Interreg
Danube Transnational Programme
SIMONA

WP 6: Sediment sampling in Large Lakes and Reservoirs

Output T4.3.1: Demonstration at Iron Gate Reservoir

SIMONA

November 2021

PROJECT TITLE	Sediment-quality Information, Monitoring and Assessment System to support transnational cooperation for joint Danube Basin water management
ACRONYM	SIMONA
PROJECT DURATION	1st June 2018 to 1st December 2021, 42 months

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DATE OF PREPARATION November 2021

Please cite this document as: Marjanović et. al., 2021, SIMONA Project: Sediment-quality Information, Monitoring and Assessment System to support transnational cooperation for joint Danube Basin water management: Output T4.3.1. Demonstration at Iron Gate Reservoir.

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Contents

BACKGROUND INFORMATION

OBJECTIVES OF THE DEMONSTRATION ACTIVITIES

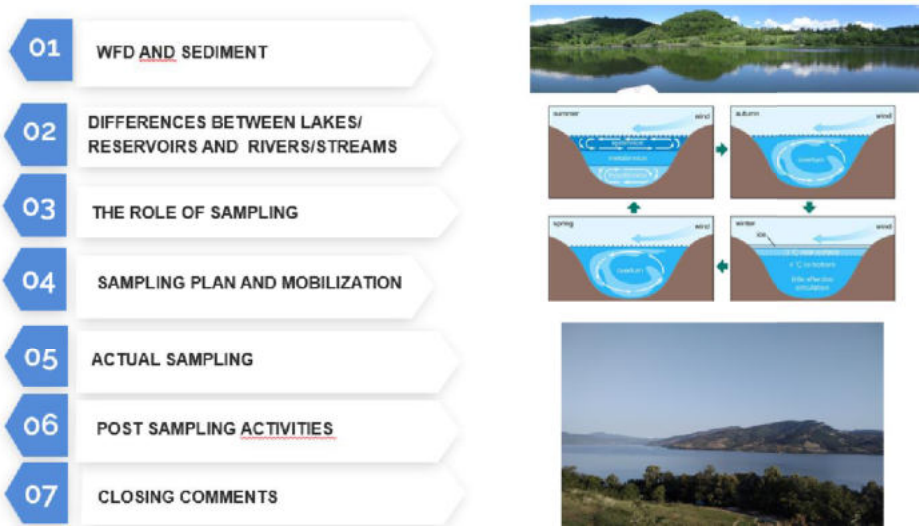
The main objective of the demonstration of sediment sampling at Iron Gate Reservoir was to:

1. Point out the important differences between sediment sampling and quality analysis in large lakes and reservoirs and rivers and streams having in view of the specific sediment sampling and analysis objectives and unique chracteristics of lake and reservoir systems.
2. Demonstrate, in the field, the process of preparation for and the actual sampling of sediments in large lakes and reservoirs.
3. Demonstrate the work of the specialized equipment used and draw attention of the participants to common difficulties and problems that can be encountered in the field, and
4. Share the experiences gained by the Jaroslav Černi Water Institute while working on sediment quality at Iron Gate Reservoir for the last 30years.

TOPICS COVERED DURRING DEMONSTRATION AT IRON GATE

Demonstration of sediment sampling at the Iron Gate Reservoir was initially planned as a 2 day event with participation of all the project partners and was envisiged as a contribution to a trainning and desimination activities within the Simona Porject WP6. Unfortunatelly, du to COVID pandemic this was imposible to implement and the demonstration was carried out over 2 days in September 2021 for participants from Bulgaria and Republic of Serbia and video materials and a presentations were prepared for further disimination to partners within the project and beyond.

The demonstration covered seven distinct topics.



INTRODUCTION

The Water Framework Directive introduced a system of water management through river basin management which allows us to use natural, geographic and hydrological boundaries to view systems as a whole rather than focusing on political or administrative borders. This allows us to observe processes at a level above national level and adress problems at an all-encompassing and coordinated manner.

Chemical and physical analysis of sediments can be used as a tool for the monitoring of pollutant discharges to a river or lake system. In order to be able to make valid comparisons among stations or reference sites, consistent sampling techniques should be maintained. Sediments can be used to help locate non-point, historical, or intermittent discharges that may not be readily apparent using samples collected from the water column.

Despite regular sediment quality assessment by member states, a reliable estimation of the overall amount of contaminated sediment in Europe is hard to give. the main reason for this is the absence of uniformity in sampling methods, analytical techniques and applied sediment quality standards or guideline values. This causes a lack of inter-comparability. typically, countries along the same river basin use different methods.

The WFD does not focus specifically on sediment but seeing that sediments are a natural constituent of aquatic environments, the management of sediments, their quality and quantity has to play an important role in water legislation.

According to the data collected through means of questionnaires and review of relevant literature, it was noted that Germany, Slovakia, Serbia, Hungary and Slovenia had national laws and/or regulations dealing with sediment quality and/or quantity in inland waters whilst Bulgaria, Croatia, Bosnia and Herzegovina, Republika Srpska, Montenegro, Austria, Ukraine, Romania and Moldova do not.

None of the basin countries has specific gudlines and legislation for sediments in large lakes and reservoirs despite the significant contribution that sediments can make to the overall status of these aquatic systems.

A review of the specific situations in the project partner countries shows that most of the project partner countries have adopted some form of the ISO 5667-12 international standard which serves as Guidance on sampling of bottom sediments from rivers, lakes and estuarine areas. Whilst some countries have further devoleped or modified the guidelines given within this standard it is safe to say that this standard should serve as a baseline or starting point for further development of advanced guidelines on the methods used for bottom sediment sampling.

For the purpose of suspended sediment sampling, those countries where suspended sediment sampling is being conducted seem to have adopted the guidance and requirements of ISO 5667-17:2008 Water quality -- Sampling -- Part 17: Guidance on sampling of bulk suspended solids which in turn suggests that this document could serve as a baseline/starting point for further development of guidelines for the sampling of suspended sediments.

Whilst the sampling methodology between countries may vary the depth of primary sediment sampling is generally no more than 5cm.

Bearing in mind the objectives of the demonstration at the Iron Gate Reservoir and the current situation in the partner countries the topic covered durring the demonstration are broader than the sampling itself and the material that folows and which is the part of the demonstration activities is reflecting this broader perspective.

TOPIC 1. WATER FRAMEWORK DIRECTIVE AND SEDIMENTS

The problem of the lake and reservoirs sediment quality assessment is of particular interest since in large lakes and reservoirs sediments potentially could have a controlling role on the status of water body in question through INTERNAL LOADING processes.

Understanding and quantification of INTERNAL LOADING is only possible through an adequate monitoring focused on sediment water interaction and especially so on quality parameters that are of importance for the dynamics of water column chemistry in large lakes and reservoirs such as are micro and macro nutrients.

This knowledge is necessary in order to develop appropriate programs of measures within RBMP within WFD aimed in achieving good water body status/potential.

The broad perspective given above is summarised conceptually in Figure 1.

Figures 2 and 3. show the evolution of the WFD Common Implementation Strategy and the time frame of interest. It should be noted that it took more than a decade for sediment to be recognized as one of the important issues in the implementation and that special role of sediments in lakes and reservoirs and their contribution to the status of water bodies is yet to be fully recognized.

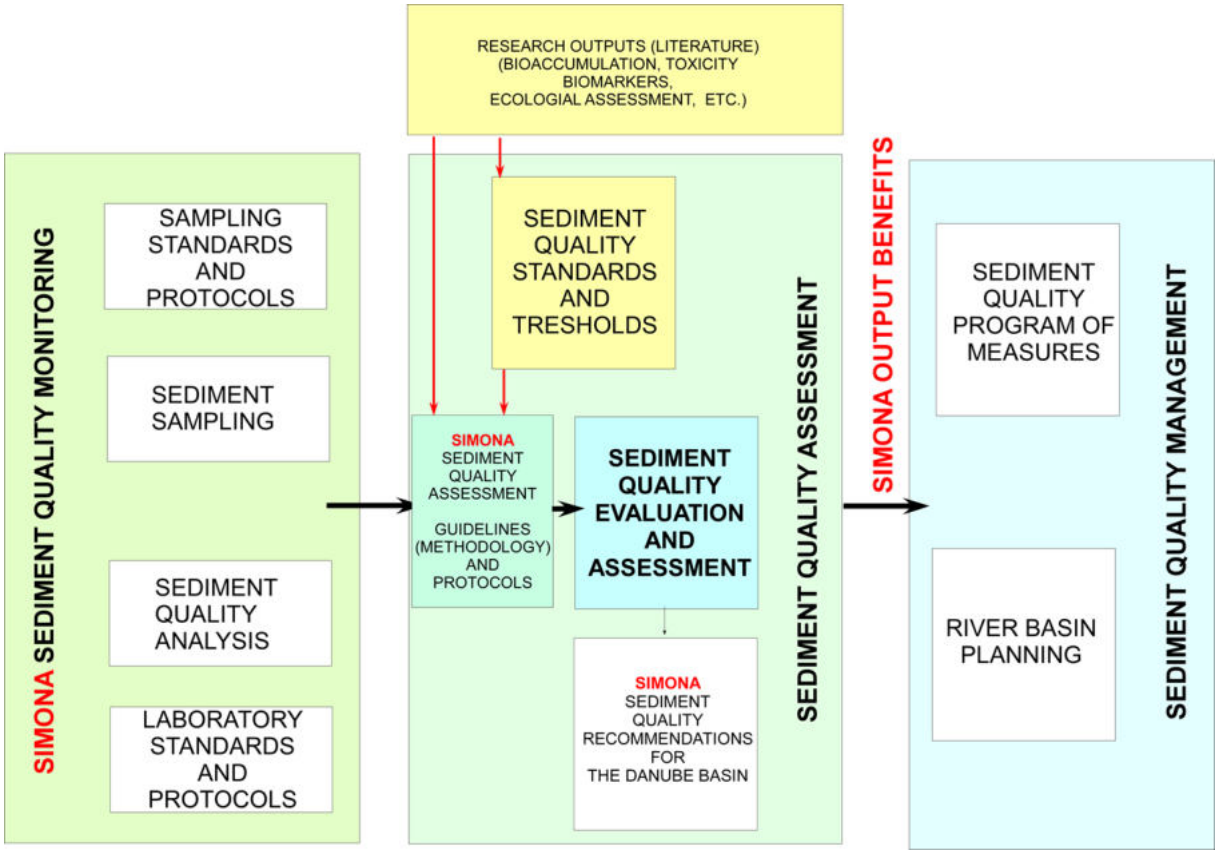


Figure 1. Broad perspective of the role of sediment quality in river basin planning as per WFD

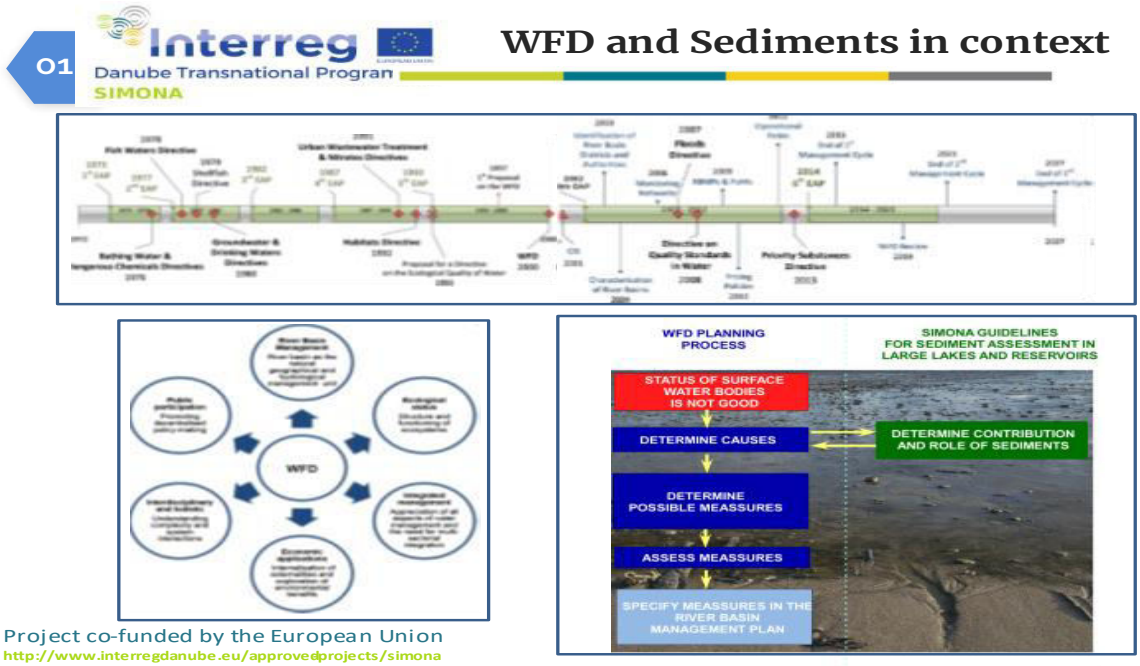


Figure 2. The role of sediment quality in the implementation of WFD

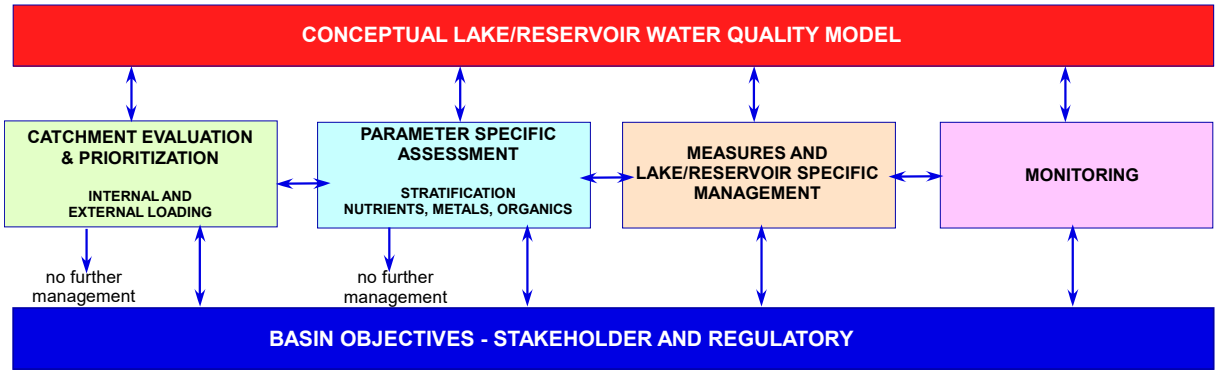


Figure 3. Sediment quality and WFD water body status objectives in context

TOPIC 2. DIFFERENCES BETWEEN LAKES AND RESERVOIRS AND RIVERS AND STREAMS

Lakes and reservoirs have significantly different characteristics (both in form and function) than rivers and streams. The differences are caused by fundamentally different structure and dynamics of dominant ecosystems in these streams which are driven and controlled by physical parameters such as water flow and velocity, light regime and thermal structure. These differences are the main cause behind the fact that the role of sediment quality in determining the status of lake and reservoir water bodies is much more pronounced than is the case with rivers and streams.(Figure 4). The remaining part of this section is devoted to the discussion of the main differences.

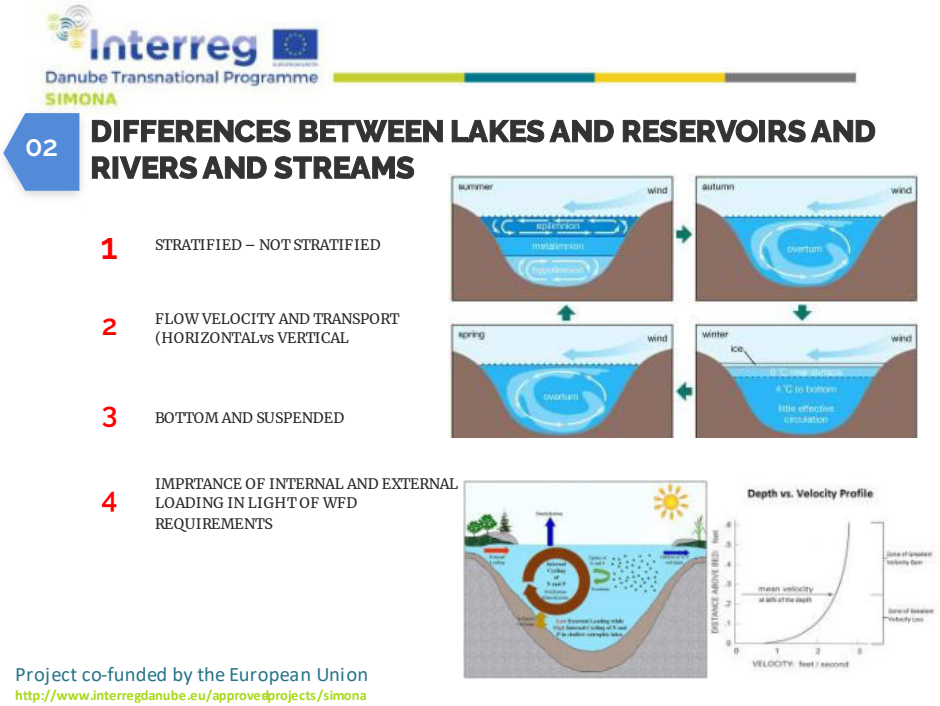


Figure 4. Main differences between lakes and reservoirs and rivers and streams

LAKE AND RESERVOIR VARIABILITY

People often visualize a lake/reservoir as a uniform mass of water, almost like a full bathtub that is evenly mixed from top to bottom, side to side and front to back. In fact, Lakes/Reservoirs are extremely **heterogeneous**, or patchy.

- The physical, chemical, and biological characteristics of Lakes/Reservoirs are extremely variable:
- Lakes/Reservoirs vary physically in terms of light levels, temperature, and water currents.
- Lakes/Reservoirs ary chemically in terms of nutrients, major ions, and contaminants.
- Lakes/Reservoirs vary biologically in terms of structure and function as well as static versus dynamic variables, such as biomass, population numbers, growth rates, sediment production rates, sediment trapping efficiency etc.

There is a great deal of spatial heterogeneity in all these variables, as well as temporal variability on the scales of minutes, hours, diel (day/night), seasons, decades, and geological time. Though Lakes/Reservoirs vary in many dimensions they are actually highly structured, similar to a forest ecosystem where, for example, a variety of physical variables (light, temperature, moisture) vary from the soil up through the canopy.

PHYSICAL STRUCTURE AND GEOLOGICAL CHARACTERISTICS

Knowledge of the formation and history of a lake is important to understanding its structure and its sediment dynamics. The current chemical and biological condition of a lake/reservoir depends on many factors, including:

- how it was formed
- size and shape of the lake basin
- size, topography, and chemistry of its watershed
- regional climate
- local biological communities
- activities of humans during the past century

Glaciers formed lake basins by gouging holes in loose soil or soft bedrock, depositing material across stream beds, or leaving buried chunks of ice that later melted to leave lake basins (Figure 5). When these natural depressions or impoundments filled with water, they became Lakes.

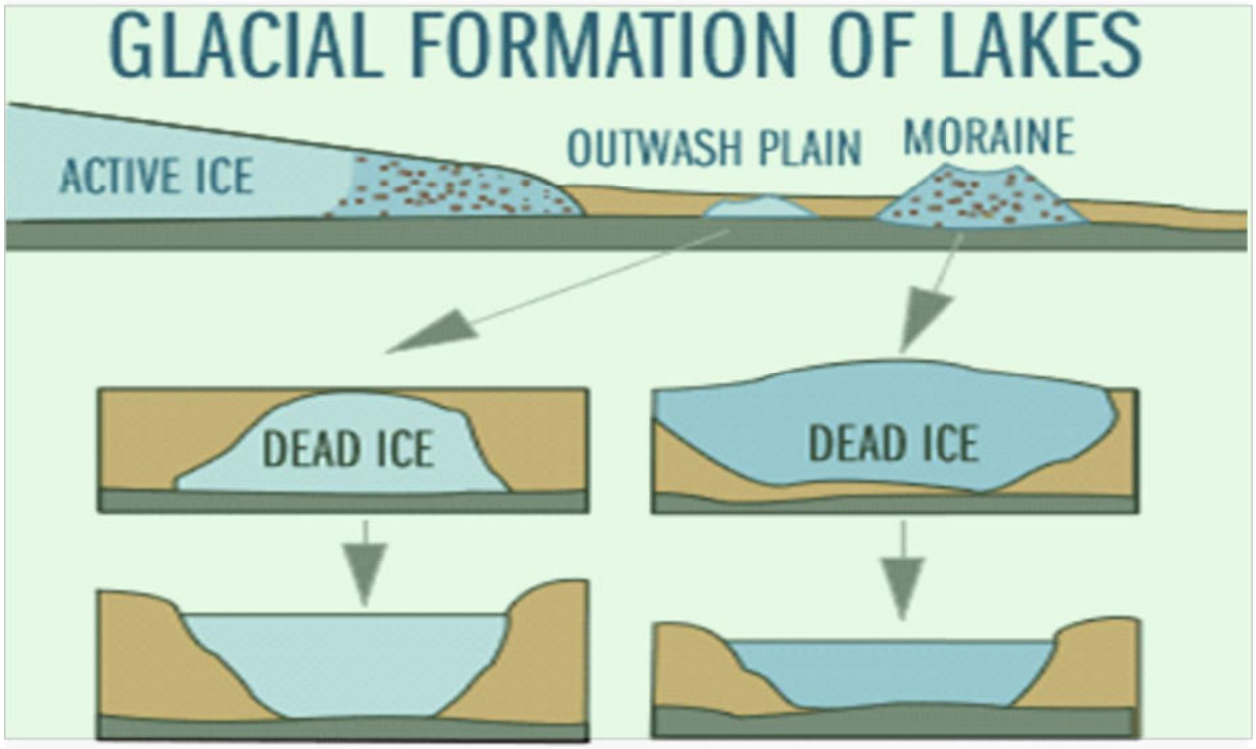


Figure 5. Formation of glacial lakes (Modified on the basis of the Primer on Lake Ecology, https://www.waterontheweb.org/under/lakeecology/)

After the glaciers retreated, sediments accumulated in the deeper parts of the lake. These sediments entered the Lakes/Reservoirs from tributaries and from decomposed organic material derived from both the watershed and aquatic from plants and algae.

Lake/reservoir sediment deposits provide a record of a lake's history. Paleolimnology is the study of lake sediments. Paleolimnologists collect lake sediments using special coring devices to study a lake's physical, chemical and biological history. Lake sediments are often dated using the radioisotopes lead-210 and carbon-14. The age of a given sediment sample is based on the radioactive decay of the isotope. Other dating methods are based on identifying sharp increases

Main factors determining structure of lakes and reservoirs are:

- Light
- Water density
- Mixing and
- Catchment characteristics

LIGHT

Perhaps the most fundamental set of properties of Lakes/Reservoirs relates to the interactions of light, temperature and wind mixing.

The absorption and attenuation of light by the water column are major factors controlling temperature and potential photosynthesis.

Photosynthesis provides the food that supports much of the food web. It also provides much of the dissolved oxygen in the water.

Solar radiation is the major source of heat to the water column and is a major factor determining wind patterns in the lake basin and water movements.

Light intensity at the lake/reservoir surface varies seasonally and with cloud cover and decreases with depth down the water column. The deeper into the water column that light can penetrate, the deeper photosynthesis can occur. Photosynthetic organisms include algae suspended in the water (phytoplankton), algae attached to surfaces (periphyton), and vascular aquatic plants (macrophytes).

The rate at which light decreases with depth depends upon the amount of light-absorbing dissolved substances (mostly organic carbon compounds washed in from decomposing vegetation in the watershed) and the amount of absorption and scattering caused by suspended materials (soil particles from the watershed, algae and detritus).

The percentage of the surface light absorbed or scattered in a 1 meter long vertical column of water, is called the vertical extinction coefficient. This parameter is symbolized by "k".

In Lakes/Reservoirs with low k-values, light penetrates deeper than in those with high k-values. Figure 6 shows the light attenuation profiles from two Lakes/Reservoirs with attenuation coefficients of 0.2/m and 0.9/m.

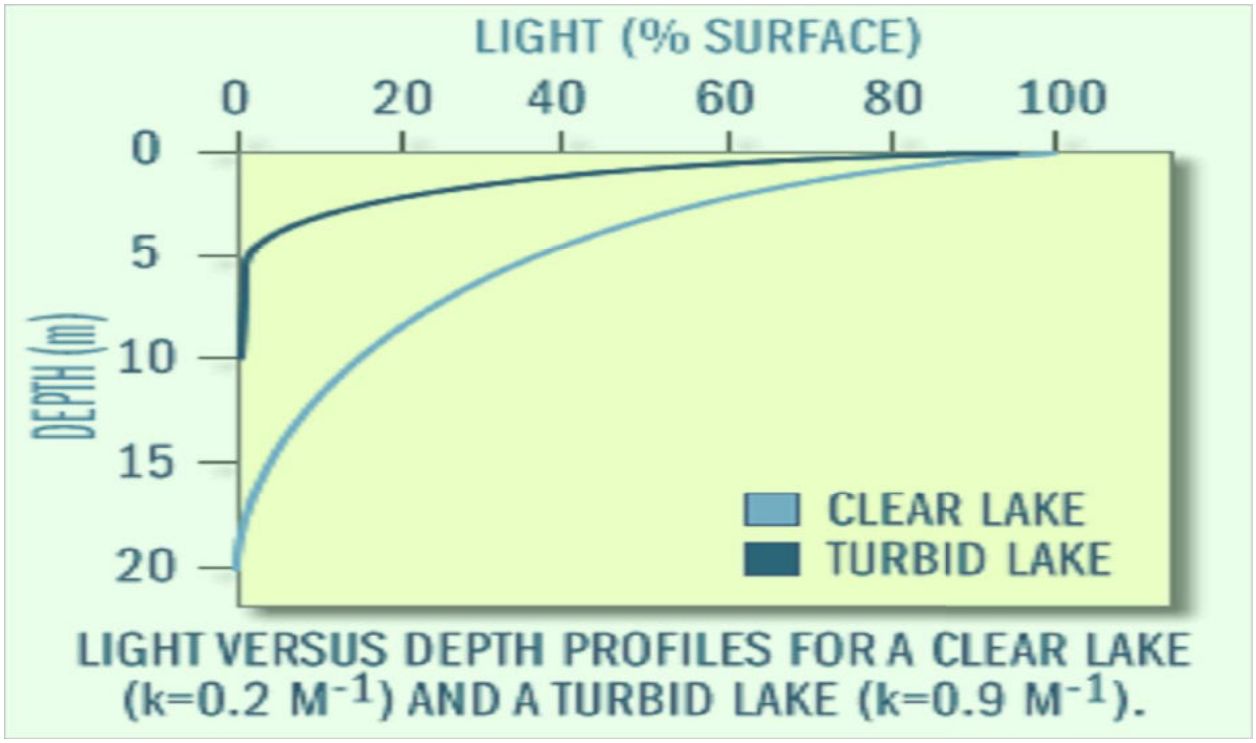


Figure 6. Light – depth profile in lakes and reservoirs (Modified on the basis of the Primer on Lake Ecology, https://www.waterontheweb.org/under/lakeecology/)

The maximum depth at which algae and macrophytes can grow is determined by light levels.

Limnologists estimate this depth to be the point at which the amount of light available is reduced to 0.5%–1% of the amount of light available at the lake surface.

This is called the euphotic zone. A general rule of thumb is that this depth is about 2 to 3 times the limit of visibility as estimated using a Secchi disk.

Light may be measured in a variety of ways for a number of different characteristics.

Since photosynthesis depends fundamentally on light, significant changes in light penetration in a lake will produce a variety of direct and indirect biological and chemical effects.

Significant changes in lake transparency are most often the result of human activities, usually in association with landuse activities in the watershed.

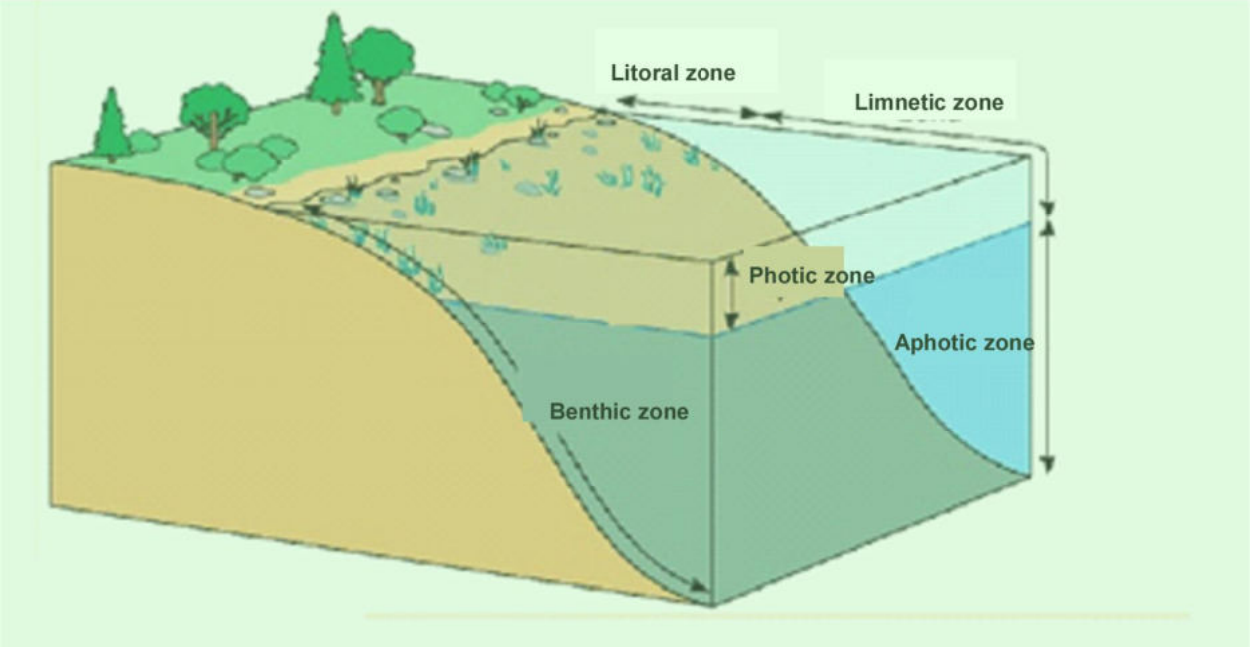


Figure 7. Zonal lake/reservoir structure (Modified on the basis of the Primer on Lake Ecology, https://www.waterontheweb.org/under/lakeecology/)

DENSITY STRATIFICATION

In the spring, immediately after ice-out in temperate climates, the water column is cold and nearly isothermal with depth. The intense sunlight of spring is absorbed in the water column, which also heatsup as the average daily temperature of the air increases. In the absence of wind, a temperature profile with depth might be expected to resemble Figure 9, decreasing exponentially with depth. However, density, another physical characteristic of water, plays an important role in modifying this pattern.

Water differs from most other compounds because it is less dense as a solid than as a liquid. Consequently, ice floats, while water at temperatures just above freezing sinks. As most compounds change from a liquid to a solid, the molecules become more tightly packed and consequently the compound is denser as a solid than as a liquid. Water, in contrast, is most dense at 4°C and becomes less dense at both higher and lower temperatures. Because of this density-temperature relationship, many Lakes/Reservoirs in temperate climates tend to stratify, that is, they separate into distinct layers.

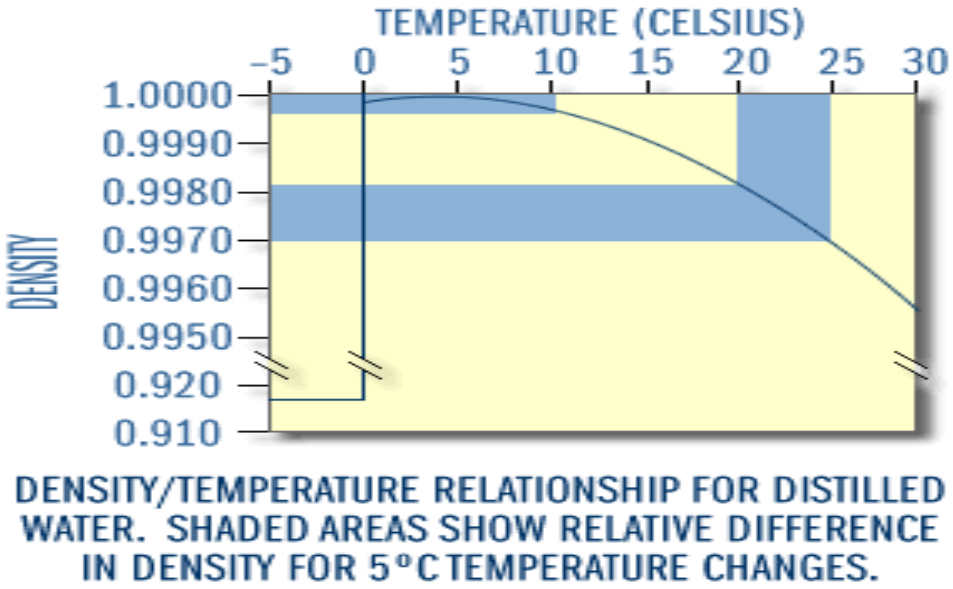


Figure 8. Water temperture-Density relationship (Modified on the basis of the Primer on Lake Ecology, https://www.watertheweb.org/under/lakeecology/

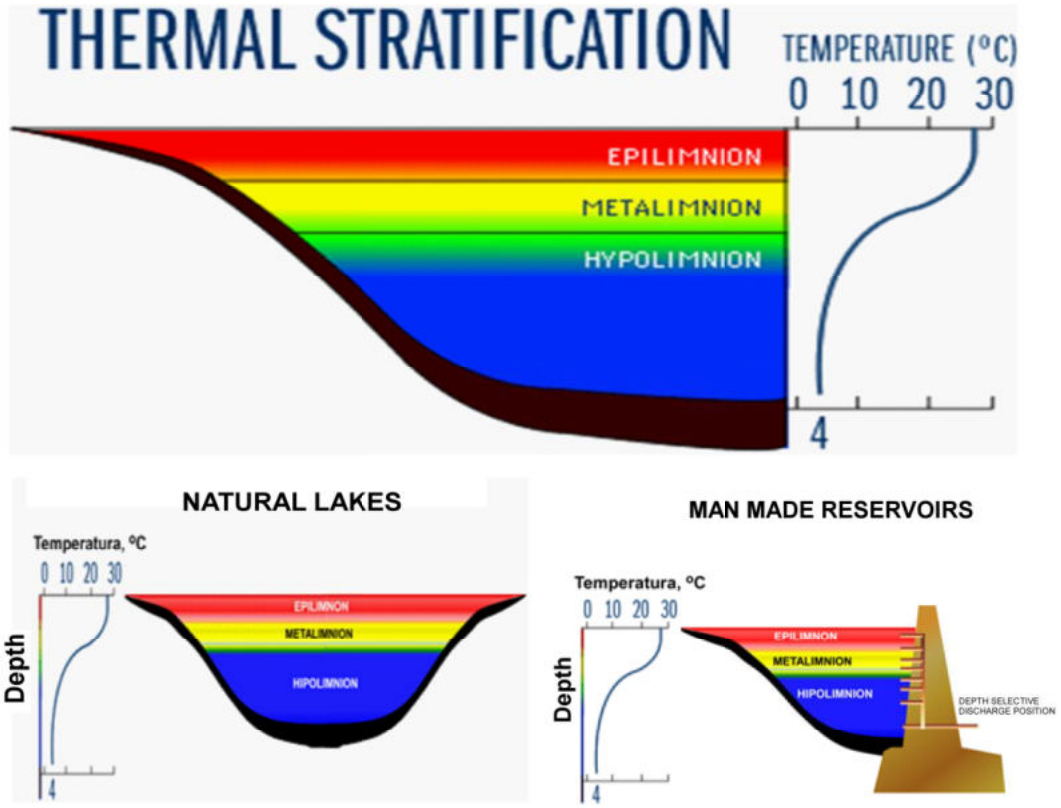


Figure 9. Thermal stratification of lakes and reservoirs(Modified on the basis of the Primer on Lake Ecology, https://www.watertheweb.org/under/lakeecology/)

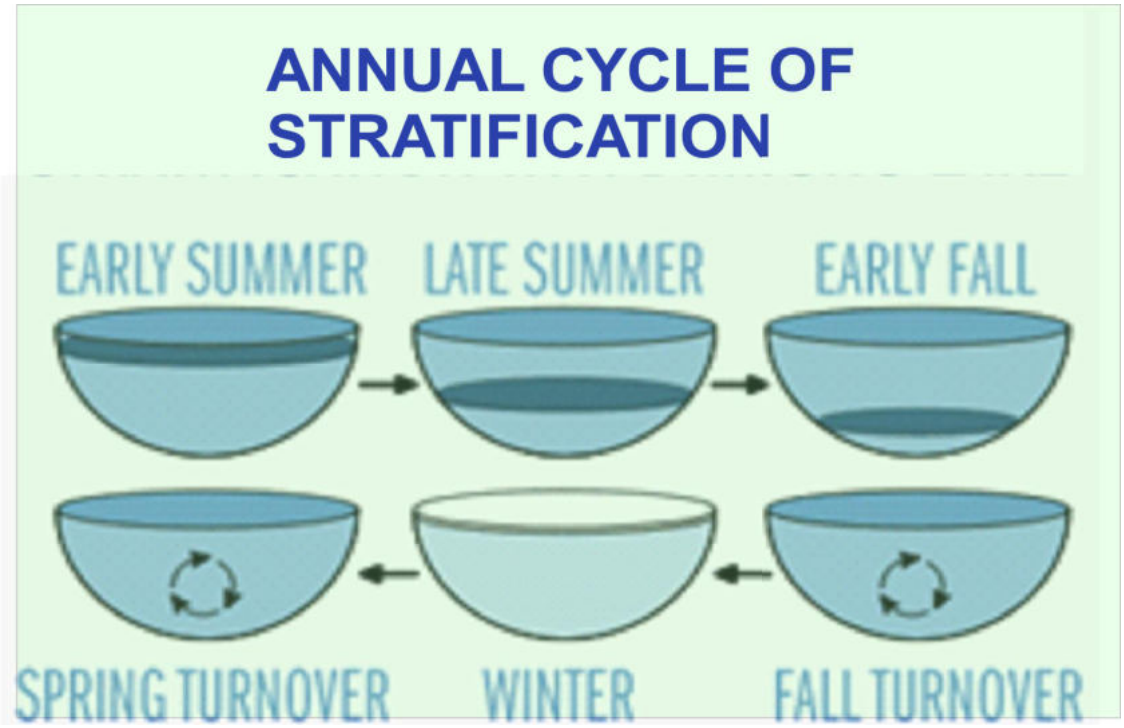


Figure 10. Annual cycle of stratification of lakes and reservoirs(Modified on the basis of the Primer on Lake Ecology, https://www.waterontheweb.org/under/lakeecology/)

SPRING

In Lakes/Reservoirs of the upper Midwest and at higher elevations, the water near a lake's bottom will usually be at 4°C just before the lake´s ice cover melts in the spring. Water above that layer will be cooler, approaching 0°C just under the ice. As the weather warms, the ice melts. When the temperature (density) of the surface water equals the bottom water, very little wind energy is needed to mix the lake completely. This is called turnover. After this spring turnover, the surface water continues to absorb heat and warms. As the temperature rises, the water becomes lighter than the water below. For a while winds may still mix the lake from bottom to top, but eventually the upper water becomes too warm and too buoyant to mix completely with the denser deeper water. As Figure 3 suggests, the relatively large differences in density at higher temperatures are very effective at preventing mixing. It simply takes too much energy to mix the water any deeper.

SUMMER

As summer progresses, the temperature (and density) differences between upper and lower water layers become more distinct. Deep Lakes/Reservoirs generally become physically stratified into three identifiable layers, known as the epilimnion, metalimnion, and hypolimnion (Figure 4). The epilimnion is the upper, warm layer, and is typically well mixed. Below the epilimnion is the metalimnion or thermocline region, a layer of water in which the temperature declines rapidly with depth. The hypolimnion is the bottom layer of colder water, isolated from the epilimnion by the

metalimnion. The density change at the metalimnion acts as a physical barrier that prevents mixing of the upper and lower layers for several months during the summer.

The depth of mixing depends in part on the exposure of the lake to wind (its fetch), but is most closely related to the lake's size. Smaller to moderately-sized Lakes/Reservoirs (50 to 1000 acres) reasonably may be expected to stratify and be well mixed to a depth of 3–7 meters in north temperate climates. Larger Lakes/Reservoirs may be well mixed to a depth of 10–15 meters in summer (e.g., Western Lake Superior near Duluth, MN).

Note that although "thermocline" is a term often used synonymously with metalimnion, it is actually the plane or surface of maximum rate of decrease of temperature with respect to depth. Thus, the thermocline is the point of maximum temperature change within the metalimnion.

AUTUMN

As the weather cools during autumn, the epilimnion cools too, reducing the density difference between it and the hypolimnion (Figure 5). As time passes, winds mix the lake to greater depths, and the thermocline gradually deepens. When surface and bottom waters approach the same temperature and density, autumn winds can mix the entire lake; the lake is said to "turn over." As the atmosphere cools, the surface water continues to cool until it freezes.

WINTER

A less distinct density stratification than that seen in summer develops under the ice during winter. Most of the water column is isothermal at a temperature of 4°C, which is denser than the colder, lighter water just below the ice. In this case the stratification is much less stable, because the density difference between 0°C and 4°C water is quite small. However, the water column is isolated from wind-induced turbulence by its cap of ice. Therefore, the layering persists throughout the winter.

This pattern (spring turnover — summer stratification — fall turnover — winter stratification) is typical for temperate Lakes/Reservoirs . Lakes/Reservoirs with this pattern of two mixing periods are referred to as dimictic. Many shallow Lakes/Reservoirs , however, do not stratify in the summer, or stratify for short periods only, throughout the summer. Lakes/Reservoirs that stratify and destratify numerous times within a summer are known as polymictic Lakes/Reservoirs . Both polymictic and dimictic.

THE WATERSHED

The watershed, also called the drainage basin, is all of the land and water areas that drain toward a particular river or lake. Thus, a watershed is defined in terms of the selected lake (or river). There can be sub watersheds within watersheds. For example, a tributary to a lake has its own watershed, which is part of the larger total drainage area to the lake.

A lake is a reflection of its watershed. More specifically, a lake reflects the watershed's size, topography, geology, land use, soil fertility and erodibility, and vegetation. The impact of the watershed is evident in the relation of nutrient loading to the watershed: lake surface area ratio (Figure 11).

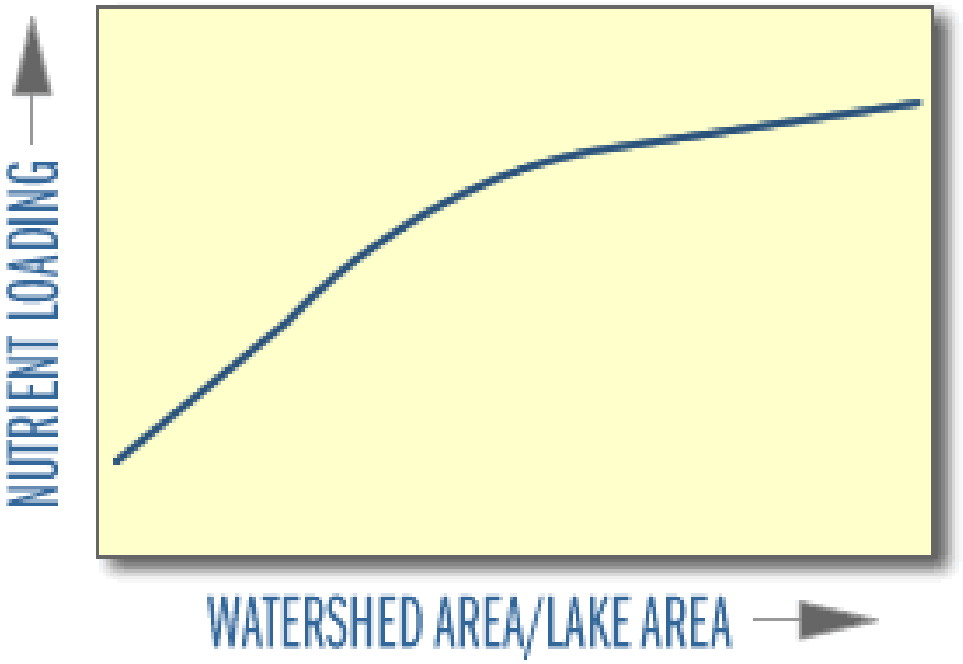


Figure 11. Nutrient loading and lake/watershed area of typical lakes and reservoirs (Modified on the basis of the Primer on Lake Ecology, https://www.waterontheweb.org/under/lakeecology/)

Typically, water quality decreases with an increasing ratio of watershed area to lake area. This is obvious when one considers that as the watershed to lake area increases there are additional sources (and volumes) of runoff to the lake. In larger watersheds, there is also a greater opportunity for water from precipitation to contact the soil and leach minerals before discharging into the lake. Lakes/Reservoirs with very small watersheds that are maintained primarily by groundwater flow are known as seepage Lakes/Reservoirs . In contrast, Lakes/Reservoirs fed primarily by inflowing streams or rivers are known as drainage Lakes/Reservoirs . In keeping with the watershed/lake area relationship, seepage Lakes/Reservoirs tend to have good water quality compared with drainage Lakes/Reservoirs . However, Lakes/Reservoirs are often more susceptible to acidification from acid rain because of their low buffering capacity.

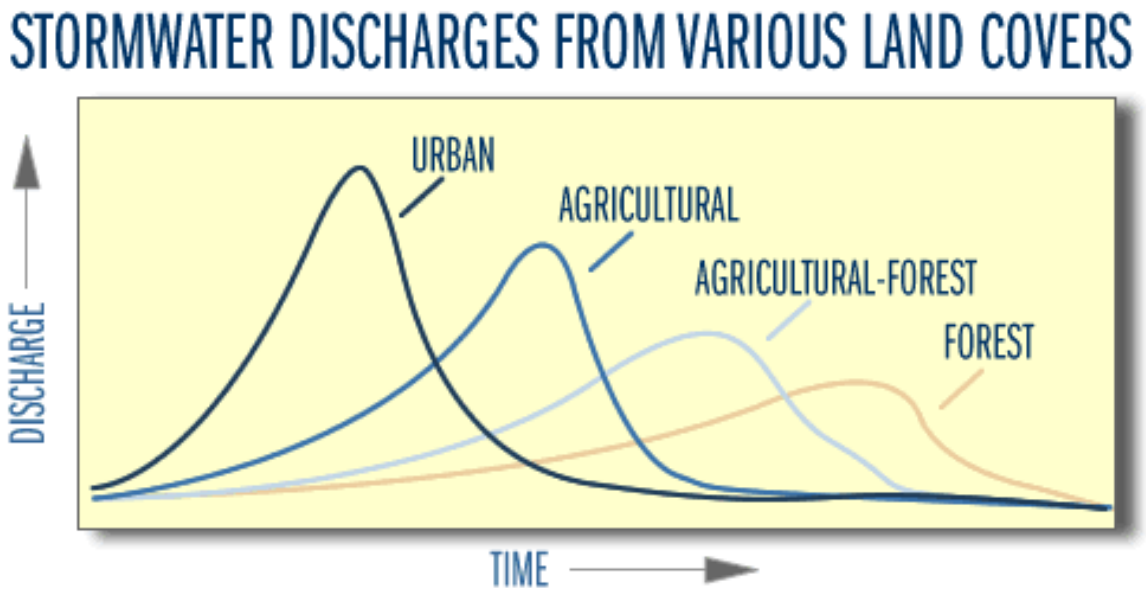


Figure 12. Lake/reservoir water inflow as a function of catchment land use
(Modified on the basis of the Primer on Lake Ecology, https://www.watertheweb.org/under/lakeecology/)

Landuse has an important impact on the quality and quantity of water entering a lake. As Figure 12 shows, the stormwater discharge to a lake differs greatly among landuses. In urban areas, the high proportion of impervious surfaces prevents absorbance of rainwater into the soil and increases the rate of surface water flow to the lake. The high flushing rates from urban areas can increase erosion of stream banks and provide sufficient force to carry large particles (i.e., soil) to the lake. Thus, water quantity affects water quality.

Additionally, as water flows over roads, parking lots and rooftops, it accumulates nutrients and contaminants in both dissolved and particulate form.

Table 1. Phosphorus export coefficients (from Reckhow and Simpson, 1980).

	Phosphorus (kg/km^{2}yr)		
Characteristic of the catchment	**HIGH**	**MID**	**LOW**
Urban	500	80-300	50
Rural/Agriculture	300	40-170	10
Forest	45	14-30	2

Precipitation	60	20-50	15

Table 1. gives representative values of export rates of phosphorus from various landuses and other sources. Phosphorus is particularly important because its availability often controls the amount of algae and the overall productivity of a lake. These values are in units of kg/km2/yr (mass of phosphorus per unit area per year). Not included here, but also important, is the influence of soil type and slope. Finer particles and steeper slopes mean higher export rates.

To clarify the relative landuse impacts, we can compare annual loads from 10 hectare (24 acre) plots of the selected landuses using the high export coefficients in Table 1.

Forest	4.5 kg phosphorus
Rural/Agriculture	30.0 kg phosphorus
Urban	50.0 kg phosphorus

One can see that, all other things being equal, converting a forest into a city can increase the phosphorus export to a lake more than ten times. Another way to look at these numbers is that almost seven years of phosphorus loading from a forested area can be deposited within one year by mixed agriculture areas and almost eleven years of phosphorus loading from a forested area can be deposited within a year from urbanized areas. A greater loading rate puts a greater strain on the system to assimilate the nutrients.

CHEMICAL STRUCTURE

In the absence of any living organisms, a lake contains a wide array of molecules and ions from the weathering of soils in the watershed, the atmosphere, and the lake bottom. Therefore, the chemical composition of a lake is fundamentally a function of its climate (which affects its hydrology) and its basingeology. Each lake has an ion balance of the three major anions and four major cations (see Table 2).

Table 2. ION BALANCE FOR TYPICAL FRESH WATER

Anions	**Percent**	**Cations**	**Percent**
HCO_3^-	73%	Ca^{+2}	63%
SO_4^{-2}	16%	Mg^{+2}	17%
Cl^-	10%	Na^+	15%

		K^+	4%
other	< 1%	other	< 1%

Ion balance means the sum of the negative ions equals the sum of the positive cations when expressed as equivalents. These ions are usually present at concentrations expressed as mg/L (parts per million, or ppm) whereas other ions such as the nutrients phosphate, nitrate, and ammonium are present at µg/L (parts per billion, or ppb) levels.

Humans can have profound influences on lake chemistry. Excessive landscape disturbance causes higher rates of leaching and erosion by removing vegetative cover, exposing soil, and increasing water runoff velocity. Lawn fertilizers, wastewater and urban stormwater inputs all add micronutrients such as nitrogen and phosphorus, major ions such as chloride and potassium, and, in the case of highway and parking lot runoff, oils and heavy metals. Emissions from motorized vehicles, fossil fuel-burning electric utilities and industry, and other sources produce a variety of compounds that affect lake chemistry.

Perhaps the best understood ions are H+ (hydrogen ion, which indicates acidity), SO_4^{-2} (sulfate) and NO_3^- (nitrate) which are associated with acid rains. Mercury (Hg) is another significant air pollutant affecting aquatic ecosystems and can bioaccumulate in aquatic food webs, contaminating fish and causing a threat to human and wildlife health.

Lakes/Reservoirs with high concentrations of the ions calcium (Ca^{+2}) and magnesium (Mg^{+2}) are called hardwater Lakes/Reservoirs , while those with low concentrations of these ions are called softwater Lakes/Reservoirs . Concentrations of other ions, especially bicarbonate, are highly correlated with the concentrations of the hardness ions, especially Ca^{+2}. The ionic concentrations influence the lake´s ability to assimilate pollutants and maintain nutrients in solution. For example, calcium carbonate ($CaCO_3$) in the form known as marl can precipitate phosphate from the water and thereby remove this important nutrient from the water.

The total amount of ions in the water is called the TDS (total dissolved salt, or total dissolved solids concentration). Both the concentration of TDS and the relative amounts or ratios of different ions influence the species of organisms that can best survive in the lake, in addition to affecting many important chemical reactions that occur in the water.

DISSOLVED OXYGEN

Biological activity peaks during the spring and summer when photosynthetic activity is driven by high solar radiation. Furthermore, during the summer most Lakes/Reservoirs in temperate climates are stratified. The combination of thermal stratification and biological activity causes characteristic patterns in water

chemistry. Figure 13 shows the typical seasonal changes in dissolved oxygen (DO) and temperature. The top scale in each graph is oxygen levels in mg O_2/L. The bottom scale is temperature in °C. In the spring and fall, both oligotrophic and eutrophic Lakes/Reservoirs tend to have uniform, well-mixed conditions throughout the water column. During summer stratification, the conditions in each layer diverge.

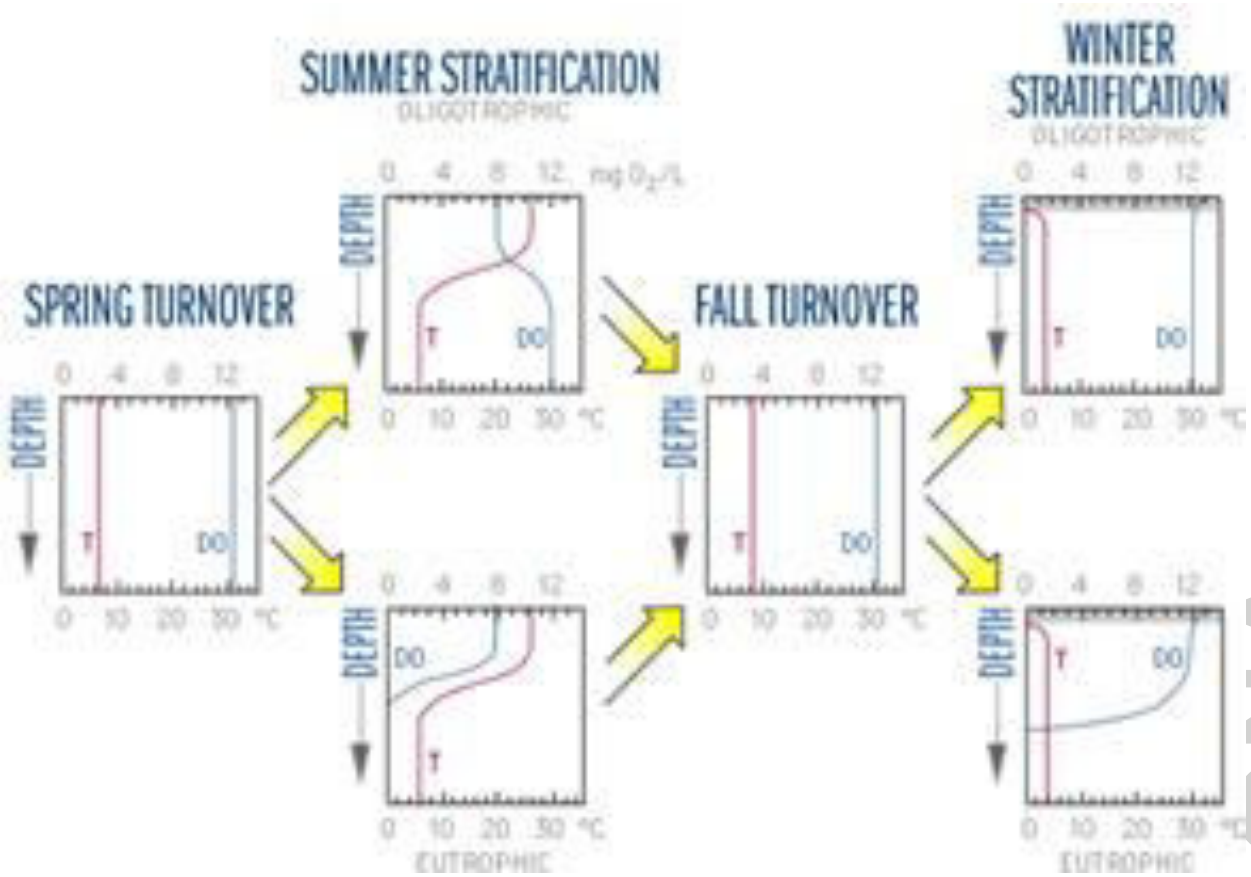


Figure 13. Oxygen regime in lakes and reservoirs at different stages of stratification (adapted from Figure 8-1 in Wetzel, R.G. 1975. Limnology. W.B.Saunders Company)

The DO concentration in the epilimnion remains high throughout the summer because of photosynthesis and diffusion from the atmosphere. However, conditions in the hypolimnion vary with trophic status. In eutrophic (more productive) Lakes/Reservoirs , hypolimnetic DO declines during the summer because it is cut-off from all sources of oxygen, while organisms continue to respire and consume oxygen. The bottom layer of the lake and even the entire hypolimnion may eventually become anoxic, that is, totally devoid of oxygen. In oligotrophic Lakes/Reservoirs , low algal biomass allows deeper light penetration and less decomposition. Algae are able to grow relatively deeper in the water column and less oxygen is consumed by decomposition. The DO concentrations may therefore increase with depth below the thermocline where colder water is "carrying" higher DO leftover from spring mixing (recall that oxygen is more soluble in colder water). In extremely deep, unproductive Lakes/Reservoirs , DO may persist at high concentrations, near 100% saturation, throughout the water column all year. These

differences between eutrophic and oligotrophic Lakes/Reservoirs tend to disappear with fall turnover (Figure 9).

In the winter, oligotrophic Lakes/Reservoirs generally have uniform conditions. Ice-covered eutrophic Lakes/Reservoirs , however, may develop a winter stratification of dissolved oxygen. If there is little or no snow cover to block sunlight, phytoplankton and some macrophytes may continue to photosynthesize, resulting in a small increase in DO just below the ice. But as microorganisms continue to decompose material in the lower water column and in the sediments, they consume oxygen, and the DO is depleted. No oxygen input from the air occurs because of the ice cover, and, if snow covers the ice, it becomes too dark for photosynthesis. This condition can cause high fish mortality during the winter, known as "winter kill." Low DO in the water overlying the sediments can exacerbate water quality deterioration, because when the DO level drops below 1 mg O_2/L chemical processes at the sediment-water interface frequently cause release ofphosphorus from the sediments into the water. When a lake mixes in the spring, this new phosphorus and ammonium that has built up in the bottom water fuels increased algal growth.

NUTRIENTS

Aquatic organisms influence (and are influenced by) the chemistry of the surrounding environment. For example, phytoplankton extract nutrients from the water and zooplankton feed on phytoplankton. Nutrients are redistributed from the upper water to the lake bottom as the dead plankton gradually sink to lower depths and decompose. The redistribution is partially offset by the active vertical migration of the plankton.

In contrast to DO, essential nutrients such as the bioavailable forms of phosphorus and nitrogen (dissolved phosphate, nitrate, and ammonium) typically increase in the spring from snowmelt runoff and from the mixing of accumulated nutrients from the bottom during spring turnover. Concentrations typically decrease in the epilimnion during summer stratification as nutrients are taken up by algae and eventually transported to the hypolimnion when the algae die and settle out. During this period, any "new" input of nutrients into the upper water may trigger a "bloom" of algae. Such inputs may be from upstream tributaries after rainstorms, from die-offs of aquatic plants, from pulses of urban stormwater, direct runoff of lawn fertilizer, or from leaky Lakes/Reservoirs shore septic systems. In the absence of rain or snowmelt, an injection of nutrients may occur simply from high winds that mix a portion of the nutrient-enriched upper waters of the hypolimnion into the epilimnion. In less productive systems, such as those in Northeastern Minnesota, significant amounts of available nitrogen may be deposited during rainfall or snowfall events (wet deposition) and during the less obvious deposition of aerosols and dust particles (dry deposition). Nitrogen and phosphorus in dry fallout and wet precipitation may also come from dust, fine soil particles, and fertilizer from agricultural fields.

THE FOOD WEB

The biological communities within Lakes/Reservoirs may be organized conceptually into food chains and food webs to help us understand how the ecosystem functions (Figures 12 and 13). The simplest illustration of the organization of the organisms within an ecosystem is the ecological pyramid (Figure 14). The broad base of primary producers supports overlying levels of herbivores (zooplankton), planktivores and much smaller numbers of carnivores (predators). These individual trophic levels may be idealized as a food chain, but in fact many organisms are omnivorous and not necessarily characterized by a particular level. Further, consumers in particular often shift levels throughout their life cycle. For example, a larval fish may initially eat fine particulate material that includes algae, bacteria and detritus. Then it may switch and graze on larger zooplankton and ultimately end up feeding on so called "forage fish" or even young game fish (i.e., top predators) when it reaches maturity (Figure 13).

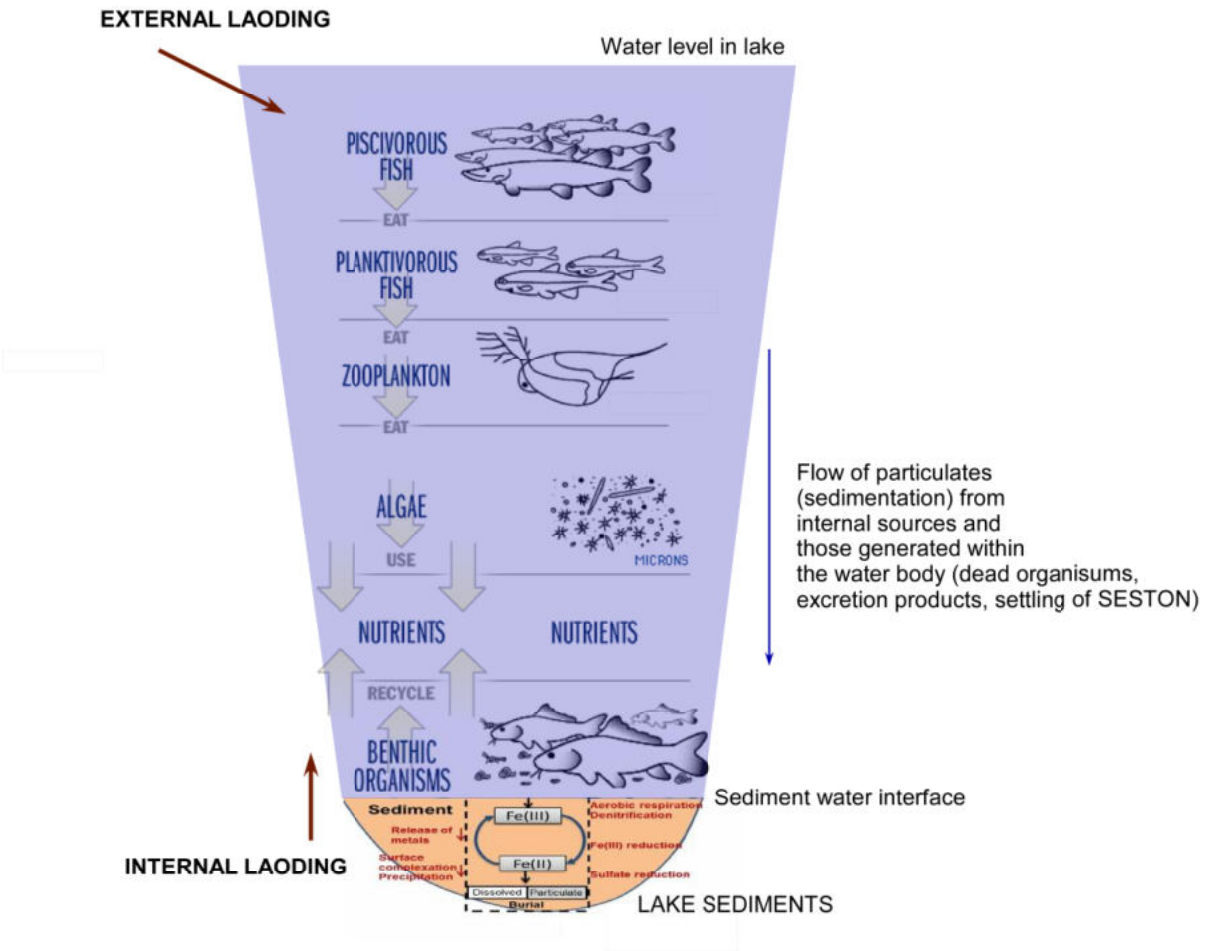


Figure 12. Typical lake/reservoir food web supported by external and internal loading showing the importance of sediments as the source of internal loading for lakes and reservoir ecosystems. (Modified on the basis of the Primer on Lake Ecology, https://www.waterontheweb.org/under/lakeecology/)

Food webs may be described in terms of both energy and nutrient (carbon, nitrogen or phosphorus) flows and flows of micronutrients (molybdenum, copper, etc.). Although the process typically begins with sunlight-driven photosynthesis by algae and plants, balanced nutrition is also required to sustain life. For example, we cannot live strictly on sugar, despite its high caloric content, irrespective of what our kids may argue.

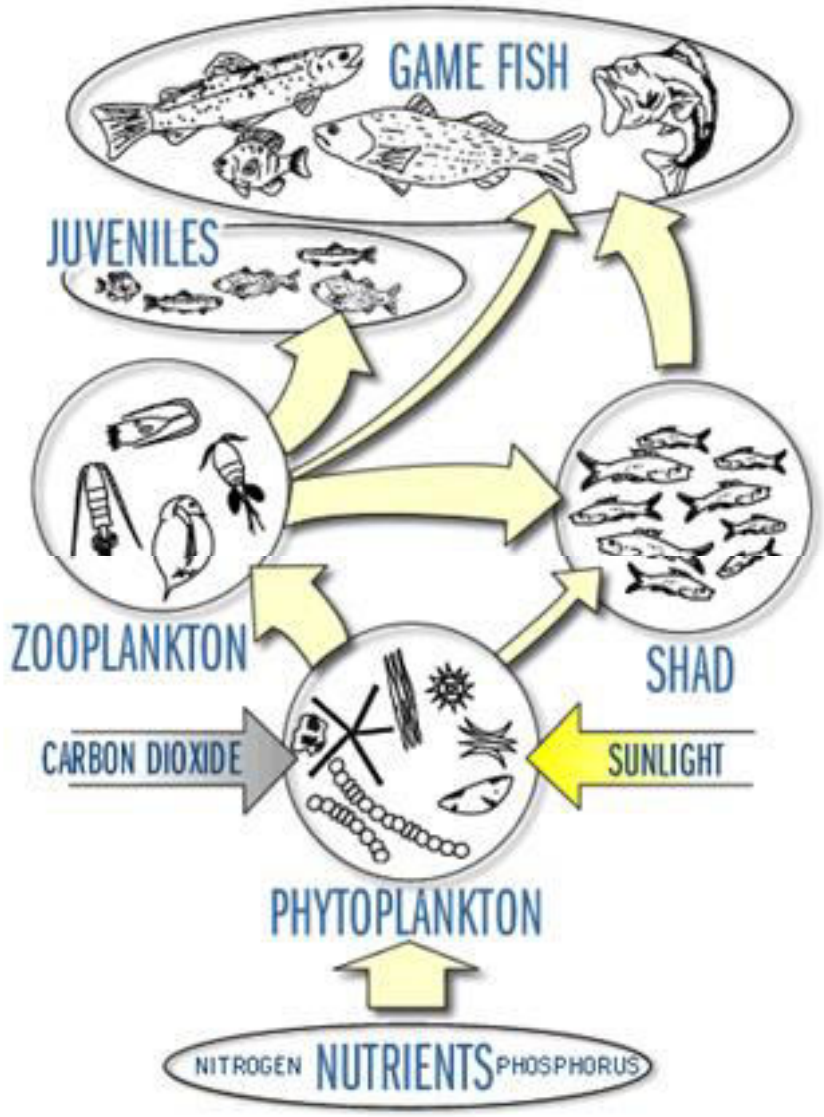


Figure 13. Nutrients as the main driver supporting living organisms within a lake/reservoir ecosystem (Modified on the basis of the Primer on Lake Ecology, https://www.waterontheweb.org/under/lakeecology/)

There are two basic life-sustaining processes in Lakes/Reservoirs , just as on land; photosynthesis and respiration. Green plants capture energy from sunlight to convert nonliving, inorganic chemicals (carbon dioxide, water, and mineral compounds) into living, organic plant tissue. Lake photosynthesizers include algae and macrophytes. Together, they are the primary producers, because they create the organic material required by most other organisms for nutrients and energy.

Oxygen, the waste product of photosynthesis, adds to the oxygen supplied to the lake by the atmosphere. In water layers where photosynthetic rates are very high, such as during an algal bloom, the water may become supersaturated. That is, the oxygen content may exceed 100% of saturation with respect to the amount the water could hold if it was allowed to equilibrate with the atmosphere. This saturation value, in turn, depends on the temperature of the water. Colder water can hold more O2 than warmer water. During periods of stratification, the only potential source of O2 to the deeper zones of the lake is photosynthesis. This occurs only if light penetrates below the thermocline. In Lakes/Reservoirs where light does not penetrate below the thermocline, there is no internal source of oxygen to the deeper waters.

Besides light, algae and higher plants need oxygen, carbon dioxide (CO_2), and mineral nutrients to survive and grow. Except for a very few species of blue green algae, most are unable to survive in anoxic(no O_2) water. CO_2 is virtually always available and comes from the weathering of carbonate rocks, such as limestone, in the watershed, diffusion from the atmosphere (very important in softwater, acid rainsensitive Lakes/Reservoirs), and from the respiration of organic matter by all of the organisms in the lake (see below). Dissolved mineral nutrients are absorbed from the water by algae and from the water and the sediments by higher plants. Typically, the most important nutrients are phosphorus and nitrogen, because they are present in very low concentrations unless there are sources of pollution and are typically low enough to limit the growth of algae. Other minerals essential to life, such as the major ions (calcium, magnesium, sodium, and potassium) and certain trace metals (iron, cobalt, molybdenum, manganese, copper, boron, and zinc), are usually present at sufficient concentrations. Silicon is required by diatoms and a few other groups of algae and is usually, though not always, present at sufficient levels. Another mineral required by all living things, sulfur (in the form of sulfate), is typically not deficient in Lakes/Reservoirs .

The whole interaction of photosynthesis and respiration by plants, animals, and microorganisms represents the food web. Food webs are usually very complex and, in any one lake ecosystem, hundreds of different species can be involved. Because the available energy decreases at each trophic level, a large food base of primary producers (mostly plants) is necessary to support relatively few large fish.

These plants may die and decompose or be eaten by primary consumers – the second trophic level. This link in the food chain typically involves zooplankton grazing on algae but also includes larval fish eating zooplankton and a variety of invertebrates that eat attached algae (periphyton) and higher plants. Other animals, such as small fish, secondary consumers (third trophic level) eat the primary consumers and thus are considered secondary consumers. Still larger consumers such as large fish, ospreys, and people are tertiary consumers (fourth trophic level). Thus, energy and nutrients originating from the photosynthetic production of biomass and energy cascade through the food web.

There is recycling of nutrients back up to the top of the cascade. Respiration, the oxidation of organic material, releases the energy that was originally captured from sunlight by photosynthesis. Both plants and animals respire to sustain their lives, and in doing so, consume oxygen. Microorganisms (bacteria and fungi) consume a large fraction of available oxygen in the decomposition of excreted and dead organic material.

Decomposers are sinks for plant and animal wastes, but they also recycle nutrients for photosynthesis. ***The amount of dead material in a lake far exceeds the living material. Detritus is the organic fraction of the dead material, and can be in the form of small fragments of plants and animals or as dissolved organic material***. This in essence is the reason behind the importance of sediments and sediment quality in lakes and reservoirs and their fundamental role in supporting good status of water bodies.

ECOSYSTEM SERVICES

When assessing the condition of Lakes/Reservoirs , ponds, and reservoirs, these water bodies are often viewed as existing along a continuum from impacted to pristine. This approach is useful for evaluating the overall health of the nation's waters, but is insufficient to adequately evaluate their suitability for alternative, and often conflicting uses. An ecosystem services perspective adds another dimension to lake management and sediment management within it in particular..

Ecosystem services as defined by the Millennium Ecosystem Assessment (2003) are: the benefits people obtain from ecosystems (for a review of the concept and additional definitions please see Fisher et al 2009). These services are often critical for life and enhance human well-being. As such they are part of the global commons and are often considered to be free. An ecosystem services perspective is an explicit acknowledgement that nature has value and that the value can be measured and used to support environmental management decisions.

To understand ecosystem services it is useful to evaluate the types of benefits provided by Lakes/Reservoirs , ponds, and reservoirs. A non-exhaustive list of benefits is presented and more information is available in reviews by Bergstrom et al (1996), Postel & Carpenter (1997), and EPA (2000). These benefits can be separated into: 1) goods and products extracted from Lakes/Reservoirs and, 2) services that depend on local ecosystem processes or lake infrastructure. In most cases, the ecosystem service benefits closely resemble the designated use categories.

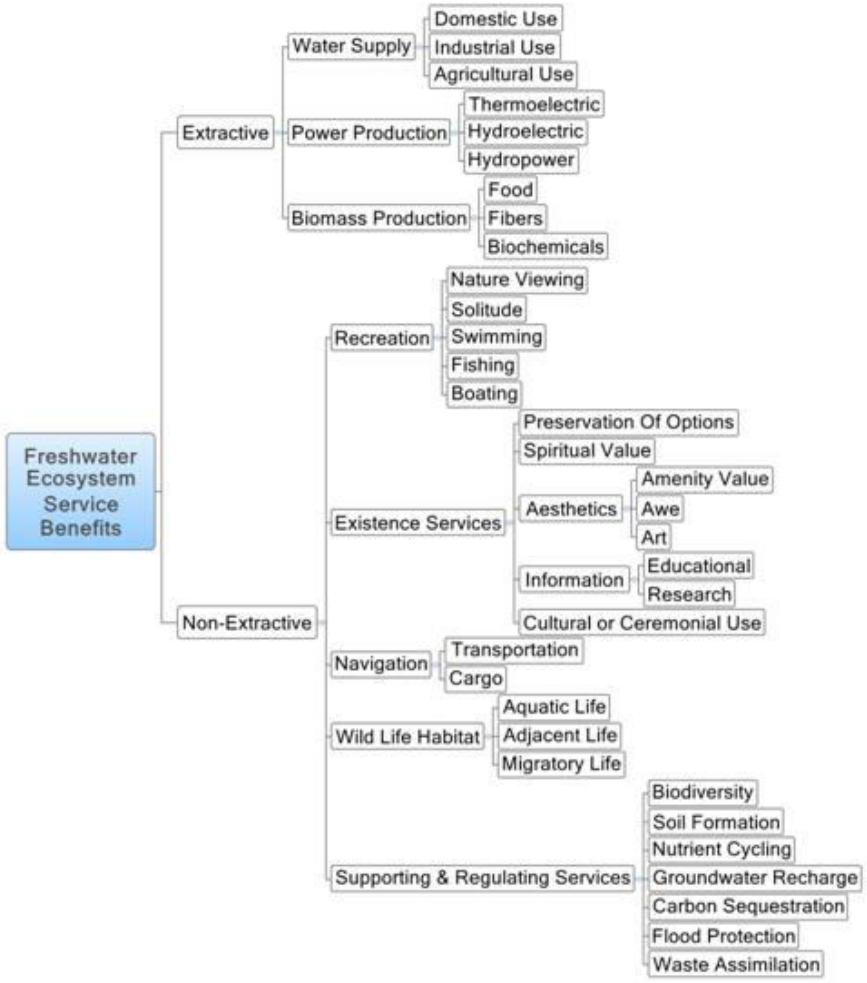


Figure 14. Benefits from ecosystem services in lakes and reservoirs (Modified on the basis of the Primer on Lake Ecology, https://www.watertheweb.org/under/lakeecology/)

Every lake can provide a multitude of ecosystem service benefits simultaneously but the actual output of each will depend on the physical characteristics of the basin and the quantity, quality, and timing of water and sediment regime. As anthropogenic influences increase ecosystem services and benefits will be affected. This can present significant challenges to managers interested in maintaining multiple ecosystem service benefits while ensuring overall lake health.

Within this context however, there are many options open to managers. It should be recognized that not all ecosystem system service benefits can be maximized simultaneously. Decisions will need to be made about which ecosystem services and benefits to emphasize in lake management plans. In doing so, managers need to estimate both the costs of ecosystem services losses as well as the expected gains for ecosystem service increases.

Watershed, lake habitat and sediment management strategies need to consider diverse objectives, designated uses, and implications of management decisions on various ecosystem services and benefits tradeoffs.

FINAL REMARKS

This section has been is intentionally extensive despite the fact that it only presents the differences between lakes and reservoirs and rivers and streams only in general terms. Our intention is to reiterate and stress the unique importance of sediments in these aquatic systems and understand what the important factors associated with sediment quality monitoring in lakes and reservoirs are. We hope that this has been achieved and that it is clear that it is of critical importance that sediment quality studies in lakes and reservoirs do not omit monitoring of all the important parameters needed for the quantification of the sediment quality and its dynamics, all of this in support of the development of sediment quality management strategies to support the implementation of the WFD and achievement of the good status of lake and reservoir water bodies.

From what has been presented in this section it is clear that sediment quality assessment for large lakes and reservoirs needs to include the following monitoring activities:

1. Monitoring of external loading of lake and reservoir systems. Monitoring of suspended sediment load and quality from the tributaries of the system (parameters of interest are organic matter, macro and micronutrients and specific parameters of interest (e.g. priority substances for example)
2. Monitoring of in lake/reservoir sediment production rates (monitoring of in situ sediment production) via monitoring of in lake suspended sediments and their sedimentation rates (of particular interest are quality and deposition rates of sediments to the bottom of the lake). Since in situ sediment production rates are highly spatially variable it is necessary to monitor these at sufficient number of locations to be able to differentiate and quantify deposition rates and quality in the littoral and limnetic zones of lakes and reservoirs.
3. Monitoring of sediment accumulation rates and sediment quality at the bottom of the lake in a manner that can support quantification of internal loading of the lake especially by organics, nutrients and metals. As the internal loading processes depend on the water quality at the sediment water interface (especially its oxygen content) adequate spatial resolution is need to characterize the system. Spatial and temporal heterogeneity is of particular concern and needs to be considered.

SIMONA Project in general and WP 6 in particular, address items 1 and 3 above while item 2 is considered to be outside the project scope.

Sampling approaches and tools for item 1 are already covered by other WP of the SIMONA Project and apply for large lakes and reservoirs and will not be discussed further. Item 3 is of specific interest to WP 6 and demonstration activities subject of this report

As a final note we need to stress that ***it is assumed that any sediment sampling and analysis is always carried out with appropriate and adequate water quality sampling and analysis*** since without appropriate water quality data the results of sediment quality analysis can not be interpreted adequately.

TOPIC 3. ROLE OF SEDIMENT SAMPLING

The main role of sediment sampling is to collect sediment samples which are representative of the field conditions and the location at which they are taken so that their quality analysis can support the quantification of flux of substances of interest (organics, nutrients, priority substances) along different sediment pathways. Furthermore, aside from the quantification of relevant fluxes, sediment samples shall be representative enough to enable the evaluation of sediment quality against the threshold values for sediments with respect to current legislation and standards for a particular aquatic system.

The quantification of sediment fluxes are of particular importance for the assessment of trends in order to be able to forecast future conditions and evaluate the need for a particular set of management measures to be included in River Basin Management Plans for a given water system.

Therefore, sediment sampling must enable, as a minimum the following (Figure 15):

1. Evaluation of seasonal dynamics of sediment quality with respect to relevant parameters (incluing a minimum of quarterly sampling program)
2. Must enable evaluation of spatial variability of sediment quality (sampling most cover littoral and limnetic zones of the lake and reservoir at sufficient number of points to evaluate variability).
3. Must cover different sediment quality parameters and pollutant forms (suspended and bottom sediments, organics, nutrients, metals, priority substances), and
4. Quantification of different source pathways (tributary inflows (suspended sediments), in situ sediment generation rates (SESTON suspended sediments in lake), and bottom sediments.

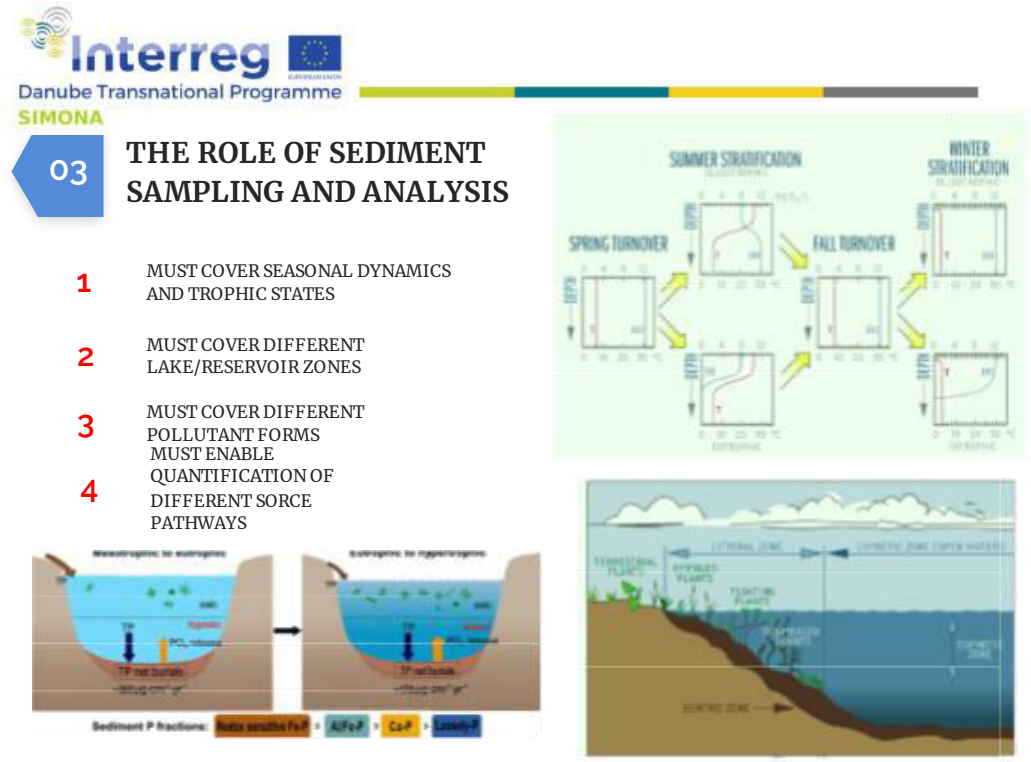


Figure 15. The role of sediment sampling

TOPIC 4. SAMPLING PLAN AND MOBILIZATION

Sampling sediments in large lakes and reservoirs is not something that can be done from the shore or a bridge and requires specialized equipment for accessing the sampling site (appropriate boat or small ship) and equipment (samplers that can access the sediments at depths that are often beyond few meters and can be more than 100 m at times. It is time consuming and costly and if not appropriately planned it can lead to failure and unrepresentative samples and unreliable results.

It is necessary to do proper planning of sampling before the activity is started. This, in practice, calls for the preparation of an appropriate mobilization plan.

The mobilization plan should contain the following as a minimum (Figure 16)

Figure 16. Minimum contents of a sampling activity mobilization plan

Example mobilization plan is given in ANNEX 1. Of this document

TOPIC 5. ACTUAL SAMPLING

Actual sampling demonstration was carried out on two tributaries in the catchment of the Danube near the Iron gate reservoir and in the Iron gate reservoir near the town of Donji Milanovac (Figure 17)

Figure 17. Sediment sampling at tributaries of the lake/reservoir and the Iron Gate I reservoir

The sampling demonstration was recorded and videos and photographs documenting the process are part of this report. Two PowerPoint files with embedded videos is attached to this report and are its integral part

TOPIC 6. POST SAMPLING ACTIVITIES

Post sampling activities include but are not limited to:

- Labeling and storing samples for transport to the lab.
- Completing Field Observation data sheets with all the necessary data and information
- Post processing and analysis of the data once the results from the lab are available

Relevant procedures and standards need to be followed throughout the process

Sample data sheet is shown on figures below.

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06 **POST SAMPLING ACTIVITIES**

1 LABEL AND STORE THE SAMPLES AS APPROPRIATE

2 FILL IN FIELD OBSERVATION SHEET

3 RECORD KEEPING ON PREDEFINED STANDARD FORM (MUST INCLUDE RECORD OF WEATHER CONDITIONS AT THE TIME OF SAMPLLING SAMPLE LABELS, RESPONSIBLE STAFF ETC)

4 MAKE SURE YOU OBSERVE AND NOTE ANY UNUSUALL CONDITIONS AND DIFFICULTIES EXPERIENCED, MALFUNCTIONING OF EQUIPMENT ETC.

5 ONCE LAB RESULTS ARE AVAILABLE COMPUTE SUSPENDED SEDIMENT DISCHARGE

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For further information on the SIMONA Sampling, Laboratory and Evaluation protocols; on the project partnership and the Danube Transnational Programme: www.interreg-danube.eu/simona

FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name:		**Sample identifier (ID):**	
Collection date (DD/MM/YYYY):		**Collection time** (HH:MM):	
Sampling matrix: □ stream/bottom sediment; □ suspended sediment; □ other (floodplain sediment, ...):			
Sampling: □ accredited; □ not accredited		**Sampling standard:**	
MONITORING SITE IDENTIFICATION:			
Monitoring site ID (WISE-SoE):		**Monitoring site ID (national):**	
Name of the Monitoring Site (e.g. name of the surface water and the city):			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): □ river; □ lake; □ wetland; □ other (floodplain, ...):			
Aim of sampling: □ general status; □ reference site (without/small anthropogenic sources); □ investigation site – find contamination source; □ investigation site for other:			
WGS84	Latitude:	**National Coordinate system**	Latitude:
	Longitude:		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? □ YES or □ NO **If no, describe the connection** between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		**Waterbody ID (national):**	
Name of the Waterbody:			
Type of the Waterbody: □ river; □ lake; □ wetland; □ coastal; □ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: □ estimated; □ measured value	**Depth of water** estimated average depth [m]:		**Flow rate** [m/s]: □ estimated; □ measured value
Water temperature [°C]:	**Water electrical conductivity** [µs/cm]:		
Water pH:	**Water transparency** (Secchi disk method) [cm]:		
Geology and background value of parent material/lithology in the area:			

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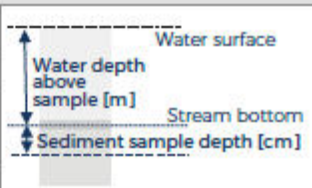
MONITORING SITE CONDITIONS (PART II):	
Extreme conditions: □ none; □ flooding status; □ ice; □ pollution plume; □ contaminated coast/bank; □ other:	
Weather conditions: □ hot; □ sunny; □ cloudy; □ changeable; □ rainy; □ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]:	
Sediment sample depth [cm]:	
Collection device: □ stainless steel scoop; □ corer; □ sampler for suspended sediment; □ other:	
Sample type: □ composite – number of subsamples: _____	
Distance between the first and last sampling site? [m]:	
Sample replicate collected? □ YES or □ NO	**Replicate ID/name:**
Sample is duplicated? □ YES or □ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]:	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	**Sediment pH** (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: □ none; □ light; □ strong; □ earthy; □ mildewed; □ putrid; □ farm slurry; □ fishy; □aromatic; □ sewage; □ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable):	**Signature:**

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Filled in data sheets are attached as Annex 2 to this report

TOPIC 7. CLOSING REMARKS: RECOMMENDATIONS

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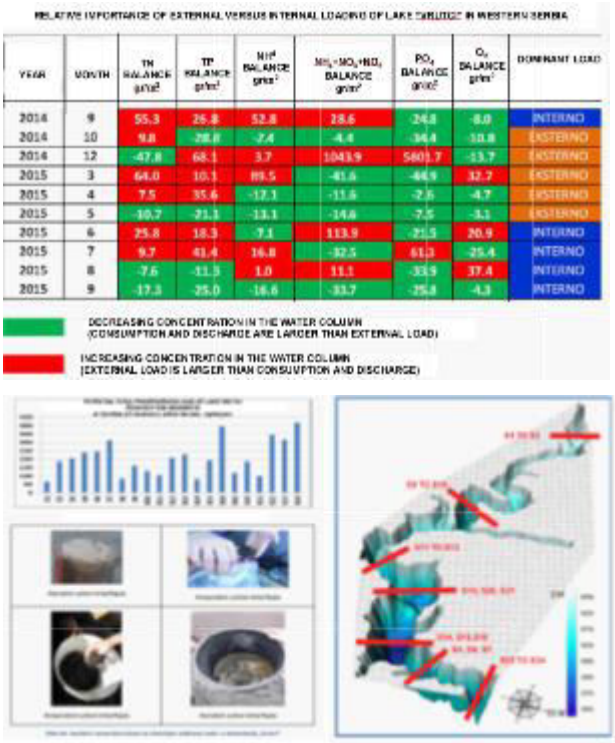
07 **CLOSING COMMENTS**

1 SEDIMENT SAMPLING IN LAKES AND RESERVOIRS SHOULD BE ACCOMPANIED BY WATER SAMPLING ALSO. WATER SAMPLING SHOULD BE CARRIED OUT SO THATTHAT DEPTH PROFILES OF CONCENTRATION OF PARAMETERS OF INTEREST CAN BE ESTABLISHED

2 NUTRIENT CONCENTRATIONS IN WATER COLUMN AND SEDIMENTS SHOULD ALWAYS BE DONE ON TOP OF OTHER PARAMETERS OF INTEREST

3 SEDIMENT QUALITY ASSESSMENT IN LARGE LAKES AND RESERVOIRS SHOULD BE CARRIED OUT AT LEAST QUARTERLY SO THAT THE DYNAMICS OF INTERNAL LOADING CAN BE EVALUATED AND QUANTIFIED

5 IN SITU SEDIMENT PRODUCTION SHOULD BEE CONSIDERED AND QUANTIFIED ESPECIALLY IN EUTROPHIC SYSTEMS



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ANNEX 1. Example of Sampling Mobilization Plan

MOBILIZATION PLAN

FOR SAMPLING OF SURFACE WATERS AND SEDIMENTS IN CATCHMENT OF A RESERVOIR XXXX

(Sampling period start date/end date)

Place, Date

THE CONTENT

As part of the annual water monitoring within the XXX project, in the period between [redacted] and [redacted]. field teams of the Jaroslav Černi Institute will perform field works on the monitoring of surface water and sediment quality in the areas of [redacted]. Within the field works, the following will be performed:

1. flow measurements (hydrometric measurements)
2. morphological measurements of surface waters
3. sampling and in situ measurements of surface waters and sediments

SURFACE WATER AND SEDIMENT MONITORING

The following equipment will be used for the purpose of performing works for the campaign of hydrometric and morphological measurements, sampling and reading of divers:

B . For hydrometric measurements:

1. Macro Water velocity and current meter
2. Micro Water velocity and current meter
3. Speed counter

C. Morphological measurements:

1. GNNS receiver
2. Zodiac boat

D. The following equipment will be used for sampling and in situ measurement of surface and water quality parameters :

1. Telescopic sampling system (Figure 7)
2. YSI ProDSS multiparameter probe
3. Various packaging for samples
4. Portable sample refrigerator

E . Various small mechanically driven tools (wrenches, pliers, etc.)

As part of surface water and sediment monitoring, works will be performed on the profiles listed in Table 1.

Table 1. Monitoring profiles and works performed on them

Monitoring profile	Hydrometric measurements	Level readings manual and automatic	Morphological measurements	Sampling
[redacted]	✓	✓ ✓		
[redacted]				✓
[redacted]	✓	✓ ✓		
[redacted]				✓
[redacted]	✓	✓ ✓		
[redacted]	✓	✓ ✓		
[redacted]	✓	✓ ✓		✓

Below are pictures of the equipment used during monitoring.

Light intensity meter

Current meter

Micro current meter

Revolution counter

GPS Receiver

„Sampling ship

Telescopic water samplling bottle

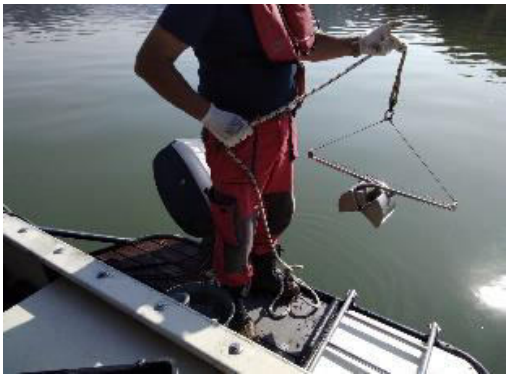
In situ multiparameter probe „YSI ProDSS“

Sample containers

Sediment core samplers for shallow sediments and bank soil

Undisturbe sample correr

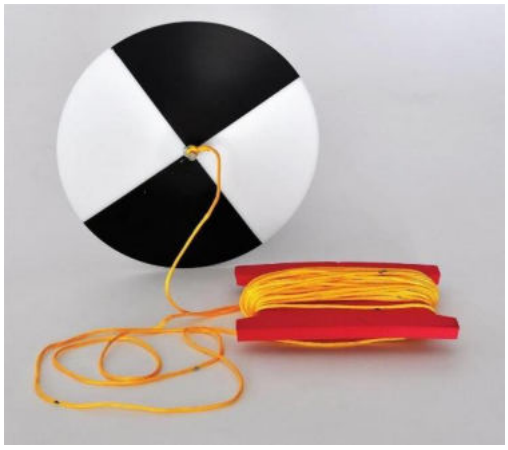
Sample field refirigirator



Eckmn Dredge sediment sampler

Undisturbed sediment core sampler

Van Dorn water sampler



Sechhi Disk

Accessories (plastic bags, bucket, gloves etc

HYDROMETRIC MEASUREMENTS

Hydrometric measurements will be performed by two separate teams. One team is composed of two members while the other is composed of 3 members.

One team carries out meassurements on streams tributaries to the lake and the second team takes meassurements in the lake.

Depending on the depth and width of the tributary, speed measurements take up to an hour per site. For the lake sites the time required is about 1 hour per measuring point (number of points need to be measured at each cross section)According to the situation on the field and the current water level in the measuring profile, the appropriate speed measurement procedure will be applied. The categorization from the water safety procedure envisages works from the boat (Figure 6)

MORPHOLOGICAL MEASUREMENTS

Morphological measurements - measurement of the transverse profile of the riverbed is performed by a team of three members. The measurement is performed from a boat using a GNSS receiver.

SAMPLING

Sampling can be done by directly filling the packaging from the river flow by descending into the riverbed, or by capturing water with a telescopic sampling system (Figure 7), from which the packaging for the samples is then filled (Figure 9).

In-situ measurements of pH, temperature, dissolved oxygen content and electrical conductivity will be performed by immersing the YSI ProDSS multiparameter probe (Figure 8) directly into the watercourse and reading the measured values from the display of the measuring apparatus. Sampling will be performed in accordance with the previously agreed methodology and in accordance with the requirements of international ISO standards that define guidelines for the collection of surface water samples.

ENGAGING FIELD TEAMS

The mobilization plan for sampling of surface and groundwater envisages the engagement of the following workers:

1. [redacted], B.Sc. in Environmental Protection , team leader 060 3835592
2. [redacted], master chemist, team leader, 064 244 5835

3. [redacted], technician
4. [redacted], tech.
5. [redacted], technician
6. [redacted], technician
7. [redacted], technician

Two Dacia Duster off-road vehicles and one Toyota Hilux will be used to transport people and equipment.

R. no.	Vehicle / Equipment	Place of loading	Place of unloading	Purpose	Note
1.	Dacia Duster	White City	Loznica	4x4	Transportation of workers and equipment
2	Dacia Duster	White City	Loznica	4x4	Transportation of workers and equipment
3	Toyota Hilux	White City	Loznica	4x4	Transportation of workers and equipment

As the sampling is planned to last for several days, there is still the possibility of changes in the plan, ie. to suspend sampling due to bad weather conditions such as heavy rainfall. You will be notified in a timely manner of any changes to the sampling and mobilization plan. In case of suspension of works, the team leaders are obliged to inform the contact person who represents the investor **immediately** after determining the need for suspension of works.

In the event of a change in the composition of the teams on the ground or the rotation of the planned team members, the contact person representing the investor will be notified at least **12 hours in** advance. Due to the nature of the work and unpredictable field conditions, it is possible that there will be changes in the planned sampling locations for a given day. Seeing that this cannot be determined in advance, but depends on current field conditions, meteorological conditions, etc., any changes and deviations from the planned sampling locations for the day, the contact person representing the investor will be notified **immediately** after determining the need for deviation from the planned dynamics before the team is sent to the newly chosen location.

Estimated working hours are from 8:00 am to 5:00 pm but this time may be exceeded in case the job requires it.

ACTIVITY PLAN

DATE		
Time	**Description of works**	**The works are realized by:**

23-03-2021		
Team 1		
Time	**Description of works**	**The works are realized by:**
08 30-9 00		Marko Marjanović, D. Radovic, S. Ostojic
09-16 00		

16 ^{00} - 17 ^{00}		
Team 2		
08 ^{30}-9 ^{00}		И.Лумовић, T. Arizanovic
10 ^{30}-16 ^{00}		
16 ^{00} - 17 ^{00}		

Etc for each day in the field

RISK ASSESSMENT

During the execution of works, there is a possibility that workers are exposed to certain risks. In order to reduce the likelihood of undesirable situations or consequences, the risks to which workers will be exposed have been analyzed and recommendations of preventive measures that must be taken in order to minimize or completely eliminate the risks are given. An overview of the identified risks is given below.

Table 3. Identified risks and measures for risk reduction and safe operation

	ASSESSED RISKS	RISK	MEASURES FOR SAFE WORK
1.	Danger of falling	Low	Obligatory observance of safety measures and technical regulations when working in the field. Locations of works (field measurements) should be properly provided. Use prescribed personal protective equipment. Perform a visual inspection of the terrain and assess whether it is safe to move on it.
2.	Risks due to participation in traffic	High	Obligatory observance of safety measures when working in the field, perform daily and weekly vehicle inspections. Use the prescribed personal protective equipment in the event of a car breakdown (high visibility vests, triangle, etc.) Observance of the OSH procedure and driving procedure. Prohibition of using the phone for the driver, even with "bluetooth" devices.
3.	Danger of landslides	Low	Obligatory observance of safety measures when working in the field. Adherence to OSH and driving procedures.
4.	Danger of falling objects	Low but there is	Obligatory observance of safety measures when working in the field. Use the prescribed personal protective equipment, which includes shoes with a protective metal cap.
5.	Dangerous surfaces / possible slipping or tripping (all types of treads that the employee comes into contact with, wet, slippery uneven surfaces, etc.)	Low but there is	Adherence to safety procedures regarding safety and health at work. Marking of dangerous places for easier observation. Be sure to move carefully on wet, slippery and uneven surfaces. Use prescribed personal protective equipment.
6.	Danger of insect bites.	Very Low	Adherence to safety procedures regarding safety and health at work. Use prescribed personal protective equipment that includes work clothes and shoes that provide protection. In case of bites, act in accordance with the instructions with the document - Response plans in case of accidents and emergencies.
7.	Harmfulness due to possible contact with waste materials, soil and water poisoning (pesticides, waste, etc.)	Low but there is	Observance of work procedures and general safety measures in places where contact with waste and hazardous substances is possible. Application of personal protective equipment intended for work

	ASSESSED RISKS	RISK	MEASURES FOR SAFE WORK
			under such conditions. Wear safety data sheets for necessary chemicals that describe first aid measures in case of an incident.
8.	Risk of cuts, stings and similar injuries due to the use of auxiliary tools or movement in the field (use of axes, mowers, plant injuries)	Middle	This risk is more pronounced when working in the area of "Rakovica". It is necessary to use the prescribed personal protective equipment, including work suits, shoes, helmets and gloves.
10.	Danger of bad weather	Low	This risk is present in both research areas. In case of weather, it is necessary to act in accordance with the Procedure in case of weather.
11.	Danger when working with the unit	Low	There is a risk of electric shock when working with the unit. In order to minimize this risk, it is necessary to perform an attestation in order to ensure their technical correctness and earthing of the unit during operation. It is necessary to turn the unit so that the exhaust gases from the unit are directed in the direction of the employees.
12.	Danger when carrying cargo	Low	Compliance with all requirements in the procedure for manual transfer of cargo and increased caution when transferring cargo. Conducting a visual assessment of the terrain, places for storing cargo, places for movement, etc.
13.	Risk of exposure and infection with COVID-19 virus	Middle	Obligatory observance of all measures prescribed in the Rulebook on work organization and protection measures for employees in the transitional period after the cessation of the state of emergency due to the pandemic caused by the COVID-19 virus , which we submit with this Mobilization Plan. These measures include mandatory wearing of protective masks and gloves in all situations where it is not possible to keep a distance of at least 2m between employees, regular hand washing with soap and disinfectant. Every morning before starting work, employees will fill out a questionnaire related to the symptoms of Covid-19. Employees will have their temperature measured every morning before starting work.

NOTE:

Due to the current situation regarding the Corona virus, all participants in the monitoring must fill in and submit to the Investor the form submitted to the IJC by Rio Sava before starting the works. In this regard, the form will be submitted to all participants in groundwater monitoring for inspection and signature in a timely manner.

During the stay in the field and in the accommodation premises during the monitoring, it is recommended to avoid handling, it is desirable to wear protective masks, each team should have a disinfectant as part of the equipment and maintain hand hygiene whenever possible.

For all planned works during the measurement, measures will be taken to protect the environment and protect workers from potential hazards of the environment in which the work is performed.

The group leader will be in charge of implementing safety measures at work, and to warn each worker of irregularities during the works. All protection measures are defined in the instructions:

1. Procedure for safe operation during water and sediment sampling
2. Procedure in case of bad weather
3. OSH Procedure and driving style
4. Jewelry wearing procedure
5. Ordinance on the organization of work and measures for the protection of employees in the transitional period after the cessation of the state of emergency due to a pandemic caused by the COVID-19 virus
6. Procedures for performing all the above works in the area of lake/reservoir xxxx by localities are described in the "Study on OSH risk assessment during surface water and sediment monitoring in the area xxxxx.

All workers must respect the protection measures from the protocol and which are determined by the manager. In case of non-compliance with the procedures, the worker will be removed from the place of work.

As the program of works envisages movement along roads of different categories, all workers are obliged to wear high visibility clothes - fluorescent jackets or vests (Figure 10). If there is a need to move through the forest belt, the obligatory part of the OSH equipment is a protective helmet and goggles (Figures 11 and 12).

Compulsory safety at work protective gear

A protective water vest will be used as a mandatory part of OSH equipment when working on water (Figure 13).

In Belgrade, DATE,

_____

Head of the team for monitoring

[redacted]

_____

Head of surface water monitoring team

Attachmet

MAPS with relevant data: Roads, sampling points, hospitals, petrol stations etc.

ANNEX 2. FIELD OBSERVATION DATA SHEETS

Interreg
Danube Transnational Programme
SIMONA

For further information on the **SIMONA Sampling, Laboratory and Evaluation protocols;** on the project, partnership and the Danube Transnational Programme: **www.interreg-danube.eu/simona**

FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_RA.BS	
Collection date (DD/MM/YYYY): 31/08/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river near Ram			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Danube river prior to the confluence of the Nera.			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 49' 17"	National Coordinate system	Latitude:
	Longitude: 21° 20' 16"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D4	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 800 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 15 m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 24,7	Water electrical conductivity [µs/cm]: 364,6		
Water pH: 7,81	Water transparency (Secchi disk method) [cm]: 0,65 m		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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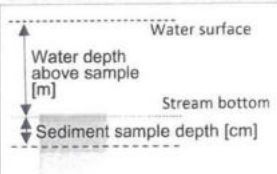
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty
SEDIMENT COLLECTION INFORMATION:
Water depth above sample [m]: 10m
Sediment sample depth [cm]: 0-20cm
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:
Sample type: ☑ composite – number of subsamples: 3
Distance between the first and last sampling site? [m]: 30m
Sample replicate collected? ☐ YES or ☑ NO — Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO
SAMPLE INFORMATION:
Sampling volume estimated, wet weight [liter]: 0,4L
Temperature of sample (field observation, right after sampling) [°C]:
Sediment pH (undisturbed): — Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):
Texture (particle size description):
Odour: ☐ none; ☑ light; ☐ strong; ☐ earthy; ☑ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):
Sample photograph identification:
Additional comments (e.g. map of the sampling site):
Sampler name (readable): M. Marjanović — Signature:



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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:	
Project name: SIMONA	Sample identifier (ID): WP6_NS-BS
Collection date (DD/MM/YYYY): 26/08/2020	Collection time (HH:MM):
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):	
Sampling: ☑ accredited; ☐ not accredited	Sampling standard: ISO 5667-12:2019
MONITORING SITE IDENTIFICATION:	
Monitoring Site ID (WISE-SoE):	Monitoring Site ID (national): 42035
Name of the Monitoring Site (e.g. name of the surface water and the city): Novi Sad - Danube river at city of Novi Sad.	
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):	
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir	
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:	

WGS84	Latitude: 45° 15' 43"	National Coordinate system	Latitude:
	Longitude: 19° 52' 40"		Longitude:

MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:	
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):	
Waterbody ID (WISE-SoE):	Waterbody ID (national): D7
Name of the Waterbody: Danube river	
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional	

MONITORING SITE CONDITIONS (PART I):		
River width [m]: 500m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 5m	Flow rate [m/s]: ☐ estimated; ☐ measured value
Water temperature [°C]: 23,7	Water electrical conductivity [µs/cm]: 335,8 mS/cm	
Water pH: 7,92	Water transparency (Secchi disk method) [cm]: 0,45	
Geology and background value of parent material/lithology in the area:		

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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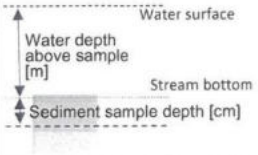
Weather conditions: ☐ hot; ☐ sunny; ☐ cloudy; ☐ changeable; ☑ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 3m	
Sediment sample depth [cm]: 0-20cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☑ composite – number of subsamples: 3	
Distance between the first and last sampling site? [m]: 30m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,4l	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☐ none; ☑ light; ☐ strong; ☑ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Sandy sediment.	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Marjanović	Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): SDTA-BRBS_01	
Collection date (DD/MM/YYYY): 08/09/2020		Collection time (HH:MM):	
Sampling matrix: ☐ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE): N/A		Monitoring Site ID (national): 42906	
Name of the Monitoring Site (e.g. name of the surface water and the city): Borska Reka midway between Rgotina and Slatina			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Borska reka under bridge near natural road R165			
Type of the monitoring site (can be different from representing waterbody): ☑ river; ☐ lake; ☐ wetland; ☐ other (floodplain, ...):			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other: South Danube Test Area sampling program of the SIMONA DTP project.			
WGS84	Latitude: 44° 01' 49,75"	National Coordinate system	Latitude:
	Longitude: 22° 12' 39,18"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): BOR_01(90)	
Name of the Waterbody: Borska reka			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 3 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 0,5 m		Flow rate [m/s]: ☐ estimated; ☐ measured value
Water temperature [°C]: 24,7°	Water electrical conductivity [µs/cm]: 1704 mS/cm		
Water pH: 4,89	Water transparency (Secchi disk method) [cm]: 70,5m		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty

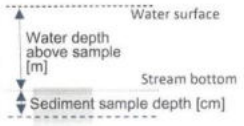
SEDIMENT COLLECTION INFORMATION:

Water depth above sample [m]: 0,5m

Sediment sample depth [cm]: 10cm

Collection device: ☑ stainless steel scoop; ☐ corer; ☐ sampler for suspended sediment; ☐ other:

Sample type: ☑ composite – number of subsamples: 5



Distance between the first and last sampling site? [m]: 25m

Sample replicate collected? ☐ YES or ☑ NO | Replicate ID/name:

Sample is duplicated? ☐ YES or ☑ NO

SAMPLE INFORMATION:

Sampling volume estimated, wet weight [liter]: 300 gr

Temperature of sample (field observation, right after sampling) [°C]: 24,5°

Sediment pH (undisturbed): | Sediment pH (post-homogenization):

Colour (Munsell soil colour chart number):

Texture (particle size description):

Odour: ☑ none; ☐ light; ☐ strong; ☐ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil

Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):

A few small pebbles are visible.

Sample photograph identification:

Additional comments (e.g. map of the sampling site):

Sampler name (readable): M Marjanović | Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): SDTA_BRFP_01	
Collection date (DD/MM/YYYY): 08/09/2020		Collection time (HH:MM): 09:41	
Sampling matrix: ☐ stream/bottom sediment; ☐ suspended sediment; ☑ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national): 42906	
Name of the Monitoring Site (e.g. name of the surface water and the city): Borska reka midway between Rgotina and Slatina			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Borska reka under bridge near national road R165			
Type of the monitoring site (can be different from representing waterbody): ☑ river; ☐ lake; ☐ wetland; ☐ other (floodplain, ...):			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other: South Danube Test area sampling program for SIMONA DTP project.			
WGS84	Latitude: 44° 09' 52,40"	National Coordinate system	Latitude:
	Longitude: 22° 12' 41,3"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☐ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): Bor_01 (go)	
Name of the Waterbody: Borska reka			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 3m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]:	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]:	Water electrical conductivity [µs/cm]:		
Water pH:	Water transparency (Secchi disk method) [cm]:		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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A stream of cooperation

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For further information on the **SIMONA Sampling, Laboratory and Evaluation protocols;** on the project, partnership and the Danube Transnational Programme: **www.interreg-danube.eu/simona**

Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty
SEDIMENT COLLECTION INFORMATION:
Water depth above sample [m]:
Sediment sample depth [cm]: 30cm
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:
Sample type: ☑ composite – number of subsamples: 5
Distance between the first and last sampling site? [m]: 25m
Sample replicate collected? ☐ YES or ☐ NO — Replicate ID/name:
Sample is duplicated? ☐ YES or ☐ NO
SAMPLE INFORMATION:
Sampling volume estimated, wet weight [liter]:
Temperature of sample (field observation, right after sampling) [°C]:
Sediment pH (undisturbed): — Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):
Texture (particle size description):
Odour: ☑ none; ☐ light; ☐ strong; ☐ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Small stones visible.
Sample photograph identification:
Additional comments (e.g. map of the sampling site):
Sampler name (readable): M. Marjanović — Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): SDTA_TIBS_01	
Collection date (DD/MM/YYYY): 08/09/2020		Collection time (HH:MM):	
Sampling matrix: ☑stream/bottom sediment; ☐suspended sediment; ☐other (floodplain sediment, ...):			
Sampling: ☑accredited; ☐not accredited		Sampling standard:	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): TIMOK			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Timok river near national road R169 and small beach.			
Type of the monitoring site (can be different from representing waterbody): ☑river; ☐lake; ☐wetland; ☐other (floodplain, ...):			
Aim of sampling: ☐general status; ☐reference site (without/small anthropogenic sources); ☐investigation site – find contamination source; ☑investigation site for other:			
WGS84	Latitude: 44° 06' 14,3"	National Coordinate system	Latitude:
	Longitude: 22° 34' 13,5"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑YES or ☐NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): TIM_2	
Name of the Waterbody: TIMOK			
Type of the Waterbody: ☑river; ☐lake; ☐wetland; ☐coastal; ☐transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 25 m ☑estimated; ☐measured value	Depth of water estimated average depth [m]: 1,5 m	Flow rate [m/s]: ☐estimated; ☐measured value	
Water temperature [°C]: 20,1	Water electrical conductivity [µs/cm]: 1075 µS/cm		
Water pH: 7,3	Water transparency (Secchi disk method) [cm]:		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑none; ☐flooding status; ☐ice; ☐pollution plume; ☐contaminated coast/bank; ☐other:

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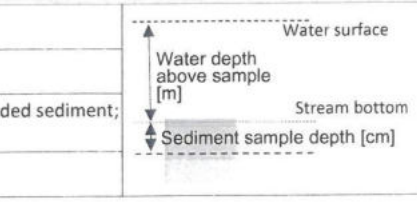
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty
SEDIMENT COLLECTION INFORMATION:
Water depth above sample [m]: 1m
Sediment sample depth [cm]: 0-10cm
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:
Sample type: ☑ composite – number of subsamples: 2
Distance between the first and last sampling site? [m]: 25 m
Sample replicate collected? ☐ YES or ☑ NO — Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO
SAMPLE INFORMATION:
Sampling volume estimated, wet weight [liter]: 0,3 l
Temperature of sample (field observation, right after sampling) [°C]:
Sediment pH (undisturbed): — Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):
Texture (particle size description):
Odour: ☐ none; ☑ light; ☐ strong; ☑ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Some peat and sand are present in the sample.
Sample photograph identification:
Additional comments (e.g. map of the sampling site):
Sampler name (readable): M. Marjanović — Signature:



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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): SDTA-TIBS-02	
Collection date (DD/MM/YYYY): 08/09/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard:	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): TIMOK			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Timok river near national road R169 and small beach.			
Type of the monitoring site (can be different from representing waterbody): ☑ river; ☐ lake; ☐ wetland; ☐ other (floodplain, ...):			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 06' 14,3"	National Coordinate system	Latitude:
	Longitude: 22° 34' 13,5"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): TIM-2	
Name of the Waterbody: TIMOK			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: ☑ estimated; ☐ measured value 25m	Depth of water estimated average depth [m]: 1,5 m		Flow rate [m/s]: ☐ estimated; ☐ measured value
Water temperature [°C]: 20,1	Water electrical conductivity [µs/cm]: 1075 µS/cm		
Water pH: 7,3	Water transparency (Secchi disk method) [cm]:		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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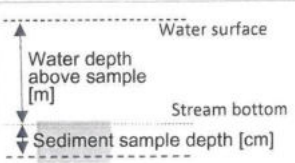
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 1m	
Sediment sample depth [cm]: 10-25cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☑ composite – number of subsamples: 2	
Distance between the first and last sampling site? [m]: 25m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,3l	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☐ none; ☑ light; ☐ strong; ☑ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Some peat and sand are present in the sample	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Marjanović	Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): SDTA-TIBS_03	
Collection date (DD/MM/YYYY): 08/09/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard:	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): TIMOK			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Timok river near national road R169 and small beach			
Type of the monitoring site (can be different from representing waterbody): ☑ river; ☐ lake; ☐ wetland; ☐ other (floodplain, ...):			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 06' 14,3"	National Coordinate system	Latitude:
	Longitude: 22° 34' 13,5"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): TIM_2	
Name of the Waterbody: TIMOK			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 25 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 1,5 m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 20,1	Water electrical conductivity [µs/cm]: 1075 mS/cm		
Water pH: 7,3	Water transparency (Secchi disk method) [cm]:		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty

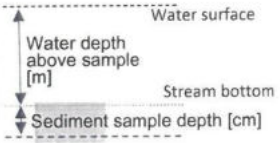
SEDIMENT COLLECTION INFORMATION:

Water depth above sample [m]: 1m

Sediment sample depth [cm]: 25-50cm

Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:

Sample type: ☑ composite – number of subsamples: 2



Distance between the first and last sampling site? [m]: 25m

Sample replicate collected? ☐ YES or ☑ NO | Replicate ID/name:

Sample is duplicated? ☐ YES or ☑ NO

SAMPLE INFORMATION:

Sampling volume estimated, wet weight [liter]: 0,3l

Temperature of sample (field observation, right after sampling) [°C]:

Sediment pH (undisturbed): | Sediment pH (post-homogenization):

Colour (Munsell soil colour chart number):

Texture (particle size description):

Odour: ☐ none; ☑ light; ☐ strong;
☑ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil

Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):

Some peat and sand are present in the sample.

Sample photograph identification:

Additional comments (e.g. map of the sampling site):

Sampler name (readable): Marko Marjanović | Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): SDTA_TIBS_04	
Collection date (DD/MM/YYYY): 08/09/2020		Collection time (HH:MM): 12:30	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Timok			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Timok river near national road R169 and small beach.			
Type of the monitoring site (can be different from representing waterbody): ☑ river; ☐ lake; ☐ wetland; ☐ other (floodplain, ...):			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other: South Danube Test Area sampling program for SIMONA DTP project.			
WGS84	Latitude: 44° 06' 14,3"	National Coordinate system	Latitude:
	Longitude: 22° 34' 13,5"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): TIM_2	
Name of the Waterbody: TIMOK			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 25m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 1,5m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 20,1°	Water electrical conductivity [µs/cm]: 1075 µS/cm		
Water pH: 7,3	Water transparency (Secchi disk method) [cm]:		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty

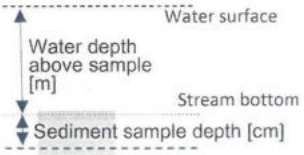
SEDIMENT COLLECTION INFORMATION:

Water depth above sample [m]: 1m

Sediment sample depth [cm]: 30cm

Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:

Sample type: ☑ composite – number of subsamples: 3



Distance between the first and last sampling site? [m]: 30m

Sample replicate collected? ☐ YES or ☐ NO | Replicate ID/name:

Sample is duplicated? ☐ YES or ☐ NO

SAMPLE INFORMATION:

Sampling volume estimated, wet weight [liter]: 300gr

Temperature of sample (field observation, right after sampling) [°C]: 20°c

Sediment pH (undisturbed): | Sediment pH (post-homogenization):

Colour (Munsell soil colour chart number):

Texture (particle size description):

Odour: ☐ none; ☐ light; ☐ strong;
☑ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil

Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):
Some peat and sand are present in the sample.

Sample photograph identification:

Additional comments (e.g. map of the sampling site):

Sampler name (readable): M. Majnović | Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): SDTA_TIFP_01	
Collection date (DD/MM/YYYY): 08/09/2020		Collection time (HH:MM):	
Sampling matrix: ☐ stream/bottom sediment; ☐ suspended sediment; ☑ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE): N/A		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): TIMOK			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Timok river near national road R169 and small beach.			
Type of the monitoring site (can be different from representing waterbody): ☑ river; ☐ lake; ☐ wetland; ☐ other (floodplain, ...):			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other: South Danube Tast area sampling program of the DTP SIMONA project.			
WGS84	Latitude: 44° 06' 14,3"	National Coordinate system	Latitude:
	Longitude: 22° 34' 13,5"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national):	
Name of the Waterbody: TIMOK			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 25m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]:	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]:	Water electrical conductivity [µs/cm]:		
Water pH:	Water transparency (Secchi disk method) [cm]:		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty

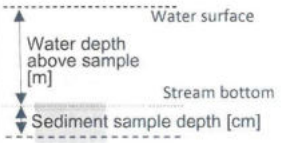
SEDIMENT COLLECTION INFORMATION:

Water depth above sample [m]: /

Sediment sample depth [cm]: 25cm

Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:

Sample type: ☑ composite – number of subsamples: 5



Distance between the first and last sampling site? [m]: 25m

Sample replicate collected? ☐ YES or ☐ NO | Replicate ID/name:

Sample is duplicated? ☐ YES or ☐ NO

SAMPLE INFORMATION:

Sampling volume estimated, wet weight [liter]:

Temperature of sample (field observation, right after sampling) [°C]:

Sediment pH (undisturbed): | Sediment pH (post-homogenization):

Colour (Munsell soil colour chart number):

Texture (particle size description): sandy texture with some fine particles present.

Odour: ☑ none; ☐ light; ☐ strong;
☐ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil

Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):
Small stones present.

Sample photograph identification:

Additional comments (e.g. map of the sampling site):

Sampler name (readable): M. Maganović | Signature:

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For further information on the **SIMONA Sampling, Laboratory and Evaluation protocols;** on the project, partnership and the Danube Transnational Programme: **www.interreg-danube.eu/simona**

FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_RA_BS	
Collection date (DD/MM/YYYY): 31/08/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river near Ram			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Danube river prior to the confluence of the Neru.			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 49' 17"	National Coordinate system	Latitude:
	Longitude: 21° 20' 16"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D4	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 800 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 15 m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 24,7	Water electrical conductivity [µs/cm]: 364,6		
Water pH: 7,81	Water transparency (Secchi disk method) [cm]: 0,65 m		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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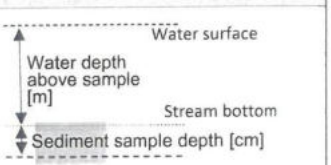
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 10m	
Sediment sample depth [cm]: 0-20cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☑ composite – number of subsamples: 3	
Distance between the first and last sampling site? [m]: 30m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,4l	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☐ none; ☑ light; ☐ strong; ☐ earthy; ☑ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Marjanović	Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_SD_BS	
Collection date (DD/MM/YYYY): 30/08/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national): 42055	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river near Smederevo.			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 41' 52"	National Coordinate system	Latitude:
	Longitude: 20° 57' 25"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☐ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D5	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 850m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 8m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 24,7	Water electrical conductivity [µs/cm]: 364,6		
Water pH: 7,81	Water transparency (Secchi disk method) [cm]: 0,65 m		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty
SEDIMENT COLLECTION INFORMATION:
Water depth above sample [m]: 6m
Sediment sample depth [cm]: 0-20cm
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:
Sample type: ☑ composite – number of subsamples: 3
Distance between the first and last sampling site? [m]: 30m
Sample replicate collected? ☐ YES or ☑ NO — Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO
SAMPLE INFORMATION:
Sampling volume estimated, wet weight [liter]: 0,4l
Temperature of sample (field observation, right after sampling) [°C]:
Sediment pH (undisturbed): — Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):
Texture (particle size description):
Odour: ☐ none; ☑ light; ☐ strong; ☐ earthy; ☑ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Some sand and seashells present before sieving.
Sample photograph identification:
Additional comments (e.g. map of the sampling site):
Sampler name (readable): Marko Marjanović — Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_LE_BS	
Collection date (DD/MM/YYYY): 25/08/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Ledinci – Danube river near village of Ledinci			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...):			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 45° 13' 12''	National Coordinate system	Latitude:
	Longitude: 19° 48' 13''		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D8	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 650 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 5 m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 23,7	Water electrical conductivity [µs/cm]: 335,8		
Water pH: 7,9	Water transparency (Secchi disk method) [cm]: 0,45 m		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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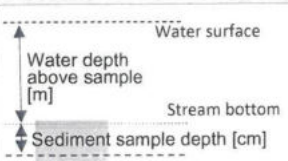
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☑ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 3m	
Sediment sample depth [cm]: 0–10cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☑ composite – number of subsamples: 3	
Distance between the first and last sampling site? [m]: 30 m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,4m	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☑ none; ☐ light; ☐ strong; ☐ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Sand and pebbles present.	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Marjanović	Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:

Project name: SIMONA	Sample identifier (ID): WP6_NS_BS
Collection date (DD/MM/YYYY): 26/08/2020	Collection time (HH:MM):
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):	
Sampling: ☑ accredited; ☐ not accredited	Sampling standard: ISO 5667-12:2019

MONITORING SITE IDENTIFICATION:

Monitoring Site ID (WISE-SoE):	Monitoring Site ID (national): 42035

Name of the Monitoring Site (e.g. name of the surface water and the city):
Novi Sad - Danube river at city of Novi Sad.

Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):

Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir

Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:

WGS84	Latitude: 45°15'43"	National Coordinate system	Latitude:
	Longitude: 19° 52' 40"		Longitude:

MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:

Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO
If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):

Waterbody ID (WISE-SoE):	Waterbody ID (national): D7

Name of the Waterbody: Danube river

Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional

MONITORING SITE CONDITIONS (PART I):

River width [m]: 500m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 5m	Flow rate [m/s]: ☐ estimated; ☐ measured value
Water temperature [°C]: 23,7	Water electrical conductivity [µs/cm]: 335,8 mS/cm	
Water pH: 7,92	Water transparency (Secchi disk method) [cm]: 0,45	

Geology and background value of parent material/lithology in the area:

MONITORING SITE CONDITIONS (PART II):

Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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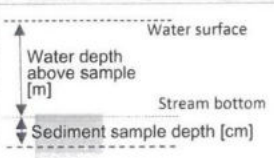
Weather conditions: ☐ hot; ☐ sunny; ☐ cloudy; ☐ changeable; ☑ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 3m	
Sediment sample depth [cm]: 0-20cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☑ composite – number of subsamples: 3	
Distance between the first and last sampling site? [m]: 30 m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,4 l	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☐ none; ☑ light; ☐ strong; ☑ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Sandy sediment.	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Marjanović	Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_SB_BS	
Collection date (DD/MM/YYYY): 27/08/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river near Stari Banovci village			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 59' 20"	National Coordinate system	Latitude:
	Longitude: 20° 17' 48"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☐ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D6	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 550 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]:	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 23,5	Water electrical conductivity [µs/cm]: 342,9		
Water pH: 7,97	Water transparency (Secchi disk method) [cm]: 0,55		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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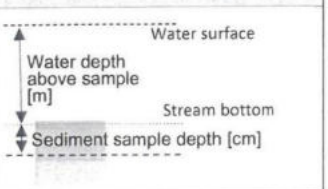
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 2m	
Sediment sample depth [cm]: 0-20cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☑ composite – number of subsamples: 3	
Distance between the first and last sampling site? [m]: 50m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,3l	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☑ none; ☐ light; ☐ strong; ☐ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Sandy sediment.	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Marjanović	Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_RT_BS	
Collection date (DD/MM/YYYY): 30/08/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667 - 12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river near Ritopek			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 44' 27"	National Coordinate system	Latitude:
	Longitude: 20° 39' 37"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D5	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 500m ☑ estimated; ☐ measured value		Depth of water estimated average depth [m]:	Flow rate [m/s]: ☐ estimated; ☐ measured value
Water temperature [°C]: 24,3		Water electrical conductivity [µs/cm]: 354,9 mS/cm	
Water pH: 7,86		Water transparency (Secchi disk method) [cm]: 0,8m	
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty

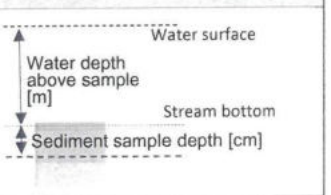
SEDIMENT COLLECTION INFORMATION:

Water depth above sample [m]: 4m

Sediment sample depth [cm]: 0-20cm

Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:

Sample type: ☑ composite – number of subsamples: 3



Distance between the first and last sampling site? [m]: 30m

Sample replicate collected? ☐ YES or ☑ NO | Replicate ID/name:

Sample is duplicated? ☐ YES or ☑ NO

SAMPLE INFORMATION:

Sampling volume estimated, wet weight [liter]: 0,5 l

Temperature of sample (field observation, right after sampling) [°C]:

Sediment pH (undisturbed): | Sediment pH (post-homogenization):

Colour (Munsell soil colour chart number):

Texture (particle size description):

Odour: ☐ none; ☑ light; ☐ strong;
☐ earthy; ☑ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil

Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):

Peat present in the sample.

Sample photograph identification:

Additional comments (e.g. map of the sampling site):

Sampler name (readable): Marko Marjanović | Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_VG_BS	
Collection date (DD/MM/YYYY): 01/09/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river near Veliko Gradiste			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 46' 16"	National Coordinate system	Latitude:
	Longitude: 21° 31' 40"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☐ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D3	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 1000m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 3m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 24,5	Water electrical conductivity [µs/cm]: 370,7 mS/cm		
Water pH: 7,75	Water transparency (Secchi disk method) [cm]: 0,55 m		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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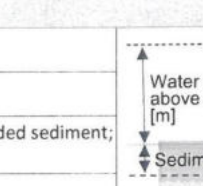
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty
SEDIMENT COLLECTION INFORMATION:
Water depth above sample [m]: 2m
Sediment sample depth [cm]: 0,1 – 20 cm
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:
Sample type: ☑ composite – number of subsamples: 3
Distance between the first and last sampling site? [m]: 30m
Sample replicate collected? ☐ YES or ☑ NO — Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO
SAMPLE INFORMATION:
Sampling volume estimated, wet weight [liter]: 0,5l
Temperature of sample (field observation, right after sampling) [°C]:
Sediment pH (undisturbed): — Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):
Texture (particle size description):
Odour: ☐ none; ☑ light; ☐ strong; ☐ earthy; ☑ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Fine particles sediment.
Sample photograph identification:
Additional comments (e.g. map of the sampling site):
Sampler name (readable): M. Marjanović — Signature:



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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_TE_BS	
Collection date (DD/MM/YYYY): 03/09/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national): 42085	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river at Tekija			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 41' 06"	National Coordinate system	Latitude:
	Longitude: 22° 24' 27"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☐ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D3	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 1100 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 22 m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 24,3	Water electrical conductivity [µs/cm]: 362,1 µS/cm		
Water pH: 7,78	Water transparency (Secchi disk method) [cm]: 0,75 m		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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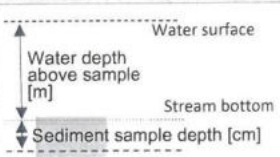
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 5m	
Sediment sample depth [cm]: 0-20cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☑ composite – number of subsamples: 5	
Distance between the first and last sampling site? [m]: 50m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,5m	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☐ none; ☑ light; ☐ strong; ☐ earthy; ☑ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Maganović	Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_KL_BS	
Collection date (DD/MM/YYYY): 04/09/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Kladovo - Danube river near Kladovo			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 37' 19"	National Coordinate system	Latitude:
	Longitude: 22° 35' 55"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☐ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D2	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 950m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]:	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 23,9	Water electrical conductivity [µs/cm]: 360,6		
Water pH: 7,82	Water transparency (Secchi disk method) [cm]: 0,8		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty

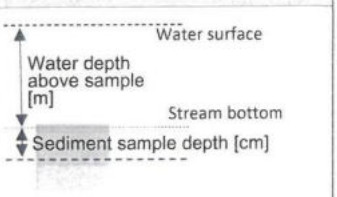
SEDIMENT COLLECTION INFORMATION:

Water depth above sample [m]: 3m

Sediment sample depth [cm]: 0-20cm

Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:

Sample type: ☑ composite – number of subsamples: 3



Distance between the first and last sampling site? [m]: 30m

Sample replicate collected? ☐ YES or ☑ NO | Replicate ID/name:

Sample is duplicated? ☐ YES or ☑ NO

SAMPLE INFORMATION:

Sampling volume estimated, wet weight [liter]: 0,4l

Temperature of sample (field observation, right after sampling) [°C]:

Sediment pH (undisturbed): | Sediment pH (post-homogenization):

Colour (Munsell soil colour chart number):

Texture (particle size description):

Odour: ☐ none; ☑ light; ☐ strong;
☐ earthy; ☑ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil

Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):

Sample photograph identification:

Additional comments (e.g. map of the sampling site):

Sampler name (readable): Marko Marjanović | Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6- KU-BS	
Collection date (DD/MM/YYYY): 05/09/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Kusjak – Danube river near Kusjak.			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 19' 10"	National Coordinate system	Latitude:
	Longitude: 22° 32' 48"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): DZ	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 1100 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 10 m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 23,6	Water electrical conductivity [µs/cm]: 355,2		
Water pH: 7,85	Water transparency (Secchi disk method) [cm]: 0,95m		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

Page 1 | 2

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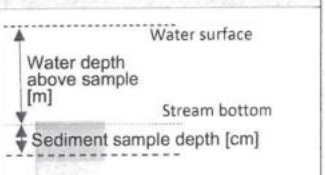
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 8 m	
Sediment sample depth [cm]: 0-20 cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☑ composite – number of subsamples: 3	
Distance between the first and last sampling site? [m]: 30 m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,5 l	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☐ none; ☑ light; ☐ strong; ☐ earthy; ☑ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.):	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Marjanović	Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:	
Project name: SIMONA	Sample identifier (ID): WPG-DM-02-01
Collection date (DD/MM/YYYY): 09/09/2020	Collection time (HH:MM):
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):	
Sampling: ☑ accredited; ☐ not accredited	Sampling standard: ISO 5667-12:2019

MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE): N/A		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river at Donji Milanovac (991km)			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side): Danube river in line with Donji Milanovac village.			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 28' 12,9"	National Coordinate system	Latitude:
	Longitude: 22° 08' 19,6"		Longitude:

MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:	
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):	
Waterbody ID (WISE-SoE):	Waterbody ID (national): D3
Name of the Waterbody: Danube river	
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional	

MONITORING SITE CONDITIONS (PART I):		
River width [m]: 1600 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 7m	Flow rate [m/s]: ☐ estimated; ☐ measured value
Water temperature [°C]: 24,1	Water electrical conductivity [µs/cm]: 364,6 mS/cm	
Water pH: 7,3	Water transparency (Secchi disk method) [cm]: 0,7m	
Geology and background value of parent material/lithology in the area:		

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

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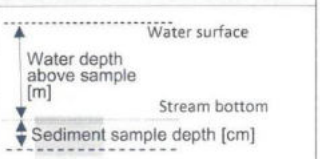
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 6m	
Sediment sample depth [cm]: 0-5 cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☑ composite – number of subsamples: 5	
Distance between the first and last sampling site? [m]: 50m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,4 l	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☑ none; ☐ light; ☐ strong; ☑ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Fine sediment, fine particles.	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Marjanović	Signature:

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FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:	
Project name: SIMONA	Sample identifier (ID): WPG-DM-02_03
Collection date (DD/MM/YYYY): 09/09/2020	Collection time (HH:MM):
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):	
Sampling: ☑ accredited; ☐ not accredited	Sampling standard: ISO 5667-12:2019

MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river near village of Donji Milanovac			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 28' 12,9"	National Coordinate system	Latitude:
	Longitude: 22° 05' 19,6"		Longitude:

MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:	
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):	
Waterbody ID (WISE-SoE):	Waterbody ID (national): D3
Name of the Waterbody: Danube river	
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional	

MONITORING SITE CONDITIONS (PART I):		
River width [m]: 1600m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 7 m	Flow rate [m/s]: ☐ estimated; ☐ measured value
Water temperature [°C]: 24,1	Water electrical conductivity [µs/cm]: 364,6	
Water pH: 7,3	Water transparency (Secchi disk method) [cm]: 0,7m	
Geology and background value of parent material/lithology in the area:		

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

Page 1 | 2

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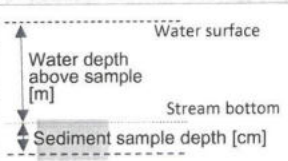
Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty	
SEDIMENT COLLECTION INFORMATION:	
Water depth above sample [m]: 6m	
Sediment sample depth [cm]: 10cm – 25cm	
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:	
Sample type: ☐ composite – number of subsamples: 5	
Distance between the first and last sampling site? [m]: 50m	
Sample replicate collected? ☐ YES or ☑ NO	Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO	
SAMPLE INFORMATION:	
Sampling volume estimated, wet weight [liter]: 0,4l	
Temperature of sample (field observation, right after sampling) [°C]:	
Sediment pH (undisturbed):	Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):	
Texture (particle size description):	
Odour: ☐ none; ☑ light; ☐ strong; ☑ earthy; ☐ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil	
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Fine particles	
Sample photograph identification:	
Additional comments (e.g. map of the sampling site):	
Sampler name (readable): M. Marjanović	Signature:

SIMONA

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Interreg Danube Transnational Programme SIMONA

For further information on the **SIMONA Sampling, Laboratory and Evaluation protocols;** on the project, partnership and the Danube Transnational Programme: **www.interreg-danube.eu/simona**

FIELD OBSERVATION SHEET FOR SEDIMENT SAMPLING

APPENDIX 3 OF THE SIMONA SEDIMENT QUALITY SAMPLING PROTOCOL

MONITORING PROGRAMME/ SAMPLING PROJECT INFORMATION:			
Project name: SIMONA		Sample identifier (ID): WP6_DM-02-02	
Collection date (DD/MM/YYYY): 09/09/2020		Collection time (HH:MM):	
Sampling matrix: ☑ stream/bottom sediment; ☐ suspended sediment; ☐ other (floodplain sediment, ...):			
Sampling: ☑ accredited; ☐ not accredited		Sampling standard: ISO 5667-12:2019	
MONITORING SITE IDENTIFICATION:			
Monitoring Site ID (WISE-SoE):		Monitoring Site ID (national):	
Name of the Monitoring Site (e.g. name of the surface water and the city): Danube river near Donji Milanovac village			
Sample location description with specific information (bridge, high power electric lines, railway line, major road, natural park, ...) (provide map on opposite side):			
Type of the monitoring site (can be different from representing waterbody): ☐ river; ☐ lake; ☐ wetland; ☑ other (floodplain, ...): reservoir			
Aim of sampling: ☐ general status; ☐ reference site (without/small anthropogenic sources); ☐ investigation site – find contamination source; ☑ investigation site for other:			
WGS84	Latitude: 44° 28' 12,9"	National Coordinate system	Latitude:
	Longitude: 22° 08' 19,6"		Longitude:
MONITORING SITE REPRESENTING THE FOLLOWING WATERBODY AND ITS BASIN:			
Is it the same waterbody as the Monitoring Site has? ☑ YES or ☐ NO If no, describe the connection between waterbody and monitoring site (tributary, recipient, ...):			
Waterbody ID (WISE-SoE):		Waterbody ID (national): D3	
Name of the Waterbody: Danube river			
Type of the Waterbody: ☑ river; ☐ lake; ☐ wetland; ☐ coastal; ☐ transitional			
MONITORING SITE CONDITIONS (PART I):			
River width [m]: 1600 m ☑ estimated; ☐ measured value	Depth of water estimated average depth [m]: 7 m	Flow rate [m/s]: ☐ estimated; ☐ measured value	
Water temperature [°C]: 24,1	Water electrical conductivity [µs/cm]: 364,6		
Water pH: 7,3	Water transparency (Secchi disk method) [cm]: 0,7m		
Geology and background value of parent material/lithology in the area:			

MONITORING SITE CONDITIONS (PART II):
Extreme conditions: ☑ none; ☐ flooding status; ☐ ice; ☐ pollution plume; ☐ contaminated coast/bank; ☐ other:

Page 1 | 2

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Weather conditions: ☐ hot; ☑ sunny; ☐ cloudy; ☐ changeable; ☐ rainy; ☐ frosty
SEDIMENT COLLECTION INFORMATION:
Water depth above sample [m]: 6m
Sediment sample depth [cm]: 5cm - 10cm
Collection device: ☐ stainless steel scoop; ☑ corer; ☐ sampler for suspended sediment; ☐ other:
Sample type: ☑ composite – number of subsamples: 5
Distance between the first and last sampling site? [m]: 50m
Sample replicate collected? ☐ YES or ☑ NO — Replicate ID/name:
Sample is duplicated? ☐ YES or ☑ NO
SAMPLE INFORMATION:
Sampling volume estimated, wet weight [liter]: 0,4l
Temperature of sample (field observation, right after sampling) [°C]:
Sediment pH (undisturbed): — Sediment pH (post-homogenization):
Colour (Munsell soil colour chart number):
Texture (particle size description):
Odour: ☐ none; ☑ light; ☐ strong; ☐ earthy; ☑ mildewed; ☐ putrid; ☐ farm slurry; ☐ fishy; ☐ aromatic; ☐ sewage; ☐ fuel/oil
Information on sediment components (seashells, animals, peat, wood, tar, stones, waste, plastics, etc.): Fine particles
Sample photograph identification:
Additional comments (e.g. map of the sampling site):
Sampler name (readable): M. Marjanović — Signature:

SIMONA