# Long-term ecosystem and socioecological research in the Dutch Wadden Sea

Bruno J. Ens, Katja J.M. Philippart, Martin J. Baptist, Lucien Hansen, Frans Sijtsma



wappen sea
LONG-TERM ECOSYSTEM RESEARCH











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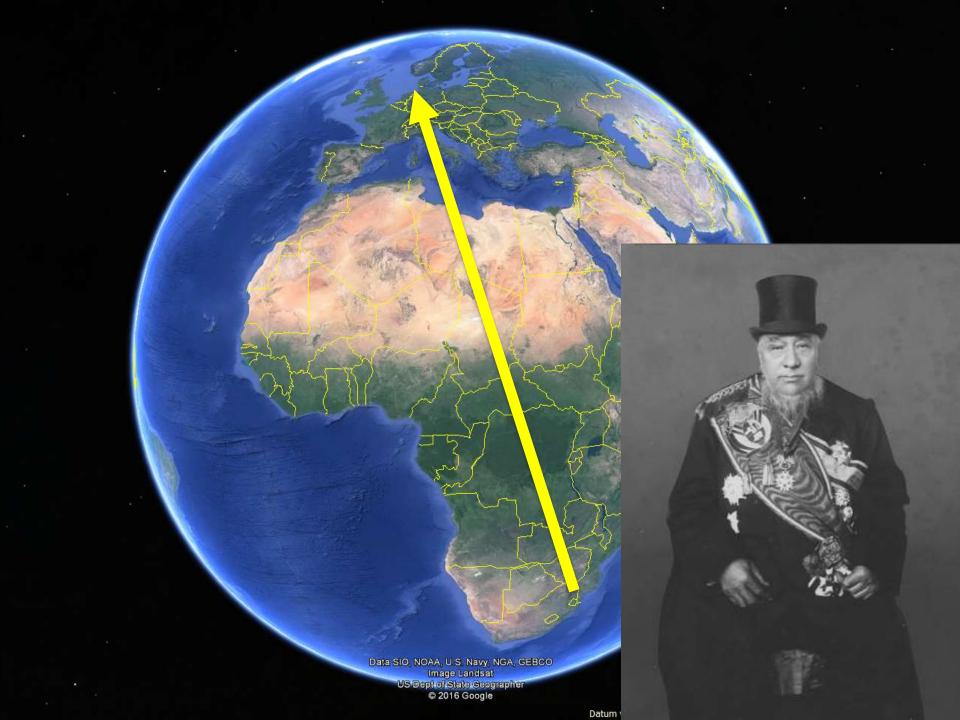
wappen sea Long-term ecosystem research



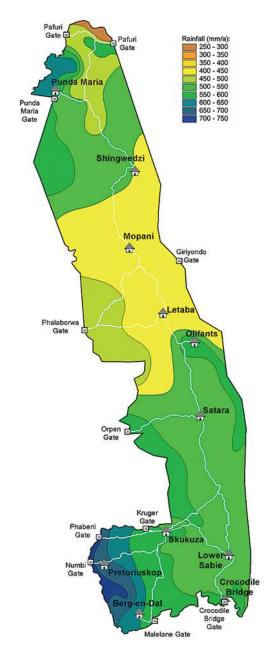


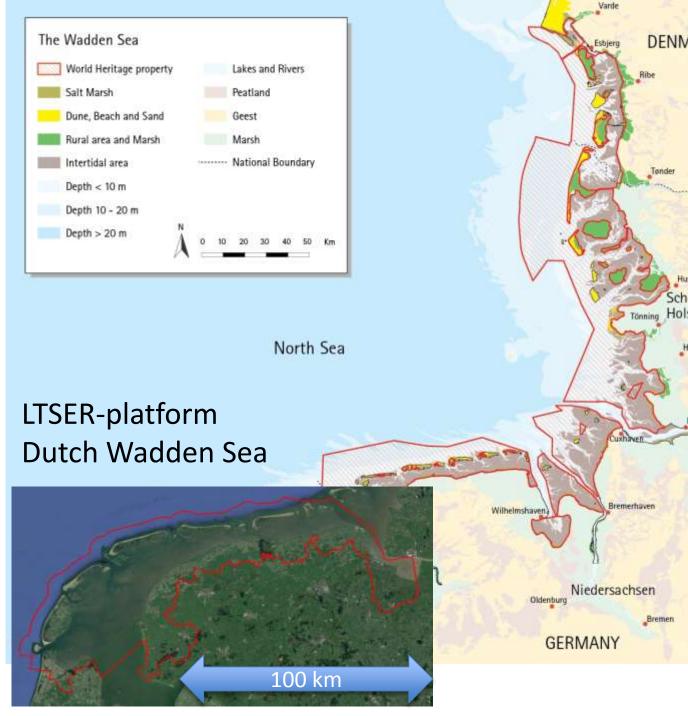
#### Aims

- Introduce WaLTER
- Importance long-term research & monitoring
- Socio-economic research taking off
- Value of Citizen Science for LTER



#### Kruger Park







OUR
WADDEN SEA
WORLD HERITAGE SITE









# www.walterwaddenmonitor.org

#### Themes

All themes of which WaLTER advises.

#### index

Walt

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natural values of tidal flats

alien species

renewable energies

climate & nature

demography & quality-oflife

gas and salt extraction

tourism

economic sectors

shellfish fisheries

climate & safety

dredging

#### Tools

All tools developed by WaLTER.

#### index

data portal

maps portal

evaluation of supply and demand

intertides

seed

wad-now

hotspot viewer

#### **Publications**

Alle publications released by WaLTER.

#### index

articles

wadden stories

booklets

prints

reports

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#### About WaLTER

Information about the project and its partners.

#### index



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the motivation

the project

work packages

contributers

advisory board

pilots

Iter-nl

contact

















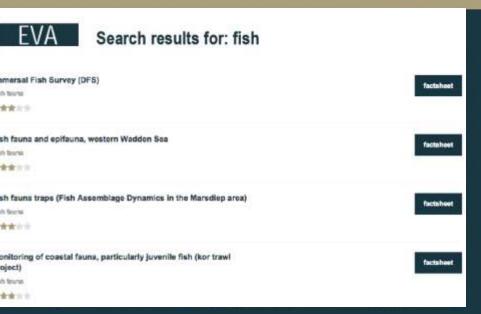
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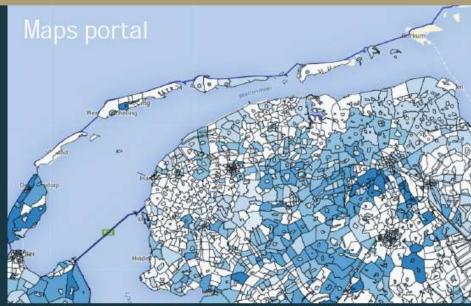
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# Interactive tools



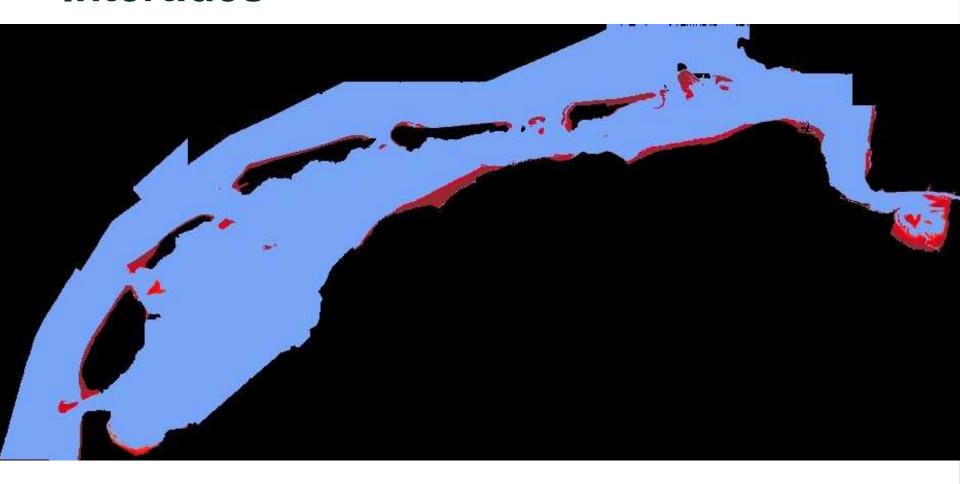








## **Intertides**



#### Wadden data portal



Links to >10.000 data sets

## Data processes involved in data portal

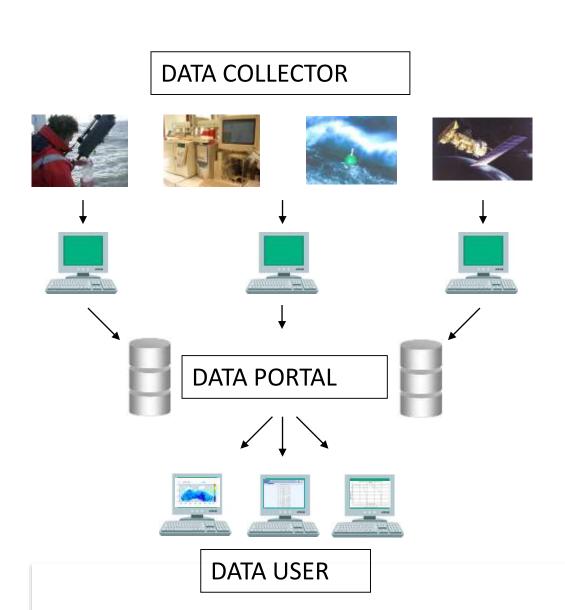
Data collection & quality control

Data storage and archiving

Data transfer

Data integration

Data redistribution





- What are questions?
- What should be monitored?
- What is monitored how?
- What are cost-effective improvements?

























#### - Walter

## **Importance LTER**

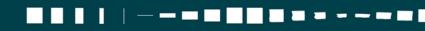




Philippart et al.: Sources and sinks of phosphorus and nitrogen before, during and after eutrophication of the World Heritage Wadden Sea



#### - Walter





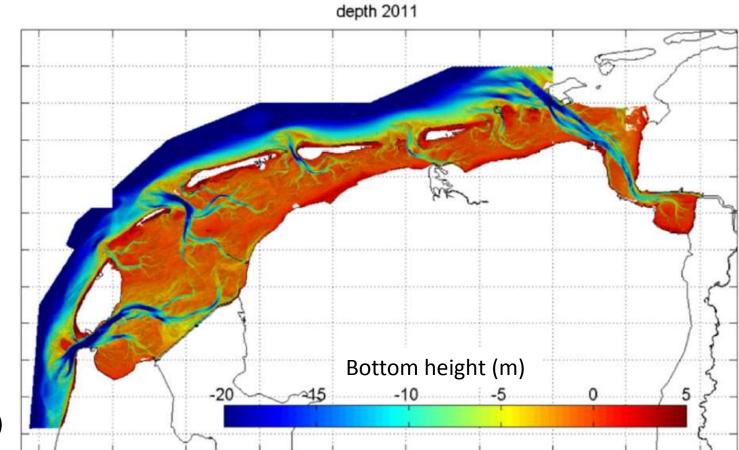


# Soil subsidence due to gas extraction

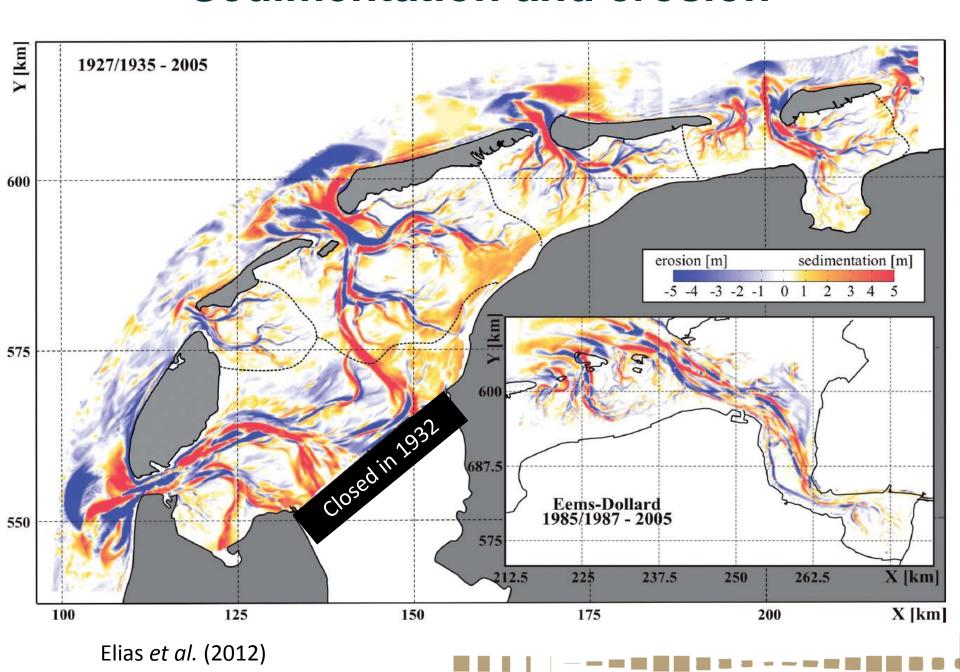




# Monitoring bottom height since 1927

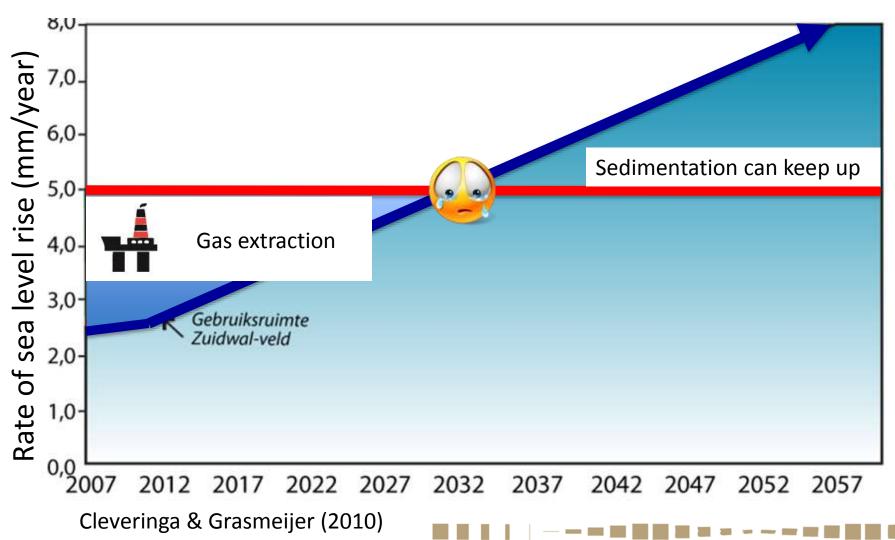


### Sedimentation and erosion





## Which extraction can be allowed?



# Which recreation can be allowed?



# Which spots do recreationists value most?



## **National Wadden Hotspots**





High national importance of Wadden Sea islands – and in Germany also high attractivity of the mainland coast

# Volunteers count the birds

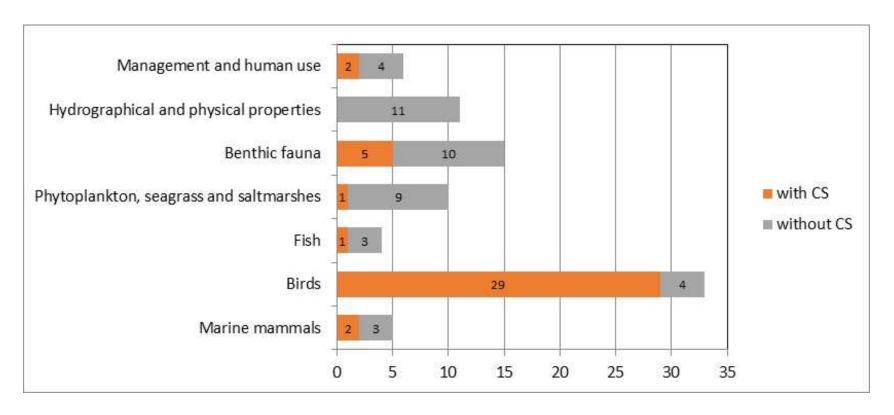


## Citizen Science



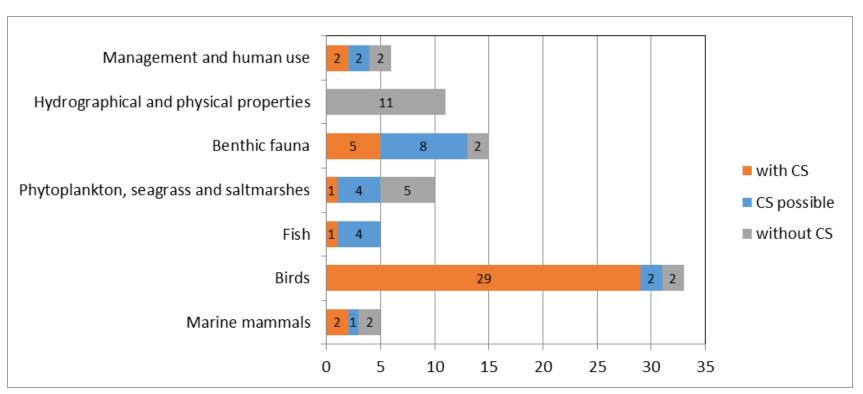


# Citizen science in current monitoring programs in the Dutch Wadden Sea





# Additional opportunities for Citizen Science in monitoring









www.walterwaddenmonitor.org



# Come and visit us for joint studies















# Tap into the power of citizen science



