Understanding planktonic systems: Update and links to the MSFD

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Key messages

- MSFD indicators and targets developing at UK and OSPAR levels
- Development of biodiversity indicators challenging
- Integration of monitoring datasets crucial for representative assessments
- Preservation of multi-decadal biological t-s should be a priority

Marine Strategy Framework Directive (MSFD)

Objective: to achieve Good Environmental Status (GES) of Europe's seas by 2020

1. Biodiversity

- 2. Non-indigenous species
- 3. Fisheries
- 4. Marine food webs
- 5. Eutrophication
- 6. Sea floor integrity
- 7. Hydrographical conditions
 8. Pollution
 9. Contaminants
 10. Marine litter
 11. Energy and noise

The MSFD: Where are we now?

Indicators Good Environmental Status!





Process happening at Member State AND OSPAR levels

How does the MSFD process work?



Who cares about plankton?

Plankton res Major eco biodiversit Climate ch Links betw J pressures Changes in

he shifts, hing, OA ropogenic

Challenge: Indicator species vary geographically

Research from
 Continuous Plankton
 Recorder (CPR) survey
 shows northward shifts of
 1000 km!

Beaugrand et al, Science

Warmtemperate pseudo-oceanic species

1958-1981

1982-1999

2000-2002

2003-2005

60°N

50°N

60°N

50°N

60°N

50°N

60°N

50°N

Subarctic species

1958-1981



1982-1999



2000-2002



2003-2005



0.0 0.4 0.8

0.00 0.04 0.08 Mean number of species per CPR sample

per assemblage

Challenge: Multiple datasets, multiple methods



- UK has no centralized monitoring programme
- Sampling varies in
 - Frequency
 - Spatial representativity (single points vs CPR)
 - Time-series length varies
 - Limited zooplankton sampling
 - Method of collection
 - Method of analysis
 - Level of taxonomic res.

McQuatters-Gollop 2012 Phil Trans Gowen, McQuatters-Gollop et al 2013 Defra

Integration is key: Continuous Plankton Recorder (CPR) vs. W Channel Obs L4





- 1948-present
- Monthly resolution
- Unique sampling method CPR
- Large spatial area –
- spatially representative
- Phytoplankton Colour Index

- 1988 (zoo), 1992 (phyto) present
- Weekly resolution
- Traditional net tows (zoo), bottle (phyto)
- Single point sampling
- Chlorophyll from water sample (HPLC)

Challenge: Climate change or MSFD pressure?



cator of omass istal —

patterns

McQuatters-Gollop, et al 2007 L&O McQuatters-Gollop & Vermaat 2011 J of Sea Rsrch

We need to preserve time-series!!



- Helps identify change
- Baseline selection
- Separate longterm signal from natural variability

McQuatters-Gollop et al 2007 L&O McQuatters-Gollop 2012 Phil Trans

JK Solution: The lifeform approach



Tett et al 2008, ICES Journal of Marine Science Gowen, McQuatters-Gollop et al 2013 Defra

Challenge: Setting targets

ot

• Need targets which: Allow climate changes, trigger management action if *manageable* anthropogenic pressure detected



McQuatters-Gollop 2012 Phil Trans Gowen, McQuatters-Gollop et al 2013 Defra

Deja vu: upscaling – from UK to OSPAR

- The same challenges, again
- Retain UK expertise -> apply to OSPAR level
- Multiple member state monitoring datasets
- -> lifeforms
 - One European scale dataset: Continuous Plankton Recorder -> provides regional perspective required by MSFD

Current challenge: Monitoring

- MSFD wants consistency and comparability in ecological datasets
- Is this possible/practical/best way? What about different but comparable?
- Time-series preservation key cost effective, baselines, pressure attribution
- UK level and OSPAR level
- Monitoring public consultation in UK now underway

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Thank you!



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The Continuous Plankton Recorder (CPR)

Plankton are excellent indicators
SAHFOS
Longest, most spatially extensive oceanic monitoring program in the world





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