

# More than 1 million barriers on Europe's rivers: study

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More than 1.2 million barriers criss-cross Europe's rivers—nearly twice as many as previously thought—threatening some of the world's most diverse ecosystems, new research showed Wednesday.

Although the rivers have been dammed, forded or bridged for centuries, there is a surprising lack of detailed databases of the continent's waterways.

Most only list barriers of a certain height, above 10 metres, for example, leaving hundreds of thousands of smaller water breaks undocumented.

In a pan-European initiative, scientists collated more than 120 data bases on European rivers and ran tests to ensure no barrier was repeated in the final tally.

They found 629,955 unique [barrier](#) records—a huge number demonstrating the extent to which human activity has influenced river ecosystems.

To compare the data with reality, the researchers then undertook a mammoth verification operation: they walked along more than 2,700 kilometres of European rivers, manually inputting any missing from records into the database.

The number of barriers recorded in field was on average 2.5 times higher than in existing inventories.

Extrapolating that discrepancy to continent-wide figures, the team estimated the true number of barriers across European [rivers](#) to be more than 1.2 million.

## **A fragmented network**

"The extent of river fragmentation in Europe is much higher than anyone had anticipated," says Barbara Belletti, a river geomorphologist who led the study at Politecnico di Milano.

Christian Zarfl from the Centre of Applied Geoscience at Germany's Eberhard Karls University of Tübingen and Bernhard Lehrer, from Montreal McGill University's department of geography, said the research was "the most comprehensive inventory of river barriers ever created.

"Nevertheless it still substantially under-represents reality," they said of the river database, published in the journal *Nature*.

Zarfl and Lehrer said the true figure of 1.2 million artificial barriers would make Europe's waterways "possibly the most fragmented river network in the world."

The authors said that while larger barriers such as [hydroelectric dams](#) often cause concern among conservationists, the presence of much smaller barriers such as weirs and sluices was a far more insidious threat to [river ecosystems](#).

Dams above 15 metres in height, for example, account for fewer than one percent of artificial river barriers in Europe. More than 90 percent of the barriers are under 5 metres high.

The experts said this provided an opportunity to rectify river flow, since many of the barriers are "small, old and obsolete"—therefore easily removable.

"To avoid 'death by a thousand cuts', a [paradigm shift](#) is necessary: to recognise that although large dams may draw the most attention, it is the small barriers that collectively to the most damage," the said.

"Small is not beautiful."

**More information:** Barbara Belletti et al. More than one million barriers fragment Europe's rivers, *Nature* (2020). [DOI:](#)

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