



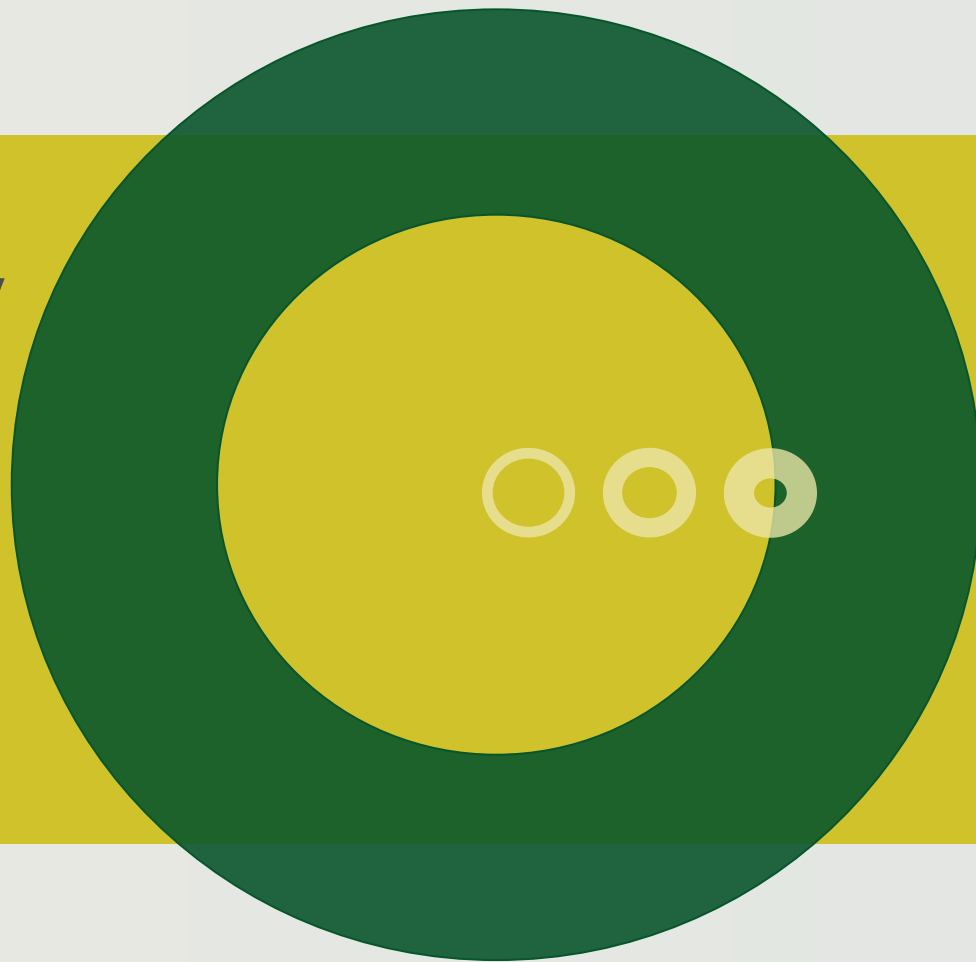
VIDENCENTRET FOR LANDBRUG

Virkemidler i recipienten og kanten af dyrkningsfladen

Besøg af FVM

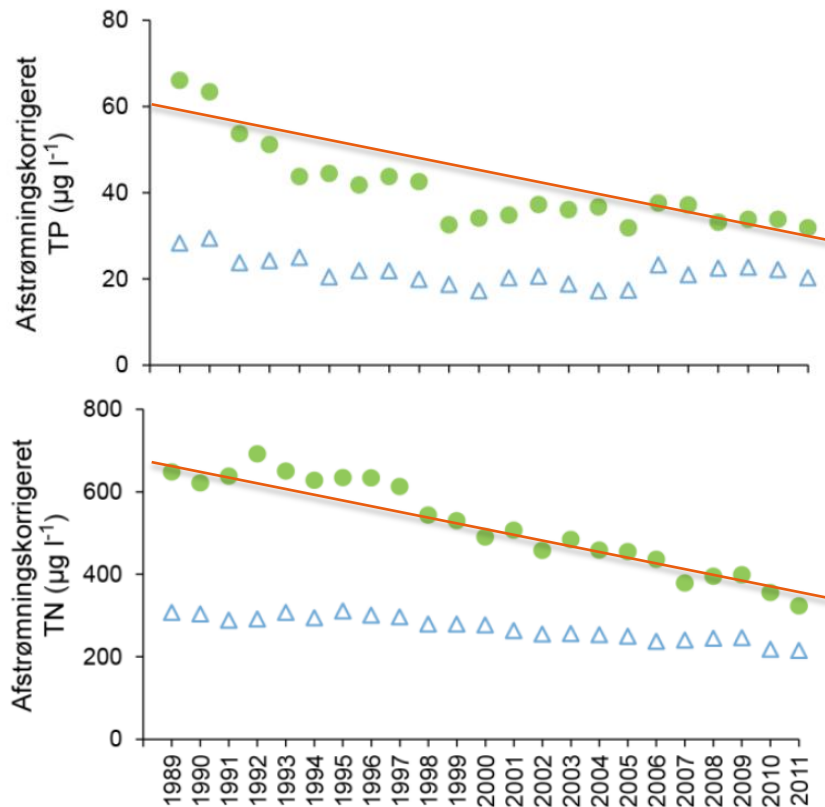
2. dec. 2013, Skejby

Flemming Gertz

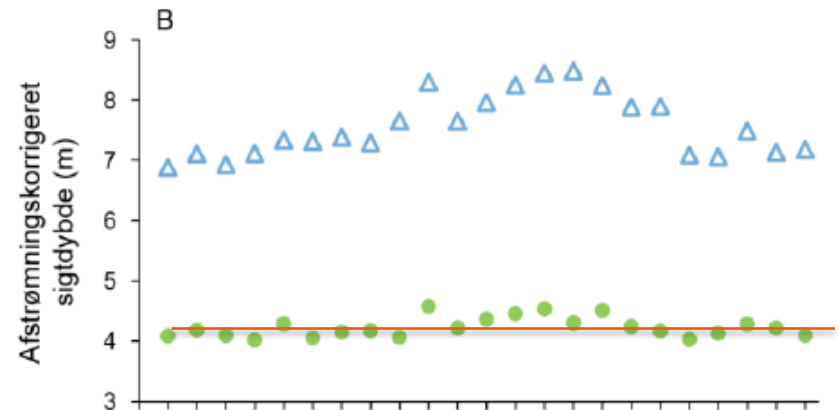


Marine virkemidler – hvorfor?

Koncentrationer i danske farvande



Sigtdybde



Vejen tilbage fra eutrof tilstand

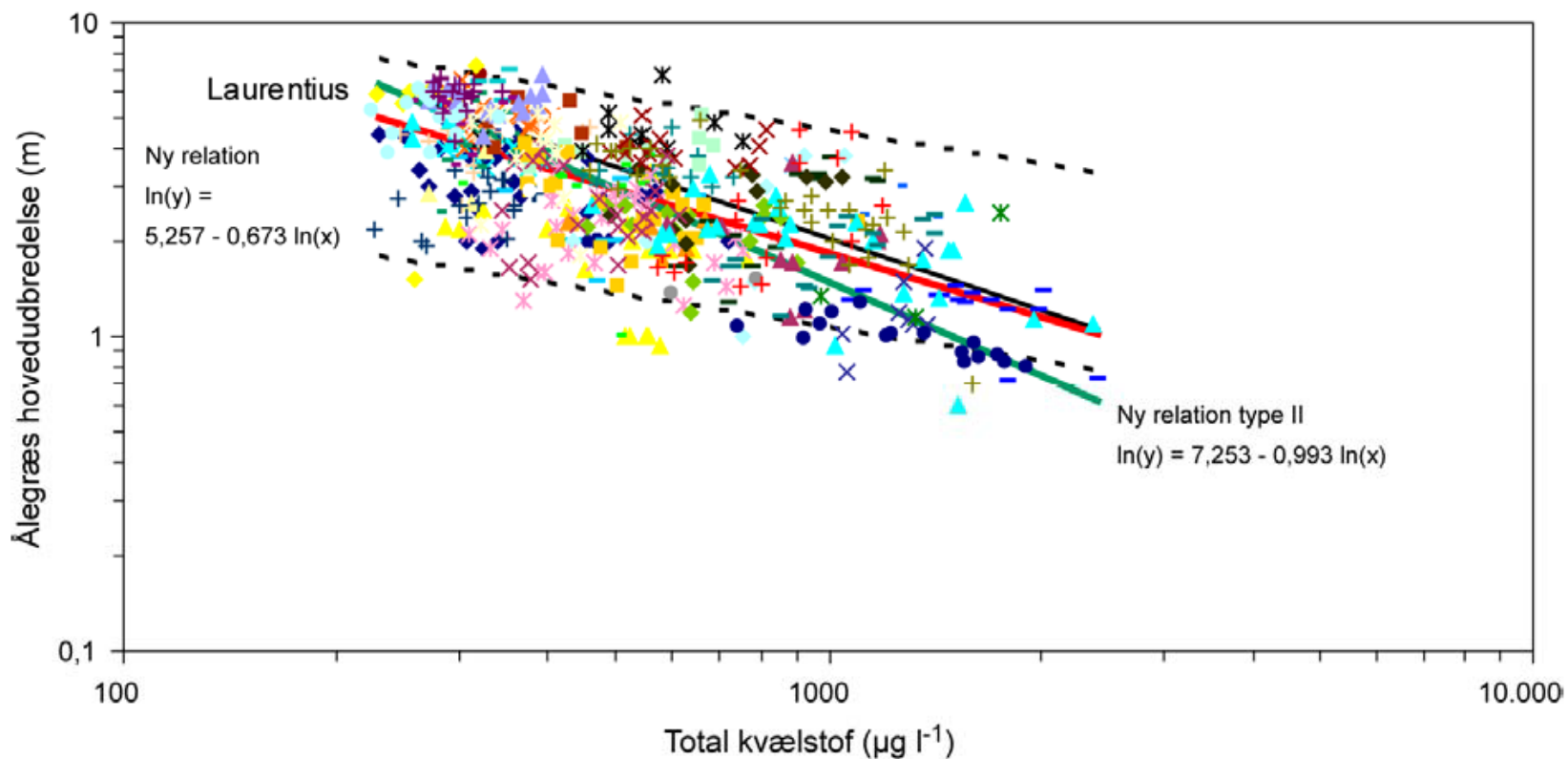
Gunni Ærtebjerg Nielsen, Aarhus Universitet (DMU),
Vand og jord nr.4 2011:

”Vi ved en masse om hvad der sker når havmiljøet belastes med næringsstoffer, men vi ved ikke en dyt om hvad der sker når næringsstofbelastningen fjernes”

Gunni Ærtebjerg Nielsen har i 30 år har arbejdet med miljøovervågning af de danske farvande, vurdering af deres tilstand og udvikling



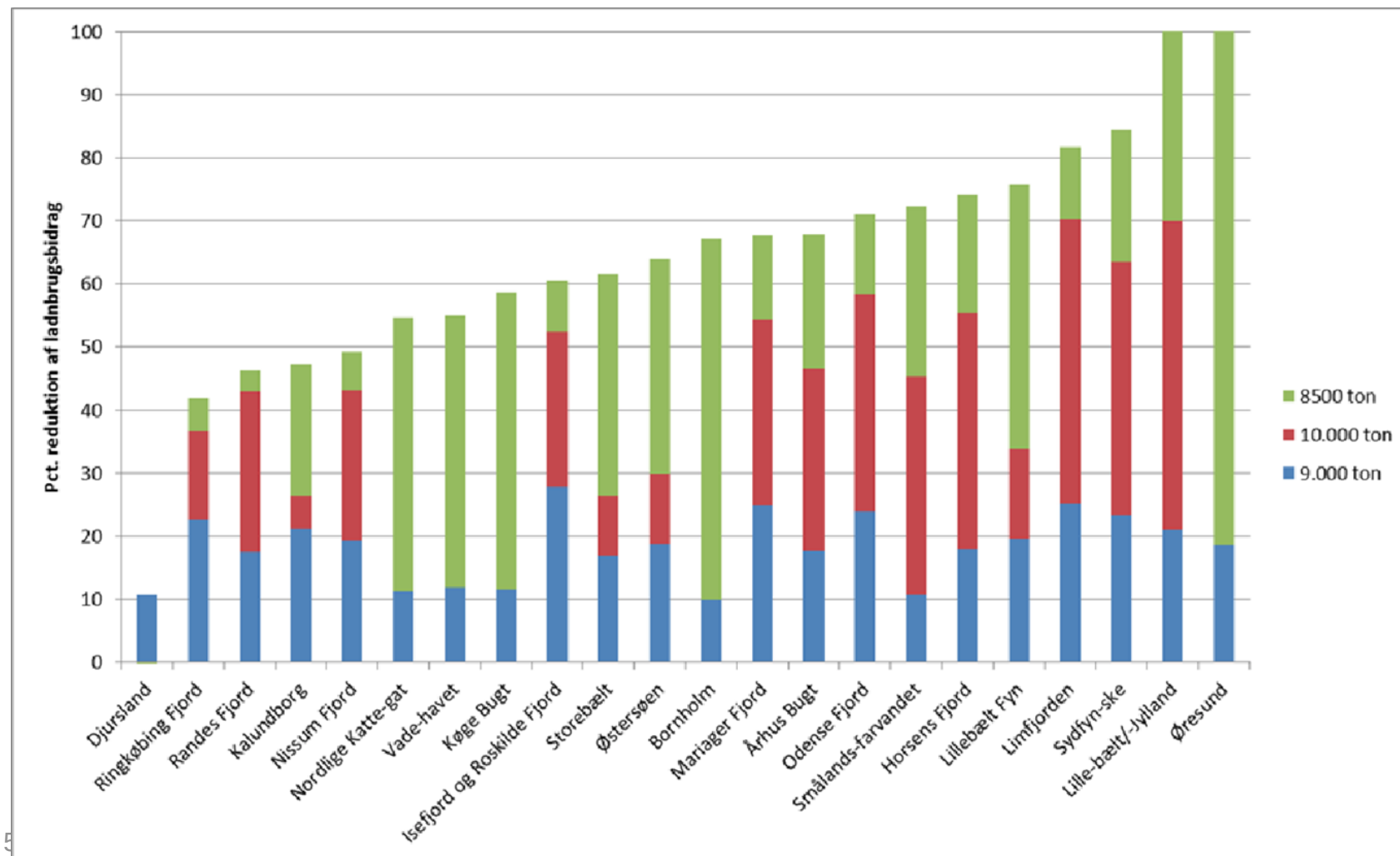
Marine virkemidler – hvorfor?



FASTLÆGGELSE AF MILJØMÅL OG INDSATSBEHOV UD FRA ÅLEGRÆS I DE INDRE DANSKE FARVANDE,
 Arbejdsrapport fra DMU nr. 256, 2009

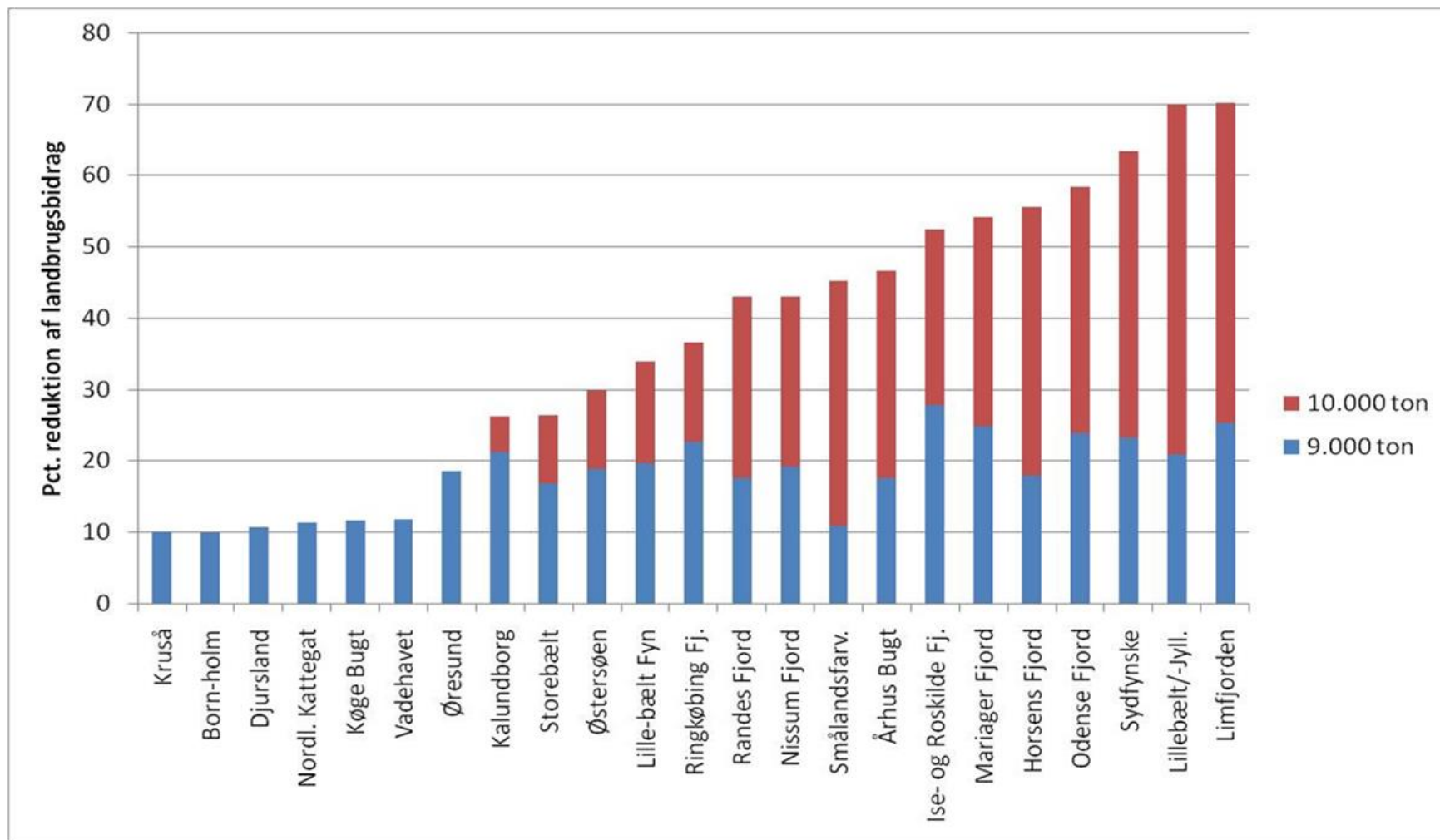
Marine virkemidler – hvorfor?

- "Ålegræsværktøjet" - reduktionsbehov

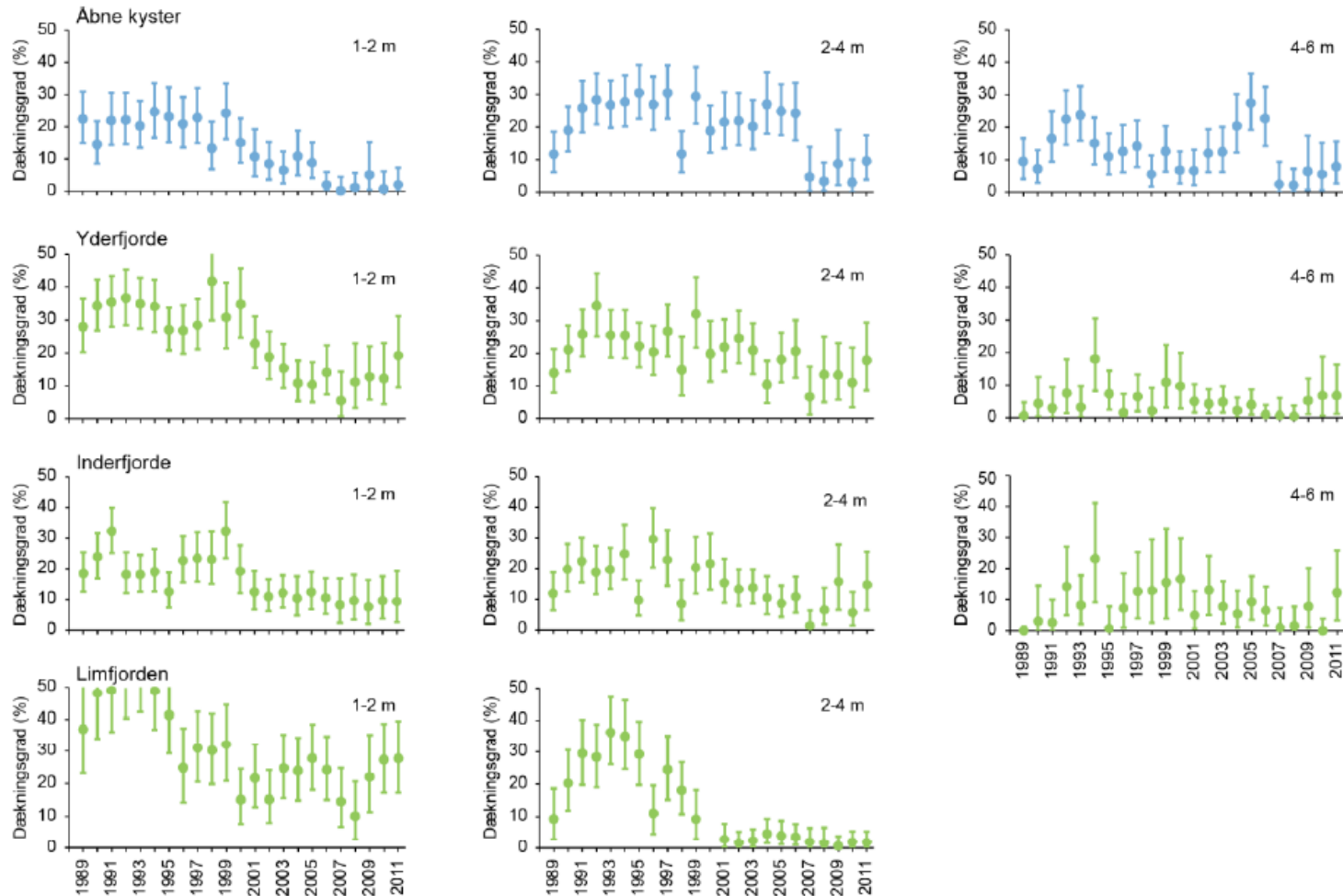


Marine virkemidler – hvorfor?

- "Ålegræsværktøjet" - reduktionsbehov



Baggrund – ålegræs dækningsgrad



Nyt beregningskompleks

ECO Lab template

Biogeochemical Model (Inner Danish waters)

Pelagic phase:

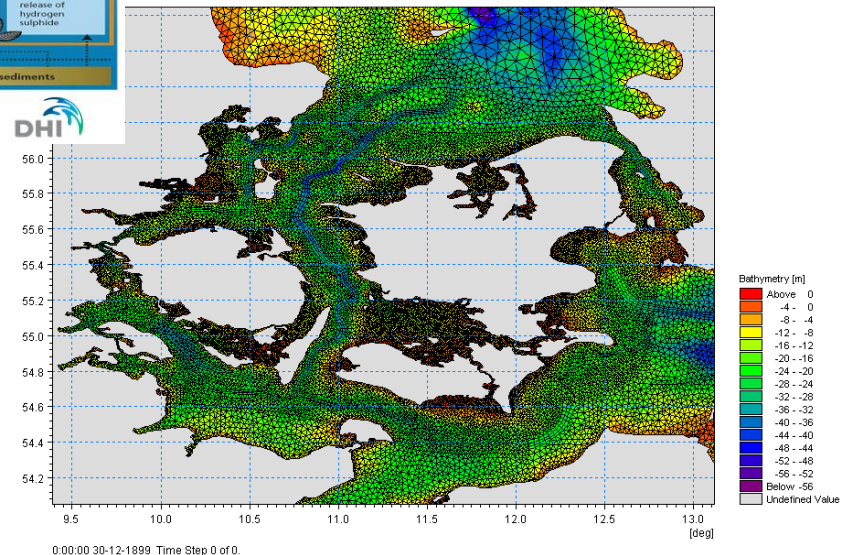
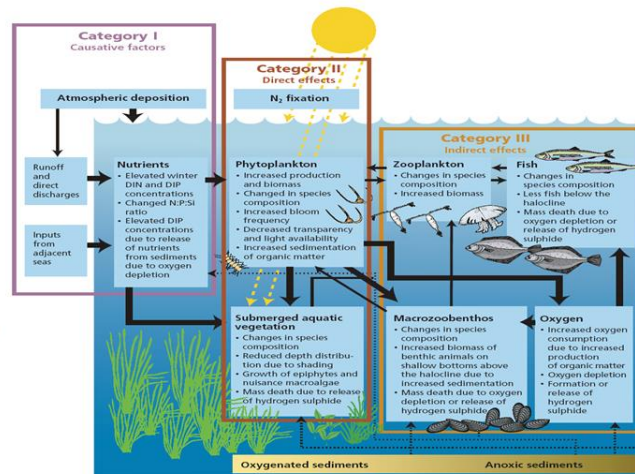
- Phytoplankton (C, N, P) – 3 groups
- Chlorophyll-a
- Zooplankton (C) – groups of micro & meso
- Detritus (C, N, P) – POM
- Ammonia (NH₄)
- Nitrate and Nitrite (NO_x)
- Inorganic P (PO₄)
- Dissolved Oxygen
- DOM (C, N, P) – refractory and labile

Sediment phase:

- Sediment organic material (C, N, P)
- Sediment inorganic nutrients (NH₄, NO_x, PO₄)
- Iron bound P
- Reduced substance
- Sediment inorganic material

Local model (Fjord models):

- Macro algae
- Sea grass
- Micro benthic algae

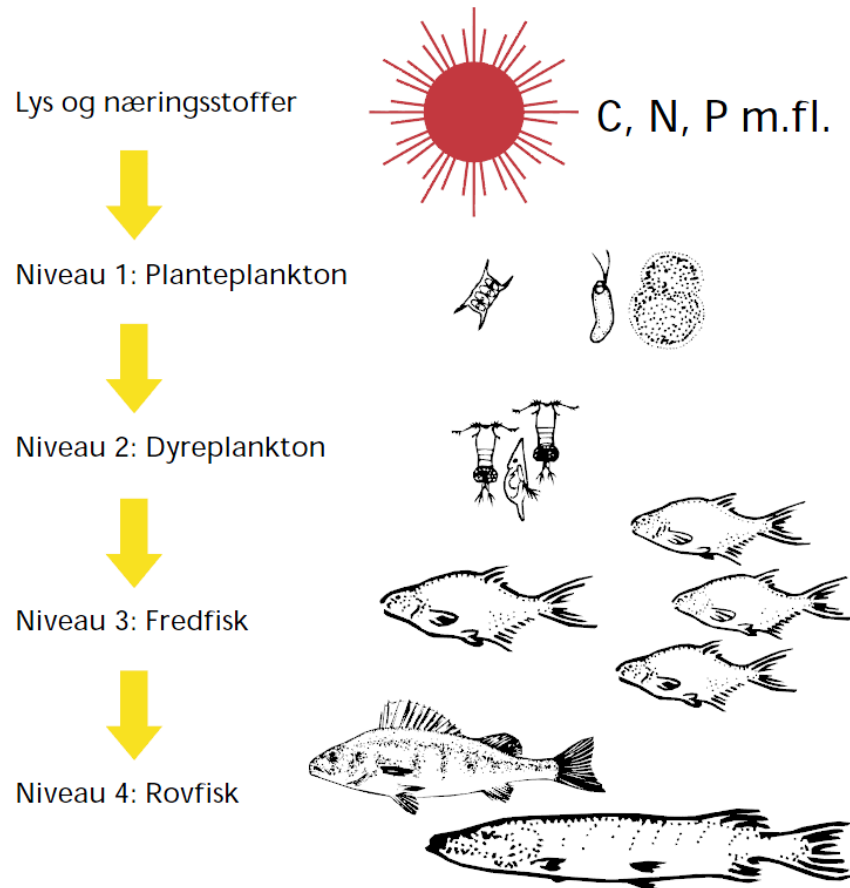


- Dynamisk/mekanistisk model (DHI)
 - Indre danske åbne farvande
 - Limfjorden, Odense Fjord, Roskilde fjord
- Empiriske/statistisk modeller (Aarhus Universitet)
 - 22 fjorde
 - Klorofyl – næringsstof relationer

Ny forvaltning med marin indsats

- Fiskeriforvaltning i relation til vandmiljøtilstand
 - Skrabende redskaber på bunden
 - Fiskeritryk
- Muslinger på line
- Iltning af bundvand i udvalgte fjorde
- Stenrev i udvalgte fjorde
- Reetablering af ålegræs – filtereffekt (www.novagrass.dk)

Nye virkemidler – Fiskeri



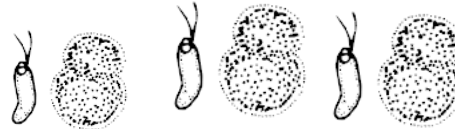
Nye virkemidler – Fiskeri

Lys og næringsstoffer



C, N, P m.fl.

Niveau 1: Planteplankton

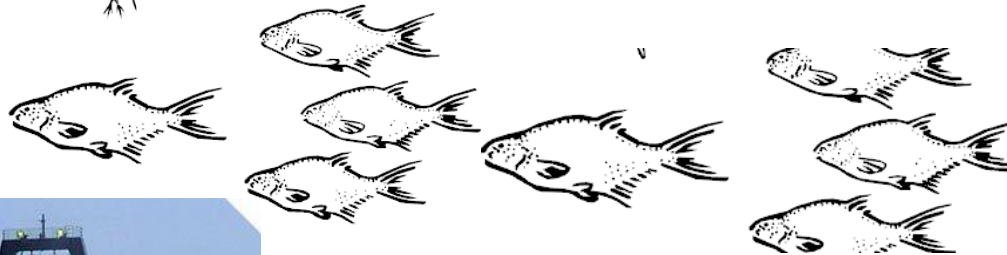


Uklart vand

Niveau 2: Dyreplankton



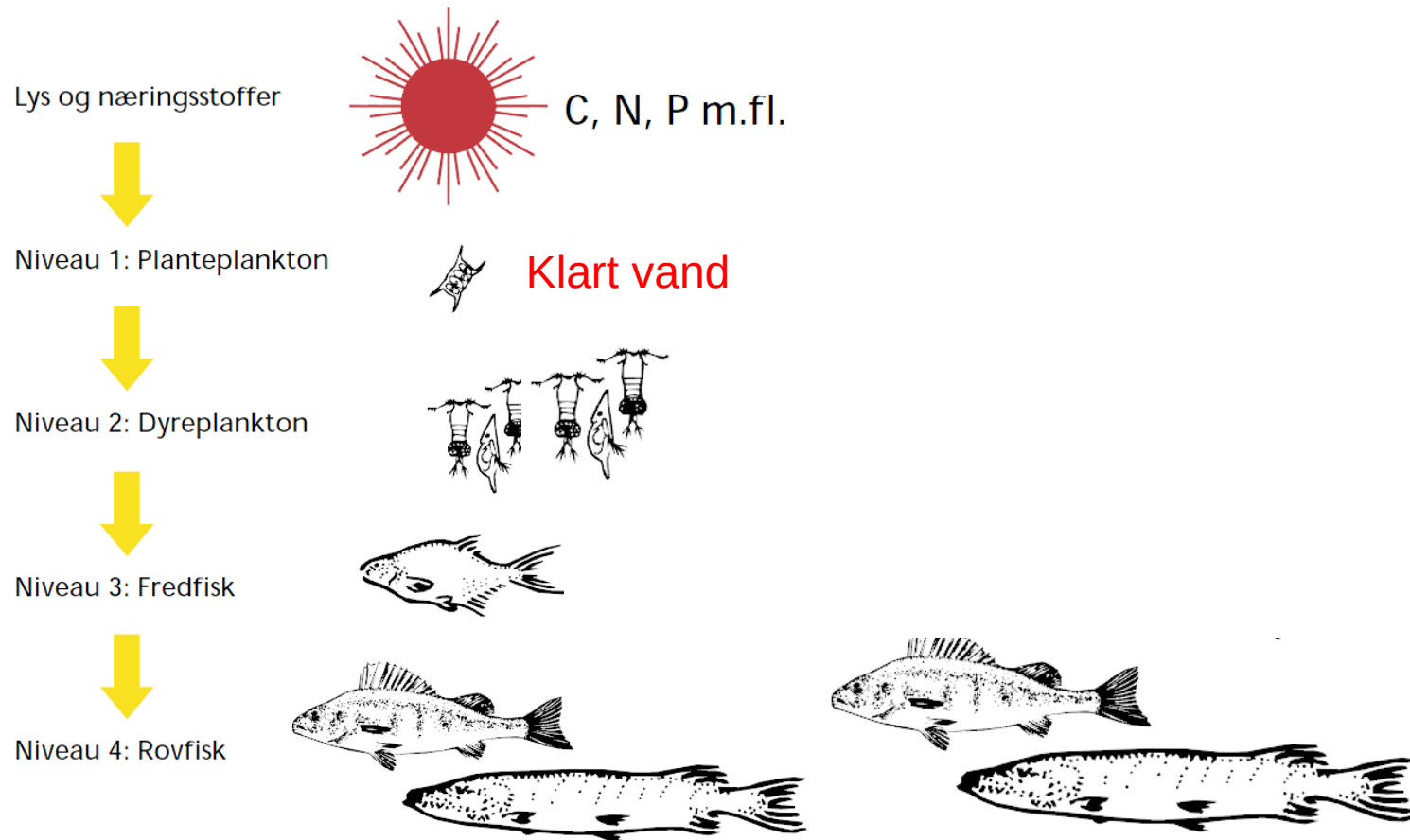
Niveau 3: Fredfisk



Niveau 4: Rovfisk



Nye virkemidler – Fiskeri



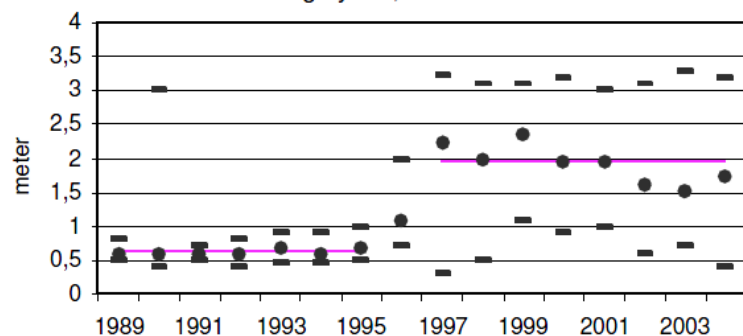
Muslinger (MUMIHUS)

- Muslinger som "kompensationsopdræt"
- Fjerner ca. 1 ton N pr ha.
- 2 gange mere end dyrkning til konsum
- Ca. 100 kr./kg N. (uden afsætning)
- 6% af Limfjordens areal svarer til 9000 ton N
- Del af samlet løsning
- Afsætningsløsning

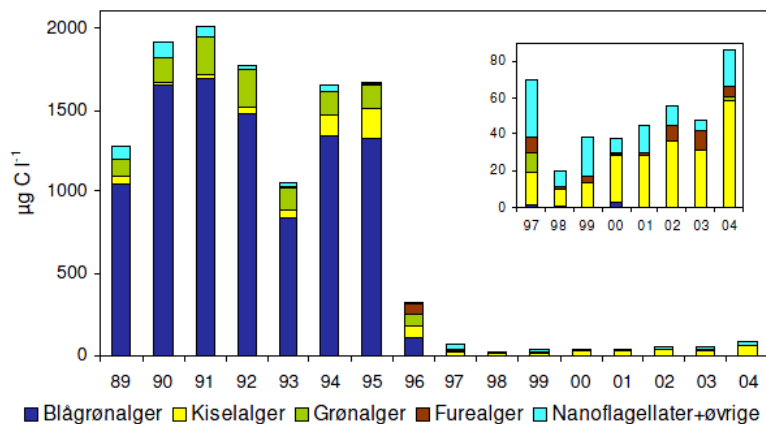


Muslinger – ex filtrering Ringkøbing Fjord

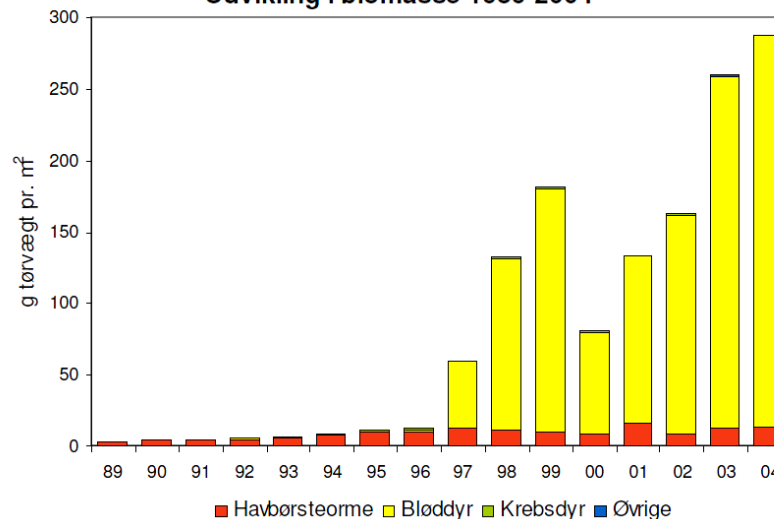
St. 1 Sigtdybde, sommermiddel



Fytoplankton biomasse, st. 1

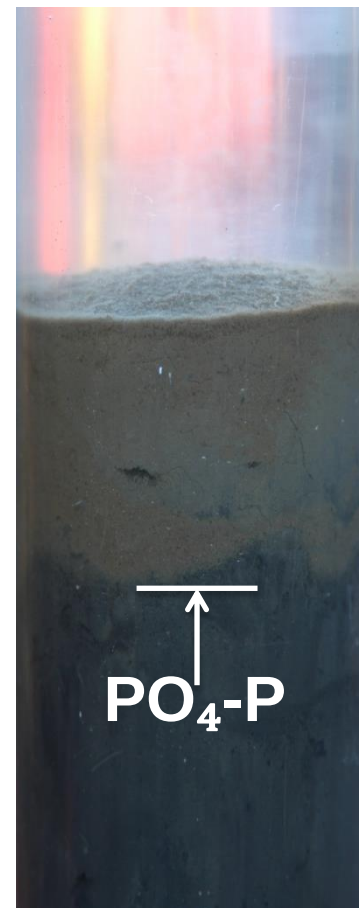
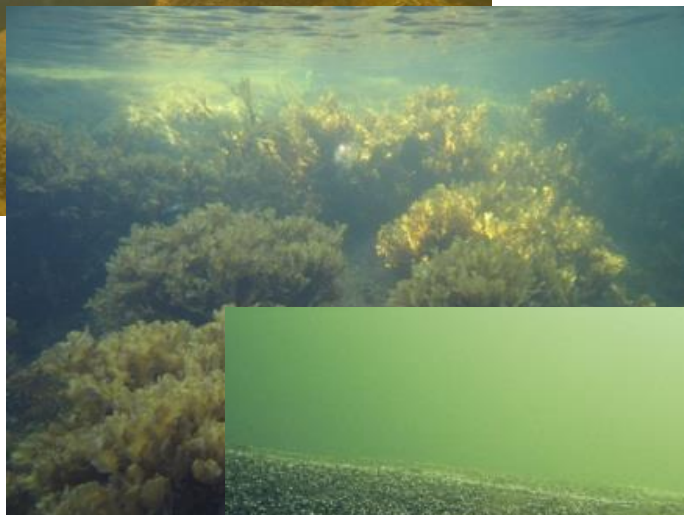


Udvikling i biomasse 1989-2004

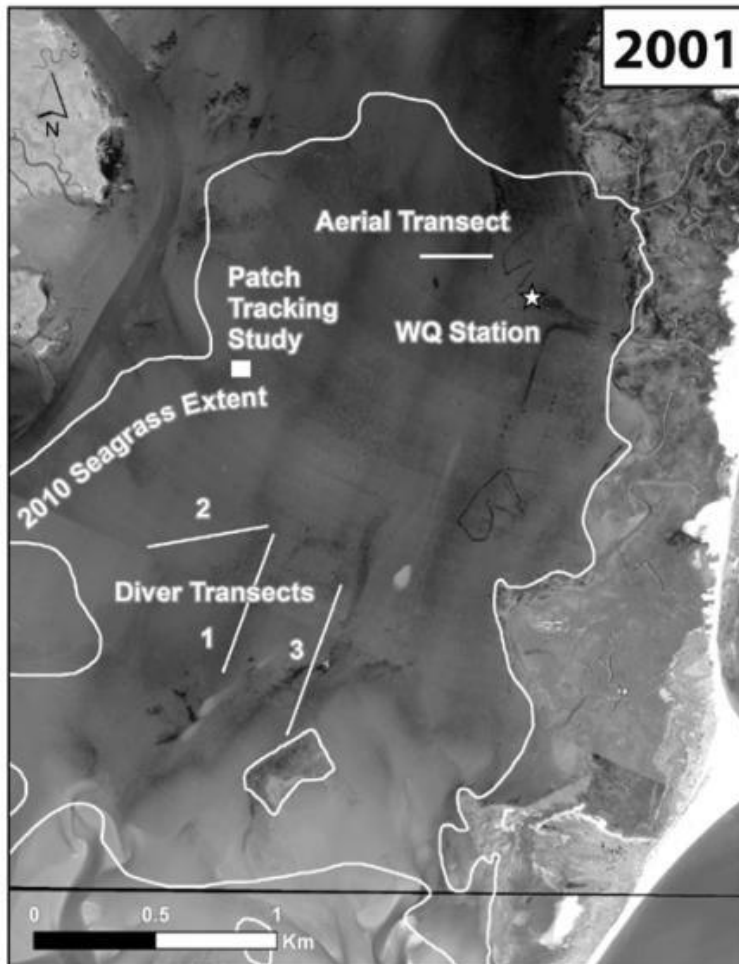


Stenrev og iltning

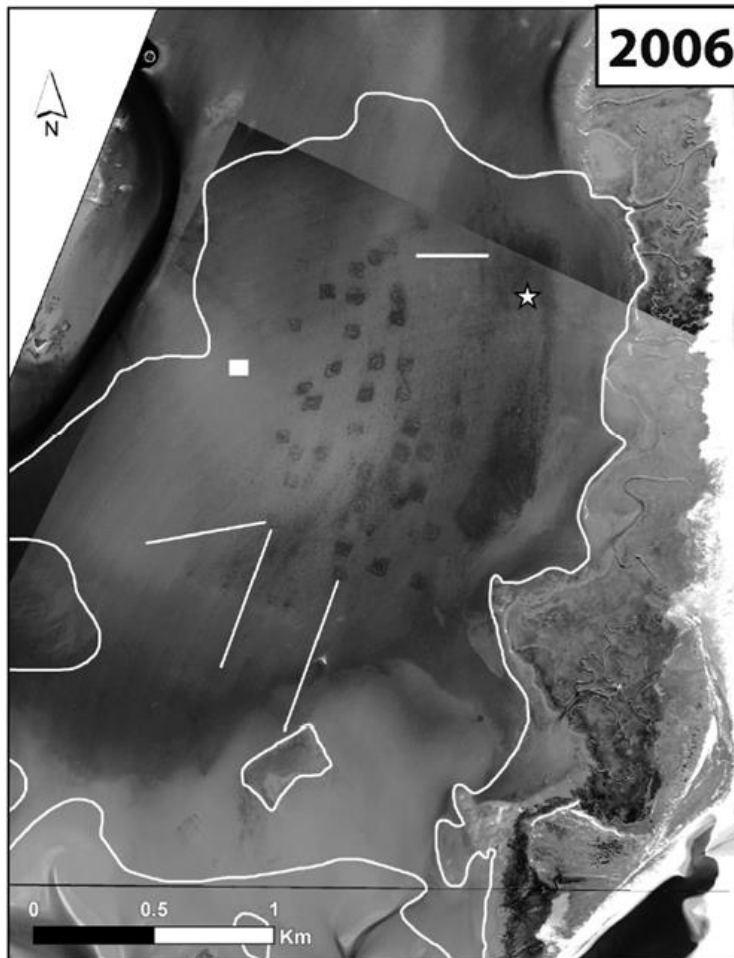
Sten + lys = O_2 = en bedre miljøtilstand



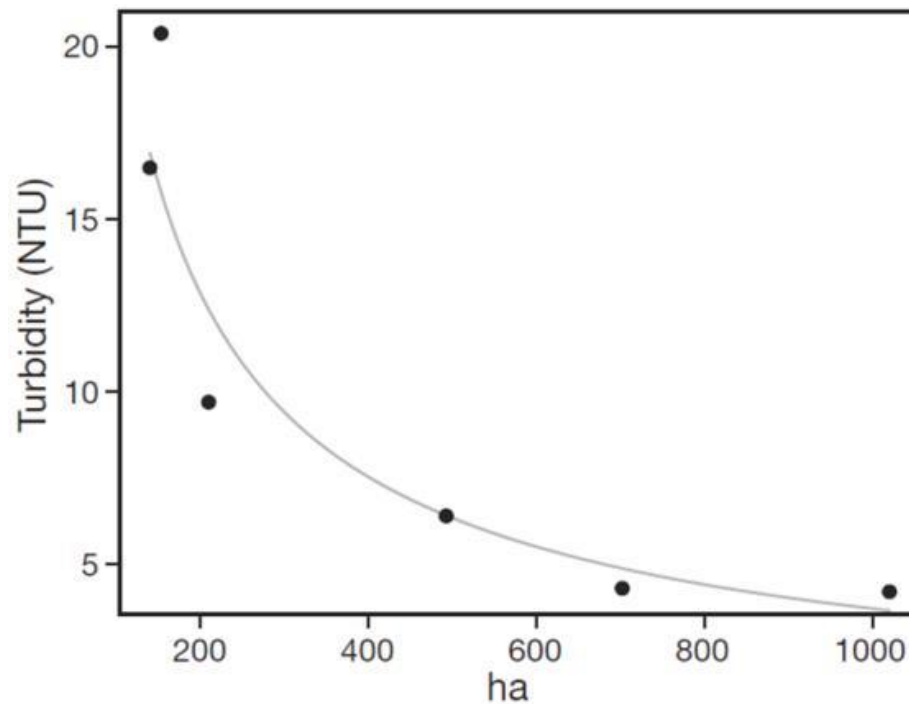
Ålegræs



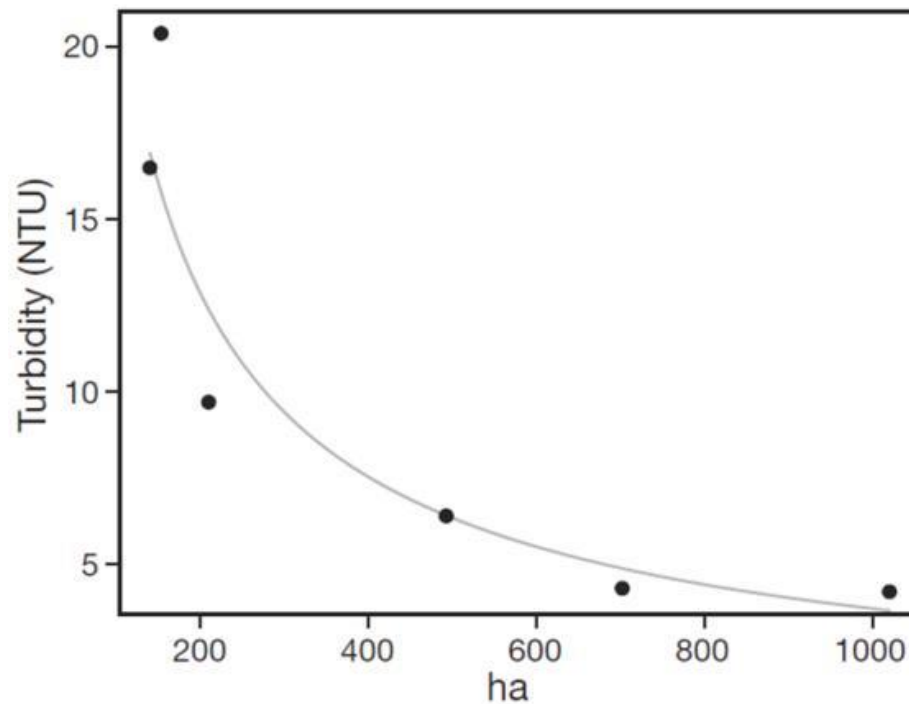
Ålegræs



Ålegræs



Ålegræs



www.novagrass.dk

NOVAGRASS innovative
eelgrass
restoration
techniques

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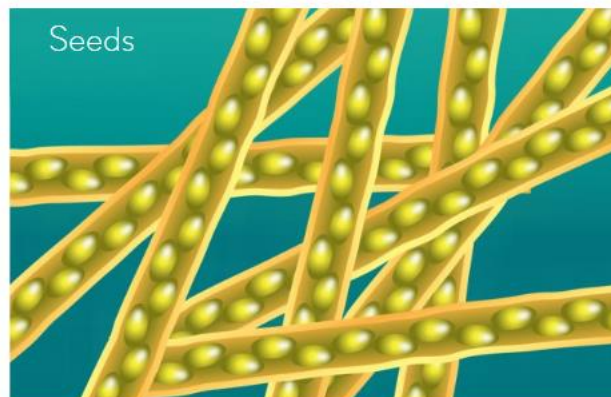
The
Danish Council for
Strategic Research



ABOUT NOVAGRASS / PARTNERS / RESEARCH / LARGE-SCALE RESTORATION / FACTS ABOUT EELGRASS / NEWS AND EVENTS

The NOVAGRASS research project will develop innovative techniques for large-scale restoration of eelgrass in coastal areas.

Eelgrass produces large quantities of seed, and while this offers the potential to restore large areas, it is currently not happening. The project aims to develop innovative techniques for mechanical harvesting of shoots, optimal storage, and planting under different environmental conditions. The project will produce guidelines for eelgrass restoration under different environmental and climatic conditions, and the consortium of universities and private companies will develop equipment and effective techniques for large-scale eelgrass restoration.



Project leader Associate Professor Erik Kristensen, University of Southern Denmark, presents NOVAGRASS



First tests with the large-scale separation techniques carried out by NYFAM. Done on hand harvested eelgrass, summer 2013



Visit our forum to participate in discussion or ask a question to the Experts. Visit Forum here



VIDENCENTRET FOR LANDBRUG

NOVAGRASS innovative
eelgrass
restoration
techniques

Supported by: The
Danish Council for
Strategic Research



Virkemidler på land

- uden for dyrkningsfladen

- Ander kilder end landbrug. P fra spildevand- overløb
- Vådområder
- Minivådområder
- Intelligente randzoner
- "MiniÅdale"

Virkemidler på land - minivådområder

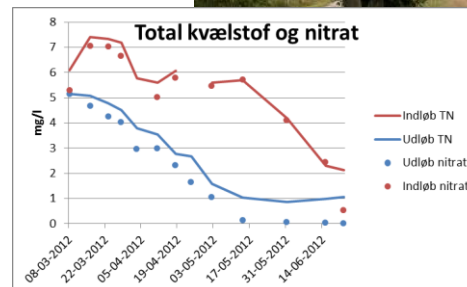
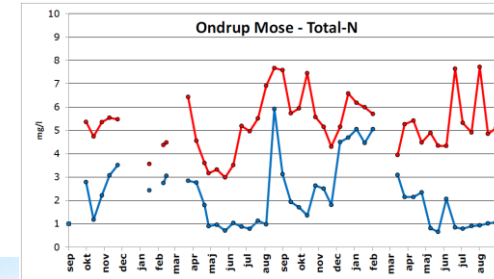
Filter system:

Større potentiale, kompliceret
(Orbicon, www.supremetech.dk)



Åben bassin system:

Sikker effekt, mindre potentiale
Stor viden fra 2014



Virkemidler på land

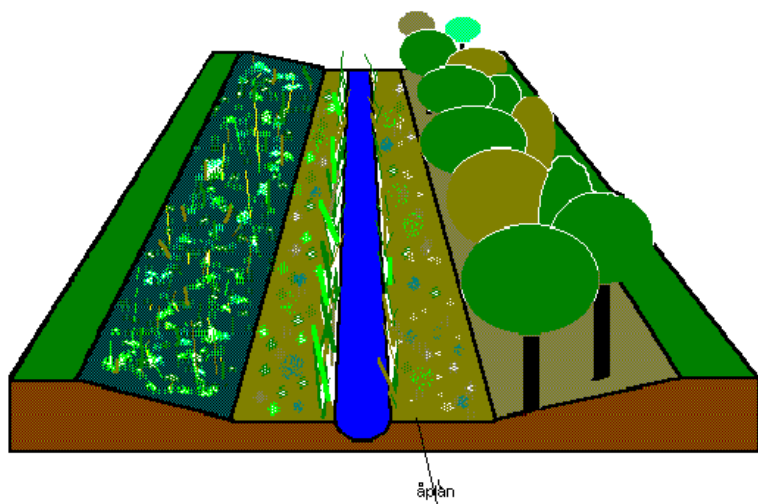
- Intelligente randzoner



- Typisk mindre dræn
- Fjerner N og P, sand, silt
- Reducerer grøde (skygning)
- Et lille projekt 2013-2015

Virkemidler på land

- MiniÅdale



Virkemidler på land

- MiniÅdale

Høj vandstand



Lav vandstand

