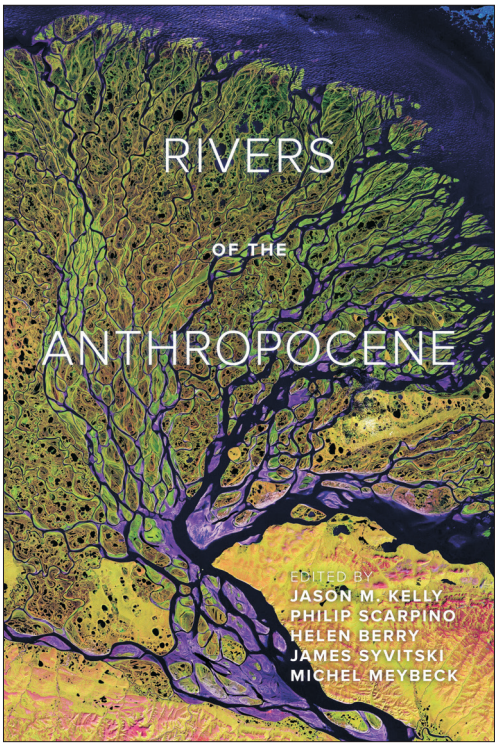
Kelly, J.M., Scarpino, P., Berry, H., Syvitski, J. and Meybeck, M. (eds.): Rivers of the Anthropocene. Oakland, University of California Press. 2017. 240 p.

Reading the title of the book, we think about streams in a new geological epoch, their geomorphological description or their role in our life. This book is much more than a simple introduction, it is a summary of the first results of the "Rivers of the Anthropocene (RoA) Network" project, established in 2013. The main idea that is followed throughout the entire book is human modification of the riverine environment (or river scape) to the extent that it became irreversible. Following a detailed historical overview of literature on human transformation of nature in general, citing well-known 19th and 20th century scientists, the authors emphasise the profound impacts of human activities on rivers during the past 250 years. Such impacts were induced by global population growth, the increased utilisation of fossil fuels, commercial activities extending over the whole world, and industrial processes, the production of chemicals, which have combined to lead to serious environmental consequences worldwide. Such consequences embrace, for instance, the decline of native species and, in parallel, the introduction of exotics as well as transformations in the chemistry and ecology of rivers caused by emissions from agriculture and industry practiced on the catchments.



Land drainage, river channelisation and impoundment, and wetlands development have also altered habitats and stressed ecosystems. In the background of all this is the human hubris, the thesis that humanity can control nature and have power over natural phenomena. In the authors' opinion, even if humanity could abandon this way of thinking, it would be already too late to get back to the old picture since a new, modified era that we call Anthropocene has already started. It is not just about environmental pollution, it is about changing the natural elements, like building dams and controlling rivers to the extent that the river's self-purification capacity is overstrained. People are not aware of the depletion of freshwater resources while 80 per cent of the world's population lacks healthy drinking water. The project's main objective is to make people realise the importance of rivers and their sustainable use in the future.

It was a very good idea to involve, in addition to natural scientists and engineers, also experts in other areas like social sciences in the writing of the book. Even artists, policy makers, and community organisers can have their contribution to the discussion across disciplinary and professional boundaries about the relationships between humans and their riverine environments. This is an important aspect because, as the authors explain in the book, there is not just one view of the Anthropocene, but there are many. Each layer of the population sees the epoch in a different way, and all the different opinions are considered relevant and important.

The original proposal for this book derived from Jason M. Kelly, Director of the Arts and Humanities Institute and Associate Professor of History at Indiana University–Purdue University Indianapolis and comprised two tasks to accomplish in the book: to recognise and diagnose the environmental pressures by using methods applied in natural sciences and engineering, and then to analyse the conditions that lead to them through approaches common in social sciences and humanities. It was hoped that transdisciplinary collaboration would allow the elimination of bad practices and bad decisions.

It seems that progress towards the Anthropocene is an irreversible and negative process that only brings bad outcomes. The authors refute this statement, for instance, through presenting the investigation of the Singapore River, a futuristic engineering project for island water with promising results for the future. In addition, authors deal with the Ethiopian Blue Nile basin, the English Fenlands, the Seine Basin and the Chicago River.

The chapter on the English Fenlands is of particular geomorphological interest. It presents an anthropogenic topography, the system of *roddon*s, sediment bodies

formed under the conditions of the Holocene, through differential compaction following draining. Now it is an Anthropocene landscape with inverted topography, as winding ridges rise 2 m higher than the surrounding clay surface. In the Fenlands they constitute the only higher ground, where local farmhouses are built.

The chapter on the Blue Nile in Ethiopia is particularly interesting for its societal aspects. Today no more than 5 per cent of water resources are utilised in Ethiopia. This explains that dam construction is on the rise. The proposed intensive use of the largest tributary to the Nile affects conflicting political and economic interests of Egypt and Sudan and calls for agreements on transboundary management. With regard to climate change infrastructure developments seem legitimate. However, irrigation projects do not necessarily decreased vulnerability to floods and droughts, especially if marginal groups of the population are considered. The large-scale projects underway may enhance existing inequalities. This is a typical example of the socio-economic implications of changes that the Anthropocene brings about.

The RoA project, which is aimed at improving the riverine environment, does not only comprise a theory, but also practical implementation. Each component has a software which depicts the river's conditions and geomorphological attributes. The first model is elaborated for the River Tyne in North England. A main issue to decide is when we should regard a river damaged, from which state the natural river scape cannot be restored. The methodology used here assesses the status of the river in the light of the provision of ecosystem services. The methodology is designed to be applicable worldwide for other medium-sized temperate rivers. In the background of the methods proposed two 'classical' approaches can be detected: conservation-based management and design with nature.

With respect to river restoration it is necessary to ask the question: What can we call a natural river scape? To give a precise answer is not easy, for at least two reasons. Firstly, there is no consensus about what are the reference conditions typical of a river in natural or semi-natural state. For instance, the vision of an 'ideal meandering form' was the widely accepted reference condition for restoration efforts in the river scapes of the United States. Before European settlement, however, anabranching systems transporting cohesive sediments in forested and swampy landscapes were the reality. Secondly, it is not agreed upon how to assess the fragmentation of catchments, which usually makes effective ecological restoration difficult. A key concept here is catchment connectivity, i.e. the unhindered communication between the main channel, the side-channels and oxbow lakes in the floodplain.

It is very hard to change back the river to its natural state, because for restoration the scientists should know river hydrology, hydraulics, geomorphology, ecology, and have to be sure that they will not cause more damage than benefit – as it has happened, for instance, with floodplains in Hungary. As a consequence of the river regulations of Tisza River, the country has lost most of its floodplains, marshes and swamps. To protect the remaining ones, we need to have much information on habitats, animals and plants living there. Back to the RoA's method, the help of the Google Earth or other virtual globe complements our knowledge which is necessary on the river (for example: fishing, timber, water supply, water quality control), we will have an output that represents these attributes with numerical data. Through Google Earth this information can reach people who badly need this knowledge: local residents and the policy makers.

Towards the end of the book a most interesting method is described and can be wholeheartedly recommended for use in Hungary. The essence of this method is to show people how they have to protect the riverine environment. The first model is the White River. It is common to have all the streets waterlogged in the settlements of Hungary after major rainfalls. People don't know that this is waste of freshwater vital for living. How can we show them this importance? The FLOW (Can you see the river?) is a project of the CALL framework in which they built a 6-mile-long path from the Indianapolis Museum of Art to White River State Park. There are a few stations on this path, where people can learn about the infrastructure of the river, its history and ecology, and if they want to know more, there is a chance to access the webpage. At the stations there are big mirrors made from stainless steel, signed with a lot of red dots on its surface with their descriptions. Looking at the mirrors from different angles, the dots show the visitors different pieces of information on the river, this way they can see themselves in the mirror in relation to the river. The Indianapolis Museum of Art also has a walkable map with the size of 40 m^2, where visitors can find their home, workplace, locations, so they can learn about their relation to the river. The project already got a lot of positive feedback from people who said they had not known much about the river's importance until they learnt about this project.

Summarising the RoA project's first result, this is a very profound work to make people realise how important the rivers around us are. Although the authors naturally cannot achieve fundamental changes in the world with their book, but this is an excellent initiative to spread useful thoughts and methods across the world, to reach the people of Anthropocene.

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