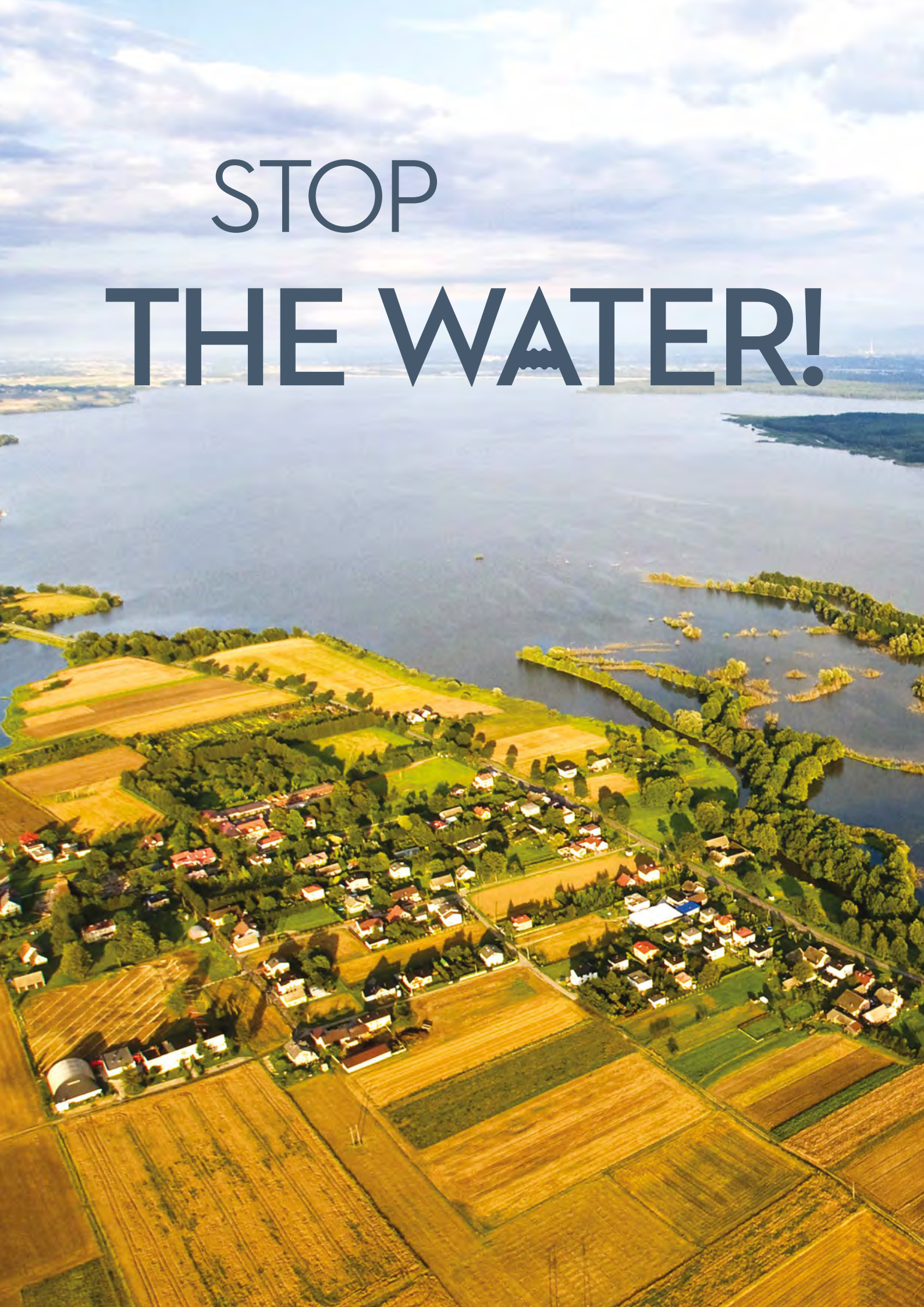


STOP THE WATER!





There are about 1.3 billion km³ of water on Earth. The waters of the oceans and seas account for 96.5% of the planet's total water resources, and the remaining saltwater makes up 0.9%. Freshwater accounts for only 2.5%. The Earth's total freshwater resources consist of glaciers and the planet's ice cover – 68.7%, groundwater – 31.01%, surface water and other freshwater – 1.2%. Water is constantly moving in a closed circuit. It evaporates from the surface of seas, rivers, oceans, and land as well as a result of transpiration from green surfaces. Subsequently, in the form of precipitation, it falls to the ground, penetrates the surface, and supplies it with groundwater or flows down into lakes, seas, and oceans.



The Vistula River mouth at the Goczałkowicki Reservoir / photo: Andrzej Siudy



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Fifty-kilogram silver carps caught in an overflow basin after the flood in 2010 / photo: Andrzej Siudy



Surface water is the water we should use. Groundwater as well as the waters of the glaciers and ice cap, in turn, should be an untouchable resource. Unfortunately, the ice sheet covering the Arctic and the Antarctic is currently undergoing severe degradation due to climate change. The melting of the glaciers causes the water from them enter the oceans, i.e. to become saline water. At the same time, fresh water resources are dramatically shrinking.

In Silesia there is a so-called anthropogenic lake region with numerous water reservoirs created as a result of human activity. These are mainly reservoirs with dams, cave-ins, and ponds. Currently, the number of reservoirs created as a result of ground subsidence due to mining activity is on the rise.

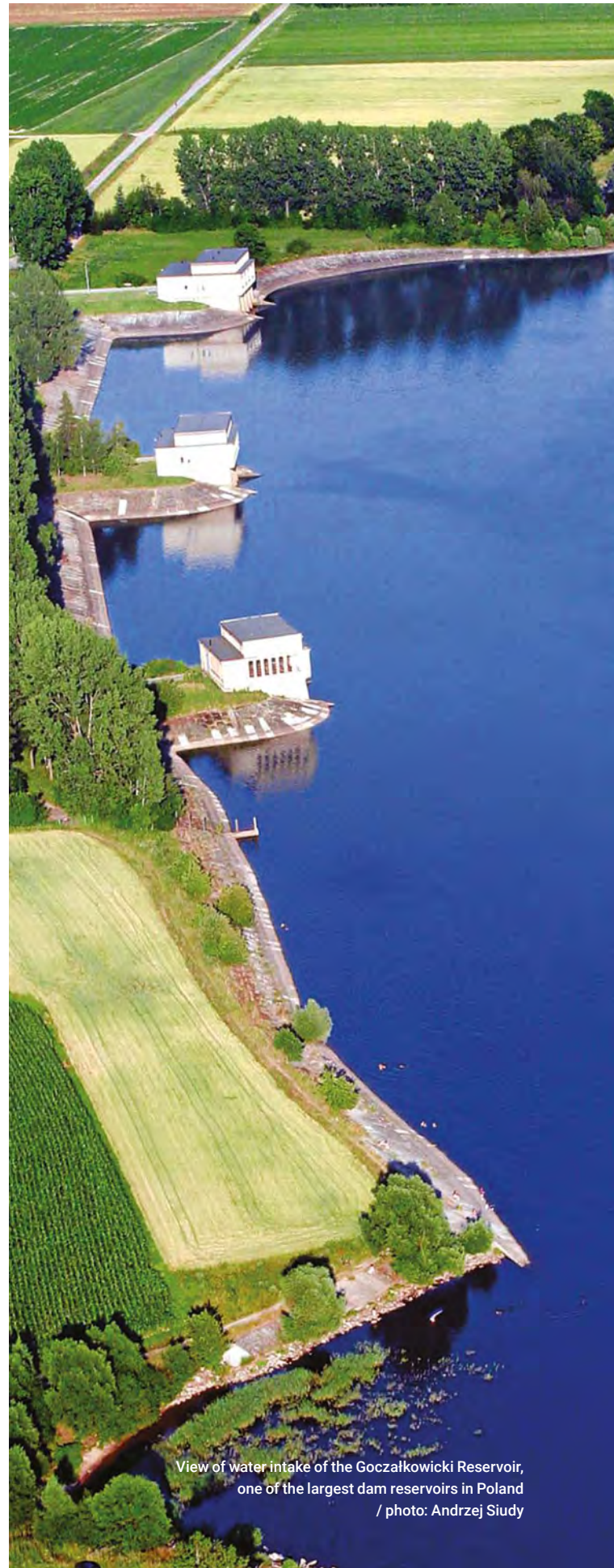
In this region there are approx. 15,900 water reservoirs occupying a total area of 194.7 km², which amounts to 2.64% of the total area of Silesia. This is a relatively large number, but once the so-called lake density was even greater – in the period from the 16th to 18th centuries it amounted to approx. 4.5%. In these times, water was intensively used in water mills. In the Duchy of Pszczyna alone, there were about 250 water wheels, which were used as propulsion for mill wheels, blowers, and hammers in forges and sawmills. The hydrotechnical solutions used at that time indicate other functions as well, such as flood control and drought prevention. Moreover, they can serve as a model for solutions in the construction or reconstruction of contemporary small retention systems. Since the invention of the steam engine, the role of reservoirs ceased to be important, and they have slowly disappeared.

In Upper Silesia, sustainable water management was present since the Middle Ages – mainly on the land belonging to the Cistercians, the Piast dynasty of Cieszyn, and the noble families Thurzó, Promnice, Hochberg, and Donnersmarck. Almost every watercourse that functioned in Upper Silesia at that time in the form of cascade lakes, in which water was flowing from one to another. This shows that already in the Middle Ages people

were struggling with water shortages and saw the need to save this resource. Moreover, systems of connected cascade ponds offered protection against floods, as evidenced by the large proportion of dry reservoirs and dikes across the valleys of streams that slowed down the flow of water.

In addition to their functions of flood protection and water retention, these systems played an important role as reservoirs for animal and plant species, which is why the ponds were used for fish farming. The beginnings of pond management in Silesia go back to the 15th century, but the first breeding ponds were created earlier, probably due to the use of numerous old riverbeds of the Little Vistula, the Oder (Odra), and their river basins. The intensive development of settlements in Silesia and Lesser Poland gave the process of pond formation much more dynamics. The increasing number of inhabitants of the cities and towns caused an increase in the demand for fish, also due to compulsory fasting and the fact that dishes containing fish were considered meatless. At that time, several pond districts appeared in Upper Silesia, including those which supplied Cracow with fish. At the turn of the 15th and 16th centuries, Casimir II, Duke of Cieszyn, initiated the construction of ponds and the development of fishing in the Duchy of Pszczyna. In this region, water management was focused on fish production as early as in the 16th century. At the end of the 18th century, the area of the ponds in the Duchy of Pszczyna exceeded 48 km². Even at the beginning of the 19th century, almost every house had a pond, and fish was the basis of the diet of the region's inhabitants. Apart from its use in fish farming, water fulfilled two important functions in this region. It was a source of energy and, as evidenced by old maps, systems were created to keep large amounts of water in the environment.

One more aspect of water management should be mentioned at this point. The progressing development of industry and increasing urbanization caused a decline of water quality in Silesia. In 1867, in the meadows of the Gostynia river valley, a hydrobotanical cleaning plant was established. After being filtered through the ground and plant roots, the treated water flowed into the Paprocany reservoir, which is one of the oldest dammed reservoirs still existing in Poland (it is already visible on the maps of Christian Friedrich von Wrede from 1747–1753). Nowadays, small water reservoirs or private ponds next to houses have disappeared and have been replaced by large dam reservoirs, e.g. in Goczałkowice. The reconstruction of cascade ponds may be a way to build small retention systems in Silesia. These reservoirs should be multi functional, and their functions should include: drought and flood prevention, fish farming, and leisure. Moreover, an emphasis should be put on values related to the landscape and nature, which will allow to increase the biodiversity of these areas. Moreover, a system of ponds built on single stream may significantly affect not only the amount of water in the environment, but also its quality, which will increase the amount of good quality water resources in the region. Due to the large dispersion of reservoirs in Silesia, the scope of their influence (retention, flood control activities, ecosystem services, counteracting the effects of climate change) will be significantly larger.



View of water intake of the Goczałkowicki Reservoir,
one of the largest dam reservoirs in Poland
/ photo: Andrzej Siudy