

Higher trophic levels in the Southern North Sea

Trophos



OBJECTIVES

Study of food web interactions on BCS

- benthic pelagic coupling
- Food availability and distribution of sea birds

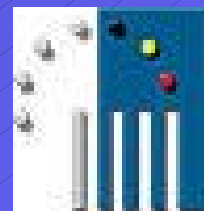
Life history and dispersal of selected key species

Data management and valorisation

Partners:



Sponsor

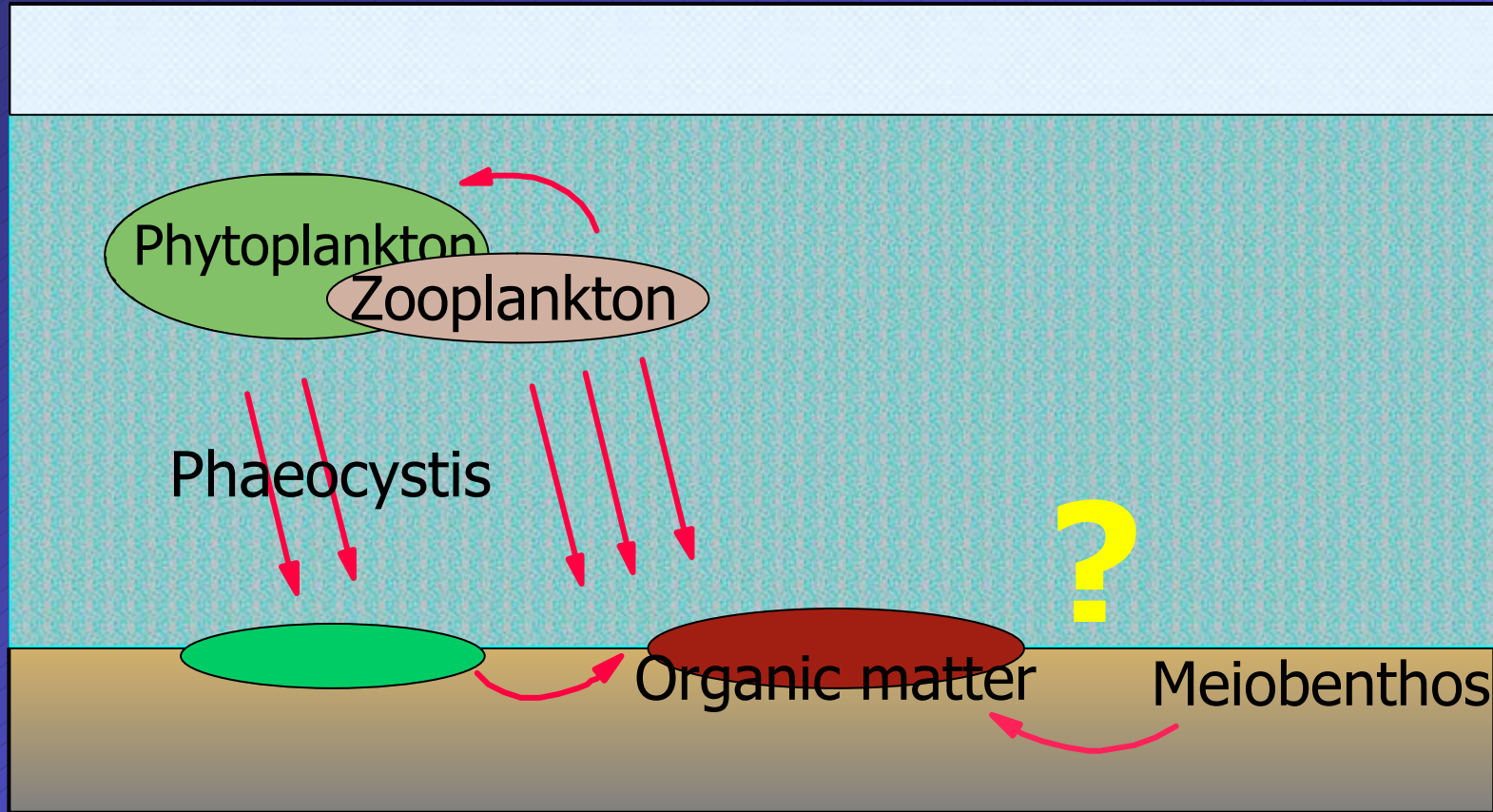


Context

- PODO I:
 - Considerable differences in benthic food webs are reflected in benthic structural and functional diversity
 - Distribution of sea birds is linked to the distribution of their prey (pelagic fish)
 - Dispersal of marine organisms reflects hydrodynamics and behaviour
 - Urgent need for data management

Methodology

Benthic pelagic coupling: introduction



Winter

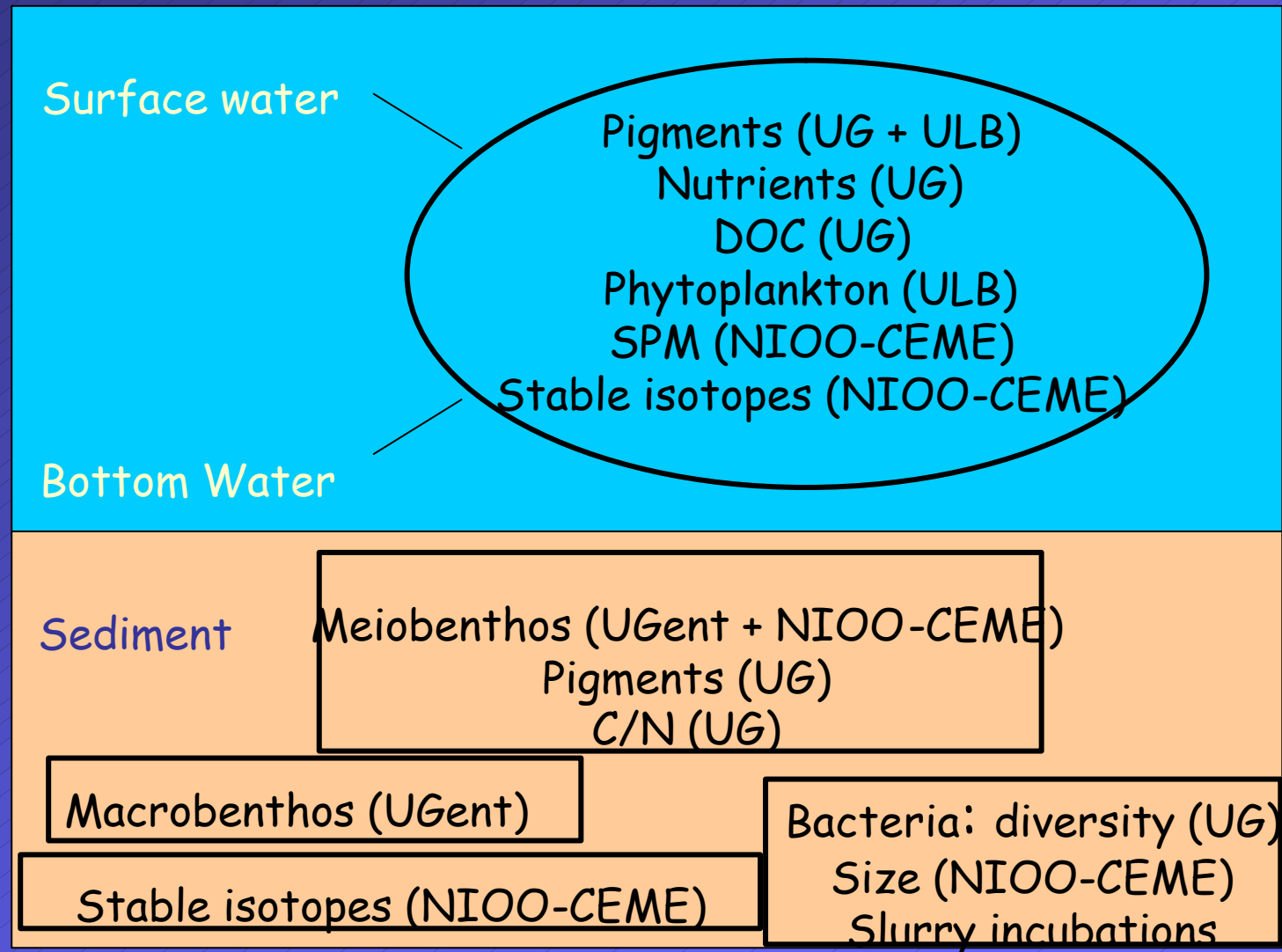
Spring

Summer

Temperature / Nutrients / Light

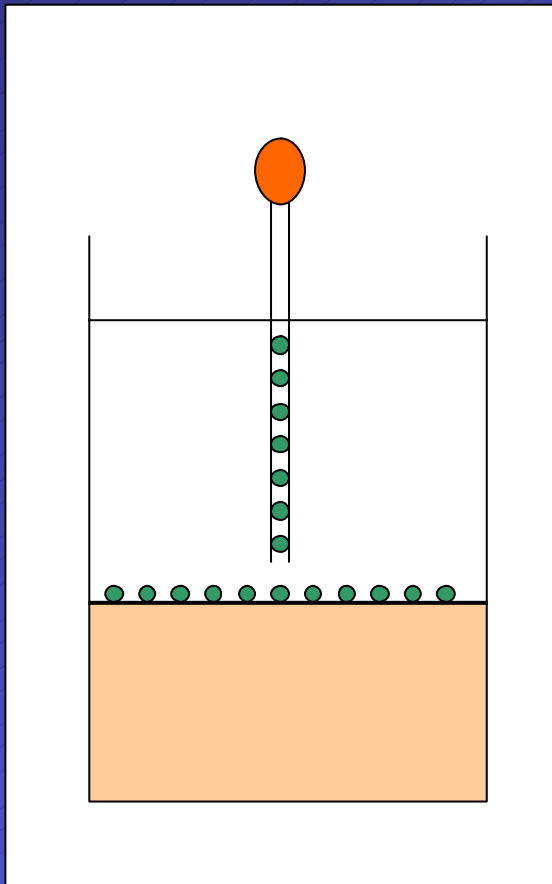
Methodology

Benthic pelagic coupling: sampling



Methodology

Benthic pelagic coupling: experiments



- Basic Tools: ^{13}C and ^{15}N enriched OM (Diatoms and Phaeocystis) cultured in the lab as tracer
- Incubation of sediment cores at bottom water temperature
- Create deposition event and follow uptake in the different taxa through ^{13}C -enrichment

Methodology

Benthic pelagic coupling: modelling

Approach:

Data from main field campaigns + isotope tracer experiments



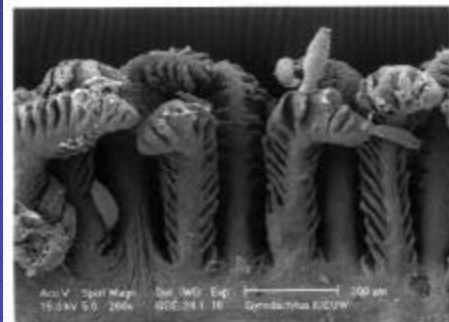
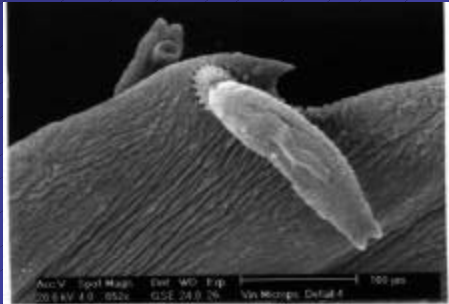
Compute coherent benthic food web flows through "Inverse Modelling"

(NIOO-CEME)

Methodology

Life history and dispersal of key species

Gyrodactylus - flatworm



Pomatoschistus minutus - sand goby



Solea solea - Dover sole

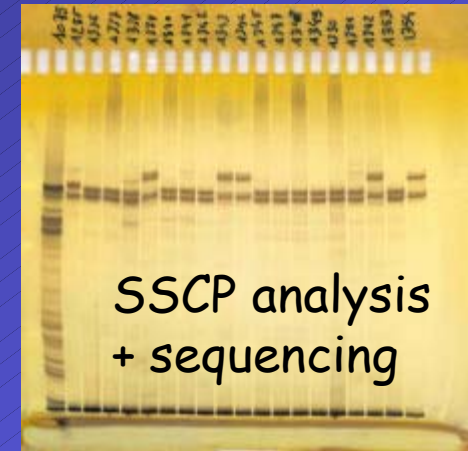


Mesopodopsis slabberi - mysid



Sprattus sprattus - sprat

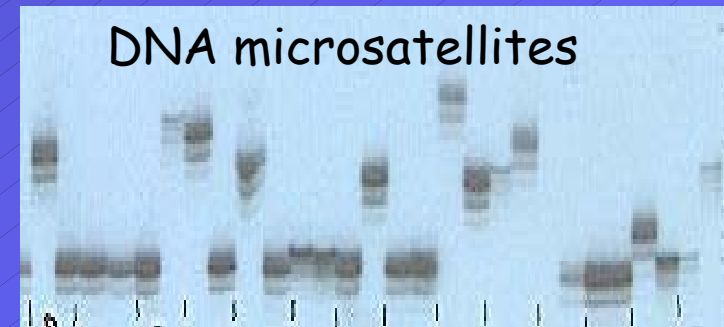




Mesopodopsis slabberi

GENOTYPING

Gyrodactylus, Pomatoschistus, Solea solea
& Sprattus sprattus

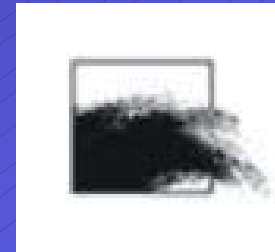


Expected results: population structure, gene flow and population dynamic parameters

Methodology

Life history and dispersal of key species

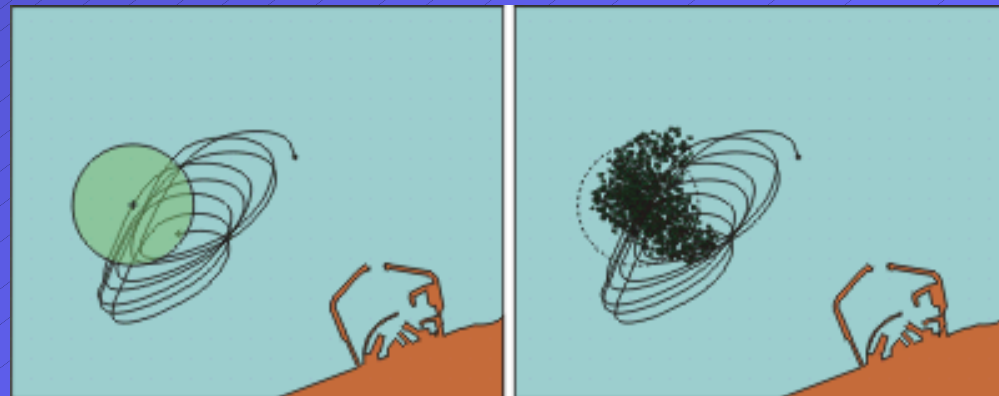
MODELLING



Pelagic behaviour (eg retention, dispersal and aggregation) of the fishes and *Mesopodopsis*



Expected result: a 3-D
particle tracking model

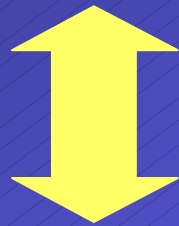


Piscivorous - avian coupling I

Temporal and spatial
distribution of pelagic fish
(UG)



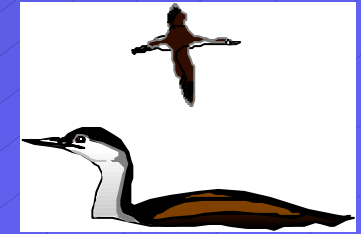
Sampling using midwater trawl-net



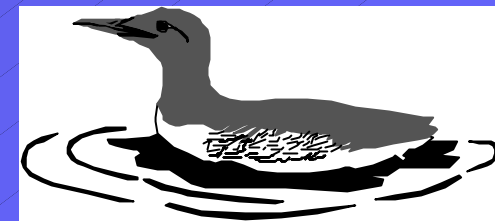
Distribution of piscivorous
seabirds (IN)



terns



grebes and divers



auks

Piscivorous - avian coupling II

Terns as bio-indicators



Shifts in prey fish
availability



- food composition
- fitness consequences
- foraging decisions
- population size and dispersal

Scientific output

- Unravelling the benthic food web
- Fate of Phaeocystis
- life history characteristics, gene flow and population structure of key species
- 3-D particle tracking model
- Understanding distribution patterns and behaviour of seabirds

DATA MANAGEMENT



- Metadatabase (cruises, papers,...): public
- Database with supporting data: public
- Scientific database (restricted)
- Archiving of data + data rescue (\pm public)

- Data exchange (between scientists)
- Contacts with IDOD, IODE/GCMD,...

Valorisation



- Website
(<http://www.vliz.be/projects/trophos/>)
- News letters, electronic magazine,...of VLIZ
- Towards: scientists, administration (OSTC, IDOD), end users (government, management)
"broad" public, ...