

CIVIL ENGINEERING RESEARCHERS WIN INNOVATION AWARDS

BY BERNADETTE DOMBROWSKI



Three civil engineering researchers from WVU are part of a team awarded the 2016 United States Army Corps of Engineers Innovation of the Year Award for their research on composite components for locks and dam systems.

Hota GangaRao, P.V. Vijay and Mark Skidmore from WVU's Constructed Facilities Center worked with the U.S. Army Corps of Engineers' Construction Engineering Research Laboratory in Champaign, Illinois, to design, test and implement glass-fiber reinforced plastic wicket gates at the Peoria Lock and Dam on the Illinois River at Creve Coeur, Illinois.

Wicket gates help maintain a navigational pool in the river by resting on the bottom of the river. They are raised when the water gets too low.

"We're excited to have won this award because of the immense amount of research and development incorporated in the wicket gates to make it a great success," said GangaRao. "Many of our faculty and graduate students worked diligently to make a good end product in an economical manner. This is fitting recognition for all our dedicated folks that worked toward the singular goal of advancing the state-of-the-art technology."

The use of GFRP in navigational structures is a new concept, but an important one. Ninety-five percent of the dams managed by the USACE are more than 30 years old, and 52 percent have reached or exceed the 50-year service lives for which they were designed. It would cost approximately \$24 billion to fix all the dams that need repairs.

"This project marks the first implementation of GFRP-based products for navigational structures in the United States," says GangaRao. "We're proving that it's the ideal material for these projects because it's corrosion-resistant, which lowers maintenance costs, and could also prove to have lower initial cost than existing materials."

Current structures use a mix of large timber, a product much more difficult to obtain than it was 50 years ago, welded steel I-beams, angles and plates. These materials make the product extremely heavy to lift and susceptible to corrosion.

The GFRP components, manufactured by Composites Advantage Inc., were installed in August 2015 on the Illinois River. The anticipated cost savings for the two locations is nearly \$19 million over a 50-year lifetime.

With approximately 87,000 dams listed in the National Inventory of Dams, GangaRao hopes this project is just the beginning of GFRP's use in navigational structures.

"Our research and development work, and the consequent field implementations, for a variety of infrastructure systems, are getting national recognition, but we are just scratching the surface" said GangaRao. "Our nation will soon start spending millions of dollars to upgrade infrastructure systems, and we have the ability to step in and greatly reduce that total cost."

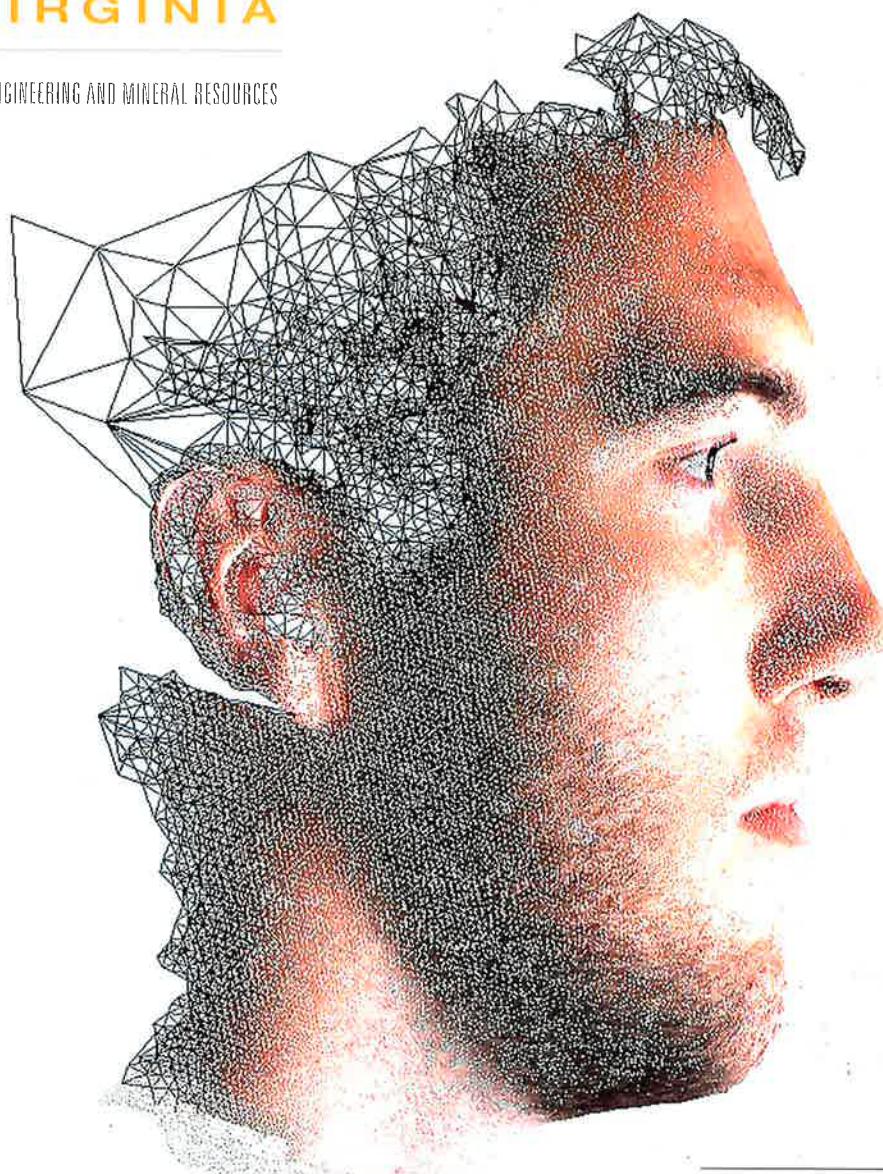
This is the second time GangaRao and his team have won a USACE Innovation of the Year Award for its work in composites, having won in 2014 for their work on a Huntington-area bridge.

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