Community structure of the macrozoobenthos and demersal fish in the Belgian North Sea

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INTRODUCTION

▪ The ocean → important, focus on marine ecosystems is necessary

▪ In the North Sea, research has been conducted :
  • Impact of fisheries
  • Eutrophication
  • Sediment extraction
  • Pollution by trace metals and polychlorbiphenyls

AIM

1. Investigate the community structure of the macrozoobenthos and demersal fish
2. Identify the relationships between environmental factors or anthropogenic impacts
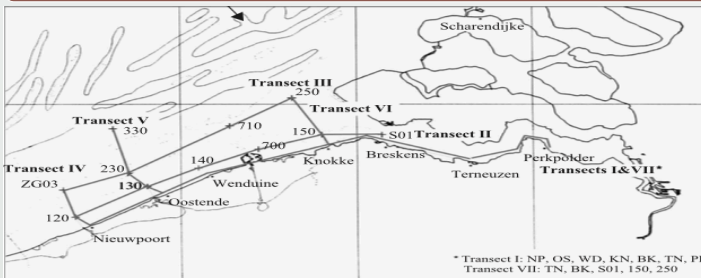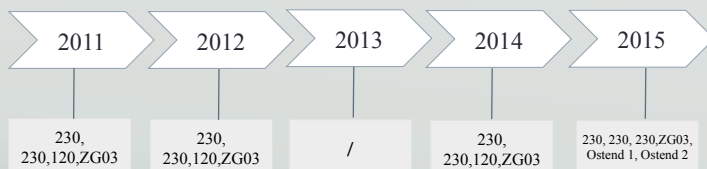
MATERIAL & METHOD

Figure 1: Sampling stations 230, ZG03 and 120, Danis et al 2004

Pictures by Lina De Borger & Marc Kochzius

▪ Samples were taken with the RV Simon Stevin using a beam trawl

▪ Three different stations in the Belgian North Sea
  ➤ 230, ZG03 and 120

▪ After beam trawling → samples were examined on board

▪ The organisms were identified and number of weight of individuals was recorded

▪ Stations 230, ZG03 and 120 :
  ➤ Similar salinity : +/- 32,7 p.s.u.
  ➤ Similar granulometry : 125-250 μm

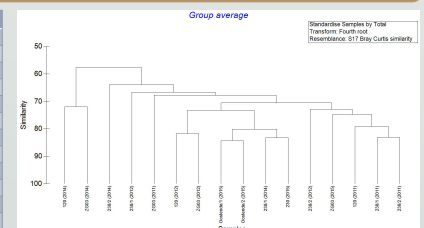▪ Program PRIMER V6
  ➤ Diversity indices
  ➤ Cluster analysis

SAMPLING DATA

2011 → 2012 → 2013 → 2014 → 2015

2011	2012	2013	2014	2015
230, 230,120,ZG03	230, 230,120,ZG03	/	230, 230,120,ZG03	230, 230, 230,ZG03, Ostend 1, Ostend 2

RESULTS

Group average

Sample station	Species Richness	d (Margalef's diversity index)	J (Pielou's evenness index)	H (Shannon diversity index)
230/1 (2011)	10	1,954325169	0,400099781	0,921097064
230/2 (2011)	12	2,38861965	0,48610037	1,20791404
120 (2011)	16	3,257208614	0,371034966	1,02872785
ZG03 (2011)	15	3,040061373	0,417544044	1,13073023
230/1 (2012)	8	1,520593687	0,48325297	1,00489630
230/2 (2012)	18	3,691503096	0,308801802	0,89251200
120 (2012)	19	3,908050337	0,390584927	1,15005348
ZG03 (2012)	14	2,822914132	0,380874908	1,00525071
230/1 (2014)	12	2,38861965	0,551615264	1,37071243
230/2 (2014)	15	3,040061373	0,60250339	1,63160942
120 (2014)	20	4,125797578	0,224508381	0,67274674
ZG03 (2014)	15	3,908050337	0,470800355	1,38624291
230 (2015)	16	3,257208614	0,457513669	1,26849723
ZG03 (2015)	18	3,691503096	0,491147894	1,41960000
Oostende/1 (2015)	15	3,040061373	0,443736513	1,20166075
Oostende/2 (2015)	15	3,040061373	0,338319675	0,91658966

Table 1 : Diversity indices

Graph 1 : Group average ; Fourth root transformation

Standardise Samples by Total
Transform: Fourth root
Resemblance: S17 Bray Curtis similarity

CONCLUSION

• Shannon diversity index (H) : low → might indicate habitat degradation or environmental pollution
• Pielou index (J) : below 0,5 → different species are not equally abundant, some species dominate the community
• Station 120 & ZG03 : Usually clustered together

• Ostend 2015: clusters together
• Station 120 : Highest metal & polychlorbiphenyl concentration
• ZG03 : Located close to areas of sand extraction
• The appearance of groups is dependent of the transformation and linkage

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