


## Legal solutions of lake monitoring systems in Poland in compliance with the Water Framework Directive

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**Abstract:** The Water Framework Directive 2000/60/EC is considered a very modern strategy of water management in the EU. The purpose is to establish a framework for the protection of inland surface waters by preventing further deterioration and protecting the condition of aquatic ecosystems, as well as increasing the protection and improvement of the condition of the aquatic environment by limiting emissions and losses of priority substances. It was considered that changes in the water law in Poland during the process of implementing the guidelines of the Water Framework Directive may have contributed to widening and strengthening the monitoring system of lakes and changes in their quality, especially their ecological state. This article aims to determine the changes in legal regulations in the field of water quality/ecologically state of lakes in Poland as a result of the implementation of the WFD. The EC reports indicate that some requirements are too rigorous and complicated for Member States to implement. Water monitoring was significantly expanded and modernised which lead to improvement of lake water quality in Poland. The five-grade ecological status of lake waters and standardised biological indicators were introduced. It was highlighted that the improvement of the WFD implementation process allowed for more effective water management and the development of effective strategies for the protection of lakes in Poland and other EU countries.

## 1. Introduction

The Water Framework Directive 2000/60/EC (WFD)<sup>1</sup> is the fundamental legislative instrument in the European Union for the use and protection of water resources and may be called the water constitution of this region. Since 2004 Poland has been a Member State of the European Union and therefore has been obliged to implementation regulations of this directive. For the main premise indicated in the WFD preamble is as follows “Water is not a commercial product like any other but, rather, a heritage which must be protected, defended and treated as such”. The purpose is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater by i.e. preventing further deterioration, and protecting and enhancing the condition of aquatic ecosystems; promoting the sustainable use of water based on the long-term protection of available water resources; increasing the protection and improvement of the condition of the aquatic environment by limiting emissions and losses of priority substances, as well as ensuring progressive reduction of groundwater pollution (Article 1). Pursuant to Article 4, Member States were obliged to implement the necessary measures for surface waters to prevent the deterioration of the status of all surface water bodies, both natural and artificial and heavily modified. They should also take measures to gradually reduce pollution from priority substances and to cease or gradually reduce emissions, discharges and losses of priority hazardous substances. Thus, the WFD reflects new directions in water management, taking into account the basic principles of environmental law and has the following key objectives: the procurement of an integrated EU policy regarding the long-term sustainable use of water ensuring the principle of subsidiarity; achievement of “good status” for all waters to 2015 or preserving such status; water management based on river basins with a “combined approach” of emission limit values and quality standards; regulation of prices for water use ensuring the ‘polluter pays’ principle and more efficient legislation in water protection<sup>2</sup>.

<sup>1</sup> Water Framework Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 2.12.2000, 1–73).

<sup>2</sup> See more: European Commission, Water Quality in EU: Introduction to the new EU Water Framework Directive, 2000, accessed February 23, 2021, <http://www.europa.eu.int/comm/environment/water/water-framework/overview.html>; Muhammad M. Rahaman, Olli Varis,

The directive established principles to limit deterioration of water bodies and achieve 'good status' lakes by 2015 in EU countries. Moreover, the directive recognizes that some water bodies may take longer to achieve good status. For this reason, Member States can take advantage of the exemption under the natural conditions of a water body and extend the deadline to 2027. The deadline for achieving good water status may also be extended if this is technically impossible or disproportionately expensive. Where exemptions apply, the WFD requires Member States to justify and explain the reasons for using an exemption in their river basin management plans<sup>3</sup>. To reach 'good status' lakes, an integrated approach to water protection is of great importance. In international law, there is the concept of ecological integrity of waters, which is equivalent to the formula for good ecological status of waters. Ecological integrity means the natural conditions of waters and other resources sufficient to ensure the biological, chemical and physical integrity of the aquatic environment<sup>4</sup>. To achieve this purpose, the first step is to determine the quality status of these water reservoirs through monitoring. Monitoring is an essential part of the implementation of the whole range of EU water legislation, including, in particular, the WFD. However, the implementation of the provisions of the WFD has caused many difficulties in EU member states. Many authors have described organisational methods and solutions supporting this process, especially in

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Tommi K. Rahaman, "EU Water Framework Directive vs. Integrated Water Resources Management: The Seven Mismatches," *Water Resources Development* 20, no. 4 (2004): 567. DOI: 10.1080/07900620412331319199; Ryan Stoa, "Subsidiarity in Principle: Decentralization of Water Resources Management," *Utrecht Law Review* 10, no. 2 (2014): 35. DOI: <https://doi.org/10.18352/ulr.267>; Elżbieta Zębek, "Międzynarodowe i krajowe podstawy prawne i bioindykatory (glony) oceny stanu jakości wód powierzchniowych," in *Odpowiedzialność za środowisko w ujęciu normatywnym*, ed. Elżbieta Zębek, Michał Hejbudzi (Olsztyn: Wydawnictwo UWM, 2017), 119–138; Elżbieta Zębek, "Legal protection of waters in the context of human rights," *Themis Polska Nova* 1, no.13 (2018): 14–24; Elżbieta Zębek, Agnieszka Napiórkowska-Krzebietke, "Rozwój przepisów prawnych w zakresie bioindykacji środowiskowej a stan jakości wód jeziorowych," *Studia Prawnoustrojowe* 43 (2019): 375–393. DOI: <https://doi.org/10.31648/sp.4616>.

<sup>3</sup> Sprawozdanie Komisji dla Parlamentu Europejskiego i Rady w sprawie wykonania ramowej dyrektywy wodnej (2000/60/WE) Planu gospodarowania wodami w dorzeczu, 2012 (COM/2012/0670 final).

<sup>4</sup> Janina Ciechanowicz-McLean, "Wpływ ramowej dyrektywy wodnej na bezpieczeństwo ekologiczne morza bałtyckiego," *Gdańskie Studia Prawnicze* 32 (2014): 87.

the field of water monitoring<sup>5</sup>. In Poland, the provisions of the WFD have been implemented to the Water Law Act of 2001<sup>6</sup> and in the Water Law Act of 2017<sup>7</sup>. It is considered that changes in the water law in Poland during the process of implementing the guidelines of the Water Framework Directive may have contributed to widening and strengthening the monitoring system of lakes and changes in their quality, especially their ecological state. This article aims to determine the changes in legal regulations in the field of water quality/ecological state of lakes in Poland as a result of the implementation of the WFD. The article uses the legal dogmatic method through presenting and analysing the regulatory acts and EC reports in the field of water quality.

## 2. Implementation of the Water Framework Directive in EU Countries

### 2.1. General guidelines of the WFD on water quality and monitoring system

Directive 2000/60/EC advises the management of surface waters including lakes in accordance to River Basin Management Plans. The European

<sup>5</sup> Ralf Boscheck, “The EU Water Framework Directive: meeting the global call for regulatory guidance?,” *Intereconomics Review of European Economic Policy* (2006): 41. DOI: <https://doi.org/10.1007/s10272-006-0196-1>; Ho-Sik Chon, Dieudonne-Guy Ohandja, Nikolaos Voulvoulis, “Implementation of E.U. Water Framework Directive: source assessment of metallic substances at catchment levels,” *Journal of Environmental Monitoring* 12 (2010): 36–47. DOI: <https://doi.org/10.1039/B90785>; Maro Vlachopoulou, Deborah Coughlin, David M. Forrow, Stuart Kirk, Paul Logan, Nikolaos Voulvoulis, “The potential of using the Ecosystem Approach in the implementation of the EU Water Framework Directive,” *Science of the Total Environment* 470–471(2014): 684–694. DOI: <https://doi.org/10.1016/j.scitotenv.2013.09.072>; Gabrielle Bouleau, Didier Pont, “Did You Say Reference Conditions? Ecological and Socioeconomic Perspectives on the European Water Framework Directive,” *Environmental Science and Policy* 47(2015): 32–41. DOI: <https://doi.org/10.1016/j.envsci.2014.10.012>; Blandine Boeuf, Oliver Fritsch, Julia Martin-Ortega, “Undermining European environmental policy goals? The EU water framework directive and the politics of exemptions,” *Water* 8(2016): 1–15. DOI: <https://doi.org/10.3390/w8090388>; Phoebe Kondouri, Philippe Ker Rault, Vassilis Pergamalis, Vassilis Skianis, Ioannis Soulioutis, “Development of an integrated methodology for the sustainable environmental and socio-economic management of river ecosystems,” *Science of The Total Environment* 540(2016): 90–100. DOI: <https://doi.org/10.1016/j.scitotenv.2015.07.082>

<sup>6</sup> Water Law Act of 18 July 2001 (consolidated text LJ of 2017, item 1121).

<sup>7</sup> Water Law Act of 20 July 2017 (consolidated text LJ of 2021, item 2233).

Commission has defined a common implementation strategy, especially the guidance on monitoring. This strategy aims to promote consistency in the implementation of monitoring system by providing supplementary guidance on the design and implementation of chemical and biota standards collection of samples, processing and expression of data, and use to undertake compliance assessments<sup>8</sup>. Thus, these waters are to be characterized in terms of their bioindicators, chemical elements and hydromorphological parameters. These indices should be compared to those from waters unchanged by human activity and next classified into different ecological status categories, with the objective for all waters to meet the 'good status' (Article 4). In this range, the provisions of WFD significantly expanded the environmental objectives, especially including requirements for discharge control and a comprehensive framework for monitoring and reporting<sup>9</sup>.

According to provisions of the WFD the objectives of water management are based on the general ecological characteristics of these waters, consisting biological, chemical and hydromorphological features or their combination. Thus, Member States are required to raise complex and complete analysis of these parameters to determine the influence of anthropogenic pressures on the water environments and to classify waters with regard to 'status' categories. In case of lake waters, it is required that these waters achieve 'good ecological status'. This is a fundamental determinant for estimating the water quality system, which divided waters into five classes such as 'high', 'good', 'moderate', 'poor' and 'bad'. The final water

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<sup>8</sup> European Commission, Common Implementation Strategy for the Water Framework Directive (2000/60/EC), Guidance Document No. 32 on Biota Monitoring (The Implementation of Eqsbiota) under the Water Framework Directive Luxembourg: Office for Official Publications of the European Communities, 2014; European Commission, Common Implementation Strategy for the Water Framework Directive (2000/60/EC), Guidance Document No. 25, Guidance on Chemical Monitoring of Sediment and Biota under the Water Framework Directive (Luxembourg: Office for Official Publications of the European Communities, 2010).

<sup>9</sup> See more Eleftheria Kampa, Wenke Hansen, *Heavily Modified Water Bodies. Synthesis of 34 Case Studies in Europe* (Berlin: Springer, 2004); Andrew Farmer, *Manual of European Environmental Policy* (London: Routledge, 2012); Theodoros Giakoumis, Nikolaos Voulvoulis, "Progress with monitoring and assessment in the WFD implementation in five European River Basins: significant differences but similar problems," *European Journal of Environmental Sciences* 8, no. 1 (2018a): 44–50. DOI: <https://doi.org/10.14712/23361964.2018.7>.

quality evaluation depends on the worst level out of three separate estimations of biological, chemical and hydromorphological status. According to regulations in Annex V surface water monitoring in the case of lakes, apart hydro-morphological and chemical parameters requires the estimation of bioindicators to determine their ecological status. This ecological status estimated as the structure quality, functioning of water ecosystems and their state is compared to the natural or reference state. Finally, analysed water body is classified into one of the five performance groups: high, good, moderate, poor or bad status. For the determination of these water classes and the ecological status of waters very important is the monitoring system. In this range, Member States are obliged to procure the program for water status monitoring “to establish a coherent and comprehensive review of water status” in each River Basin District (Article 8 of WFD). Annex V of the WFD determines the locations and frequency of water samples with the emphasis on water bodies exposed to anthropogenic activity<sup>10</sup>. Three types of monitoring are specified in Annex 5 1.3 of the WFD:

- (1) surveillance monitoring is prepared for the following purposes: to supply overall estimation of the surface water status at particular catchment of the river basin; complementing and validating the impact assessment on water ecosystems; to create the effective project of monitoring programs; and the estimation of long-term changes in natural conditions and their changes caused by anthropogenic pressure;
- (2) operational monitoring is created mainly to establish the status water bodies recognized as waters with risk of failing to meet their environmental purposes, and estimation changes in the status of such bodies resulting from the measured programs;

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<sup>10</sup> European Commission, Common Implementation Strategy for the Water Framework Directive (2000/60/EC), Guidance document No. 13, Overall approach to the classification of ecological status and ecological potential, Working Group 2A (Luxembourg: European Commission, 2005); EPA, Management Strategies for the Protection of High Status Water Bodies (2010-W-DS-3), EPA STRIVE Programme 2007–2013, 2012, accessed February 23, 2021, [https://www.epa.ie/pubs/reports/research/water/STRIVE\\_99\\_web.pdf](https://www.epa.ie/pubs/reports/research/water/STRIVE_99_web.pdf); Andrew Farmer, *Manual of European Environmental Policy*, 15; Elżbieta Zębek, “Międzynarodowe i krajowe podstawy prawne i bioindykatory (głony) oceny stanu jakości wód powierzchniowych,” 129; Elżbieta Zębek, Agnieszka Napiórkowska-Krzebietke, “Rozwój przepisów prawnych w zakresie bioindykacji środowiskowej a stan jakości wód jeziorowych,” 382.

(3) investigative monitoring called as “complementary” is carried out in the following cases: inability to recognize the reason for excess in water parameters and bioindicators; surveillance monitoring shows inability to achieve the environmental purposes and operational monitoring has not settled the causes of this state of affairs; to estimate the magnitude and impact of accidental pollutions; to inform about determined program of measures to achieve the environmental purposes and special measures required to remedy the effects of accidental pollution<sup>11</sup>.

This monitoring has to be compliant with the technical standards and the requirements for exchange, and collection of information established by the INSPIRE Directive (2007/2/EC)<sup>12</sup>. In addition, according to Article 8 of the WFD the sufficient quality and comparability of analytical results made by laboratories to monitor ecological and chemical status of waters compliant with Directive 2009/90/EC should be ensured<sup>13</sup>. To estimate the ecological status there are used indicators of ecological quality for a particular surface-water category. The monitoring elements need to be indicative of the pressures that are operating in the catchment. For example in the case of lakes, there are four groups of quality elements to be considered: (1) biological – phytoplankton, other aquatic flora, benthic invertebrates and fish; (2) general physicochemical elements – oxygen, nitrate and phosphate; (3) relevant pollutants (Annex VIII) – pesticides and some metals, and (4) hydromorphological elements – water flows and physical parameters<sup>14</sup>.

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<sup>11</sup> European Commission, Common implementation strategy for the Water Framework Directive (2000/60/EC), Monitoring under the Water Framework Directive produced by Working Group 2.7 – Monitoring, Guidance Document No. 7 (Luxembourg, 2003).

<sup>12</sup> European Commission, Staff Working Document accompanying the Report from the Commission to the European Parliament and the Council in accordance with article 18.3 of the Water Framework Directive 2000/60/EC on programmes for monitoring of water status, SEC (2009) 415 (Brussels, 2009a).

<sup>13</sup> Directive 2009/90/EC of 31 July 2009 laying down, pursuant to Directive 2000/60/EC of the European Parliament and of the Council, technical specifications for chemical analysis and monitoring of water status (OJ L 201, 1.8.2009, 36–38).

<sup>14</sup> European Commission, Common implementation strategy for the Water Framework Directive (2000/60/EC), Monitoring under the Water Framework Directive Produced by Working Group 2.7 – Monitoring, Guidance Document No. 7 (Luxembourg, 2003); European Commission, Common Implementation Strategy for the Water Framework Directive (2000/60/EC), Guidance document No. 13, Overall approach to the classification of

## 2.2. Problems in implementing the provisions of the WFD in the EU

The WFD is a widely approved legal act and recognised as the most substantial part of European water protection legislation<sup>15</sup>. The effectiveness of the implementation of this directive by the EU Member States has been determined in numerous reports of the European Commission (EC) and the commentary literature. Thus, the Commission publicised the following implementation reports: the first report on the first stage of implementation in 2007; the 2 report on monitoring networks in 2009; the 3 report on the River Basin Management Plans in 2012; and the 4 report on the Programs of Measures and the Flood Directive in 2015.

The first report (COM(2007)128) of the EC in the range of implementation of the WFD was published in March 2007. This report involves the implementation of Article 5 of the WFD which requires the Member States to describe an environmental and economic analysis of water bodies by 2004. This report indicated that the number of monitored water bodies were 'at risk'. Moreover, there were many data gaps, but only three of the 27 Member States reported that the majority of water bodies were not at risk. There were several reasons for this, including agricultural and point source pollution. In this range, proper urban wastewater treatment was required in the new Member States. However, it found that these regulations have not been implemented by the EU15 to end of 2003. Although the new countries have made significant progress in these activities to their

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ecological status and ecological potential, Working Group 2A (Luxembourg, 2005); John Lucey, *Water Quality in Ireland 2006 – Key Indicators of the Aquatic Environment* (Wexford: EPA, 2007); Elżbieta Zębek, "Międzynarodowe i krajowe podstawy prawne i bioindykatory (glony) oceny stanu jakości wód powierzchniowych," 131; Agnieszka Napiórkowska-Krzebietke, "Ocena jakości/stanu/potencjału ekologicznego jednolitych części wód powierzchniowych – kryteria i unormowania prawne w Polsce," in *Odpowiedzialność za środowisko w ujęciu normatywnym*, ed. Elżbieta Zębek, Michał Hejbudzki (Olsztyn: Wydawnictwo UWM, 2017), 143; Elżbieta Zębek, Agnieszka Napiórkowska-Krzebietke, "Rozwój przepisów prawnych w zakresie bioindykacji środowiskowej a stan jakości wód jeziorowych," 382.

<sup>15</sup> Nikolaos Voulvoulis, Karl D. Arpon, Theodoros Giakoumi, "The EU Water Framework Directive: From great expectations to problems with implementation," *Science of the Total Environment* 575 (2017): 358–366. DOI: <https://doi.org/10.1016/j.scitotenv.2016.09.228>.



UE accession in 2004. Their common feature was a lack of requirements for environmental and economic assessment tools<sup>16</sup>.

The second report of the EC (COM(2009)156) of 1 April 2009 concerned the programs for water status monitoring. It was showed that all Member States established the monitoring programs required by Article 8 and Annex V. There were two exceptions: Greece did not procure the report, and Malta did not implement monitoring programs of surface water. This report indicates a good organisation of monitoring effort in EU, with more than 107,000 stations reported for monitoring of surface and groundwater. However, the shortcomings in particular river basin districts or water categories were revealed as some countries that joined the EU in 2004 and 2007 did not apply the necessary assessment methods for bioindicators in many river basin districts<sup>17</sup>. Furthermore, in 2009, draft River Basin Management Plans were made accessible to public consultations in 17 Member States. In most drafts there were plans proving information on the current and foreseen status of water bodies by 2015. In addition, the likely achievement of good status by this year varied greatly from below 10 % of surface water bodies in Belgium-Flanders and the Czech Republic to above 80 % in Ireland, Bulgaria, France, and Estonia. Moreover, the Directive 2009/90/EC determining the technical specifications for chemical analysis and monitoring of water status was adopted<sup>18</sup>.

<sup>16</sup> European Commission, Staff Working Document accompanying the Communication “Towards Sustainable Water Management in the European Union” – First stage in the implementation of the Water Framework Directive 2000/60/EC, SEC (2007) 362 (Brussels, 2007).

<sup>17</sup> European Commission, Common implementation strategy for the Water Framework Directive (2000/60/EC), Guidance Document No. 19, Guidance on surface water chemical monitoring under the Water Framework Directive, Technical Report - 2009 – 025 (Luxembourg, 2009b).

<sup>18</sup> Daniel Hering, Angel Borja, Jacob Carstensen, Laurance Carvalho, Mike Elliott, Christian K. Feld, Anna-Stiina Heiskanen, Richard K. Johnson, Jannicke Moe, Didier Pont, Anne Lyche Solheim, Wouter van de Bund, “The European Water Framework Directive at the age of 10: A critical review of the achievements with recommendations for the future,” *Science of The Total Environment* 9, no. 1 (2010). DOI: <https://doi.org/10.1016/j.scitotenv.12>; European Commission, Communication From The Commission to the European Parliament and The Council - The Water Framework Directive and the Floods Directive: Actions towards the ‘good status’ of EU water and to reduce flood risks, COM(2015) 120 final (Brussels, 2015a); European Commission, Ecological flows in the implementation of the Water Framework Directive, Guidance Document No. 31

In 2012, the European Commission communicated the Blueprint to Safeguard Europe's Water Resources, which evaluated the existing policy. This report showed that only slightly above 50% of the surface waters would reach "good status" in 2015. Therefore, it was stated that additional actions were needed to preserve and improve EU waters. The European Environment Agency reported poor ecological status in about 50% of surface waters and indefinite chemical status in 40% of the waters in 2012. This situation was caused by insufficient budgets within the Member States to reach the purposes of the WFD by 2015<sup>19</sup>.

The next problem in WFD implementation consisted of the most monitoring programs described by the EU countries have concentrated "on the monitoring of individual structural parameters, on the assumption that the good quality of such elements corresponds to the good functioning of ecosystems". Thus, these programs were based on symptoms rather than causes of water degradation. Consequently, in 21 of 27 Member States, there were no explicit relations between negative impact on water ecosystems and measure programs. In addition in 23 of 27 these countries, the analysis of shortcomings in these regulations implementation for the elaboration of suitable and cost-effective measures was not carried<sup>20</sup>. According to the last

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Technical Report - 2015 – 086 (Luxembourg, 2015); Blandine Boeuf, Oliver Fritsch, Julia Martin-Ortega, "Undermining European environmental policy goals? The EU water framework directive and the politics of exemptions," 9.

<sup>19</sup> European Commission, Report on the Implementation of the Water Framework Directive (2000/60/EC) – River Basin Management Plans, COM (2012) 670 final (Brussels, 2012a); European Commission, Ecological flows in the implementation of the Water Framework Directive, Guidance Document No. 31 Technical Report - 2015 – 086 (Luxembourg 2015b); Jan Verheke, Dirk Uyttendaele, Michiel de Vries, Working on the Water Framework Directive – exploratory note in relation to the future article 19.2. review of the Directive, MINARAAD, 2017, accessed February 23, 2021, <https://eeac.eu/wp-content/uploads/2018/01/171222-EEAC-exploratory-note-water-policy-def-1.pdf>; Matjaž Glavan, Špela Železnikar, Gerard Velthof, Sandra Boekhold, Sindre Langaas, Marina Pintar, "How to enhance the role of science in European Union Policy making and implementation: The case of agricultural impacts on drinking water quality," *Water* 11, no. 3 (2019): 492. DOI: <https://doi.org/10.3390/w11030492>.

<sup>20</sup> European Commission, Common implementation strategy for the Water Framework Directive (2000/60/EC), Monitoring under the Water Framework Directive Produced by Working Group 2.7 – Monitoring, Guidance Document No. 7 (Luxembourg, 2003); European Commission Staff Working Document accompanying the Report from the Commission

analysed report of 2015, in less than 50% of surface waters in the EU good ecological status was found<sup>21</sup>.

Problems in implementing these provisions of the WFD in some European countries may be caused by the fragmentation of water management bodies because responsibilities are highly fragmented between them. Examples of such countries are Georgia, Moldova and Ukraine, candidates for the EU, which, in accordance with the signed EU integration acts<sup>22</sup>, have committed themselves to implementing the provisions of

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to the European Parliament and the Council in accordance with article 18.3 of the Water Framework Directive 2000/60/EC on programmes for monitoring of water status, SEC (2009) 415 (Brussels, 2009a); European Commission, Attitudes of Europeans towards Water-related Issues – Summary, Flash Eurobarometer 344 (Brussels, 2012b); European Commission, Staff Working Document – European Overview accompanying the document Report on the Implementation of the Water Framework Directive (2000/60/EC) – River Basin Management Plans, SWD (2012) 379 final, 2012c; Nikolaos Voulvoulis, Karl D. Arpon, Theodoros Giakoumi, “The EU Water Framework Directive: From great expectations to problems with implementation,” 362; EEAC, The EU Water Framework Directive results to date and outlook for the future, EEAC Working Group on Fresh Water Affairs, 2018, accessed February 23, 2021, <https://eeac.eu/wp-content/uploads/2018/09/The-EU-Water-Framework-Directive-Results-to-date-and-outlook-for-the-future.pdf>; Theodoros Giakoumis, Nikolaos Voulvoulis, “Water Framework Directive programmes of measures: Lessons from the 1 planning cycle of a catchment in England,” *Science of The Total Environment* 668 (2019): 903–916. DOI: <https://doi.org/10.1016/j.scitotenv.2019.01.405>.

<sup>21</sup> European Commission, Communication From The Commission to the European Parliament and the Council - The Water Framework Directive and the Floods Directive: Actions towards the ‘good status’ of EU water and to reduce flood risks, COM(2015) 120 final (Brussels, 2015a); European Commission, Ecological flows in the implementation of the Water Framework Directive, Guidance Document No. 31 Technical Report - 2015 – 086 (Luxembourg, 2015b); European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, The EU Environmental Implementation Review: Common challenges and how to combine efforts to deliver better results, COM(2017) 63 final (Brussels 2017); Theodoros Giakoumis, Nikolaos Voulvoulis, “The Transition of EU Water Policy Towards the Water Framework Directive’s Integrated River Basin Management Paradigm,” *Environmental Management* 62, no. 5 (2018b): 819–831. DOI: <https://doi.org/10.1007/s00267-018-1080-z>.

<sup>22</sup> European Commission, Association agreement between the European Union, the European Atomic Energy Community and their Member States, Ukraine (OLJ L 161(3), p. 1–2132), 2014a; European Commission Association agreement between the European Union, the European Atomic Energy Community and their Member States, the Republic of

the WFD. Other authorities are responsible for management, monitoring, and water quality. There is no complete database or understanding of the links between existing multi-level legal institutions in these countries. The water quality standards in these countries have been regulated for a specific type of water use in water law<sup>23</sup>. In Ukraine, these standards have been set at more than 1000 parameters and are much higher than those specified in the WFD, but in practice water quality monitoring is limited to around 80 parameters, with only about a third of them being similar to those in the directive. The general problem is the lack of environmental monitoring tools<sup>24</sup>. Moreover, Georgian, Moldavian and Ukrainian water law do not classify water bodies according to the quality or quantity of water. The assessment of water quality is based on the assumption that one of the parameters exceeds the maximum allowable concentrations, water reservoir then cannot be used for specific purposes. Water quality standards are too restrictive and unattainable for most water users. Thus, the biggest problems with water monitoring in these countries are the lack of a clearly defined legal basis for water quality parameters, no quality objectives, no measurement and analysis methods applied and there is no provision for harmonization between different water agencies. In addition, another significant problem in the adaptation of EU legislation in these three countries are differences in the terminology used in the legislation, norms and standards, e.g. water quality, pollution, river basins and the overall concept of the protection of water resources in

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Moldova (OLJ L 260, p. 1–740), 2014b; European Commission, Association agreement between the European Union, the European Atomic Energy Community and their Member States, Georgia (OLJ L 260, p. 1–740), 2014c.

<sup>23</sup> Law of Georgia on Water (LJ of 1997, No. 936); Law of the Republic of Moldova on Water (LJ of 2011, No. 272); Water Code of Ukraine (LJ of 1995, No. 213–95).

<sup>24</sup> Nina Hagemann, Bernd Klauer, Ruby M. Moynihan, Marco Leidel, Nicole Scheifhacken, “The role of institutional and legal constraints on river water quality monitoring in Ukraine,” *Environmental Earth Sciences* 72, no. 12 (2014): 4745–4756. DOI: <https://doi.org/10.1007/s12665-014-3307-5>; Yuliya Vystavna, Dmytro Diadin, “Water scarcity and contamination in eastern Ukraine,” *IAHS-AISH Proceedings and Reports* 366 (2015): 149–150. DOI: <https://doi.org/10.5194/piabs-366-149>.

terms of legislation. This is a significant obstacle to the integration of EU legislation and complicates practical alignment with this legislation<sup>25</sup>.

An example of another country that has implemented the WFD provisions is the Netherlands, whose regional water authorities have facilitated the implementation of the river basin approach<sup>26</sup>. Most of the directive's water provisions have already been implemented. However, the longer the implementation process has progressed, the greater the uncertainties regarding the exact meaning of the obligations under the directive regarding river basin management plans. The water quality in the Netherlands is not good and the latest forecasts by the Dutch environmental assessment agency show that by 2027 95% to 60% of Dutch water will not meet the WFD standards<sup>27</sup>. Water quality and the main water management instruments are determined in the Water Act<sup>28</sup>. The main legal instruments are plans and programs, among which we can distinguish the national water policy plan of the central government, regional water policy plans from the voivodeship, land development plans of the Ministry of Infrastructure and Water. State water management and regional water management plans, authorities responsible for regional waters. In the Netherlands, surface water quality standards are set in accordance with Chapter 5 of the Environmental Management Act<sup>29</sup>. With regard to the ecological status, a division was made into natural waters and artificial or heavily modified waters, which is approximately 96–99% of waters. The definition of good ecological status and good ecological potential applies in the Netherlands as quality standards. However, a specification is required to give concrete content to these abstract definitions. Therefore, the government has clearly decided that it will not be binding

<sup>25</sup> Yuliya Vystavna, Maryna Cherkashyna, Michael R. van der Valk, “Water laws of Georgia, Moldova and Ukraine: current problems and integration with EU legislation,” *Water International* 43, no. 3 (2018): 424–435. DOI: <https://doi.org/10.1080/02508060.2018.1447897>.

<sup>26</sup> Carel Dieperink, Tom Raadgever, Peter J. Driessen, Amoud A.H. Smit, Marleen W. van Rijswijk, “Ecological ambitions and complications in the regional implementation of the water framework directive in the Netherlands,” *Water Policy* 14, no. 1 (2012): 160–173.

<sup>27</sup> Planbureau voor de Leefomgeving W. Ligtoet et al., *Waterkwaliteit en -veiligheid. Balans van de Leefomgeving 2014 – Deel 6*, 2014.

<sup>28</sup> *Waterwet* (Stb. 2009, 107, last amended by Stb. 2015, 399).

<sup>29</sup> *Wetmilieubeheer* (Stb. 1979, 442, last amended by Stb. 2013, 20).

norms of good ecological status and good ecological potential. The parameters used to determine the ecological status of “natural” waters are set out in the Ministerial Monitoring Ordinance<sup>30</sup>. For artificial or heavily modified waters, it lays down guidelines for setting the standards that apply to the specific body of water. These standards are then embedded in the management plans for each specific water body, therefore there is no legally binding standard. In light of EU implementation requirements, this practice can hardly be considered with EU law. Moreover, the objectives of the directive must be achieved in all water bodies, whereas in the Netherlands this only applies to designated waters. Water monitoring is based on the ecological, chemical and hydrological status, as in other EU countries. However, the responsibility for implementing the surface water monitoring program rests with the authority that authorized the waste water discharge. This is problematic for two reasons. Firstly, the authorities only issue a permit on the basis of the chemical status, and the ecological status requirements are not met. Secondly, the monitoring program in accordance with EU guidelines allow the possibility to connect water bodies of the same type in order to monitor, provided that a sufficient number of monitoring points to assess the state of their water<sup>31</sup>. The Dutch guidelines do not explain how these conditions were established. Thus, a problematic issue in the Netherlands is how the quality standards of the ecological elements are implemented in the Dutch legal framework. They are not a valid in law document, but only in plans that are binding only for those authorities who have agreed to the plan. As a result, quality standards relating to the ecological status of waters cannot be enforced for a number of human activities that affect water quality, such as agriculture<sup>32</sup>. Nevertheless, the report of the European Parliament of 2020 shows that the WFD is fit for the intended purpose. However, its

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<sup>30</sup> Regeling monitoring Kaderrichtlijn Water (Stb. 2010, 5615, last amended Stb. 2015, 38398).

<sup>31</sup> European Commission, Common implementation strategy for the Water Framework Directive (2000/60/EC), Monitoring under the Water Framework Directive Produced by Working Group 2.7 – Monitoring, Guidance Document No. 7 (Luxembourg, 2003).

<sup>32</sup> Lorenzo Squintani, Ernst Plambeck, Marleen van Rijswijk, “Strengths and Weaknesses of the Dutch Implementation of the Water Framework Directive,” *Journal for European Environmental & Planning Law* 14 (2017): 269–293. DOI: <https://doi.org/10.1163/18760104-01403002>.

implementation needs to be improved and accelerated. While an Integrated Water Management Framework (IWM) has been created for many thousands of water bodies in the EU, which is helping to slow water status deterioration and reduce chemical pollution, less than half of the EU's water bodies are in good condition despite the 2015 deadline. Moreover, only one of the four indicators for freshwater, has improved in the last 10–15 years. The reasons for this are problems with the implementation of water legislation, mainly due to insufficient funding and insufficient coverage of environmental objectives in sectoral policies<sup>33</sup>.

### 3. Changes in Polish legal regulations in the Field of Water Quality

#### 3.1. WFD implementation in Polish legislation

Directive 2000/60/EC was implemented early into the Water Law Act of 2001 and then in the Water Law Act of 2017. In Poland, as in other EU countries, the transposition of the directive still presents many difficulties. The adoption of the Water Law Act 2001 was the first stage in the process of transposing the directive into Polish law. To properly implement the WFD rules in Poland, a timetable has been set for these activities: 2002–2003 designation of river basin districts, 2002–2003 identifying interested parties and proposing procedures for public participation, 2003 establishing the necessary GIS infrastructure, 2003 introducing laws and regulations as well as administrative provisions and provisions necessary for implementation of the WFD, 2003 determination of the administrative district authorities, 2002–2005 assessment of the current state and initial needs analysis, 2002–2006 setting environmental objectives, 2005–2009 needs analysis, 2006–2009 action programs, 2006–2009 river basin management plans, 2009–2012 implementation of the action program, 2013 update of the status for river basin districts, 2013–2014 review of the action program and river basin management plans and 2015 publication of the updated river basin management plan<sup>34</sup>.

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<sup>33</sup> Parlament Europejski, Wdrażanie unijnego prawodawstwa dotyczącego wody, Procedura: 2020/2613(RSP), Interpelacje z 7 grudnia 2020, accessed March 10, 2022, [https://www.europarl.europa.eu/doceo/document/O-9-2020-000078\\_PL.html](https://www.europarl.europa.eu/doceo/document/O-9-2020-000078_PL.html).

<sup>34</sup> Rafał Miłaszewski, Tomasz Walczykiewicz, Draft report to the European Commission regarding economic analysis of water management for the Vistula and Oder river basins in accordance with the requirements of the Water Framework Directive 2000/60/EC together

The main problems that arose during the WFD implementation process were mainly due to the many shortcomings of the Water Law Act of 2001. For this reason, on 24 June 2010, the European Commission sent Poland allegations regarding incorrect transposition of the provisions of the directive. In 2011, the provisions of the Water Law were amended, which was supposed to remove the deficiencies. However, the EC required the demonstration of all essential measures taken by Polish authorities to implement the WFD and limit the negative impact on the state of the waters. Moreover, there were identified issues with complying with this process such as the lack of data, access to existing data, financing of works and timely implementation of the main points of the schedule<sup>35</sup>.

The European Commission has assessed the second generation of river basin management plans notified by Poland following the WFD in terms of water status and the progress recorded since the first river basin management plans were developed. In the hierarchy range of pressure on the surface waters, the most important was unknown effect (36%), followed by nutrients (22%) and habitat transformation (8%). Therefore, there is no identification of the sources of pollution of water bodies, which does not allow for the elaboration of protective measures against their degradation and eutrophication. In addition, the number of operational and diagnostic monitoring sites to record ecological status decreased in comparison to the first river basin management plans. Insufficient monitoring of the ecological status of waters does not allow for their proper classification and hence there are gaps in statistical studies. The monitoring data is therefore inaccurate. However, there was a significant increase in the number and proportion of water bodies classified in ecological status (almost to 80%), while 70% of water bodies had an ecological status below good. Overall, the second river basin management plan improved the quantity and quality

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with the concept of forward-looking activities (Warsaw: Departament Zasobów Wodnych Ministerstwa Środowiska, 2004); Maciej Maciejewski, Tomasz Walczykiewicz, „Dotychczasowe doświadczenia związane z wdrażaniem Ramowej Dyrektywy Wodnej,” *Infrastruktura i Ekologia Terenów Wiejskich* 4, no. 1 (2006): 63–76.

<sup>35</sup> PGW Wody Polskie, Water Directive – state of implementation into the Polish legal order, 2013, accessed February 23, 2021, <http://www.rdw.org.pl/cele-i-harmonogram.html>; Bartosz Rakoczy, *Opinion on a draft act amending the act - Water law and some other acts*, Sejm print No. 2106 (Warsaw: Office of the Senate, Office of Analysis and Documentation, 2014).



of directly available information as provided in the action programs. On this basis, priority actions for 2019 have been developed. There are include improving surface water monitoring by including all relevant quality elements in all water categories, implementing further measures to ensure good quantitative status of waters, ensuring that projects that can affect the state of water bodies, have been thoroughly assessed and justified in accordance with the requirements of the WFD<sup>36</sup>.

Pursuant to the provisions of the WFD, water management planning is divided into river basin districts. In Poland, these plans are regulated in Article 13 of the Water Law and contain the following elements:

- a general description of the characteristics of the river basin district,
- a summary of the identification of significant anthropogenic pressures and the assessment of their impact on the status of surface and ground-water,
- list of protected areas,
- map of the monitoring network, along with the presentation of monitoring programs,
- setting environmental objectives for water bodies and protected areas,
- a summary of the results of the economic analysis related to the use of water,
- a summary of the activities included in the country's water and environmental program,
- a list of authorities competent for water management in the river basin district.

The Polish water law of 2017 is characterized by a very extensive network of 9 river basin districts (Vistula, Odra, Dniester, Danube, Jarft, Elbe, Niemen, Pregoła, Świeża) divided into water regions, which may complicate water monitoring (Article 13). As a consequence, it is not possible to examine the water quality of all water reservoirs in a given year and

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<sup>36</sup> EEAC, The EU Water Framework Directive results to date and outlook for the future, EEAC Working Group on Fresh Water Affairs, 2018, accessed February 23, 2021, <https://eeac.eu/wp-content/uploads/2018/09/The-EU-Water-Framework-Directive-Results-to-date-and-outlook-for-the-future.pdf>; European Commission, Report from the Commission to the European Parliament and the council on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC) Second River Basin Management Plans First Flood Risk Management Plans, COM(2019) 95 final (Brussels, 2019).

the assessment is carried out cyclically every few years. For example, as part of the river monitoring program for 2016–2021, 2,564 water sampling points have been planned, and 2,329 out of 4,586 surface water bodies (SWBs) will be monitored, which constitutes 51% of all SWBs. Moreover, out of 2,257 SWBs not covered by monitoring studies, 700 were characterized as not endangered due to the water condition. In the case of lake waters, 1044 SWBs have been designated. As part of the network of monitoring points and programs for the years 2016–2021, 567 lakes will be monitored with the use of 567 sampling points, which constitutes 54.31% of the SWBs of all lake waters.

The consequence of incomplete monitoring of waters is the lack of sufficient data, e.g. biological tests of waters to determine the typology of waters and reference conditions, hence they are considered preliminary, as well as the lack of sufficient data to fully assess the impact on individual water bodies. Moreover, there is a lack of a sufficient staffing to implement the WFD implementation tasks, along with organizational, financial and legal problems<sup>37</sup>. A practical example of implementing the provisions of the WFD are measures to improve the quality of water in the Barycz river basin. The most important problem in this regard is related to water management as a result of anthropogenic activities, i.e. the municipal sector, industry and agriculture, which make it difficult to achieve the environmental objectives. From among 11 integrated bodies of surface water, as many as 6 are endangered due to poor quality condition, which means that derogations from the originally established date for water bodies that require it are expected. Thus, the entire catchment area is at risk of not achieving the WFD goals. One of the reasons is the high implementation costs of all protective measures<sup>38</sup>.

A comprehensive analysis of the WFD implementation status shows that it is unlikely to achieve good ecological status for all surface water bodies, but also for protected areas. One of the problems is the incorrect

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<sup>37</sup> Teresa Błaszczak, “Ramowa Dyrektywa Wodna: Strategia wdrażania,” in *Integrated Coastal Zone Management at the Szczecin Lagoon: Exchange of experiences in the region*, ed. Bernhard Glaeser, Agnieszka Sekścińska, Nardine Löser, *Coastline Reports* 6 (2005): 87–99.

<sup>38</sup> Katarzyna Tokarczyk-Dorociak, Szymon Gębarowski, “Implementation of Water Framework Directive in Barycz river basin,” *Infrastruktura i Ekologia Terenów Wiejskich* 10 (2011): 15–27.

assessment of the current status of waters by not taking into account the hydromorphological status, ichthyofauna and benthos, i.e. those factors which in most waters are most likely critical for the assessment of their current status. As a result, the needs of activities necessary to achieve the environmental objectives were not identified, and therefore these activities were not included in the National Water and Environmental Program or in other documents. In addition, no attempt has even been made to define environmental objectives for protected areas. An example is the Drawa river located in the Natura 2000 area of the Drawa Primeval Forest PLH320046 and, to a large extent, in the Drawa National Park. It is separated by a water dam of the Kamienna Power Plant with an inoperative fish ladder. In this case, steps should be taken to restore ecological continuity that were not included in the Water Management Plan<sup>39</sup>.

Another problematic issue, as in the analyzed European countries, is the fragmentation of authorities managing water resources in Poland. After the reform of the water law, a new water management institution was established, the National Management Authority Polish Waters with an extensive structure. The organizational structure of Polish Waters consists of: National Water Management Board – Regional Water Management Boards (RWM) – Catchment Boards – Water Supervision with 11 regions for water management<sup>40</sup>. Apart from them, there are public administration bodies e.g. the minister of water economy, the minister of inland navigation, voivode, city president (Article 15). With such a multitude of authorities, their competences often overlap, which results in blurred responsibility for management, monitoring and water quality. Thus, efforts to improve water quality are incomplete and uncoordinated.

### 3.2. Polish monitoring system of lakes

The Water Law Act 2001 regulates water management following the principle of sustainable development, in particular, the shaping and protection

<sup>39</sup> Paweł Pawlaczyk, “The perspectives of achieving the objectives of Water Framework Directive in Poland,” *Przegląd Przyrodniczy* 23, no. 3 (2012): 52–68.

<sup>40</sup> Elżbieta Zębek, “Water-law permission as an administrative and legal instrument for the management and protection of water resources,” *Acta Scientiarum Polonorum Administratio Locorum* 19, no. 2 (2020): 119–130. DOI: <https://doi.org/10.31648/aspal.4866>.

of water resources, water use and management of water resources (Article 1). Water protection is specified in Section III of the Act, which indicates the environmental objectives and principles of water protection. The assessment of the status of surface waters includes the classification of ecological status, ecological potential and chemical status of these waters, as well as the determination of good ecological status, good ecological potential and good chemical status of surface waters (Article 38). Most of these provisions have been transferred to the Water Law Act of 2017 in Section III Water Protection in Articles 50–55. Moreover, environmental objectives, as in the previous act, consist in achieving and maintaining good surface water status, including good ecological status and good chemical status of surface waters, as well as preventing their deterioration, in particular concerning water ecosystems and other water-dependent ecosystems<sup>41</sup>.

According to Article 349 Water Law Act of 2017, the State Environmental Protection Inspectorate is responsible for surface water monitoring, which is part of the State Environmental Monitoring. The monitoring network covers individual elements of the surface water system, including lakes. The monitoring network allows you to determine the status of waters and track changes in the environment. The aim of the research conducted as part of individual monitoring is to create the basis for taking actions to improve the status of waters and their protection against pollution, including protection against eutrophication caused by the impact of the domestic and municipal sector and agriculture as well as protection against industrial pollution. Monitoring and activities planned and implemented are following the six-year water management cycle resulting from the provisions of national law transposing the requirements of the WFD<sup>42</sup>.

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<sup>41</sup> See more: Marcin Pchałek (ed.), *Gospodarowanie wodami. Kluczowe wyzwania w ramach nowego cyklu planistycznego* (Wolters Kluwer Polska, 2020); Elżbieta Zębek, “Legal protection of waters in the context of human rights,” 18.

<sup>42</sup> Lidia Kiedryńska, *Monitoring i metody oceny jakości wód według Ramowej Dyrektywy Wodnej, Komentarz praktyczny*, ABC LEX, 2016, accessed March 23, 2022, <https://sip-1lex-1pl-10000f4nx0b6a.han.uwm.edu.pl/#/publication/469858101/kiedrynska-lidia-monitoring-i-metody-oceny-jakosci-wod-wedlug-ramowej-dyrektywy-wodnej?keyword=Kiedry%C5%84ska&cm=STOP>.

Similar to other European countries, in Poland, there are four types of monitoring systems<sup>43</sup>: (1) diagnostic monitoring, (2) operational monitoring, (3) research monitoring, and (4) area-protected. Diagnostic and operational monitoring is aimed at providing information on the degree of compliance with the basic environmental objective of the WFD, which is the achievement of at least good status by waters. This monitoring is established to provide information on the status of water bodies, as well as to provide information on the responses of water bodies to specific types of pressure, including assessing long-term changes in water bodies occurring under natural conditions and various anthropopressure conditions. Diagnostic monitoring is cyclical with a minimum frequency every six years. However, operational monitoring covers the lake surface water bodies designated as threatened by failure to achieve good status to assess any changes in the status arising from the corrective action programs adopted by the water manager in Poland. This monitoring is carried out cyclically, at least every three years in the water management cycle. Research monitoring may be established to explain the reasons for the failure to meet the environmental objectives by a given homogeneous part of lake surface waters, where the results of diagnostic monitoring indicate that these objectives will not be achieved, and when operational monitoring has not been initiated. Moreover, the monitoring of protected areas is used to determine whether water bodies meet additional environmental objectives resulting from the nature of the protected area, especially the Nature 2000 sites<sup>44</sup>.

Monitoring tests are conducted at measuring and control points. Diagnostic and operational monitoring is carried out at the measuring and control point representative of the assessed water body. Research as part of research monitoring and monitoring of protected areas is conducted at a location depending on the occurrence of the phenomenon/event/contamination being investigated and the location of the given protected area. The location of the points is based on water lists, updated characteristics of water bodies, as well as the emission lists referred to in Article 317 (1) point

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<sup>43</sup> Regulation of the Minister of Infrastructure of 13 July 2021 on the forms and methods of monitoring surface water bodies and groundwater bodies (LJ of 2021, item 1576).

<sup>44</sup> Agnieszka Napiórkowska-Krzebietke, "Ocena jakości/stanu/potencjału ekologicznego jednolitych części wód powierzchniowych – kryteria i unormowania prawne w Polsce," 145.

8 of the Water Law Act, submitted by the National Water Management Authority to the Chief Inspectorate for Environmental Protection, taking into account the VIEP data on emissions to waters.

Research and assessment of surface water shall be done under State Environmental Monitoring. Since 2004, the assessment of water quality under the Water Law Act of 2001 has been in force along with a 5-grade classification of surface waters. According to this classification, the following water quality classes have been distinguished: I – very good quality, II – good quality, III – satisfactory quality, IV – unsatisfactory quality and V – poor quality with associated colour designation as blue, green, yellow, orange and red, respectively. This nomenclature of water quality classes also applies today. According to Annex 1, the bioindicator system was then expanded to include phytoplankton saprobicity, periphyton saprobicity, benthic macroinvertebrates, chlorophyll a, faecal coliforms and coliform bacteria. Currently, the Water Law Act of 2017 requires the monitoring system to be expanded. The assessment of the status of surface waters is being carried out in relation to water bodies, based on the results of the state environmental monitoring and presented by an assessment of the ecological status, assessment of the chemical state and assessment of the state. Ecological status/ecological potential is a definition of the quality of the structure and functioning of the surface water ecosystem, classified based on the results of research on biological elements and the physicochemical and hydromorphological indicators supporting them. The ecological status of surface water bodies is classified by giving the water body one of five quality classes, where first-class indicates very good ecological status, the second class - good ecological status, and the third, fourth and fifth classes - moderate, poor and bad ecological status, respectively. The classification of the assessed water body depends on the results of the classification of individual biological elements, with the principle that the ecological status/potential class corresponds to the class of the worst biological element. In addition to each class (I–V) and ecological status (high, 'good', 'moderate', 'poor' and 'bad'), coloured markings have been subordinated as blue, green, yellow, orange and red, respectively<sup>45</sup>.

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<sup>45</sup> Regulation of the Minister of Infrastructure of 13 July 2021 on the forms and methods of monitoring surface water bodies and groundwater bodies (LJ of 2021, item 1576);

The status of a water body is assessed by comparing the results of the classification of ecological status/potential and chemical status. A water body can be assessed as being in “good condition” if, at the same time its ecological status/potential is classified as being at least “good”, the chemical status is classified as “good”. In other cases, i.e. when the chemical status is classified as “below good” or the ecological status/potential is classified as “moderate”, “poor” or “bad”, the water body is assessed as being in poor condition. Due to the large number of water bodies in Poland, it is impossible to cover all of them with monitoring. For this reason, when presenting the ecological status/potential assessment, a distinction is made between results for monitored water bodies and for unmonitored water bodies, which are classified by extrapolation, based on the results obtained for the monitored water body or as a result of expert judgment. The results of the ecological status/potential classification, due to the relatively low confidence level, are presented by giving the water bodies thus assessed two classes: ecological status/potential “at least good” and “below good”. The following standard bioindicators are used in the Polish monitoring system: Phytoplanktonic Index for Polish Lakes (PMPL), Multi-metric diatomaceous index (IOJ), Macrophyte Ecological Status Index (ESMI), Benthic macroinvertebrates and Lake Fish Index LFI +, LFI-EN<sup>46</sup>.

Due to emerging problems with the implementation of the WFD to Polish legislation and in organizational and practical activities in Poland, guidelines were developed in this regard. On their basis, postulates were formulated, including well-structured water quality monitoring programs and established monitoring of pollutant discharges as well as programs of planned water protection activities are essential. To analyse these monitoring data, it is necessary to use modern, professional tools, namely mathematical models and information systems, especially spatial information systems integrated with the models. These actions should be based primarily on the correct transposition of the WFD and other directives to the new Water Law. The Environment Committee of the Senate of the Republic of Poland decided that the amendment to the current act of the Water Law

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Agnieszka Napiórkowska-Krzebietke, “Ocena jakości/stanu/potencjału ekologicznego jednolitych części wód powierzchniowych – kryteria i unormowania prawne w Polsce,” 146.

<sup>46</sup> Ibid.

inadequate. Regardless of the legislative matters, there is no proper coordination of EU and national activities in the field of responsibilities related to water resources. Therefore, it is necessary to strengthen institutional water management. Water management plans should be carried out by all state units related to water, including departmental institutes that are subordinate to the Minister of the Environment, in cooperation with other relevant units and universities, in a coherent and properly coordinated manner<sup>47</sup>.

## 5. Conclusions

The WFD is considered a very modern approach to water management and indicates new directions in water management, taking into account the basic principles of environmental law such as the principle of suitable development, the principle of subsidiarity and the ‘polluter pays’ principle, and also the principle of social participation. As legal provisions on water protection develop in European law, there is also a noticeable change in the assessment of their quality. This law includes not only standards aimed at regulating pollution and other harmful activities towards the environment, but also all standards whose purpose is to prevent, reduce or counteract threats to the environment, including aquatic ones. Thus, EU legislation deals with both water quality standards, pollution protection and water resource management principles.

But as the European Commission reports and literature indicate, some provisions have been observed to be too stringent and difficult for Member States to implement. The most important problems include:

- a failure to address requirements related to access to environmental justice
- lack of sufficient environmental and economic assessment tools
- gaps in individual river basin districts or individual water categories, e.g. there were still many river basin districts without assessment methods for biological quality elements, especially in the countries that joined the EU in 2004 and 2007

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<sup>47</sup> Marek Gromiec, “Problems of water protection planning in the Water Framework Directive,” *Water Supply and Water Quality* 2014, accessed March 10, 2022, [https://water.put.poznan.pl/images/fullpapers/2014/OCHRONA\\_JAKOSC\\_WOD/249\\_WODA2014\\_WODA\\_2014.pdf](https://water.put.poznan.pl/images/fullpapers/2014/OCHRONA_JAKOSC_WOD/249_WODA2014_WODA_2014.pdf).



- insufficient budget within the Member States, to reach the goals of the WFD by 2015, especially for the some important “basic measures”, e.g. water sewage treatment or a solution for the nitrate emission from agriculture
- monitoring programs that focused “on the testing of individual structural parameters, on the assumption that the good quality of such elements corresponds to the good functioning of ecosystems” and, thus, these programs concentrate on symptoms, rather than on the causes of water degradation.

The consequence of these shortcomings was the fact that nearly half of EU surface waters did not reach good ecological status in 2015. Thus WFD has not delivered its main objectives of non-deterioration of water status and the achievement of good status for all EU waters. This suggests too high expectations of the WFD regulations for the Member States with regard to achieving this ecological status of waters. Proper coordination of monitoring will not only contribute to achieving environmental objectives but also reduce the administrative and financial burden of monitoring.

Similar problems with the implementation of the WFD have also been observed in Poland. The identified problems that could have an impact on the proper continuation of this process are the lack of data, access to existing data, financing of works and timely implementation of the main points of the schedule. In this field, Poland has received the recommendations of the European Commission, the most important of which are: investments required to comply with the Urban Waste Water Treatment Directive and effective implementation and enforcement of the measures in the new nitrate action programs. However, in Poland, during the implementation of the WFD regulations and other executive acts, the surface water monitoring system has been significantly expanded and modernised. In addition to the five-grade classification of water quality, water assessment was introduced, especially lakes, based on the ecological status of waters, introducing standardised biological indicators for phytoplanktonic, benthic diatoms, macrophytes, macroinvertebrates, and fishes. Thus, all links in the food chain of the lakes, which participate in the process of self-purification of waters, and are very sensitive to changes occurring during the inflow of anthropogenic pollution, are taken into account. However, there should be criticism here about the insufficient number of measurement

points in water quality monitoring, the lack of application of all indicators in the assessment of the ecological status of water, the lack of precise identification of pollution sources, and the lack of definition of environmental objectives for water reservoirs located in protected areas, e.g. Natura 2000, All this causes gaps in monitoring and the inability to plan and implement protective measures to achieve environmental goals. Because accurate and harmonised assessment of water quality allows the development of strategies for the protection of lake water quality. Nevertheless, further implementation and improvement of the WFD implementation process allowed for more effective assessment of water quality and, as a consequence, to take action as soon as possible to improve water quality and achieve at least good ecological status, which is the most important goal of the directive.

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