



USACE
ecologist helps
agencies strike
balance between
missions,
environment **34**

Environmental Operating Principle #5

Consider the environment in employing a risk management and systems approach throughout the life cycles of projects and programs.



Engineering With Nature delivers triple wins

Since 2017, Drs. Jeff King, Burton Suedel, Tosin Sekoni and Brandon Boyd at the U.S. Army Engineer Research and Development Center have been implementing an Engineering With Nature research and development effort that utilizes tools from landscape architecture.

The ERDC team, along with U.S. Army Corps of Engineer district offices, identified opportunities in Florida and Texas to integrate EWN techniques and practices into USACE repair, replacement and rehabilitation projects. The team will work with members of the Dredge Research Collaborative, a network of landscape architects in academia and private practice focused on infrastructure and sediment management.

The EWN initiative and landscape architecture both consider many of the same opportunities related to infrastructure design and performance, such as the re-imagining of existing infrastructure to meet more diverse and functional engineering criteria, providing greater ecological value and delivering recreational opportunities as well as aesthetic benefits.

Given the complimentary nature of these two disciplines and mutual interest in infrastructure enhancement, the research project was initiated to further promote those shared design principles and precedent knowledge. These principles and knowledge can be integrated into EWN approaches that are collaboratively pursued by engineers, hydrologists, biologists, ecologists and landscape architects.

EWN has stimulated new practices in engineering and ecology that are creating a powerful new paradigm for how projects can get built, ultimately seeking to build layers of economic, environmental and social benefits into projects through collaborative efforts across disciplines.

While EWN engineers and scientists bring a knowledge of natural processes and an understanding of how these processes get integrated, landscape architects are formally trained to think about how people interact with a design.

Landscape architects also translate the conceptual stage of a project directly into a specific drawing, using a visual vocabulary for communicating how natural processes can be integrated into traditional engineering projects.

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Example of a Galveston Studio rendering by Cornell University landscape architecture student, Yiren Du. The rendering, which is similar to those that will be executed for this project, was part of a collaborative effort with USACE Galveston District by Auburn and Cornell University landscape architecture students and faculty. The illustration shows the potential seawall concept and its integration with dune habitat features.

For this research and development effort, prioritization and ranking of projects was based on criteria, including — but not limited to — review of a proposed project; potential for incorporation of EWN practices, including human use benefits; potential applications of designs and techniques; and project type and location.

Working collaboratively with USACE districts, the ERDC/DRC project delivery team will develop project renderings and offer a report to the districts that illustrate integration of EWN concepts with an explanation of added benefits the designs will deliver.

The Jacksonville District is one USACE district with projects that are being evaluated as part of this R&D effort. One of those projects will take place at the W.P. Franklin Lock and Dam Recreation Area South, located in Alva, Florida.

“For fiscal year 2018, Jacksonville District received funds to close the W.P. Franklin swimming beach, which covers approximately one half acre of shoreline,” said Nelson Colón, natural resource program manager, Jacksonville District.

“The design work, which has begun, will entail replacement of approximately 60 cubic yards of beach sand with suitable fill material and topsoil, removal of buoys, planting of native estuarine vegetation and implementation of other water recreation opportunities, such as for fishing or a paddle craft launch for canoes and kayaks,” he said.

“The goal,” Colón added, “is to develop an environmentally friendly waterborne recreation feature for the park.”

In another part of the project, at the W.P. Franklin South Entrance, former dredged material disposal sites located on both sides of the access road to the park and covering approximately 13 acres of land are slated for restoration.

“These sites are mowed regularly to prevent them from becoming overgrown with invasive vegetation,” he said. “The goals of implementing a managed reforestation are to prevent the establishment of invasive species, promote use by pollinators and local wildlife and reduce the maintenance burden.

“The scope would include re-grading for contour variation, planting native vegetation and creating interpretive trails,” Colón said. “An initial funding request for this proposal was included in the fiscal year 2020 budget.”

“Applying EWN techniques and practices offers more possibilities to fully integrate an infrastructure project with elements of the natural environment,” said Carol Bernstein, chief of the Operations Division, Jacksonville District.

For many of the infrastructure projects being evaluated this year, the proposed R&D support may also result in additional insight specific to maximizing engineering, environmental and human-use benefits; enhancing or prolonging the maintenance cycle; and incorporating biological approaches and materials that

could potentially offer innovative ideas or strategies for assimilating infrastructure with the aquatic environment.

Bernstein is excited to see the future report and project renderings for the two Jacksonville District projects.

“EWN offers a win-win process where a district can leverage design services coupled with landscape architecture renderings that will help to communicate ideas and engineering concepts; manage stakeholder expectations related to potential outcomes; and increase process transparency to see the results of this R&D initiative — all of these play a role in managing risk,” Bernstein said.

If you are interested in sharing your ideas about new USACE infrastructure projects for future consideration and working with the EWN PDT, then please contact King at Jeffrey.K.King@usace.army.mil.

For more information about the EWN initiative, please visit:

www.engineeringwithnature.org

For information about the Dredge Research Collaborative, visit:

www.dredgeresearchcollaborative.org

Contributing writers include Dr. Jeff King, U.S. Army Engineer Research and Development Center; Prof. Rob Holmes, Auburn University; and Holly Kuzmitski, U.S. Army Engineer Research and Development Center, Public Affairs Office.



(Photo by Prof. Rob Holmes, Auburn University)

The swimming beach at the W.P. Franklin Lock and Dam, Recreation Area South, will be decommissioned and replaced with environmentally friendly waterborne recreation features.

