

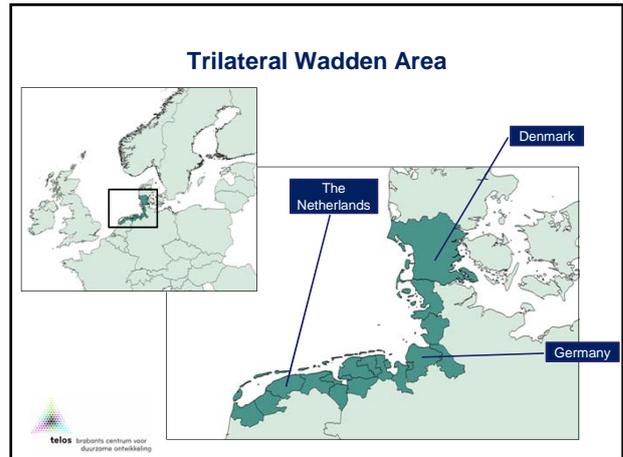
# The 'Waddenbarometer'

A monitoring tool for island and coastal zone management in the UNESCO Worldheritage Wadden

Presentation at the 14th International Conference "Niss(i)ology and Utopia: back to the roots of Island Studies" of the "International Small Islands Studies Association", ISISA organized by University of the Aegean and RETI - the Excellence Network of Island Universities  
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**The World Heritage List is the most prestigious List of cultural and natural monuments world wide**

**2014 entire Wadden Sea on the World Heritage List with the extension of the Danish part**

An exceptional opportunity to reinforce conservation and management and advance sustainable regional development with the stakeholders

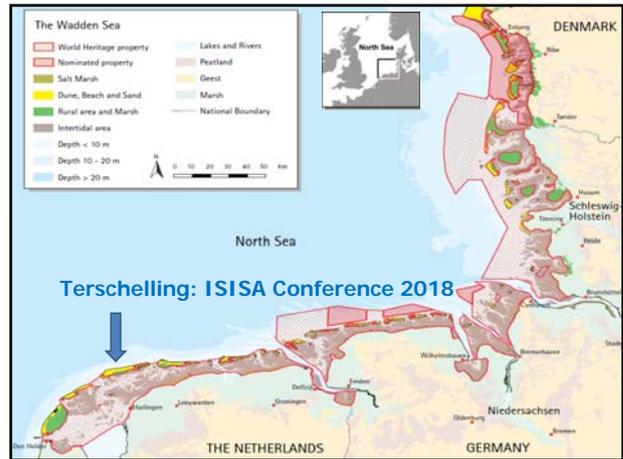


**The Wadden Sea**

- World Heritage property
- Nominated property
- Salt Marsh
- Dune, Beach and Sand
- Rural area and Marsh
- Intertidal area
- Depth < 10 m
- Depth 10 - 20 m
- Depth > 20 m
- Lakes and Rivers
- Peatland
- Geest
- Marsh
- National Boundary

Labels: DENMARK, THE NETHERLANDS, GERMANY, North Sea, Schleswig-Holstein, Niedersachsen.



## Wadden Sea Region: 25 inhabited islands

- The area counts 25 inhabited islands and several smaller vegetated islands and barren high sands.
- The total area of the islands is about 2.000 km<sup>2</sup> and the Wadden Sea itself covers about 8.000 km<sup>2</sup>.
- The mainland is one of the oldest and most complex cultural landscapes in Europe and has been inhabited for more than 5.000 years
- At present, 1 million inhabitants live on islands and administrative regions directly bordering the Wadden Sea. An estimated 3.5 million inhabitants live in the 17,500 km<sup>2</sup> of land with severe flooding risks. i.e. at less than 5 m above or even below mean sea-level in this region.



## Nature Conservation and Human Interaction in the Wadden area since many centuries

- Towards safety and protection of flooding: building dikes
- From reclaiming land to nature protection
- From nature protection to shared use
- From national to trilateral management
- The Wadden system needs to be managed so that both the ecosystem and the social system can develop in a sustainable way. This in itself is a real challenge.
- **Proper management requires sufficient ecological and social background information and knowledge to manage this integral system**

## Goals of Trilateral Integrated Coastal Zone Management (ICZM) by Wadden Sea Forum

- A **balanced population structure** with a healthy share of young and elderly people, with indigenous young people choosing to stay in the region and population decline being averted.
- **Almost full employment** for which a wide diversity of jobs is needed.
- With regard to welfare WSR residents should have an adequate income, good living conditions and high life expectancy. Social equality and work-life balance should ensure satisfaction among the population.
- **This requires balanced economic development that provides future prospects for people living and working but should also generate surpluses for environmental protection measures.**
- The economy in the WSR should be made resilient for economic recessions and international competition by means of strategies for innovation and entrepreneurship.
- → **Needed: proper monitoring WADDENBAROMETER**



## The 'Waddenbarometer'

A monitoring tool for Integrated coastal zone management

## The Waddenbarometer: methodology

## The Sustainability Balance Sheet makes sustainable development measurable in the Waddenregion

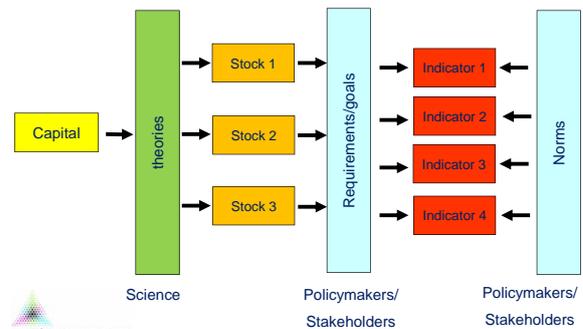
Planet: Ecological Capital

A model consisting of capitals, stocks, requirements, indicators and norms

People: Socio-cultural Capital

Profit: Economic Capital

## The framework of the Waddenbarometer



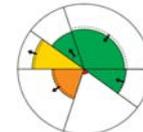
### Stocks per capital in the Waddenbarometer

Economic capital	Socio-cultural capital	Ecological capital
Labour	Social and Economic Participation	Nature and biodiversity
Capital	Political Participation	Land soil
Economic Structure (1)	Art, culture and cultural heritage	Sea soil
Economic Structure (2)	Safety	Air
Spatial conditions	Health	Salt (surface) water
Infrastructure/connectivity	Housing and living environment	Fresh (surface) water
Energy, raw materials and consumables	Education	Groundwater
		Landscape



### How does it look like in practice?

- A stock is represented by a pie diagram with indicators as pieces of the pie.
- Indicators have different weights. That's why pie pieces differ in size.
- The colours of the pie pieces show how we have to interpret the results.
- The indicator scores change in time because of changes in the behaviour of consumers and firms and as a result of policy measures of governments.
- These changes are shown by using arrows.
- The dotted line shows the situation in the previous measurement.
- An arrow directed outwards means improvement, directed inwards means worsening



### Some results at the level of the whole Dutch Wadden sea area

## Economic Capital

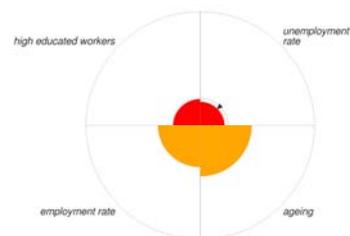


## Labour

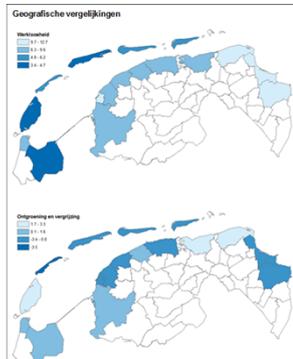
<b>There is enough work in the Waddenregion and the surrounding regions</b>	<ul style="list-style-type: none"> <li>• unemployment rate</li> <li>• employment rate</li> </ul>
<b>The potential of the total potential workforce is being used</b>	<ul style="list-style-type: none"> <li>• ageing</li> </ul>
<b>The labour supply has at least a start qualification</b>	<ul style="list-style-type: none"> <li>• high educated workers</li> </ul>



## Labour



## Labour: Unemployment +ageing



## Economic structure

The touristic sector has succeeded in becoming one of the key sectors of the economy of the Waddenregion

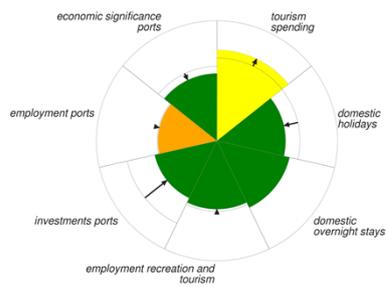
- tourism spending
- domestic holidays
- domestic overnight stays
- employment recreation and tourism

The harbors of the Waddenregion have developed themselves to sustainable harbors: World Heritage worthy

- investments ports
- employment ports
- economic significance ports

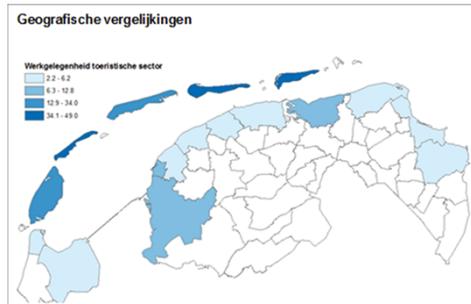
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## Economic structure



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## Economic structure: employment in recreation and tourism



## Social-cultural Capital

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## Social and economic participation

Social participation in society is guaranteed. Nobody is being excluded.

- social cohesion

People trust each other

Citizens are active in society

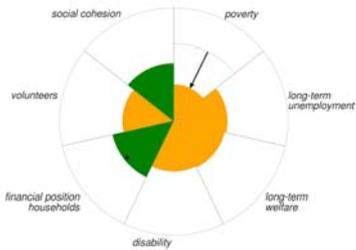
- volunteers

Citizens are able to maintain themselves economically

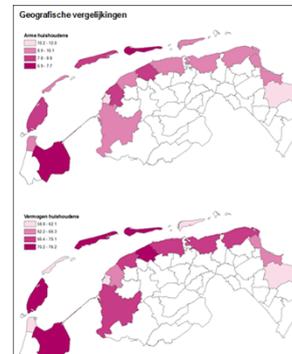
- poverty
- long-term unemployment
- long term social welfare
- disability
- financial positions households

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## Social and economic participation



## Social and economic participation: poverty + wealth

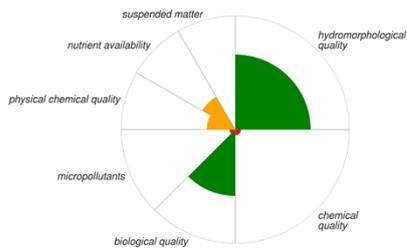


## Ecological Capital

## Sea water

<b>The natural development of trenches and plates (for currents, sand) will not be hindered</b>	<ul style="list-style-type: none"> <li>• [See sea soil]</li> <li>• hydro morphological quality</li> </ul>
<b>The sea water is clean and transparent enough</b>	<ul style="list-style-type: none"> <li>• chemical quality</li> <li>• biological quality</li> <li>• micro pollutants</li> <li>• physical chemical quality</li> </ul>
<b>The food web is in balance</b>	<ul style="list-style-type: none"> <li>• nutrient availability</li> <li>• suspended matter</li> </ul>

## Sea water



## Sea Water: biological quality



### Some conclusions: economic capital

- Economic crisis is leaving its marks: very high and increasing unemployment, negative economic growth (almost everywhere).
- Relatively high production of sustainable energy
- Tourism is scoring quite well
- Harbours under pressure
- Lots of information, especially on issues regarding the desired economic transition, is lacking



### Some conclusions: ecological capital

- Environmental quality in general ok, but a number of issues:
  - Salinisation: threat or chance?
  - CO2 and NOx emissions still high
  - Fresh surface water: polluted (like in the rest of the Netherlands)
- Landscape of high quality and highly rewarded, but the openness of the sea is threatened
- Nature and biodiversity:
  - land and borders of the Wad: OK
  - Problems especially in the intertidal zones as shown in all approaches: nature points, musselbeds and sea grass meadows and shellfish and worm eating birds



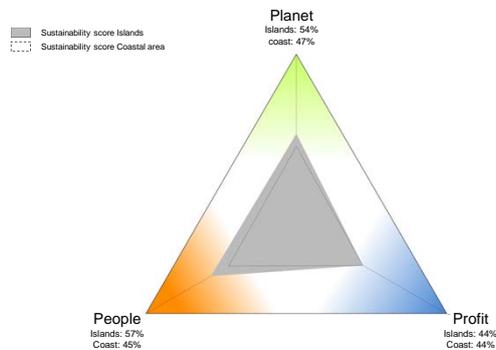
### Some conclusions: social cultural capital

- Social and economic participation is under pressure: increasing poverty, high youth unemployment; population decline
- Art, culture and cultural heritage are OK as far as we are measuring this: more statistical information is needed
- Liveability, quality of life is under pressure: satisfaction with a number of local amenities is relatively low, school infrastructure is an issue
- Safety as far it is related to classical issues as crime, violence etc.: OK. Information on flood risks and earthquakes should be incorporated

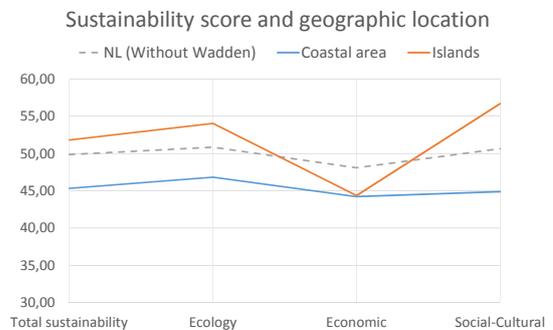


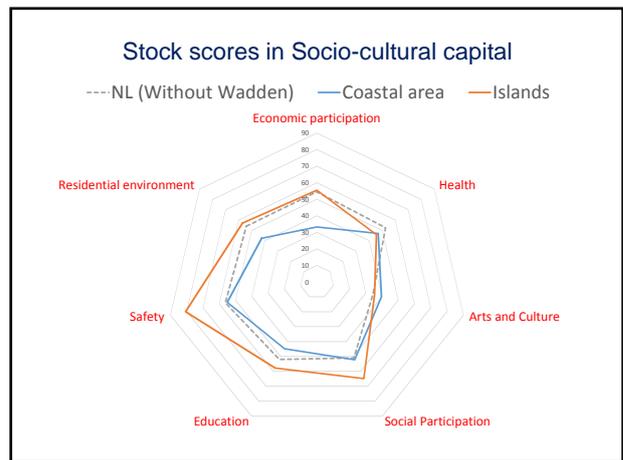
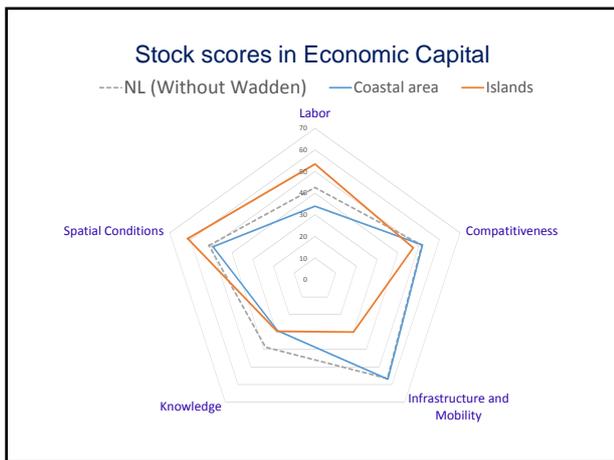
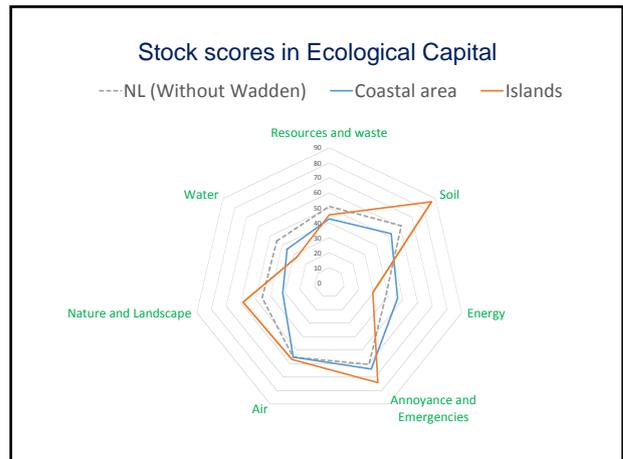
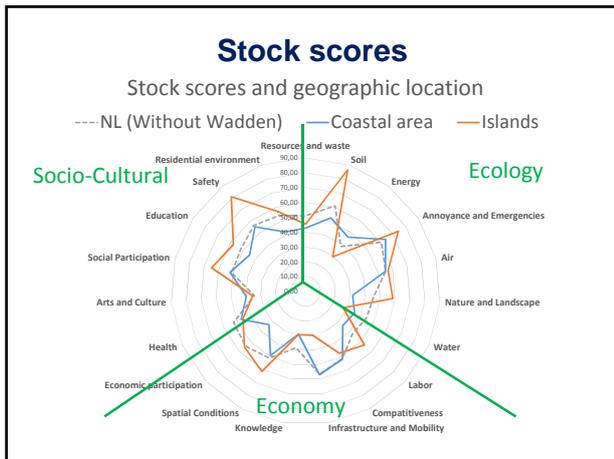
### Differences in performance between the Wadden islands and the mainland

### Islands VS. Coastal area



### Comparing areas





### Conclusions on the comparison

- The Wadden Islands score significantly higher on ecological sustainability than the coastal areas
  - Due to high scores on soil quality and nature and landscape indicators
  - The coastal zones do score better on Energy, mainly because of wind energy gains
- The Wadden Islands score significantly higher on social sustainability than the coastal areas
  - Economic participation, residential environment and safety are the main drivers on the Islands
- Overall, the brain drain and economic participation are big social issues for the entire Wadden area compared to the rest of The Netherlands
  - Lack of knowledge and highly educated people
  - High levels of long term unemployment and spendable income
  - The Wadden Sea remains to be a buffer zone in economic perspective.
- Interdisciplinary view on sustainable development gives more insight in economic and social dynamics next to the ecological status

### Final remarks

- The prototype is more or less finished. Now it should be validated and debated. Key questions:
  - are we measuring the right things,
  - in the right way,
  - and are the norms which we are using broadly accepted and shared?
- The existing visions for the Wadden region are foremost ecological and partly economic visions. A social-cultural vision is lacking with exception of cultural heritage
- Information is lacking as shown. Sometimes because the information still is not collected or asks for more (time) investments. Sometimes because it's not available at the requested geographical level. The results of our study can be used for setting a research agenda.
- A (further) connection needs to be made, directly and indirectly, with the program of the Waddenfund

telos brabants centrum voor duurzame ontwikkeling

## Socio Economic challenges Wadden Region

- **Demography:** population decline, aging, spatial sorting
- Regional economy and labour market: jobs, unemployment, income, education → **well-being** (OECD)
- **Interaction Economie** ↔ **Ecology**, especially in sectors like fishery, agriculture, energy, tourism, harbour and related shipping and manufacturing activities
- Needed: **value change approach** and regional innovation and investment strategy; Social Impact Analysis
- Trilaterale coastal zone management; **science policy matrix**
- **Ecosystem Services:** economic and nature valuation methods; Hotspot monitor, Big Data
- Economic spin-offs of the UNESCO World Heritage status



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Thank you for your attention!



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