

Cynthia Annett, PhD

Research Associate Professor

Center for Hazardous Substance Research

Kansas State University

Title: An international perspective on natural and nature-based solutions for inland flood risk reduction with lessons for an uncertain future

Using nature as infrastructure is an idea that is gaining interest as our existing stormwater infrastructure ages beyond its effective lifespan and extreme weather events increase in frequency and severity. While Natural and Nature-based Solutions (NNbS) have been around for a long time under a variety of names and used for a variety of purposes, there is often the impression amongst stakeholders that they are too new, too novel, and too risky to include in the design of inland flood mitigation measures. Yet the idea of nature as infrastructure may be the missing piece in creating resilient flood risk reduction strategies for our uncertain future.

Our international task group has spent the past two years working through an exploding literature on NNbS and reconciling the many ways in which it is described, categorized, justified, implemented, and evaluated. The lack of consistency in how practitioners in different parts of the world define NNbS has been a stumbling block to the widespread adoption of these techniques. In this presentation we will present an overview of our synthesis of current knowledge and provide suggestions on how to integrate NNbS into a hybrid approach that can move past these stumbling blocks. Most importantly, we describe how coordinating projects within watersheds and considering techniques that cross between the rural-urban divide at larger watershed levels may provide more cost effective approaches than typically considered when addressing localized flooding within a community.

The Nature-based Solutions guide for inland flood risk reduction complements our recently published guide on publicly available database and mapping tools for environmental and climate risk. Taken together we hope they will provide assistance to smaller municipalities and rural communities that may not have the capacity to otherwise access the resources they need to incorporate NNbS into their planning and may therefore default to more traditional gray infrastructure approaches.

One of the major takeaways from our work on these two guides is that there is a need to integrate climate risk reduction strategies into environmental cleanups. As a result, the next phase of our work will be to develop additional guides on how to use publicly available data to identify brownfields properties that are vulnerable to flooding and how to safely use brownfields properties for NbS projects. And finally, we will be forming a task group to develop a new standard guide on coastal flooding to provide a more comprehensive overview of NNbS for flood risk reduction.