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Feeder Report 2021 - Waste water

Introduction

1.1 This paper summarises the status and trends in waste water in relation to potential impacts in the OSPAR area, and measures taken to manage these impacts.

1.2 Waste water from domestic and commercial foul water and sewage and industrial sources can result in damaging impacts in the marine environment, particularly through emissions of nutrients, hazardous chemicals including oestrogens and antibiotics as well as litter, including microplastics.

OSPAR QSR2023

(/en/ospar-assessments/quality-status-reports/qsr-2023/)

Distribution and Intensity

2.1 Waste water is ubiquitous in the OSPAR Contracting Parties. More than 23 600 urban waste water treatment plants are covered by the Urban Waste Water Treatment Directive (UWWTD) (91/271/EEC), across the European Union (EU) (European Commission, 2020). The distribution of treatment plants that are located in coastal (NUT3) regions across Europe is shown below. The distribution and intensity broadly follows that of the human population.

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Map data: © OSPAR Commission | Tiles © Esri — Sources: GEBCO, NOAA, CHS, OSU, UNH, CSUMB, National Geographic, DeLorme, NAVTEQ, and Esri

Figure 1: Urban Waste Water Treatment Directive: Active Treatment Plants (EMODnet, 2021) https://odims.ospar.org/en/submissions/ospar_waste_treatment_plants_2021_12_001/ (https://odims.ospar.org/en/submissions/ospar_waste_treatment_plants_2021_12_001/)

2.2 Industrial waste water derives from a very diverse number of enterprises and is treated, either at source or within the urban waste water stream.

Pressures, Impacts and Measures - Urban Waste Water

3.1 Waste water from domestic and diffuse sources contains a complex cocktail of chemicals that are washed down drains from domestic dwellings, roads, and small commercial properties. The UWWTD requires member states to collect waste water and treat it to reduce Biological and Chemical Oxygen Demand (BOD and COD) and nutrients. However, some substances, in particular micropollutants, are not routinely removed by treatment and smaller communities where less treatment is required remain a potential source of pollutants. Additionally, many treatment plants are unable to operate fully after heavy rainfall, and storm surges frequently occur, allowing raw effluent to enter the water system. Antibiotics and other excreted pharmaceuticals are increasingly being found in waste water and are among those which cannot be easily tackled by many treatment plants, as they require costly, more stringent, and energy-intensive treatment techniques.

3.2 The treatment of urban waste water from our homes and workplaces is fundamental to ensuring public health and environmental quality. The main objective of the UWWTD, and equivalent national legislation for non-EU countries, is to protect the environment — specifically surface waters — from the adverse effects of waste water discharges — such as oxygen-consuming organic pollution, which degrades aquatic life — and microbiological contamination with pathogens. This is achieved through the collection and treatment of waste water in settlements and areas where population and economic activities are sufficiently concentrated (agglomerations). The polluting load generated is generally expressed in population equivalents (p.e.). The UWWTD requires the collection and treatment of waste water in all agglomerations over 2 000 p.e. In most cases, it stipulates that waste water must be subject to biological treatment (secondary treatment), but in catchments with particularly sensitive waters, such as those suffering from eutrophication, more stringent (tertiary) waste water treatment may be required to substantially reduce nitrogen and phosphorus pollution. The differing levels of treatment can be applied to waste water and usually include:

1. Removal of objects like grit from waste water. This prevents damage to the equipment further along the treatment process.
2. Primary treatment, which removes fine particles. Waste water is held in a tank where heavier solids can settle to the bottom, while any lighter solids and fat float to the surface. The settled and floating materials are separated, while the remaining liquid proceeds to secondary treatment or is discharged to the environment.
3. Secondary treatment, also known as biological treatment, removes the remaining organic matter, suspended solids and some of the bacteria, viruses and parasites, and to some extent nutrients and chemical substances.
4. More stringent treatment is applied to remove the remaining nutrients when discharging into sensitive waters. Specific treatment techniques, such as disinfection, can be used to further remove bacteria, viruses and parasites harmful to public health, or any remaining chemicals and harmful substances. So-called “tertiary” treatment or even “fourth stage treatments are not defined within the UWWTD, but these can be tailored to the known contaminants in the waste stream and the environmental sensitivities of the waters they discharge into. These further treatments can involve further filtration, adsorption, membrane separation, ion-exchange, oxidation-reduction and/or disinfection. Several OSPAR Contracting Parties - e.g. Switzerland, Germany (Link 1 & Link 2), and Sweden - have initiated national or regional efforts to upgrade a selection of their urban waste water treatment plants (UWWTP) with technologies predominately based on ozonisation and/or activated carbon to reduce non-UWWTD-regulated emissions of micropollutants.

3.3   The 10th biennial report on member states’ implementation of the UWWTD and their programmes of investment describes the situation in 2016 and encompasses over 23 600 agglomerations where people (and, to a limited extent, industry) generate waste water amounting to 612 million population equivalents (p.e.) (European Commission, 2020). The report shows that collection and treatment of urban waste water have improved over the last decade in the EU as a whole, with compliance rates of 95% for collection, 88% for secondary (biological) treatment, and 86% for more stringent treatment (removal of phosphorus and nitrogen). However, some member states are still some way from attaining full compliance with the UWWTD. **Table 1** shows the types of urban waste water treatment in place across OSPAR countries in 2016. It shows that, with the exception of Norway, OSPAR countries have predominantly secondary and tertiary treatments.

3.4   Finance and planning remain the main challenges facing the water service sector (European Commission, 2020). The total investment needed to ensure compliance with the UWWTD, as estimated in 2016 by all member states (including the United Kingdom at the time) come to almost €229 billion. The OECD similarly estimates that EU countries and the United Kingdom will need to spend an additional €253 billion between 2020 and 2030 to reach and maintain full compliance with the UWWTD (OECD, 2020). Current spending in many member states has been found to be too low to reach and maintain long-term compliance.

Table 1: Urban waste water collection and treatment in OSPAR countries[1] (EEA, 2020)

	Type of waste water treatment (%)				
Country	**None**	**Primary**	**Secondary**	**Tertiary**	**Not specified**
Belgium	5	0	8,4	74,6	0
Denmark	0	0,2	1,4	90,4	0

Country	Type of waste water treatment (%)				
	None	Primary	Secondary	Tertiary	Not specified
Finland	0	0	0	85	0
France	0	0	11	69	2
Germany	0	0,01	2,1	93,8	1,1
Ireland	1,6	0,8	40,2	20,9	0,7
Luxembourg	1,4	1,6	21,8	75,2	0
Netherlands	0	0	0,8	98,7	0
Norway	1,9	21,3	3,9	58,9	0
Portugal	0,1	7	46,7	38	0,1
Spain	0,3	1,7	23,9	69	2,3
Sweden	0	0	4	83	0
Switzerland	0,3	0	11	87	0
United Kingdom	0	0	43	57	0

[1]Data is for the entire country, not just OSPAR regions

3.5 In 2019 the European Commission conducted an evaluation of the UWWTD to see whether the existing rules have reached their objectives, and whether they still serve their purpose (European Commission, 2019). The assessment confirms that the UWWTD has proved very effective overall when fully implemented. The reduction of organic matter and nutrients in treated waste water has improved water quality throughout the EU. The European Commission remarked that though implementing the UWWTD has been expensive, they believed that the benefits clearly outweighed costs. Moreover, implementing the UWWTD has been crucial to meeting the objectives of other EU legislation, such as the Water Framework Directive and the Marine Strategy Framework Directive.

3.6 The Commission's evaluation involved a thorough modelling exercise conducted by the Joint Research Centre, which helped identify the main outstanding issues (**Figure 2**):

1. Some EU countries are lagging behind with implementing the UWWTD and need to step up their efforts. Implementation is supported through substantial EU funding and compliance promotion activities. Implementation was also driven, where needed, through infringement.
2. Storm water overflows place significant pressure on surface water bodies. With more heavy rainfall events expected in the future, they will be an increasingly important source of pollution.
3. Individual and other appropriate systems that can be substituted for centralised collection systems are a problem if badly managed and unmonitored. However, they may sometimes offer a useful cost-effective alternative. Small agglomerations or non-connected dwellings place significant pressures on 11% of the EU's water surface bodies (this includes freshwater lakes). The UWWTD does not cover this issue.

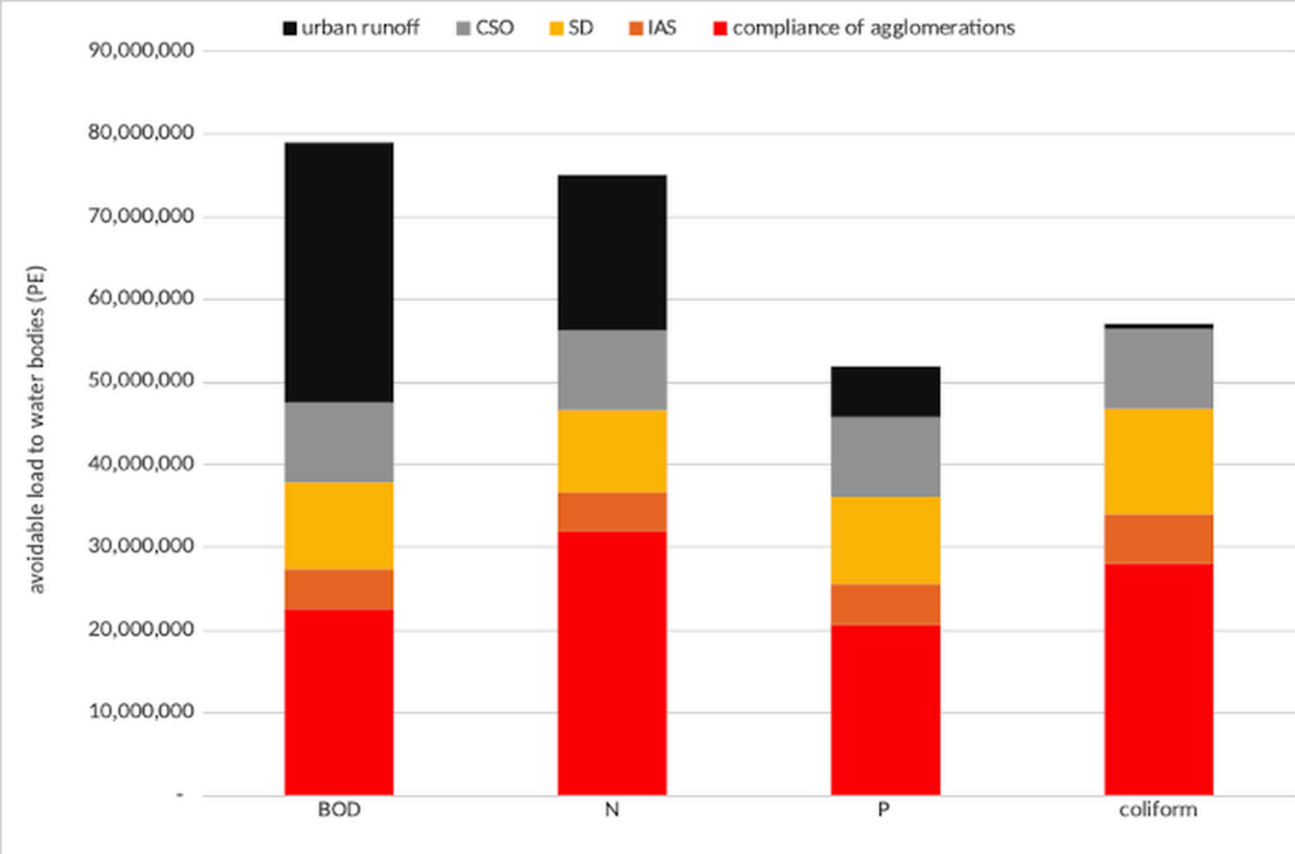

Figure 2: Remaining Avoidable EU Waste Water Loads of BOD, Nitrogen, Phosphorous and Coliforms and their respective sources (European Commission, 2019)

Remaining EU loads that can be avoided (SD=agglomerations <2 000 p.e., CSO=combined sewer overflows, IAS=individual or other appropriate systems); p.e. = population equivalent. Coliforms are bacteria that can cause diseases. For comparison, the total urban waste water generated is currently about 612 million p.e. Source: Joint Research Centre (2019).

3.7 In addition to these shortcomings, the UWWTD does not deal adequately with new concerns, such as the pollution of water bodies by pharmaceutical residues and microplastics in the waste water system.

3.8 The European Commission has now launched an impact assessment to consider revising the UWWTD[2] (/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/waste-water/#2). Based on the findings in the impact assessments, the European Commission may come forward with a proposal to revise the UWWTD in the first quarter of 2022. The impact assessment will assess policy measures to address the issues identified in the Evaluation (European Commission, 2019). These are in particular: how to better deal with storm water overflows and urban runoff, discharges from small agglomerations not covered by the scope of the UWWTD, and individual systems that are often badly designed, managed and/or unmonitored. Further, the impact assessment will assess how to deal with micropollutants (including pharmaceuticals and microplastics), how to reduce pressure on eutrophic areas, and how to integrate the directive in the circular economy (e.g. through improved requirements on sludge reuse). Lastly, it will also be assessed how the requirements on monitoring, reporting and information to the public can be updated to reflect technological progress since the 1990s. In addition, the governance of the sector will be considered and it will be assessed how better planning of investments can be ensured.

3.9 Analysis of water and sediment worldwide indicates that microplastics are ubiquitous in freshwater and marine ecosystems (UNEP, 2020). Microplastics in waste water can stem from toiletries or cosmetics, tyre wear, or from the abrasion of synthetic textiles during washing to produce microfibres. These microfibres, which have been reported as the most abundant type of microplastics in waste water and freshwaters, are of particular concern. They have been identified in the intestinal tract of zooplankton, river-bed organisms, and mussels. They can result in gut blockage and starvation. The companion feeder report on plastics provides more information on the sources and impacts of plastics on the marine environment.

3.10 The United Kingdom banned the use of microbeads in personal care and cosmetic products from January 2018 (UK Government, 2018) and other countries have followed suit. In September 2018, the European Parliament called on the European Commission to introduce an EU-wide ban on intentionally added microplastics in products such as cosmetics and detergents by 2020, and to take measures to minimise the release of microplastics from textiles, tyres, paint and cigarette butts. Several initiatives have been taken to reduce microplastics from textile laundry. In France, new washing machines must be equipped with microplastic filters from 2025. The Swedish Environmental Protection Agency initiated an international innovation competition to speed up market introduction of new solutions to reduce microplastics from the washing of textiles. Such solutions could pave the way to new criteria in the Eco-design directive for domestic washing machines. On 30 January 2019, the European Chemicals Agency published a proposal for restricting the use of intentionally added microplastics: the proposal was out for consultation in autumn 2020 with the aim of adopted regulation by 2022 (European Chemicals Agency, 2019).

3.11 Behaviour change "nudges" and campaigns can reduce the use of such products. While certain textile designs can reduce microfibre generation during washing although such products may be expensive. One possible solution is to develop household-based systems to prevent microplastics from being released into sewer lines or the environment. For instance, technologies already exist that are able to remove 97 per cent of microfibres (UNEP, 2020).

Pressures, Impacts and Measures - Industrial Waste Water

4.1 Industrial effluents are very varied. Some industrial effluents are similar to typical urban effluents, but generally the concentration levels and the substances present in industrial waste water are different from those of urban waste water. Some industrial waste waters are treated on site while others are allowed to emit to the sewerage system and are dealt with by UWWTPs.

4.2 Some effluents from industrial activities (mainly food processing industry) can be spread on land as a source of nutrients. Certain water effluent streams from industry are relatively easily handled by UWWTPs (such as those from slaughterhouses), as they mainly contain organic loads. There are other industrial effluents (e.g. containing metals or recalcitrant chemicals) that may have a significant impact on the environment and would require on-site specific (not conventional) treatments if transferred to a UWWTP.

4.3 In 2016, the European Pollutant Release and Transfer Register (E-PRTR) reported emissions to water above set thresholds from around 3 600 facilities. Based on national assessments, in most countries industrial point sources of pollution are identified as a relatively small source of pressure (EEA, 2018a). The data suggest that smaller industrial point sources not regulated by the Industrial Emissions Directive (IED) may exert greater pressure on the quality of water than the larger installations covered by the IED. This suggests that the IED regulatory process is effective in controlling industrial pollution but that measures to control pollution from smaller industry may be less effective. Industrial sectors that include large-scale activities such as pulp and paper, iron and steel, energy supply, non-ferrous metals and chemicals sectors tend to have a higher proportion of direct releases to water and these generally require onsite capacity to treat the waste water before their release. Those industrial sectors with generally smaller scale installations, e.g. other manufacturing, and food and drink production, tend to report higher proportions of releases to the sewer system (i.e. indirect releases) than direct releases to water.

4.4 According to E-PRTR data, direct emissions (in mass) to water from industry for most pollutants have slightly decreased in recent years and, in the meantime, transfers from industry towards UWWTPs have marginally increased (except for heavy metals).

4.5 Analysis of the eco-toxic loading related to different pollutant groups over the period from 2008 to 2016 indicates that within industry, chemicals and energy supply are generally the most significant contributors to the eco-toxicity of direct releases to water and to indirect releases to UWWTPs (EEA, 2018a). The eco-toxic loading due to direct releases from industry has clearly decreased in recent years for heavy metals (mainly originating from metal processing activities), and for chlorinated organic substances and other organic substances. Indirect releases through UWWTPs have decreased for heavy metals and have remained relatively constant for other organic substances and there is no clear trend for chlorinated organic substances. However, over the same period, the toxic loading due to direct releases to water from UWWTPs has increased for heavy metals, which suggests that other sources not regulated under the IED are impacting on heavy metals in UWWTP releases. The toxic loading has decreased for chlorinated organic substances and other organic substances.

4.6 **Table 2** is taken from the European Environment Agency's 2018 report "Industrial waste water treatment – pressures on Europe's environment" and shows the impacts of different industrial pollutant groups on human health and the water environment.

Table 2: Impact of different pollutant groups on human health and the water environment (EEA, 2018a)

Pollutant group	**Inorganic substances**	**Chlorinated organic substances**	**Other organic substances**	**Heavy metals**
Substances considered in this report	Chlorides, Cyanides, Fluorides, Nutrients (nitrogen and phosphorus)	Brominated diphenylethers, Chloro-alkanes, Dichloromethane, Dioxins and furans, Halogenated organic compounds, Hexabromobiphenyl, Hexachlorobenzene, Hexachlorobutadiene, Tetrachloroethylene, Tetrachloromethane, Trichlorobenzenes, Trichloroethylene, Trichloromethane, Polychlorinated biphenyls, Pentachlorobenzene, Pentachlorophenol, Vinyl chloride, 1,2-dichloroethane,	Anthracene, Benzene, Benzo(g,h,i)perylene, Di-(2-ethyl hexyl) phthalate, (DEHP) Ethyl benzene, Ethylene oxide, Fluoranthene, Naphthalene, Nonylphenol and nonylphenol ethoxylates, Octylphenols and octylphenol ethoxylates, Organotin compounds, Phenols, Polycyclic aromatic hydrocarbons (PAHs), Toluene, Xylenes,	Arsenic and compounds, Cadmium and compounds, Chromium and compounds, Copper and compounds, Lead and compounds, Mercury and compounds, Nickel and compounds, Zinc and compounds

Pollutant group	Inorganic substances	Chlorinated organic substances	Other organic substances	Heavy metals
Associated health impacts in humans	Chlorides are generally not toxic to humans except in the special case of impaired sodium chloride metabolism in which congestive heart failure may occur. High nitrate concentrations can cause methemoglobinemia in infants.	Some of these substances are known or suspected carcinogens (e.g. dichloromethane) while others (e.g. chloro-alkanes) can impact on human organs such as the kidneys, liver and thyroid gland.	This is a very broad range of compounds and their impacts on human health are varied. Some (such as benzene) are carcinogenic while others (e.g. PAHs) are known to result in birth defects. Some of these compounds can also be involved in the atmospheric reactions that generate ground-level ozone, an air pollutant that can have significant human health impacts.	Heavy metals have a range of potential impacts on humans, with a number of them being carcinogens. Short-term impacts can also include damage to the kidneys and liver, as well as impacting on brain development in children.
Impact on the water environment	Chlorides may impact freshwater organisms and plants by altering reproduction rates, increasing species mortality, and changing the characteristics of the entire local ecosystem. High nitrate concentrations can cause eutrophication, increased plant growth, problem algal blooms, loss of life in bottom water and an undesirable disturbance to the balance of organisms present in the water.	A number of these substances are known to impact on the growth and reproduction of aquatic animals. Some of these compounds can also accumulate in aquatic animals, presenting problems throughout the food chain. They can also cause oxygen depletion in water, negatively impacting the health of relevant species.	As with human health impacts, the impacts on the water environment of this broad group of pollutants is varied. For example, some organotin compounds are very toxic to algae, molluscs, crustaceans and fish, and have also been identified as endocrine disruptors. Some of these compounds can also bioaccumulate in marine animals, resulting in potential impacts throughout the food chain.	Heavy metals are of particular concern in the aquatic environment due to their toxicity and persistence. A number of these metals are also defined as priority substances under the WFD.

OSPAR Measures

4.7 OSPAR’s 2010 Hazardous Substances Strategy had the target of the cessation of discharges, emissions, and losses of hazardous substances. OSPAR’s work on hazardous substances comprises:

1. identifying substances that are of concern for the marine environment
2. monitoring and assessing the sources and pathways of contaminants and their concentrations and effects in the marine environment, and
3. identifying actions and measures required to achieve the Strategy objectives.

4.8 For OSPAR purposes, hazardous substances are defined as substances that are persistent, liable to bioaccumulate and toxic (PBT substances), or which give rise to an equivalent level of concern as the PBT substances. For example, this might be concern that they can interfere with the hormone system of organisms. OSPAR identifies substances on the market that pose a risk for the marine environment and maintains a list of OSPAR Chemicals for Priority Action and a list of Substances of Possible Concern. These Lists are undergoing substantial review and revision in 2021/22. For each chemical on the lists OSPAR has prepared a background document that assesses the situation for the substance and concludes on what actions OSPAR should take to move towards the cessation target. Each of these chemicals also has a monitoring strategy detailing monitoring and progression towards the cessation target.

4.9 OSPAR has adopted control measures promoting the application of best available techniques and associated emission and discharge limit values for the most important industries. Measures include substitution of hazardous substances, use bans or restrictions, and best environmental practices, and address releases of hazardous substances from diffuse sources, such as consumer products.

Future trends

5.1 Much has already been done in recent decades to improve waste water treatment. The proportion of households connected to treatment facilities is now over 95% for much of western Europe. However, urban wastewater treatment now needs to address challenges like climate change, changes in population and newly emerging pollutants (EEA, 2019a).

5.2 Extreme weather events linked to climate change are bringing heavier and more frequent rainfall in some areas, but water scarcity in others, affecting how well storm sewers and treatment plants operate.

5.3 In some areas, climate change means that heavy rainfall will be more frequent. In urban areas — where rainwater drains into the sewers carrying domestic sewage and industrial waste water (so-called ‘combined sewers’) — the rain enters the combined sewer network faster than it was designed for. This can cause overloading of the sewer network, leading to surface water flooding and overflow at urban waste water treatment plants, with untreated sewage flowing into rivers, lakes, or coastal areas. Sustainable urban drainage systems, which allow rainwater to be absorbed through carefully designed vegetation buffers can provide a solution, as they are designed to manage runoff in a sustainable way.

5.4 In recent years, concern has increased regarding the presence of many chemicals at low concentrations within the water environment. With so many different substances in use, many chemicals reach surface waters via urban waste water treatment plants that apply traditional treatment methods. Research has shown that many of the chemicals in waste water now arise from use in our homes and leaching from products or are directly added in the case of cleaning products and excreted pharmaceuticals (UKWIR, 2018). Concern is growing over the presence of mixtures of chemicals in the environment — the so-called 'cocktail effect' — that may be impacting aquatic life (EEA, 2018b).

5.5 Emissions data and research show that the aquatic environment has to deal with mixtures of chemicals, including many more substances than just priority substances. Nutrients from urban point sources, agricultural diffuse pollution, pollutants from stormwaters and atmospheric deposition, as well as many potentially harmful organic chemicals from urban waste water and agriculture, have been shown to be present in freshwater systems simultaneously. Indeed, scientific monitoring approaches highlighted the co-occurrence of hundreds of chemicals in water.

5.6 This complexity presents a mismatch with the single-substance approach of current chemicals assessment under most environmental legislation. The challenge is to figure out if combined adverse effects result from these mixtures and which of the many substances present are the most important for the toxicity of a mixture. Considerations of combined effects and potential mixture toxicity could be integrated into the existing assessment schemes. OSPAR should be encouraging the development of such schemes.

5.7 An example of an increasing concern is antimicrobial resistance (AMR), which arises from the use of antimicrobials, such as antibiotics, in human and veterinary medicine. Use and excretion of antimicrobial agents has resulted in increased occurrence of microorganisms resistant to antibiotics, which can cause disease and are now resisting medicinal treatment. As a consequence, it has become increasingly difficult to tackle certain infections (WHO, 2018). Urban waste water treatment plants could be increasing the transfer of AMR genes to the environment, but currently there is very limited information on the pathways for AMR in the environment to reach pathogens as well as human microbiome and the significance of this (EEA, 2019b).

5.8 There is also growing concern about chemical pollutants being able to interfere with the normal functioning of hormones, so-called endocrine-disrupting chemicals (EDCs), that could play a causative role in these diseases and disorders. Evidence shows that in some fish species, the link between exposure to chemicals with reproductive disorders and dysfunction is strong. There are few studies on the impacts of chemical ED on invertebrate populations, despite the fact that the first ever example of ED caused a catastrophic decline in — and even local extinction of — many mollusc populations in various parts of the world (EEA, 2012).

Conclusions

6.1 Key messages

3 (/en/ospar-assessments/quality-status-reports/qsr-2023/other-assessments/waste-water/#3)

1. The Urban Waste Water Treatment Directive has greatly improved the quality of urban waste water. Most OSPAR countries now have predominantly secondary and tertiary treatment plants.
2. Stormwater overflows are a continuing problem that is exacerbated by climate change. Rainwater draining into sewers faster that it was designed can cause flooding at treatment plants with untreated sewerage flowing into fresh- and coastal waters. OSPAR could encourage further efforts to reduce this issue.
3. There is growing concern regarding the presence of microplastics and low concentration and mixtures of pharmaceuticals including antibiotics and contraceptives because of the growing evidence that they impact on aquatic life. OSPAR should encourage further research and control measures for these growing concerns.

4. The toxic loading due to direct releases to water from UWWTPs has increased for heavy metals, which suggests that other sources not regulated under the IED are impacting on heavy metals in UWWTP releases. OSPAR could monitor these releases and encourage further mitigating actions.

Distribution and intensity of activity

6.2 Waste water is ubiquitous in the OSPAR Contracting Parties. More than 23 600 urban waste water treatment plants are covered by the UWWT Directive across the EU. The distribution and intensity of treatment plants broadly follow that of the human population.

Trends

6.3 Much has already been done in recent decades to improve waste water treatment but some Contracting Parties are lagging behind in implementing the UWWTD. The proportion of households connected to treatment facilities is now over 95% for much of western Europe. However, urban waste water treatment now needs to address challenges like climate change, changes in population and newly emerging pollutants.

6.4 Microplastics in waste water from toiletries or cosmetics or from the abrasion of synthetic textiles during washing produce microfibres. These microfibres, which have been reported as the most abundant type of microplastics in waste water and freshwaters, are of particular concern. Some countries have banned some types of microplastics but much more needs to be done.

6.5 Concern is also increasing regarding the presence of many chemicals at low concentrations within the water environment and over the presence of mixtures of chemicals in the environment — the so-called 'cocktail effect' — that may be impacting aquatic life. Among the low-concentration chemicals of concern, pharmaceuticals including antibiotics and contraceptives are of particular concern because of the growing evidence that they impact on aquatic life.

Pressures and impacts

6.6 Waste water from domestic and commercial foul water and sewage and industrial sources can result in damaging impacts in the marine environment, particularly through emissions of nutrients, hazardous chemicals including oestrogens and antibiotics as well as litter, including microplastics.

6.7 Regulation has done much to control the emissions of nutrients and industrial pollution, but smaller, less regulated settlements and plants remain of concern. And increasing storm surges mean that treatment plants are more regularly by-passed, allowing raw effluent to enter water bodies.

6.8 New and emerging issues such as microplastics, pharmaceuticals and mixtures of chemicals at relatively low concentration are of growing concern.

Footnotes

[2] https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12405-Water-pollution-EU-rules-on-urban-wastewater-treatment-update (https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12405-Water-pollution-EU-rules-on-urban-wastewater-treatment-update)

[3]The views expressed on key messages are those of the assessor and do not necessarily represent the views of the OSPAR Commission

References

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