

Significant Water Management Issue 1 – Organic Pollution

About the Joint Danube Survey 3: The Joint Danube Survey 3, also known as 'JDS3', is the world's biggest river research expedition in 2013. Its main goal is to produce highly comparable and reliable information on water quality and pollution for the entire Danube River and many of its tributaries and to raise awareness about the importance of the Danube and sustainable water management. The International Commission for the Protection of the Danube River (ICPDR) coordinates the implementation of JDS3. Launched on August 14, 2013 from Regensburg, Germany, the boats of the JDS3 will travel 2,375 km downstream the Danube River, through 10 countries, to the Danube Delta in Romania and Ukraine until late September.

About the Significant Water Management Issues: The EU Water Framework Directive (WFD) requires that all EU waters reach good status by 2015 (or at the latest by 2027). The Danube River Basin Management Plan (DRBMP) 2009 and its Joint Programme and Measures (JPM) focus on four Significant Water Management Issues (SWMIs) that affect the quality of rivers and lakes as well as transboundary groundwater bodies, namely: pollution by organic substances, pollution by nutrients, pollution by hazardous substances and hydromorphological alterations. This Fact Sheet presents an overview of the pressures, visions, measures and expectations for organic pollution. It is part of a series of four fact sheets, each dealing with one specific SWMI.

Overview of main pressures

Organic pollution is mainly caused by the emission of partially treated or untreated wastewater from agglomerations (cities or towns), industry and agriculture. The most serious organic pollution problems occur in tributaries that regularly receive untreated or inadequately treated wastewater from industrial plants and municipalities. Organic pollution can cause significant changes in the oxygen balance of surface waters. As a consequence, it can impact the composition of aquatic species and populations and therefore water status. Organic emissions and their impact can be measured and expressed with parameters such as COD (chemical oxygen demand), BOD5 (biological oxygen demand) and TOC (total organic carbon).

Main sources of organic pollution

Urban wastewater: A total of 6,224 agglomerations ($\geq 2,000$ PE¹ or Population Equivalent) are located in the Danube River Basin District (DRBD): 4,969 are in the class 2,000-10,000 PE with a total of 21 million PE; and 1,255 are in the larger PE >10,000 class, with a total of 73.6 million PE. Many agglomerations ($\geq 2,000$ PE) are neither connected to a sewage collecting system nor to a wastewater treatment plant. In total, wastewaters are not collected at all in more than 2,900 agglomerations (12.6% of the total generated load). Approximately 1,000 further agglomerations have collection systems that require more stringent treatment. The construction of sewerage collecting systems will reduce the

¹ PE (Population Equivalent) describes the average untreated biological load generated by one person per day and equals 60g of BOD5/d.

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pollutants emitted directly and infiltrated to the ground; but at the same time this could also lead to a significant increase in organic pollutants if proper treatment is not applied before discharge to surface waters.

Industry: Over the past 20 years, the closure of many heavily polluting industrial facilities in the middle and lower Danube countries has contributed to a decrease in organic pollution. However, a large portion of industrial wastewaters is still being discharged without any, or with insufficient, pre-treatment into the public sewerage network. Emissions from industry are lower than those from agglomerations but remain important. In general, almost all industrial sectors produce organic pollution. The pulp and paper industry is the largest emitter, while significant emissions are also contributed by the chemical, textile and various branches of the food industry.

Agriculture: The contribution of organic pollution from agricultural sources (especially animal breeding and manure disposal) is significant although well below the historical estimates of approximately 30% of overall total emissions. Pig and poultry farms are clearly the most relevant point sources, although many of these facilities have recently reduced the numbers of animals they maintain or have made other improvements.

SWMI Vision for organic pollution

Zero emission of untreated wastewaters into the waters of the Danube River District.

DRBM Plan 2009 and its implementation

The DRBM Plan 2009 includes a Joint Programme of Measures (JPM) where the coordinated visions, management objectives and measures of basin-wide importance for the first WFD cycle 2009-2015 can be found (<http://www.icpdr.org/main/activities-projects/river-basin-management>).

In 2012 the ICPDR published an “Interim Report on Progress in the Implementation of the Joint Programme of Measures in the Danube River Basin” (<http://www.icpdr.org/main/publications/reports>). With regard to organic pollution it concludes:

Discharge of untreated urban wastewaters into surface water bodies creates significant problems in the basin. Often sewage is only subject to mechanical treatment before being discharged directly into rivers. The level of implementation of the Urban Wastewater Treatment Directive (UWWTD) varies amongst EU Member States, for which good results are registered for agglomerations > 10,000 PE, and the other countries which are currently implementing the UWWTD in line with the transition periods agreed with the European Commission or national legislation.

Biological and tertiary treatment (organic and nutrient removal) is being applied for a large number of the upgraded and new wastewater treatment plants, as required by the UWWTD concept of setting objectives for the regulation of activities based on the nature of the environment into which they



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discharge (Article 5). Furthermore, demands for nitrogen and phosphorus removal for wastewater treatment plants in rural communities (agglomerations between 2,000-10,000 PE), representing approx. 40% of the Danube River Basin, are lower than for urban settlements (agglomerations with more than 10,000 PE).

The report is, however, highlighting both the implementation efforts and further planning. This is especially the case for those EU Directives that require substantial administrative reform and financial investments. The Non EU Member States, in the absence of a specific legal requirement for industrial installations in the Danube River Basin, have the opportunity to implement Best Available Techniques on a voluntary basis. There are additional benefits for those installations which are in countries that will have legal requirements in the future.

The reporting on the JPM highlights that many investments and actions are happening, and by the end of 2012, a number of 555 UWWTPs have been constructed, upgraded or extended which will, as expected, contribute to a considerable reduction of BOD5 and COD loads. Significant further efforts for the next RBM cycles will still be necessary for meeting the WFD environmental objectives on the basin-wide scale in regard to organic pollution.

The Joint Danube Survey 3 (JDS3) will be sampling a total of 68 sites on the Danube River. An effort was made to have most of the same sampling points that were monitored during the JDS1 and JDS2 to ensure comparability of results. Samples will be tested for parameters reflecting organic pollution (Total Organic Carbon, Dissolved Organic Carbon) and a number of other parameters both on-board the expedition's research vessels and at laboratories on the mainland.