Steering Committee for the long-term subsidence study in the Wadden Sea Region

Dr Hessel Speelman
Board Member (Portfolio Geoscience) Wadden Academy KNAW

Royal Academy of Arts and Science of the Netherlands ,
Amsterdam, April 2013

Waddenacademie

Outline

Agenda Meetings April 18/19, 2013

Wadden Academy KNAW

Portfolio/Theme Geoscience

- Subsurface Wadden Area
- Evolution Wadden Area
- Morphodynamics Wadden Sea & Islands

Procedural Issues Steering Committee

- Tasks of the Steering Committee
- Quality management and confidentiality
- Follow-up and communication
- Planning of steering committee meetings 2013-2015

Ambition Researchers and Steering Committee

Agenda Thursday April 18, 2013

11.00 – 11.20: Acquaintance Committee Members (Ramon Hanssen, Rijszard Hejmanowsky, Rune Holt, Adriaan Houtenbos, Hessel Speelman; P.M. Patrick Baud, Robert Zimmerman; Bogdan Orlic – Scientific secretary)

11.20 – 12.00: Presentation and discussion on Wadden Academy KNAW; Theme Geoscience Wadden Academy; Procedural Issues Steering Committee

12.00 – 13.00: Acquaintance with NAM Experts involved in the subsidence study (joint lunch of Committee Members and NAM Experts)

13.00 – 16.30: Presentation preliminary research programme by NAM experts and discussion of programme with committee members

Evening : Incorporation comments of Steering Committee in preliminary research programme by NAM Experts and Scientific Secretary

Agenda Friday April 19, 2013

Presentations for representatives of Nature Conservation Organizations, NAM, State Supervision of Mines, Steering Committee, Wadden Academy, Wadden Association

10.00 – 10.30: Presentation by Hessel Speelman on Wadden Academy KNAW; Theme Geoscience Wadden Academy; Procedural Issues (excerpts) Steering Committee

10.30 – 12.00: Presentation of the research programme by NAM Experts and the Initial reaction to the recommendations given by the Committee

12.00 – 13.00: Lunch for participants morning session

WaddenAcademy (founded 2008)

An entity of the Royal Academy of Arts and Sciences (founded in 1808)

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Incentives for the foundation of the WaddenAcademy

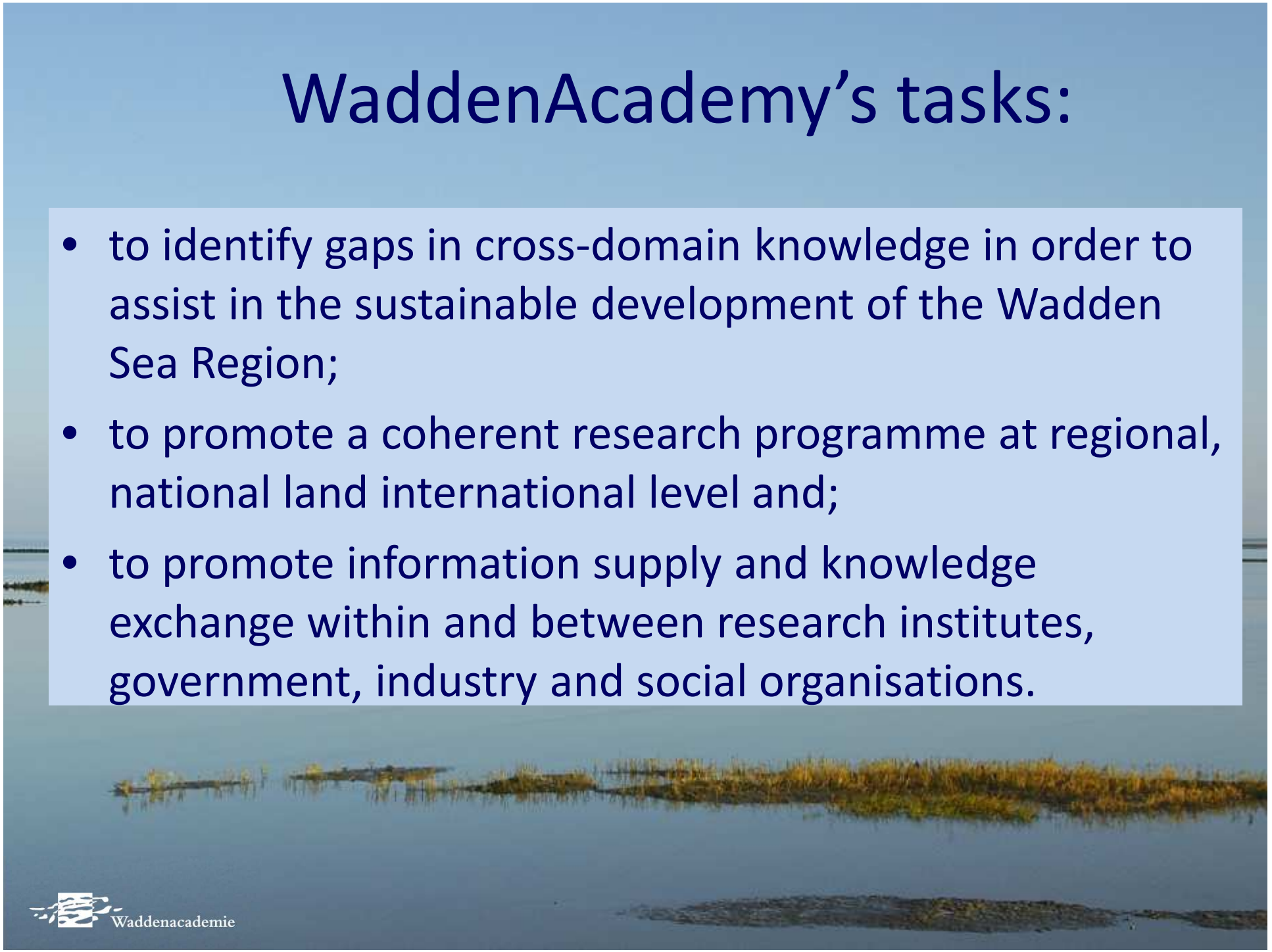
-Final report of the Advisory Group on Wadden Sea Policy (Meijer Committee, 2004): policy and management of the Wadden Sea Region had reached an impasse;

-Recommendations included: improve the natural qualities of the Wadden Sea Region; reform the policy and governance structure; shellfish fisheries and gas extraction within limits of the natural system; **a better knowledge structure for the Wadden Sea Region**

-Government decisions: quit mechanical fisheries on cockles; allow gas extraction following ‘hand on the tap’ principle; establishment of the Wadden Fund (800 million euro; 20 years) for enhancement of the natural values and a sustainable economy; **establishment of the Waddenacademie for the development of a good knowledge structure.**

WaddenAcademy's tasks:

- to identify gaps in cross-domain knowledge in order to assist in the sustainable development of the Wadden Sea Region;
- to promote a coherent research programme at regional, national land international level and;
- to promote information supply and knowledge exchange within and between research institutes, government, industry and social organisations.



WaddenAcademy's Ambition:

...to develop the Wadden Sea Region into an incubator for widely applicable integrated knowledge of sustainable development of a coastal area, in which natural values are a key element and form the foundations of the local and regional economy.

The region is a meeting place for scientists from the Netherlands and elsewhere, administrators, policymakers and management agencies. Together, they develop sustainable and innovative solutions based on interdisciplinary knowledge.

By 2020, the trilateral Wadden Sea Region will be the best monitored and best understood coastal system in the world.

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Resilience of the Wadden Sea Area

WaddenAcademy promotes integrated multi-disciplinary research in a system approach

Geoscience

Ecology

Society and cultural history

Social and spatial Economics & planning

Climate and water

For more information see: www.waddenacademie.nl

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Board WaddenAcademy

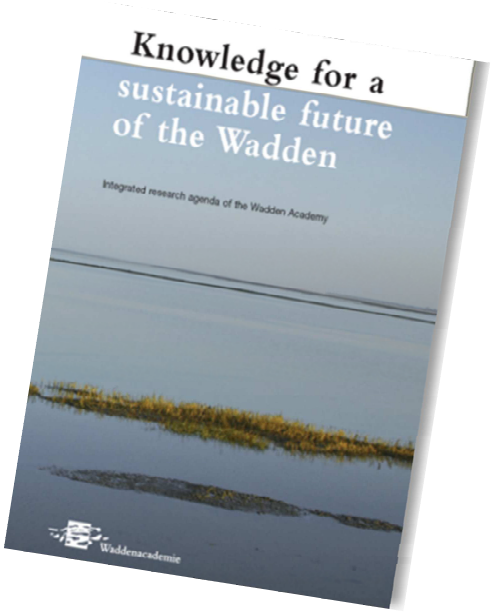
Per 1-1-2013:
Katja Philippart new board member Ecology

Hessel Speelman,
Jouke van Dijk,
Jos Bazelmans,
(Peter Herman) en
Pavel Kabat

The integrated research agenda

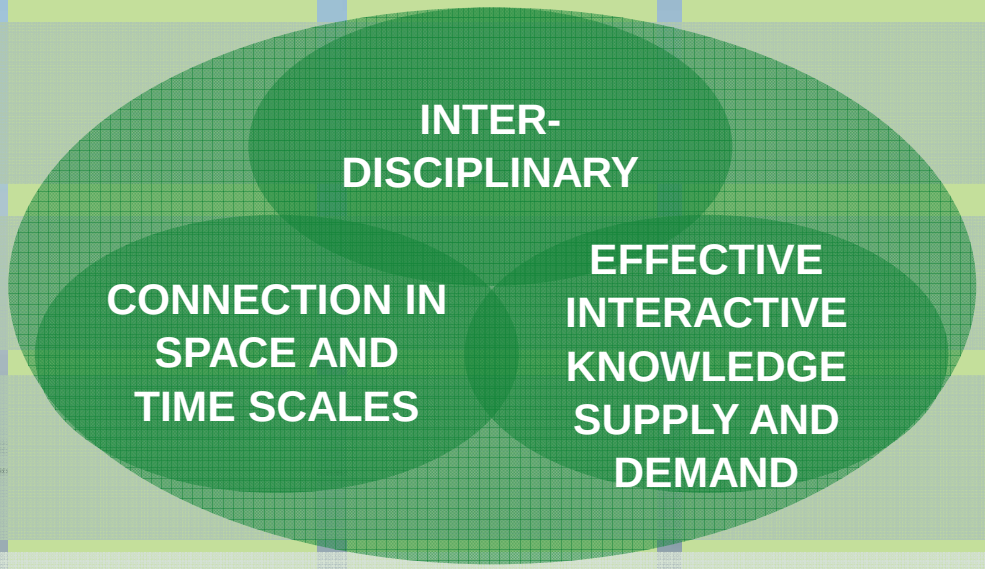
‘Knowledge for a sustainable future of the Wadden’

Research agenda for the Dutch Wadden Sea Region



System Matrix

	1 WADDEN CLIMATE	2 WADDEN NATURE	3 WADDEN WELL-BEING
A PAST WADDEN			
B WADDEN MONITOR			
C WADDEN FUTURE			
a WADDEN EXPERT			
b WORLD WADDEN			



Trilateral Waddensea area

UNESCO-Worldheritage site since 2009

Denmark

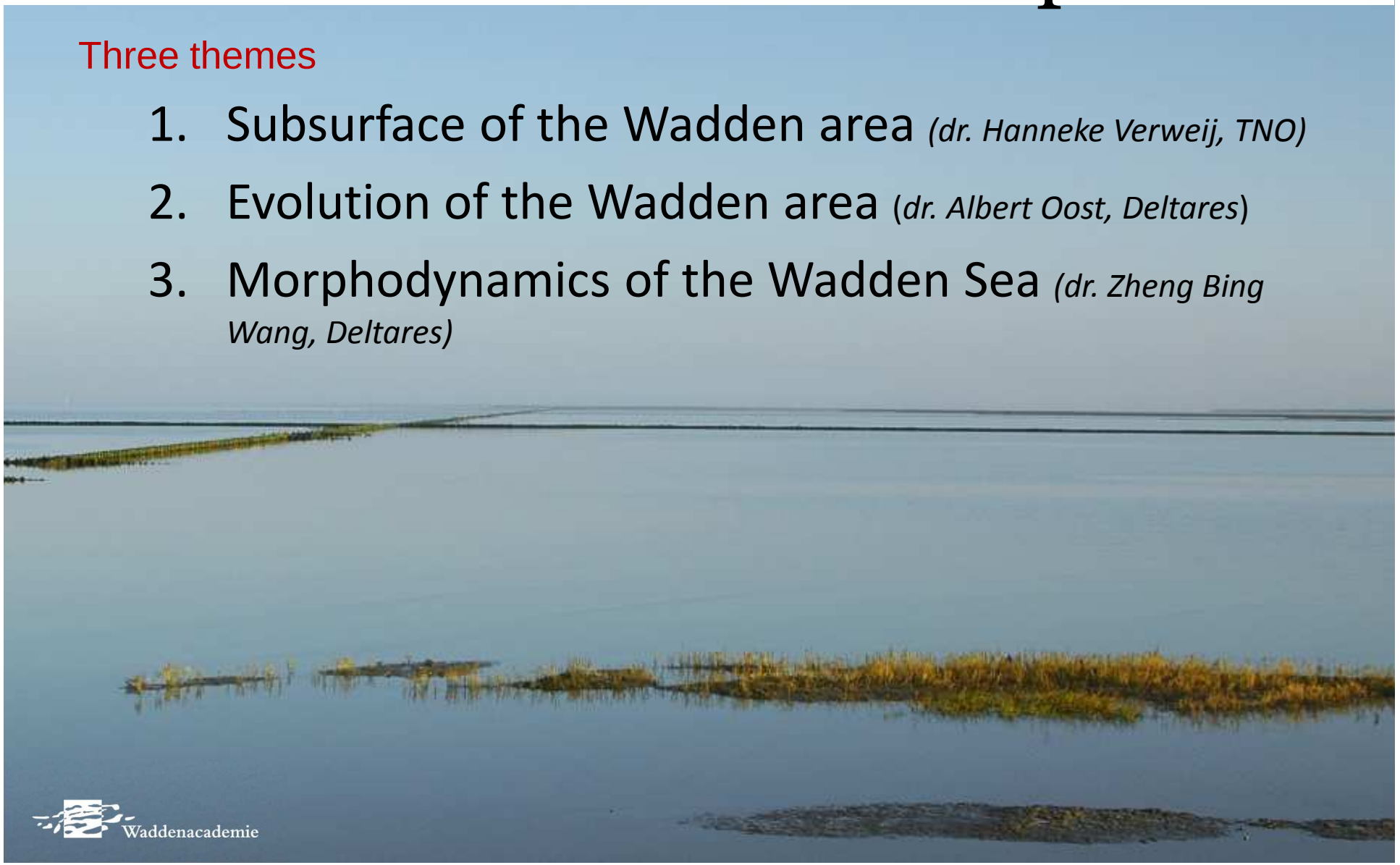
Germany

Netherlands

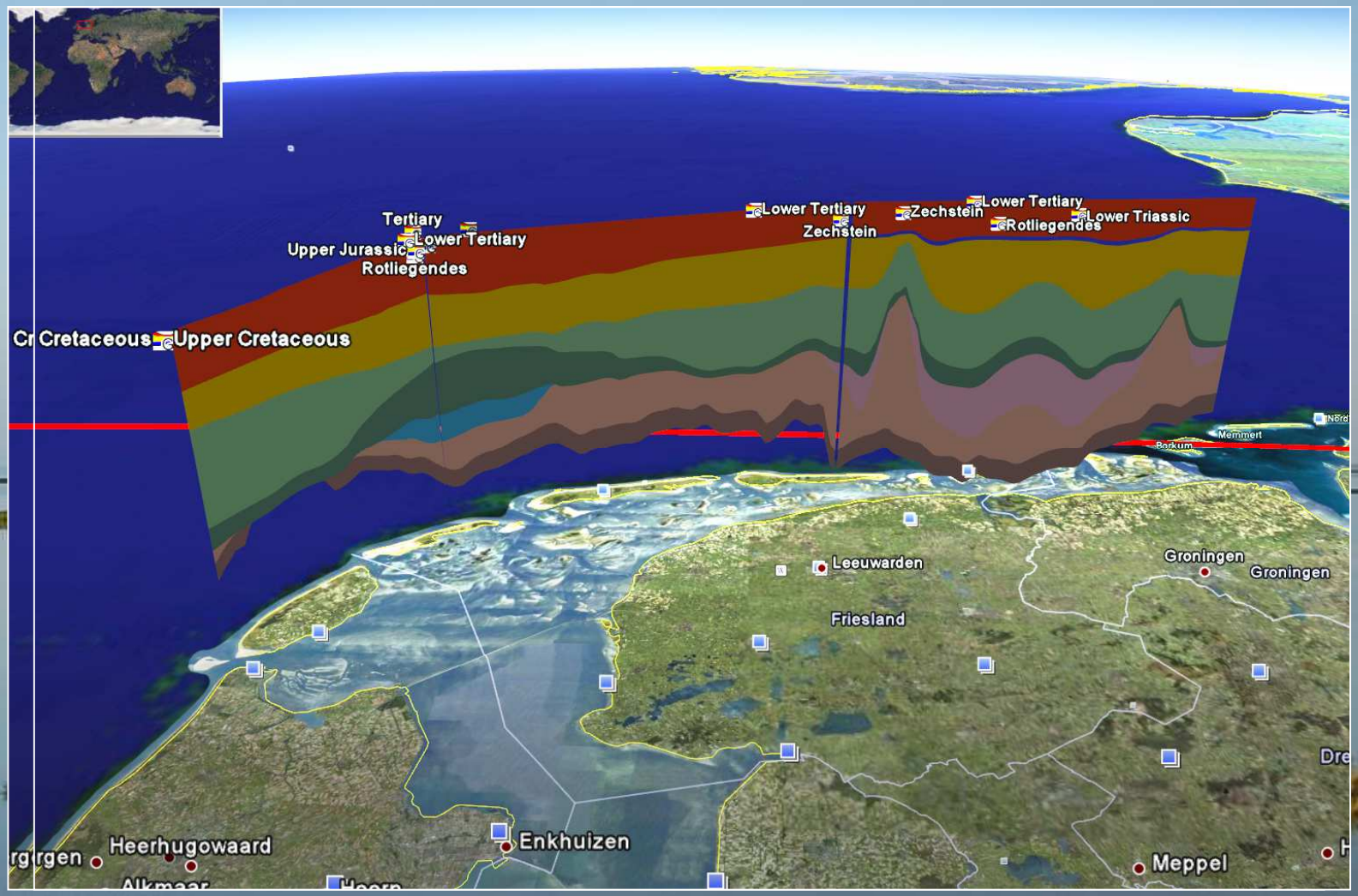
Geoscience: Development of the Wadden area in time and space

Three themes

1. Subsurface of the Wadden area *(dr. Hanneke Verweij, TNO)*
2. Evolution of the Wadden area (*dr. Albert Oost, Deltares*)
3. Morphodynamics of the Wadden Sea *(dr. Zheng Bing Wang, Deltares)*



1. Subsurface of the Wadden area



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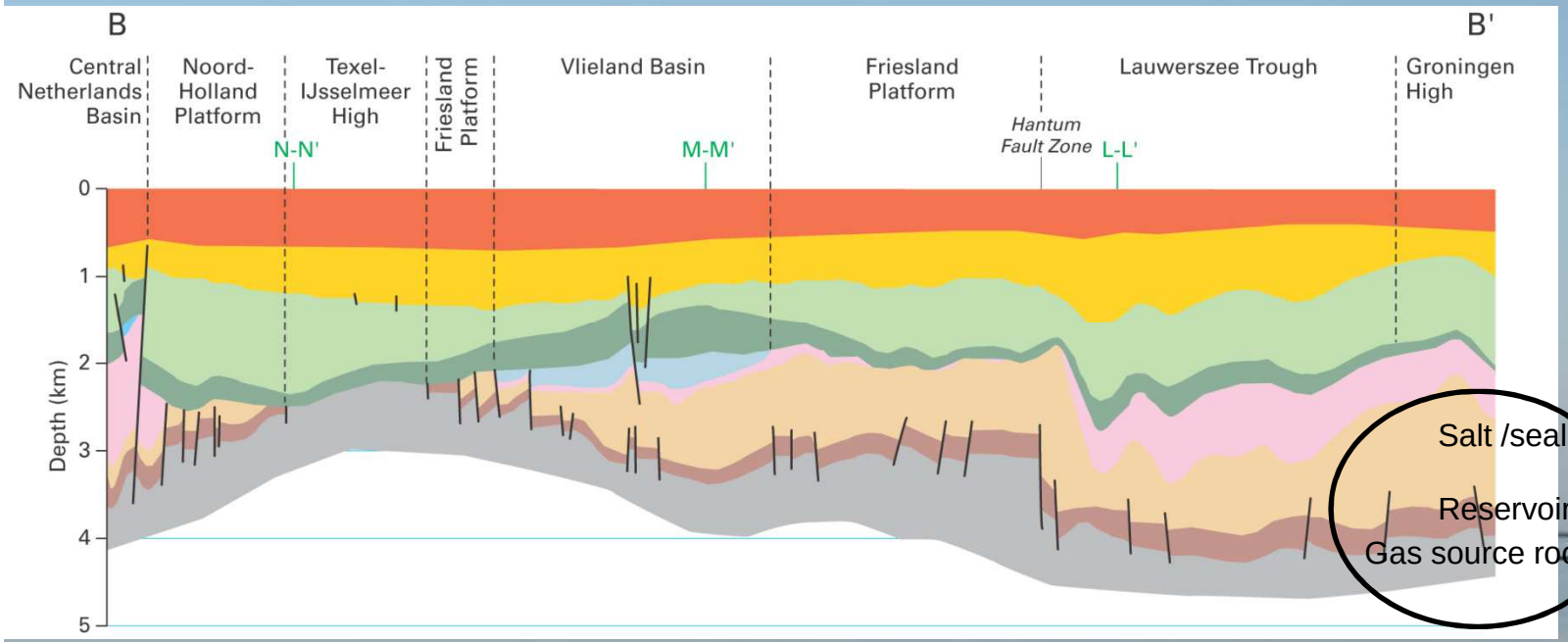
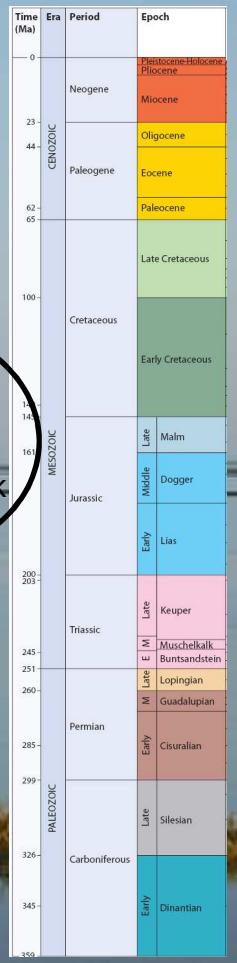
Heterogeneous subsurface Wadden area





- Different structural elements ~ different geological histories~different processes

  ~ Great differences in present-day stratigraphy and structural framework and physico-chemical properties of rocks and fluids
- Influence Zechstein salt?
- Influence faults?
- Influence fluids (water, gas)?

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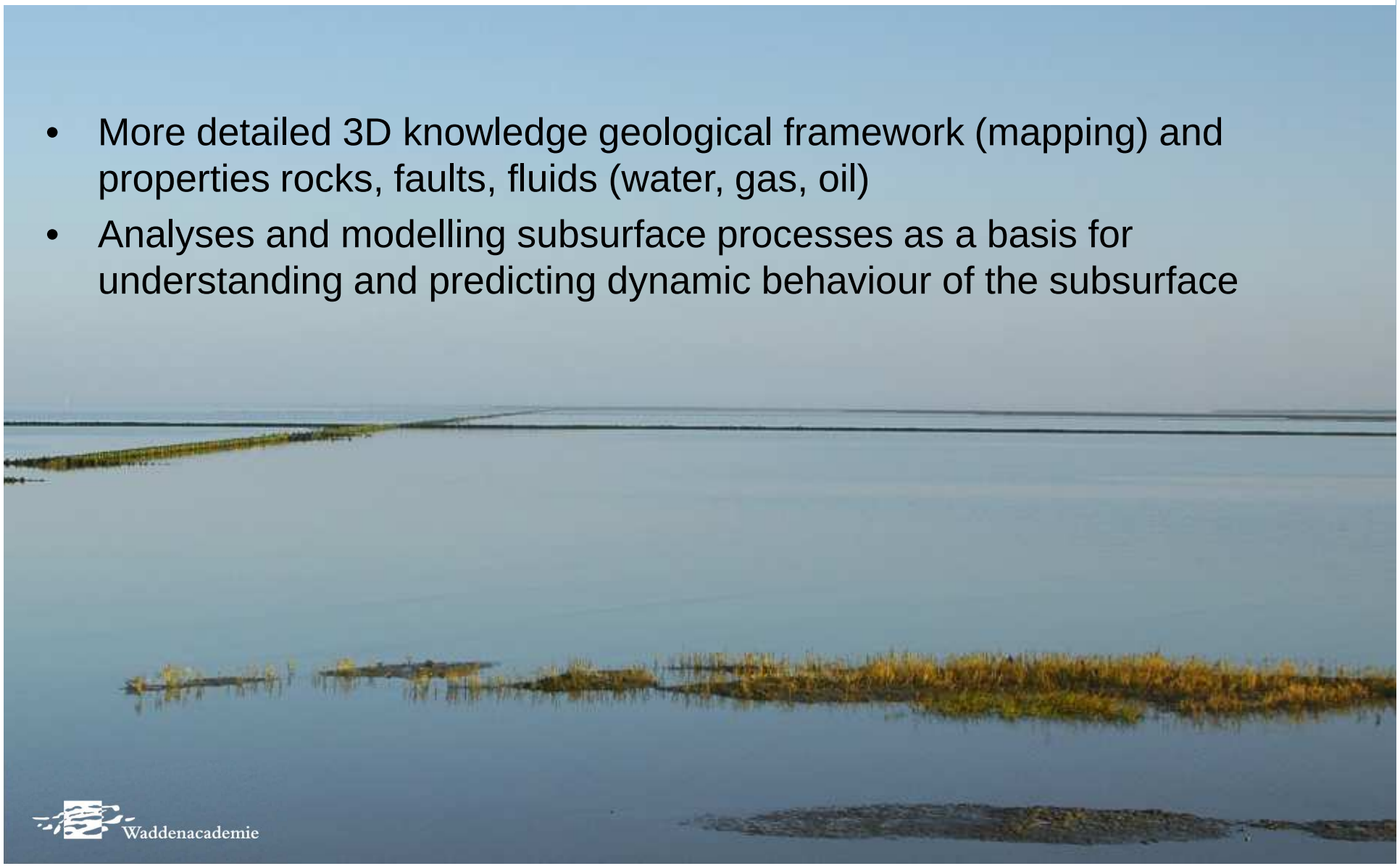
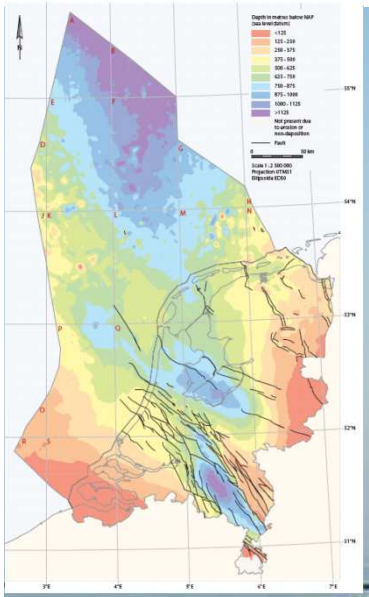
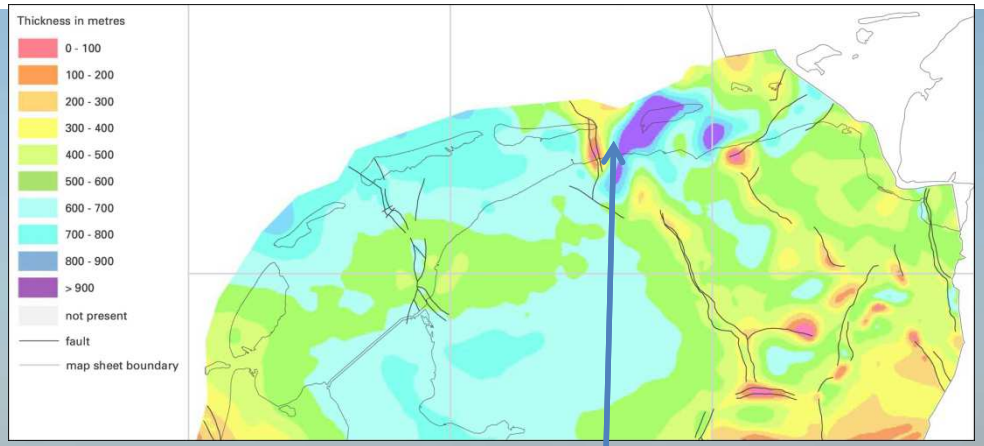
Subsurface of the Wadden area

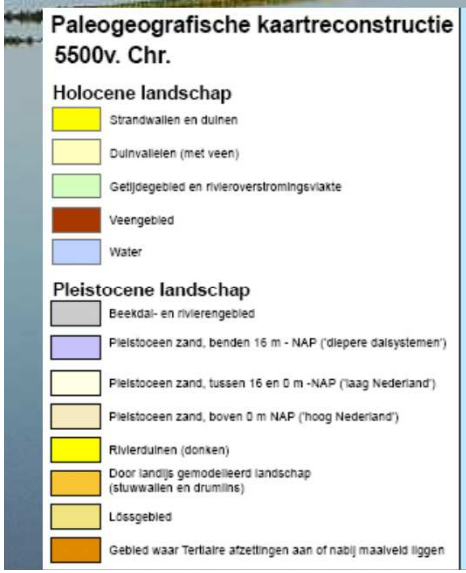


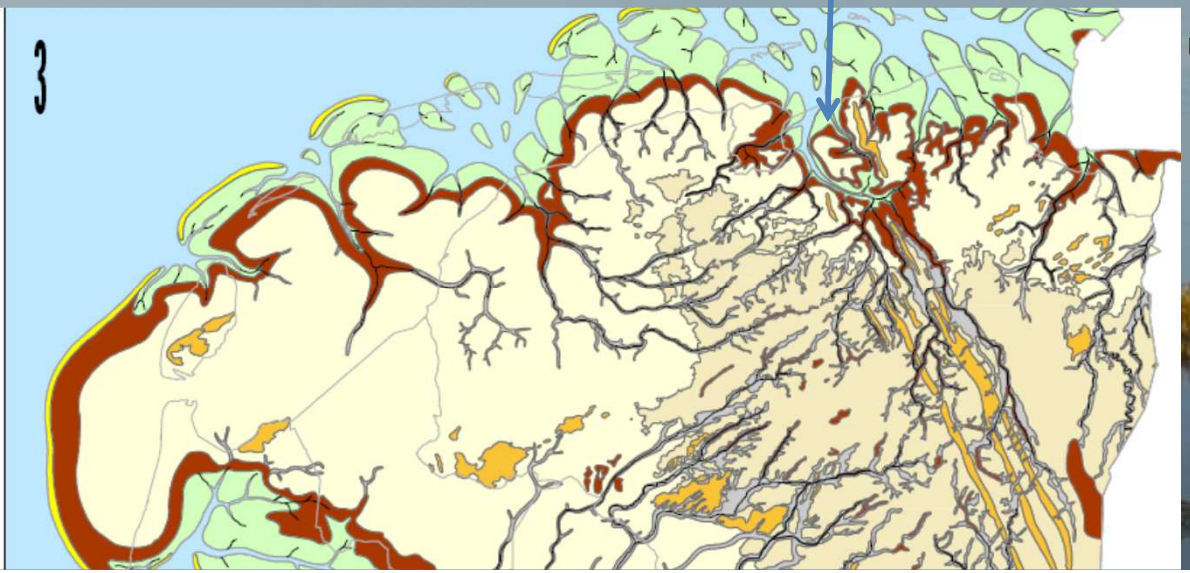
- More detailed 3D knowledge geological framework (mapping) and properties rocks, faults, fluids (water, gas, oil)
- Analyses and modelling subsurface processes as a basis for understanding and predicting dynamic behaviour of the subsurface

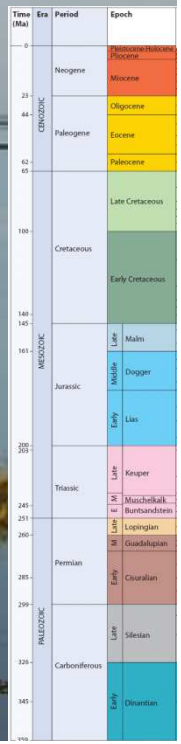
Influence ‘deep’ geological framework & ongoing geological processes on Holocene & future evolution Wadden area





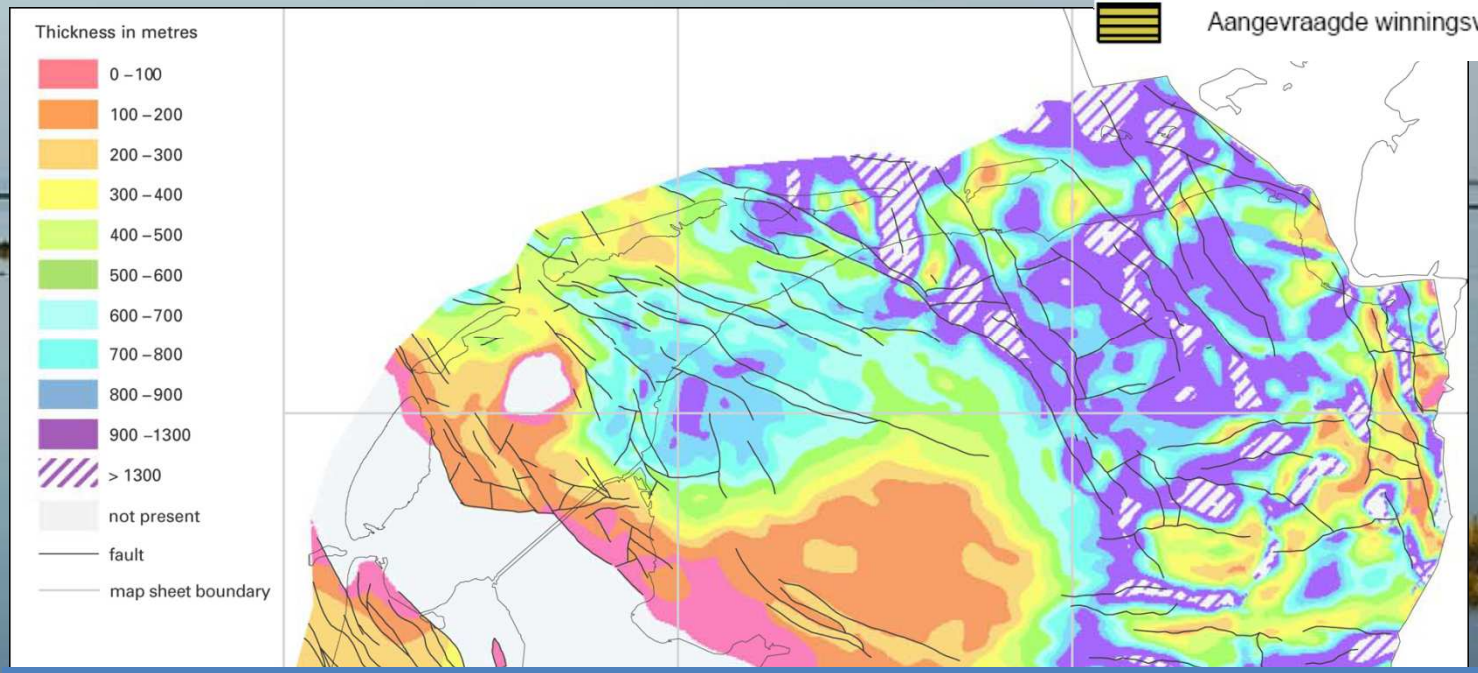


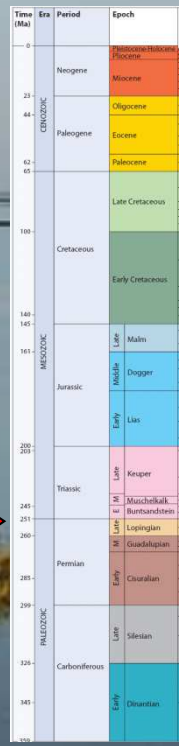




Effect present & future use subsurface

- Changes in subsurface, near and at the ground surface and Wadden Sea bed

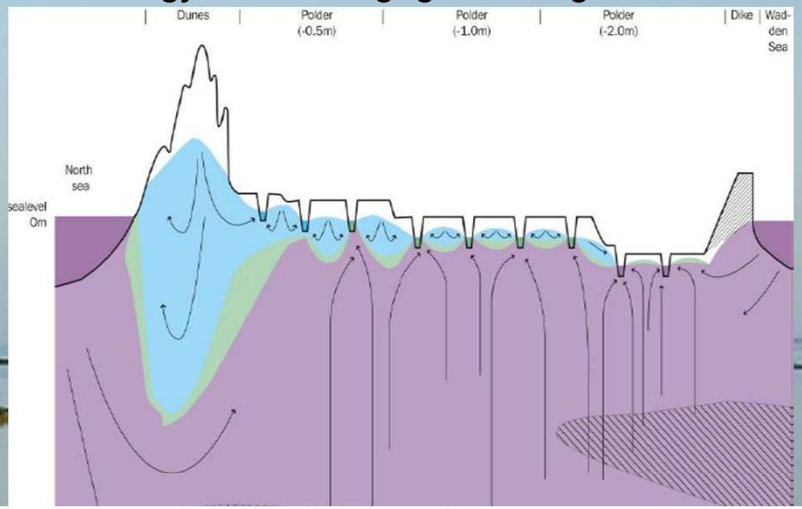


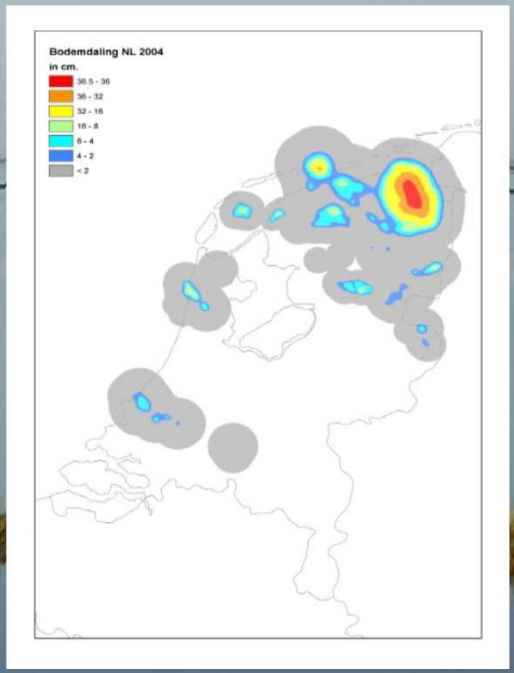


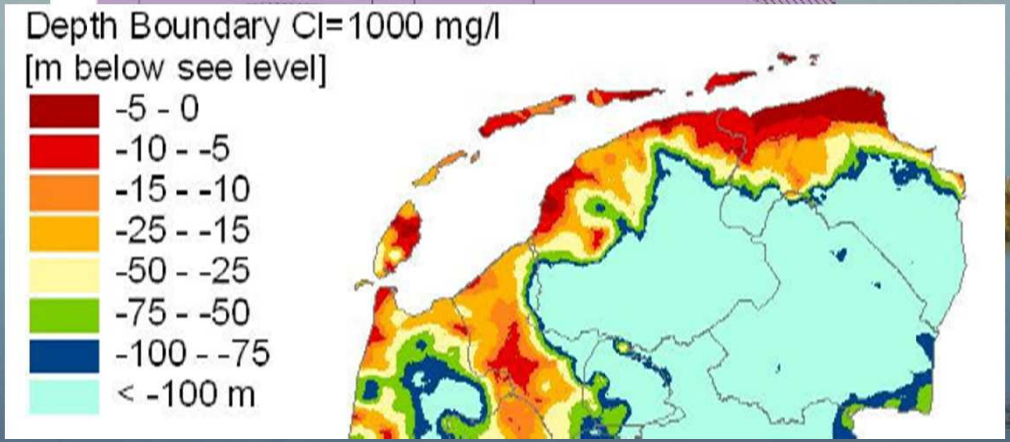
Thickness Zechstein Group: relation faults and salt structures

Effect present & future use subsurface

Accumulation and entwining of effects of multiple use subsurface, such as production groundwater, gas, geothermal energy, salt mining, gas storage…







2. Evolution of the Wadden area

Island tail Schiermonnikoog

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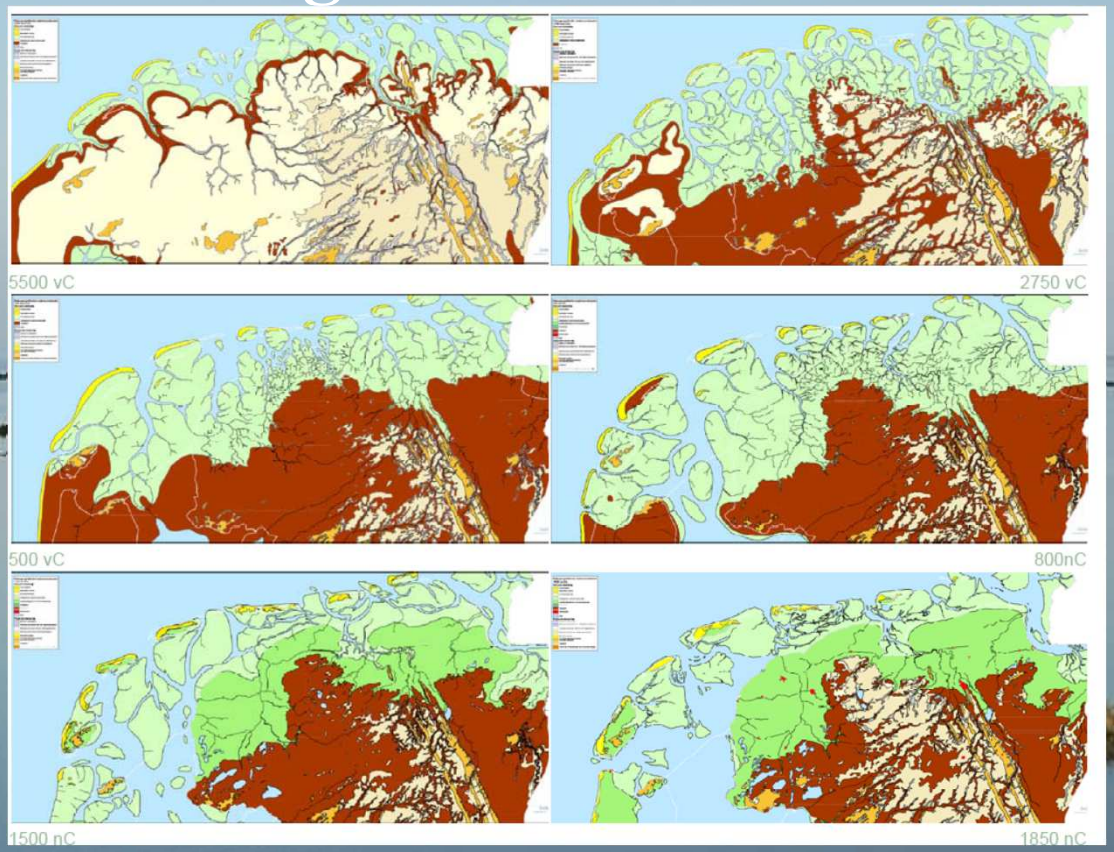
Reconstruction Holocene morphological development Wadden area

With special focus on development in relation to change of climate and sea level



(Vos and De Vries, Deltares 2009)

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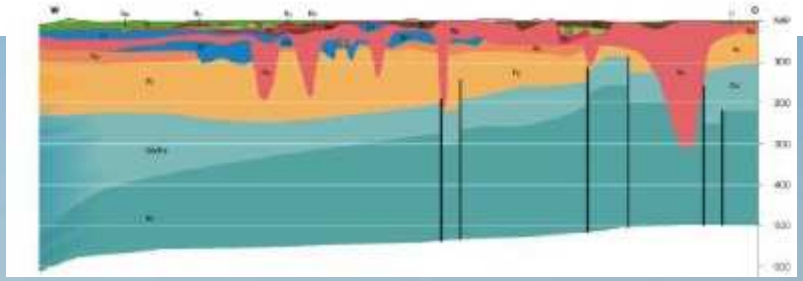
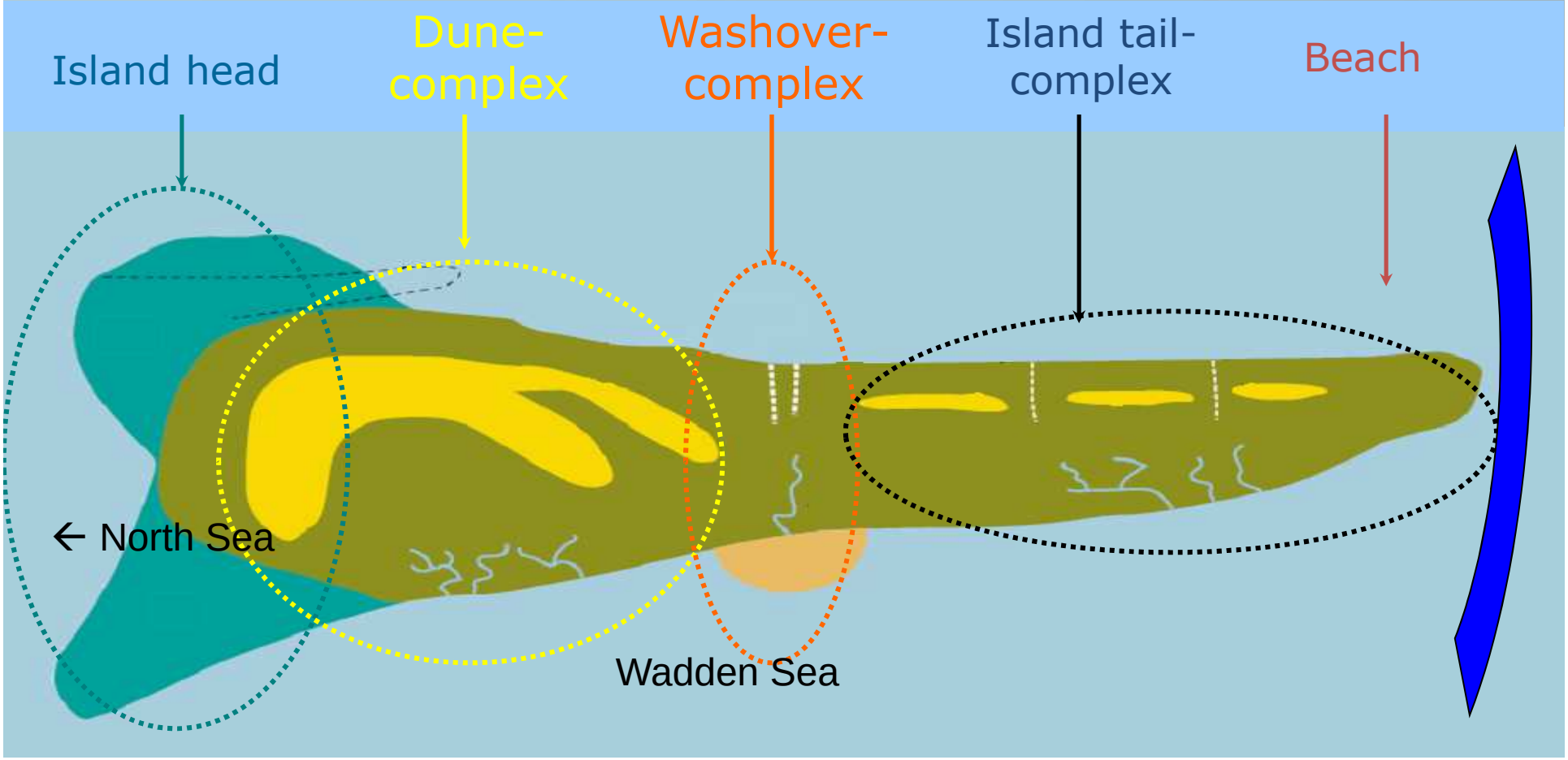
Influence pre-Holocene geological structures on present-day geomorphology and geomorphological processes

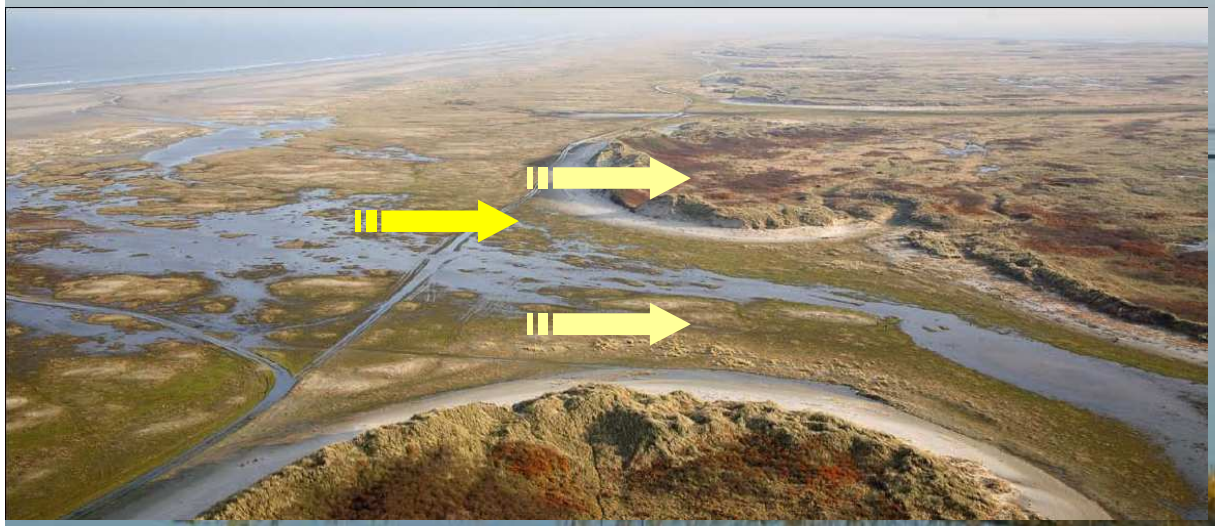




Natural dynamics islands and robustness islands in relation to sea level changes

Natural dynamics:

- Overwash
- Stormerosion
- Eolian transport of sand



Washover Schiermonnikoog: transport of water and wind

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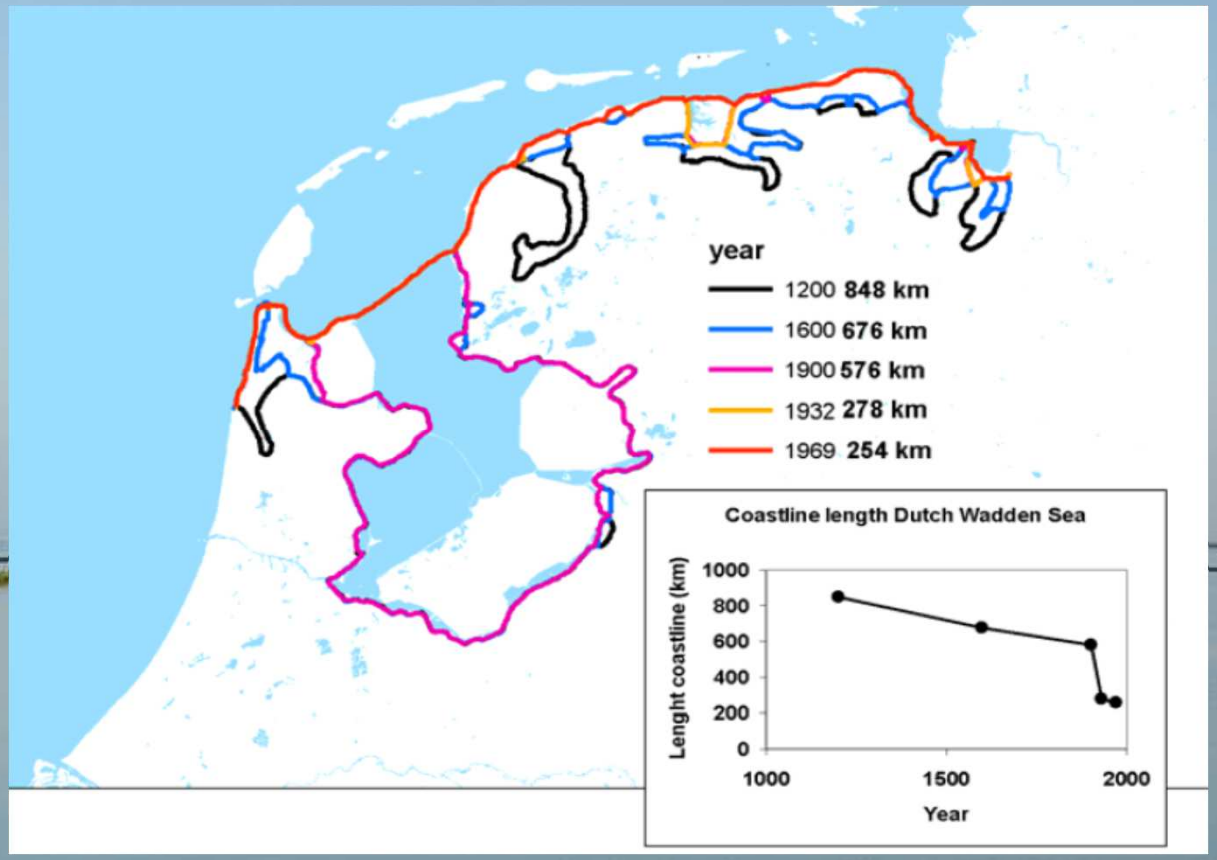
Human influence as ‘geological force’



Decrease in length coastline, reconstructed from historical maps
(H Olff, Groningen University**, 2009)**

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3. Morphodynamics of the Wadden Sea

Erosion of beach and dunes related to heavy storm (Ameland, 2006)

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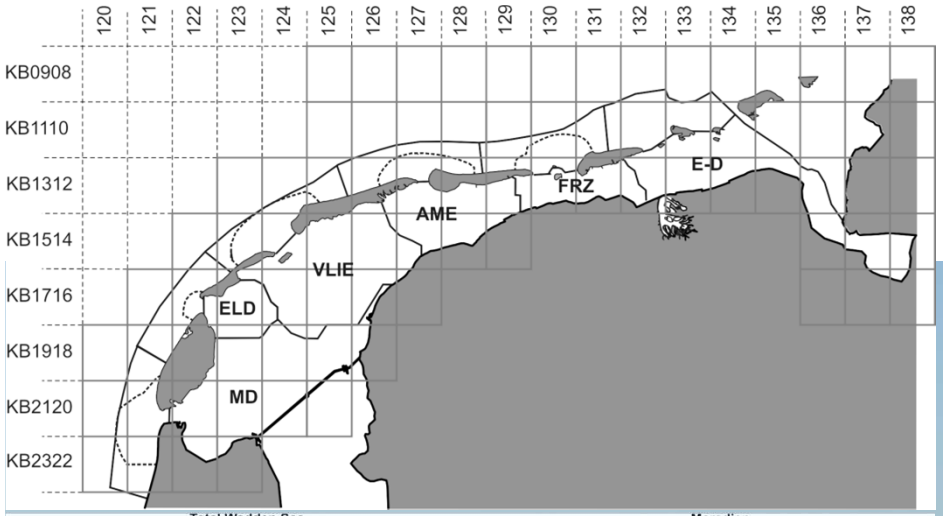
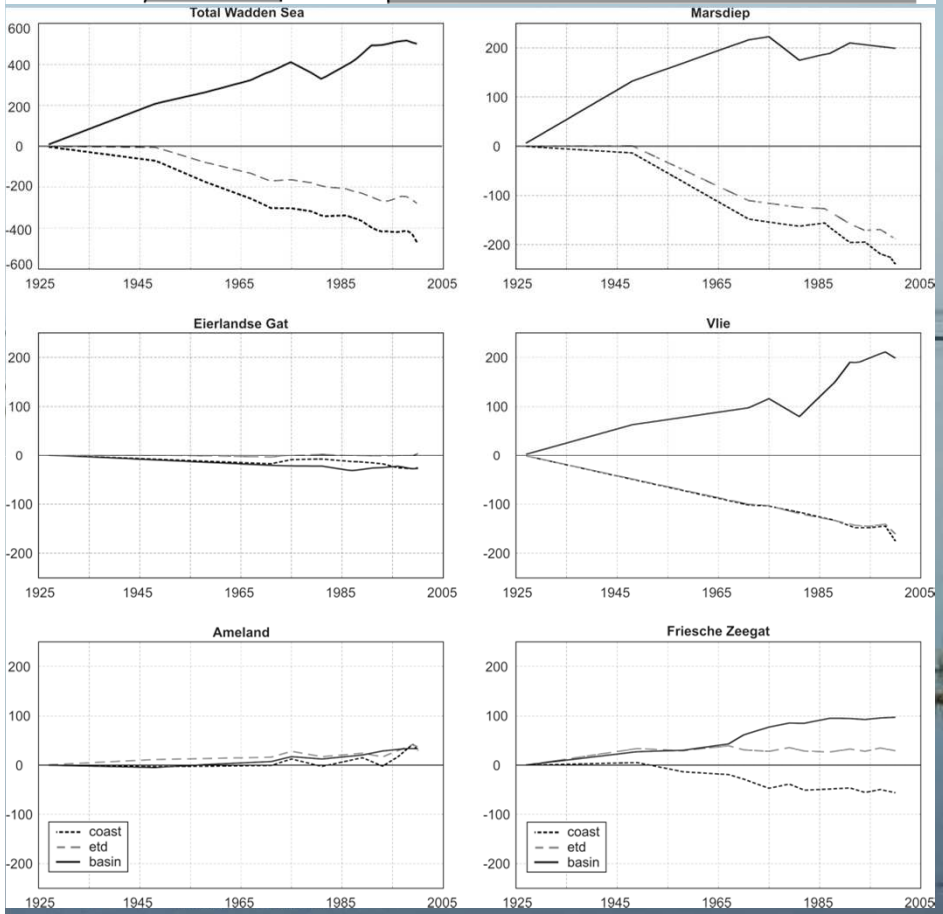
Sediment balance in relation to erosion North Sea coast

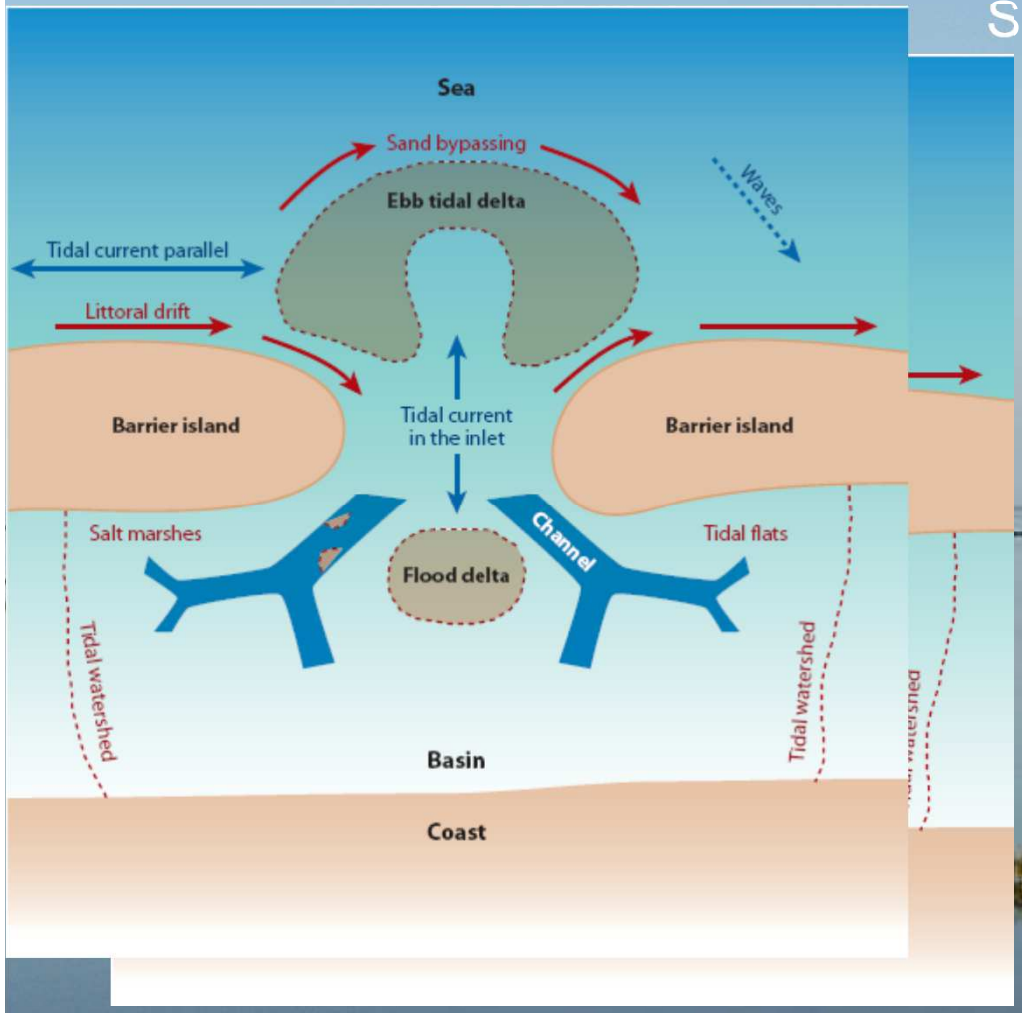




- Inaccuracies and uncertainties of available data
- Frequency of bathymetric measurements
- Classification in subsystems Wadden Sea

- Separate sediment balance for sand and silt

Development dynamics of tidal inlet system



Subsystems:

- Ebb-tidal delta
- Island heads
- Tidal inlet
- Channels
- Inter-tidal flats

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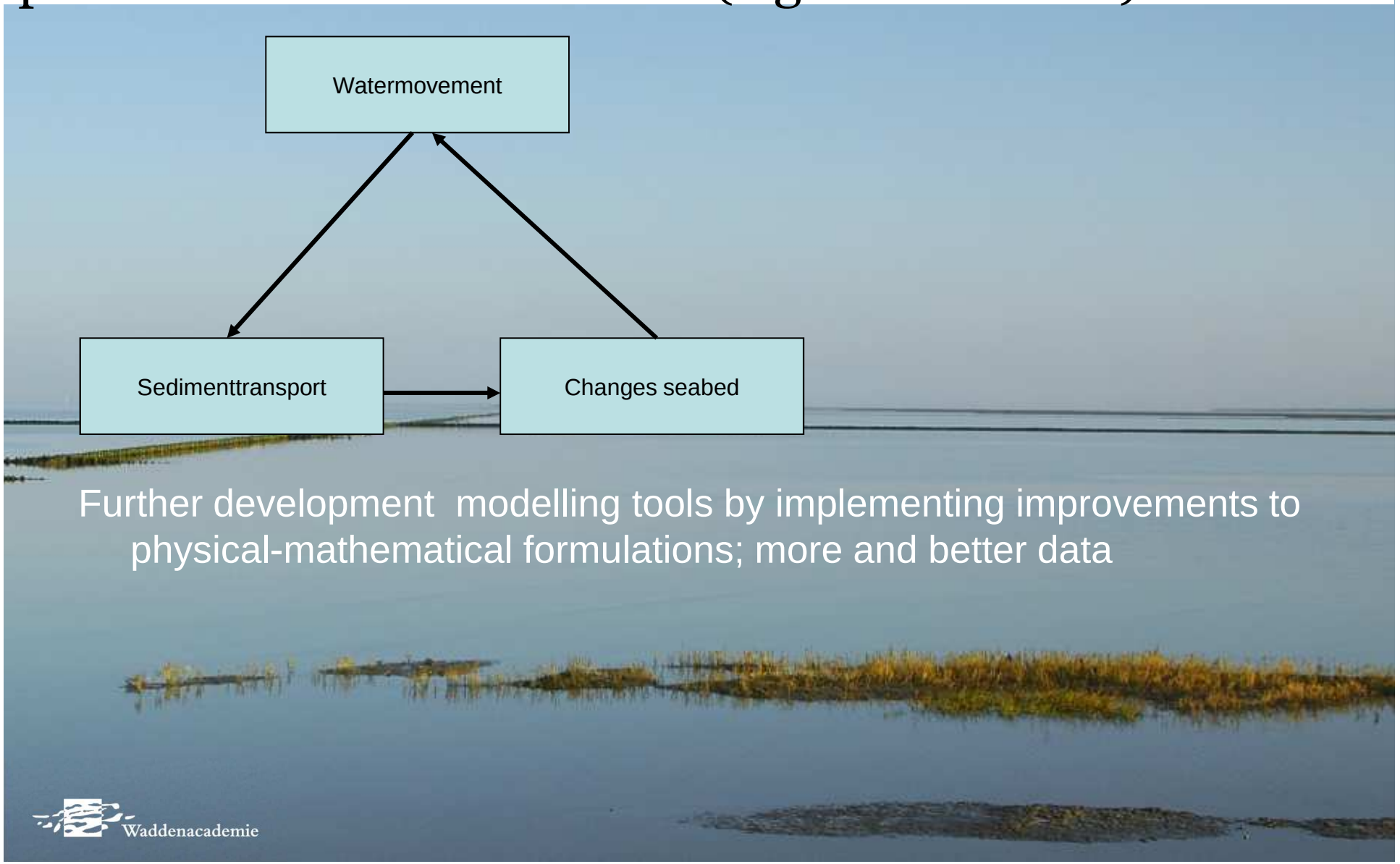
Processes on engineering timescale, interaction processes (e.g. bio-builders)



Further development modelling tools by implementing improvements to physical-mathematical formulations; more and better data

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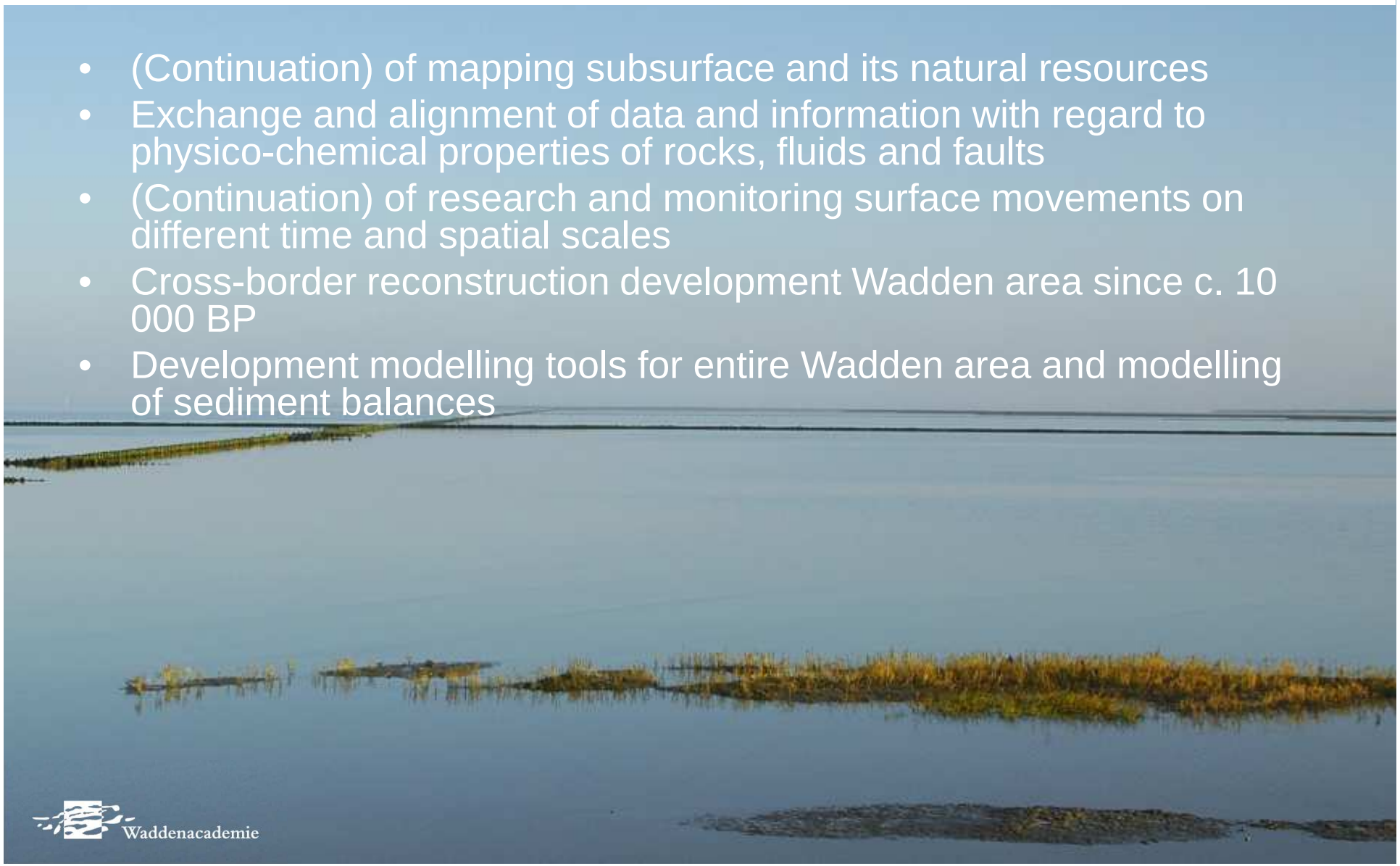
Trilateral geoscience research themes

- (Continuation) of mapping subsurface and its natural resources
- Exchange and alignment of data and information with regard to physico-chemical properties of rocks, fluids and faults
- (Continuation) of research and monitoring surface movements on different time and spatial scales
- Cross-border reconstruction development Wadden area since c. 10 000 BP
- Development modelling tools for entire Wadden area and modelling of sediment balances



Joint ambition

(of researchers executing study and steering committee for the long-term subsidence study in the Wadden Sea Region):

Realise a scientifically state of the art study that improves the knowledge of the subsidence which has already occured, with the aim of improving the forecasting of future subsidence in the Wadden Sea Region