Education and Culture
Lifelong Learning Programme
ERASMUS

SUMMER SCHOOL

ECOLOGICAL STATE OF LAKE DUROWSKIE BASING ON

- ALGAE-

Aursulesei Iulia Geanina (UAIC)
Izabela Chrobak (UAM)
Tiruneh, Desalegn-aberra (CAU)
Katarzyna Majkowska (UAM)

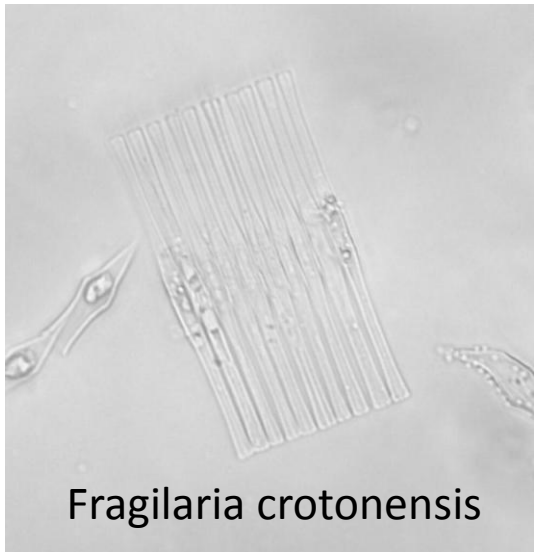
Supervisor: Dr Beata Messyasz (UAM)

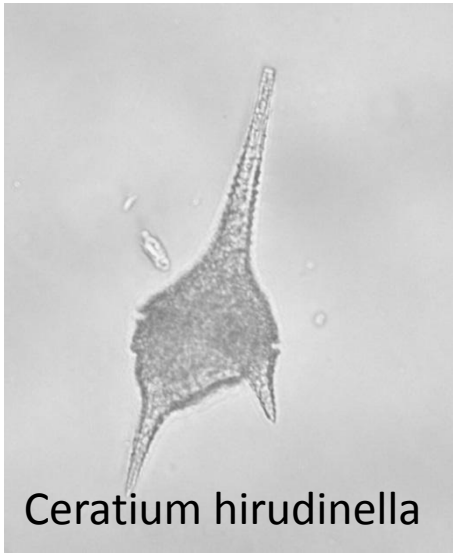
Poznań and Wągrowiec, 30th June – 14th July 2013

Education and Culture
Lifelong Learning Programme
ERASMUS

Introduction

- Phytoplankton gather photosynthesizing microscopic organisms with an important role in determining the ecological state of waters.
- They are the first organisms that react to changes in their ecosystem.

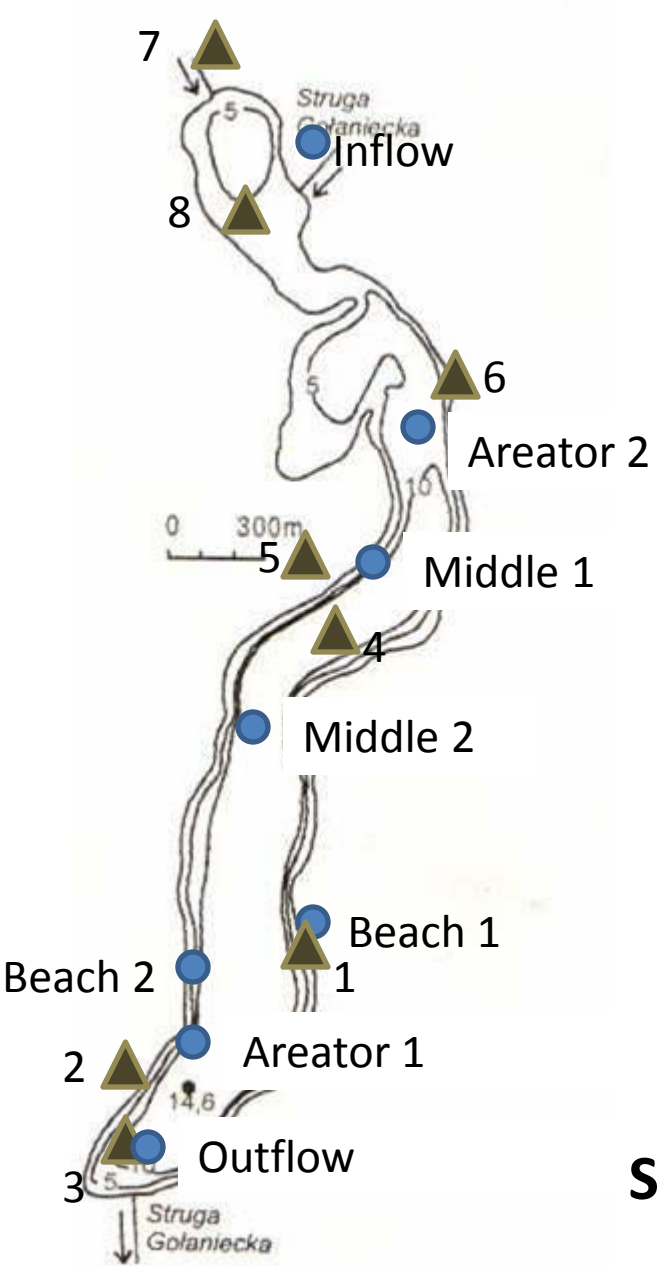

Fragilaria crotonensis


Ceratium hirudinella


Dinobryon sp.

Education and Culture
Lifelong Learning Programme
ERASMUS

Methodology



Phytoplankton

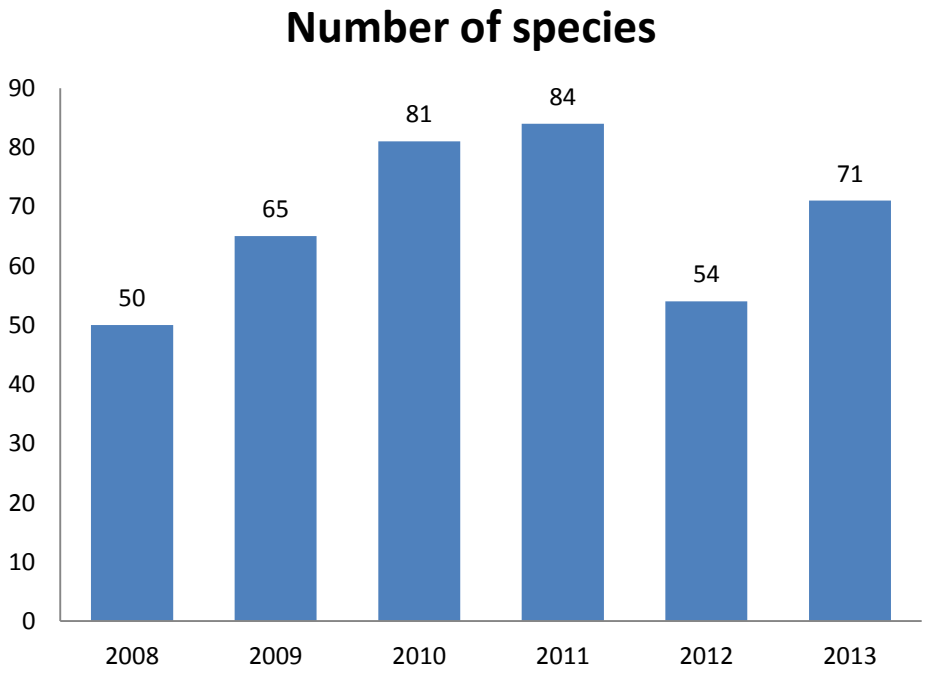
Periphyton

Sampling sites

Jaccard Index – results [%]

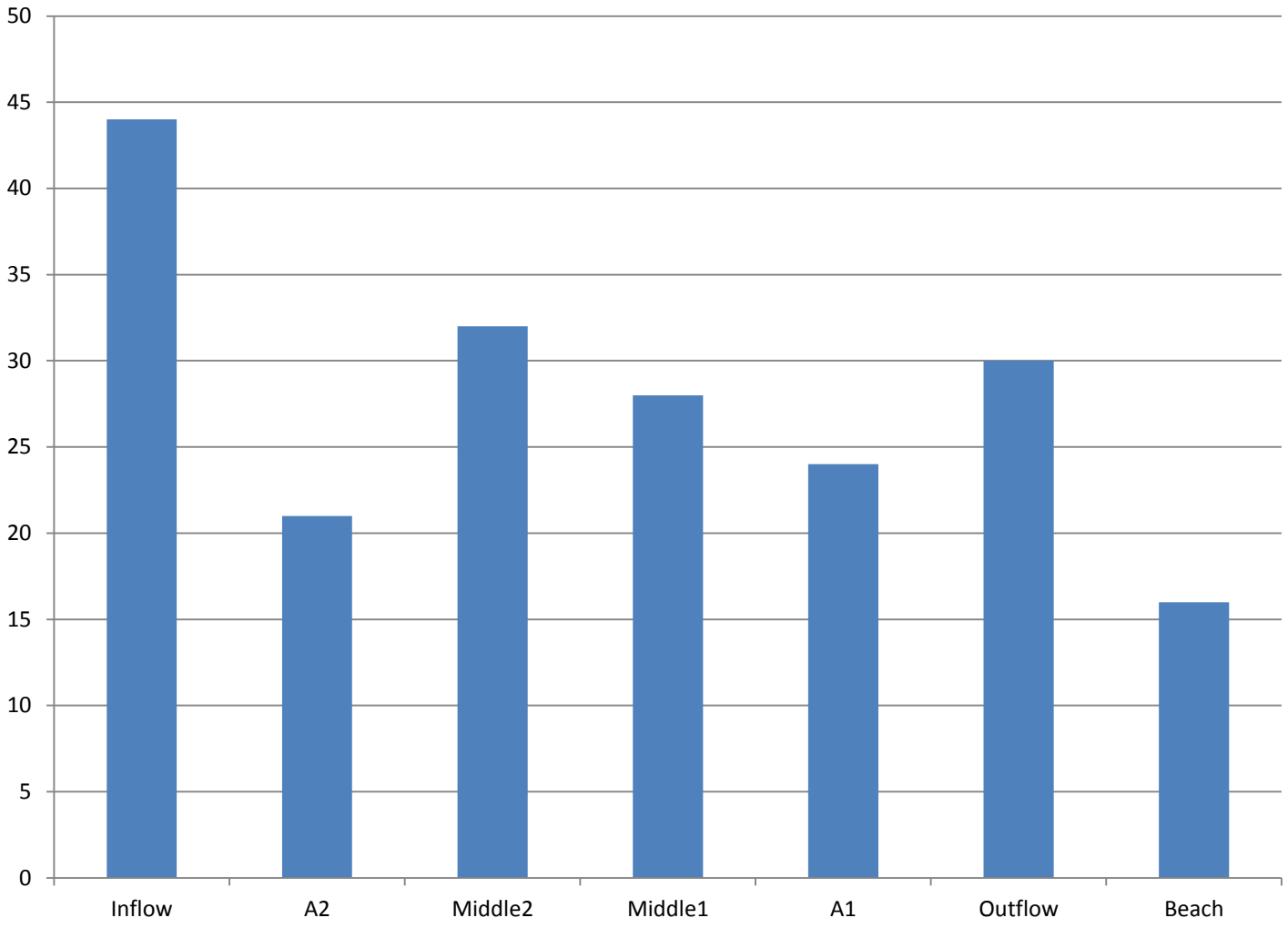
YEAR	2009	2010	2011	2012	2013
2008	84	51	43	33	40
2009	-	48	28	20	29
2010	-	-	42	42	62
2011	-	-	-	34	58
2012	-	-	-	-	77

The Jaccard index was determined to compare the variations of phytoplankton and periphyton communities between 2008 and 2013.



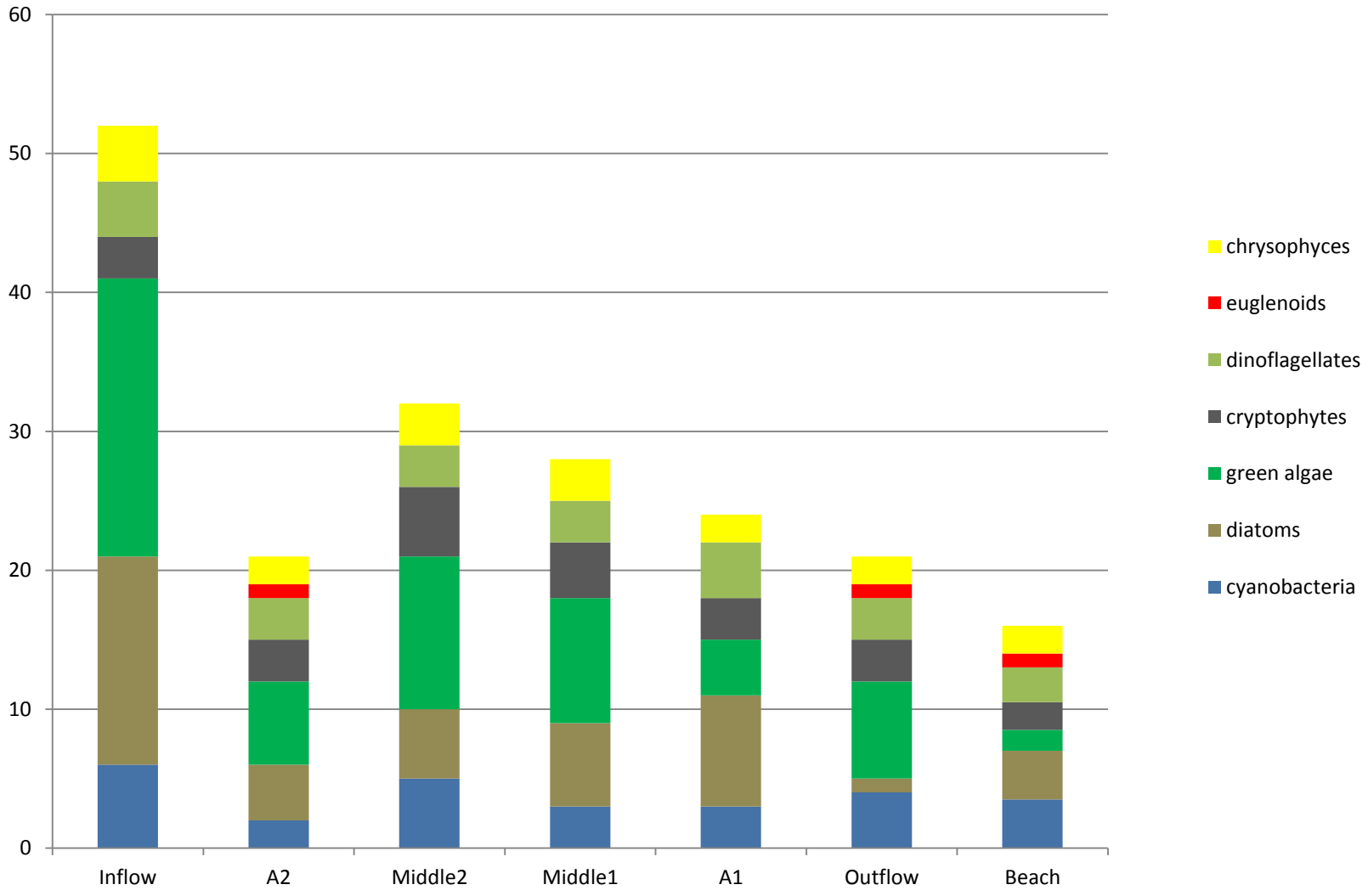
Education and Culture
Lifelong Learning Programme
ERASMUS

Total number of phytoplankton species



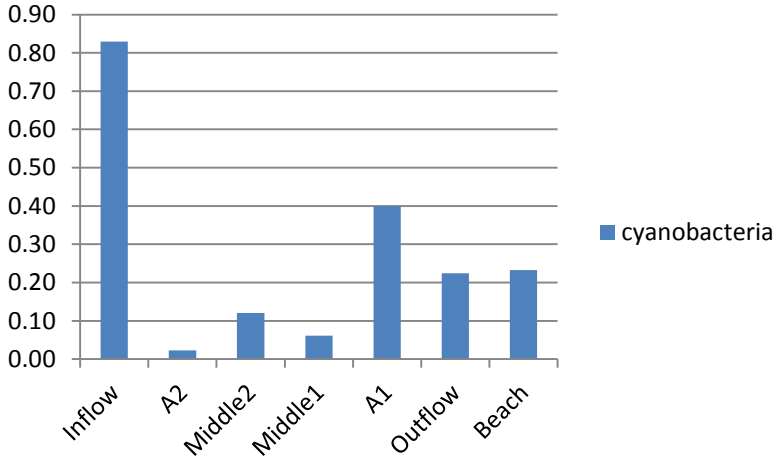
Education and Culture
Lifelong Learning Programme
ERASMUS

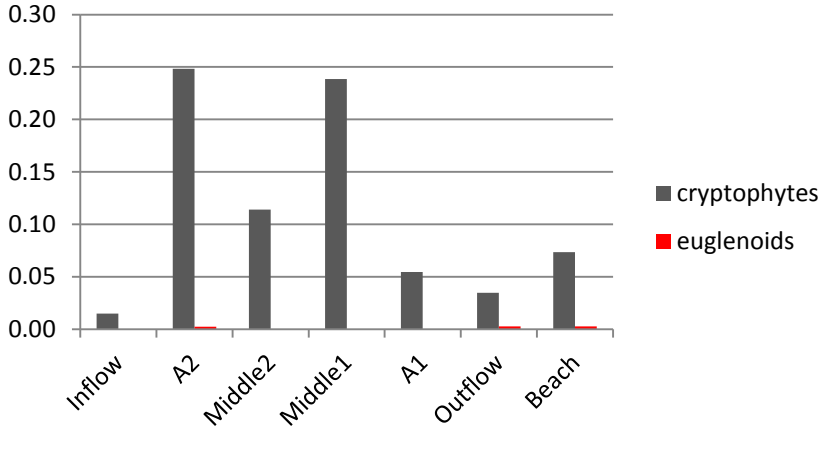
Number of species in every group of algae

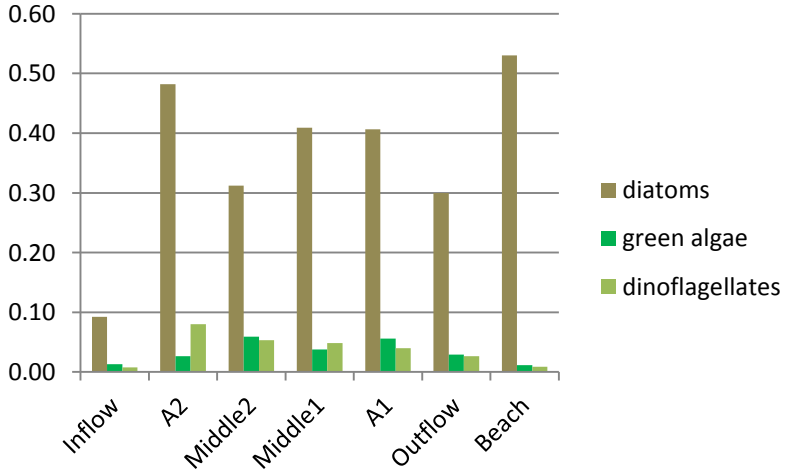


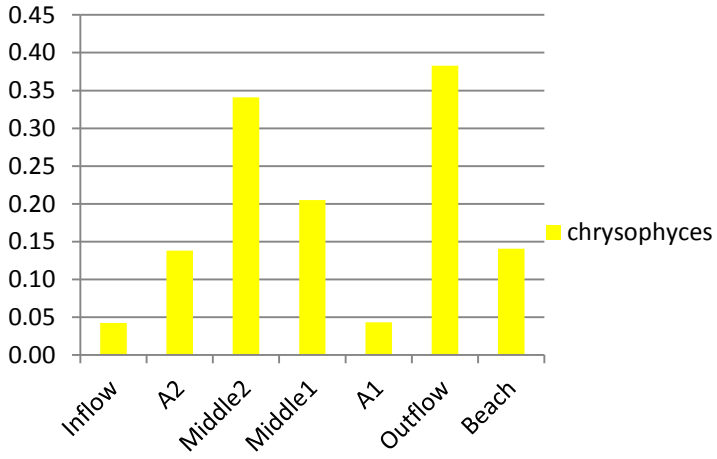
Education and Culture
Lifelong Learning Programme
ERASMUS

Number of algae groups in %









Education and Culture
Lifelong Learning Programme
ERASMUS

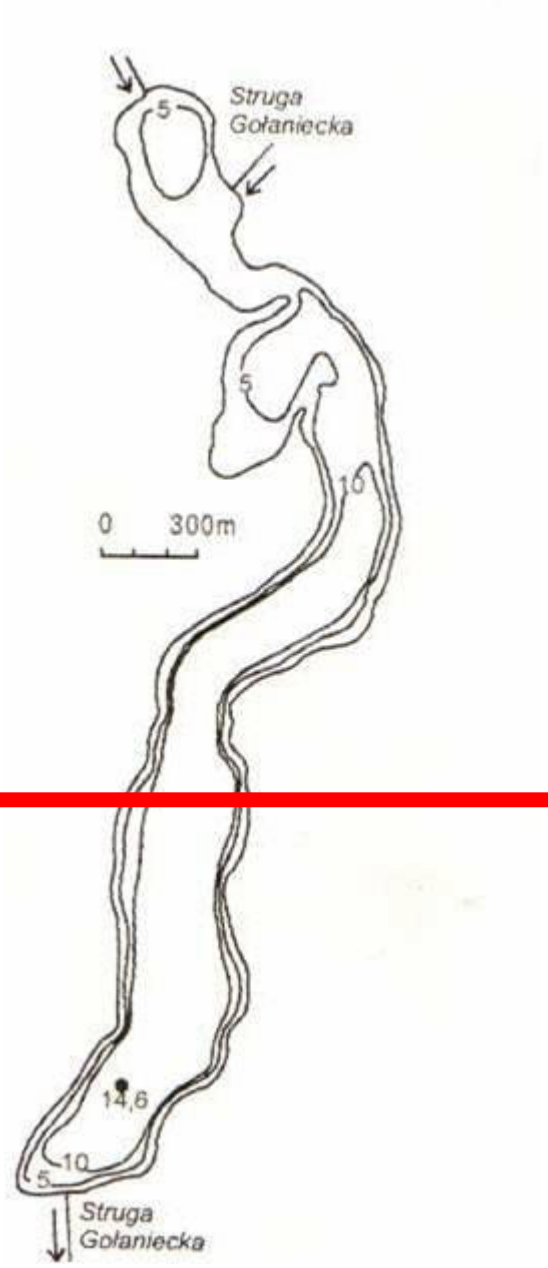
The mixed index of Nygaard is based on the number of species from all sorts taxonomical groups of algae

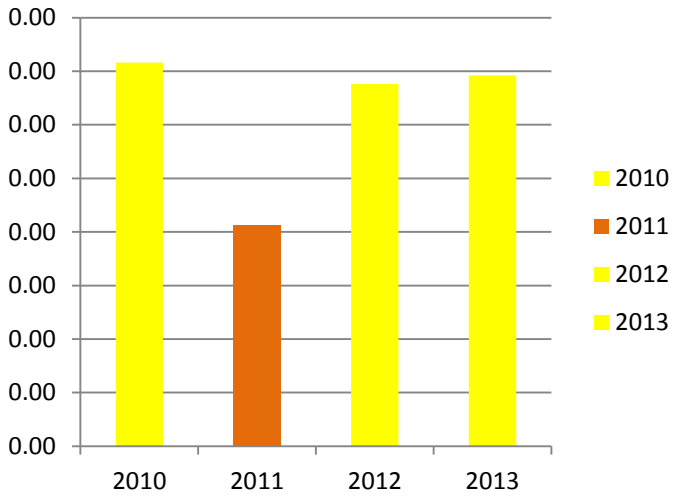
Station	2008	2009	2010	2011	2012	2013	Trophyc State
Aerator 1	9,67	16	8,3	9	7	8	Hypertrophy
Aerator 2	-	26	11,5	5	8	14	Hypertrophy
Middle 1	-	9	12,5	13	3	5,5	Hypertrophy
Middle 2	-	-	8,3	18	9	7,5	Hypertrophy
Inflow	-	-	1,8	17	9	19	Hypertrophy
Outflow	-	-	6,5	5	-	12	Hypertrophy
North	-	-	11,5	5,3	-	-	Hypertrophy
Beach 1	-	-	-	3	9	7	Hypertrophy
Beach 2	-	-	-	-	5	6	Hypertrophy

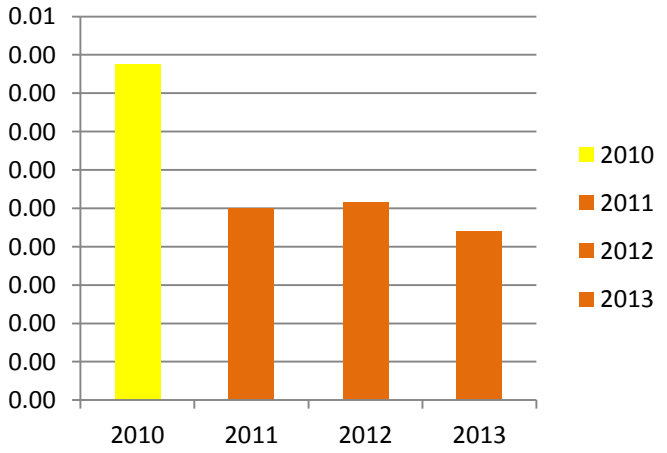
Legend	Result
Dystrophic	0 - 0.3
Oligotrophic	< 1.0
Mesotrophic	1.0 - 2.5
Eutrophic	3 - 5
Hypertrophic	5 - 43

Education and Culture
Lifelong Learning Programme
ERASMUS

Diatom index





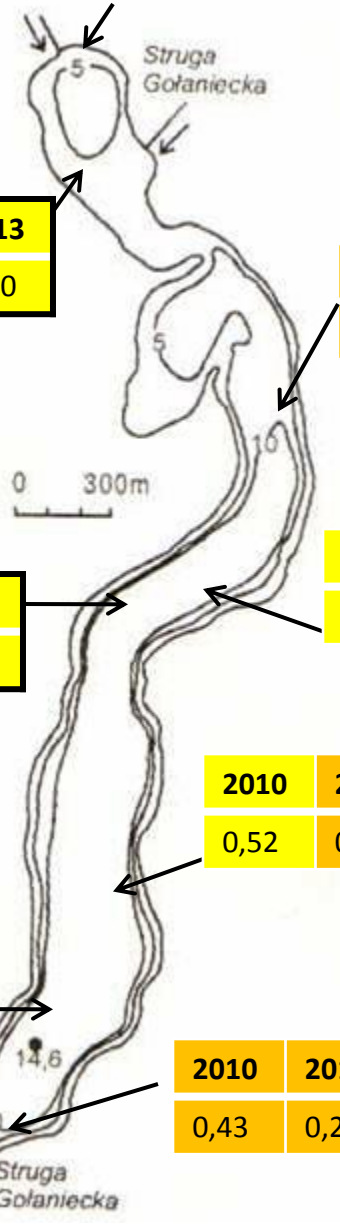


>0,83	Very good
0,55	Good
0,30	Moderate
0,15	Poor
<0,15	Bad

Education and Culture
Lifelong Learning Programme
ERASMUS

Diatom index

2010	2011	2012	2013
0,29	0,28	0,32	0,33



2010	2011	2012	2013
0,28	0,26	0,33	0,40

2010	2011	2012	2013
0,28	0,26	0,33	0,40

2010	2011	2012	2013
0,43	0,29	0,29	0,34

2010	2011	2012	2013
0,40	0,20	0,54	0,27

2010	2011	2012	2013
0,52	0,22	0,23	0,28

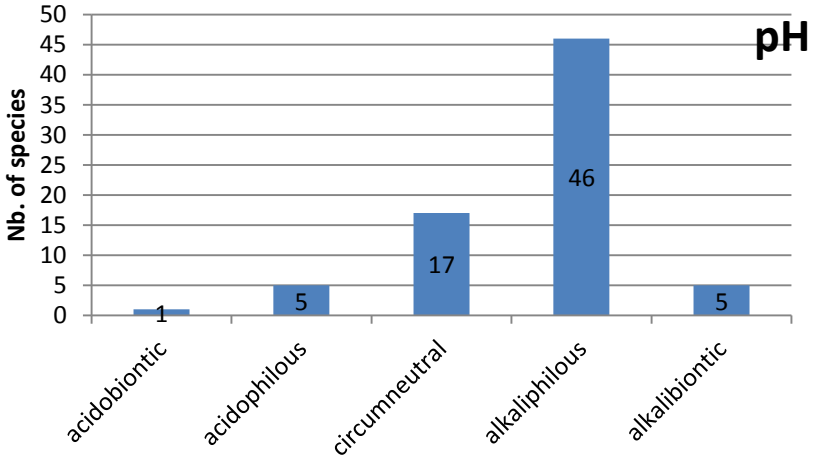
2010	2011	2012	2013
0,36	0,30	0,23	0,15

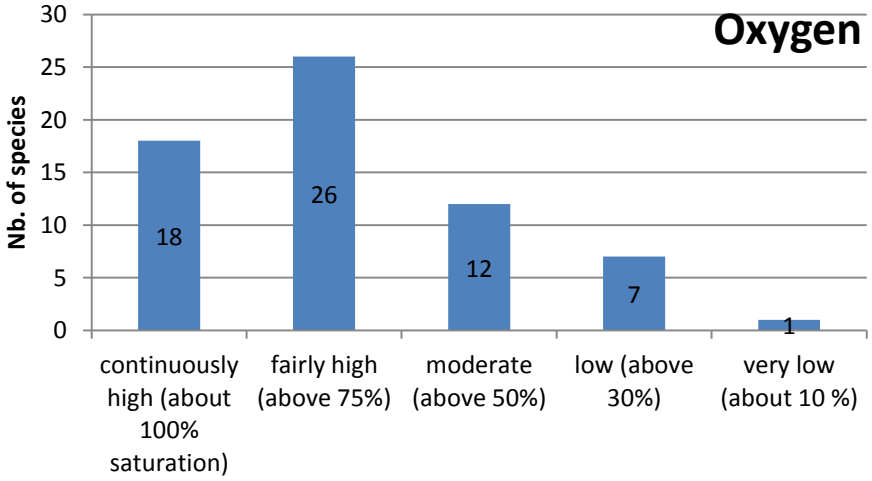
2010	2011	2012	2013
0,43	0,23	0,31	0,23

>0,83	Very good
0,55	Good
0,30	Moderate
0,15	Poor
<0,15	Bad

Education and Culture
Lifelong Learning Programme
ERASMUS

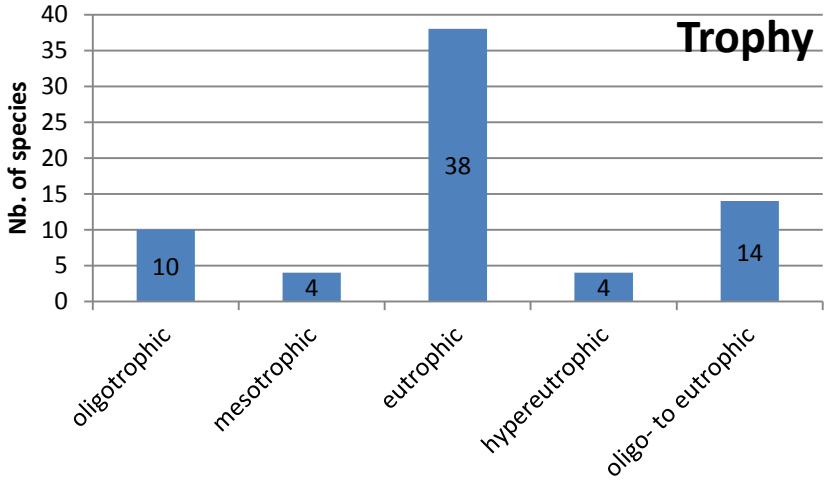
Ecological preferences of indicator species





Dominant species

1. Achnanthes minutissima var. affinis
2. Cymbella affinis
3. Amphora pediculus



Education and Culture
Lifelong Learning Programme
ERASMUS

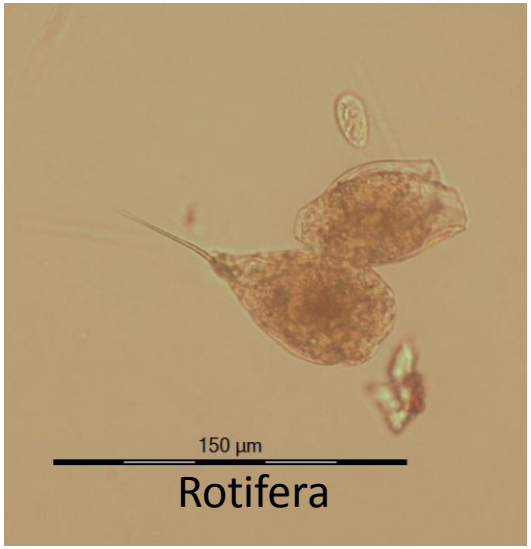
Fresh Water Red Algae – *Hildebrandia rivularis*

(http://upload.wikimedia.org/wikipedia/commons/9/99/Hildenbrandia_rivularis_02_by-dpc.jpg)

Education and Culture
Lifelong Learning Programme
ERASMUS

Zooplankton

- Dominance of small species- Rotifers
- Lack of larger species – Cladocerans
- Abundance of planktivorous fish



Rotifera

Copepoda

Education and Culture
Lifelong Learning Programme
ERASMUS

Conclusions

- 40% of similarity in species composition with 2008
- Nygaard index – high trophy
- Diatom index – difference between northern and southern part
- Alkaline ph, fairly high oxygen concentration, eutrophic state
- New stations of *Hildenbrandia rivularis*
- Dominance of small zooplankton species

THANK YOU FOR YOUR ATTENTION!

DZIEKUJEMY ZA UWAGE!

MULŢUMIM PENTRU ATENŢIE!

VIELEN DANK FÜR IHRE AUFMERKSAMKEIT!