

Building a better dam map

June 2 2011

Humans have been building reservoirs and dams for thousands of years. Over the past few decades, their construction has spiked as our need to harness water – critical in flood control, irrigation, recreation, navigation and the creation of hydroelectric power – has grown. And while dams and reservoirs have important benefits, they can also be disruptive and costly to both humans and the environment.

A close assessment of critical environmental and social tradeoffs associated with dams and reservoirs within the global river network has been impossible because the data describing their location, size and purpose have been incomplete and inadequate.

That is, until now.

The culmination of a four-year collaboration by a team of scientists from around the globe, coordinated by the Global Water System Project and led by McGill University's Bernhard Lehner, has produced the Global Reservoir and Dam database (GRanD), a unique, geographically explicit, high-resolution global database of large dams and reservoirs.

"Thorough continental assessments and ongoing sustainable dam management and planning haven't been possible due to a lack of data. We've only been able to look at dams on a case-by-case basis," explained Lehner. "The Three Gorges Dam, for example, has been heavily investigated, but no one ever included the 100-plus large dams upstream from it in a single impact assessment. Now we can look at all of them at the same time to figure out what the combined effect is. This gives us a

holistic view of a whole river basin."

According to the paper published on May 31 in *Frontiers in Ecology*, GRanD currently contains information regarding 6,862 dams and their associated reservoirs with a total storage capacity of 6,197km³. Based on this figure, the authors estimate that about 16.7 million reservoirs larger than 0.01ha may exist worldwide. The team also found that nearly 50 per cent of large rivers – that is, those with an average flow of more than 1000m³ per second – are affected by large dams and [reservoirs](#) worldwide. GRanD data includes (in most cases) the dam and reservoir names, spatial co-ordinates, construction year, surface area, storage capacity, [dam](#) height main purpose and elevation.

More information: GRanD is freely available for non-commercial use at www.gwsp.org/85.html

Provided by McGill University

Citation: Building a better dam map (2011, June 2) retrieved 20 September 2024 from <https://phys.org/news/2011-06-building-a-better-dam-map.html>

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