Physical oceanography sets the scene for the Marine Strategy Framework Directive implementation in the Baltic Sea

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Idea of this presentation

- The European seas are very different, and the physical characteristics affect the ecological functions
- MSFD requires the reaching of good environmental status and acknowledges that physical features affect it – but these effects have not been evaluated in detail
- In this talk we focus on the Baltic Sea and how its oceanographical parameters affect the determination and assessment of GES

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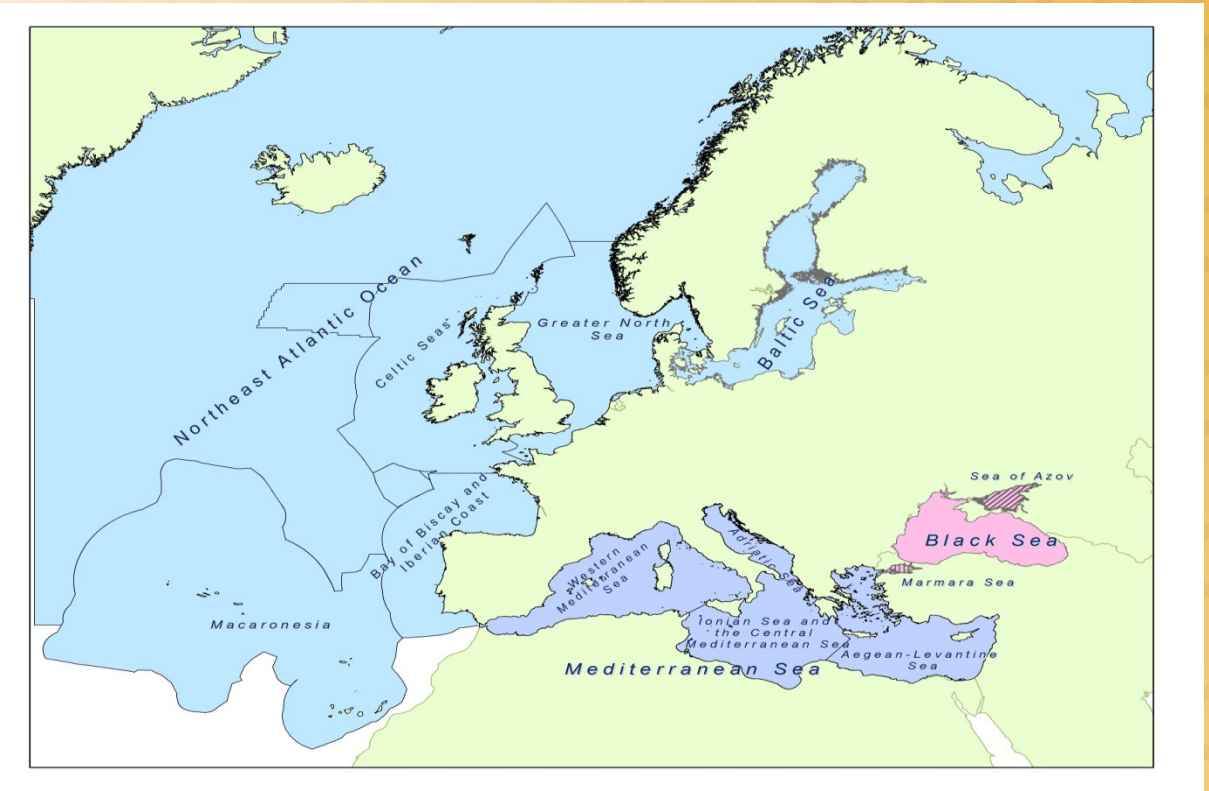
The European Seas



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Oceanography affects ecological functions

Basin	Area, 10^3 km^2	Mean depth, m	Mean salinity, ‰	Fresh water budget	Ice cover (on average)	Tides	Water residence time (years)
Baltic Sea	393	54	7.5 (0-30)	Pos.	37%	Weak	40
Black Sea	422	1 200	18	Pos.	Northeast only	Weak	3 000
Greater North Sea	750	80	34–35	Pos.	No	Strong	Not applicable
Mediterranean Sea	2 970	1 500	38	Neg.	No	Weak/ Moderate	80-100
NE Atlantic shelf	13 500	1 500	34–35	Not applicable	No	Strong	Not applicable

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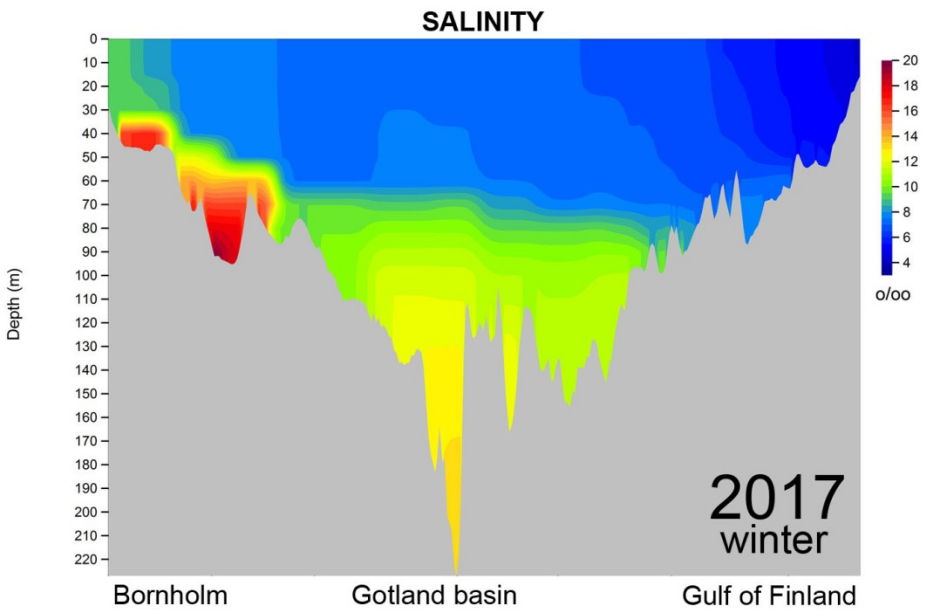
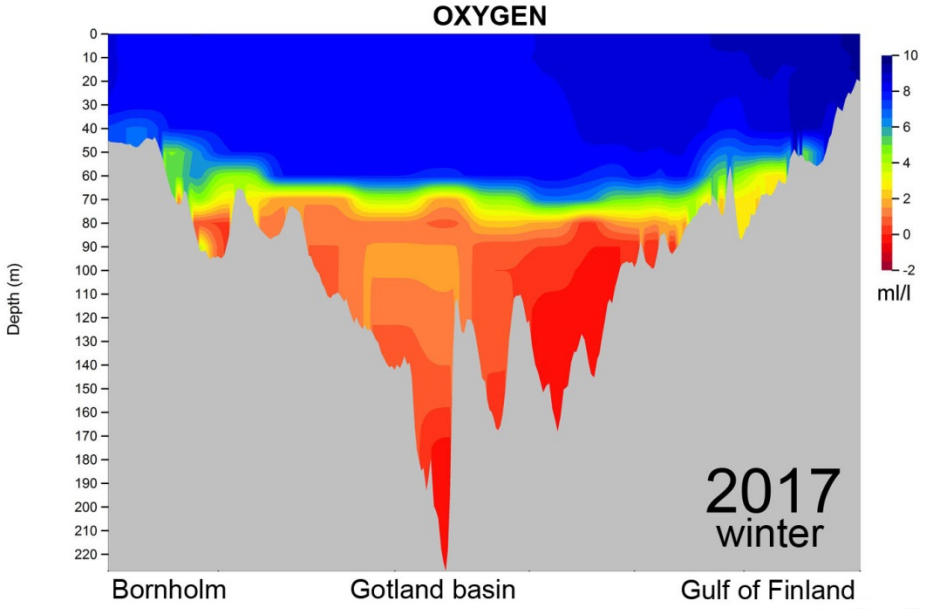
Stratification and mixing





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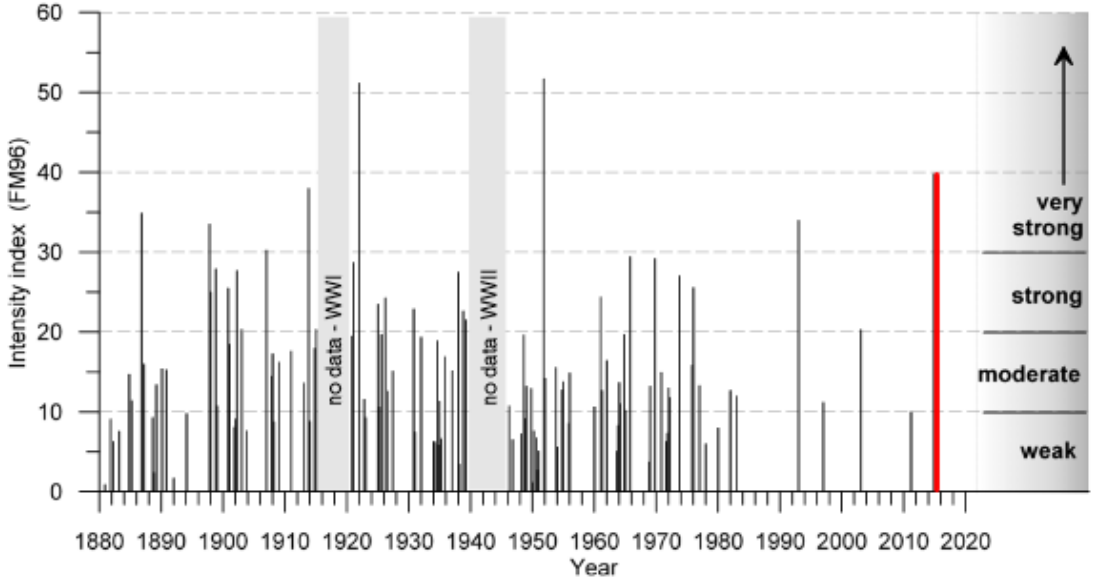
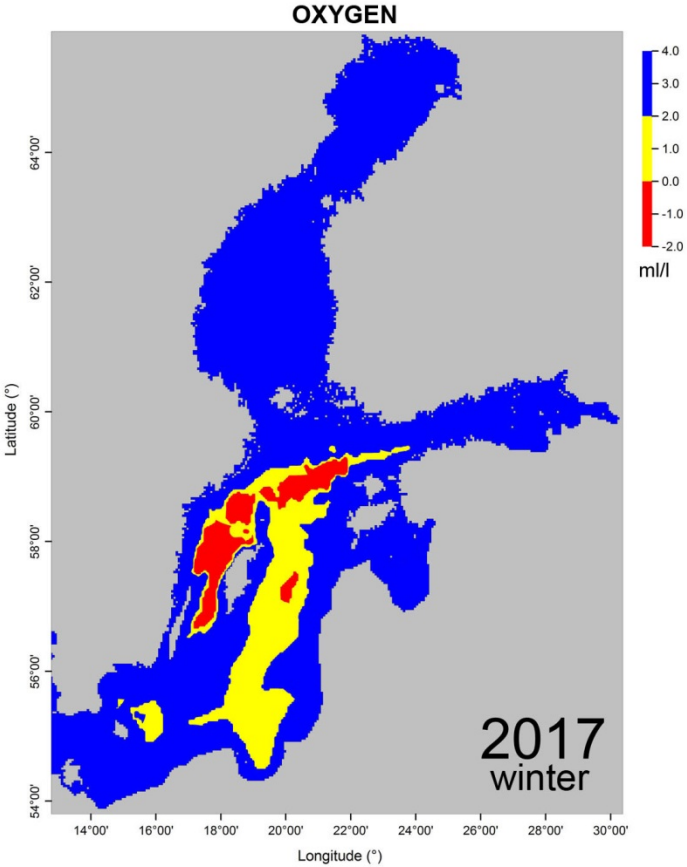
Major Baltic Inflows (*Mohrholz* et al., *2015)*





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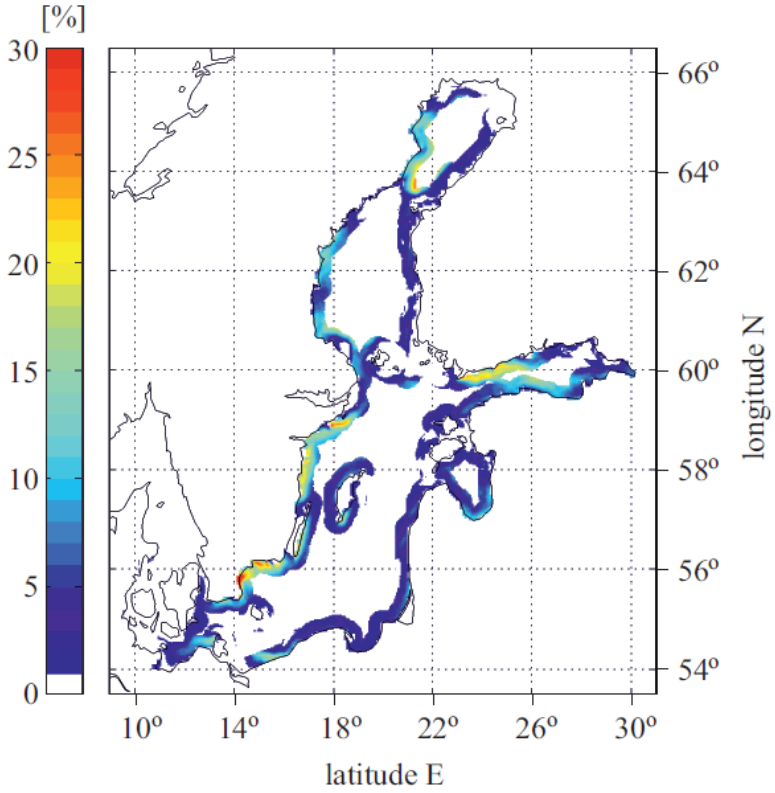
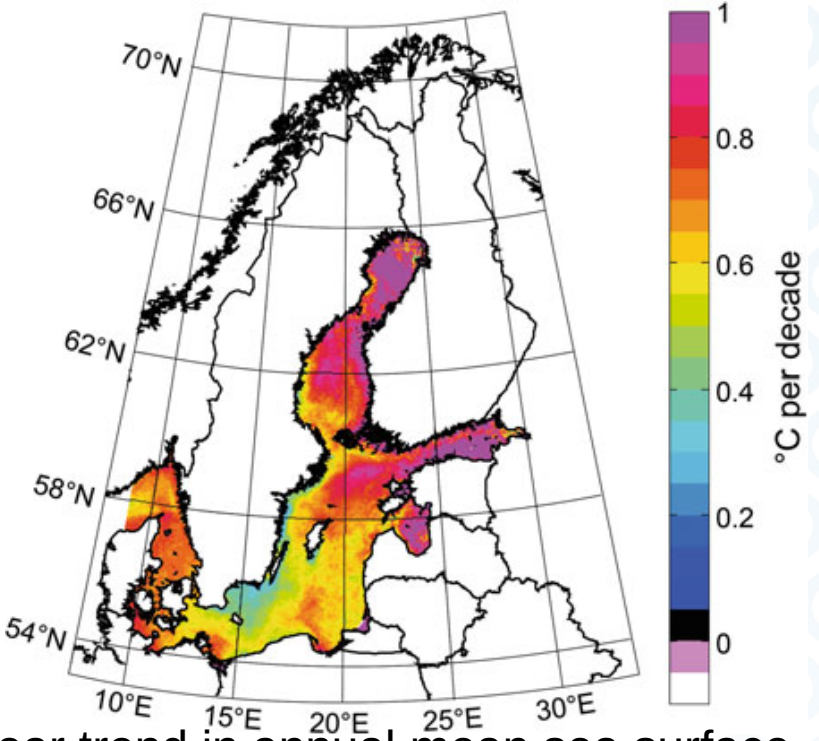
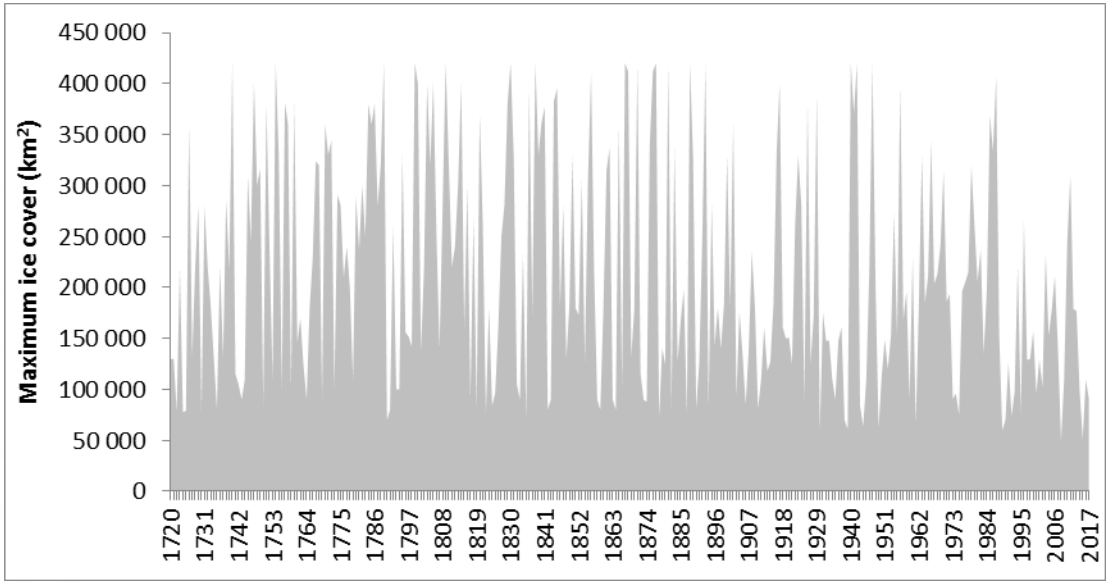
Upwelling probability in % for 1990-2010, May-Sept, Lehmann et al. 2012)





Linear trend in annual mean sea surface temperature based on infrared satellite data (1990–2008) (BACC II)

Annual maximum area of ice cover in the Baltic Sea between 1720-2017. Source: Finnish Meteorological Institute.



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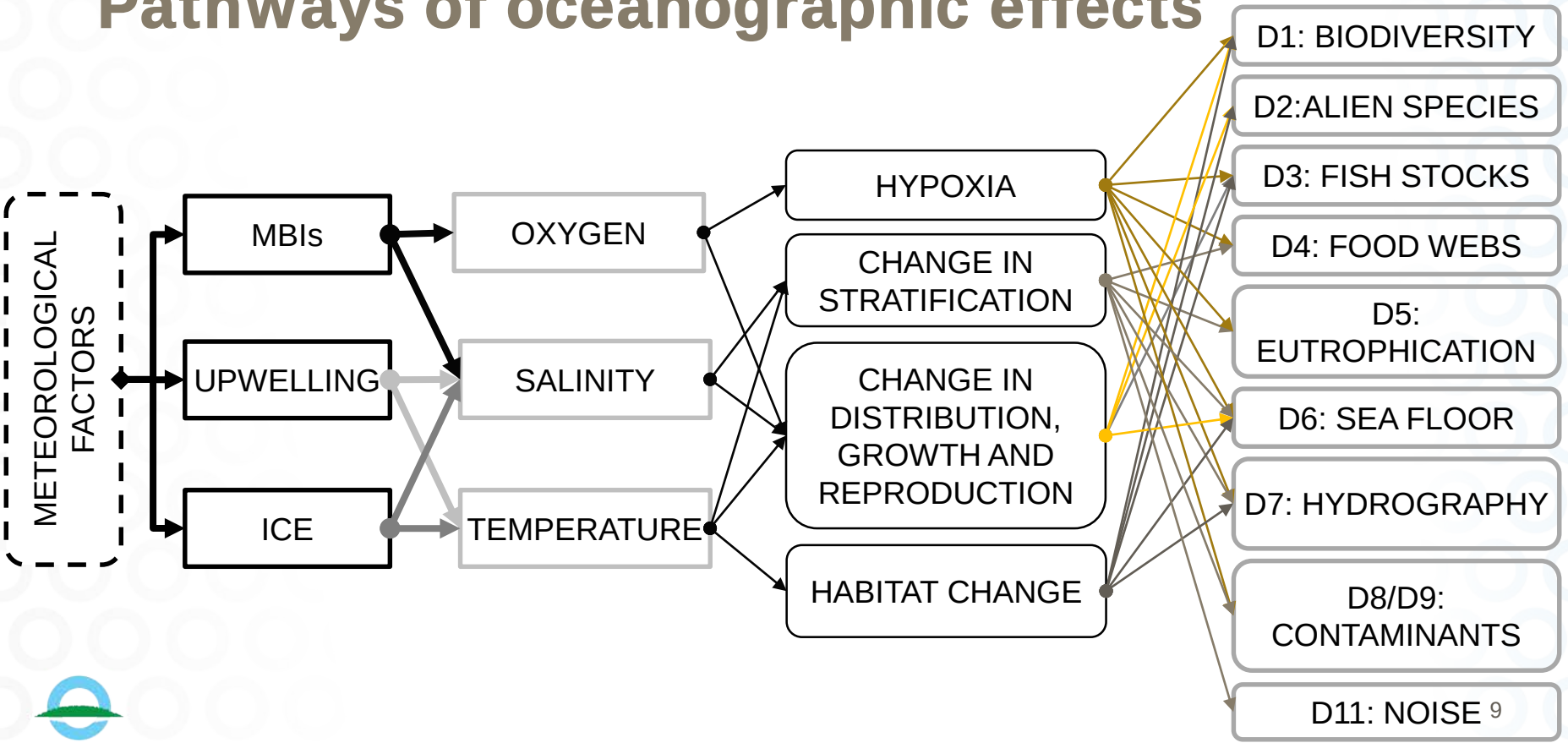
Pathways of oceanographic effects



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Wee need to…

- **Identify** how oceanography affects GES definitions, assessment, and management

→ **Create realistic scenarios of reaching GES**

- Create rules about **how to treat extreme oceanographic events in the assessment data** in relation to GES assessment

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Thank you!

Photo: Metsähallitus