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BONUS
SCIENCE FOR A BETTER FUTURE OF THE BALTIC SEA REGION

BONUS Soils2Sea: Future governance approaches for reducing excess nutrients at local farm scale – Upscaling

17 May 2017 | Ecologic Institute, Pfalzburger Str. 43/44, 10717 Berlin, Germany

Wednesday, 17 May 2017	
9:00 – 9:15	**Arrival - welcome coffee**
9:15 – 9:45	**Opening and Welcome to the Workshop + Introduction to Soils2Sea** *Jens Christian Refsgaard (Geological Survey of Denmark and Greenland - GEUS) and Grit Martinez (Ecologic Institute)*
9: 45– 10:15	**Soils2Sea Scenarios** *Jørgen E. Olesen (Aarhus University)*
10:15 – 11:00	**New governance concepts and monitoring** *Nico Stelljes & Katriona McGlade (Ecologic Institute)*
11:00 – 11:15	**Coffee Break**
11:15 – 12:30	**How can co-governance be applied in practice?** **World Café** *Table 1: Governance. Moderation: Katriona McGlade (Ecologic Institute)* *Table 2: Stakeholders. Moderation: Grit Martinez (Ecologic Institute)* *Table 3: Monitoring. Moderation: Nico Stelljes (Ecologic Institute)*
12:30 – 13:30	**Lunch**
13:30 – 14:35	**What are the conditions for successful co-governance?** *Presentation and discussion in small groups. Moderation: as above*
	Coffee
14:45 – 15:15	**Examining co-governance at different scales** *Plenary discussion. Moderation: Grit Martinez (Ecologic (Institute)*
15:15 – 15:45	**Project results for the Baltic Sea Scale** *Alena Bartosova (Swedish Meteorological and Hydrological Institute - SMHI)*
15:45 – 16:00	**Wrap-up and closing of the workshop** *Jens Christian Refsgaard and Nico Stelljes*
16:00 – 19:00	**Excursion 'Tour of Berlin' (guided Bus-Tour through Berlin, starting from Workshop location and ending at the Oxymoron Restaurant)**
19:00 – 21:00	**Networking Dinner, Presentation of Soils2Sea Film,** **Restaurant Oxymoron (Hackesche Höfe, Rosenthaler Straße 40/41, 10178 Berlin)**

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Scenarios for the workshop in Berlin, Germany, 17 May 2016

Background

In Europe, targets for load reductions for total allowable organic fertiliser to surface waters and total loads to the Baltic Sea basins have been set via the WFD and HELCOM. Yet imagine that we as stakeholders have the possibility to influence the *way* in which nitrate loads are managed under the third WFD implementation cycle (2021-2027). We would like to have a discussion of the three alternative governance scenarios outlined below. Rather than regulating what farmers may put on crops, we suggest a form of governance where farmers are regulated by the loads from their fields (or in the nearest waterway). These scenarios differ in the degree and approach to centralised/decentralised decision making and the data used to plan and monitor the regulation.

Spatially differentiated measures

Spatial targeting of mitigation measures has the potential to produce economic and environmental benefits. Between the root zone of crops and outflow to streams, nitrogen is reduced in the groundwater. This is called groundwater retention. How much reduction occurs in the groundwater varies with factors including the soil-type, soil depth, slope and how much tile drainage there is. If the retention is high, lower amounts of N reach the stream. We could therefore exploit this fact by relocating crops with larger nitrogen leaching losses to fields with higher retention.

In the Norsminde and Odense catchment area (BONUS Soils2Sea Case Study area in Denmark), 10-20% extra nitrate reduction can be obtained in the subsurface through optimal spatial location of crops. Further gains can be made through optimal location of constructed mini-wetlands, but also of in-stream mitigation measures prolonging the transport times, increasing the uptake in vegetated zones or enhancing filtering in streambed sediments. Altogether there can be substantial economic and environmental gains, because it will be possible to produce the same crop yield with reduced nutrient load or increased crop yield with unchanged nutrient load.

To exploit the full potential of spatially targeted measures, retention maps with a fine spatial resolution (1- 25 ha) are necessary. However, in Denmark for example, the level of uncertainty associated with maps at this resolution is seen to be too high for use in government regulation. For this reason, the Danish government currently uses retention maps at around 1500 km^2 resolution, while expecting to improve this towards 15 km^2 resolution in the future. Although 1500 km^2 resolution maps have a lower level of uncertainty they also cancel out almost all economic and environmental gains of a spatially differentiated approach.

Scenario A

In the '**Centralised**' context, the State makes all decisions on the use of measures, including fertilisation norms, at farm or field level. The government uses retention maps at a low resolution (e.g.15km^2) to produce spatially differentiated regulations for land-use. This differentiation can increase the effectiveness of catch-crops, constructed wetlands, and help to define fertilisation norms. Government monitors at large

catchment level to evaluate if N reduction targets to coastal waters are met. To monitor and control implementation, farmers are required to report detailed plans for cropping systems and fertilisation. Farmers fulfilling the government requirements receive subsidies from the EU CAP.

- Approach: top-down (clear N-reduction targets uniformly for the whole catchment)
- Monitoring: Authorities are responsible for detailed monitoring
- Retention maps: only low resolution maps are used to structure the land use
- Subsidies: Are connected with the requirements set by the authorities

Scenario B

Under the '**flexible management**' scenario, authorities and farmers work together to reduce N emissions through a market-based 'cap and trade' system. This would be initiated by government authorities per catchment, with all farmers obliged to participate. Based on retention maps with relatively high resolution (e.g. 25 ha), permits for N loading are distributed on a field basis. The community of farmers can trade N load allowances amongst themselves. To document compliance each farmer reports with detailed plans for cropping systems and fertilization (as in Scenario A). Non-compliance with individual allowances is sanctioned by forfeit of a deposit that is then passed onto other farmers for carrying out mitigation measures. Government authorities can intervene in the market by buying up or selling permits from the system to reduce or allow increases to N loads. The government performs control monitoring at catchment level to evaluate if the reduction targets to the coastal waters are achieved.

- Approach: market based.
- Monitoring: Authorities only monitor the N load at catchment level. More detailed monitoring could be arranged by farmers.
- Retention maps: Are used by authorities to calculate the exact amount of allowances and their distribution among the catchment.
- Subsidies: Are connected with the precise usage of allowances.

Scenario C

The '**self-governance**' approach describes a low level of State involvement in the management, monitoring and control of N loading. This scenario places a focus on the self-governance of farmers within one catchment. Farmers in the catchment self-organize, (e.g. forming a water council) to decide on measures to reach government-set targets. Detailed retention maps - at 1 ha resolution - have higher uncertainty, but can be used by farmers as a tool for spatially differentiated management of the catchment. A system of self-monitoring is established to check and modify the retention maps and ensure that the target goals are reached (e.g. monitoring at a field or sub-catchment level). Authorities support the process of self-monitoring by providing financial and technical support and information (e.g. establishing a water council with a technical support, detailed retention maps, monitoring process support). The authorities will monitor only the entire catchment at the outlet. The allocation of EU CAP subsidies is based on reaching the target loads for the entire catchment and their distribution is negotiated between the farmers. If farmers/water council cannot agree on a plan for implementation, the State will impose a central regulation based on Scenario A.

- Approach: self-governance
- Monitoring: Authorities only monitor the N load at catchment level. More detailed monitoring could be arranged by farmers.
- Retention maps: Could be one tool used by farmers to optimize their fertilizer usage.
- Subsidies: Are only given if the reduction target for the whole catchment is reached.

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Participant list			
First Name	**Last Name**	**Country**	**INSTITUTION**
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Tapio	Salo	Finland	Natural Resources Institute Finland
Kirsten Flemming	Hansen	Denmark	National Agency of Environmental Protection
Susanna	Kaasinen	Finland	HELCOM
Lisbet	Ogstrup	Denmark	The Danish Society for Nature Conservation
Mateusz	Sekowski	Poland	Agricultural Advisory Center
Airi	Vetemaa	Estonia	Estonian Organic Farming Foundation
Helge Kjaer	Soerensen	Denmark	Landboforeningen Odder-Skanderborg (Lokal Farmers Union)
Maria	Staniszewska	Poland	Coalition Clean Baltic
Andis	Zilans	Latvia	University Of Latvia
Sergey	Aleksandrov	Russia	Atlantic Research Institute of Marine Fisheries and Oceanography (AtlantNIRO)
Bo	Gustafsson	Sweden	Baltic Nest Institute, Stockholm University
Natalia	Oblomkova	Russia	Institute for Engineering and Environmental Problems in Agricultural Production
Rüdiger	Wolter	Germany	German Environment Agency
Ann-Karin	Thorén	Sweden	Swedish Agency for Marine and Water Management
Flemming	Gertz	Denmark	SEGES
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Alena	Bartosova	Sweden	SMHI

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Boris	**Chubarenko**	Russian Federation	**Atlantic Branch of P.P.Shirshov Institute of Oceanology of Russian academy of Sciences**
Grit	**Martinez**	Germany	**Ecologic Institute**
Katriona	**McGlade**	Germany	**Ecologic Institute**
Nico	**Stelljes**	Germany	**Ecologic Institute**

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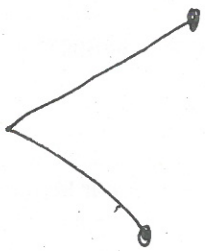

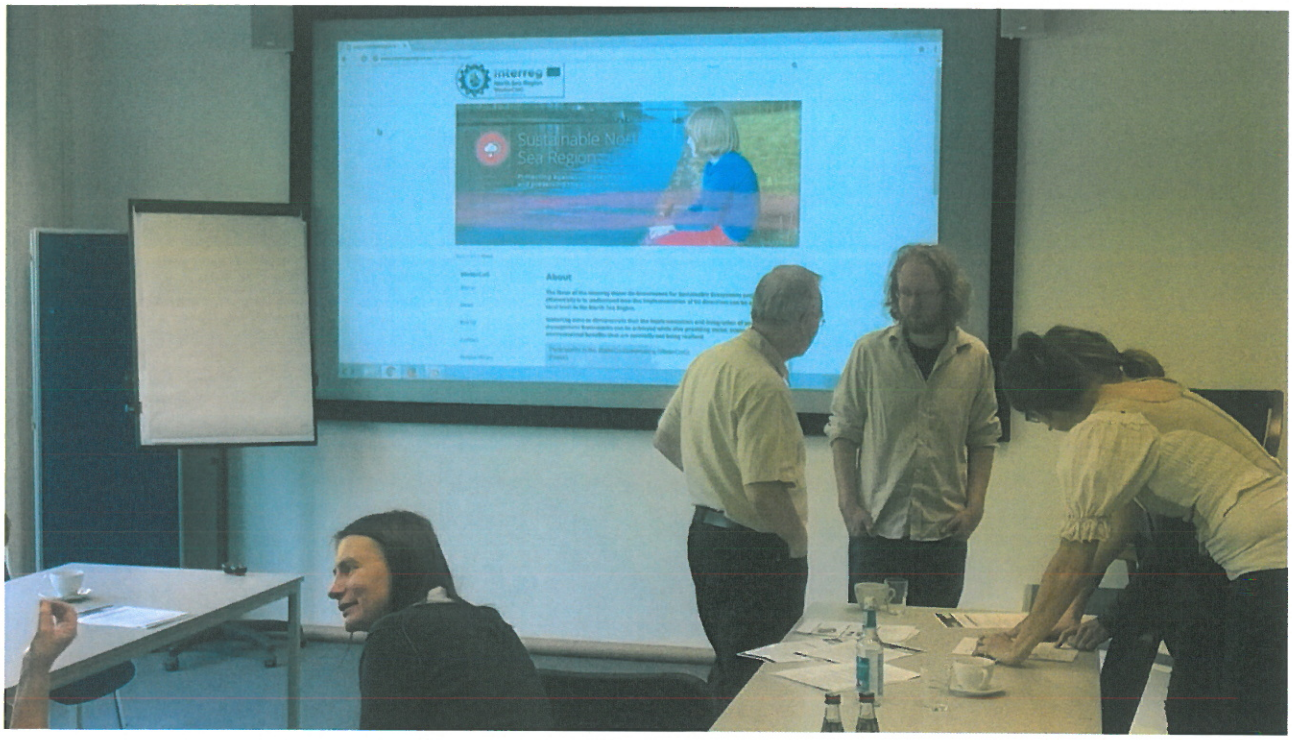
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