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Rethink the Delta

- wat is dat voor project / traject?
- wat doen we voor Nlse kust

Marcel Taal, t.b.v. samenwerkdag kust 10-06-2022

Knowledge is responsibility

Deltares, let’s hear it and take initiative

In 2030 a calculated action perspective for a liveable Netherlands, even under extreme sea level and climate conditions.

National knowledge program 2023-2030

2022-2023: make full use of Deltares' interdisciplinary expertise to work together on this task.

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What is Rethink the Delta?

Our delta remains inhabitable even with 2-3 meters sea level rise, land subsidence, drought and other climate extremes…

Therefore we need to Redesign, Re-engineer and Rethink our Delta

Why? To be prepared

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What?

To develop actionable insights so that our delta remains inhabitable even with 2-3 meters sea level rise, land subsidence, drought and other climate extremes…

Herefore

- Develop knowledge (reserach)
- design en engineering
- Work together in co-creation with stakeholders
- Develop the future delta community

Be prepared and therefore utilize our know-how (and our partners) and work together, over arching our programs, units and assignments.

12-18 months pre-investment, supported by SMO (3.2 mln) and develop an (inter)national program to work on this with stakeholders (10 years)

How?

Build on eachother: we stand for an open and inclusive way of working; we want to avoid individual activities, everyone is part of a bigger -interlinked, inter connected- assignment

Key words: together, open, integrated, inclusive

Include all our know-how when needed; coastal morfologists, hydrologists, geotechnical engineers, hydraulic engineers, modellers, landscape architects, designers, engineers, risk management experts, system thinkers, levee experts, specialists and generalists

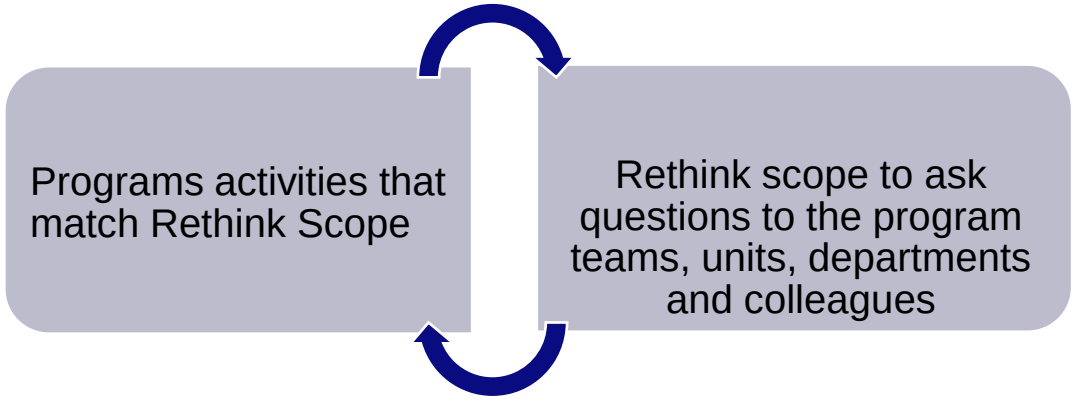
A collaboration that stimulates others… open mindset to other expertise…

Make time and space for eachother to listen, develop and build ideas

What does this mean: *Halen en brengen….*

How do we want to work on Rethink the Delta?

1. Based on activity plan, open invitation to whole of Deltares (strong believe in creativity and capabilities, inclusive)
2. Integrate pieces of the puzzle (avoid post-stamp projects, learn from eachother)
3. Use the power of visualisations



Samenwerking RWS-Deltares (overzicht jaarstart 2022)

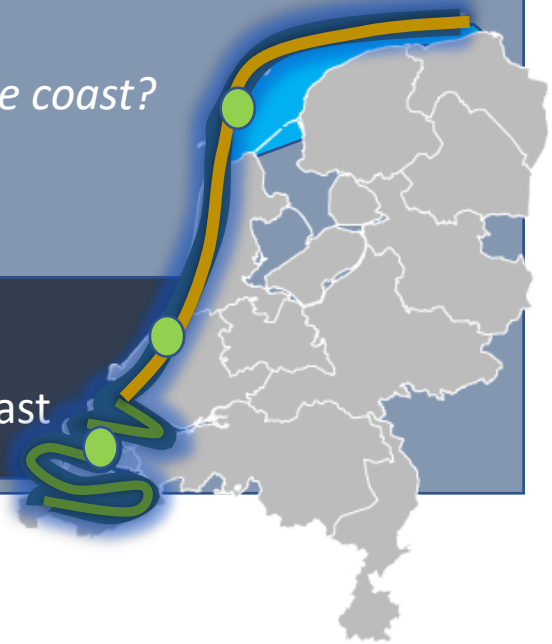
Vision Dutch Coastal system (Marcel Taal e.v.v.a)

Given the natural dynamics of the coastal system, what are possible solutions for the coast?

OUTPUT: maps now & future, media output

Coastal outlook (Bob Hoogendoorn, Matthijs Gawehn, Bas Huisman e.a.)

Data + models for future projections → OUTPUT: projections as basis for the Vision Dutch Coast



Mud & Nature based solutions (Bob Smits, Bas van Maren e.a.)

Which areas suitable for NBS with mud, how much growth and when to start.

OUTPUT: opportunity map

Sand availability (Tommer Vermaas, Ymkje Huismans e.a)

Scenario's for availability and need of sand

OUTPUT: (interactive) tool effect policyt and SLR scenario's on availibity and need

Ecological system (Luuk v.d. Heijden e.a.)

Impact loss of intertidal areas on ecology

OUTPUT: maps evolution intertidal areas and impact on ecology

Dunes, groundwater en ecology (Stephanie Ijff e.a.)

Impact change in groundwater in the dunes on ecology

OUTPUT: three cases with maps on groundwater and ecology

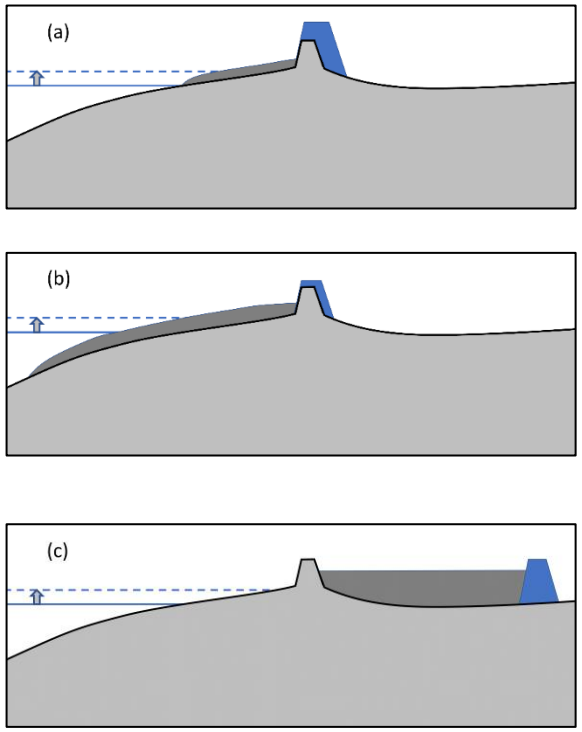
Delta Plan Mud

Bas van Maren
Julia Vroom
Bob Smits
Jasper Dijkstra

Mud now seems abundant but will be a scarce resource

→ should be used strategically.

Nature-based Solutions for Safety and Habitability: Living Dikes, Wisselpolders



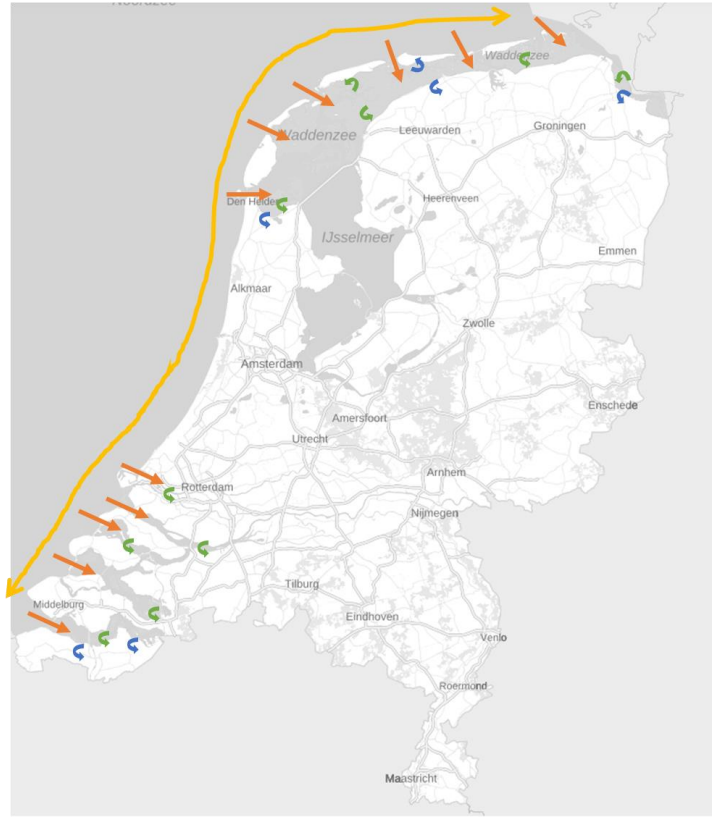
Multidisciplinary:
-Hydro-& morphodynamics
-Ecology
-Socio-economics

Where to apply these (first)?

When to start?

How much sediment needed?

How fast does a polder silt up?



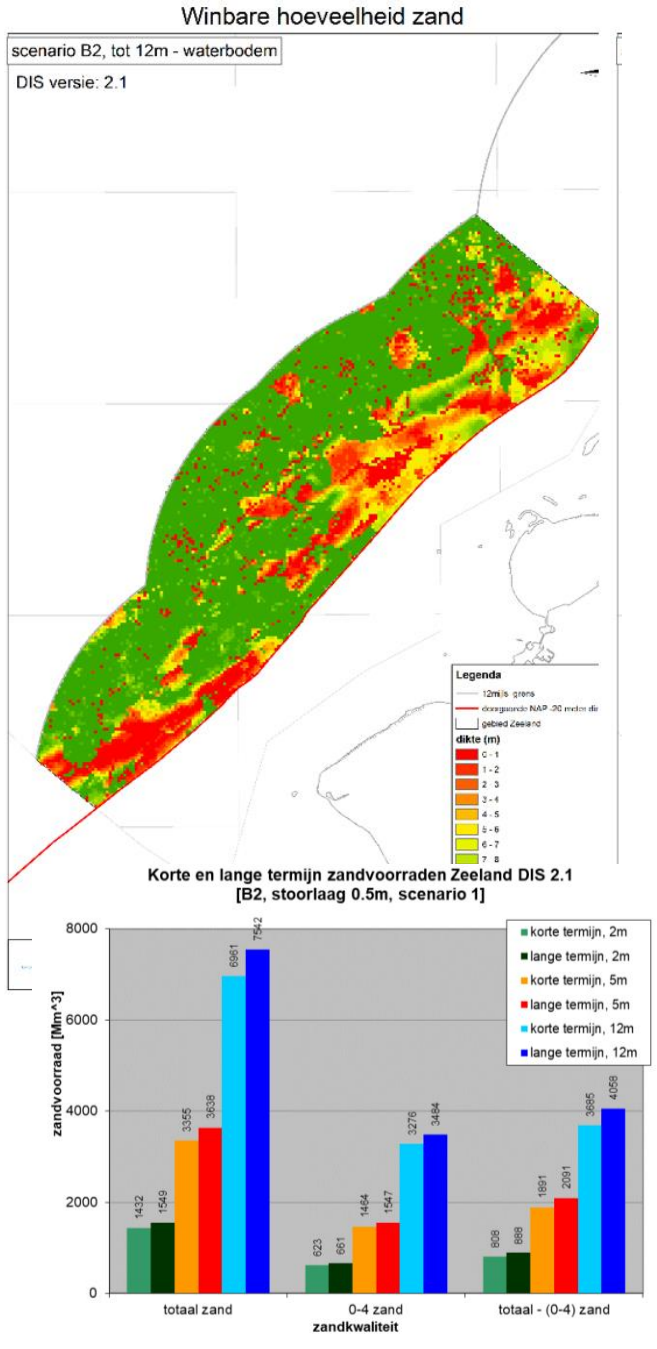
Sediment availability and need

DIS and beyond:

- ‘Simple’ calculations, more aspects needed
- Include more parameters (e.g. shipwrecks)
- Use volumes in ‘policy-decision-support-tool’
- Calculate volumes for several scenario’s

Need – construction & coastal maintenance

- For coastal maintanence (results from KP Zeespiegelstijging)
- Commercial use: hardly any numbers for the future known, predictions to be explored and translated to a (North Sea-) sand usage (incl. regional need)



Effecten van zeespiegelstijging op ecotopen Waddenzee

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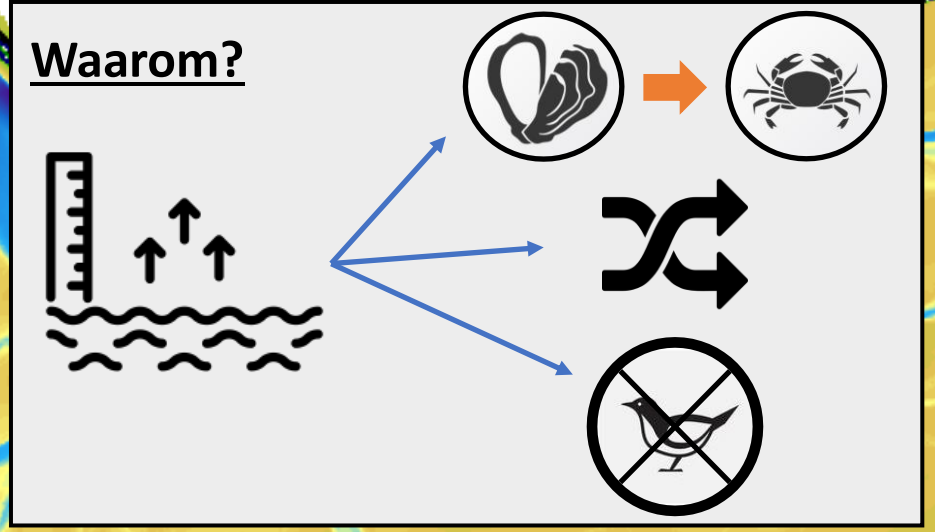
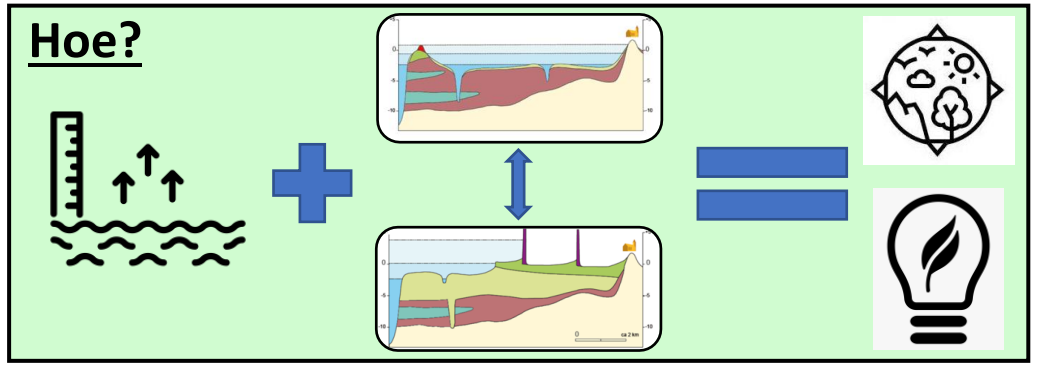
23 mei 2022

Waarom?



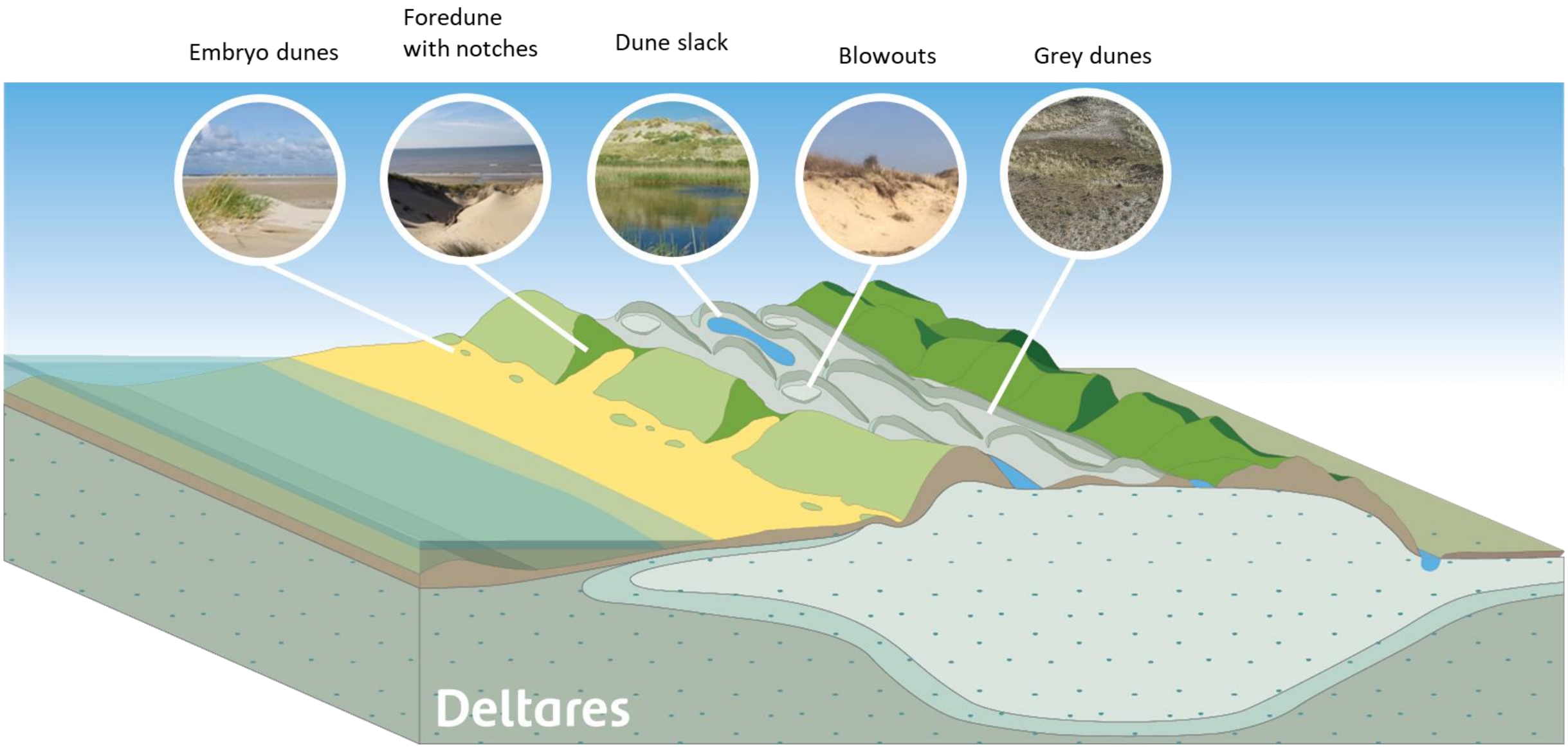
Wie?

Hoe?



Aim is to predict morphological changes under accelerated SLR and translate them into alterations in ecotopes and subsequently ecology

ReThink the Delta – application ‘dunes’. With: Joost Delsman, Maaike Maarse and Stéphanie IJff

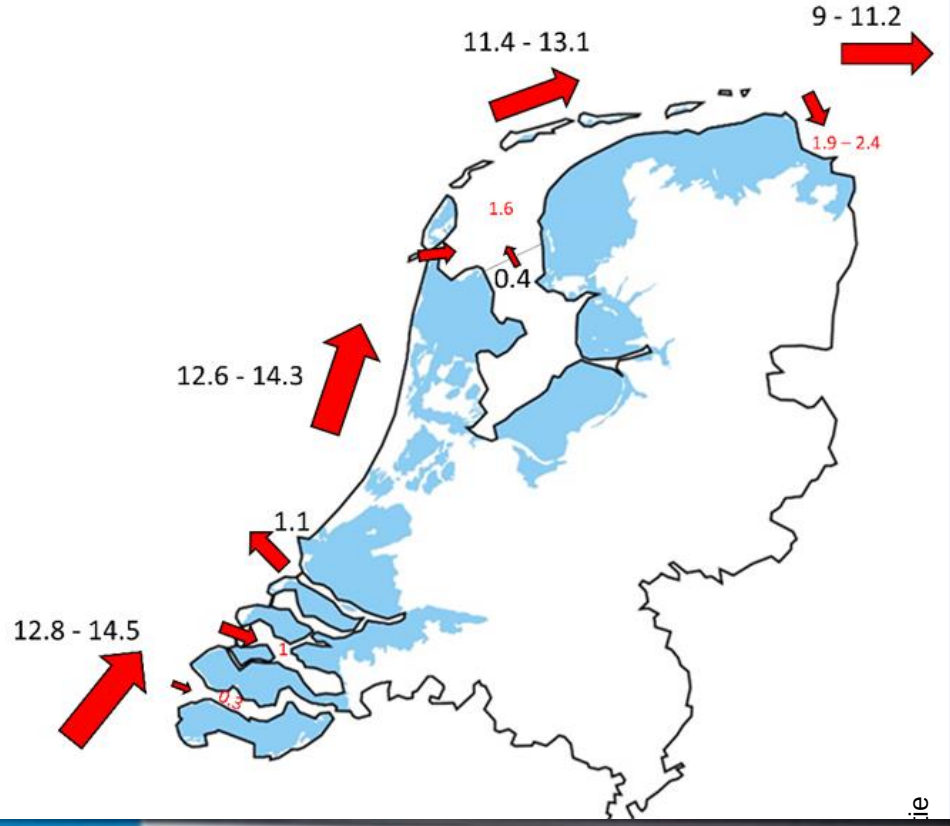


How will sea level rise affect the fresh water dome, and the natural habitats of dune landscapes?

Coastal outlook

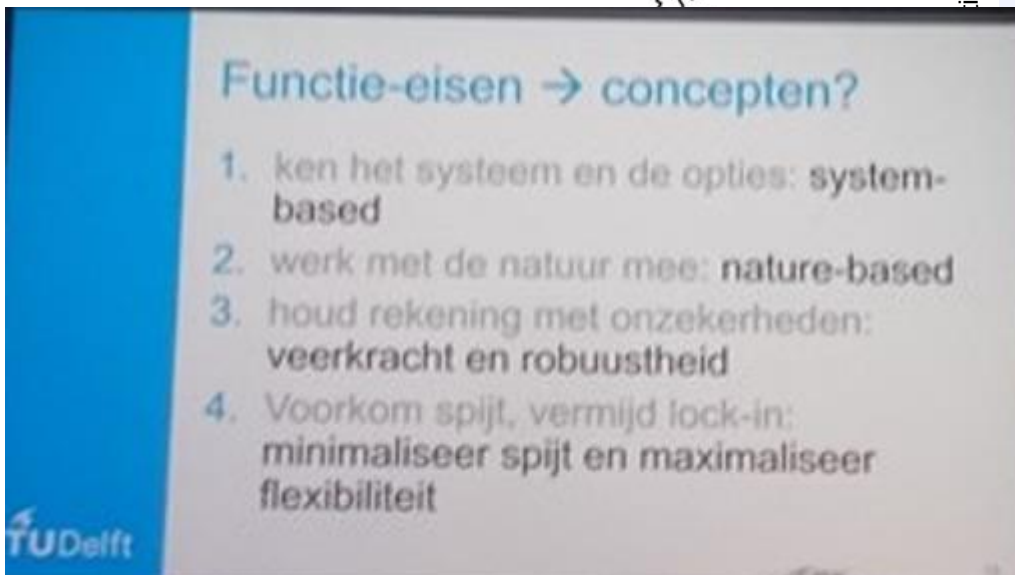
- Portfolio gedachte = samenbrengen (van inhoudelijke ontwikkelingen in projecten) ,
  op het gebied van data en modellering,
  om een objectieve basis te leggen voor de toekomstverwachtingen voor de kust.
- synthese beschikbare data en gebruik relevante modellen -> delen resultaten
- *….outlook in which the current and near future state of the coast will be described in physical parameters and in terms of potential flooding and erosion and how this will affect the population .. (…map at 1km alongshore resolution of coastal systems …and how they may be affected by sea level rise, subsidence and human interventions. New and existing interventions ….. will be predicted in the near-future using data-model assimilation)*
- Voorstel / ambitie is nadrukkelijk ‘global’, met beschikbaar budget in 2022 kaart maken voor ‘Noordzee’

Coastal vision – aim / outputs



Just start with (pilot)

- Integrate Deltares knowledge of the Dutch coastal system into coastal maps that support the discussion and decision making and ‘rethinking’ the delta (just collect what is available)
  -> make first version
- Describe, based on literature and Deltares experience, leading physical and ecological principles that should guide opportunities and limitations of our future coastal management strategy/
  -> White paper
- Assess one or two potential coastal management strategies and measures
  -> Test our way of working
- Outreach : Essay or news item in a national newspaper



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Coastal vision – outcome / impact

OUTCOME

- A Deltareswide team is in place and active
- Coastal system knowledge can easily be found and used (for discussions etc on rethinking our delta)
- Deltares expertise on sediment management in the Netherlands is more visible in the national debate on future strategies for coastal management

IMPACT

- Dutch coast remains a multifunctional landscape (also under climate change and a growing population)
- Measures and solutions will be implemented timely
- Enable a realistic national debate on solutions for accelerated sea level rise based

Vragen / discussie

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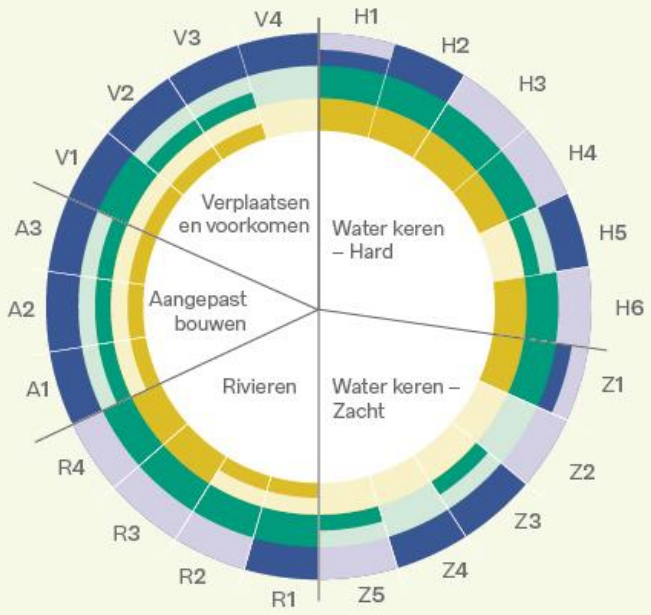
Effectiveness and feasibility of adaptation measures and building blocks? When and where?

Building blocks and adaptation strategies



Water keren – Hard (H)
- H1 Dijken ophogen/ verbreden/overslagbestendig
- H2 Compartimentering (inc ringdijk stad)
- H3 Dam lokaal/mega
- H4 Stormvloedkering
- H5 Dubbele dijken
- H6 Golfbreker

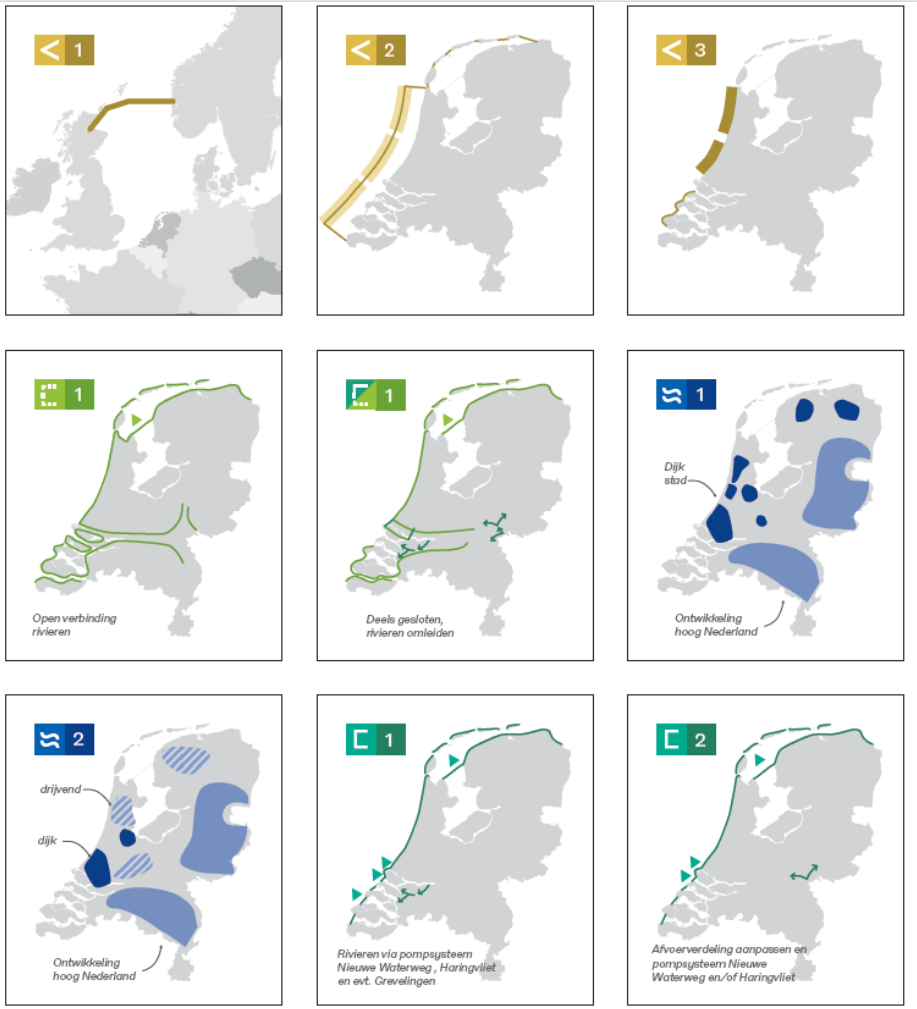
Water keren – Zacht (Z)
- Z1 Kustsuppletie lokaal/mega
- Z2 Vegetatie/vooroevers kust
- Z3 Zeewaartse landstrook/verbonden eilanden
- Z4 Natuurlijk land ophogen
- Z5 Kunstmatig land ophogen (megaterp)

Rivieren afvoeren/bergen (R)
- R1 Ruimte voor rivier
- R2 Andere afvoerverdelingen Rijntakken, Maas en Ben
- R3 Bergen IJsselmeer/ kustmeer/Zuidwestelijke delt
- R4 Afsluiten-pompen-spuien

Aangepast bouwen (A)
- A1 Verhoogd (terp/palen)
- A2 Drijvend
- A3 Schade beperkend (wetproof/dryproof)

Verplaatsen en voorkomen (V)
- V1 Bouwvrije zones
- V2 Bouwen met korte levensduur
- V3 Verplaatsen
- V4 Ontwikkelingen hoog Nederland

Adaptation strategies



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Gezamenlijk producten binnen Rethink

Tipping point data-base

Visual Delta

Pathways

Driver	Threshold /limit	Range/uncertainty	Description (long)	Region	Hard or soft limits	Threshold for what (coastline, flood risk, wateroverlast, water supply, nature,..)	Solutions: possible (follow-up) measure to solve threshold	References	Toegevoegd door	Review
sea-level rise (mm/year)	10.4	6.7-14.1	Ameland	Wadden		nature, flood risk	sand nourishment	Wang et al 2018, https://doi.org/10.1017/njg.2018.11	Marjolijn Haasnoot	Ymkje?
sea-level rise (mm/year)	4		1.9 Mm3/jr sedimentbehoefte kustfundament Westerscheldemonding	Zuidwestelijke Delta, Kust en Voordelta		flood risk	sand nourishment, adapt strategy (redefine coastal foundation, adapt nourishment strategy)	Technisch advies sedimentbehoefte Kustgenese 2, https://pub.kennisbank.deltares.nl/Details/fullCatalogue/1000003669	Arno Nolte	
sea-level rise (m)	0.5	depends on change in Rhine river discharge	W2: KWA 20dagen/5jr	Zuidwestelijke Delta		zoetwater		Figure 2 v2 Sea level rise and Summary Results	Gundula Winter	
sea-level rise (m)	> 0.72		ATP Oosterschelde kering: macrostabiliteit binnenwaarts (STB); betrouwbaarheid sluiting kunstwerk (BSKW); piping kunstwerk (PKW)	Zuidwestelijke Delta, Oosterschelde	hard limit	flood risk		https://www.zwdelta.nl/sites/all/files/default/publicaties/rw1929-201-17-004991-rapd-integraleveiligheidoosterschelde.pdf	Gundula Winter	OK (Arno)