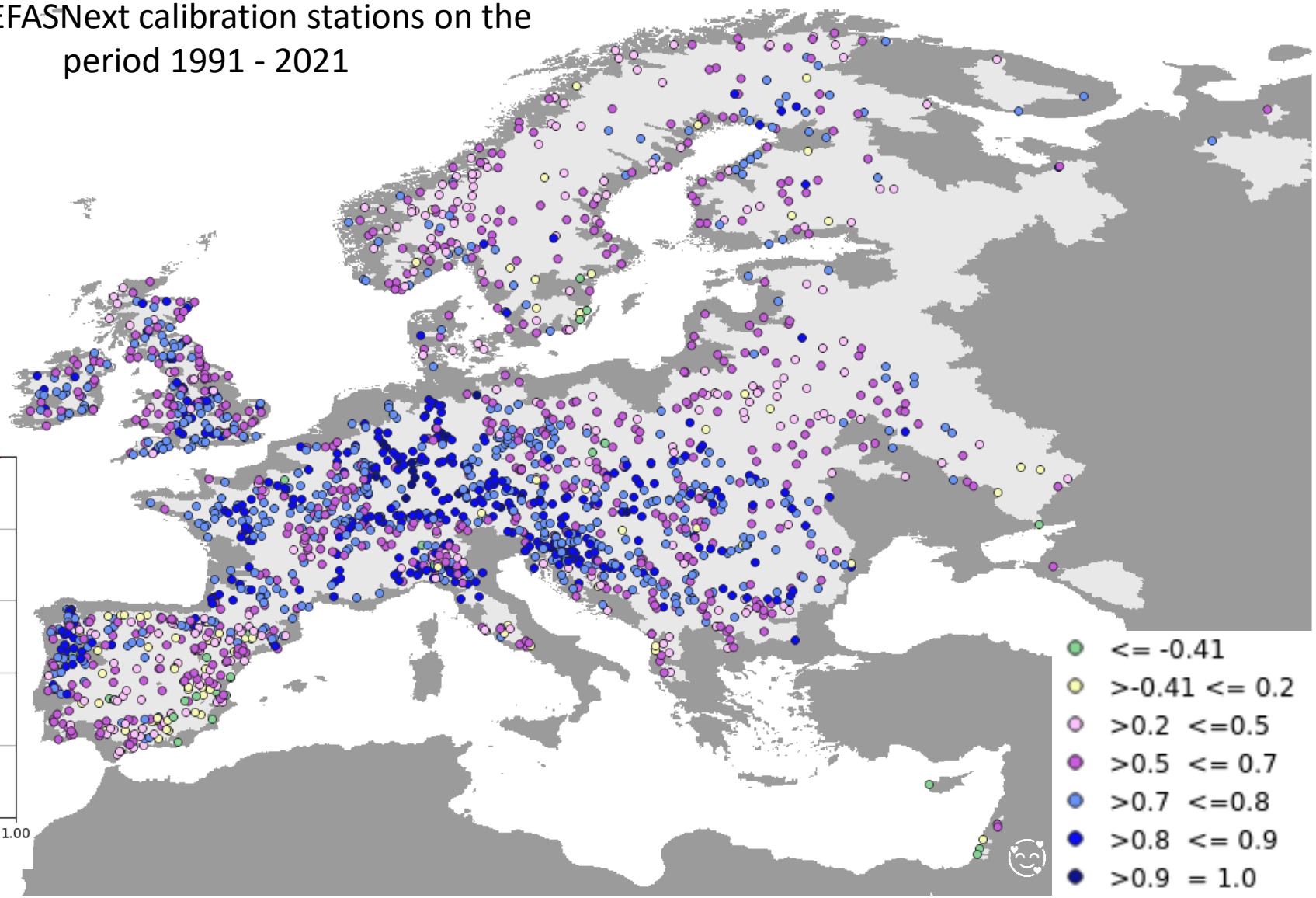
KGE of EFASNext calibration stations on the period 1991 - 2021

KGE average = 0.58
KGE median = 0.69



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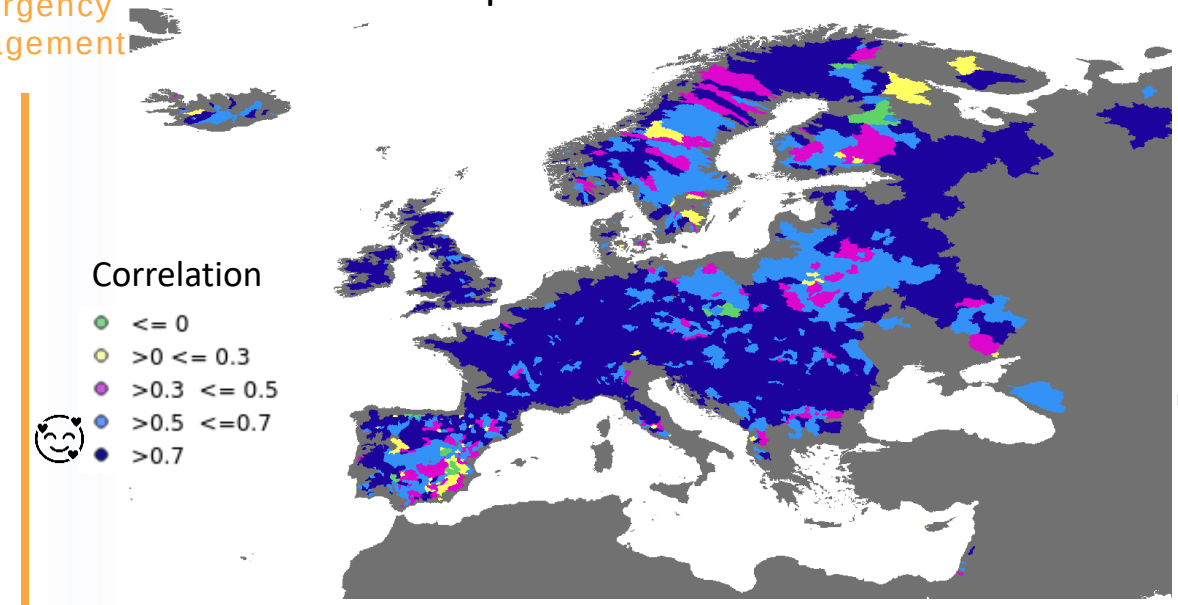
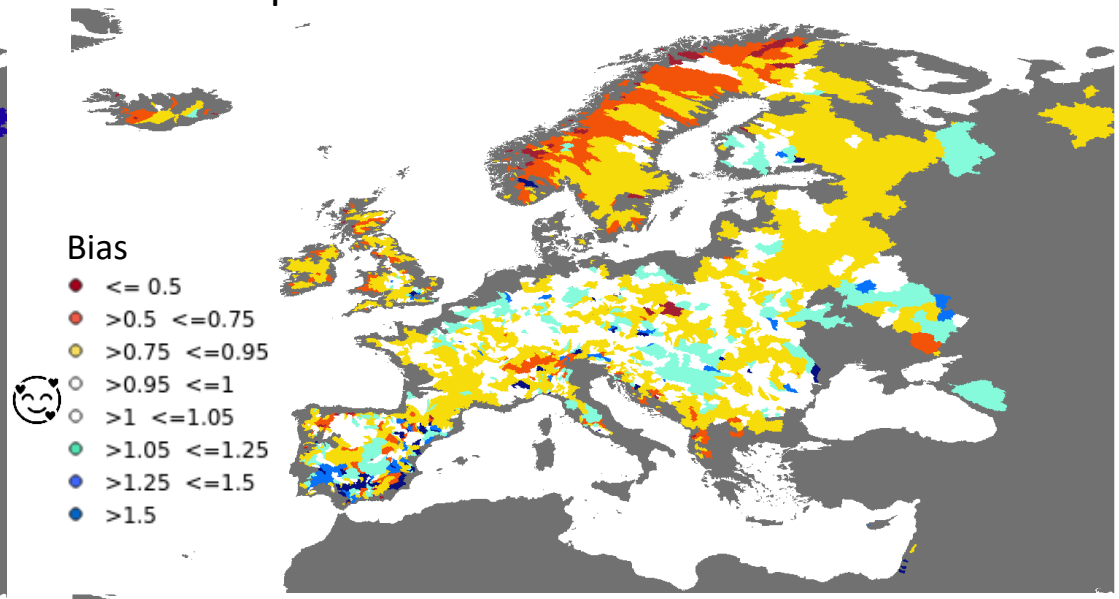
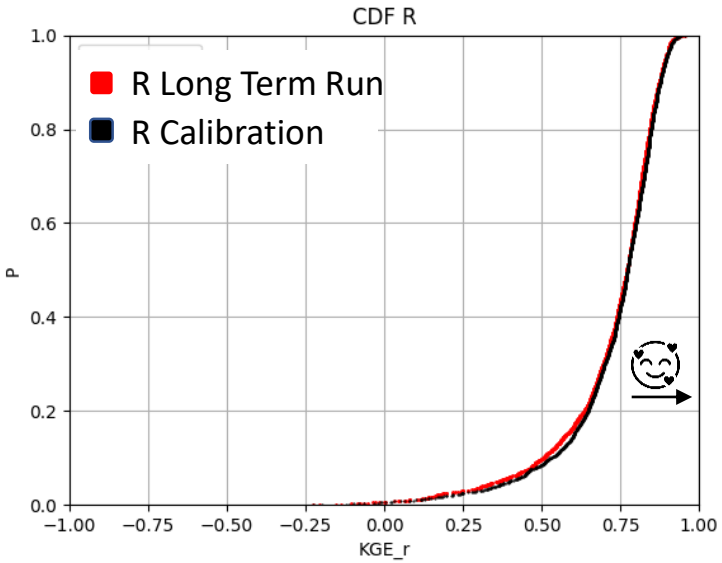
# HYDROLOGICAL MODEL PERFORMANCE (Long Term Run)

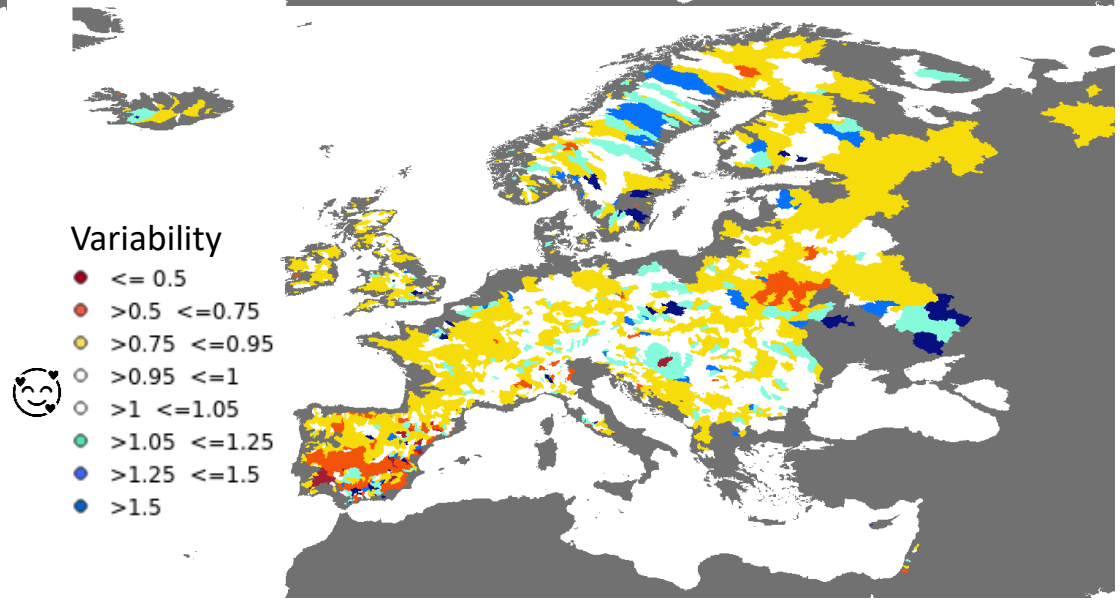
KGE components for EFASNext calibration stations on the period 1991 - 2021




R average = 0.72
R median = 0.77



# EFASNext vs EFAS4 (Long Term Run)

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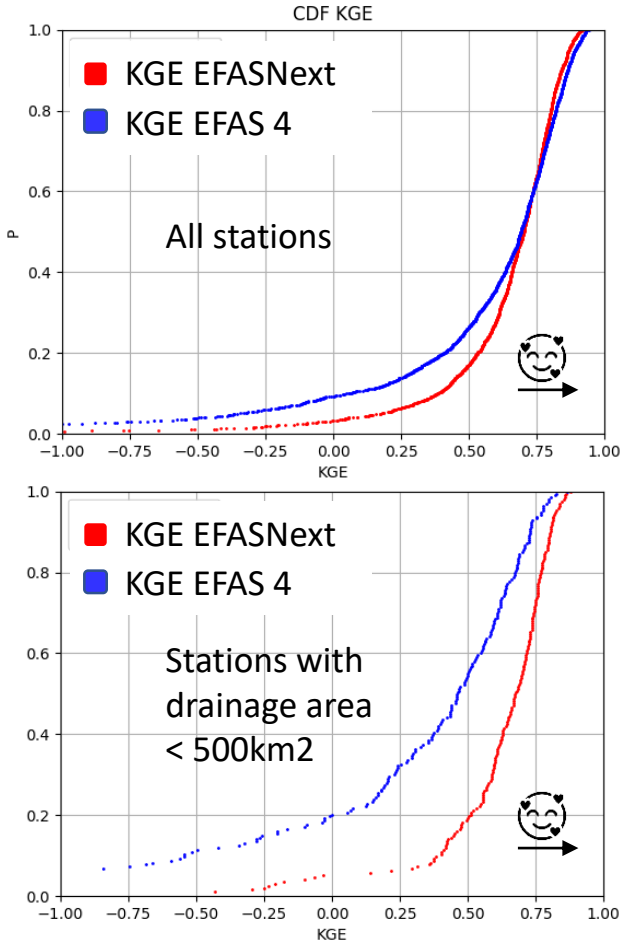
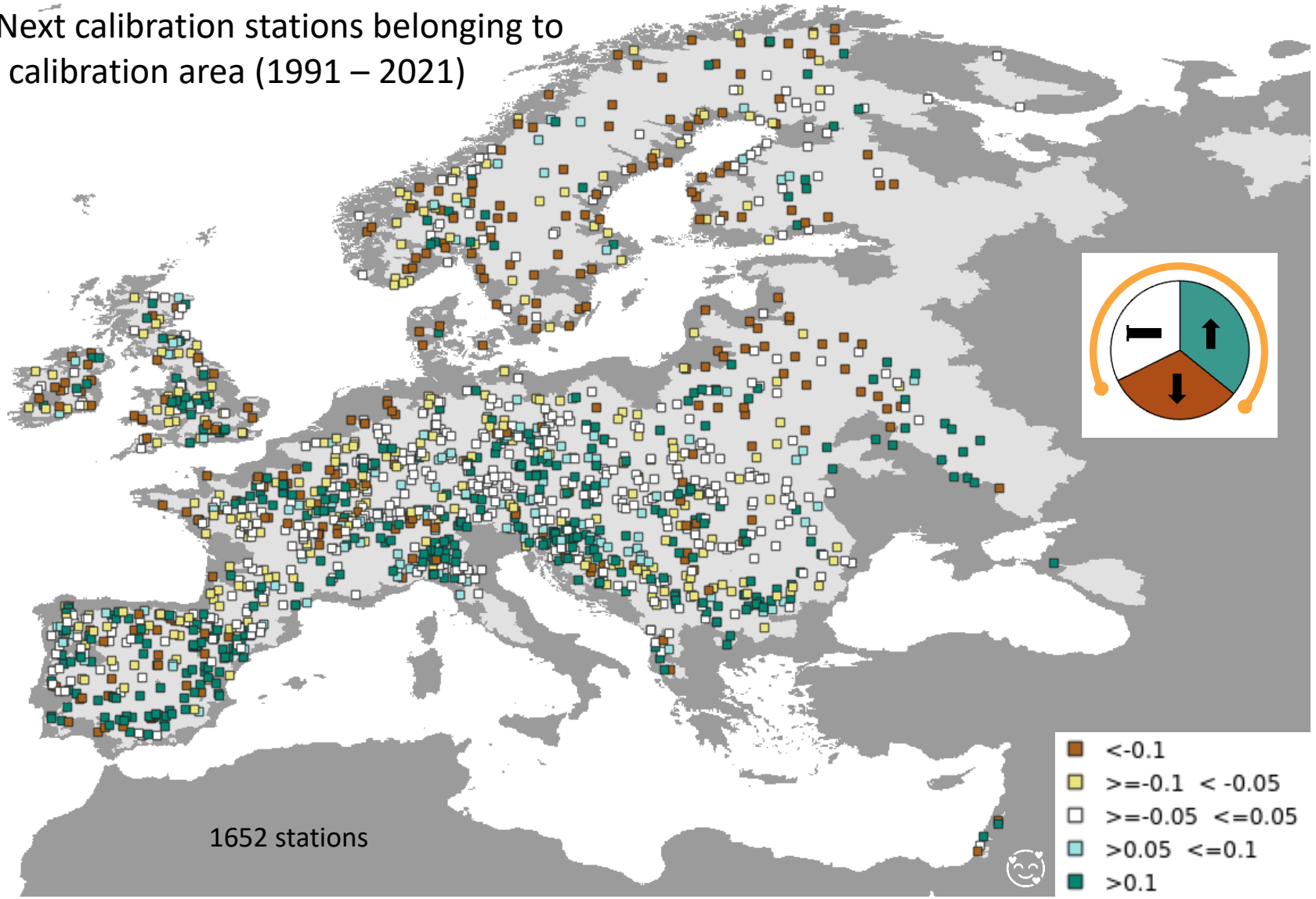
Difference between EFASNext KGE and EFAS4 KGE for the EFASNext calibration stations belonging to EFAS4 calibration area (1991 – 2021)



# EFASNext vs EFAS4

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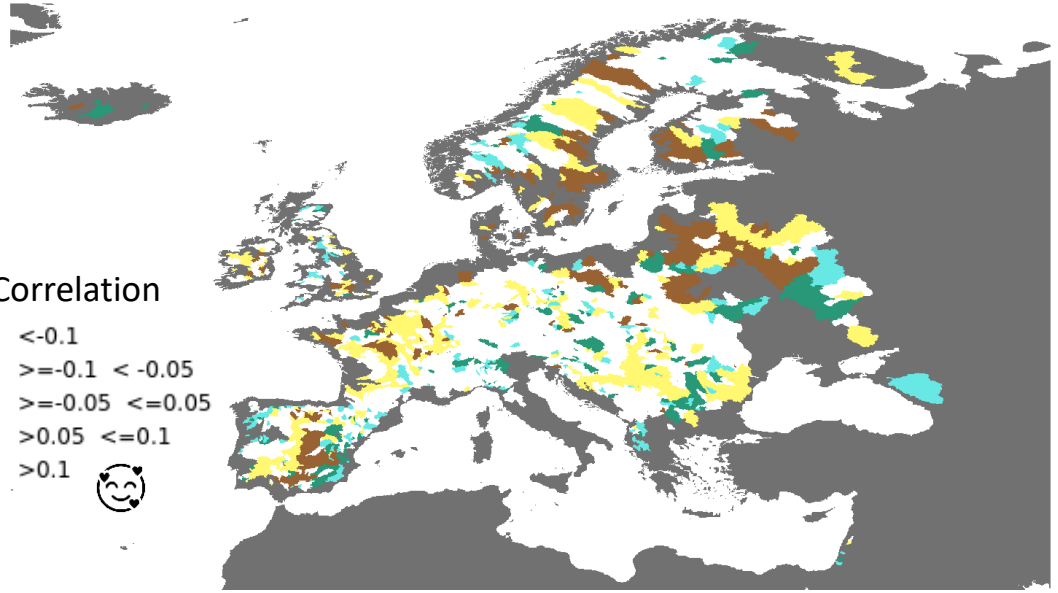
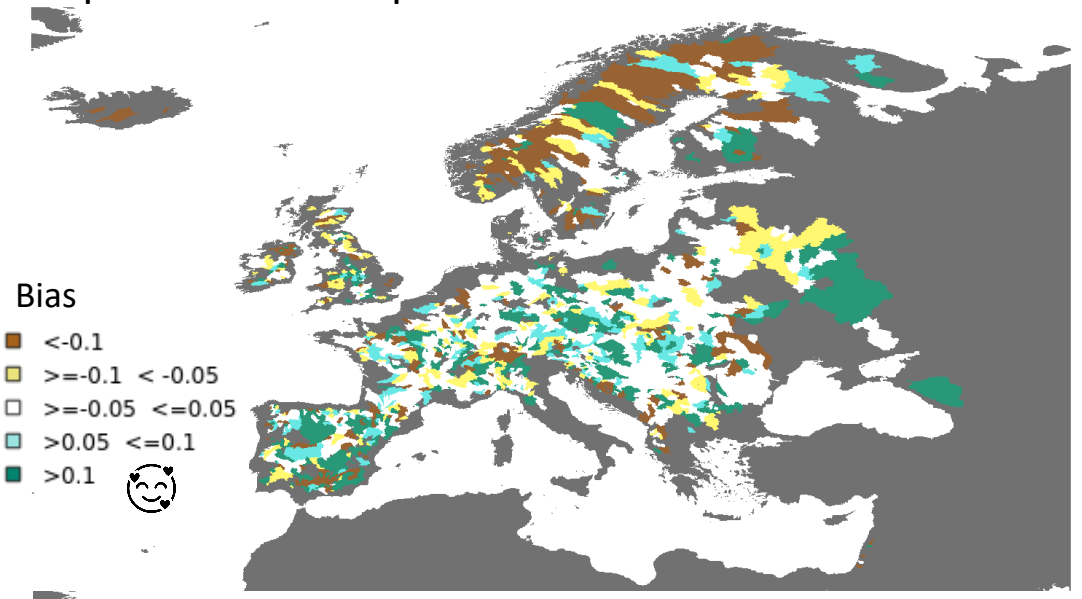
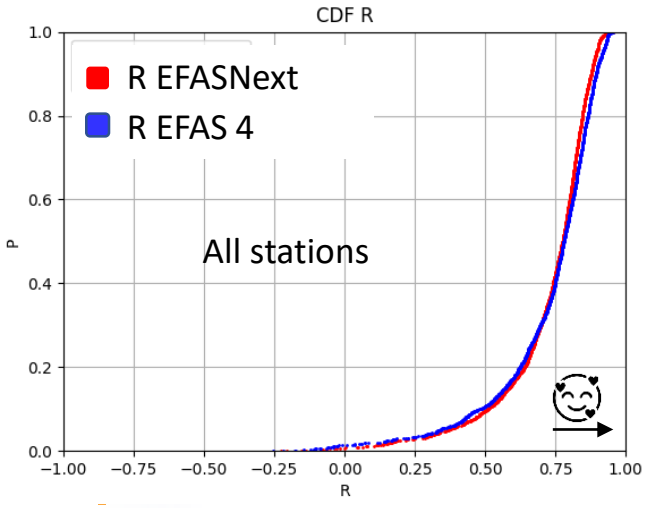
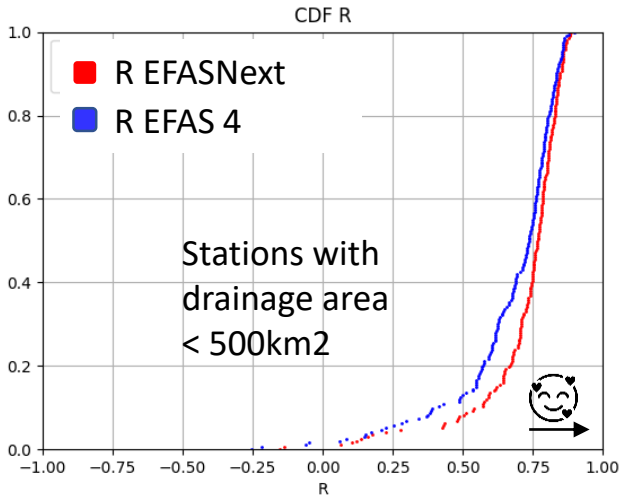
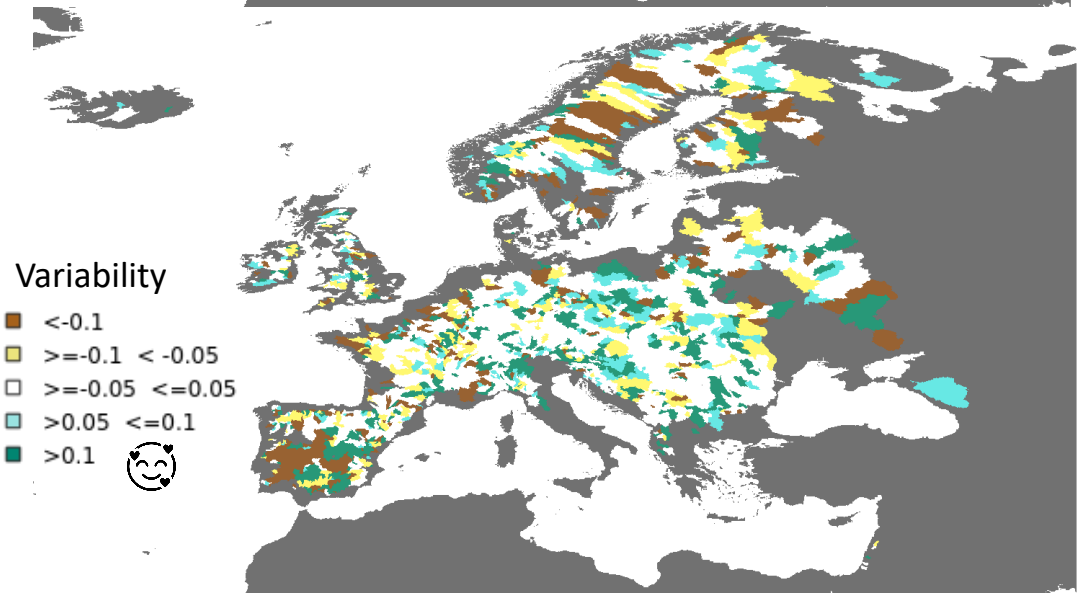
## Difference between EFASNext and EFAS4 for KGE components on the period 1991 - 2021



# EFASNext vs EFAS4

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New ranges for bypass flow to prevent soil from getting too dry

Many ‘bad’ stations are immediately downstream of a reservoir or a lake

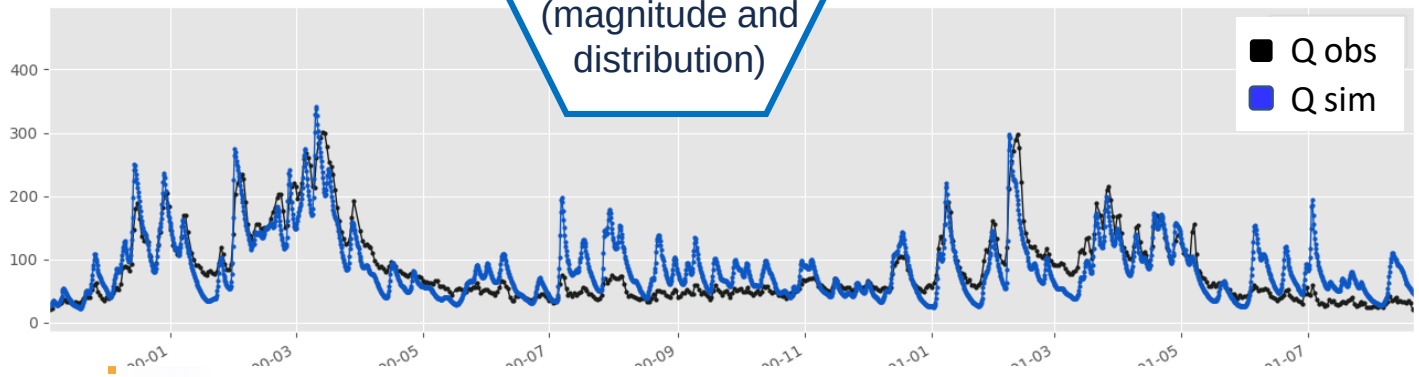
New forcings dataset have some differences in some catchments

Some catchments are very flashy and ‘too early’

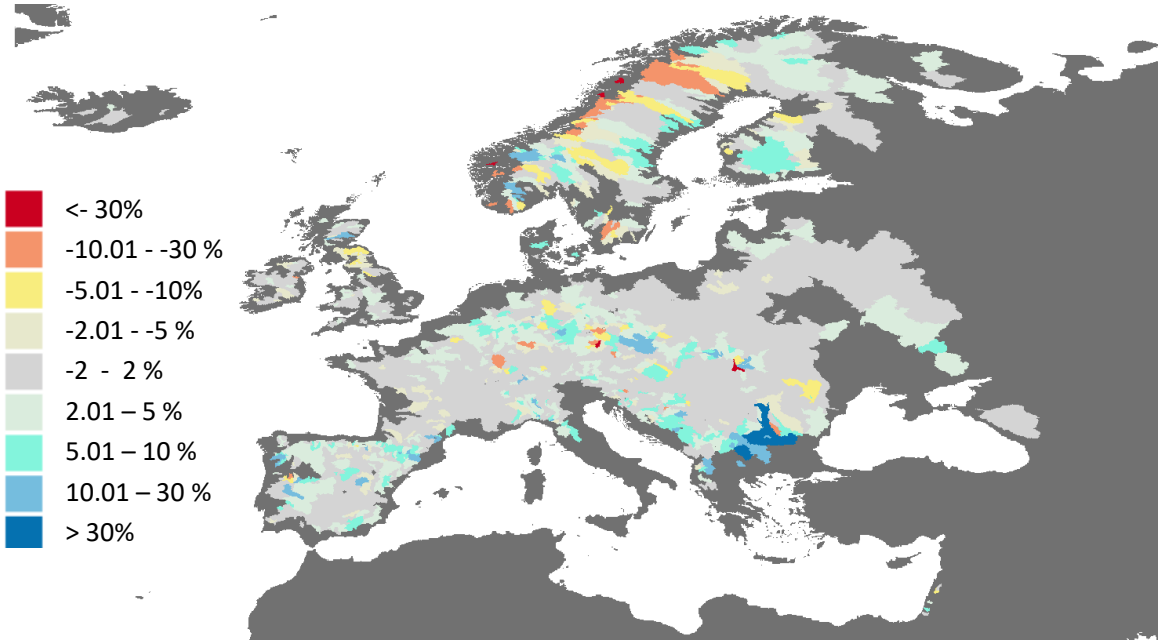
More calibration points = less flexibility

Execution order and interaction of Lisflood modules? lateral flow? urface routing?

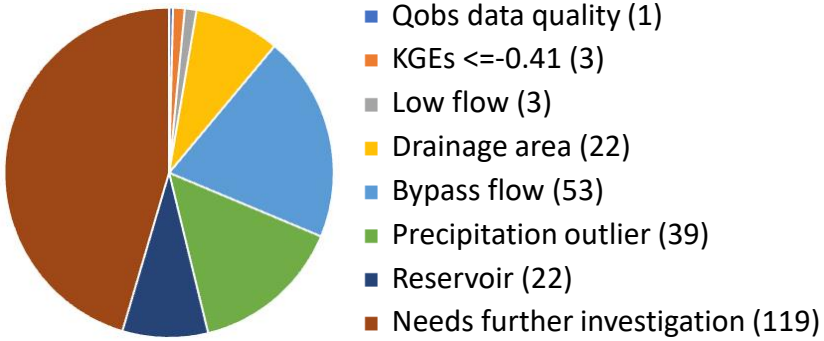
Significant changes to soil conductivity (magnitude and distribution)




Percentage difference in the total accumulated precipitation between EFASNext and EFAS4 for the calibration inter-catchments (1990– 2017).




Source of KGE degradation for the “worst” 262 stations (KGE difference > 0.1)



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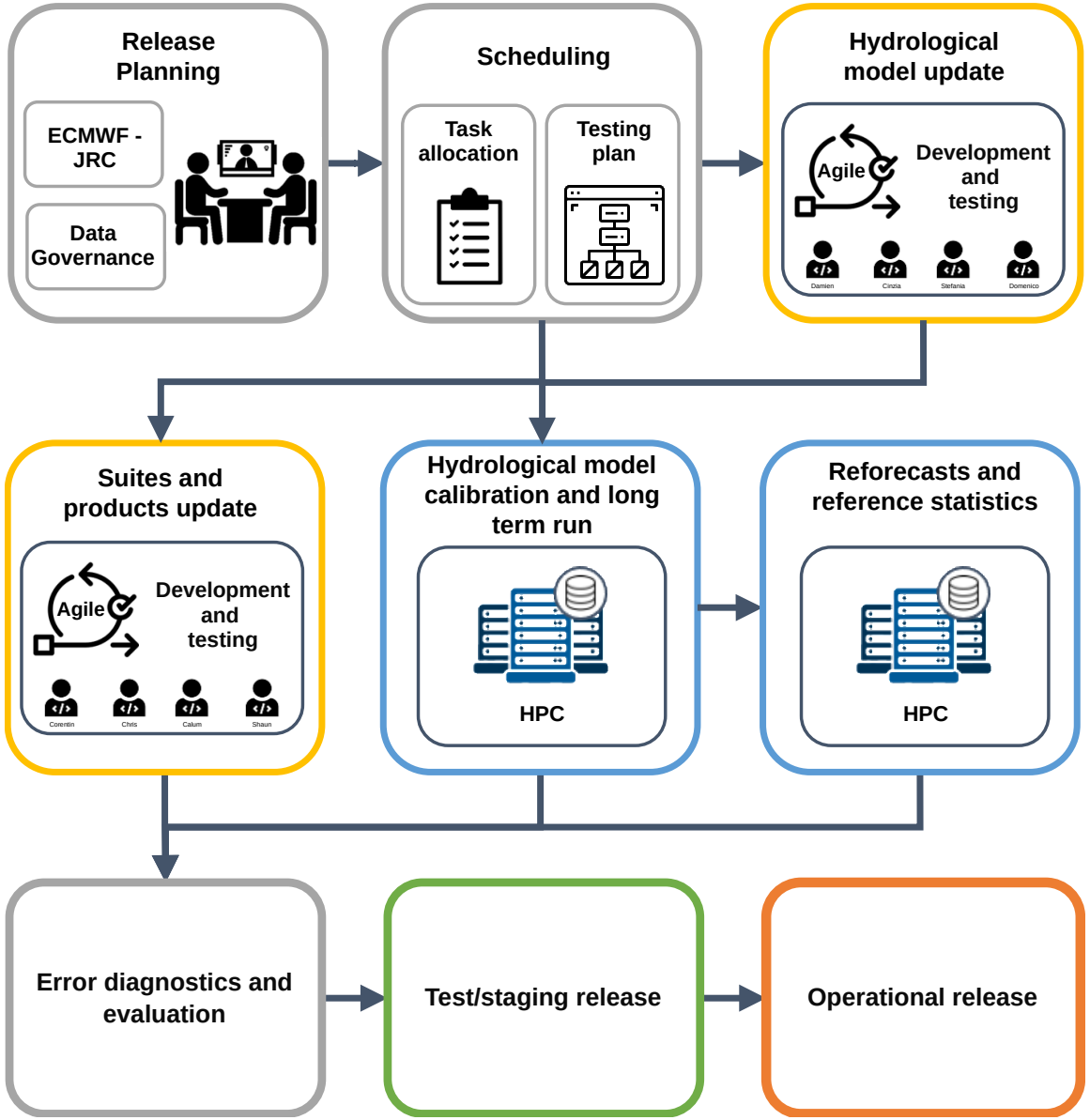
# WHAT'S NEXT?

Q2/2019 -> Q3 /2022

Q2/2022 -> Q1 /2023

Targeting Q2 /2023



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# Thank you!


https://github.com/ec-jrc/**lisflood-code**

https://github.com/ec-jrc/lisflood-**lisvap**

https://github.com/ec-jrc/lisflood-**utilities**

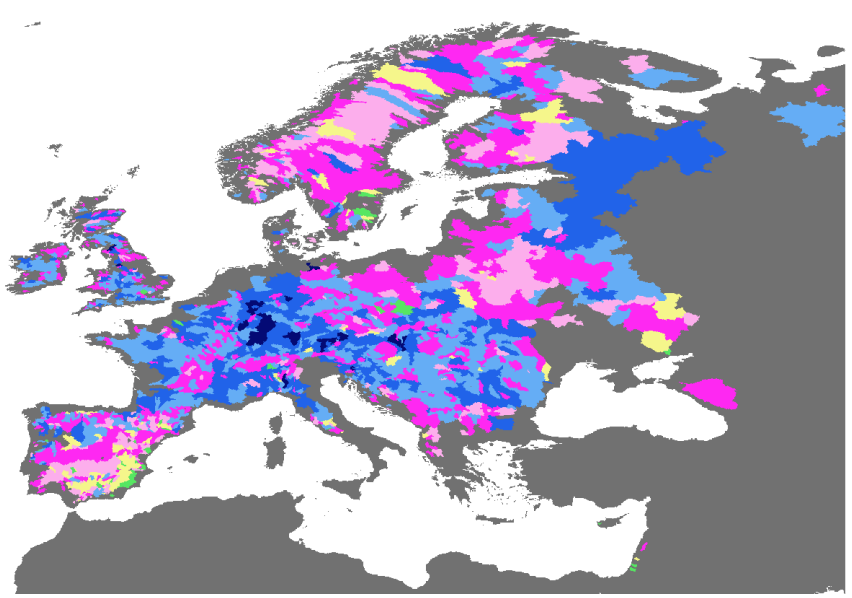
https://github.com/ec-jrc/lisflood-**usecases**

https://github.com/ec-jrc/lisflood-**calibration**

Emergency Managemer

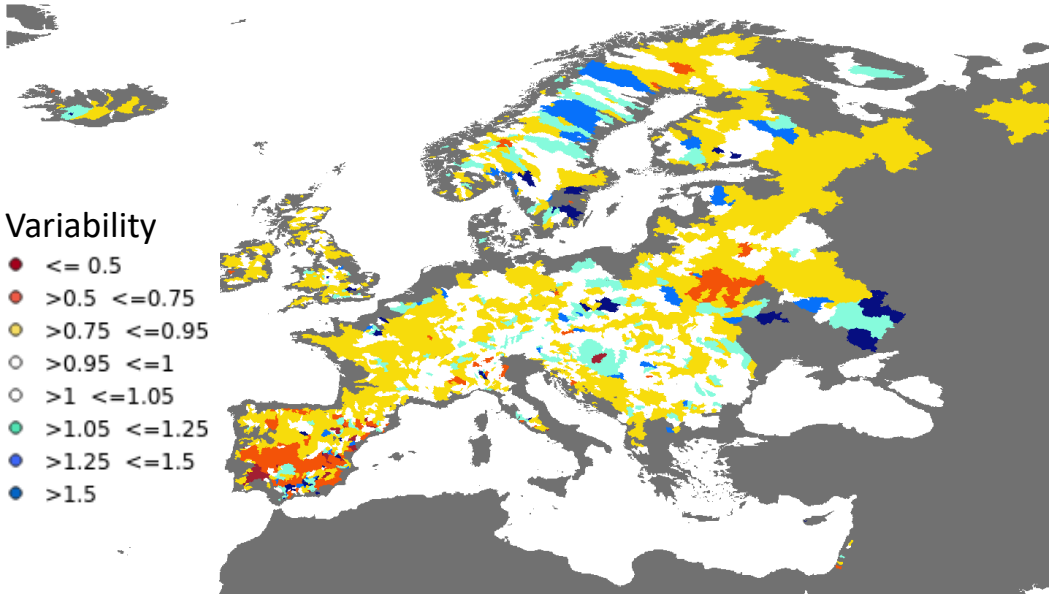
KGE

- <= -0.41
- >-0.41 <= 0.2
- >0.2 <=0.5
- >0.5 <= 0.7
- >0.7 <=0.8
- >0.8 <= 0.9
- >0.9 = 1.0



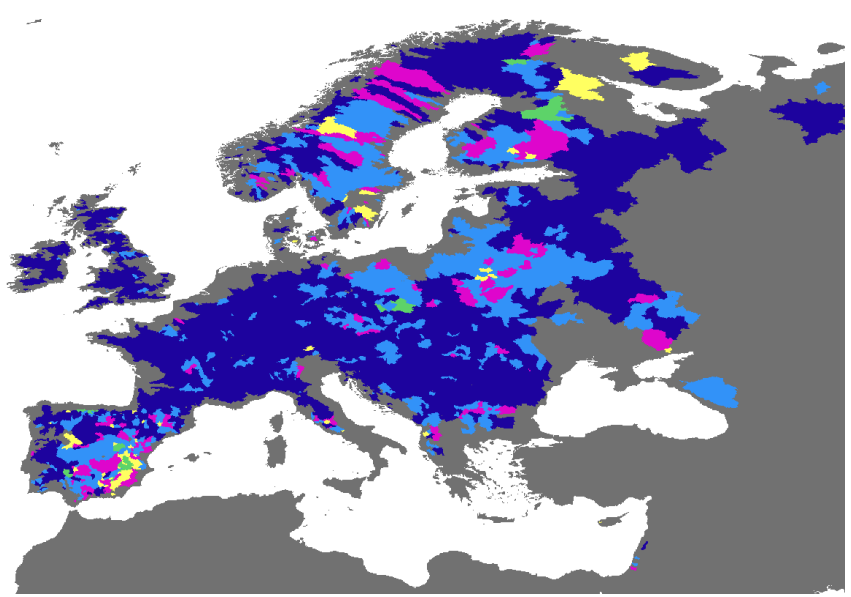
Variability

- <= 0.5
- >0.5 <=0.75
- >0.75 <=0.95
- >0.95 <=1
- >1 <=1.05
- >1.05 <=1.25
- >1.25 <=1.5
- >1.5



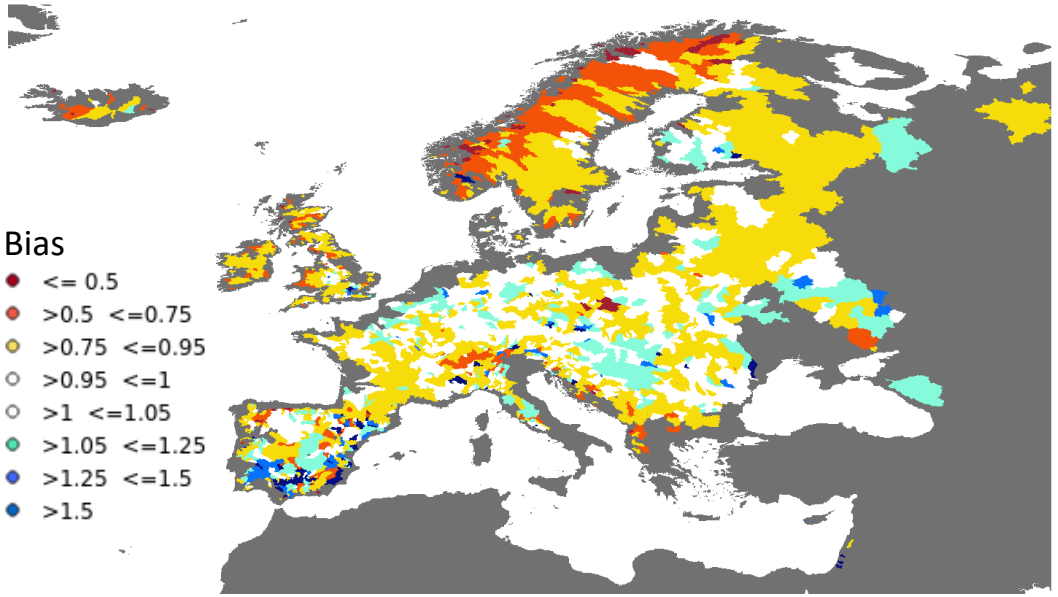
Correlation

- <= 0
- >0 <= 0.3
- >0.3 <= 0.5
- >0.5 <=0.7
- >0.7



Bias

- <= 0.5
- >0.5 <=0.75
- >0.75 <=0.95
- >0.95 <=1
- >1 <=1.05
- >1.05 <=1.25
- >1.25 <=1.5
- >1.5



Emergency Managemer

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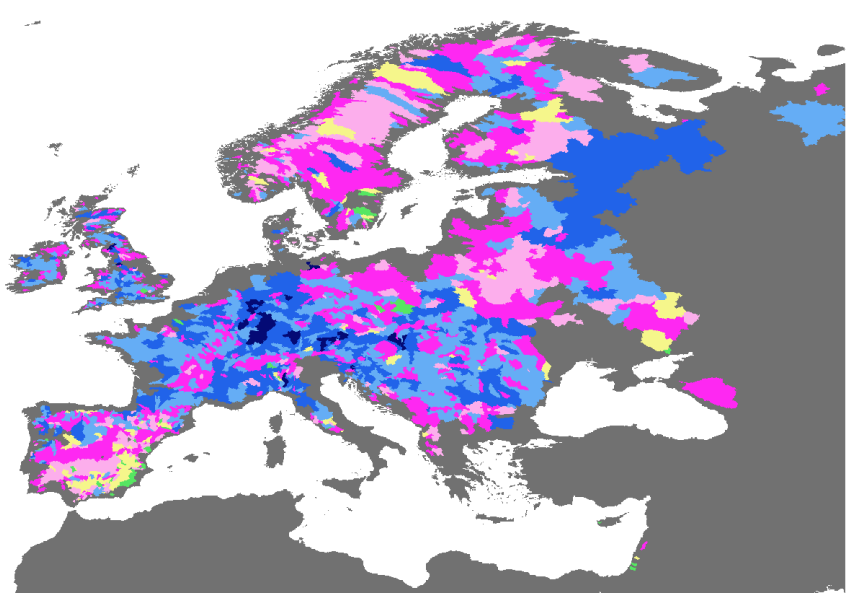
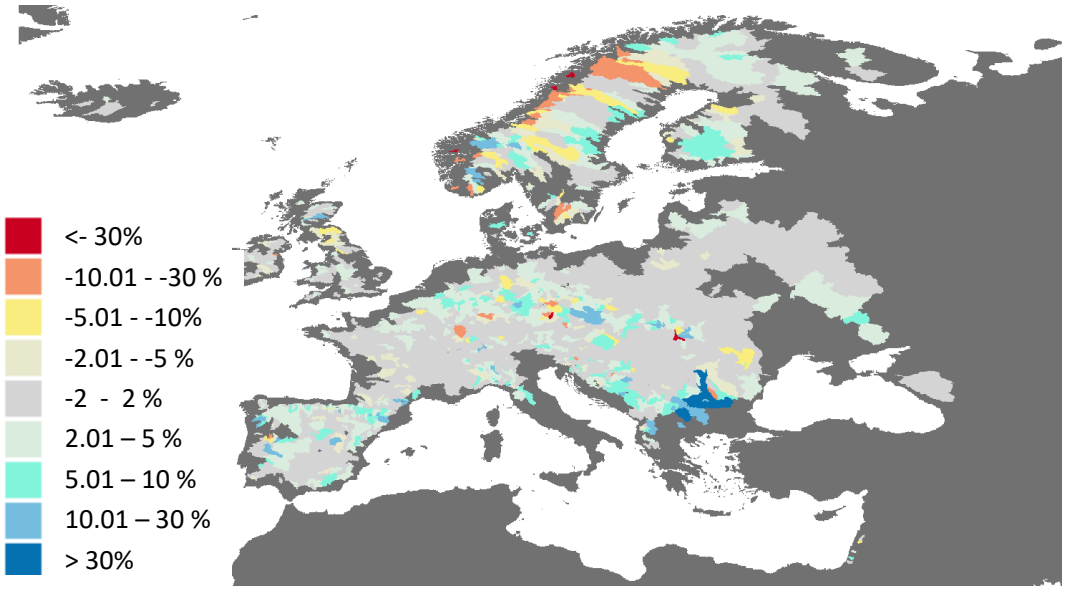
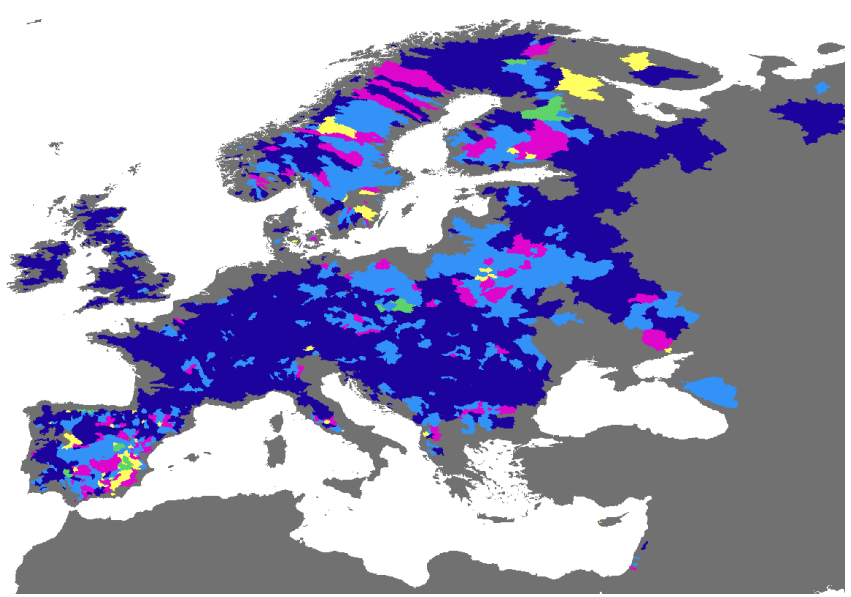




- <- 30%
- -10.01 - -30 %
- -5.01 - -10%
- -2.01 - -5 %
- -2 - 2 %
- 2.01 – 5 %
- 5.01 – 10 %
- 10.01 – 30 %
- > 30%

Correlation

- <= 0
- >0 <= 0.3
- >0.3 <= 0.5
- >0.5 <=0.7
- >0.7



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