

Socio-economic developments and management in the Wadden Sea Region

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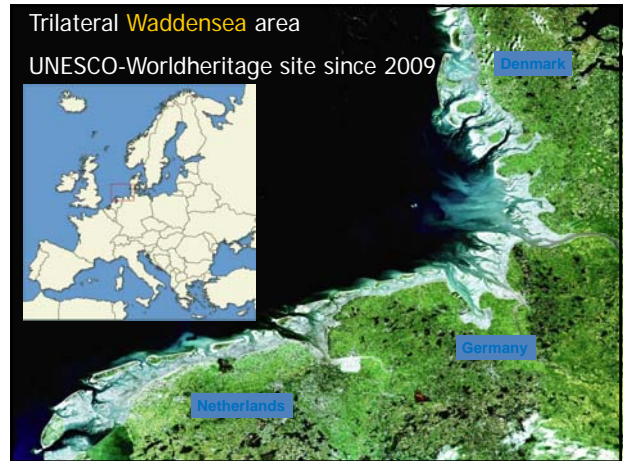


The Wadden Sea is the world's largest coherent intertidal flats with a unique ecosystem characterized by a rich benthic fauna supporting millions of coastal birds

PHOTO: MARIÏK STICK



Ecological values



Trilateral Waddensea area

UNESCO-Worldheritage site since 2009

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

Terschelling

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 km² and the Wadden Sea itself covers about 8000 km².
- 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 km² 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 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 can only be applied if there is sufficient ecological and social background information and knowledge to manage this integral system
→ establishment Waddenacademie



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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.



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Resilience of regions



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Working on robust resilience



New (Coal fired) power plants in Eemshaven and in Germany: cooling water, dredging, jobs?



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Extraction of natural gas on sea and land



Ameland, gemeentelijke Aardgas-Opst. 1 van de WSW op de Noord- en Zuidzijde van Ameland. Het gebied is bestemd voor de winning van aardgas en de verwerking daarvan tot gasolie en gas. Het gebied is bestemd voor de winning van aardgas en de verwerking daarvan tot gasolie en gas. Het gebied is bestemd voor de winning van aardgas en de verwerking daarvan tot gasolie en gas.

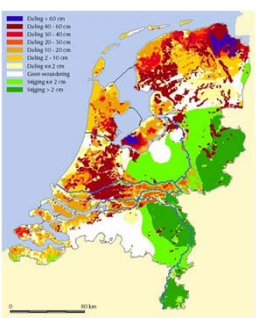
Gedemptgebied Aardgas-Opst. 1 van de WSW van Ameland. 17-01-2008



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Natural gas extraction causes soil subsidence → earthquakes

Earthquakes 1986-2014. Source: KNMI



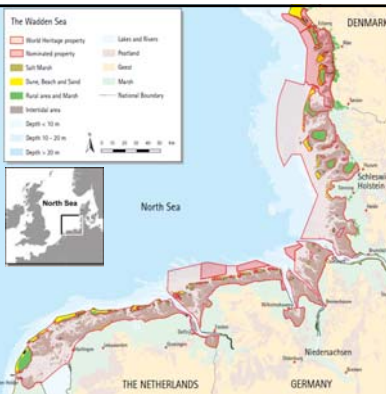
Lack of data at a small spatial scale

- A major problem with the implementation of especially the economic aspects of the ICZM is the lack of up-to-date information at the trilateral level with regard to demographic change, (un)employment and the structure of the regional economy.
- The available information is fragmented and restricted to certain areas at the national or regional scale or specific economic sectors.
- The problem is often that definitions of e.g. economic sectors are not the same for small spatial areas in the three countries. Comparable information is often only available at the level of rather large spatial administrative regions, while information is needed at the detailed geographical scale of municipalities or parishes for effective ICZM, where the regional demarcation of the area is small enough to assume a strong relation between the ecosystem in the Wadden Sea and the demographic and socio-economic situation for the inhabitants in the coastal zone.

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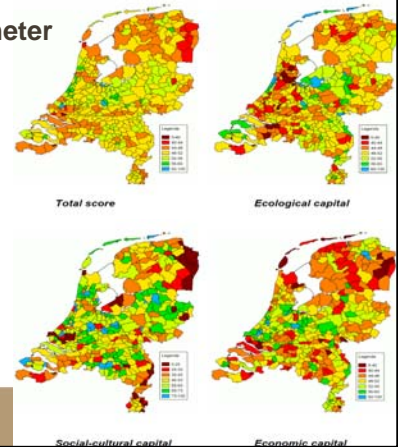
The Wadden Sea Region covers an area, which encompasses the coastal zones, the Wadden Sea with its islands and sands and the relevant parts of the Exclusive Economic Zones (EEZ) of Denmark, Germany and the Netherlands. (WSF/CWSS)



Demarcation of the Wadden area (LAU-2 classification), 2013

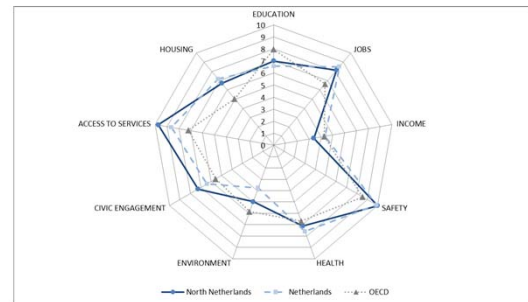


Waddenbarometer

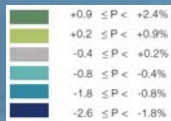


OECD-project: How is life in your region? Case study North of the Netherlands (also Southern Denmark)

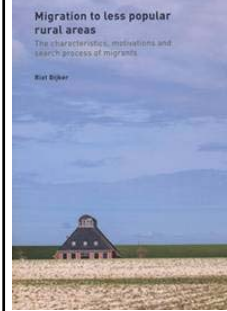
Wellbeing outcomes North NL, Netherlands, OECD (OECD, 2014)



Population Average annual change (%) per LAU-2 region between 2002 en 2013



SOURCE: Sijtsma et al. (2014) WaLTER rapportage (in druk)

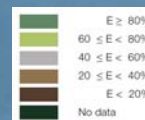


Dissertation Rixt Bijker (January 2013): There are also many migrants **to** the less popular rural areas! Also important: **quick connections to nearby city** + **fast ICT Broadband access**

Labour market indicators in the Wadden area

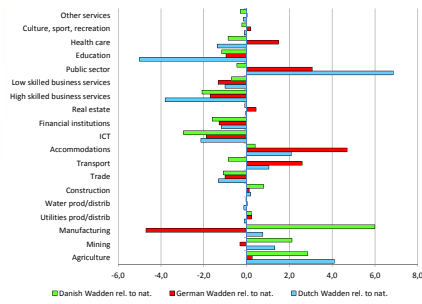
	Jobs × 1000	Perc. job growth annual %	Empl- ment function %	Unem- ployme nt rate %	Percentage of jobs in 2011 in				
					agric.	manuf	tourism	edu.	health
Wadden area	103.1	0.8	58.1	6.2	6.8	10.4	6.2	5.5	13.9
Wadden Islands	12.8	0.6	86.9	3.9	7.7	4.1	25.7	4.8	7.3
Netherlands	8483.5	1.2	76.1	5.1	2.7	9.7	4.2	10.5	15.3
Wadden area	249.24	0.7	58.0	7.1	5.8	18.2	7.8	3.0	14.1
Wadden Islands	24.7	0.0	83.8	4.2	7.0	2.5	36.5	1.5	11.7
Germany	29134.1	0.5	53.8	5.4	4.7	22.6	3.1	3.8	12.8
Wadden area	98.9	-0.4	73.5	4.0	5.6	14.7	3.6	7.3	18.9
Wadden Islands	1.0	-0.7	53.5	3.5	1.3	2.1	11.0	8.8	17.1
Denmark	2600.0	-1.0	71.6	4.5	2.7	8.7	3.2	8.4	19.6

Employment Rate Number of jobs (%) per inhabitant in the age group 18-64 per municipality in 2011



SOURCE: Sijtsma et al. (2014) WaLTER rapportage (in druk)

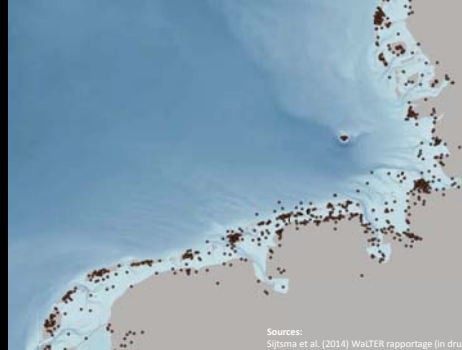
Employment structure of jobs Wadden area relative to national structure, 2011



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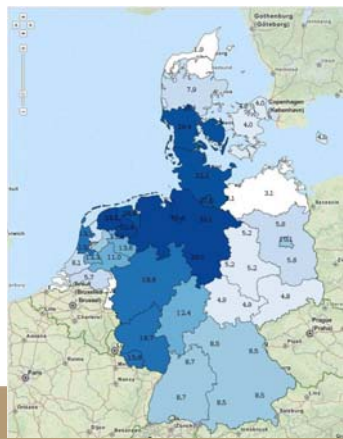
Highly attractive places for tourists in wadden municipalities in 2013

Value locations in the Hotspotmonitor



Sources: Jilisma et al. (2014) WALTER rapportages (in druk)

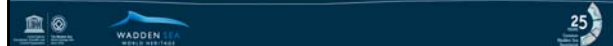
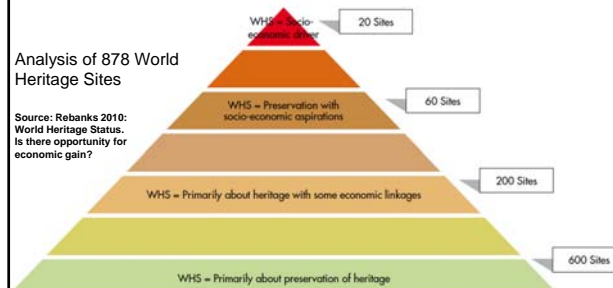
Origin of the people who find the Wadden an attractive location: distance decay, but less in Germany



Wadden Sea World Heritage – Perspectives for socio-economic development

Analysis of 878 World Heritage Sites

Source: Rebenks 2010: World Heritage Status. Is there opportunity for economic gain?



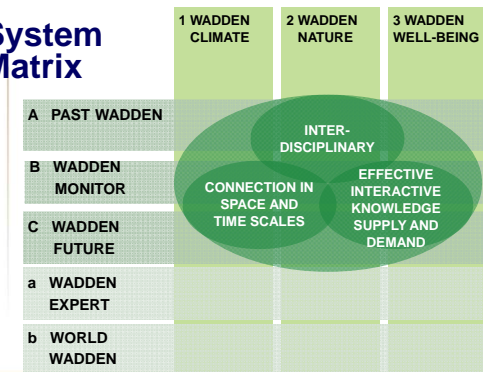
Wadden Academy's tasks:

- 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 and international level and;
- to promote information supply and knowledge exchange within and between research institutes, government, industry and social organisations.

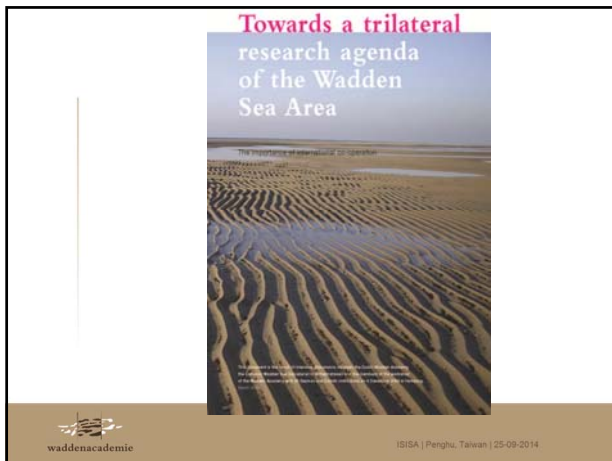


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System Matrix



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Science - Policy Matrix

	Tourism	Coastal Protection Activities	Fishing and Aquaculture	Agriculture	Mining	Energy Generation	Ports and Shipping	Off-shore gas	PRESSURES			RESPONSE
									Invasive Alien Species	Pollution	Harbour Loss	
SCIENCE												
Subsurface use and geofluids												
Longer term geomorphology												
Shorter term morphodynamics												
ECOSYSTEM												
Biodiversity - Reef-building Zoobenthos												
Biodiversity - Diadromous Fish												
Biodiversity - Breeding Birds												
Habitats - Subtidal Sandbanks												
Habitats - Salt Marshes												
Habitats - Beaches & Dunes												
Functions - Primary Productivity												
Functions - Nursery North Sea Fish												
Functions - Fueling Station Migratory Birds												
CULTURAL HISTORY												
Awareness/valuation												
Maintenance												
Use												
Public access												
SOCIO-ECONOMY												
Employment												
Income												
Population												
Viability												
CLIMATE/HAZARD												
Longer term sea-level rise												
Fresh water availability												
Weather extremes												

Size of the box: degree of concern to management	High	Management has a high level of concern for the value due to its current degraded condition and/or the high level of single or cumulative pressures affecting it.	<input type="checkbox"/>
	Moderate	Management has a moderate level of concern for the value due to its current condition and/or the moderate level of single or cumulative pressures affecting it.	<input type="checkbox"/>
Low	Management has a low level of concern for the value due to its current good condition and/or the low level of single or cumulative pressures affecting it.	<input type="checkbox"/>	
Colour of the box: Adequacy of Information	Good	The good level of information available directly supports management decisions and is currently sufficient to allow progress on the particular issue/interaction. However, further information to support ongoing adaptive management may still be required.	<input type="checkbox"/>
	Moderate	The moderate level of information gives a reasonable basis for management decisions, but decisions regarding some aspects of the issue/interaction may be hampered by current knowledge gaps.	<input type="checkbox"/>
	Low	The low amount or adequacy of information is a hindrance to management. Decisions are pending the availability of improved scientific understanding of the issue/interaction.	<input type="checkbox"/>

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Socio Economic challenges Wadden Region

- Demography: population decline, aging, spatial sorting
- Regional economy and labour market: jobs, unemployment, income, education → well-being (OECD)
- Interaction Economy ↔ 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 valuation; Hotspot monitor, Big Data
- Trilateral Research Agenda

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