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DANS₂
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Newsletter

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Danube Delta Supersite

For the Danube Delta Supersite component of the DANUBIUS-RI project, the best locations of scientifically critical importance were chosen, studied, proposed, and prepared to achieve all the project's scientific objectives, following its requirements and compliance with national and European legislation.

Following the trips and meetings held in Tulcea County, the analyzes performed by the implementation team for the Danube Delta Supersite, the measurement areas were determined - observation areas and locations for field stations, each with several observation points.

The seven locations of field research stations were selected to ensure the Danube Delta Supersite (Natural Laboratory)'s good functioning in optimal socio-economic conditions, with a minimal negative impact on the environment: Murighiol (future area HUB), Chilia Veche, Tulcea, Sulina, Sf. Gheorghe, Jurilovca and Grindu.

Each field station will have several observation points rounded off for data collection and sampling. The field stations will be located in existing buildings (Sulina) or on free construction land, in the case of stations located at Murighiol Hub, Chilia Veche, Tulcea, Sf. Gheorghe, Jurilovca, Grindu.

A. MURIGHIOL Observation Area



Fig. 1. Location plan in the area MURIGHIOL OBSERVATION AREA.

A. Field Research Station (ST) MURIGHIOL.

The Murighiol field station will have as scientific objective the set of Murighiol - Dunavăț junction points that includes the natural meanders of the Sf. Gheorghe arm and their rectification channels as well as the impact of the rectifications on the environmental state of the distribution and interdistribution depressions. It will also cover the mixing zone of the Dunavăț canal - the Razelm-Sinoe lagoon complex.

The building will have the urban indicators presented in the following tables:

No. crt	Field station	Allocated land area	Land / construction use category	Obs.
1	Murighiol	In the HUB building	Within the village of Murighiol village, Murighiol commune Current use: arable land	Private domain of local interest of Murighiol commune, administered for a period of 49 years to the National Research-Development Institute "Danube Delta"

- The access to the location of the Murighiol research station (Hub), Murighiol Commune will be made on land from Școlii Street (south) and from Trandafirilor Street (north).

The land on which the building of the Murighiol research station will be located is inside the land of the DANUBIUS-RI Hub, with a total area of 96,680.00 sqm, is located in Murighiol commune, east of the town of Murighiol, at a distance of about 2, 4 km from the center of town.

The targeted area, due to its location within the locality, falls within the service range of public institutions of general interest that serve the commune of Murighiol.

- Grind mooring point.
- The berth itself will be made of a pontoon for mooring ships and access for people.
- The pontoon will be fixed by two collars, provided with rubber rollers, of two columns on which the pontoon "slides" to take over the variation of the Danube water levels.
- The connection between the pontoon and the shore will be ensured by creating a fixed trestle, based on piles except for a last section on which will be mounted a metal walkway, which will be supported with one end of the pontoon and the other end - articulated - on the trestle , in order to be able to take over the level differences.
- The fixed step, on pillars, will connect the platform of the research station with the mobile, articulated walkway and the mooring pontoon.
- For the arrangement of the shore, a rough stone wall provided with cement mortar and a basic protection prism, made of raw square, were provided.

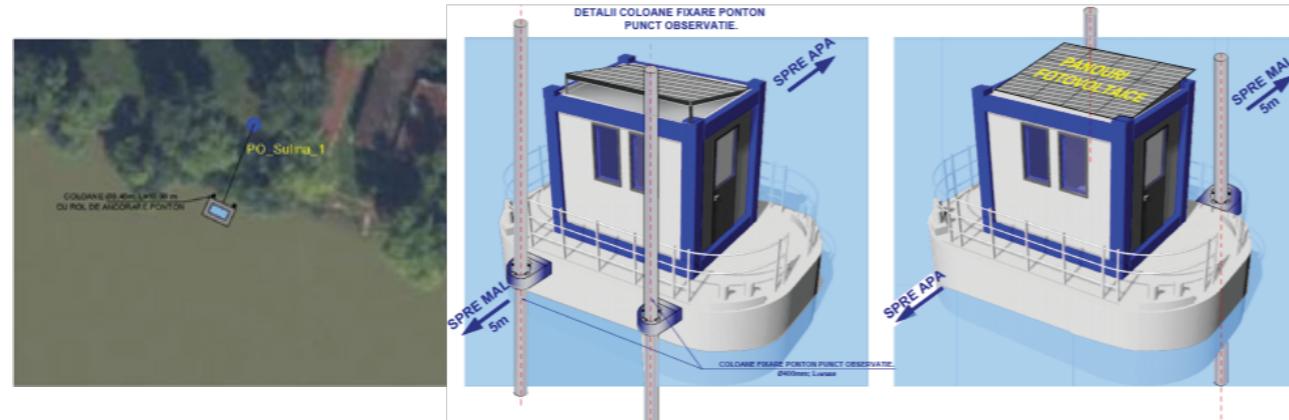
B. Observation Points (PO) and Piezometric Drilling.

The Research System (the necessary equipment complex) will be mounted in containers on a floating platform anchored with two metal columns to be able to take over the differences in water level, either, where this is not possible or the location conditions allow, in containers on shore.

It is specified that the installation of equipment in containers on land has a major impediment, namely the need to hold the Land Ownership documents on which they are located.

In view of this, the adoption of the Container on Land solution was made only in cases where the costs of placing floating platforms were unjustifiably high (eg at the Gura Sulina Weather Station or in the case of placing two floating platforms at Crisan, the confluence with the Old Danube).

For the same reason of Land Ownership, in cases where this required it, the necessary steps have been taken to conclude Protocols by which the respective owners (Romanian Waters Dobrogea - Seaside, Lower Danube River Administration) will make available the Project necessary.



Example: observation point type1 - Sulina_1. Observation point type 1. Floating platform container.



Example: observation point type 2 - Crisan_1.

Observation point type 2. Land container.

The station has rounded:

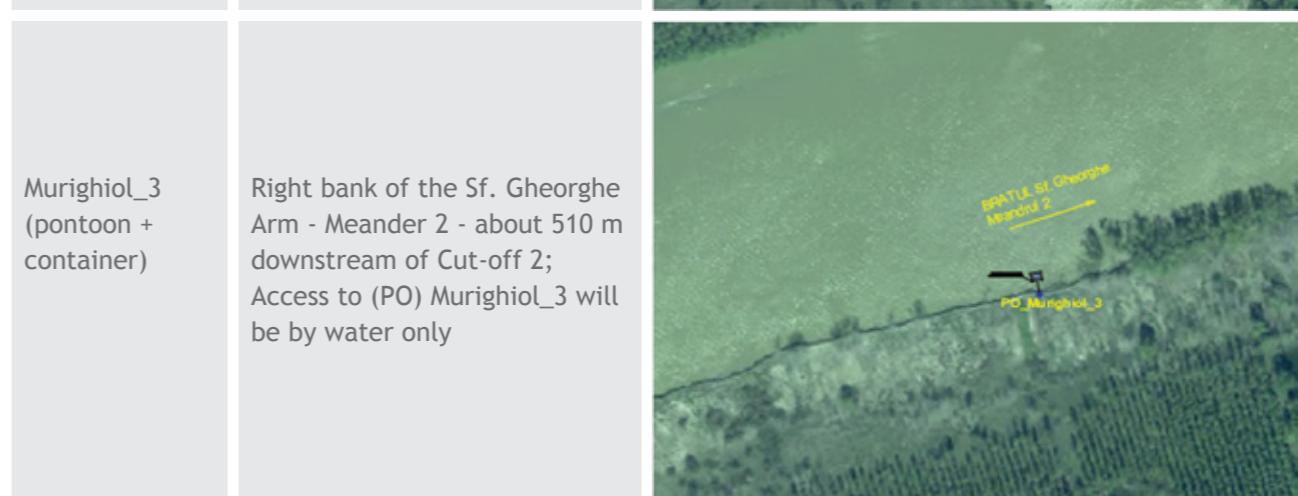
A.3 observation points:

Name PO	PO description	Location
Murighiol_1 (pontoon + container)	- left bank of the Dunavăt Canal, at approx. 90 m from the confluence with the St. George's Arm; Access to (PO) Murighiol_1 will be by water only.	



Murighiol_2
(pontoon + container)

Right bank of St. George's Arm
- approx. 130 m upstream of Cut-off 2;
Access to (PO) Murighiol_2 will be made exclusively from water,



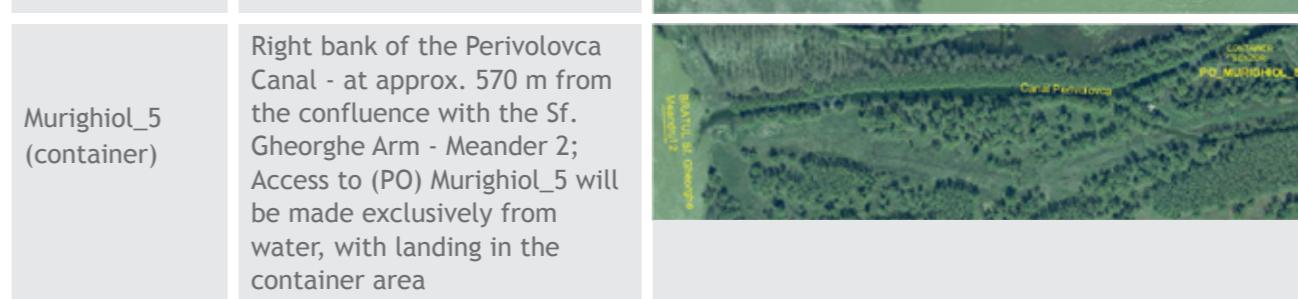
Murighiol_3
(pontoon + container)

Right bank of the Sf. Gheorghe Arm - Meander 2 - about 510 m downstream of Cut-off 2;
Access to (PO) Murighiol_3 will be by water only



Murighiol_4
(pontoon + container)

-Right straight Cut-off 2 - at approx. 300 m upstream of the confluence with the St. George's Arm;
Access to (PO) Murighiol_4 will be made exclusively from water,



Murighiol_5
(container)

Right bank of the Perivolovca Canal - at approx. 570 m from the confluence with the Sf. Gheorghe Arm - Meander 2;
Access to (PO) Murighiol_5 will be made exclusively from water, with landing in the container area

Murighiol_6 (pontoon + container)	Right bank of St. George's Arm - approx. 1830 m upstream of the confluence with Cut-off 2; Access to (PO) Murighiol_6 will be made exclusively from water	
Murighiol_7 (pontoon + container)	Right bank of St. George's Arm - approx. 700 m upstream of the confluence of Cut-off 1; Access to (PO) Murighiol_7 will be by water only	
Murighiol_8 (pontoon + container)	Right bank of the Sf. Gheorghe Arm - Meander 1 - at approx. 585 m downstream of the confluence of Cut-off 1; Access to (PO) Murighiol_8 will be by water only	
Murighiol_9 (pontoon + container)	Right bank of St. George's Arm - Cut-off 1 - at approx. 700 m upstream of the confluence with the St. George's Arm; Access to (PO) Murighiol_9 will be by water only	
Dunavăt_Razelm_1 (pontoon + container)	Right bank of the western extremity of the Dunavăt Canal - at approx. 250 m from the entrance to Lake Razelm; Access to (PO) Dunavăt_Razelm_1 will be made exclusively from water	

C. Measured parameters

Description of the equipment and parameters to be determined

The following parameters will be measured and analyzed:

Air temperature, humidity, visibility, evapo-perspiration, precipitation, aerosols, wind (speed / direction), flow, level (includes tides), waves and currents (coastal stations), water flow characterization, light transmittance (sea, lake), water temperature, conductivity / salinity, pH, chlorophyll-a, turbidity, total suspended sediment, particle size distribution (suspended and bottom), NO₃ seawater and freshwater, NH₄ seawater and freshwater, TP water seawater and freshwater, SRP seawater and freshwater, carbon (TOC, DOC), dissolved oxygen, hydrogen sulfide (H₂S), methane (CH₄).

Containers equipped with equipment that will measure a large number of hydrological, geochemical, geological, geomorphological, hydrochemical, biological, etc. parameters will be installed in the observation points. From the construction point of view, the observation points (containers) will be positioned on water or on land. Sensors for measuring the physical and chemical parameters of the water will be placed inside. Other sensors (eg those for measuring water level, speed and flow) will be mounted on movable scaffolding in water, so that it can be easily maintained / repaired / replaced.

Each observation point will be equipped with communication equipment for the transmission of measured data, with solar panels and batteries to ensure the necessary energy and with surveillance and guarding equipment (proximity sensors, perimeter lights and video surveillance).

The equipment and endowments required for each observation point will be purchased according to the parameters to be measured and analyzed: water level, conductivity, water temperature, chlorophyll a, pH, turbidity, NO₃, NO₂, NH₄, TN, carbon (TOC, DOC), dissolved O₂, T ° air, humidity, visibility, evapo-transpiration, precipitation, aerosols, wind, CH₄, H₂S, CO₂, pressure (level), 3 x (conductivity, Tapa) (at various depths), light transmissivity, NO₃ seawater / Acoustic Doppler Current Profiler (ADCP), SRP, submersible multi-parametric system for in-situ observation of particle size distribution (suspended and bottom) and volumetric concentration.

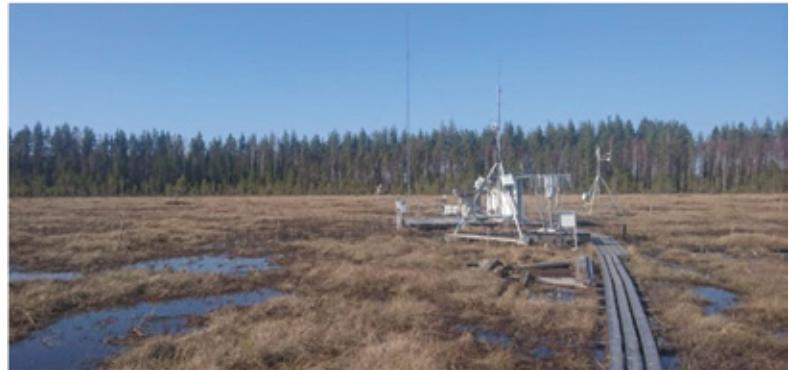
D. ESFRI Networking

In order to network with other research infrastructures, on the territory of the Danube Delta Supersite there will be installed:

- 4 observation points on the meander from Murighiol, Murighiol observation area, for the collaboration with DREAM - Danube River Research and Management
- 2 ICOS towers in the positions of the Caraorman_1 and SfGheorghe_2 observation points, for the collaboration with ICOS RI - Integrated Carbon Observation System Research Infrastructure
- 1 complete seismic station in Murighiol and a complex observatory for measuring the magnetic field, ionization of the atmosphere, modern weather station, GPS and detection of electrical discharges at the FP Letea observation point, thus ensuring collaboration with EPOS - European Plate Observing System - Research Infrastructure for Solid Earth Science. Coastal stations will also be integrated into the Black Sea hazard monitoring system and the EPOS network.

The MURIGHIOL Field Research Station will manage:

- - networking with EPOS RI - near the HUB Building will be installed equipment for a complete seismic station;
- - DREAM networking - The contribution to DREAM can be expressed through the points Murighiol_1 to Murighiol_9 - equipment.
- - networking with ICOS RI - an ICOS Tower located next to the HUB, which will be of the "tower for wetlands" type. For example, the following figures are presented:



E. Transport equipment

ST Murighiol will be equipped with the following transport equipment:



1. a catamaran - which will be used for the maintenance of the PO in the delta area of the Supersite, under the administration of ST Murighiol.



2. 4 x 4 off-road car - which will be used for land trips to the Observation Points.

3. a UTV (Utility Terrain Vehicle) - used for transporting samples and maintaining sensors in hard to reach points.



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