Euro-limpacs

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Dissemination Level (tick appropriate box)		
PU	Public	PU
PP	Restricted to other programme participants (including the Commission Services)	
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CO	Confidential, only for members of the consortium (including the Commission Services)	

Introduction

The report is focusing on the effort of filling in the gaps in data identified during the last report, in order to better sustain the data analysis for achieving the aims of the task 4.4.

Aim of the task 4.4:
As defined in the project application the aims of the task 4.4 are:

1. Identification of effects of climate change on the buffer capacity of river marginal wetlands (along the lower stretches of large rivers) – Study case: Lower Danube Wetland System/ Small Island of Braila;
2. Analysis of knowledge on the relationships between riparian wetlands and adjacent surface waters including identification of gaps and requirements for new information.

The approach for the task 4.4 was already presented in the previous activity report (deliverable 50).

ACTIVITIES during reporting period

a. Collecting the data and filling the gaps along the first growth season
b. Activities for supplementing data sets by collating new field data and laboratory experimentation including development of specific protocols for investigation of sediment /nutrient retention, and processes like mineralization rate and denitrification.
c. Preliminary evaluation of the impact of shifts in the functioning of marginal wetlands mediated by climate change on adjacent surface waters and landscapes;
d. Statistical analysis of the data sets focusing on establishing relationships between climate and hydrological time series and TDM's;

The previous report included existing data, short gaps analysis and the task to be undertaken in order to reach the objectives of the Task 4.4 as follows:

I) Existing data
Two categories of information have been collected and will need further attention in the next period for different analyzes:

- Large data sets on the dynamics of the structural and functional parameters of the main TDMs, HGMUs, local climate and river hydrology appropriate for further statistical processing;

- Knowledge explaining dynamics of the dominant populations in relation with local and large distance (catchments) driving forces: mechanisms of response to hydrological regime, trophic state, light, moisture and seasonality conditions, as well as on structural and functional relationships between different ecosystems.

II) Identified data gaps

A gap analysis pointed out some of the important problems identified both in the data set and in the tools needed for the analysis:

- Un-complementarities between some data sets both spatially (different systems) and temporally (for different time periods);
- Lack of efficient tools for scaling up from local ecosystem to landscape level;
- Inadequate modeling of specific and complex regional landscape of LDWS;

As established for both Danube Delta and Braila Islands, the hydrology is far more important that the on site climate effect. As a result we have focused our attention on investigating the links between the parameters of the hydrological regime (discharge and/or water level) and different biological structures (ecosystems, dominant groups of species and/or dominant species/populations).

New data collected during the growth season

The dataset was enlarged with new data coming from the monitoring programme (including zoobentos, phytoplankton, and zooplankton, chemical and physical data). New data were gathered concerning the discharge and level data of the Danube River. In the same time important data were added regarding the water level in shallow floodplain and delta lakes.

During last year (2006), new data have been collected on zoobentos structure (table 1) – including taxa composition as well as numerical abundance in 5 lakes and one channel from Danube Delta and RMW from Braila Islands. For this, two field trips have been organized in the Danube Delta and Braila Islands during high water levels and respectively during low water levels.
Collected data comes to fill in the gaps regarding the response of the selected compartments (phytoplankton, zooplankton, zoobentos) to unusual high Danube river discharge and high water level in lakes (observed during the year 2006). Samples are in different stages of processing (examples of collected data on aquatic invertebrates are presented in Table1).

Table 1. Examples of results on processing invertebrates collected in the Lower Danube Wetland System in 2006.

site	sampling data	taxa group	genus	species	life stage	abundance m^{-2}	sample surface area	Abundance/ sample
Baclanesti lake	22.09.2006	OLIGOCHAETA				2529	0,017	43
Baclanesti lake	22.09.2006	GASTEROPDA	Bithynia	tentaculata	ad	2059	0,017	35
Baclanesti lake	22.09.2006	GASTEROPDA	Valvata	piscinalis	ad	59	0,017	1
Baclanesti lake	22.09.2006	EPHEMEROPTERA				176	0,017	3
Baclanesti lake	22.09.2006	ODONATA				59	0,017	1
Baclanesti lake	22.09.2006	TRICHOPTERA				59	0,017	1
Baclanesti lake	22.09.2006	CHIRONOMIDAE	Paratanytarsus	austriacus	III	706	0,017	12
Baclanesti lake	22.09.2006	CHIRONOMIDAE	Parachironomus	pararostratus Harn. 1923	III	59	0,017	1
Baclanesti lake	22.09.2006	CHIRONOMIDAE	Psectrocladius	psilopterus	III	118	0,017	2
Baclanesti lake	22.09.2006	CHIRONOMIDAE	Cricotopus	flavocinctus	III	294	0,017	5
Merhei Lake	21.09.2006	OLIGOCHAETA				1235	0,017	21
Merhei Lake	21.09.2006	ACARINA				59	0,017	1
Merhei Lake	21.09.2006	GASTROPODA	Bithynia	tentaculata	ad	118	0,017	2
Merhei Lake	21.09.2006	GASTROPODA	Valvata	piscinalis	ad	59	0,017	1
Merhei Lake	21.09.2006	EPHEMEROPTERA				470	0,017	8
Merhei Lake	21.09.2006	CHIRONOMIDAE	Ablabesmyia	monilis	III	176	0,017	3
Merhei Lake	21.09.2006	CHIRONOMIDAE	Procladius	choreus	III	59	0,017	1
Merhei Lake	21.09.2006	CHIRONOMIDAE	Corynoneura	celeripes	III	294	0,017	5
Merhei Lake	21.09.2006	CHIRONOMIDAE	Cricotopus	sylvestris	III	412	0,017	7
Merhei Lake	21.09.2006	CHIRONOMIDAE	Cricotopus	flavocinctus	III	294	0,017	5

site	sampling data	taxa group	genus	species	life stage	abundance/ m2	sampling aria	abundance/ sampling area
Merhei Lake	21.09.2006	CHIRONOMIDAE	Psectrocladius	psilopterus	III	176	0,017	3
Merhei Lake	21.09.2006	CHIRONOMIDAE	Metriocnemus	scirpi (Kieff. 1906)	III	118	0,017	2

Merhei Lake	21.09.2006	CHIRONOMIDAE	Propsilocerus	danuabilis (Botn. &Albu, 1956)	III	3588	0,017	61
Merhei Lake	21.09.2006	CHIRONOMIDAE	Tanytarsus	sp.	III	2529	0,017	43
Merhei Lake	21.09.2006	CHIRONOMIDAE	Chironomus	plumosus	II	1470	0,017	25
Merhei Lake	21.09.2006	CHIRONOMIDAE	Dicrotendipes	nervosus	III	118	0,017	2
Merhei Lake	21.09.2006	CHIRONOMIDAE	Polypedilum	exsectum	II	118	0,017	2
Merhei Lake	21.09.2006	CHIRONOMIDAE	Parachironomus	pararostratus Harn. 1923	II	235	0,017	4
Merhei Lake	21.09.2006	CHIRONOMIDAE	Paratanytarsus	austriacus	III	118	0,017	2
Merhei Lake	21.09.2006	CHIRONOMIDAE	Heleniella	ornaticollis	III	59	0,017	1
Matita Lake	21.09.2006	NEMATOMORPHA	Gordius	sp.		59	0,017	1
Matita Lake	21.09.2006	OLIGOCHAETA				3882	0,017	66
Matita Lake	21.09.2006	CULICIDAE	Chaoborus	sp.		59	0,017	1
Matita Lake	21.09.2006	CHIRONOMIDAE	Procladius	choreus	III	647	0,017	11
Matita Lake	21.09.2006	CHIRONOMIDAE	Heleniella	ornaticollis	III	59	0,017	1
Matita Lake	21.09.2006	CHIRONOMIDAE	Propsilocerus	danuabilis (Botn. &Albu, 1956)	III	3529	0,017	60
Matita Lake	21.09.2006	CHIRONOMIDAE	Einfeldia	carbonaria	IV	4706	0,017	80
Matita Lake	21.09.2006	CHIRONOMIDAE	Parachironomus	pararostratus Harn. 1923	III	59	0,017	1
Babina Lake	21.09.2006	OLIGOCHAETA				3471	0,017	59
Babina Lake	21.09.2006	CULICIDAE	Chaoborus	sp.		59	0,017	1
Babina Lake	21.09.2006	CERATOPOGONIDAE				176	0,017	3
Babina Lake	21.09.2006	CHIRONOMIDAE	Procladius	choreus	III	118	0,017	2

site	**sampling data**	**taxa group**	**genus**	**species**	**life stage**	**abundance/ m2**	**sampling aria**	**abundance/ sampling area**
Babina Lake	21.09.2006	CHIRONOMIDAE	Propsilocerus	danuabilis (Botn. &Albu, 1956)	III	4765	0,017	81
Babina Lake	21.09.2006	CHIRONOMIDAE	Tanytarsus	sp.	III	118	0,017	2
Babina Lake	21.09.2006	CHIRONOMIDAE	Chironomus	plumosus	II	235	0,017	4
Babina Lake	21.09.2006	CHIRONOMIDAE	Einfeldia	carbonaria	IV	294	0,017	5
Babina Lake	21.09.2006	CHIRONOMIDAE	Parachironomus	pararostratus Harn. 1923	II	59	0,017	1

Trei Iezere Lake	21.09.2006	OLIGOCHAETA				2706	0,0085	23
Trei Iezere Lake	21.09.2006	ODONATA				353	0,0085	3
Trei Iezere Lake	21.09.2006	TRICHOPTERA				118	0,0085	1
Trei Iezere Lake	21.09.2006	EPHEMEROPTERA				118	0,0085	1
Trei Iezere Lake	21.09.2006	CHIRONOMIDAE	Procladius	choreus	III	118	0,0085	1
Trei Iezere Lake	21.09.2006	CHIRONOMIDAE	Tanypus	kraatzi	III	118	0,0085	1
Trei Iezere Lake	21.09.2006	CHIRONOMIDAE	Paratanytarsus	austriacus	IV	1059	0,0085	9
Trei Iezere Lake	21.09.2006	CHIRONOMIDAE	Chironomus	plumosus	II	353	0,0085	3
Trei Iezere Lake	21.09.2006	CHIRONOMIDAE	Cladopelma	viridula	IV	118	0,0085	1
Trei Iezere Lake	21.09.2006	CHIRONOMIDAE	Parachironomus	pararostratus Harn. 1923	III	235	0,0085	2
Sontea Channel	22.09.2006	OLIGOCHAETA				3176	0,0085	27
Sontea Channel	22.09.2006	NEMATOMORPHA	Gordius	sp.		118	0,0085	1
Sontea Channel	22.09.2006	GASTEROPDA	Lithoglyphus	naticoides		1059	0,0085	9

The data sets were checked for any inconsistency with regard to quality. Different data were cross check (discharge data for 2 gauge stations along the Danube River, at Braila and Drobeta Turnu Severin) using other sources when this was possible in order to ensure the data quality (Fig. 1). As these are recovered data from different sources (as already mentioned from former projects) different methods have been used during time for the parameter estimation.

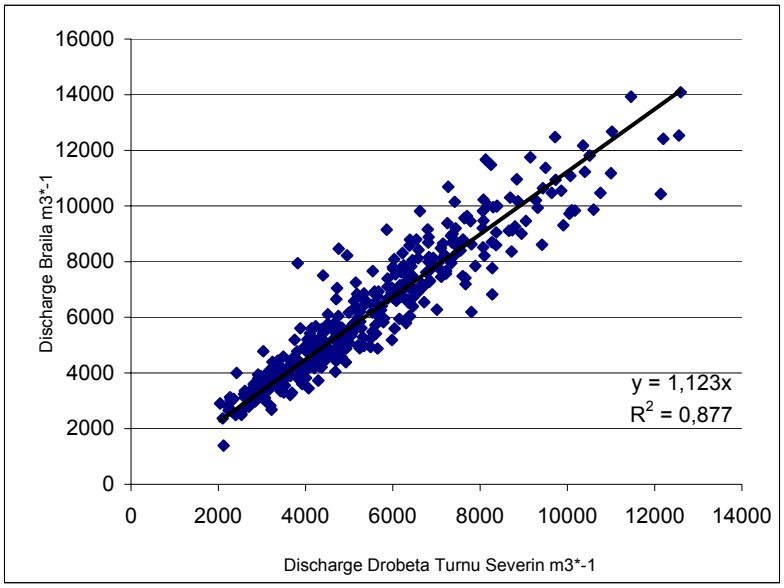

Figure 1. Regression based on Danube monthly mean discharge at two gauge stations (Braila and Drobeta Turnu Severin)

Two field protocols have been developed in order to characterize the dynamics of important parameters like mineralization and denitrification rates in different wetland types and the link with the temperature and hydrology.
Data collection will continue during the entire ongoing year (2007), with samples taken from 12 sampling sites with 5 replicates per station and with monthly sampling. A total of 540 samples will be processed and linked with a series of climatic and hydrological data. The aim is to develop a model that will link the denitrification and mineralization rates with the parameters that are controlling these processes (lake water level and discharge, water retention time, O_2 availability (for lakes), sediment nutrient content, organic matter content, redox potential, sediment pH, water and soil temperature).

FUTURE ACTIVITIES

Next 18 months activities:

- Climatic (t air, t water, pp) and hydrological data analysis for Small Island of Braila wetland system:
    a. Trend analysis ;

b. Frequency analysis;
c. Indices (e.g. number of tropical days, length of the vegetation season, number of days with frost etc);

- Emphasizing changes at ecosystem level of some key trophodynamic modules (MTD-phytoplankton, zooplankton and benthonic communities) at both structural and functional levels as a consequence of the hydrological characteristics (discharge/ flooding regimen) directly influenced by climatic characteristics
    a. Data input into database
    b. Statistical analysis of the existing data

- Analysing data in relation with the climate change scenarios
    a. Applying statistical multiple correlation models between water temperature, Danube level/discharge, water transparency, water depth, on one hand, and phytoplankton, zooplankton, benthos, on the other hand, for prediction related to climatic scenarios;

- Evaluate the effect of climate change on the buffer capacity (sediment /nutrient retention, and processes like mineralization rate and denitrification) of the floodplain wetlands.
    a. Field measurements (see developed protocols);
    b. Laboratory experiments on the denitrification, mineralization and respiration rate in different wetland types;
- Milestones:
    a. Data collection completed (month 48)
- Deliverables:
    a. Database completed (month 48)