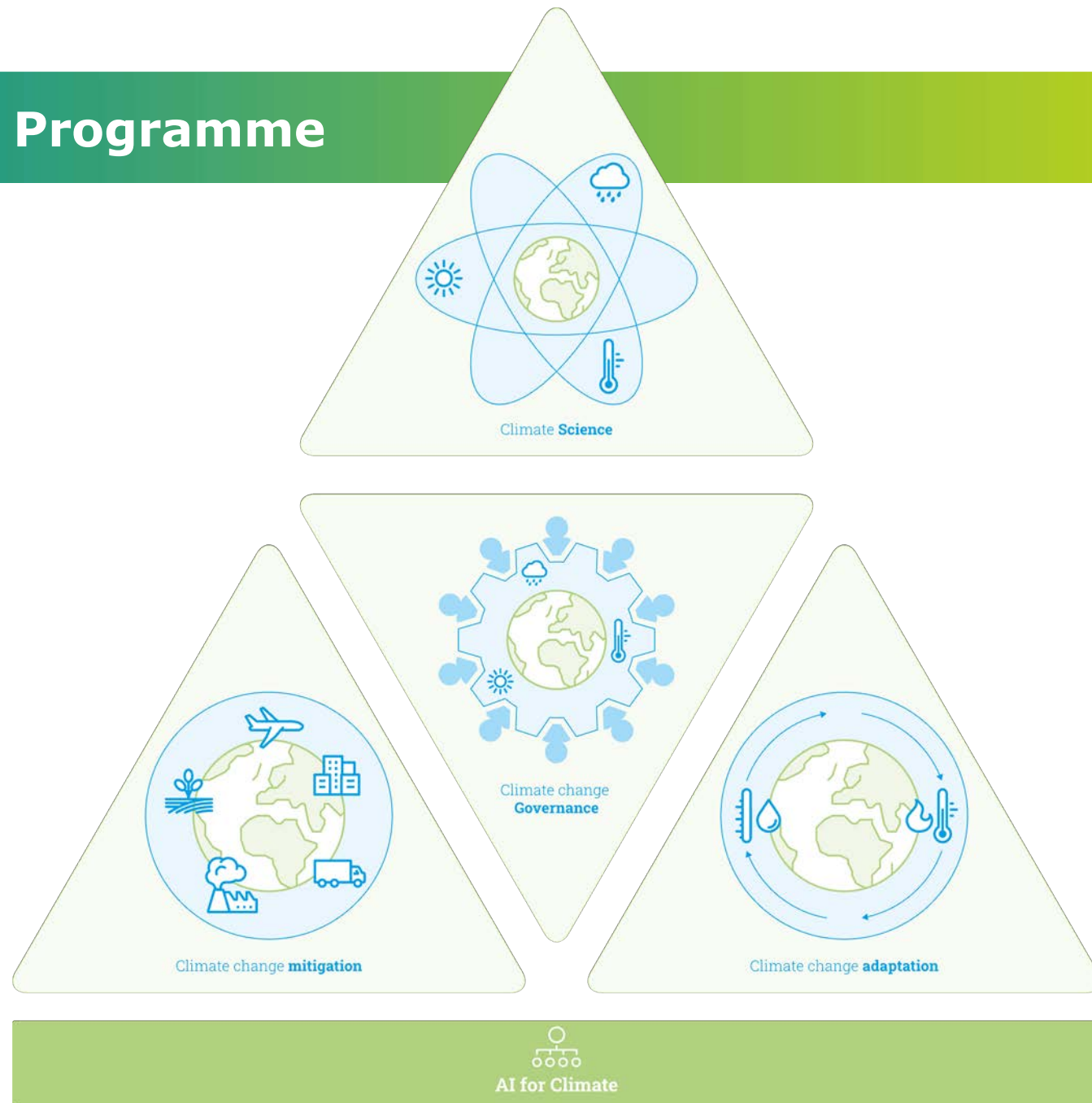




Integrated approaches to climate adaptation

Marjolein van Esch, TU Delft

Climate Action Programme



*“The cumulative scientific evidence is unequivocal: Climate change is a threat to human well-being and planetary health. Any further delay in concerted anticipatory global action on **adaptation and mitigation** will miss a brief and **rapidly closing window of opportunity** to secure a liveable and sustainable future for all.” IPCC (2022)*

Challenges

Water

- Too much: Coastal, fluvial and pluvial flooding
- Too little (drought): Water capture, storage and usage



Challenges

Heat

- Urban heat island effect, heat stress, air quality, building cooling demand



Urban environments are vulnerable

- Concentration of people
 - Key infrastructures
 - Economic assets
-
- Urban areas aggravate impacts

Urban Heat Island effect

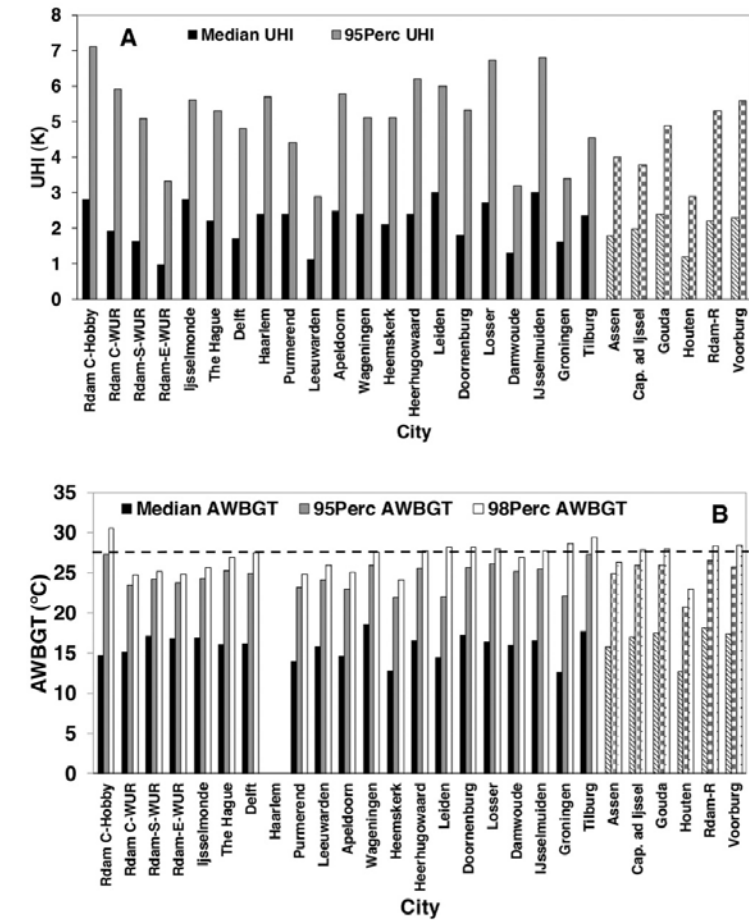
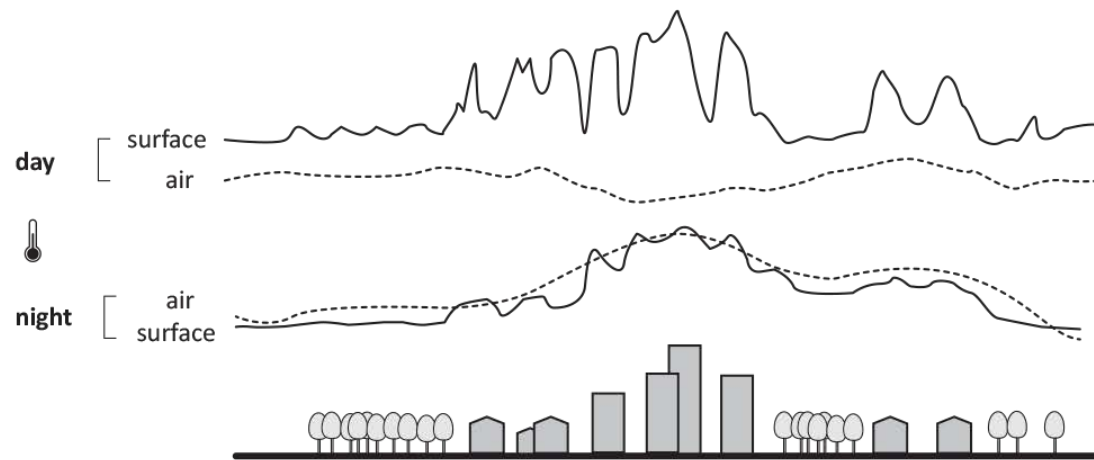


Figure 3. Observed median and percentile values of the (a) canopy layer UHI and (b) AWBGT for the studied cities in the Netherlands. The roof-level stations are shown in modified fill.

Urban Water Balance

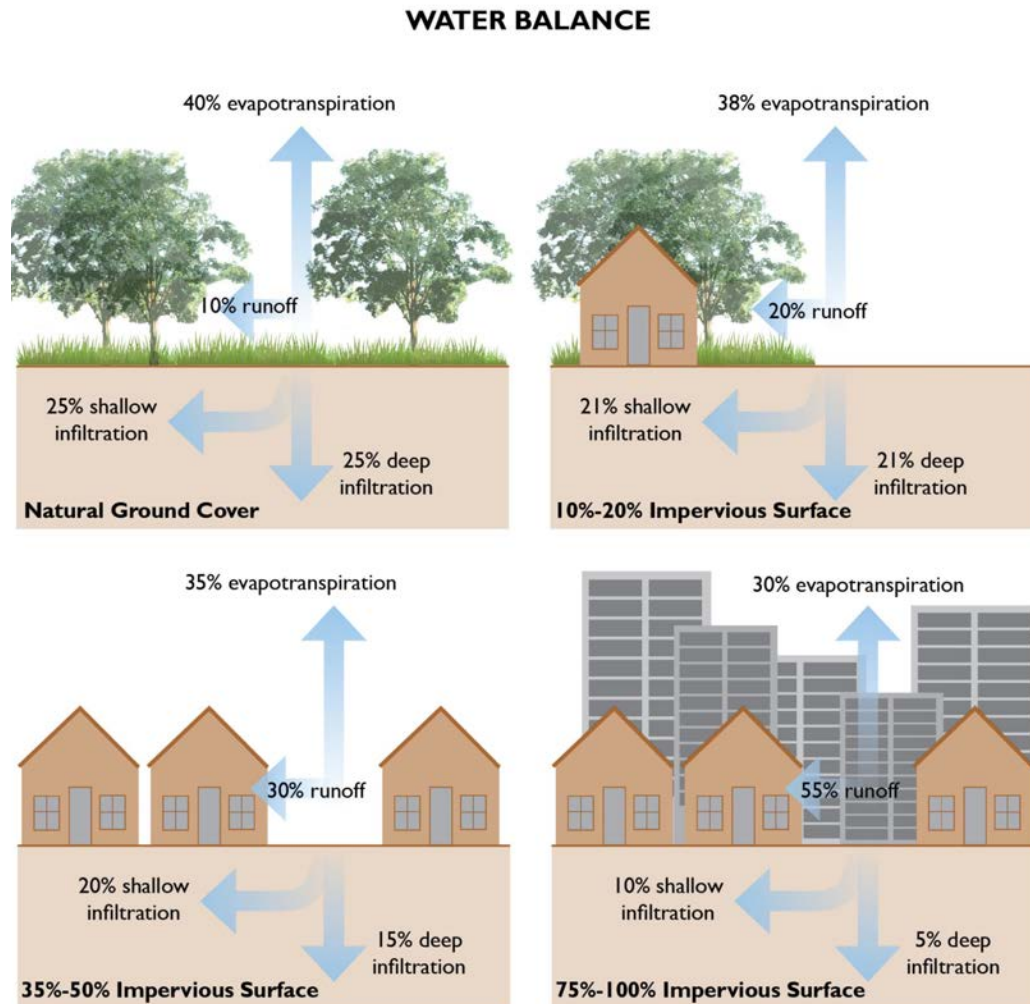
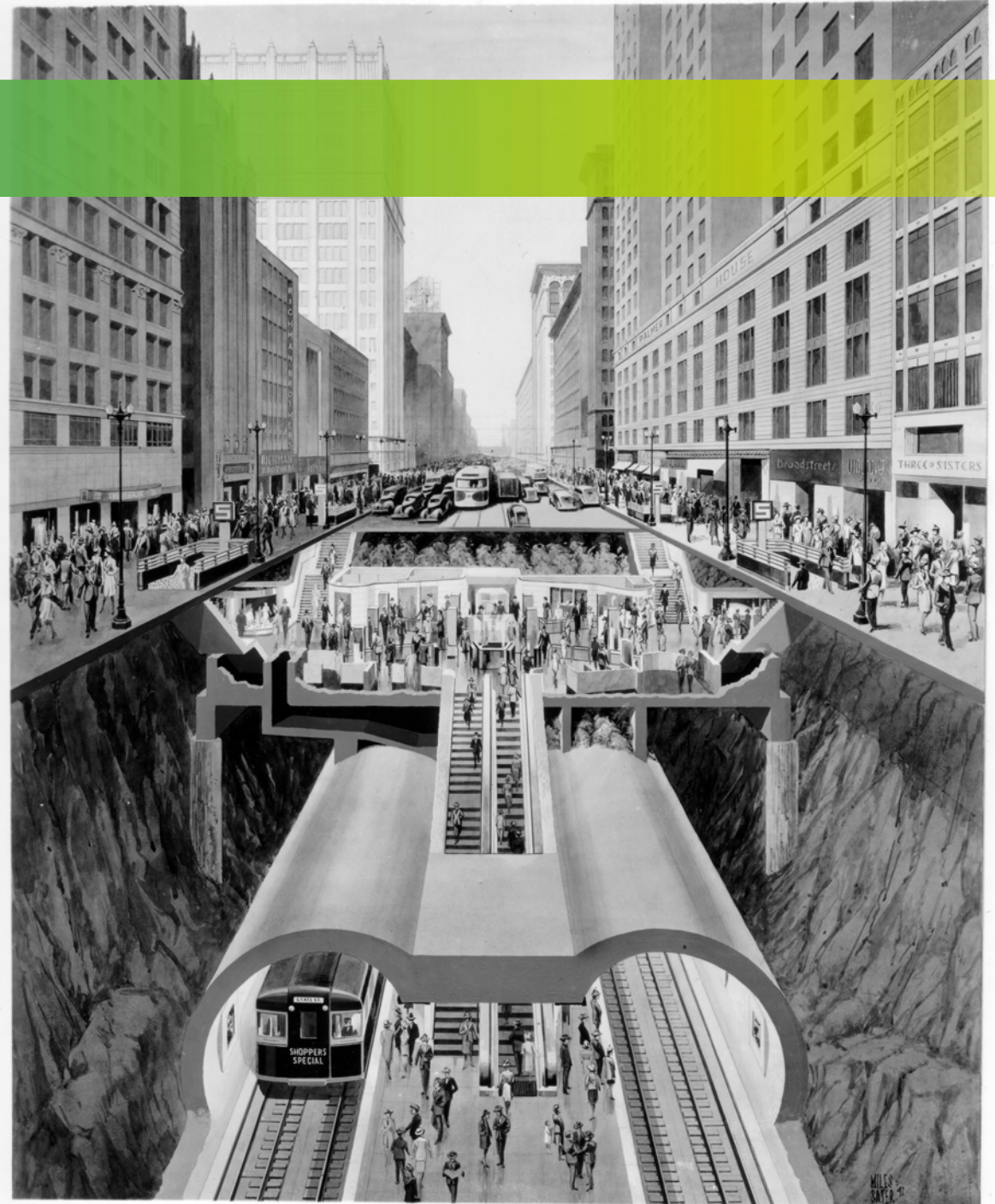


Diagram inspired by a graphic produced by the Federal Interagency Stream Restoration Working Group (FISRWG)

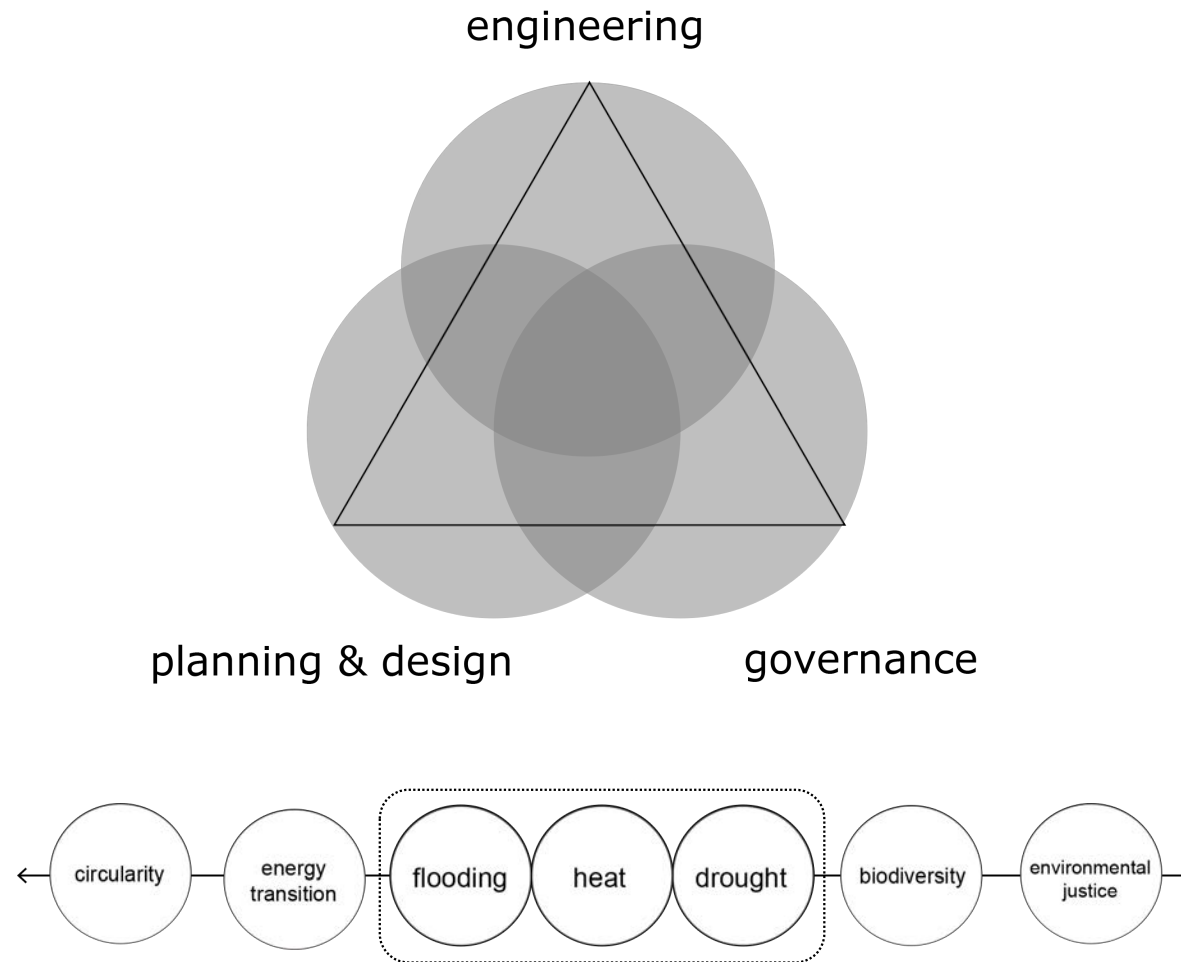
Source: ecolandscaping.org

Scarcity of space

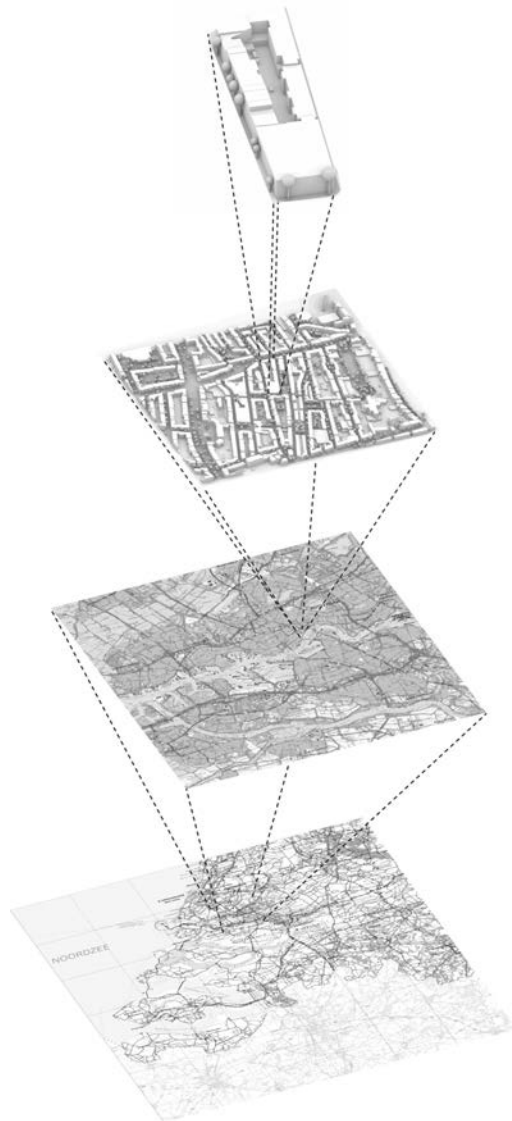


Chicago Transit Authority, 1941

Holistic & interdisciplinary approach



Through the scales



Building

Neighbourhood

City

Delta/Region

Heat



Water



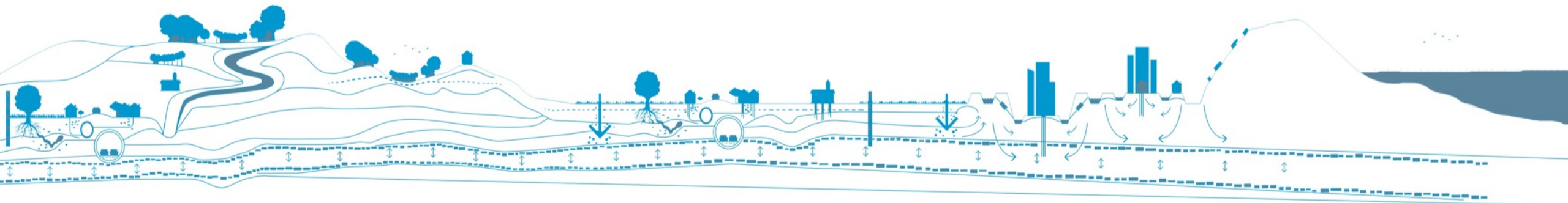
Cool buildings & Cities

Maiullari et al., 2021



Sponge Cities

De Urbanisten, 2013



Deltaic Systems

Hooimeijer, 2011



m.m.e.vanesch@tudelft.nl