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Cadastres in times of change in the environment

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Joint PCC-Eurogeographics Conference
Property data and climate adaptation – The cadastre's role in addressing climate challenges
Aalborg, Denmark, November 3-5, 2025

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Introduction

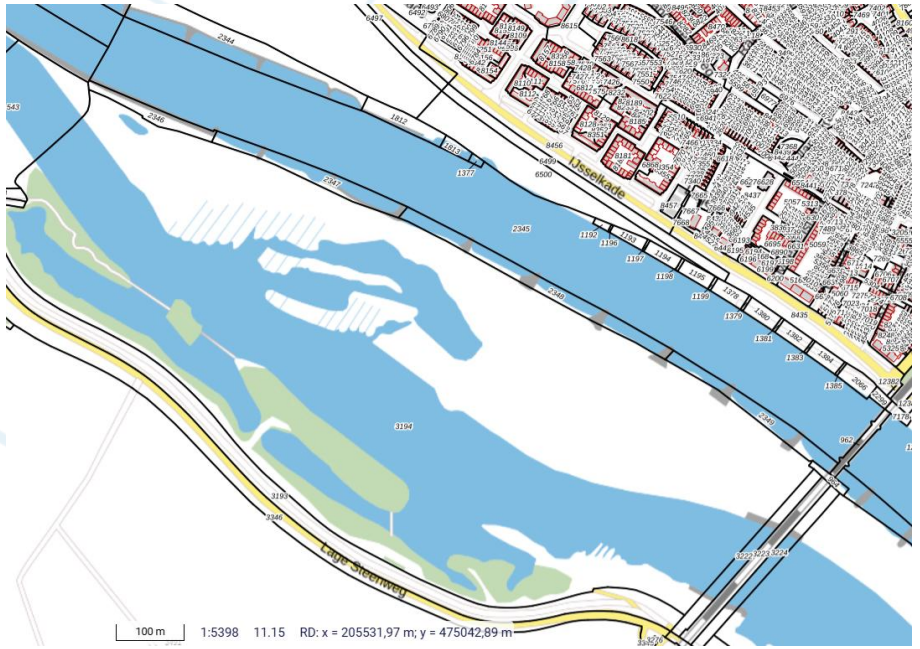
Climate change:

- global warming (heat stress)
- sea-level rise
- (reducing) greenhouse gas emissions
- excessive downpours
- longer drought periods
- (non-)resilience of nature

Basically related to the physical and natural environment

Focus on the specific cadastral aspects
(Kadaster itself is an integrated agency (cadastre, LR, mapping))

river discharges (accretion and erosion)



IJssel river at Deventer

Widening of the river bed; transparant and simple cadastral situation

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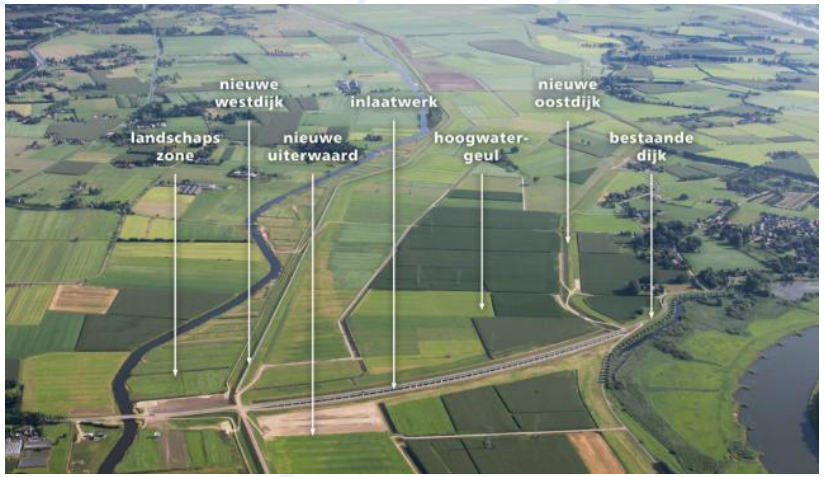
National programme ‘making room for the river’



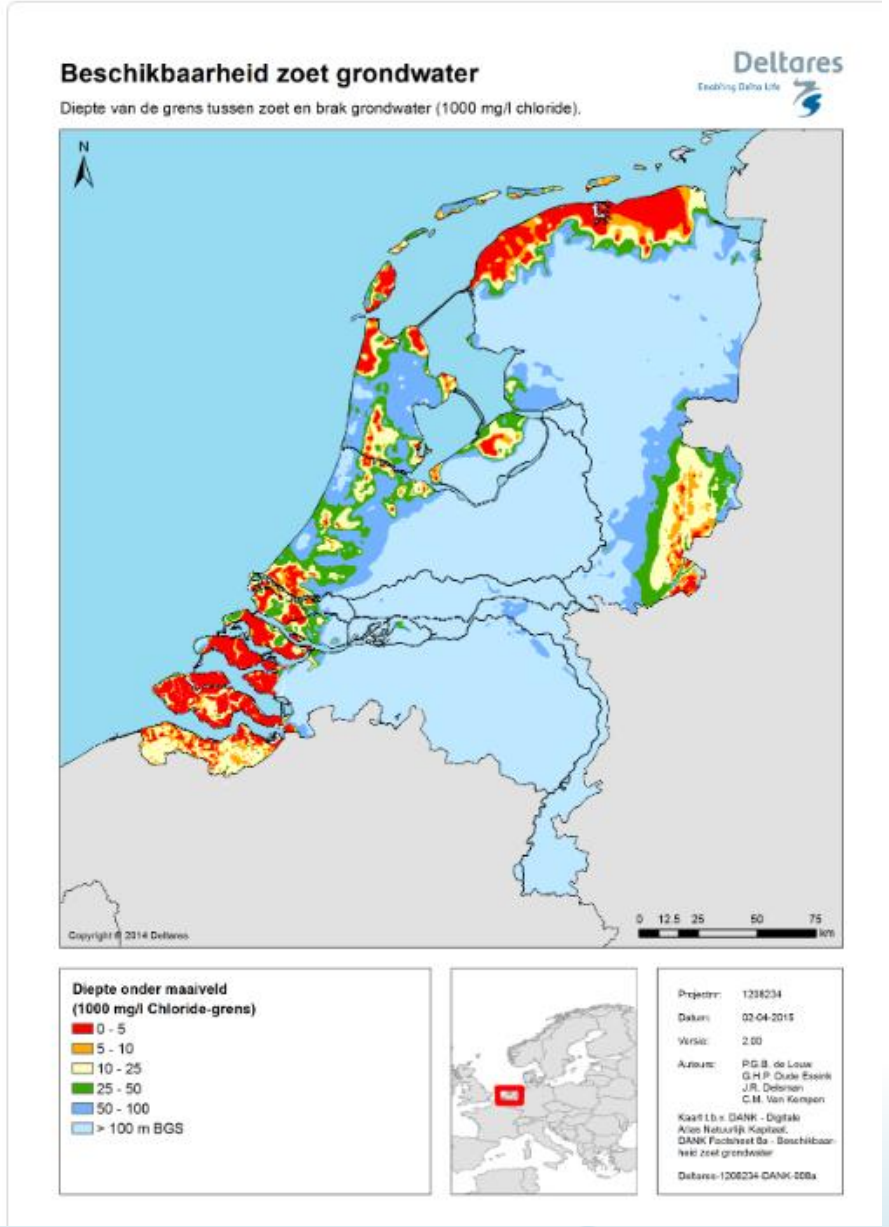
IJssel river at Veessen; major infrastructural changes, cadastral situation stable

Sea level rise: coastal defence

© Rijkswaterstaat | Harry van Reeken.

Base coastline as a physical reference

The pressing problem: soil and groundwater salinisation



data.rivm.nl

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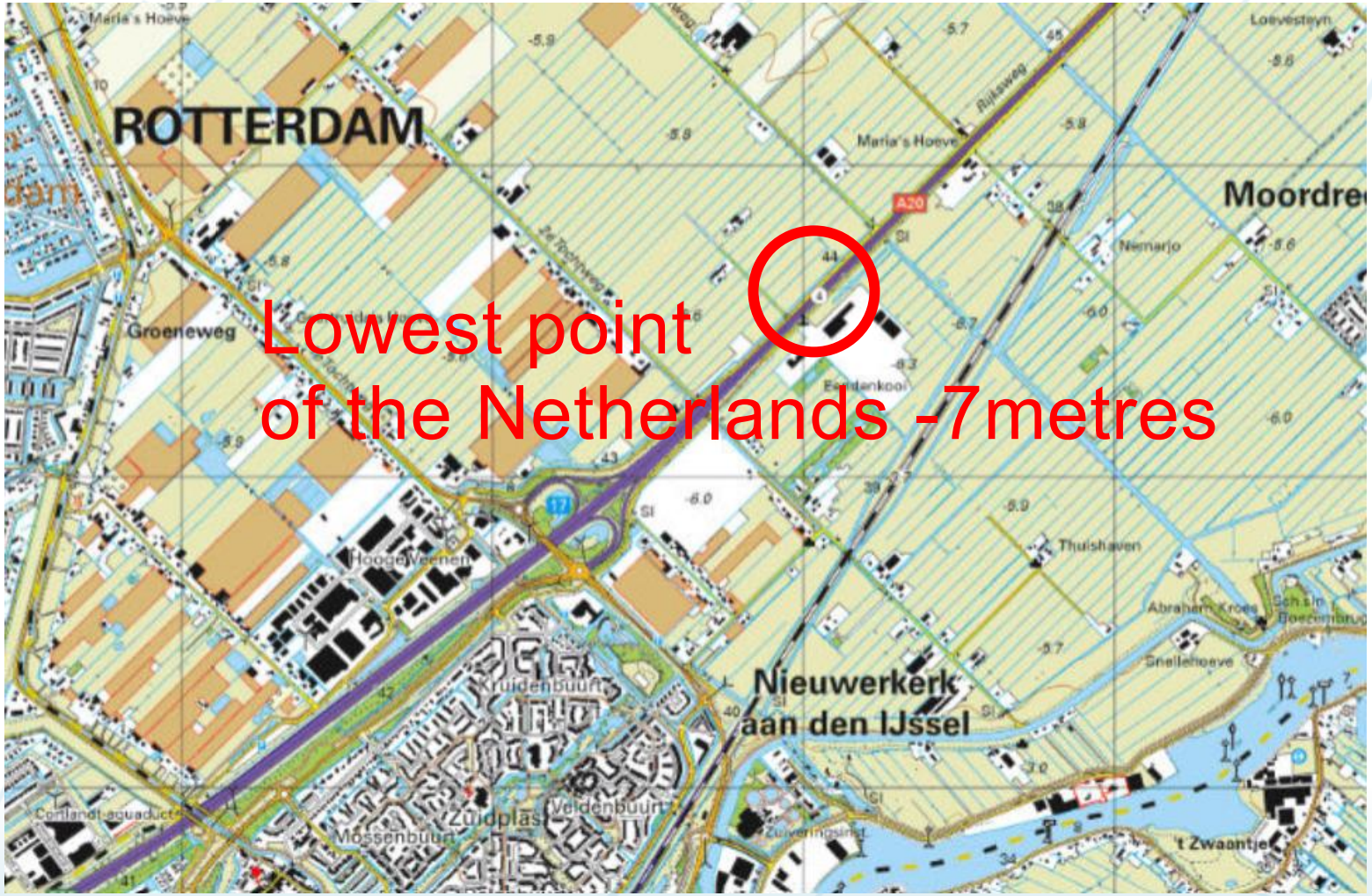
A typical Dutch case: living below sea level



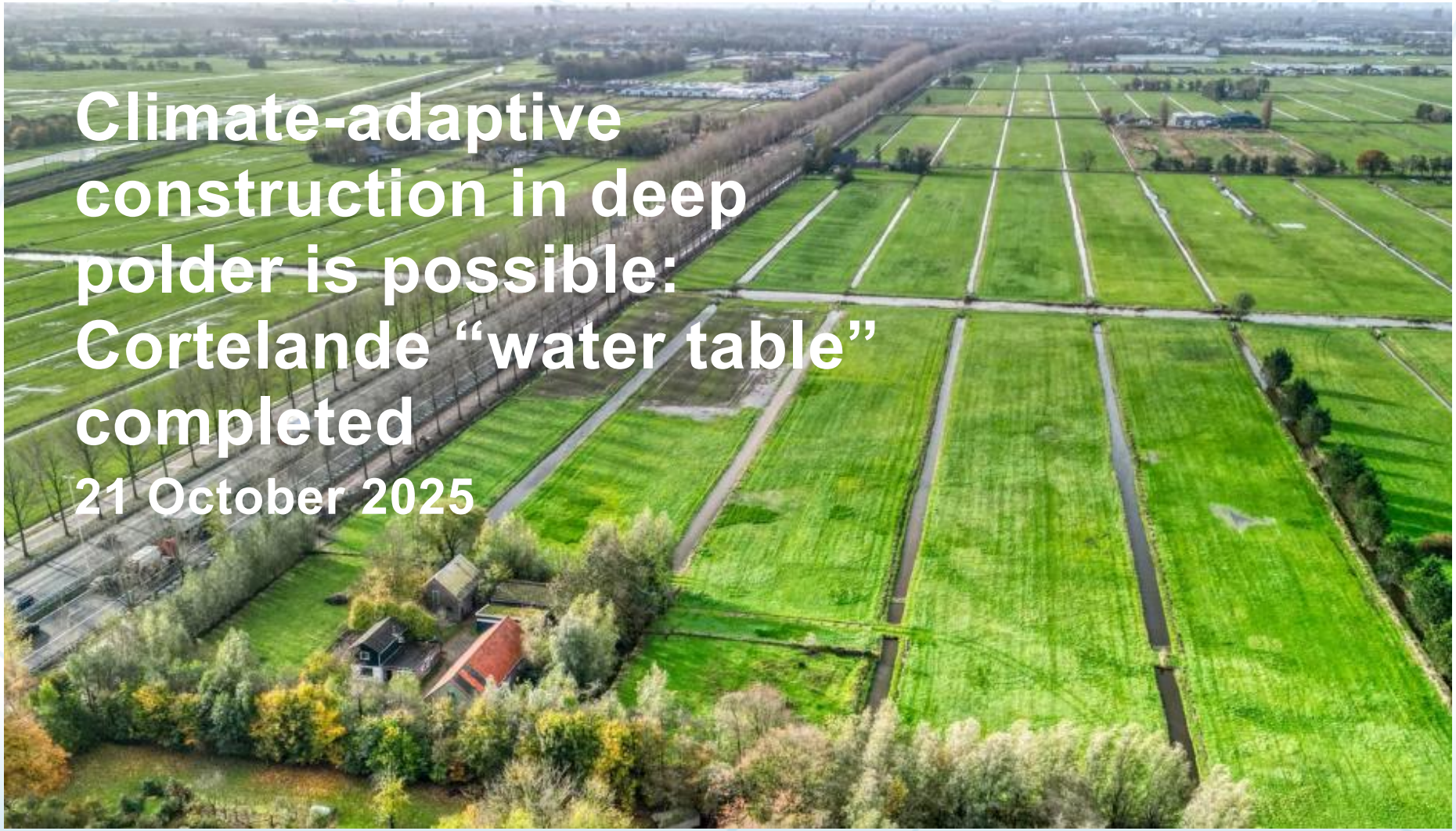
building a new village
5-6 m below sea level
for 8000 inhabitants

National planning agency:
Risk of Insecurity

Water boards:
Complex water management

First proposal 2004
Construction to start 2026

A typical Dutch case: living below sea level



Extra measures for:

Integrated water retention and controlled discharge

Tailored emergency plan

Preventing water pollution from impact building, agriculture, salinisation

Soil elevation in specific areas

The cadastral toolkit is fit for purpose in many cases

- In the Netherlands accretion and erosion (coastal and rivers) is covered in law, and mostly affects public properties

- legal adaptation to the new situation can often be solved by existing Cadastral/LR-processes
  (land transactions, vesting new rights, land consolidation)

- Cadastral data is used/needed in all these processes

Is cadastre always up for the job?

Example: energy performance of buildings

Solar panels and heat pumps are often registered by means of right of superficies for utilities. Leads to misunderstandings.

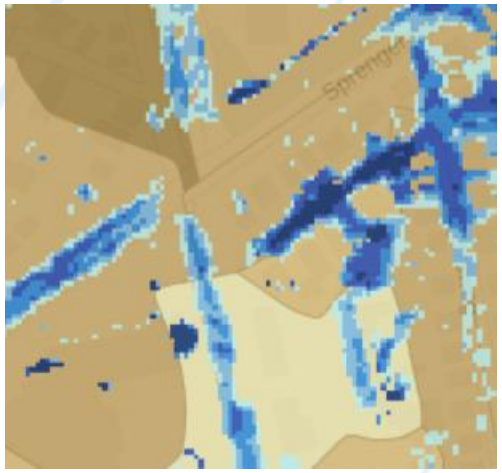
Legal sector (cadastre and notaries) works on proposal to define a specific right of superficies for sustainability. Requires a change of law.

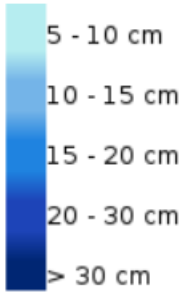
And all this is covered by the right of superficies?

https://www.knb.nl/notariaat-magazine/2022-01/notaris-en-maatschappij-opstalrecht-duurzaam-een-bijdrage-aan-verduurzaming

Example: climate change and the built environment

Risk: Excessive Downpours





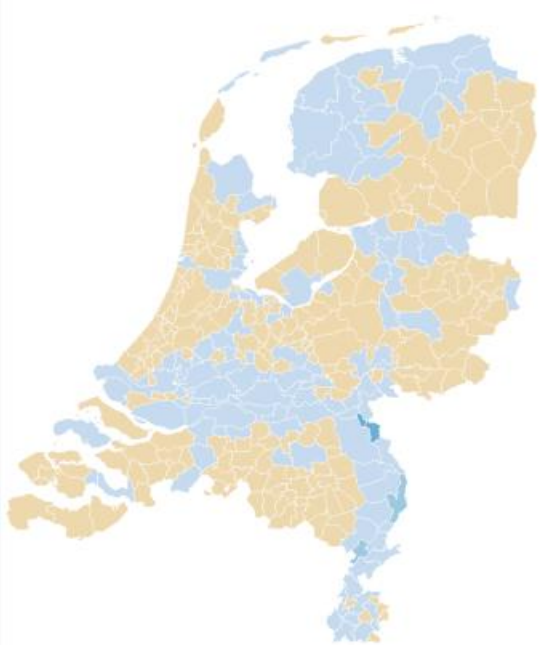
Risk: Foundation damage due to weak soil and groundwater lowering

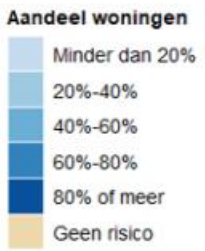
Parties involved:

- Land market (value)
- Banks: mortgages
- Insurance companies: insurance premiums
- Building industry (prevention, recovery)
- Utilities
- Emergency services
- Residents and users

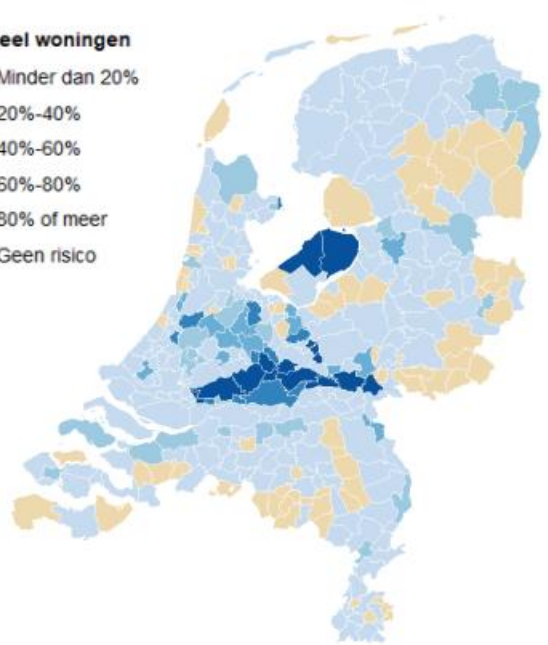
Risk of flooding per municipality

large

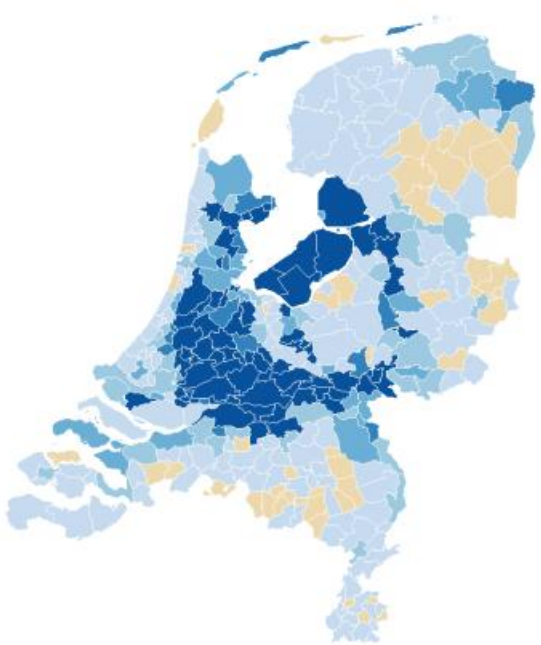


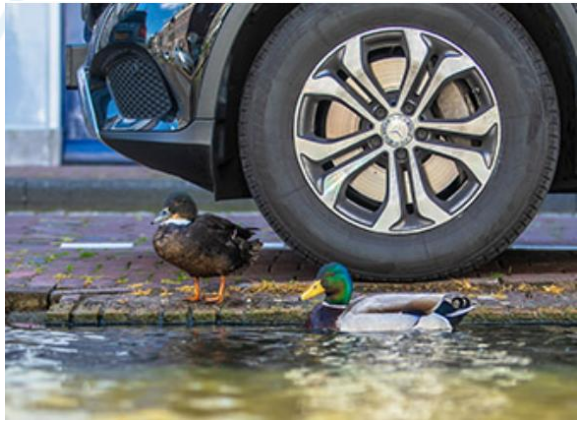


moderate



small





What do we face/what do we experience:

- 8,1M dwellings, of which 5,5M on the ground floor/terrain
- 39K dwellings face a large chance on flooding once every 10 years (especially dwellings close to rivers)
- This risk does not really affect the housing market (#transactions, prize)

Example: Energy transition

Energy transition requires 50.000 additional transformer stations: Choosing the best place for new transformer substations

Provide insight in suitable locations: e.g. preferably next to existing stations; on public properties; not conflicting with existing use or coverage

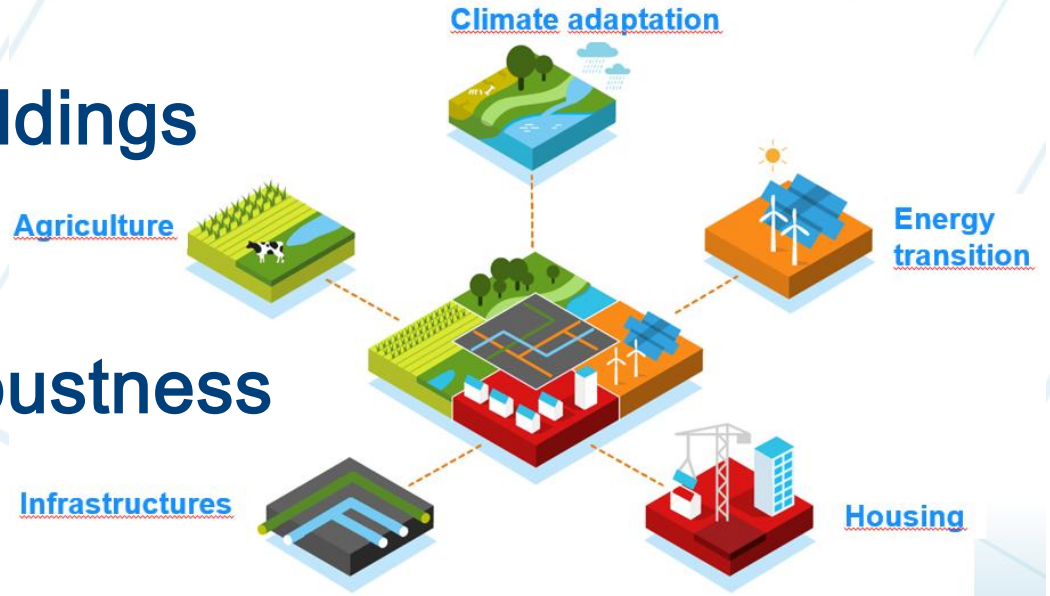
Fair compensation for farmers on peat meadows

- Water boards have to raise groundwater levels to prevent dessication
- When peat soil dries out, large amounts of greenhouse gases are released
- At the same time, this has a major impact on farmers' business operations
- In the province Friesland a program is set up to deal with this dilemma
- This may result in a compensation in money or land

Kadaster is one the parties in execution of this program

Lessons learned:
Climate change related to physical, legal and natural aspects

- Improving energy performance of buildings
- Greening of the built environment
- Energy transition
- Balancing agriculture and climate robustness
- Water and drought resilience
- Reducing greenhouse emissions



Cadastral information (rights, restrictions and responsibilities) and processes are pivotal elements in dealing with climate change