

# ENGINEERING WITH NATURE

## AN ATLAS, VOLUME 2

Showcasing Engineering with Nature principles and practices in action through 62 projects from around the world, these projects demonstrate what it means to partner with nature to deliver engineering solutions with triple-win benefits.

Humanity faces many challenges in the 21<sup>st</sup> century related to supporting a population that is expected to exceed 10 billion by the end of the century. Not least, how to reduce the increasing risks posed by natural hazards and climate change. Whether we frame the future in terms of problems to resolve or opportunities to develop, nature will figure prominently in the outcomes of our pursuits. The overarching need before us is to figure out how to discover, preserve, expand and apply nature's value.

The Engineering With Nature initiative formally began in 2010 within the U.S. Army Corps of Engineers (USACE). The initiative, with its partners and collaborators, is committed to advancing technical practice and to creating diverse, holistic value through nature-based solutions and infrastructure. In 2018, USACE published the first volume of the *Engineering*

*With Nature Atlas*. Developed to communicate the diversity of projects, contexts and organisations advancing worldwide progress in the field, it highlighted 56 projects. It promised future volumes to present new collections of projects and on 7 April 2021, USACE launched the second volume.

Volume 2 has continued the 'seeing is believing' approach, presenting Engineering with Nature (EWN) principles and practices in action through photographs and descriptions of 62 projects from around the world. Sharing examples of EWN practice and learning from project examples is the motivation for the *EWN Atlas* series. As with the first volume, the current collection of projects illustrates a diverse portfolio of circumstances, inspirations, obstacles and achievements. All of the projects in this second volume highlight the importance of collaboration to innovating



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**Publisher:** U.S. Army Engineer Research and Development Center  
**Published:** April 2021  
**Language:** English  
**Price:** Free digital download  
**ISBN:** Ebook 978-1-7325904-3-4

**Available from**  
<https://ewn.el.erdc.dren.mil/atlasv2.html>

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and creating diversified project value (i.e. multipurpose projects). They highlight the benefits that can be produced when engineering and natural processes are successfully integrated to support navigation, flood risk management, ecosystem restoration and other infrastructure purposes.

Co-written by authors Todd Bridges, Michelle Bourne, Burton Suedel, Emily Moynihan and Jeff King, the projects are grouped into eight chapters: beaches and dunes; wetlands; islands; reefs; riverine systems; floodplains; use of vegetation and natural materials; and environmental enhancement of infrastructure.

Within the opening pages, the book lays out the bigger picture with a view towards the future. While exploring the projects, readers are invited to consider questions such as, what lessons do they teach? How could EWN support my community? As the authors simply state: 'The future is shaped by understanding what others have done and then considering the potential for doing even more.'

Each project example introduces unique facets of developing sustainable projects while clearly highlighting the four common elements of EWN; the efficiencies produced, the natural processes used, the project benefits provided and the collaborative partners engaged. As with

the first atlas, this second volume uses these four critical elements to structure each project description and to define progress and success related to EWN.

*Engineering With Nature: An Atlas, Volume 2* is more than just a collection of maps and figures. In highlighting projects around the world, the atlas provides a channel for communicating progress and potential. The collection of 62 projects illustrates that restoring nature and using nature-based solutions can efficiently yield real economic, environmental and social benefits. It is not only an important resource guide, but provides broadening understanding, consideration and acceptance of natural infrastructure as a flood risk reduction and resilience strategy.



Inside spread showing the design of the Dangote Sandbar Breakwater project in Lekki, Lagos State, Nigeria.