What if one day…

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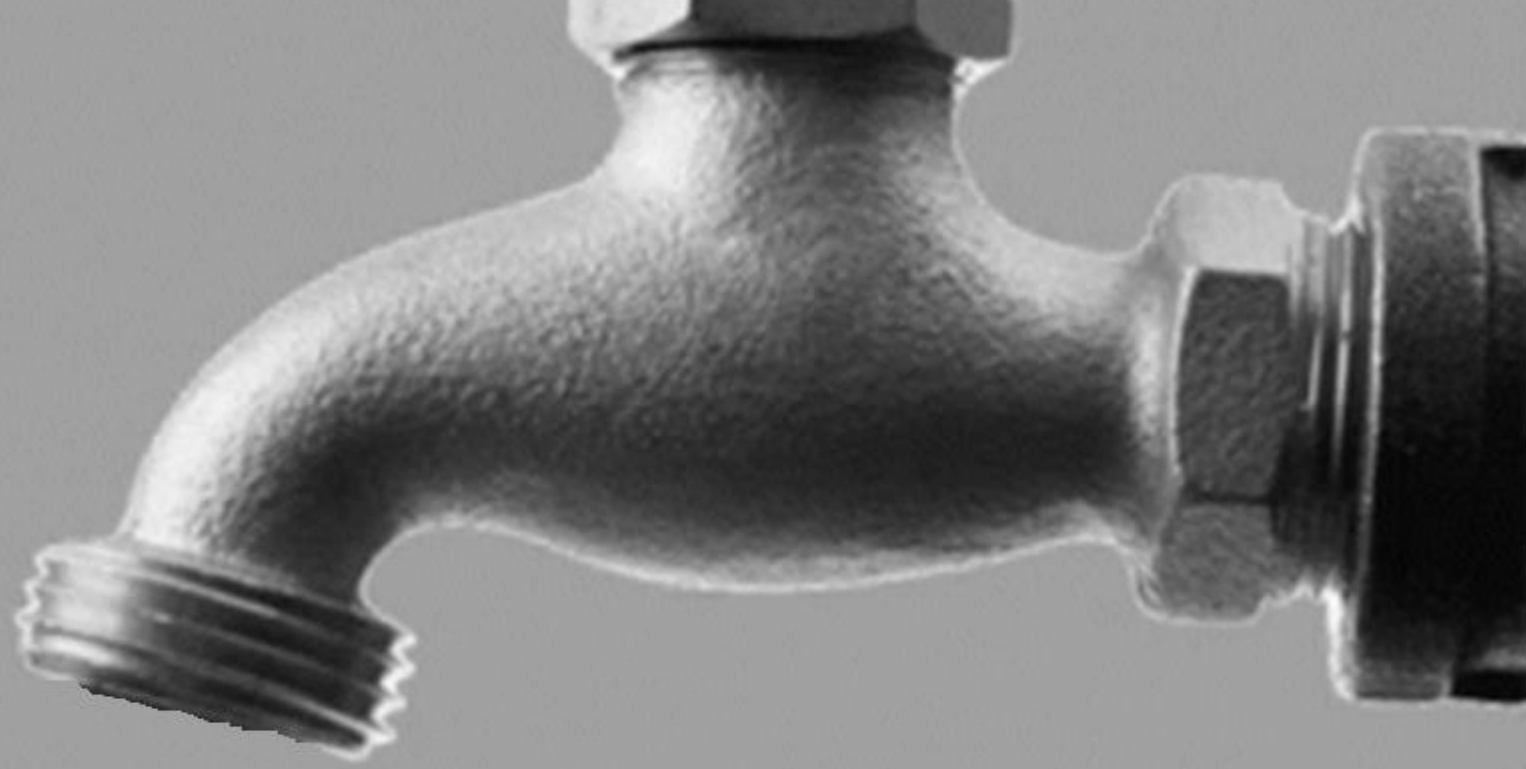
…
there
comes no
water out
of the tap?



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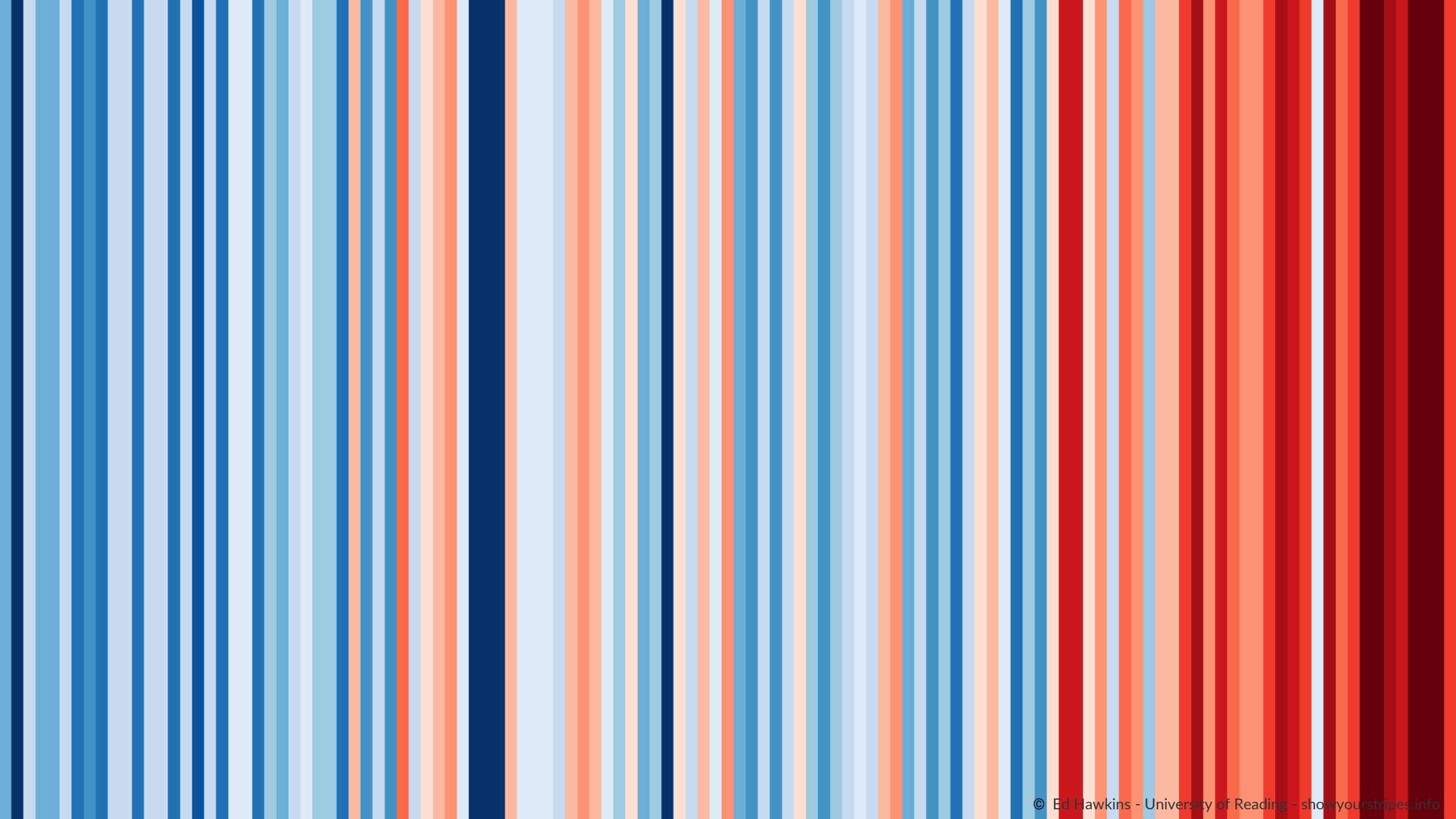
Groundwater dependence

EU: 75 %

Belgium (Fl): 50 %

Latvia: 40 %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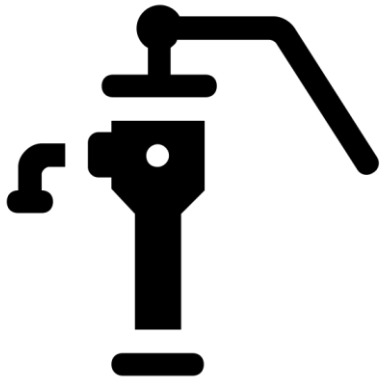
Drainage policy

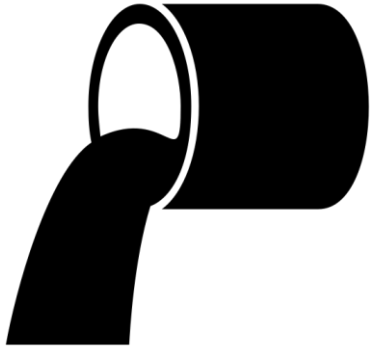
Drainage ditches
Soil sealing
Soil compaction



Groundwater abstractions

420 million m³/year

Of which 282 million m³ in phreatic aquifers

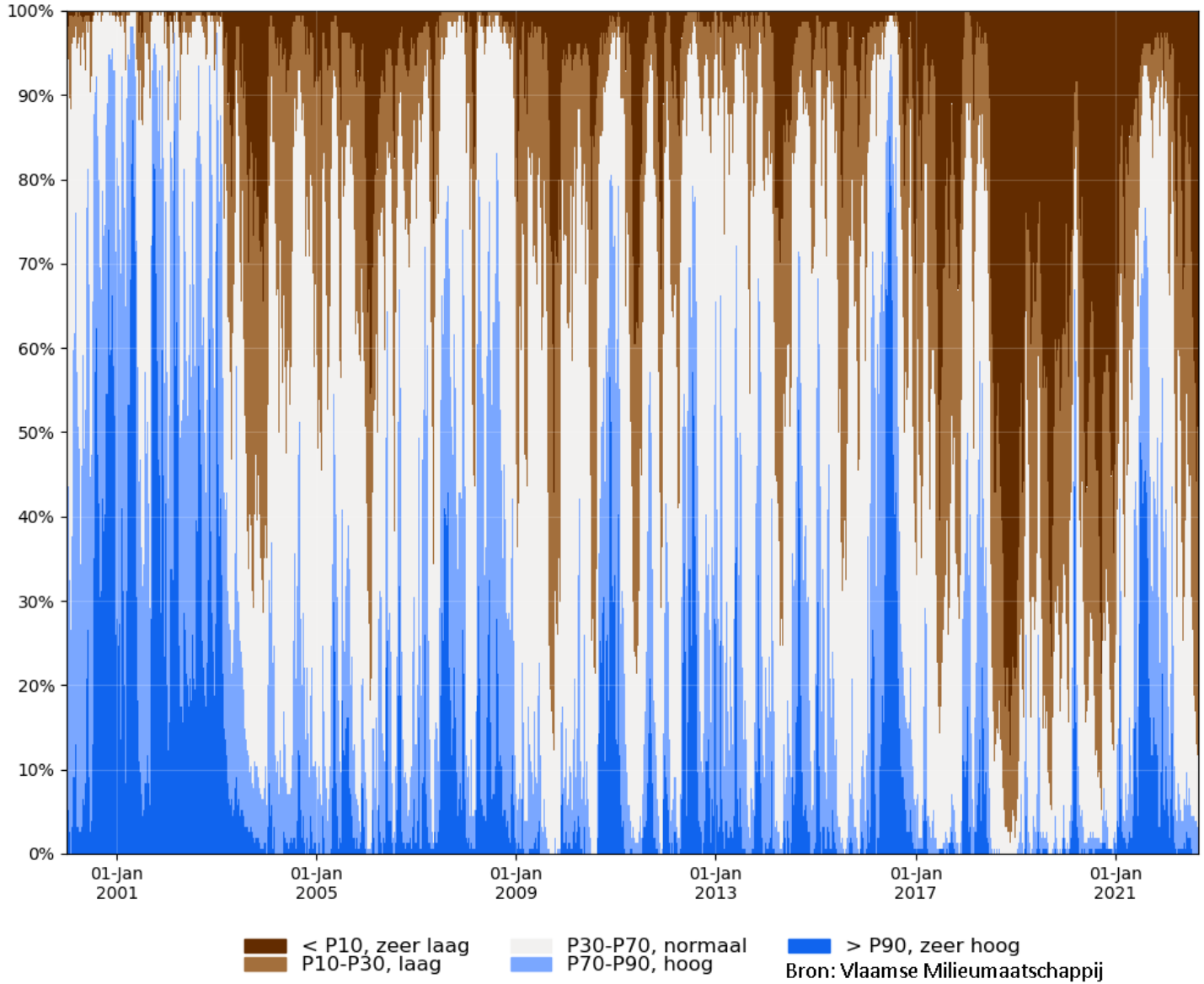


Drainage

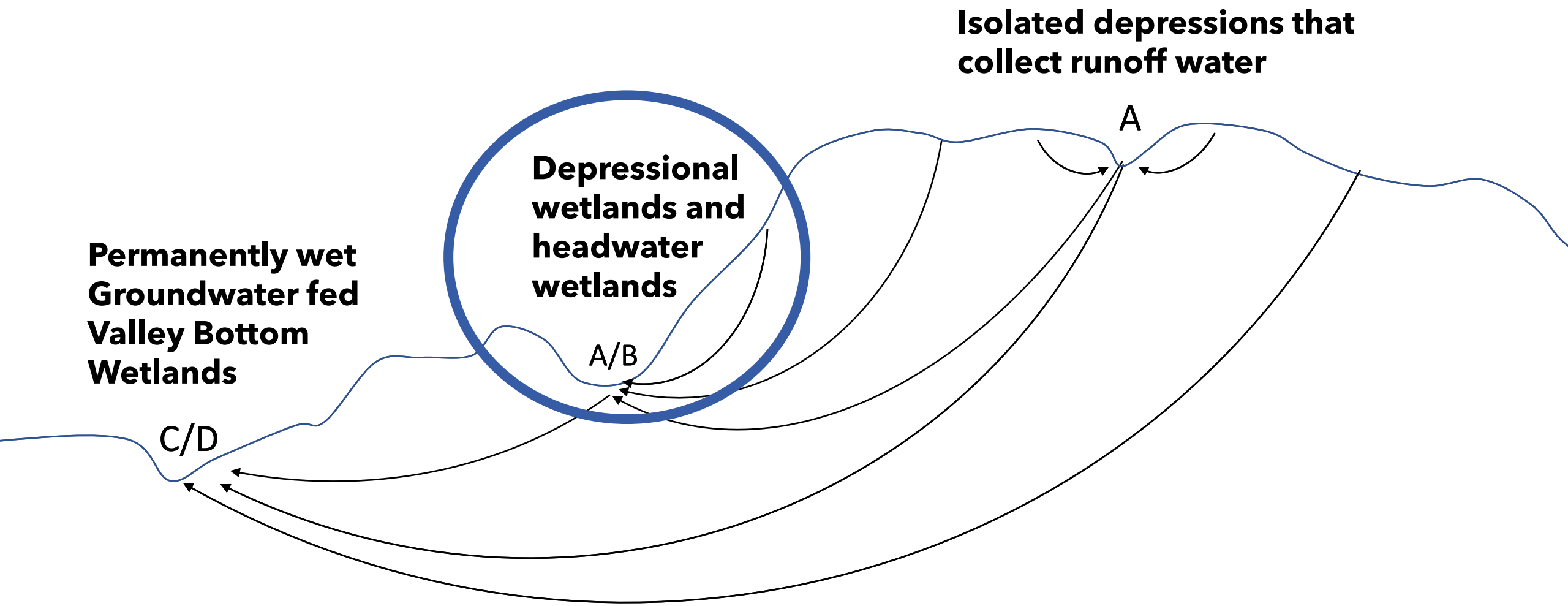
53% loss of water delivery capacity

High drainage density

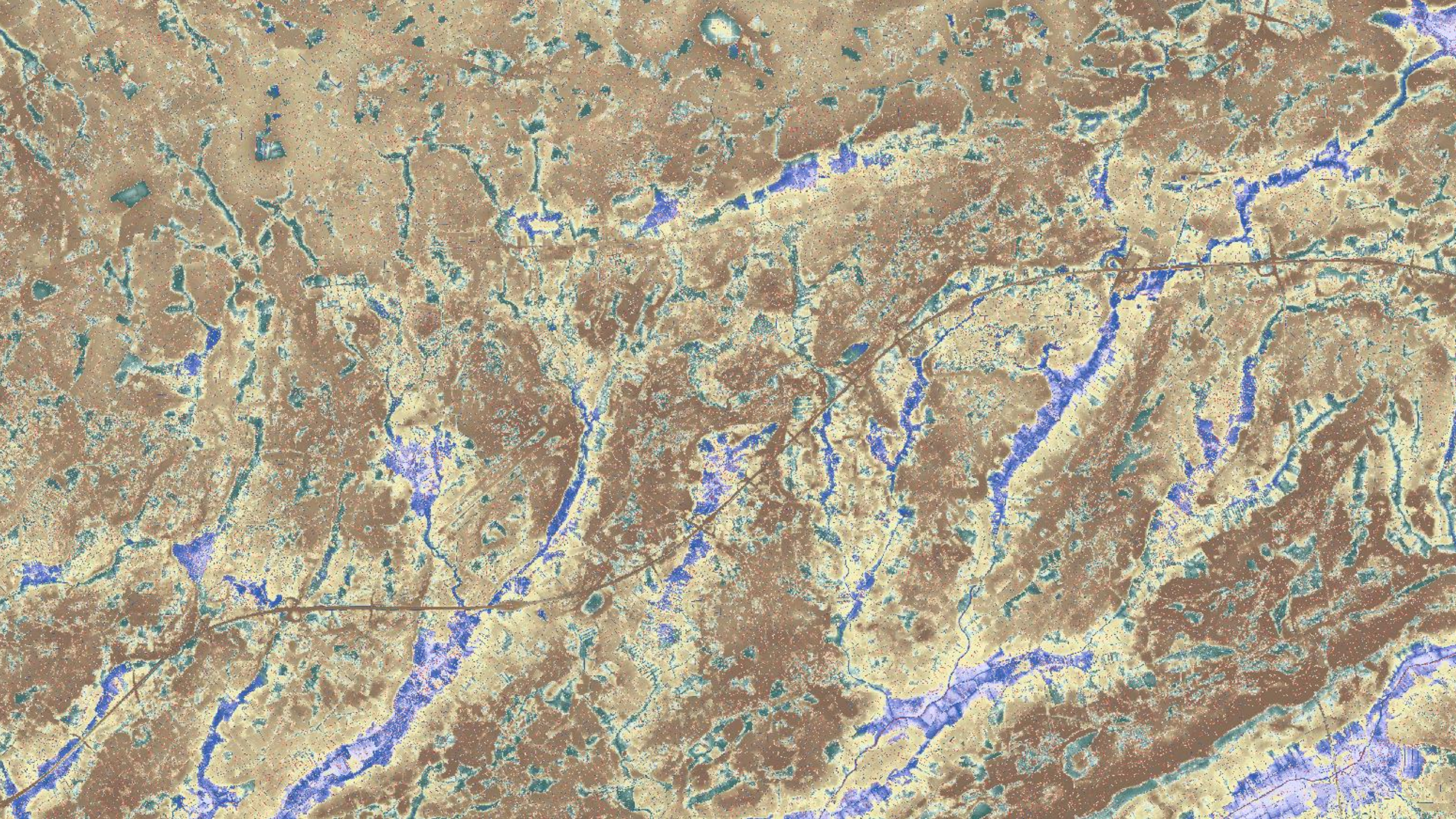
Numbers for Flanders (Belgium)

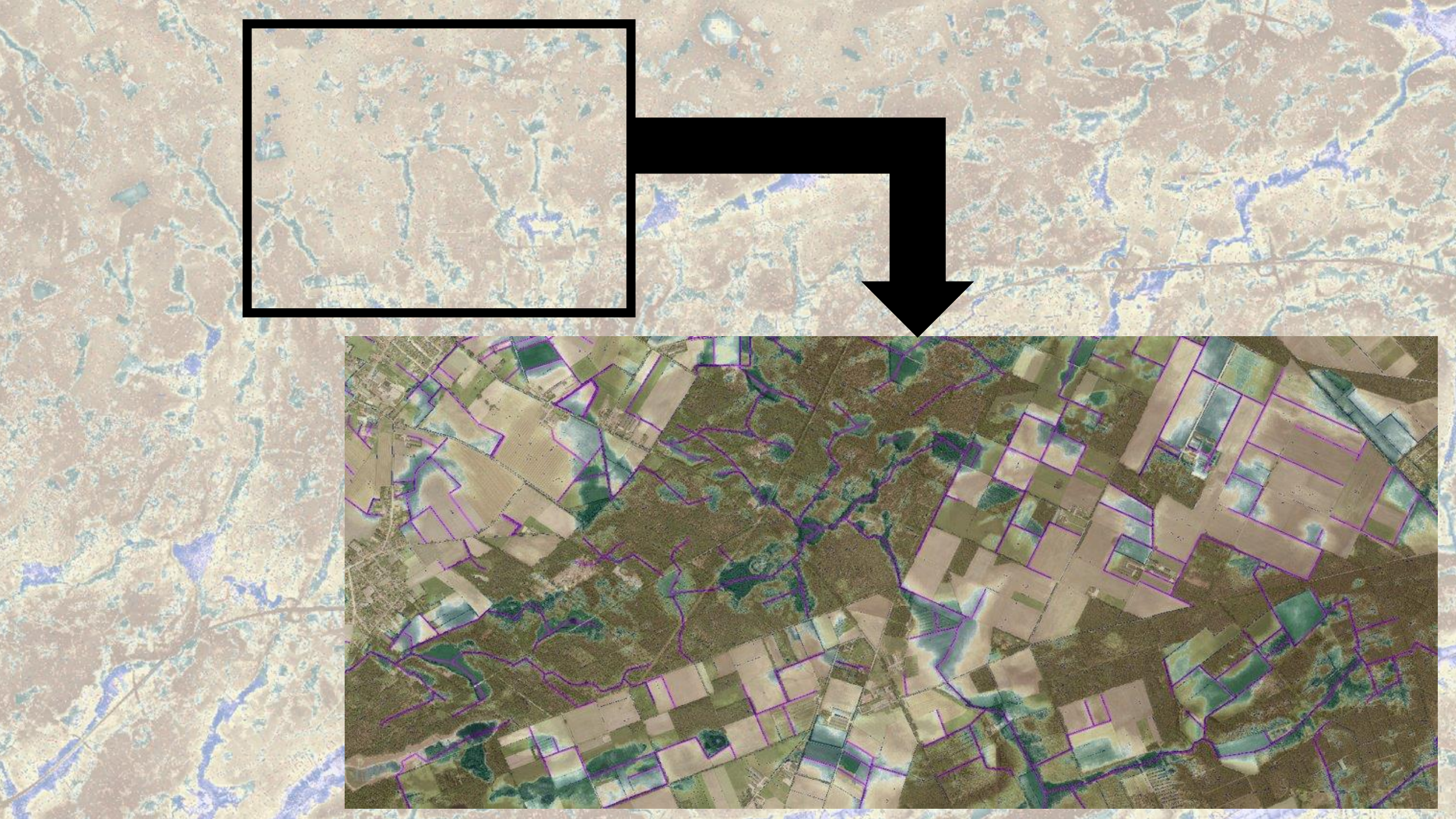

100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
01-Jan 2001
01-Jan 2005
01-Jan 2009
01-Jan 2013
01-Jan 2017
01-Jan 2021
< P10, zeer laag
P10-P30, laag
P30-P70, normaal
P70-P90, hoog
> P90, zeer hoog
Bron: Vlaamse Milieumaatschappij

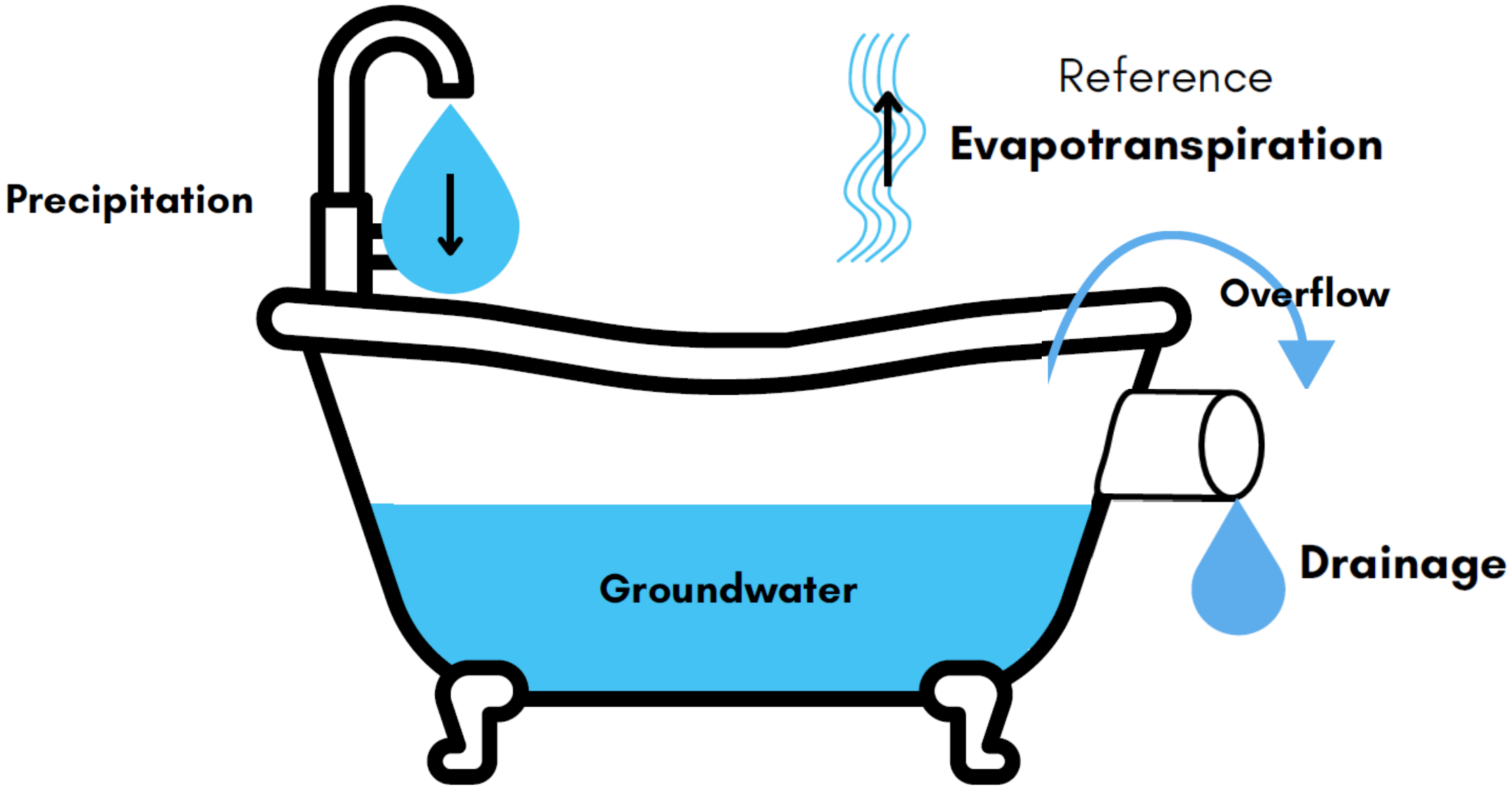

Increase water retention and
infiltration capacity of the landscape



Upstream depressional wetlands






Precipitation
Reference
Evapotranspiration
Overflow
Groundwater
Drainage

Monitoring

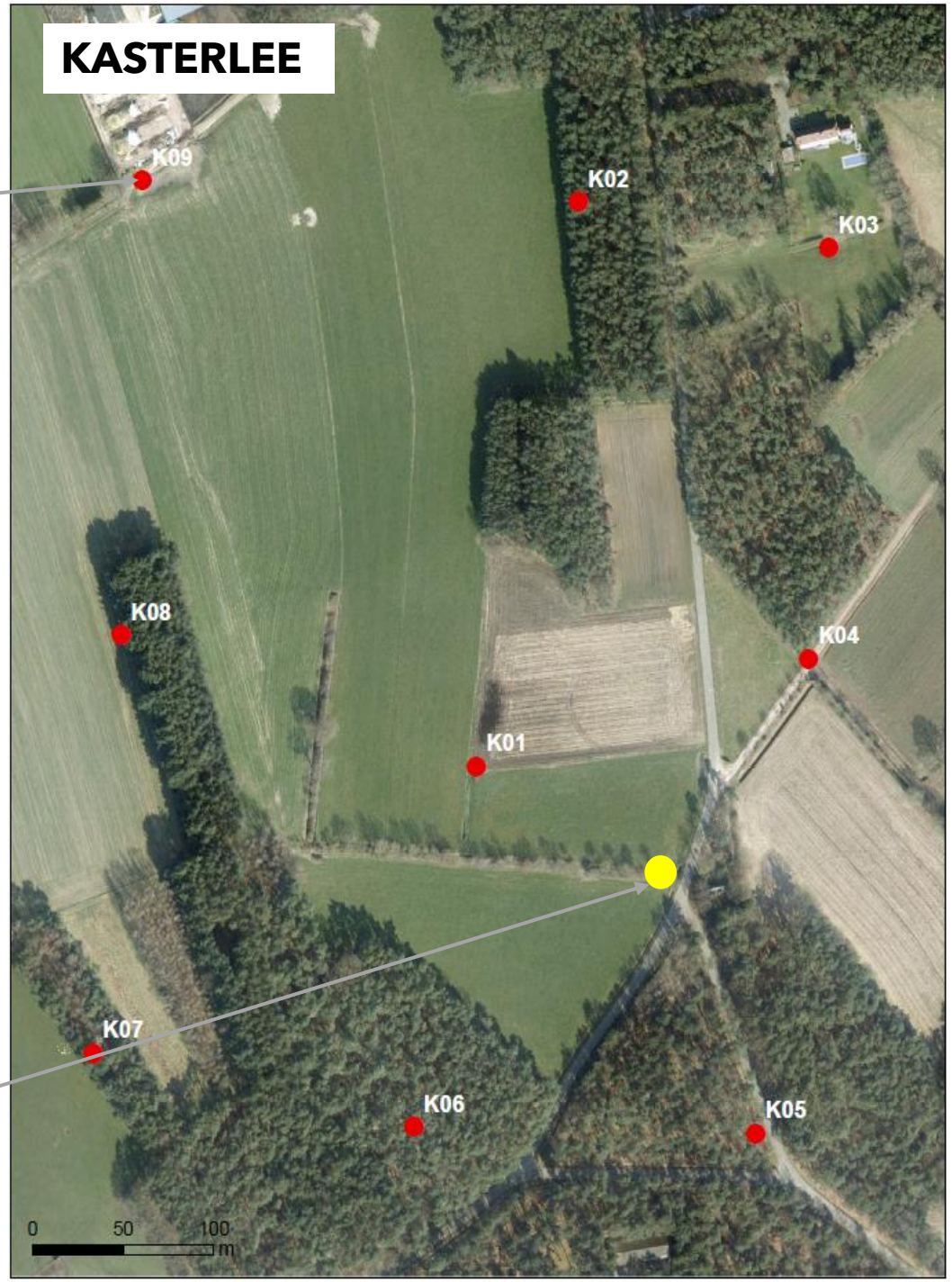
Groundwater level

Weather parameters (including precipitation)

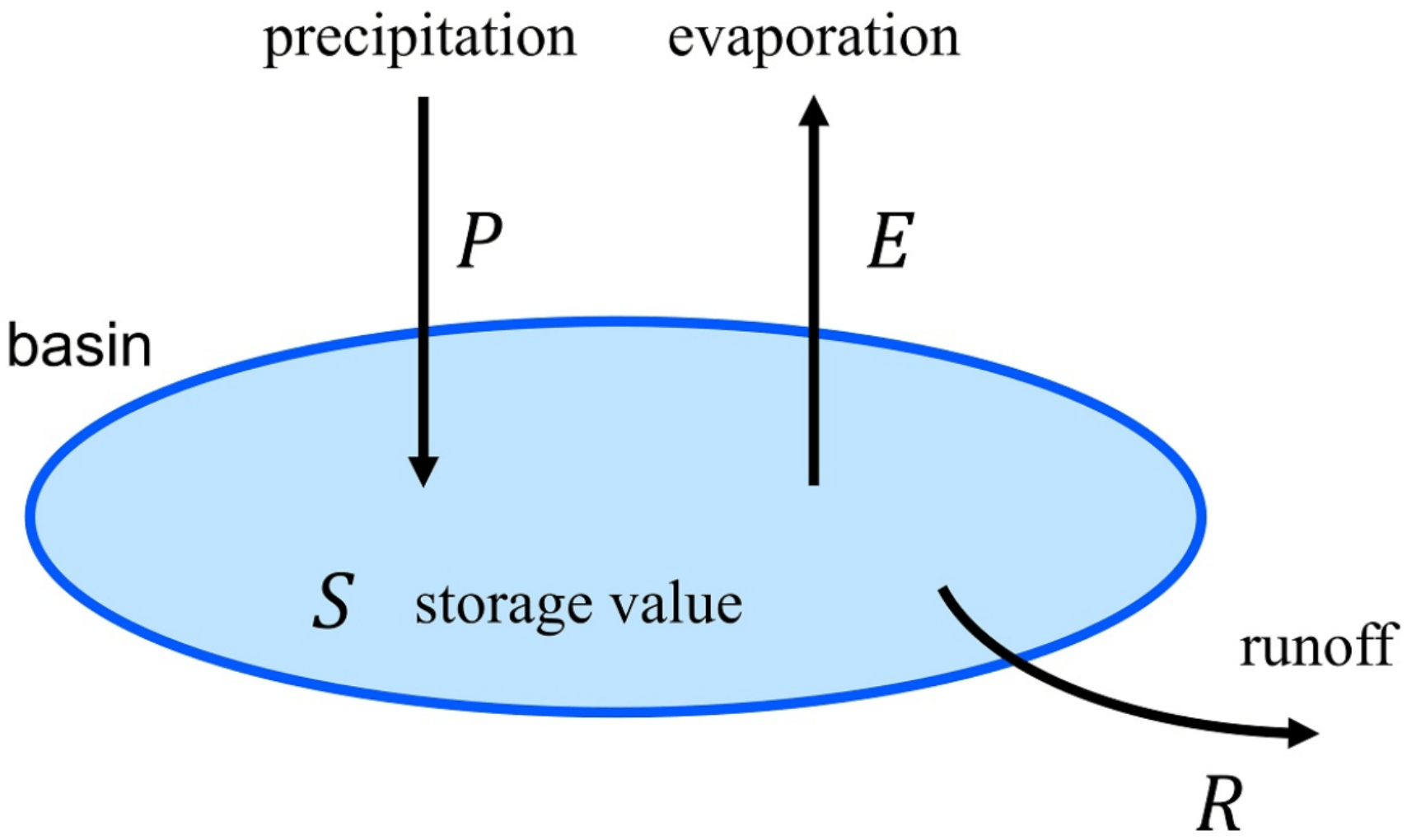
iFLUX: groundwater flux

Several soil parameters

Drainage discharge



Water budget



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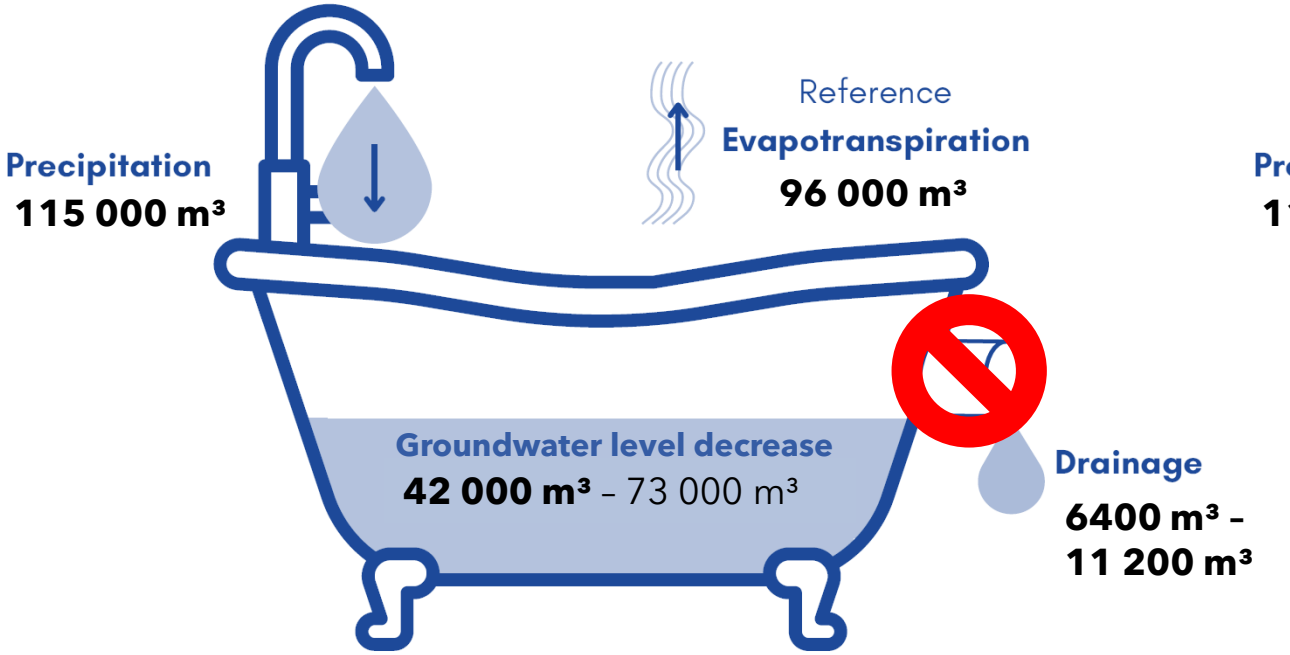
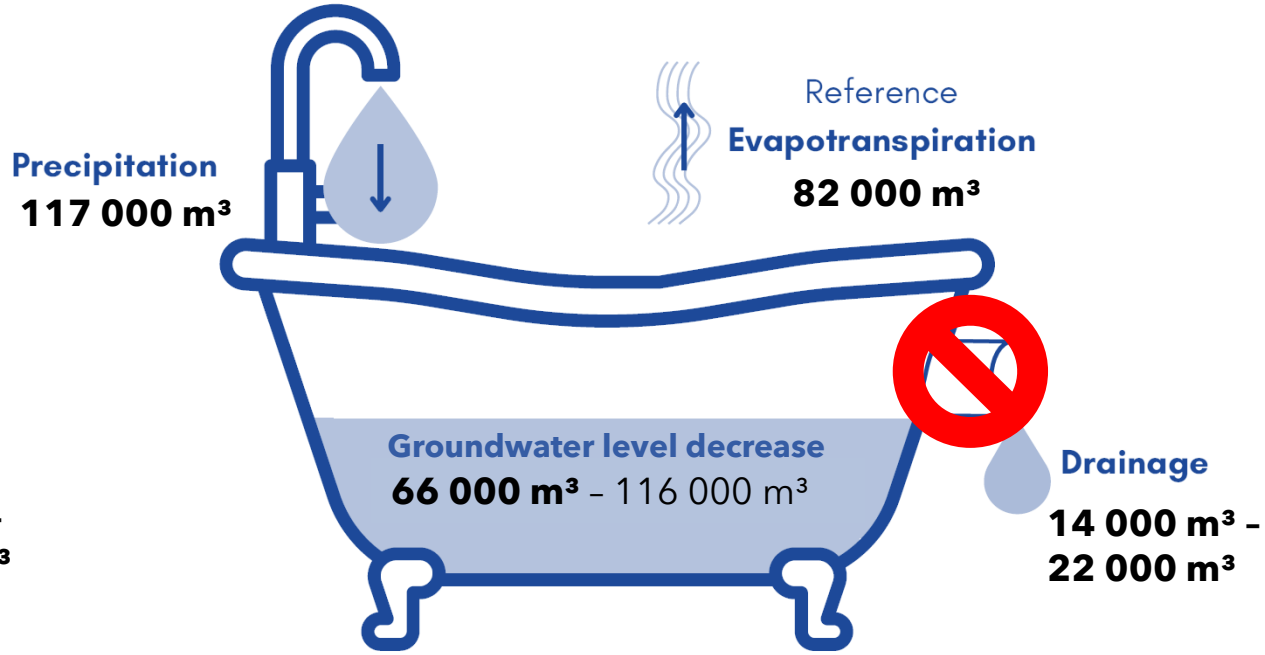
Water budget

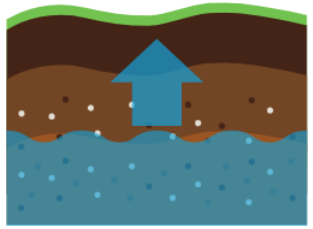
Mar ‘20 – Feb ‘21



Mar ‘21 – Feb ‘22



Groundwater level increase:
at least 24 cm

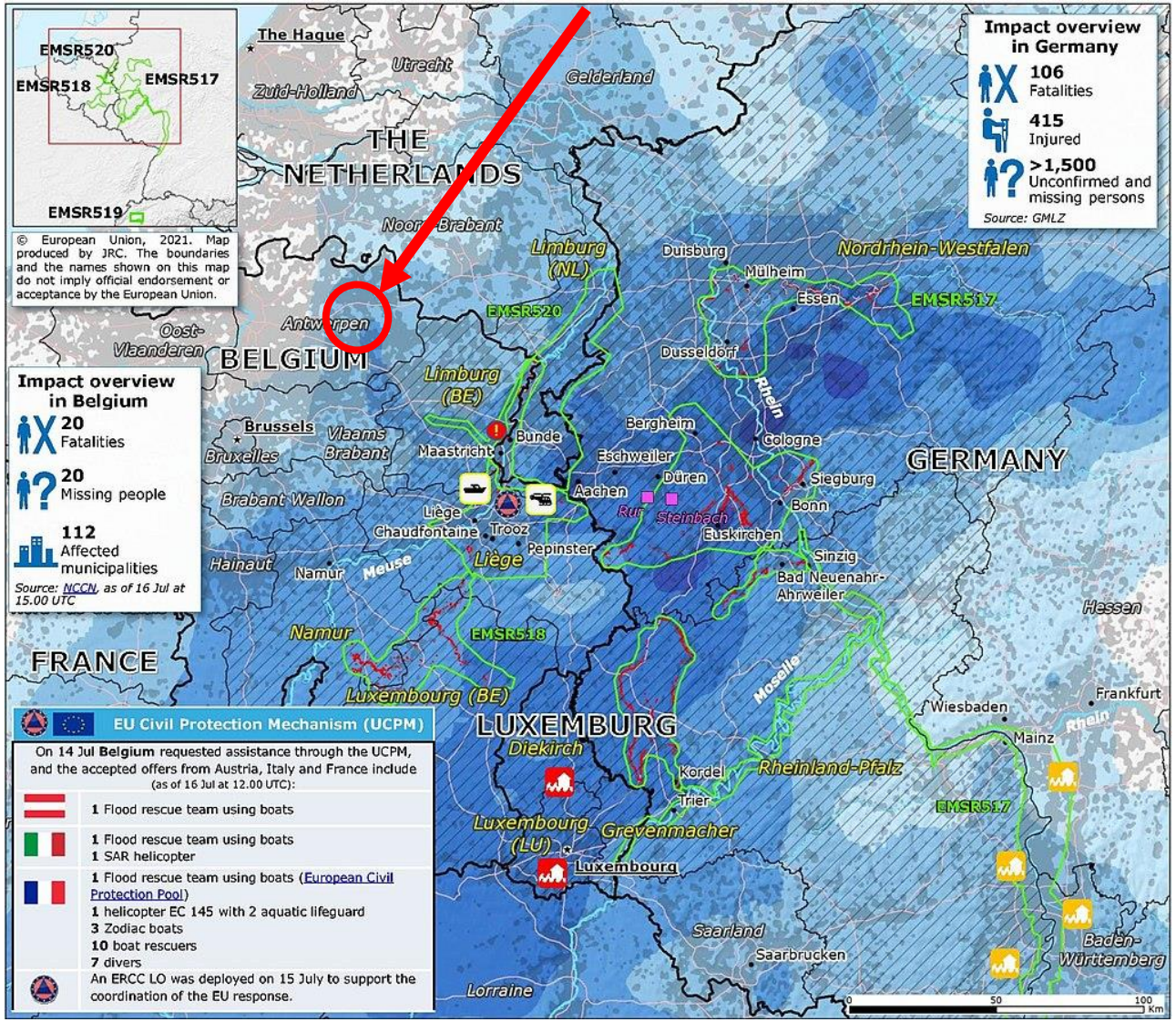


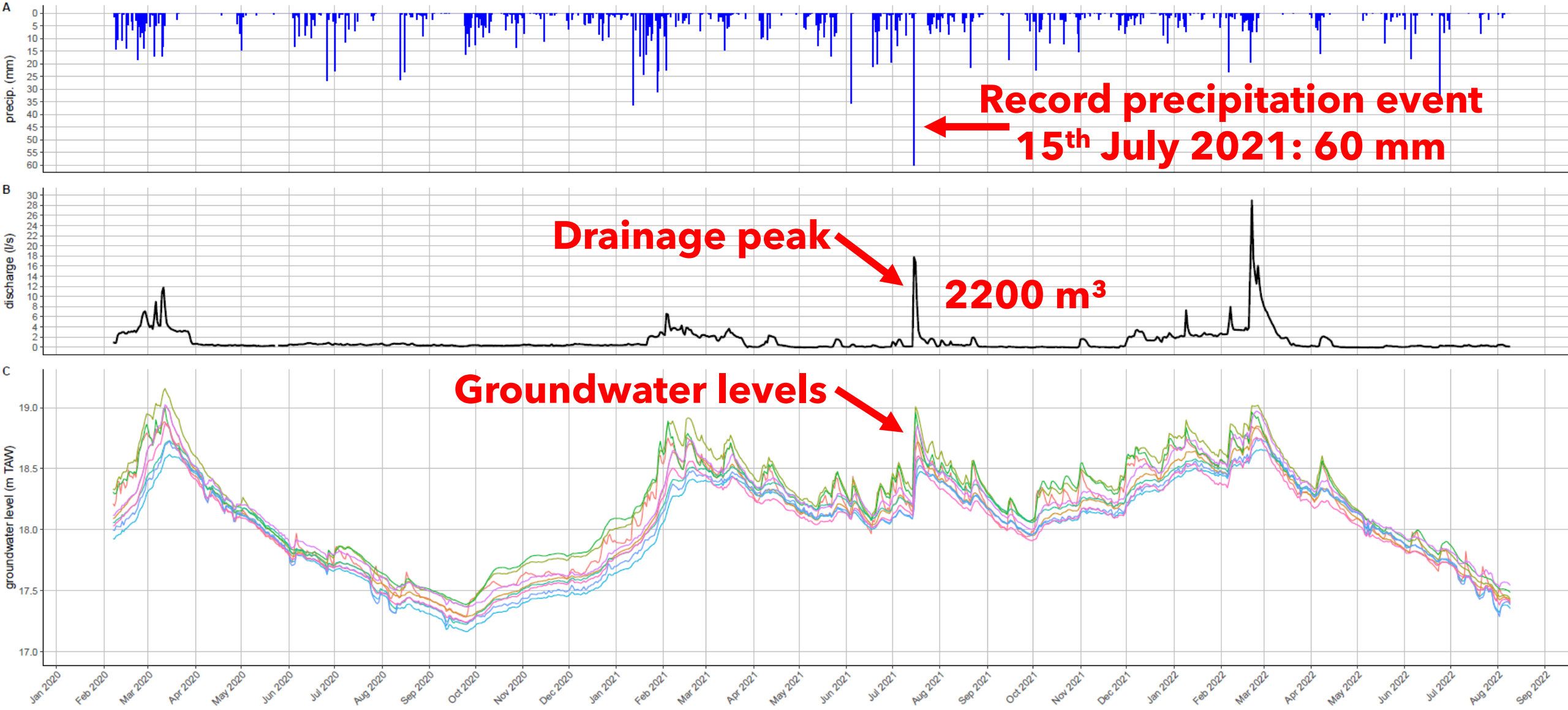
Groundwater level increase:
at least 50 cm

Upstream Depressional wetland Kasterlee

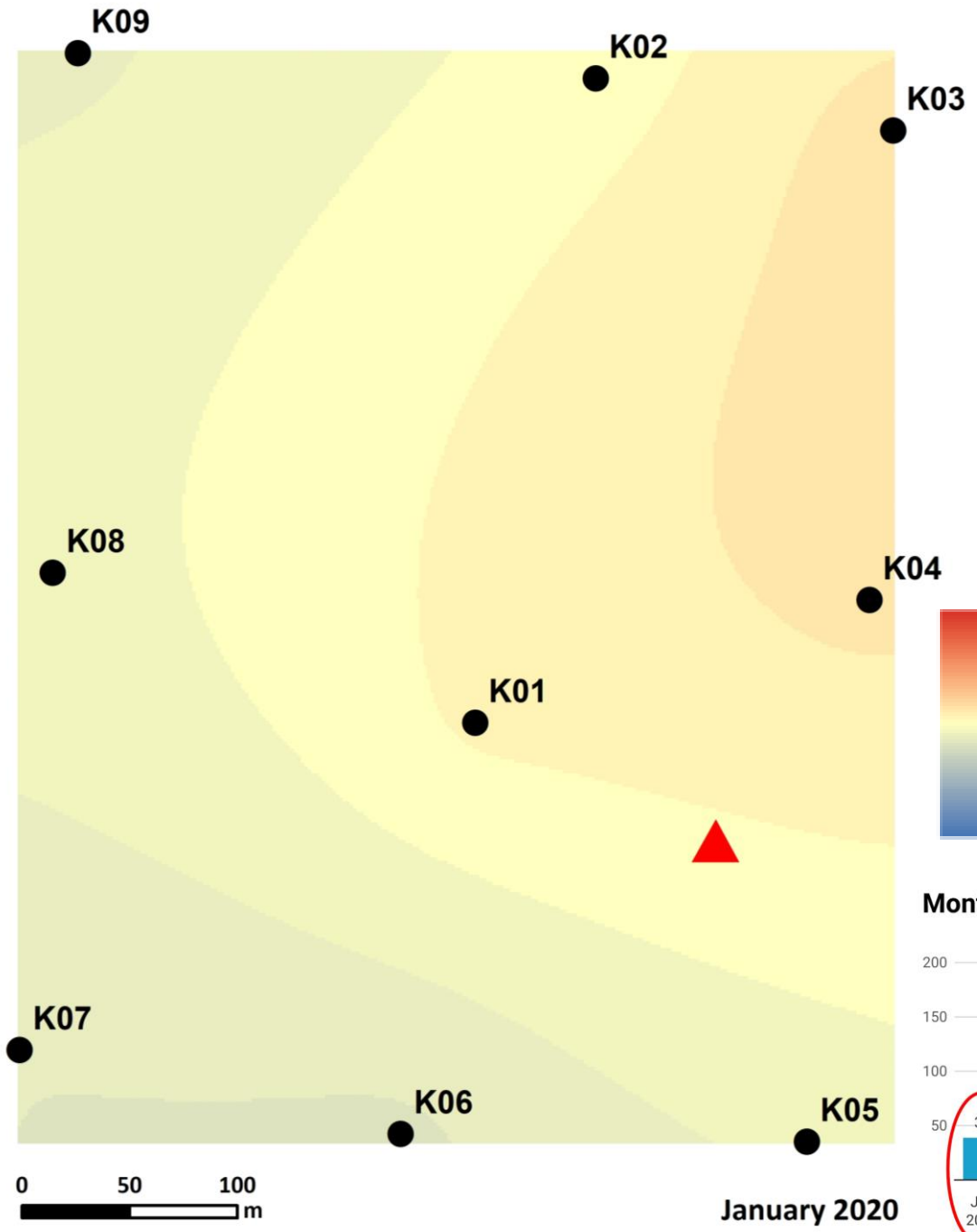
Liege (Belgium), 15/07/2021

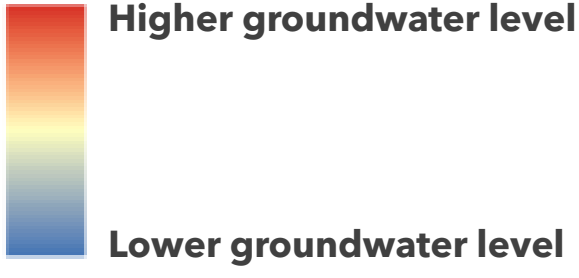
Kreuzberg (Germany), 17/07/2021

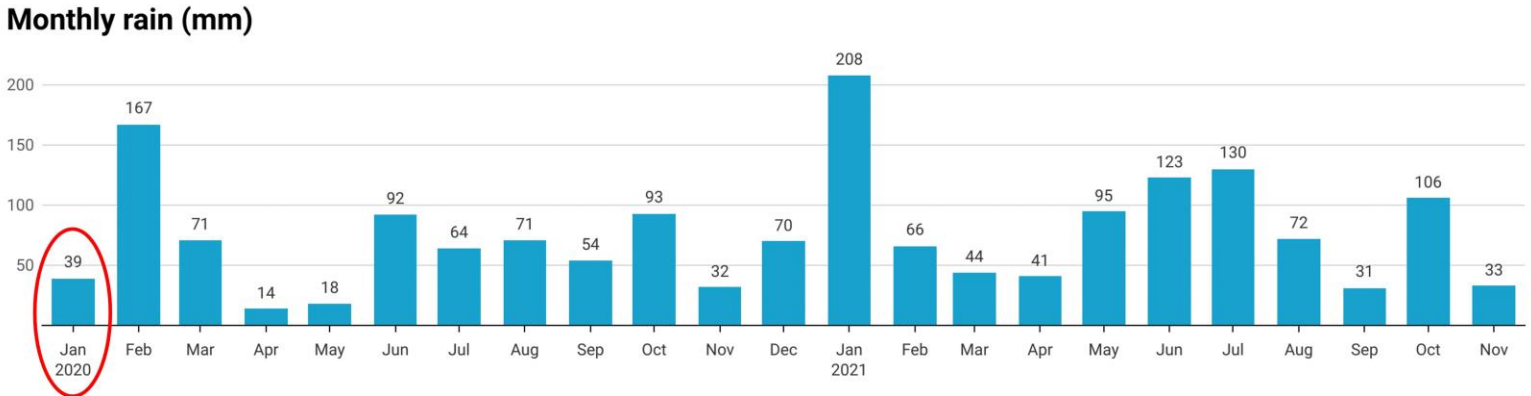



A
precip. (mm)
Record precipitation event
15th July 2021: 60 mm
B
discharge (l/s)
Drainage peak
2200 m³
C
groundwater level (m TAW)
Groundwater levels
Jan 2020
Feb 2020
Mar 2020
Apr 2020
May 2020
Jun 2020
Jul 2020
Aug 2020
Sep 2020
Oct 2020
Nov 2020
Dec 2020
Jan 2021
Feb 2021
Mar 2021
Apr 2021
May 2021
Jun 2021
Jul 2021
Aug 2021
Sep 2021
Oct 2021
Nov 2021
Dec 2021
Jan 2022
Feb 2022
Mar 2022
Apr 2022
May 2022
Jun 2022
Jul 2022
Aug 2022
Sep 2022

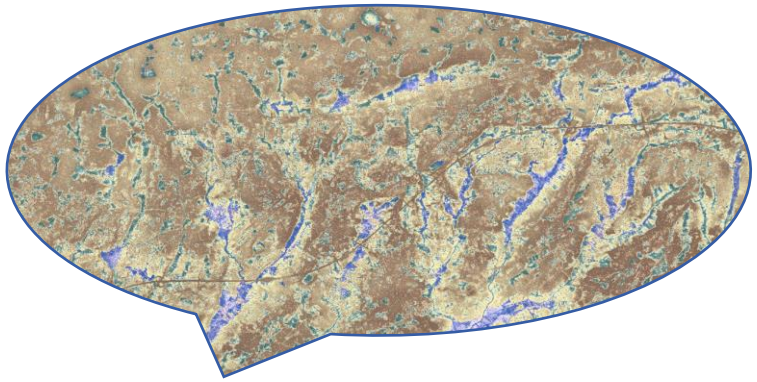
Groundwater level responds quickly to precipitation



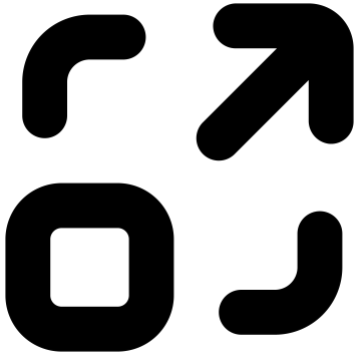





What's
NEXT



Hydrological modelling



Upscaling

Scenario analysis

Annelies Broeckx - *"The potential of upstream depressional wetlands to buffer and infiltrate water"*
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University of Antwerp

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This research is being part of the projects TURQUOISE and PROWATER
https://www.uantwerpen.be/en/projects/turquoise/
https://www.pro-water.eu/