

# Pressure on river management leads to more frequent flooding

December 13 2021, by Margriet Van Der Zee, Tim Roumen

---



Students recording and collecting sediment samples during post-flood field work.  
Credit: Leiden University

In his new book "Flooding and Management of Large Fluvial Lowlands," Paul Hudson Associate Professor of Physical Geography at Leiden University College in The Hague, examines human impacts on lowlands rivers. The past twenty years the pressure on large fluvial lowlands has increased tremendously because of flood control, urbanization and increased dependence upon floodplains and deltas for food production. The book provides a primary focus on the lower Rhine River in the Netherlands and the Lower Mississippi River in Louisiana. Five questions about the book, answered by Paul Hudson.

## **What was the main reason for you to write a book on this topic?**

Hudson: "My [personal motivation](#) is that it is my core area of expertise and I've been working on such topics for nearly 30 years. The book was a nice way to wrap up a lot of the science I've been researching—or teaching—into a coherent package. I'm super passionate about the topic and had to get it off my chest. My scholarly motivation was that as an earth scientist we often see that engineering often neglects to consider the underlying floodplain soils and sediments, which then results in riparian environmental degradation and perhaps increased [flood risk](#). Thus, the topic is approached from an earth science perspective. And climate change makes everything worse."

## **Can you give a main conclusion out of your research?**

Hudson: "The two main [human impacts](#) to lowland rivers have resulted

in increased [flood](#) risk and degraded riparian ecosystems. This has occurred because of prior mis-aligned management practices, that along [large rivers](#) require decades to manifest. A good example is the problem of accelerated ground subsidence (lowering) because of excessive drainage and groundwater pumping from past decades and centuries. The subsidence then results in further flooding, which then requires more pumping. It's maddening. Trying to improve (large) river management to restore and enhance future lowland river health is the 'art of the science' and is the essence of the book."

## **Floodings are a hot topic in the Netherlands given the recent flooding in Limburg in particular. How did you follow this and does it play a role in the book?**

Hudson: "Exactly. I'm actually working on the flooding along the Maas River in the Netherlands from this summer. As soon as the flood waters receded I headed to the field. The flood occurred after my book manuscript was already submitted, but indeed it seemed to follow the main lines of my book. Unfortunately these events are becoming more common, and in other places less rigorously managed than the Netherlands results in flooding with catastrophic consequences and fatalities. Incidentally, the section along the Maas River had just been upgraded with the Netherlands Room-for-the-River flood risk strategy, at a cost of 700 million EU along the Maas River. Considering that there were no large dike breaches along the Maas River, and considering the intensity of human habitation and concentration of economic activities, the cost of the R-4-R program should be seen as a bargain."

## **Who should read the book, what is your audience?**

Hudson: "It is really a scholarly treatise and wades quite deep into the academic literature, although I think the writing style is quite

approachable and I've tried not to make it too technical. So, anyone interested in the topic of flooding and environmental change along large rivers, especially academics, practitioners (like Rijkswaterstaat), and graduate students."

**You also did some research and field experiments with LUC-students at the Geul this year, are the results also part of this book?**

Hudson: "Yes, that's right. Unfortunately that work did not make it into the book, because the flooding occurred after I had already submitted my book. But what is interesting is that my field course did an 'environmental flows' analysis in May, before the floods, and then we returned in September to look at the impacts of the flooding on the Geul River—careful to repeat the same measurements in the same area to have a 'before and after' comparison. Very interesting to see the changes caused by the flooding."

Provided by Leiden University

Citation: Pressure on river management leads to more frequent flooding (2021, December 13) retrieved 24 June 2024 from <https://phys.org/news/2021-12-pressure-river-frequent.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.