

WATERCYCLE

Watersystem & Urban Watercycle

12 June 2025

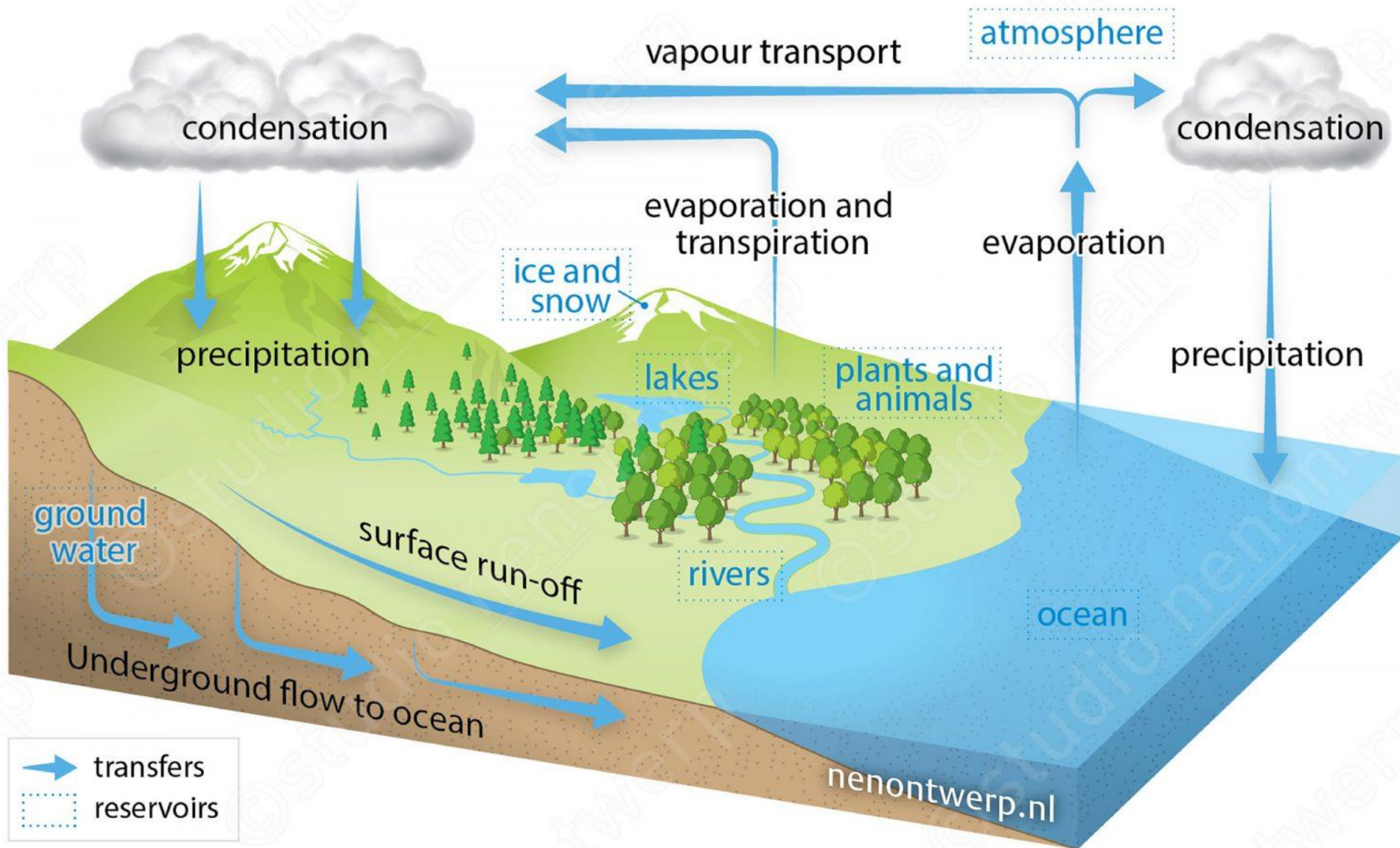
Hogeschool Van Hall Larenstein

Lecturer Watermanagement

Content:

- ✓ Watercycle
- ✓ Watersystem
- ✓ Urban watercycle

Watercycle





Precipitation
surplus

$$850 \text{ mm} - 560 \text{ mm} = 290 \text{ mm}$$



Neerslagoverschot en -tekort



00 mm

neerslag

verdamping

Neerslag en verdamping

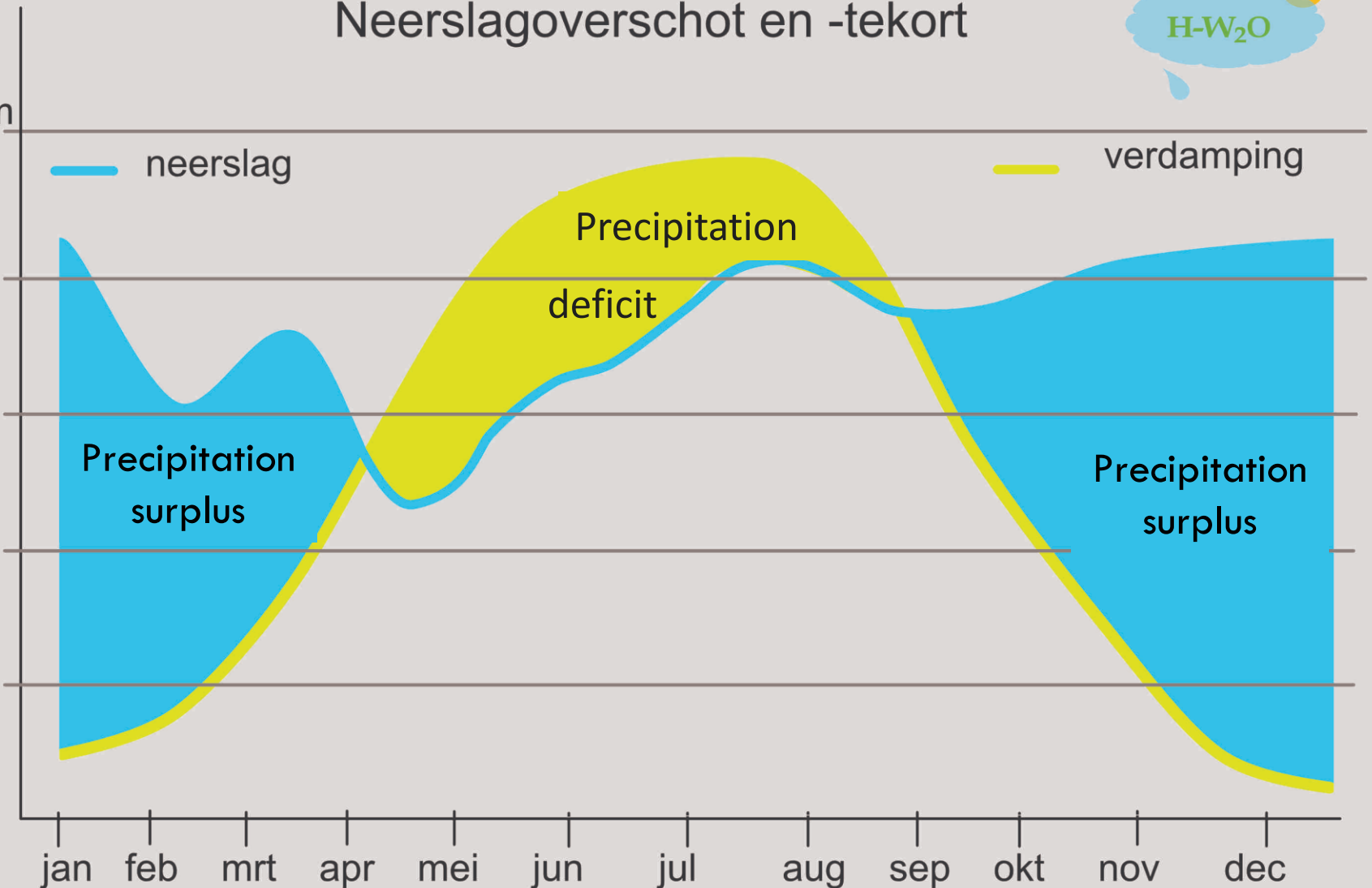
Precipitation

deficit

Precipitation
surplus

Precipitation
surplus

jan feb mrt apr mei jun jul aug sep okt nov dec





Precipitation
deficit

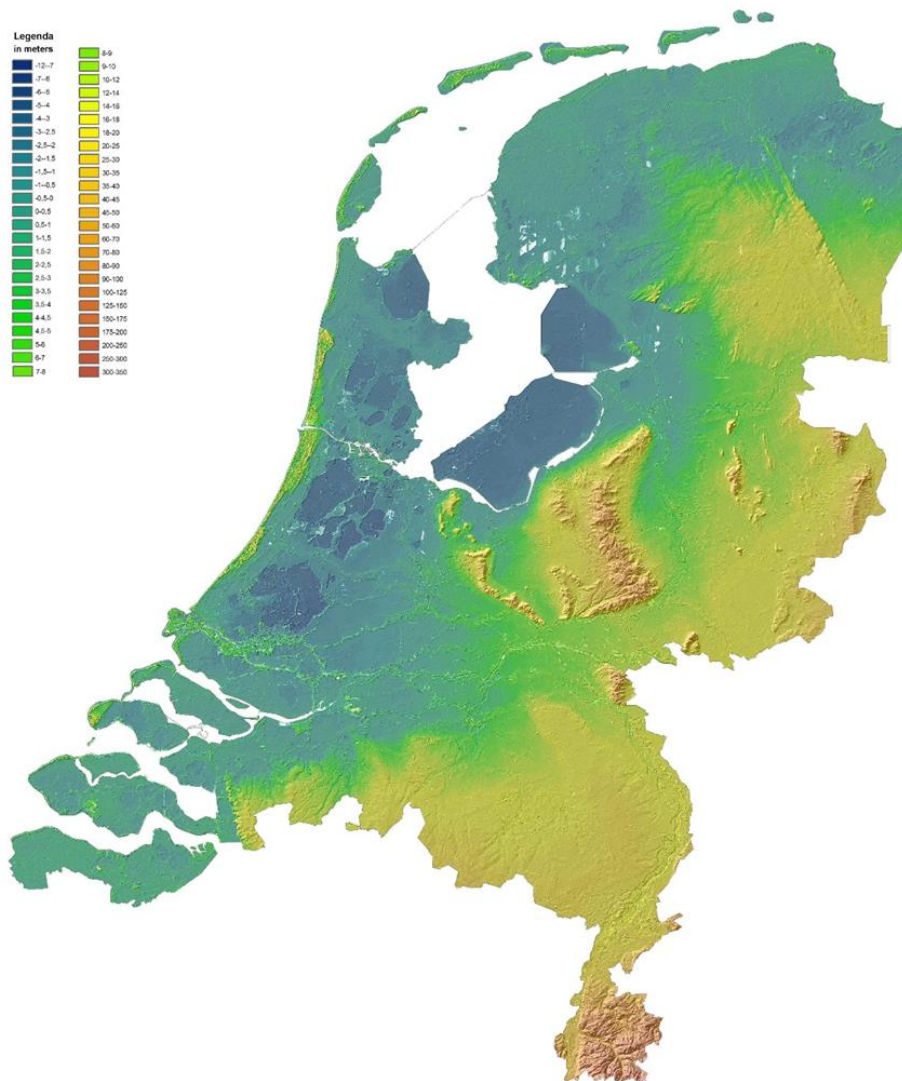
$$450 \text{ mm} - 1400 \text{ mm} = -950 \text{ mm}$$

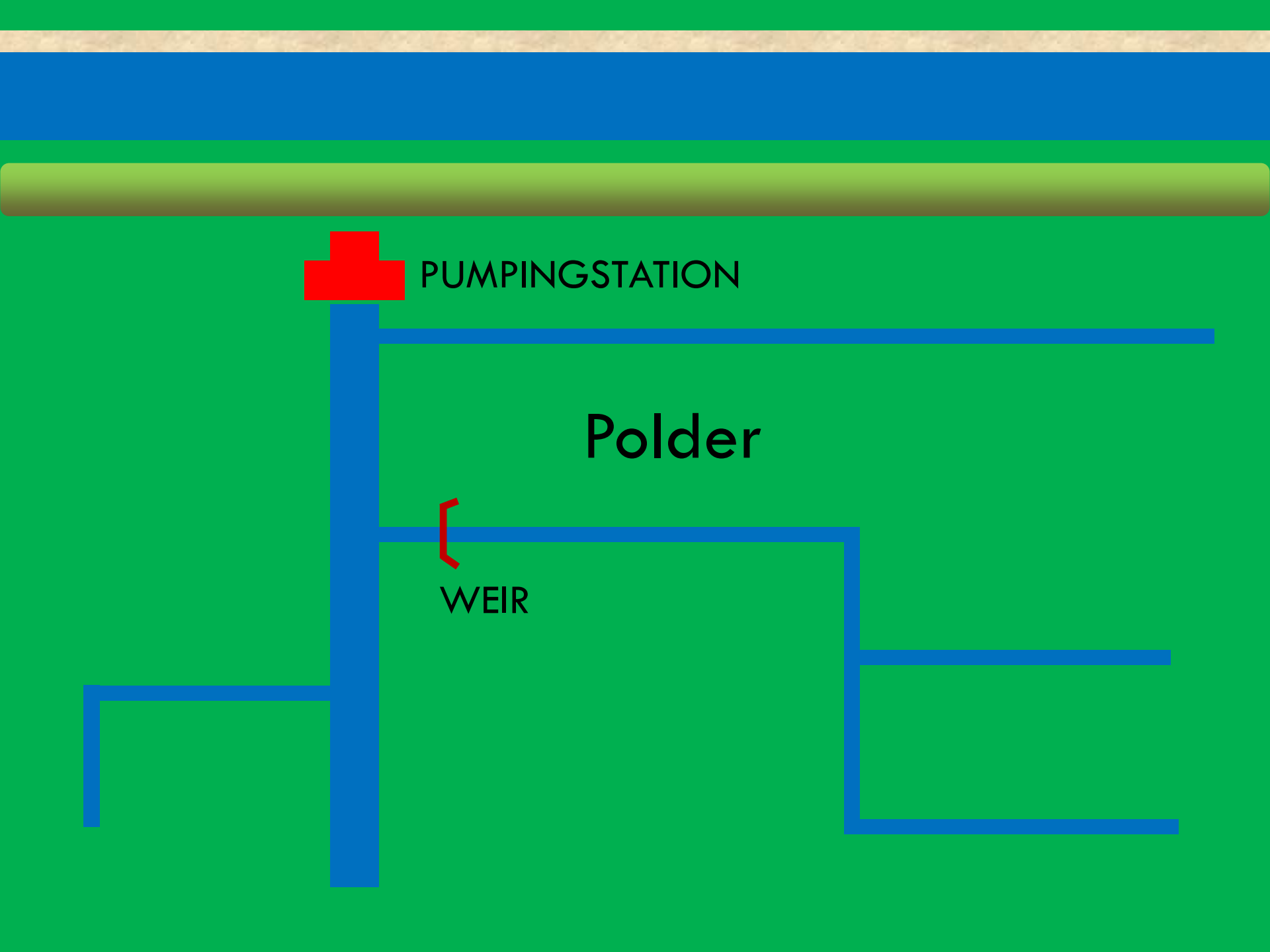


Surface water



Actueel Hoogtebestand Nederland (AHN)
met reliëf-schaduwwerking





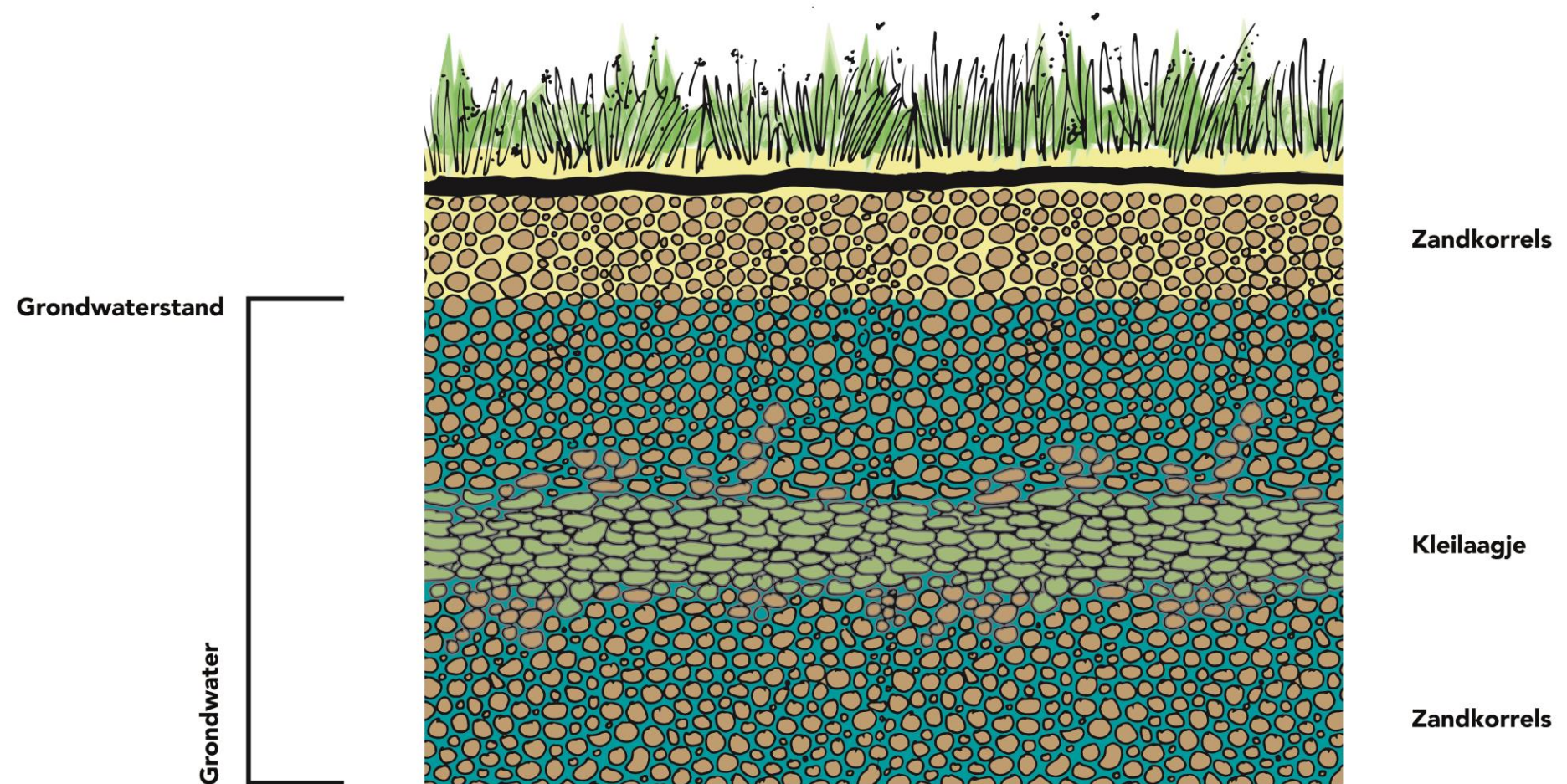
PUMPINGSTATION

Polder



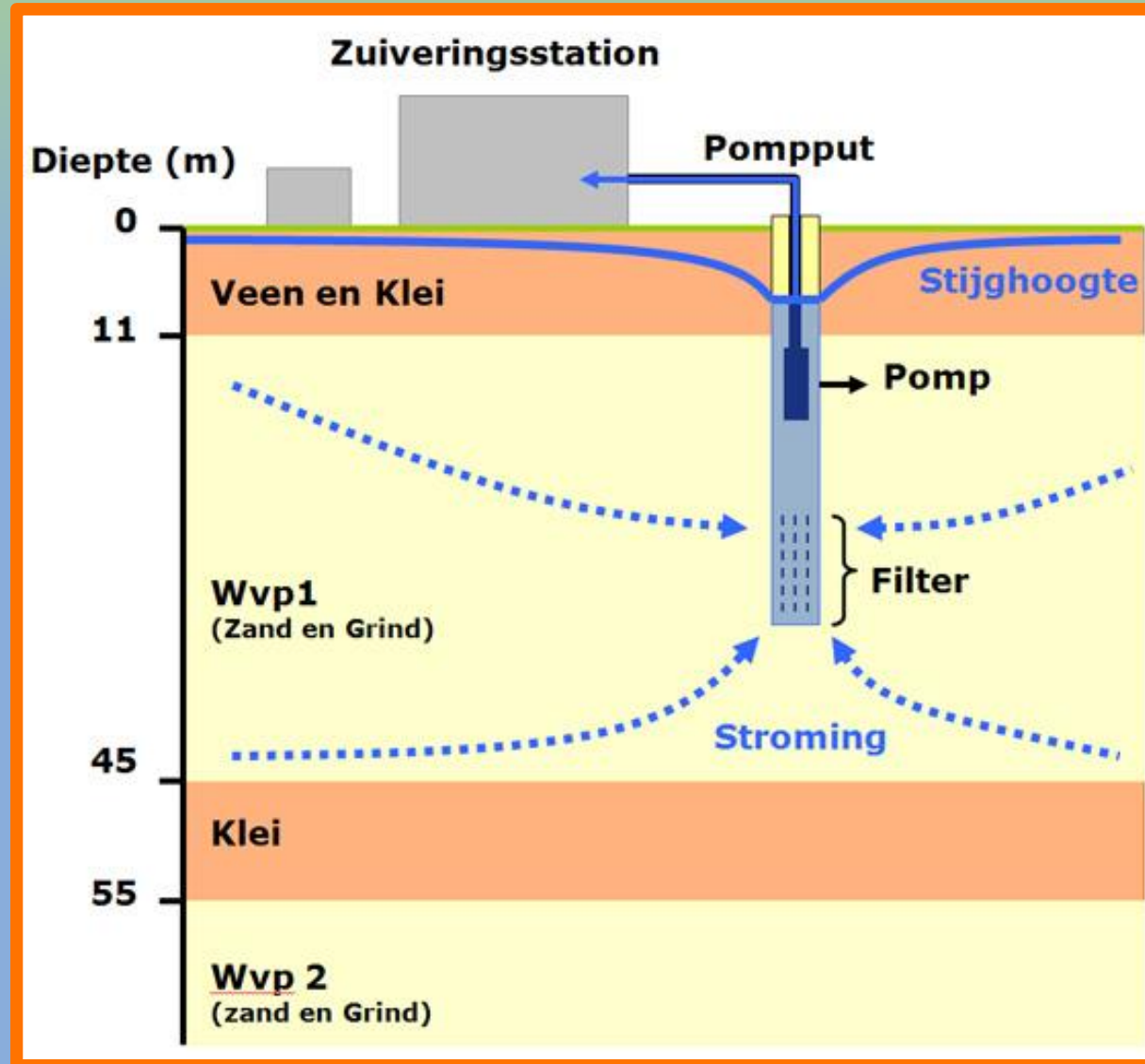
WEIR

Groundwater



Water in the pores between the soil particles

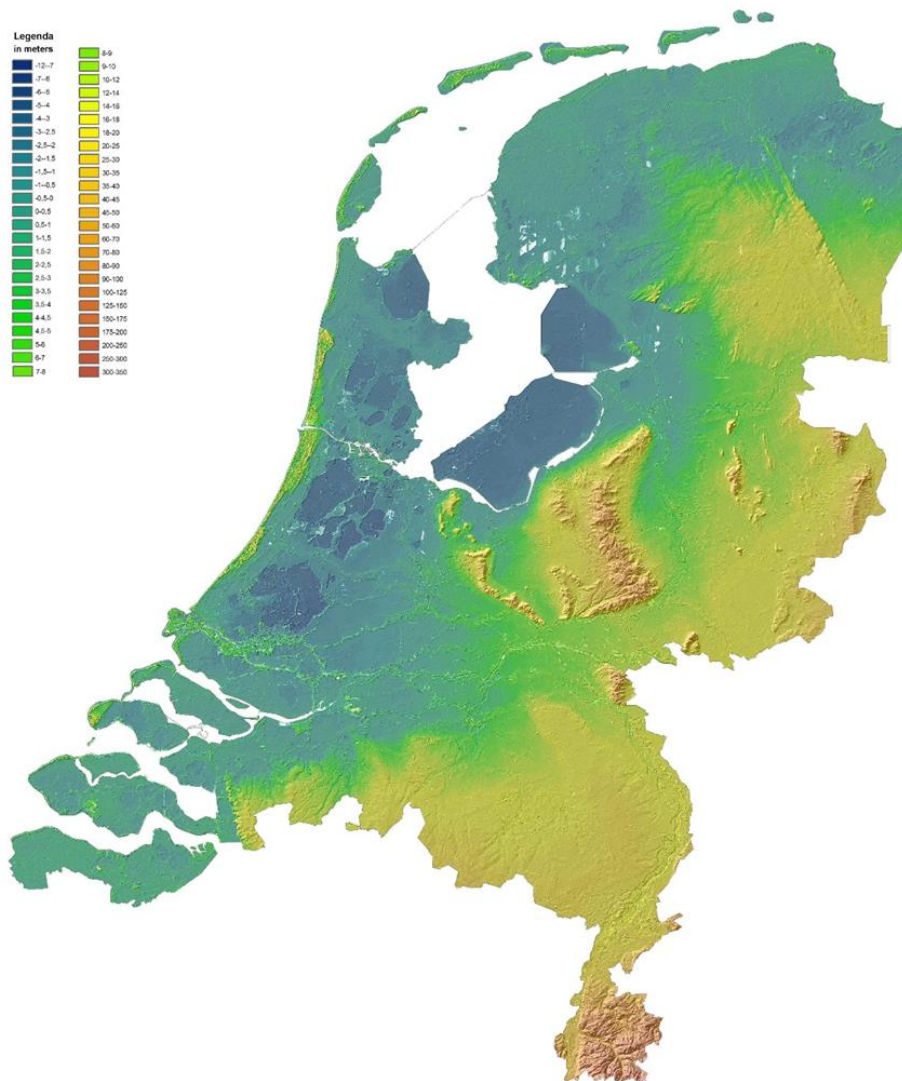
Location drinking water production

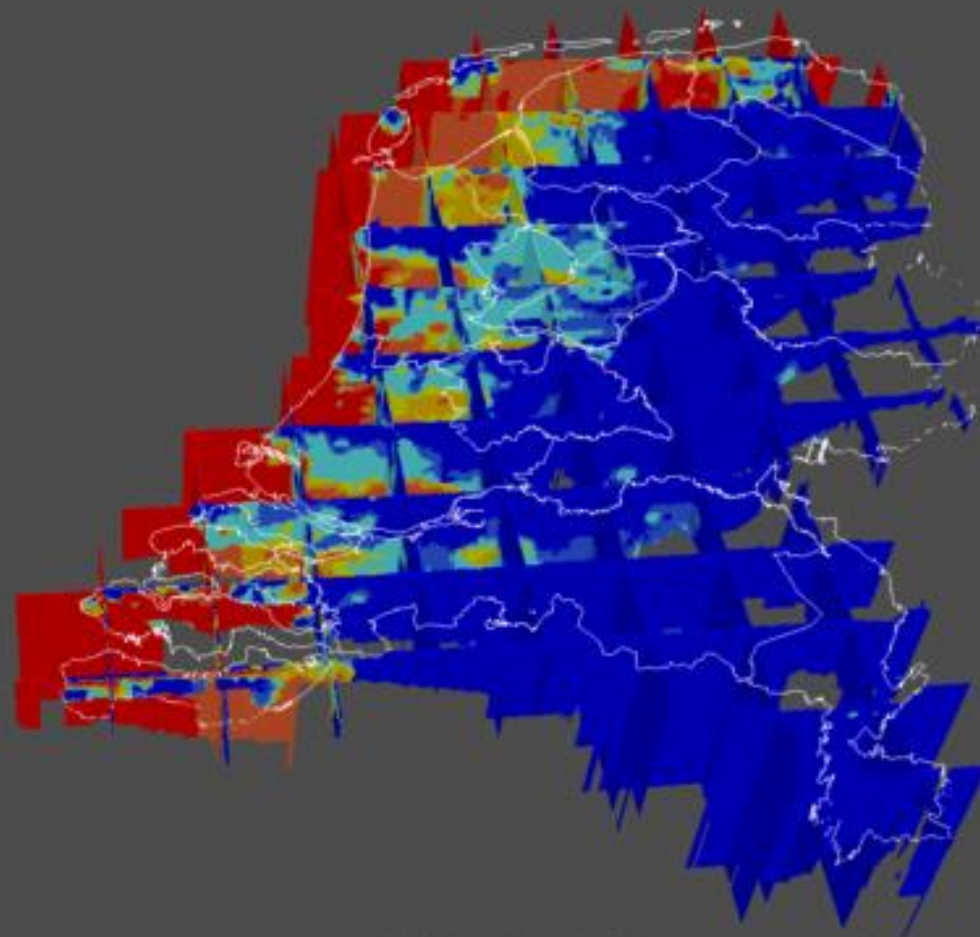


Example: Drinking water plant Spannenburg



Actueel Hoogtebestand Nederland (AHN)
met reliëf-schaduwwerking

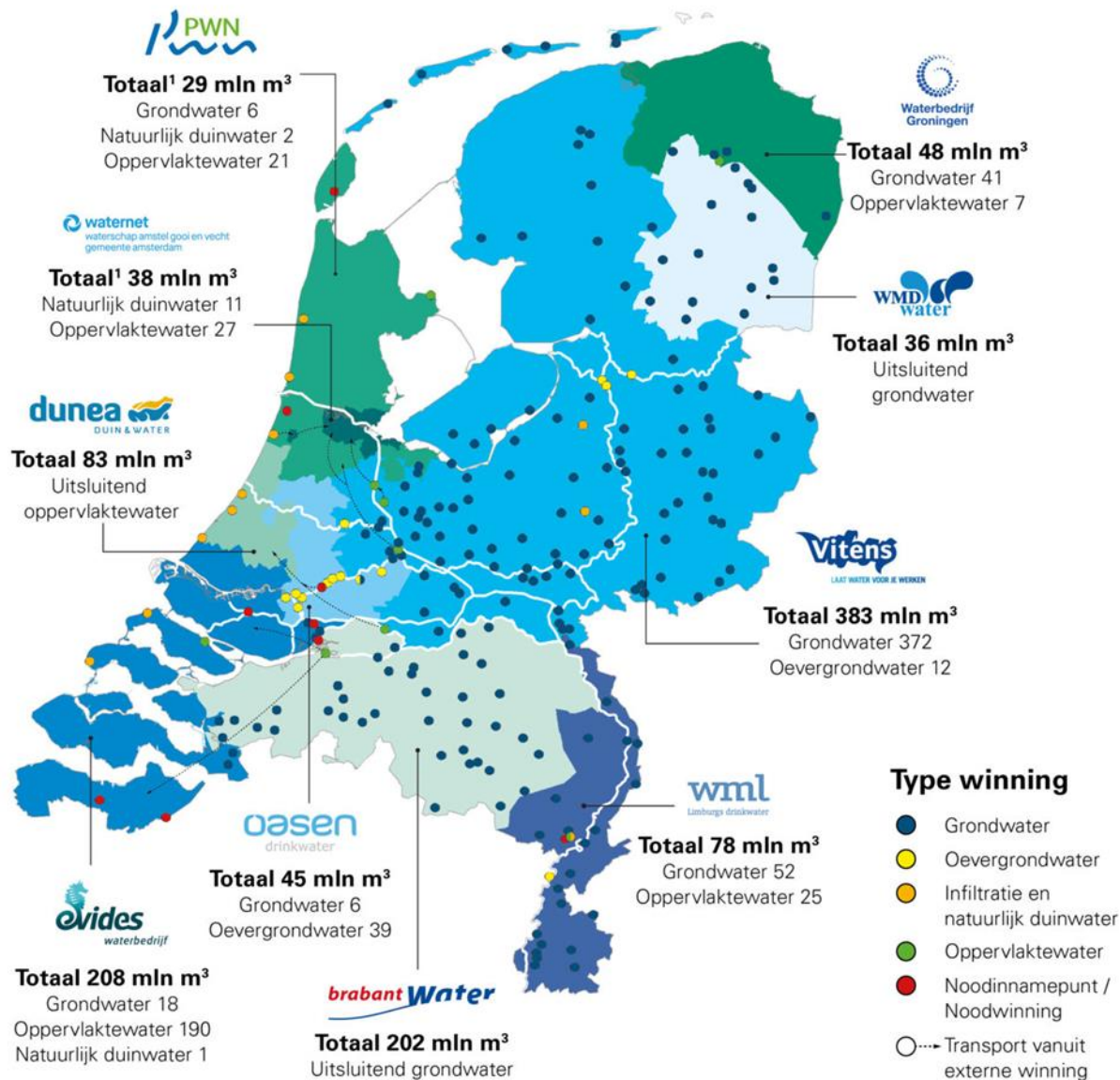




NHI fresh-salt p50 groundwater Cl concentration

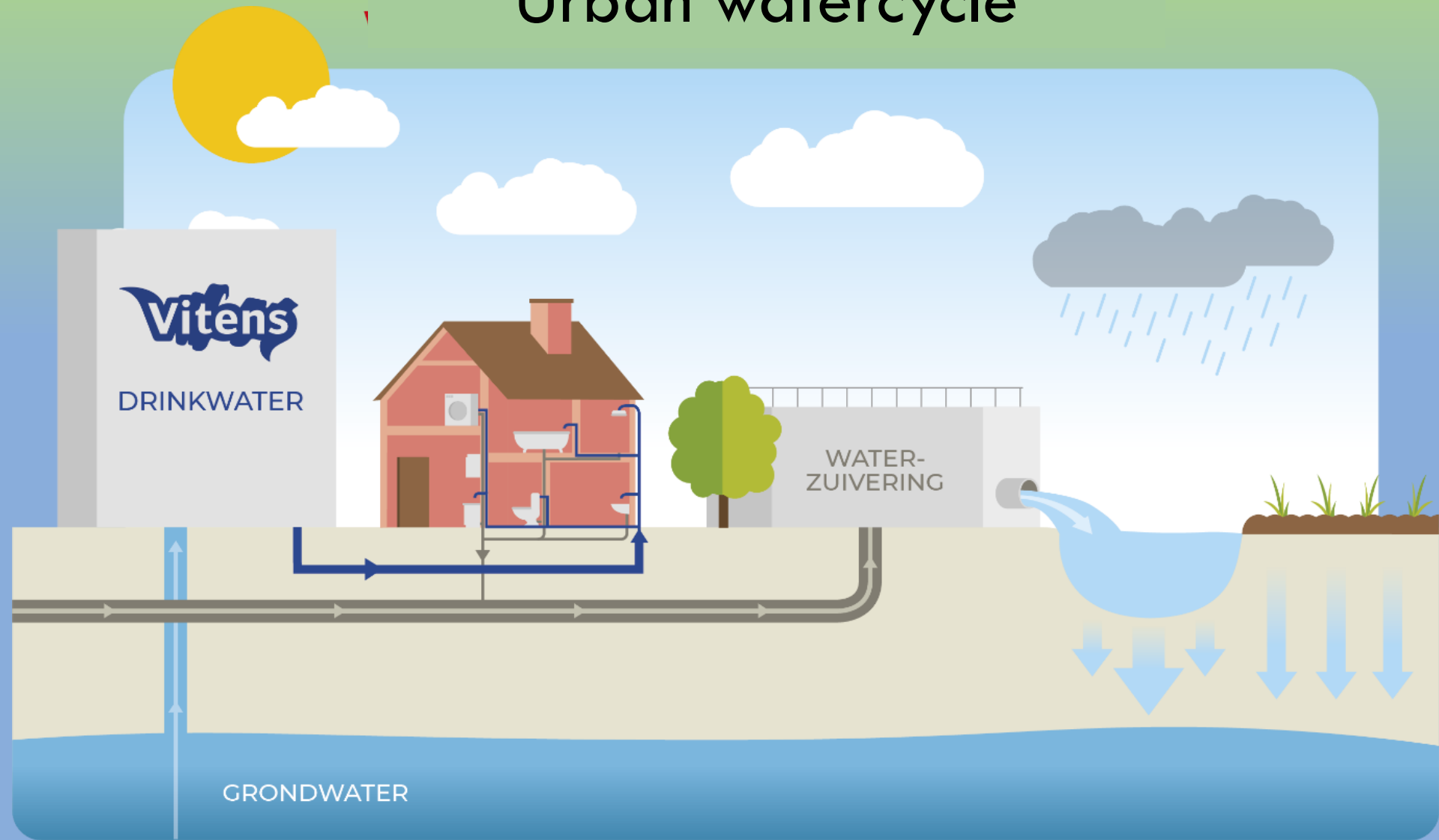


Overzichtskaart distributiegebieden drinkwaterbedrijven, bronnen, innamepunten en hoeveelheden gewonnen water (2018)



Er zijn in totaal 221 winningen², waarvan 187 grondwaterwinningen, 9 oppervlaktewaterwinningen, 14 oevergrondwaterwinningen en 11 infiltratiewinningen (incl. natuurlijk duinwater).

Urban watercycle



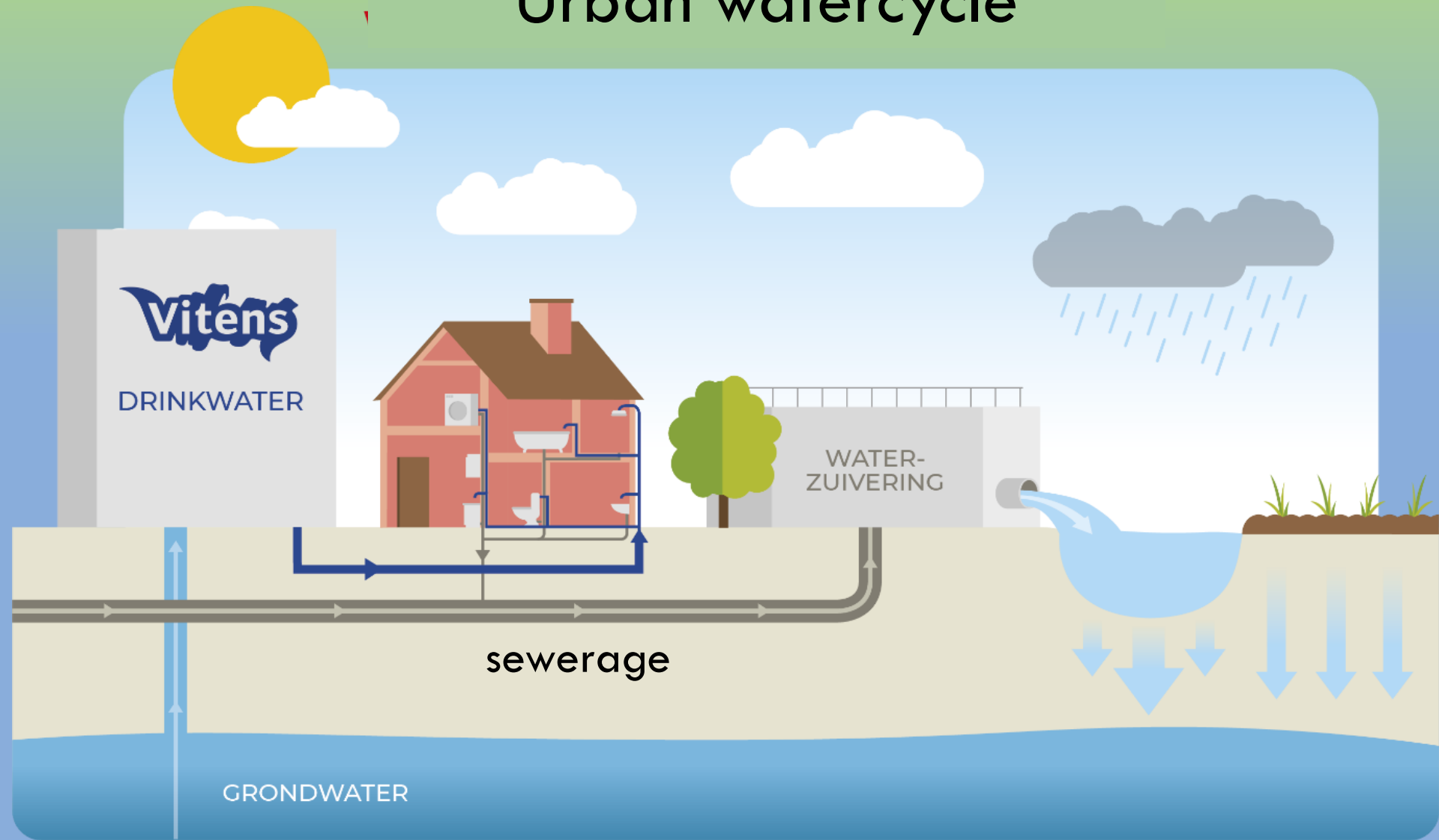


134 liters per day

- ✓ Showering 50 liters (37%)
- ✓ Toilet 30 liters (22%)
- ✓ Washing 18 liters (13%)
- ✓ Laundry 17 liters (13%)
- ✓ Other 19 liters (14%)



Urban watercycle



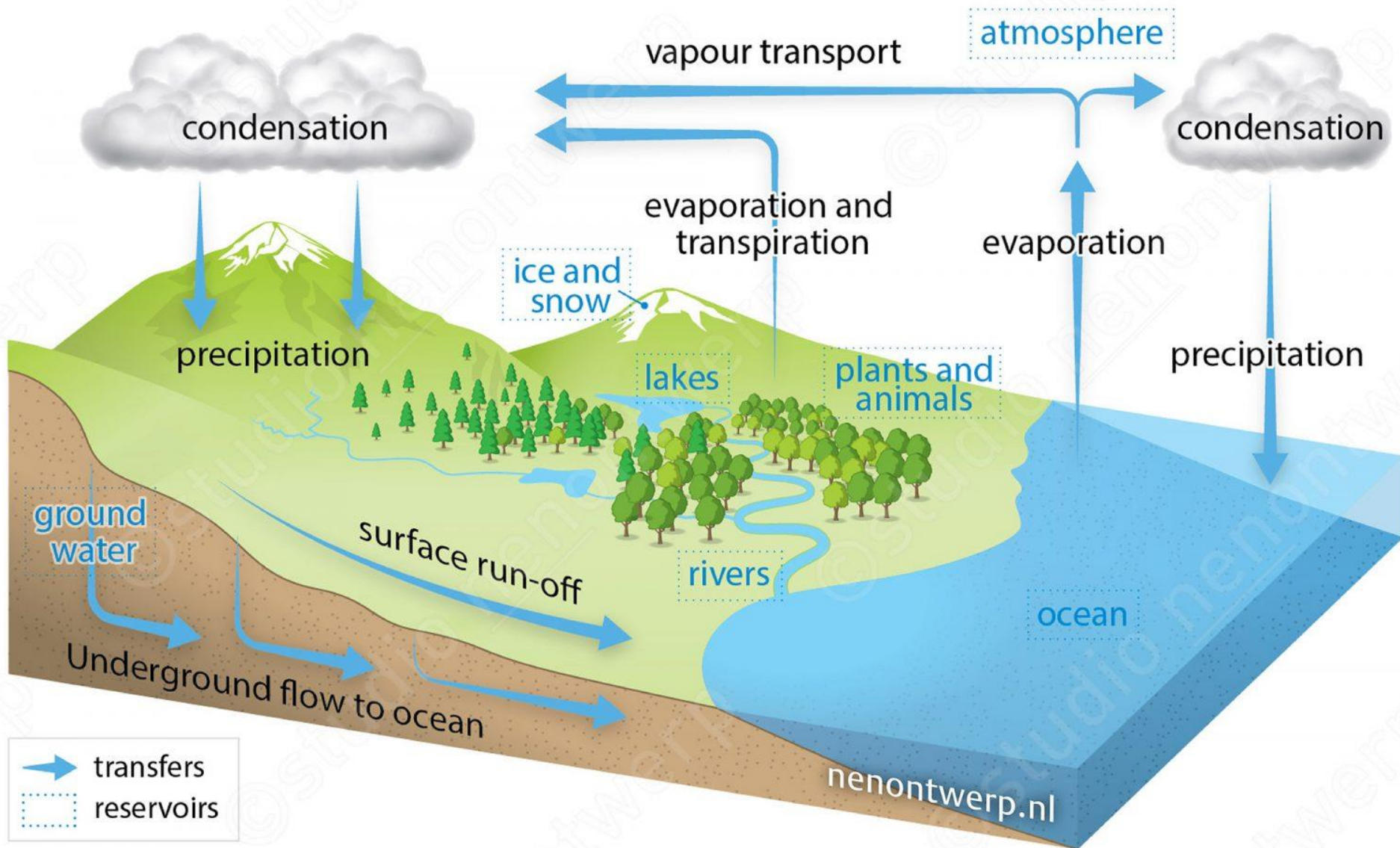
Sewage treatment plant



Back in the watersystem!



Watercycle



Climate change

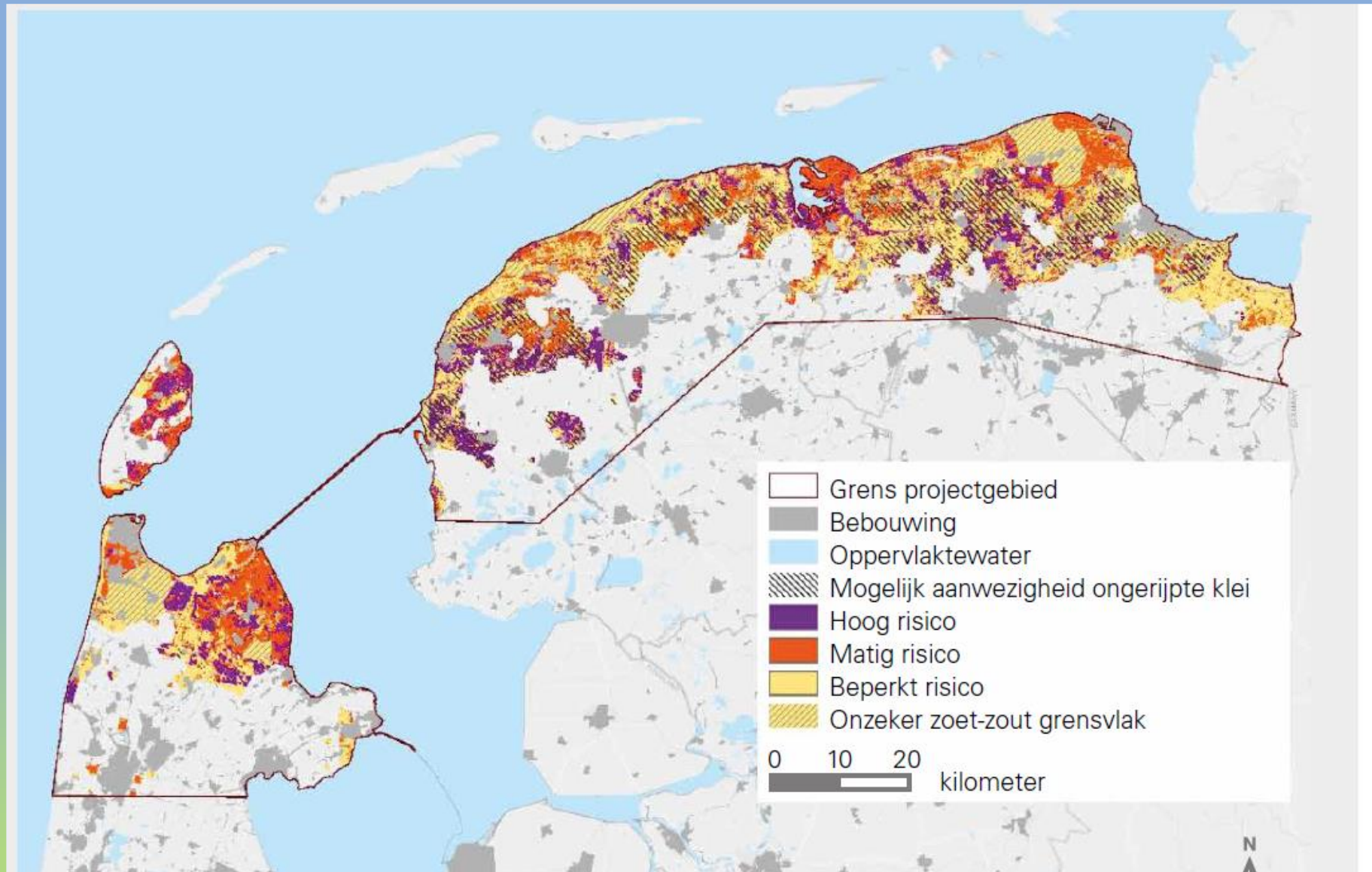
- Increasing precipitation autumn/winter (2050: 3 – 17%)
- greater shower intensity (higher moisture content: 3 – 7%)



More drought during the
growing season



Increase in salinity 2050



The background features a smooth gradient from light green at the top to light blue at the bottom. Scattered across the image are numerous water droplets of various sizes, some with highlights and shadows, giving them a three-dimensional appearance. The word "Questions?" is centered in a bold, black, sans-serif font.

Questions?