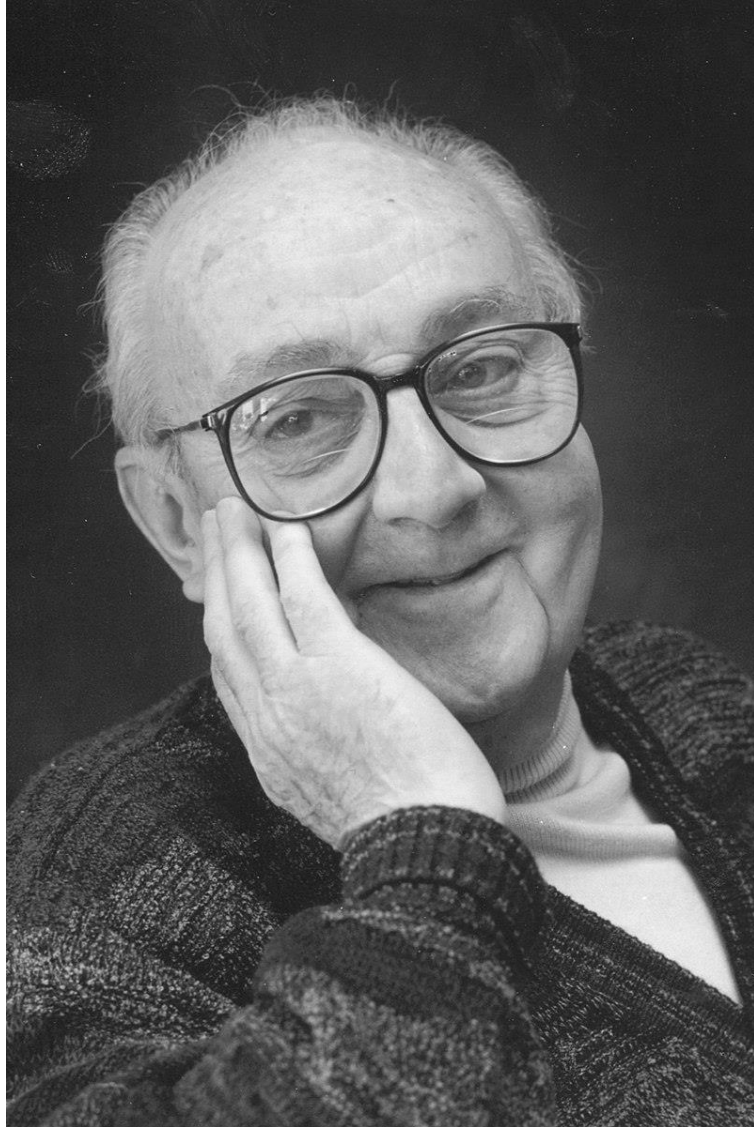


**All models are wrong,
but how do we know if they are useful?**



Martijn KULLER, PhD

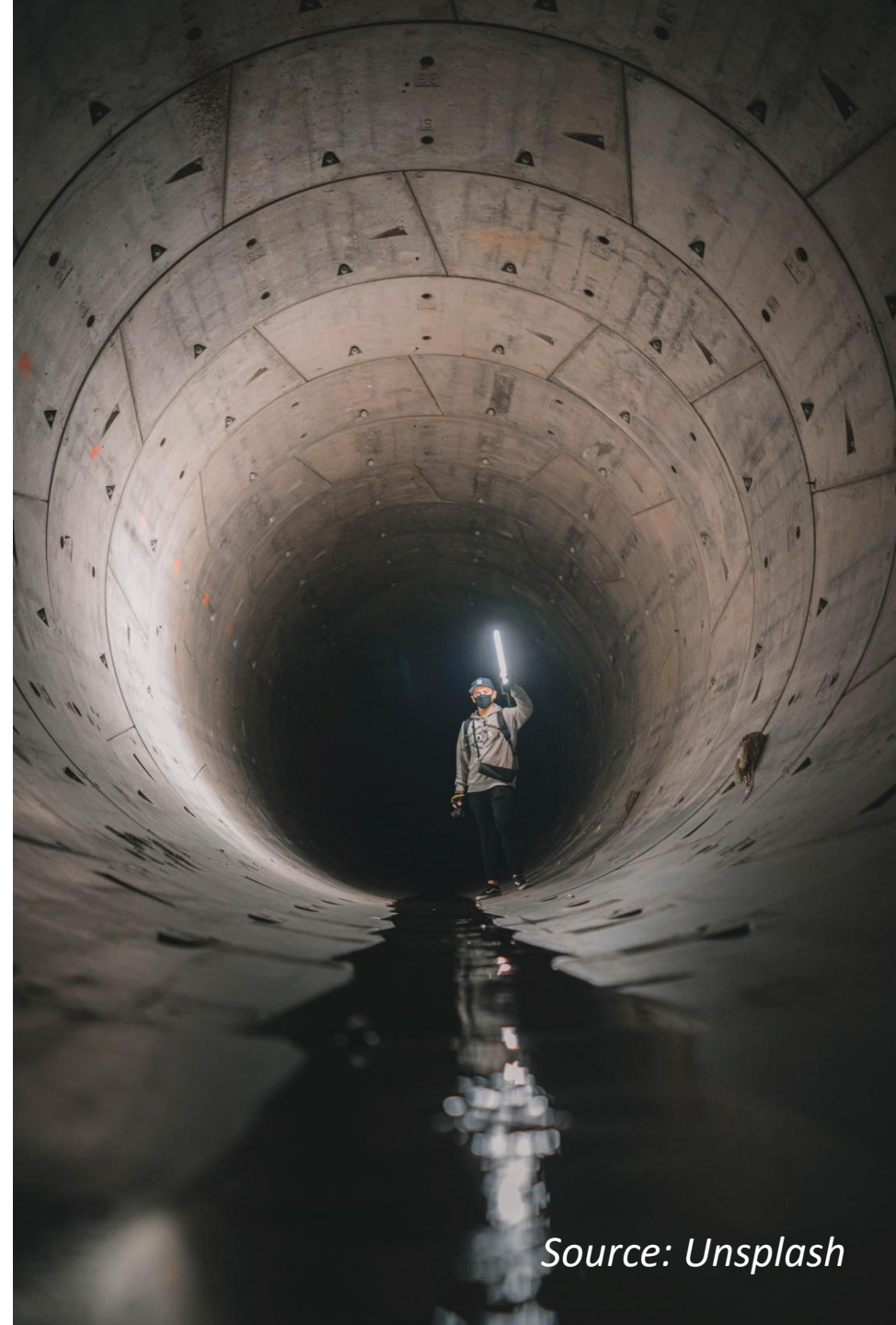
31 March 2022



Source: [DavidMCEddy](#) at [en.wikipedia](#)

“All models are wrong, but
some are useful”

George Box

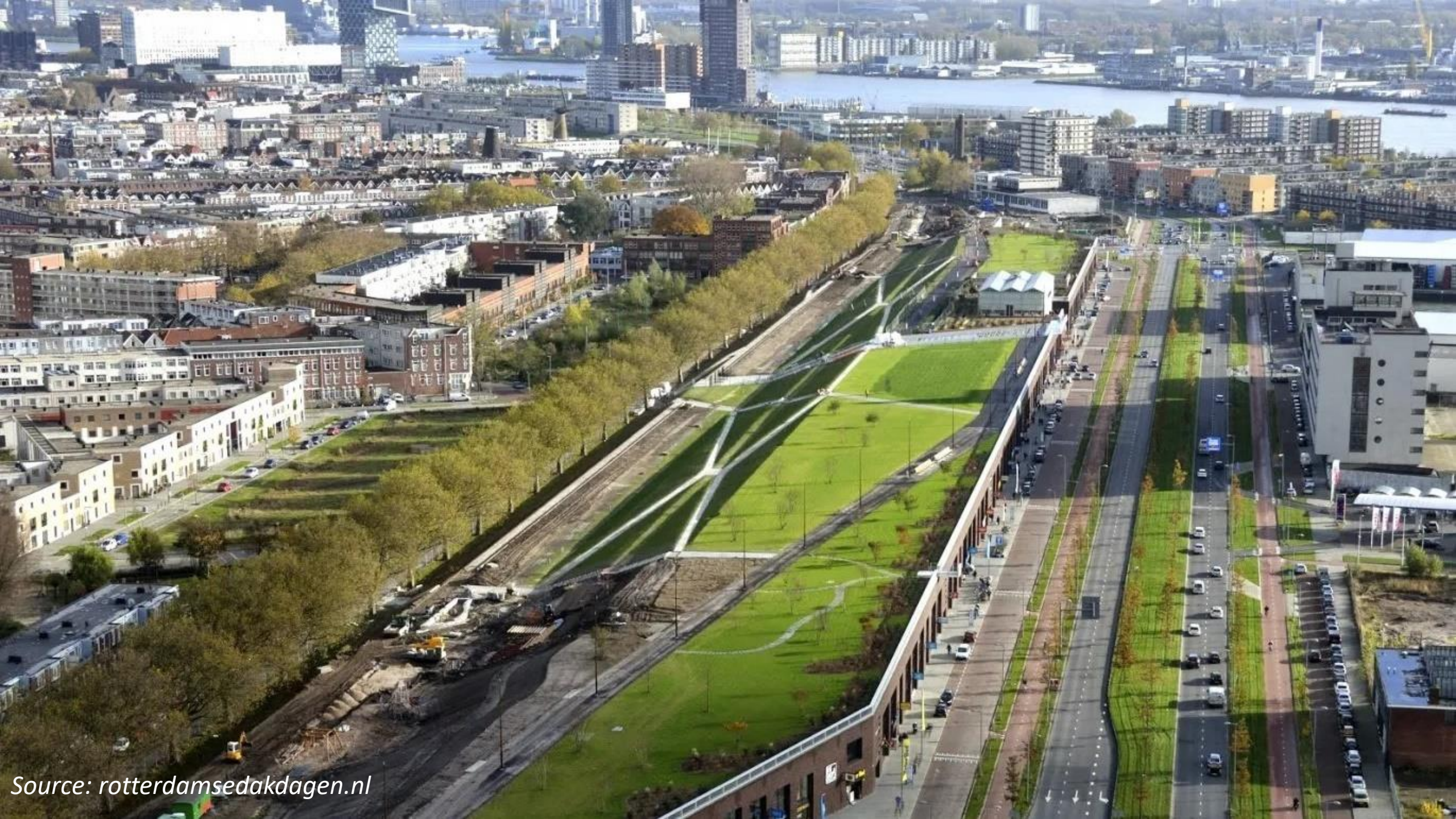


Source: Unsplash





Source: Martijn Kuller





Source: Unsplash



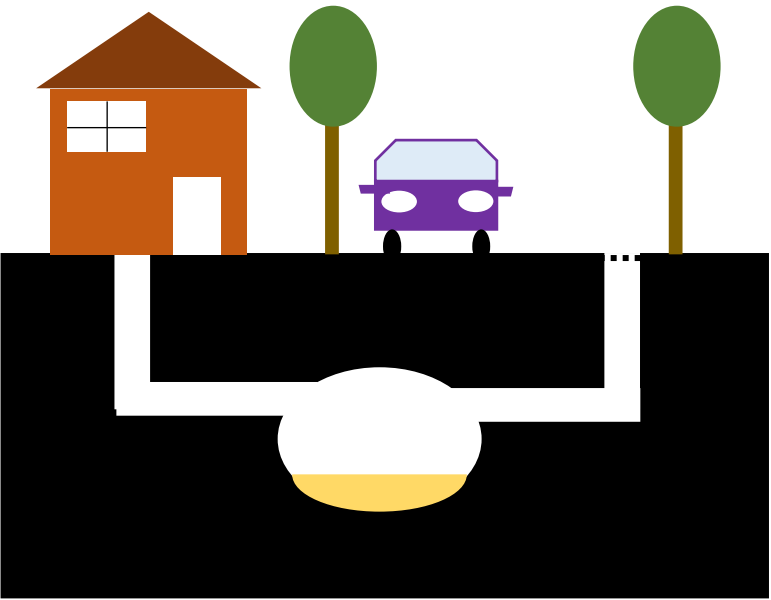
Source: Wikimedia commons



Source: Martijn Kuller



Source: Alice Aubert



Out of sight, out of mind
Engineers, capital works

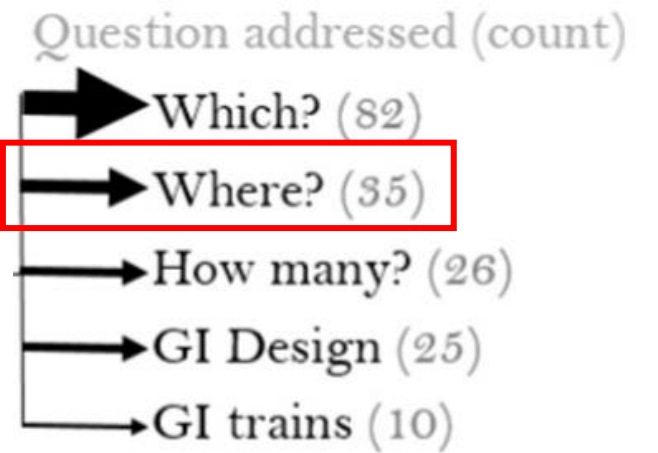
Hydraulic, hydrological and water
quality models



Part of the urban landscape

Engineers, capital works, urban
planners, parks service, businesses
and residents

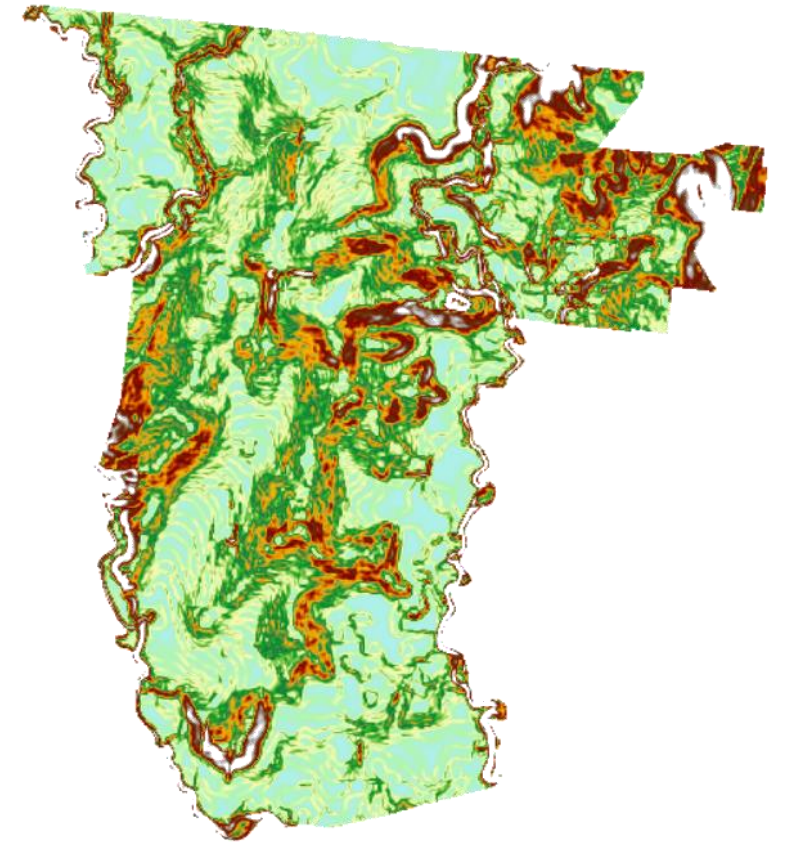
Planning Support Systems (PSS)



Adapted from Ferrans et al. 2022



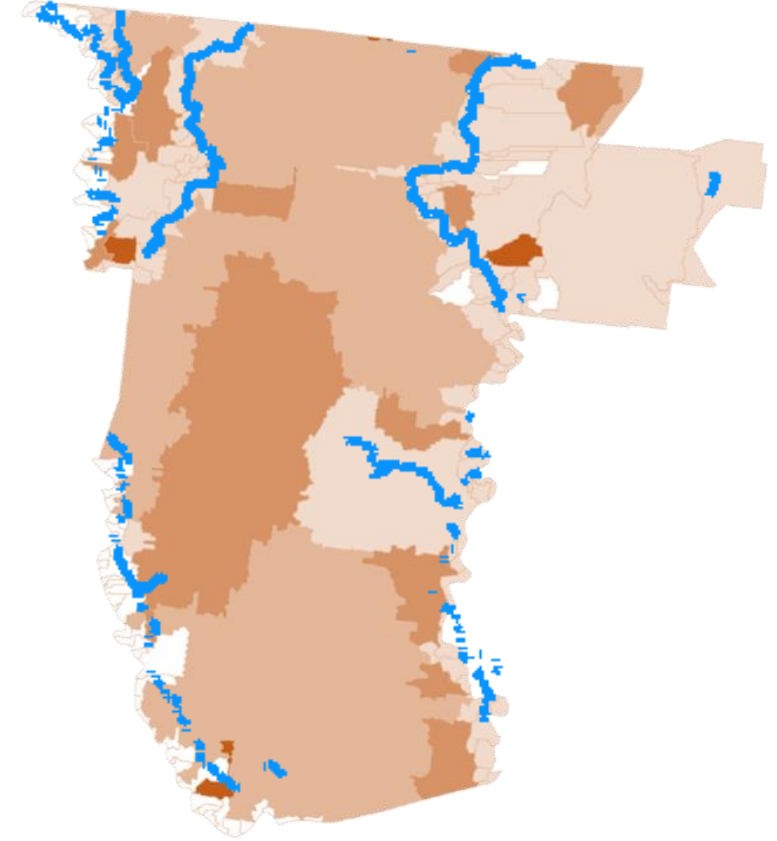
Source: Unsplash



How do we minimise costs?

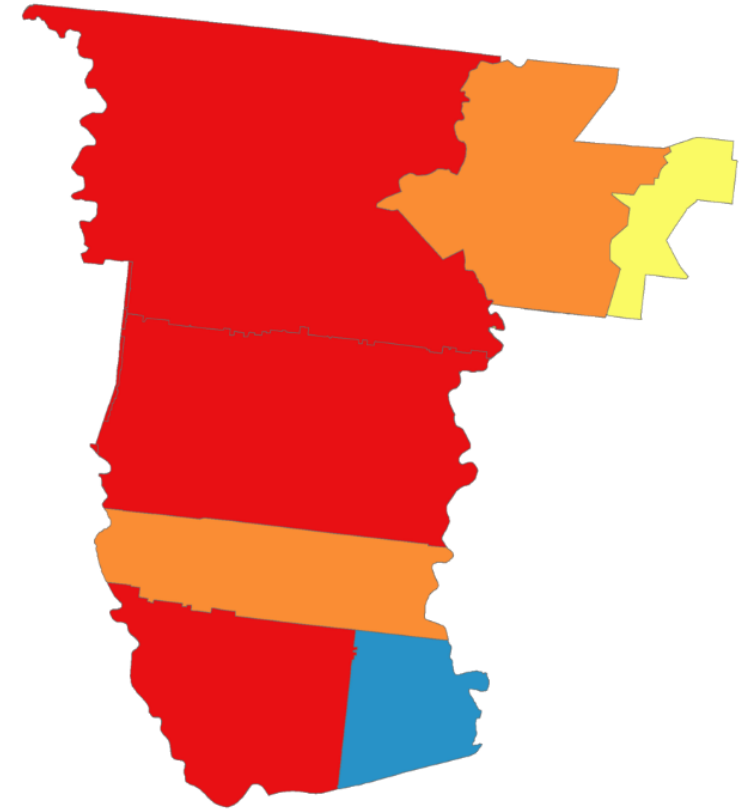


How do we plan for flood prevention?



How do we protect water quality?

Source: Unsplash



How do we mitigate urban heat?

Socket menu

Interactive map

Analysis parameters

Analysis name

Montreal

Name of the modeler

Chris

Cell size

25 x 25m

Apply

Reset

Study area

Nbs system type

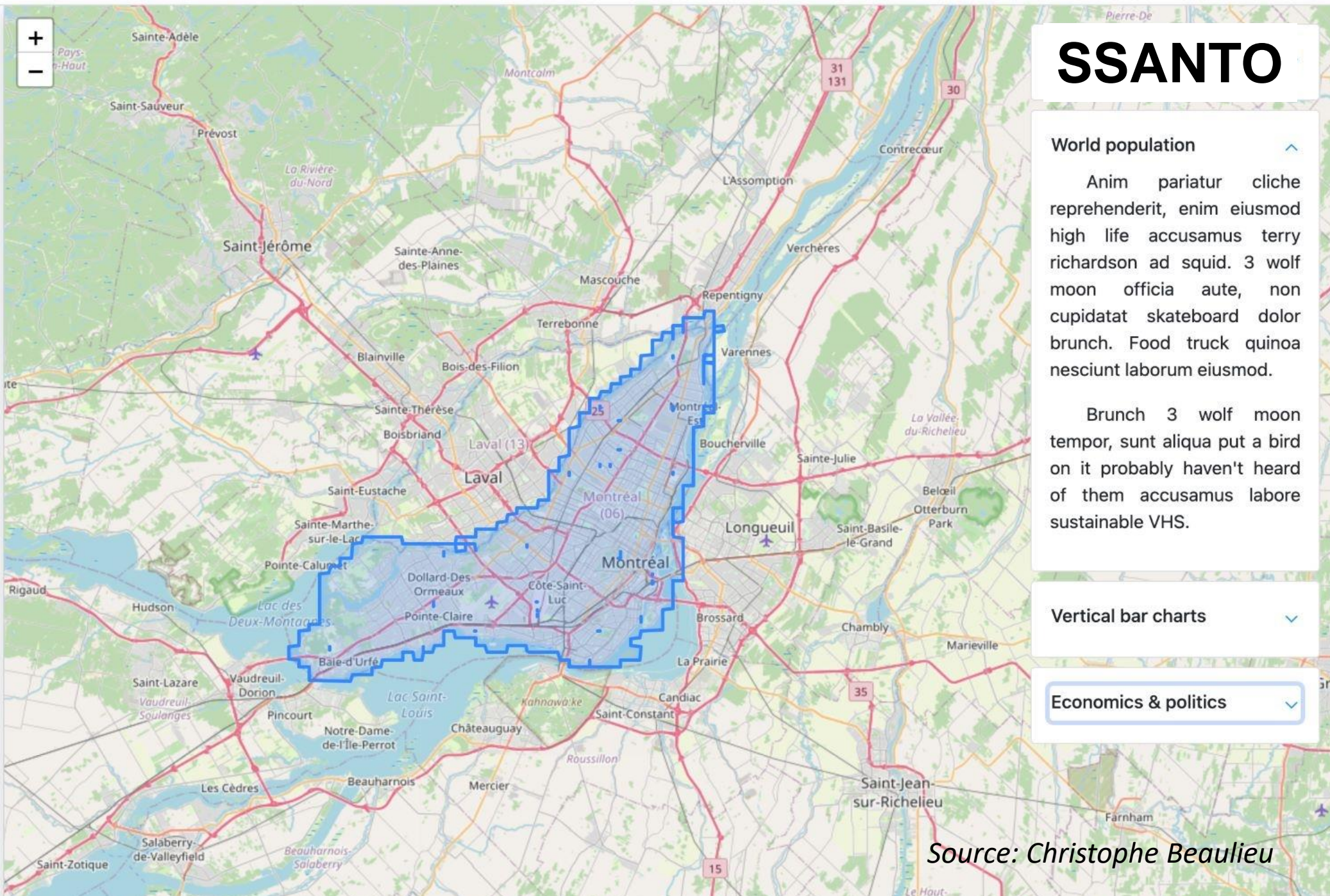
Nbs system type

Infiltration systems

Apply

Reset

Objective hierarchy



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World population

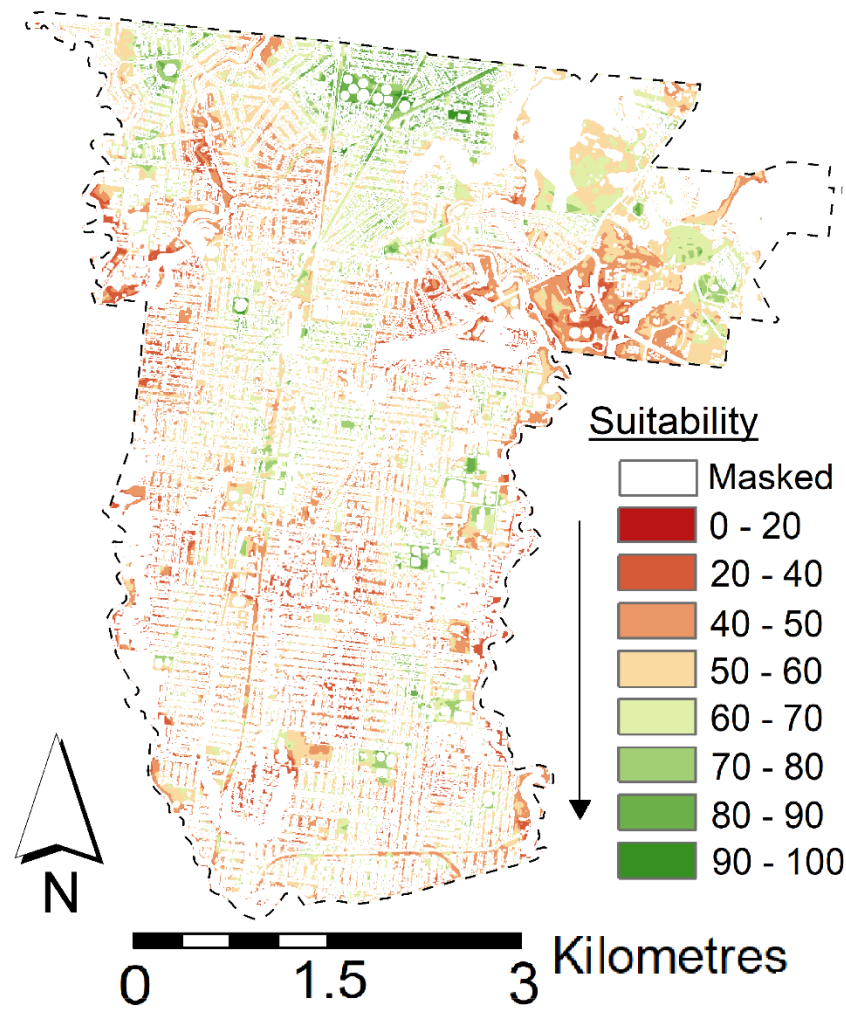
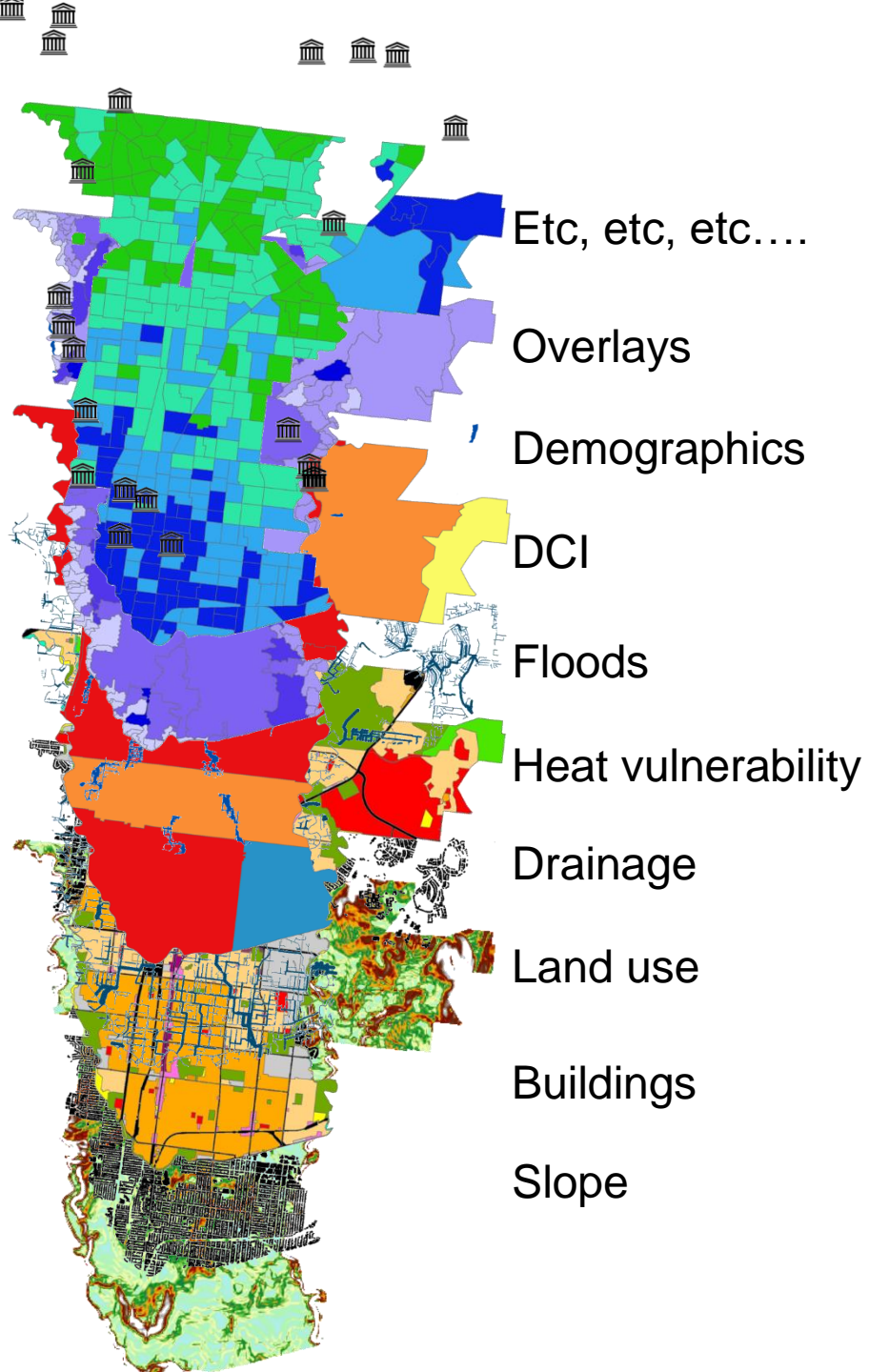
Anim pariatur cliche reprehenderit, enim eiusmod high life accusamus terry richardson ad squid. 3 wolf moon officia aute, non cupidatat skateboard dolor brunch. Food truck quinoa nesciunt laborum eiusmod.

Brunch 3 wolf moon tempor, sunt aliqua put a bird on it probably haven't heard of them accusamus labore sustainable VHS.

Vertical bar charts

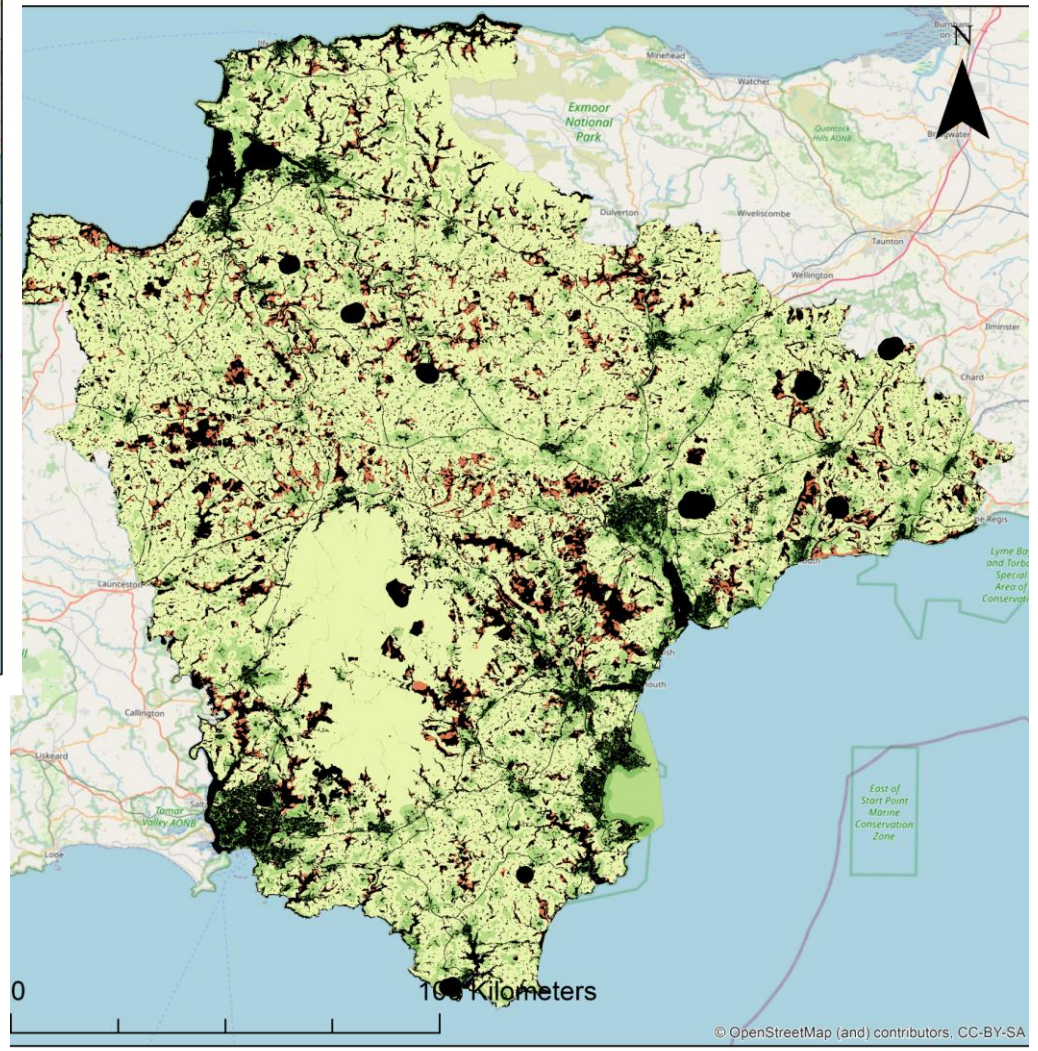
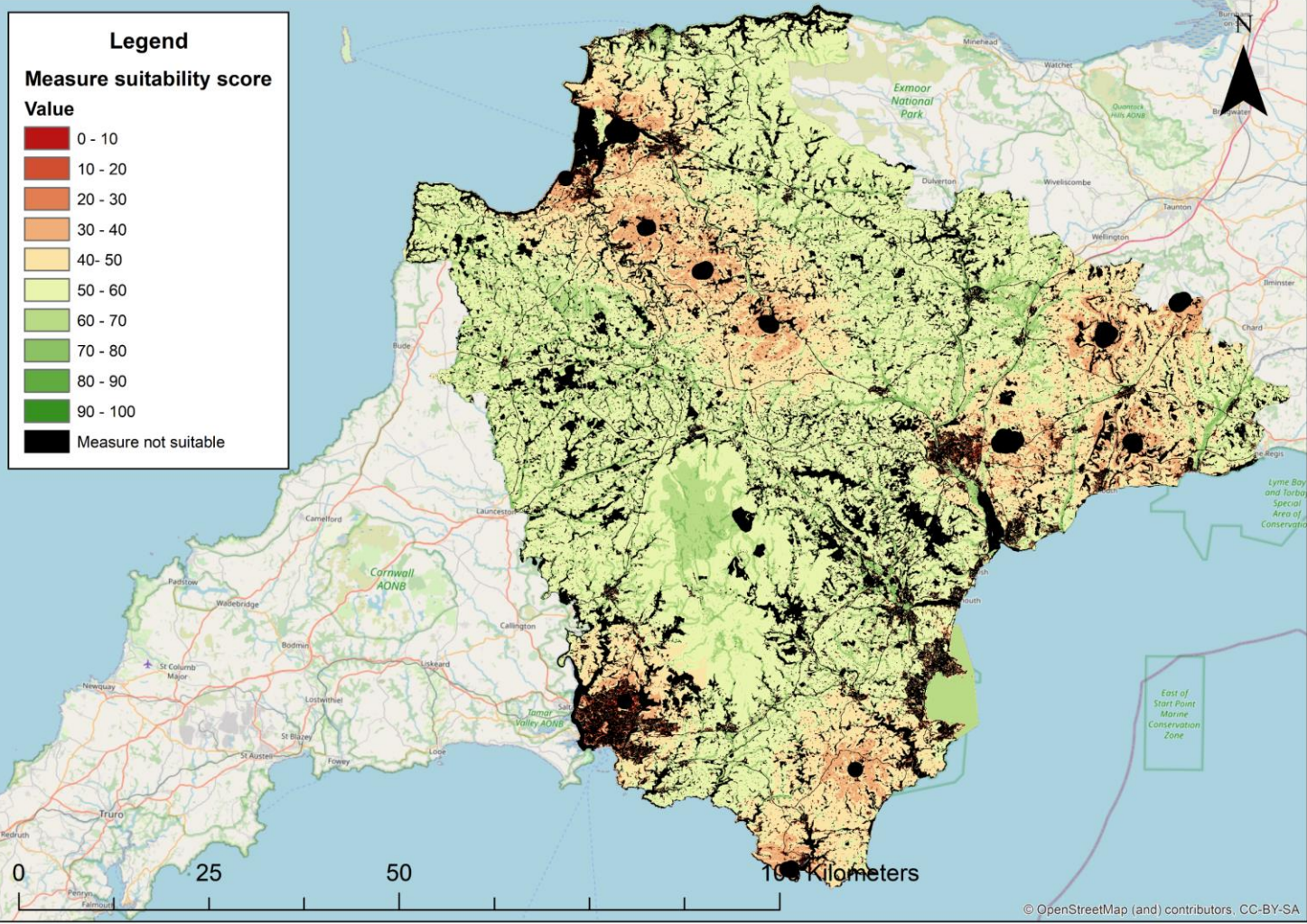
Economics & politics

Source: Christophe Beaulieu

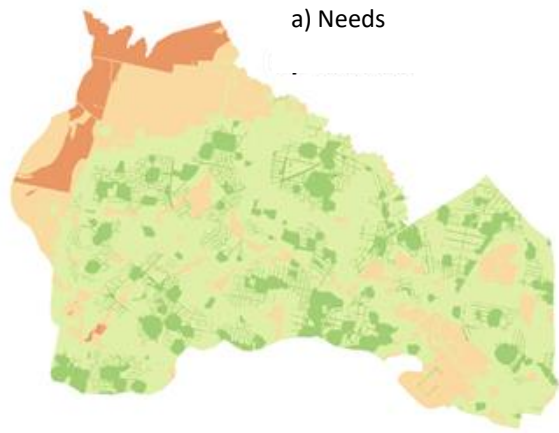


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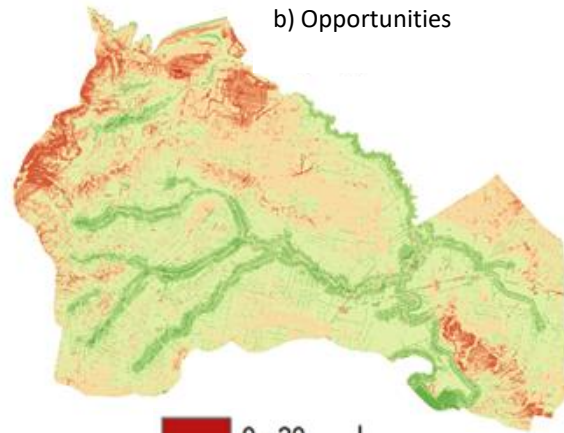
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Webber, J. L., & Kuller, M. (2021). Enhancing the Visibility of SuDS in Strategic Planning Using Preliminary Regional Opportunity Screening. *ISPRS International Journal of Geo-Information*, 10(11), 726.
<https://doi.org/https://doi.org/10.3390/ijgi10110726>

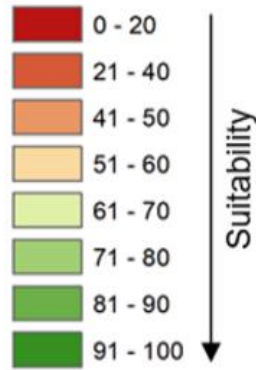
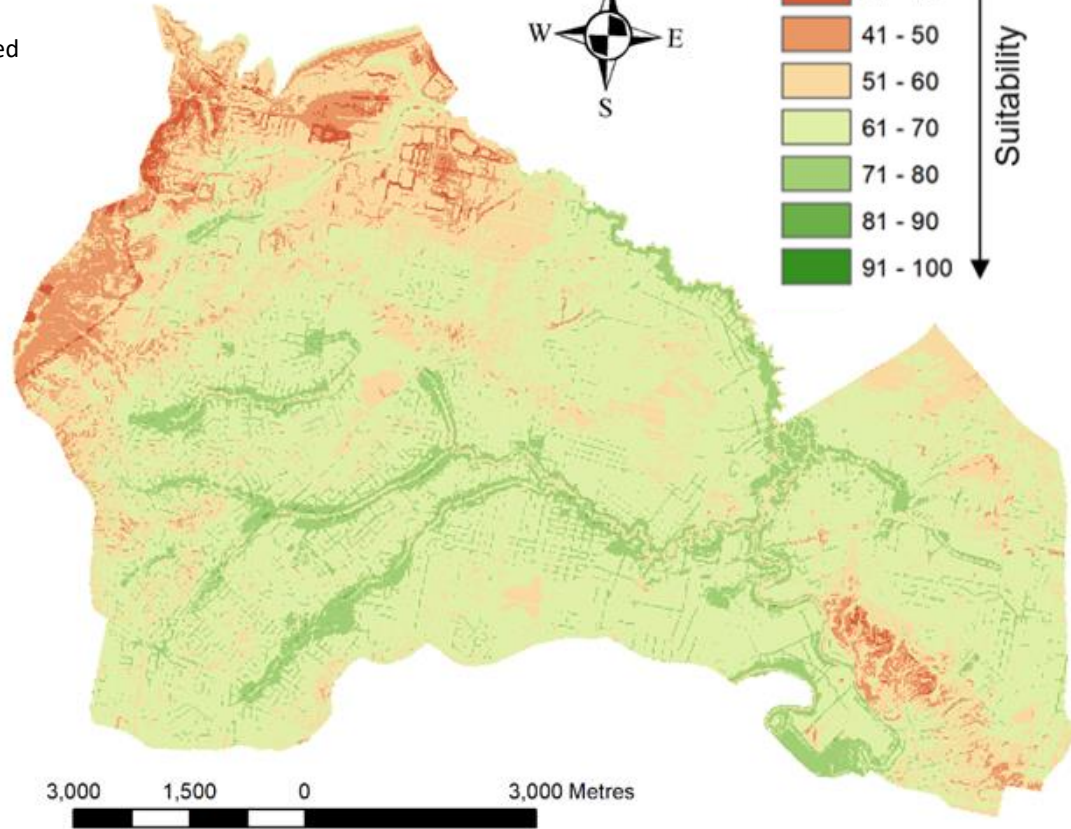


a) Needs

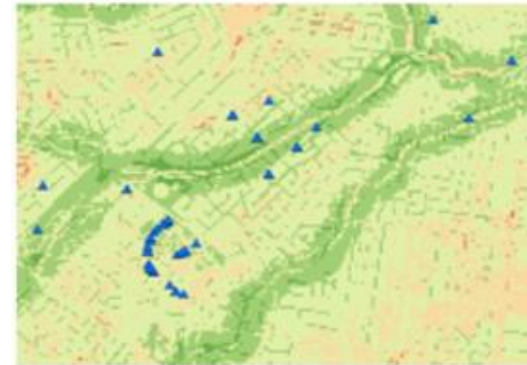


b) Opportunities

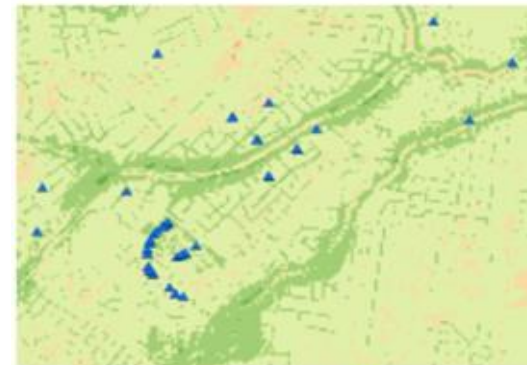
c) Combined



a) Needs



b) Opportunities



c) Combined

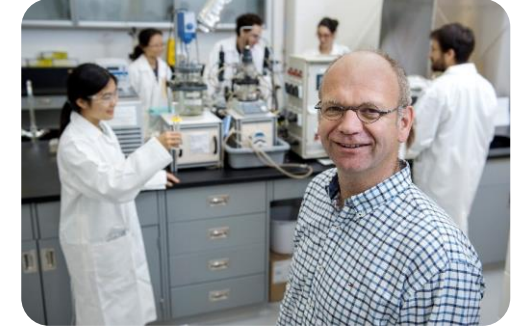
Kuller, M., Reid, D. J., & Prodanovic, V. (2021). Are we planning blue-green infrastructure opportunistically or strategically? Insights from Sydney, Australia. *Blue-Green Systems*, 3(1), 267–280.
<https://doi.org/10.2166/bgs.2021.023>

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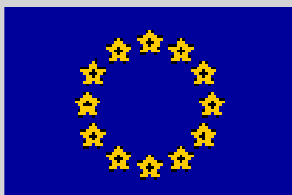
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Département de génie civil et
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Environmental Social Sciences
Eawag



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Objective 1

Develop a systematic approach to establish a list of validation performance criteria and corresponding procedures that are relevant and promising to model developers and users.

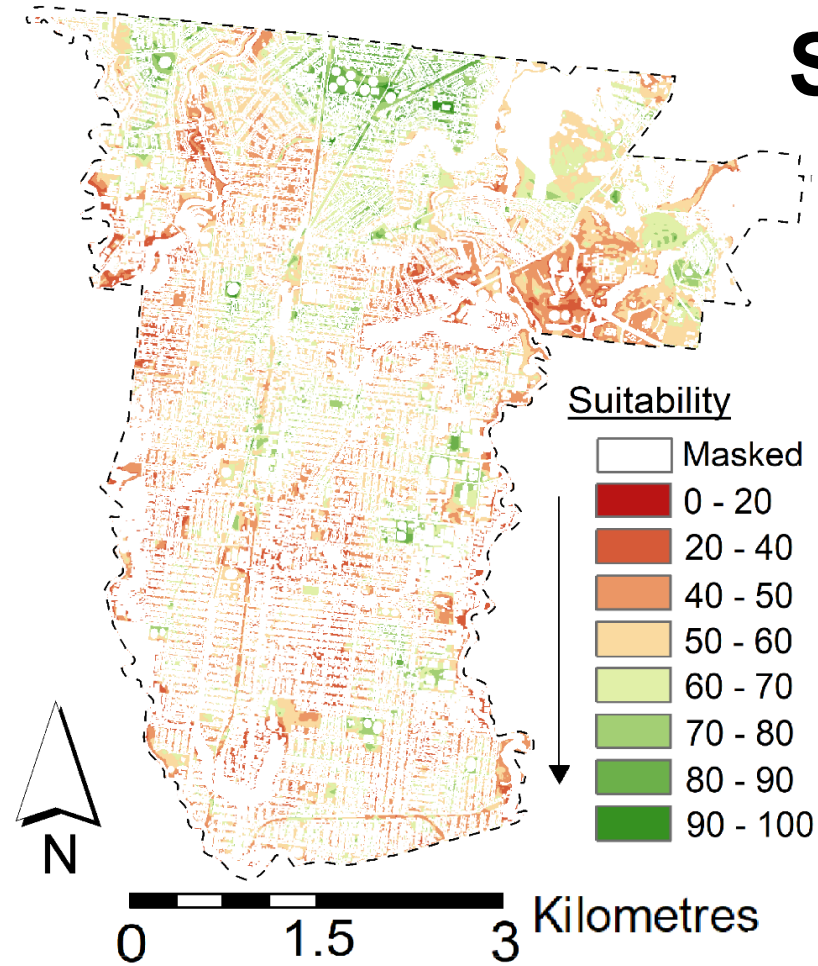
Objective 2

Empirically test the practicality and usefulness of candidate procedures for different PSS and application contexts.

Objective 3

Provide a holistic validation framework for PSS use in future NBS planning and implementation.





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