



VIDENCENTRET FOR LANDBRUG

Danish Coastal Waters og virkemidler

- erfaring og fremtidig strategi

Landsformandsmøde
25. sep. 2013, Billund

Flemming Gertz
Videncentret for Landbrug

Danish Coastal Waters (DCW)



MSc Jørgen Windolf, Department of Bioscience, Aarhus University. Freshwater biologist, MSc, from University of Copenhagen. Thirty years' experience with monitoring and management of the aquatic environment acquired through work at local, regional and most recently national level. Works with the national monitoring programme for the freshwater environment. Combined use of measurement data and simple models for calculation of freshwater runoff and input of nutrients to streams, fjords and coastal-near waters. Evaluation of the development and underlying reasons.



Chief adviser Leif Knudsen has been employed at the Knowledge Centre for Agriculture and worked within the fields of Fertilisation and Drainage since 1992. Over the years, Leif Knudsen has participated in and been the leader of numerous projects dealing with better nutrient utilisation and methods to reduce nitrogen loss in agriculture. For the last two years, nutrient contents in drainage water have been monitored. Furthermore, Leif Knudsen is responsible for calculating the economical optimal nitrogen standards.



Chief biologist Flemming Møhlenberg has been employed at the DHI Group since 1997. He is a professional marine ecologist who has more than 30 years of experience from long-term engagements at universities and the National Environmental Research Institute. During the last 20 years, he has worked with Danish monitoring data and has used this background in several data syntheses and to develop proposals for revision of monitoring programs. A coordinator and work package leader on national and international research projects. Over the past 3-4 years, he has been involved in baseline studies and EIA studies in connection with a fixed link across the Femern Belt, and in parallel has led EIA studies related to the expansion of aquaculture. Author and co-author of 50 scientific articles and a contributor to several books. Member of The Commission on Nature and Agriculture.



Chief biologist Erik Kock Rasmussen, DHI, has worked with ecological modeling of marine areas for 25 years and participated in EU or Danish funded marine research projects. Besides research projects he has participated as ecological modeler in several interdisciplinary international applied projects, like master plans (Brazil, Argentina, Chile, Bulgaria, Kaliningrad) or Environmental Impact Assessments (bridge, tunnels, power plants, marine wind mill farms).



Ragnar Elmgren is professor of Brackish Water Ecology at the Department of Ecology, Environment and Plant Sciences at Stockholm University. In 1976 he received his Ph.D. from Stockholm University for the thesis "Baltic Benthos Communities and the Role of the Meiofauna". In 1977-78 he studied the ecological effects of marine oil pollution at the Graduate School of Oceanography, University of Rhode Island. After returning to Stockholm University he has studied Baltic ecosystems, with an emphasis on bottom fauna, eutrophication effects, cyanobacterial blooms, and, increasingly, management issues and has supervised 20 Marine Ecology PhDs. His current research projects deal with adaptive management of nutrient discharges to the coastal zone, ecosystem effects of Baltic cyanobacterial blooms and ecosystem-based management of the Baltic Sea.



Patricia Glibert is a Professor at the University of Maryland Center for Environmental Science (UMCES), Horn Point Laboratory. She received her Ph.D. from Harvard University and was a Postdoctoral Scholar and an Assistant Scientist at the Woods Hole Oceanographic before moving to the University of Maryland. Dr. Glibert also holds an Honorary Doctorate from Linnaeus University, Sweden, and is a Fellow of the American Association for the Advancement of Science. Pat's research centers around questions related to nutrient dynamics, particularly the effects of eutrophication, and algal blooms. Her current work is focused on the linkages between changes in the amounts and forms of nutrient loading, harmful algal blooms (HABs), and changes in aquatic food web structure.



Hans W. Paerl is Kenan Professor of Marine and Environmental Sciences at the University of North Carolina's Institute of Marine Sciences. His research addresses nutrient cycling and primary production dynamics, environmental controls and management of harmful algal blooms, and assessing effects of human and climatic alterations of water quality and sustainability of inland and coastal waters. He received the 2003 G. Evelyn Hutchinson Award from the Association of the Sciences of Limnology and Oceanography, and the 2001 Odum Award from the Coastal and Estuarine Research Federation for addressing the causes, consequences and controls of eutrophication in aquatic ecosystems.



Jacob Carstensen is a professor at the Department of Bioscience, Aarhus University. He is an ecological statistician with over 20 years' research experience analysing environmental data. His research focuses mainly on describing and understanding long-term trends of marine ecosystems in response to natural and anthropogenic pressures, particularly eutrophication and climate change. He has worked on several projects supporting the implementation of European Directives (WFD, MSFD).

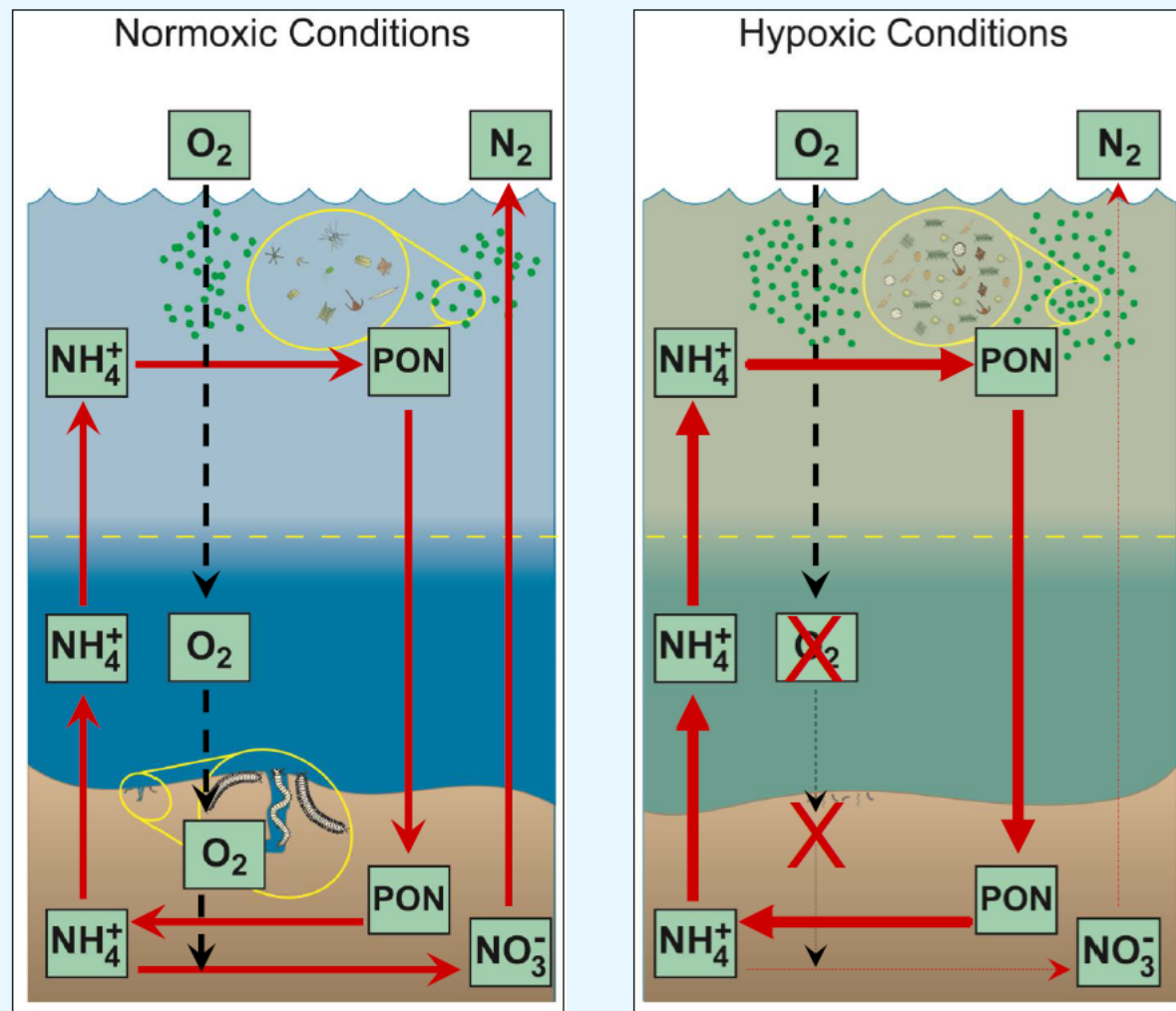
DCW - Hovedkonklusioner

- "Dual nutrient limitation" (både N og P har betydning)
- Det er usandsynligt at man kan vende tilbage til nær oprindelig tilstand alene ved at reducere i næringsstoffer
- Vægt på "funktionelle" systemer - frem for vægt på fx at opnå en ålegræs dybdegrænse på 5 eller 7 m
- Forvaltning af marine systemer skal ske ved en integreret regulering - inkluderende næringsstoffer, fiskeri, fysiske forstyrrelser herunder reetablering af tabte habitater

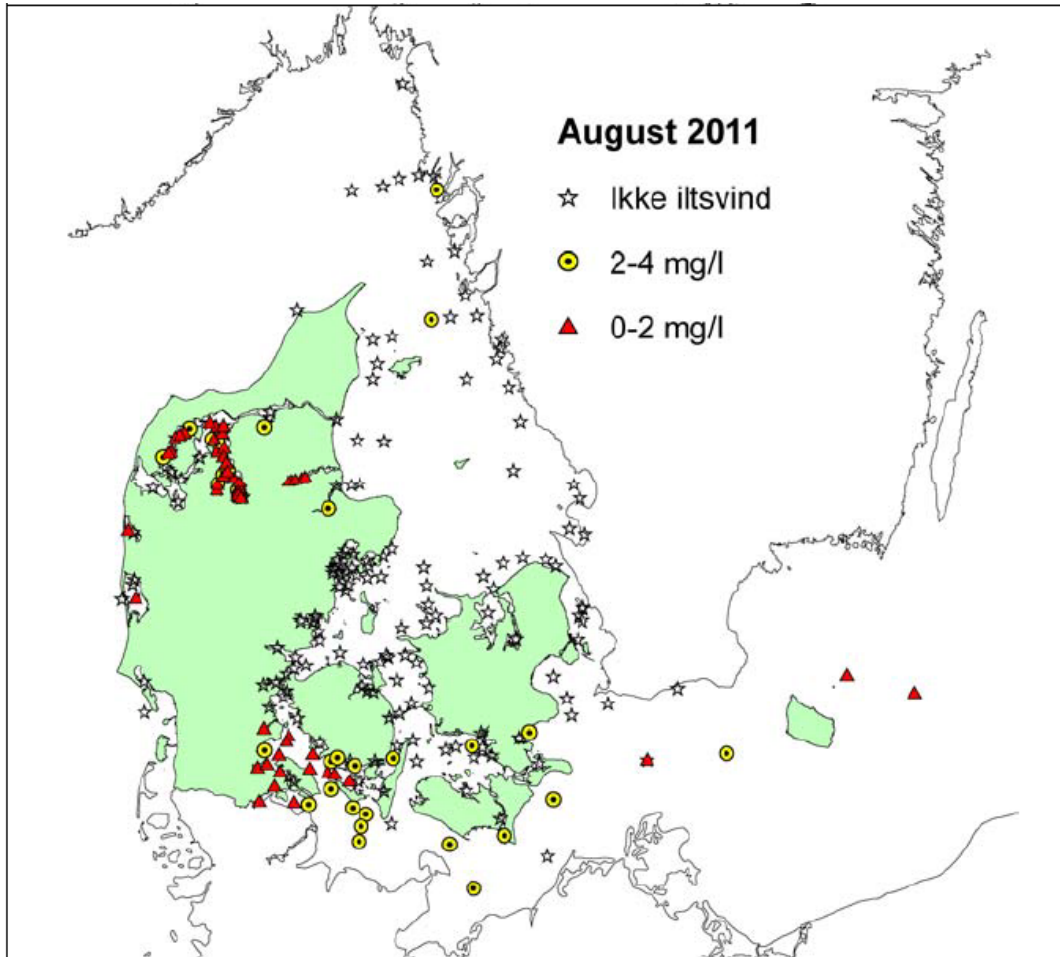
DCW - Hovedkonklusioner

- Iltsvind, tab af ålegræs og skrab på bunden har skabt "usunde" bentiske miljøer (bundforhold). Sunde bentiske samfund er nøglen til helbredelse
- Forsinket respons på reduktioner
- Endeligt er det vigtigt at skelne mellem hvad der kan løses nationalt og hvad der skal løses af andre lande

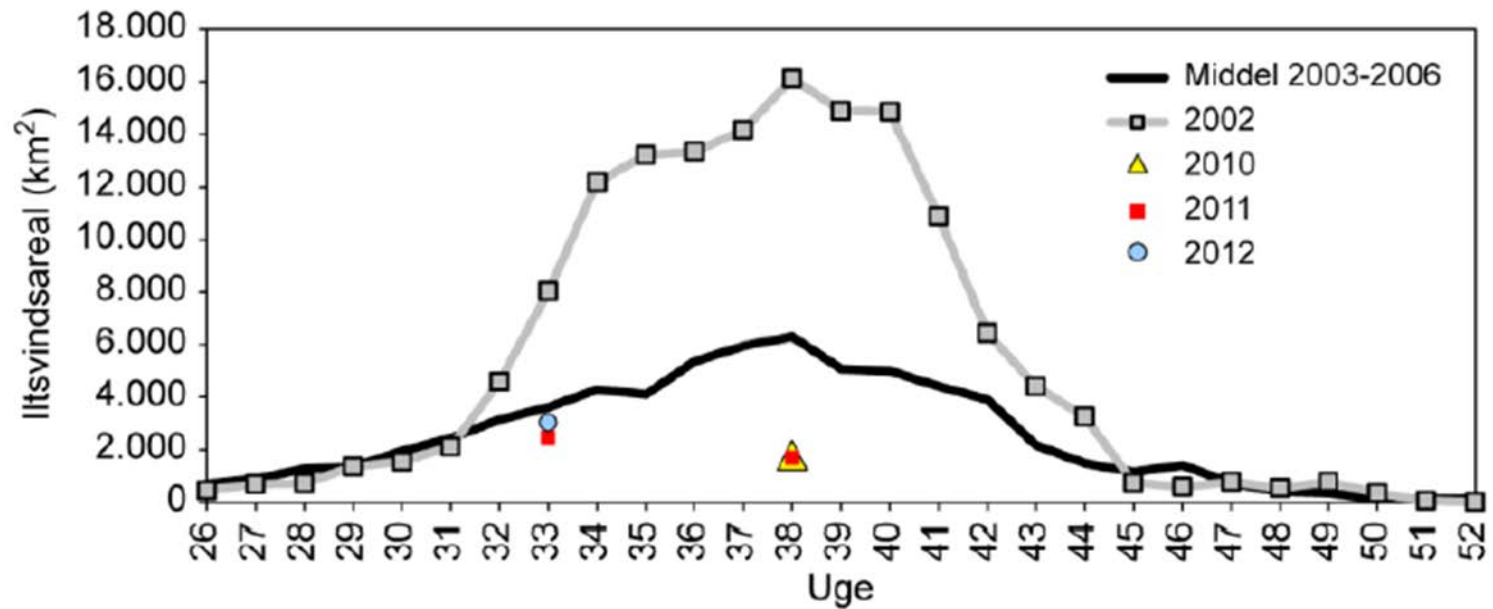
Sundt og usundt bentisk miljø



Hovedkonklusioner



Hovedkonklusioner



Hvad er dansk, hvad er internationalt, hvad er klima

Ålegræs som kvælstoffilter

Limfjorden – 1 hændelse med iltsvind 1999

Ålegræs i 1993 og 2001 i Nibe-Gjøl Bredning



Limfjordskonference 9. juni 2006

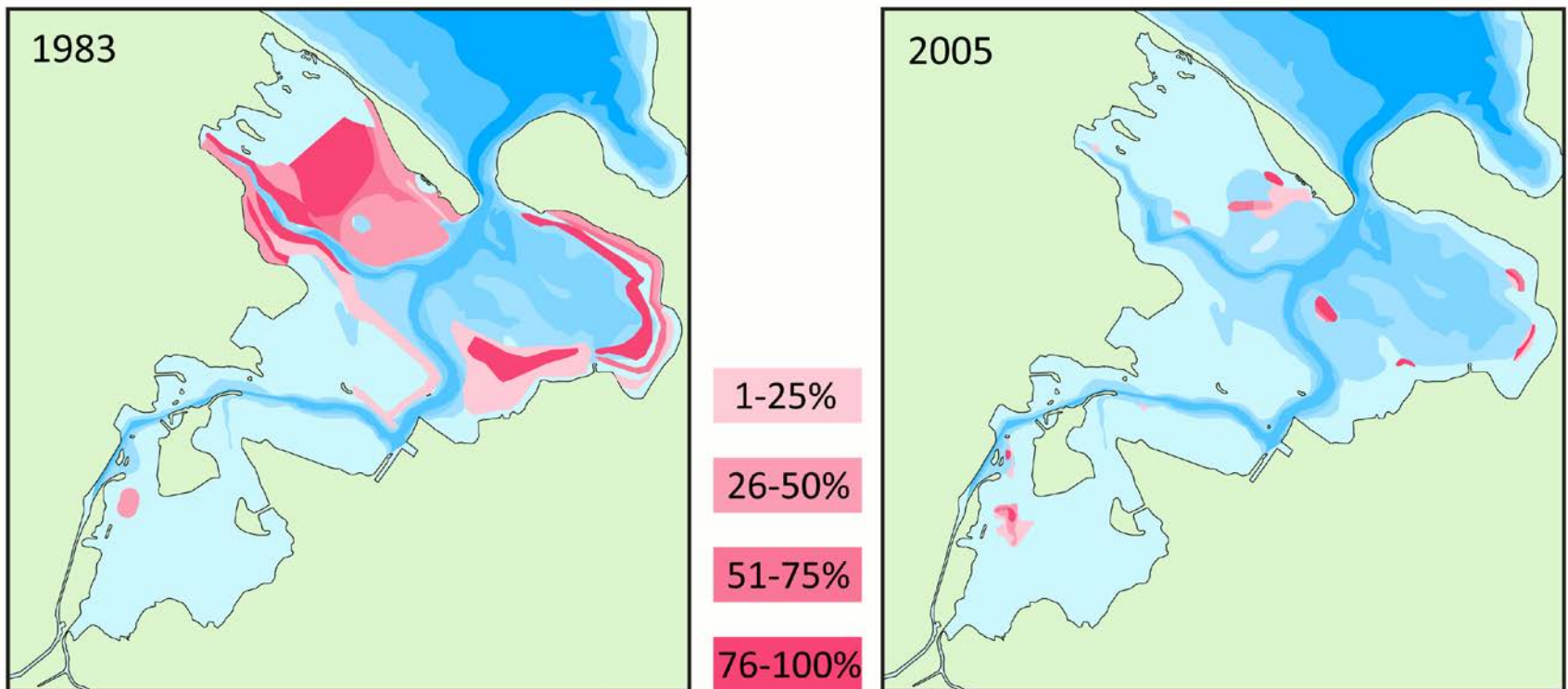


Ålegræs som kvælstoffilter

Odense Fjord

Ålegræsbede kan fjerne 150 kg N/ha/år (skønnet)

Svarer til potentielt 5 gange den planlagte N-reduktion i oplandet for Odense Fjord



Marin strategi?

- Marine virkemidler – det handler om at bryde den dårlige spiral
 - Fiskeriforvaltning (mangler)
 - Stop for skrabende redskaber på bunden (?)
 - Bæredygtigt fiskeri (?)
 - "Marine reservater" (?)
 - Iltning af bundvand i udvalgte fjorde (ingen i DK)
 - Stenrev i udvalgte fjorde (Måske pilot i Limfjorden)
 - Reetablering af ålegræs – filtereffekt (www.novagrass.dk)

Marin strategi?

- Marine virkemidler
 - Er nødvendige og ikke kun supplerende
 - Næsten intet gjort....

Virkemidler på land

- uden for dyrkningsfladen

- Ander kilder end landbrug. P fra spildevand- overløb
- Vådområder (engangserstatning mulig 2016)
- Minivådområder: >50 mio. kr i undersøgelser, fjerner også P
- Intelligente randzoner
- MiniÅdale

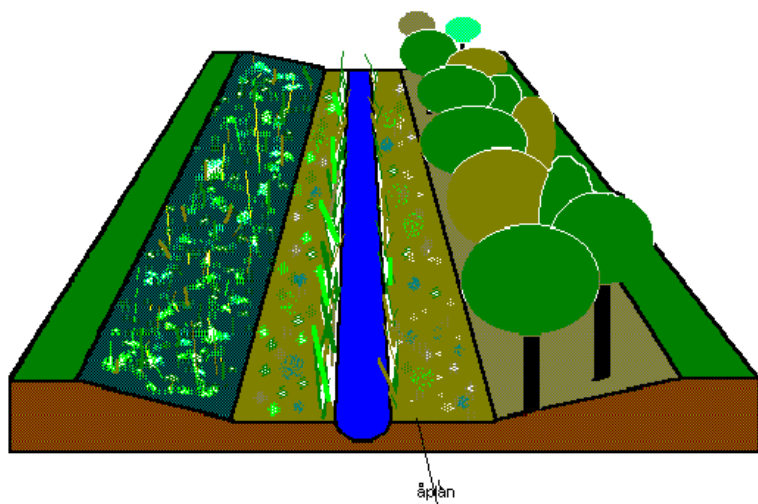
Virkemidler på land

- Intelligente randzoner



Virkemidler på land

- MiniÅdale



Virkemidler på land

- MiniÅdale

Høj vandstand



Lav vandstand



Opsummering

- Marin
 - Marine modeller – OK (NST)
 - Ålegræsværktøj – stendødt (men ikke i 1. vandplan)
 - Realistiske mål (funktionalitet af økosystemer)
 - Marin helhedsforvaltning / virkemidler – stort behov
 - Fiskeri, trawl + iltning + stenrev + ålegræs
- Virkemidler på land uden for dyrkningsfladen
 - Fortsat udvikling af minivådområder
 - Intelligente randzoner – stort behov for udvikling
 - MiniÅdale – stort behov for midler (til dels doku)