

VISUALIZING THE CONCHAS RESERVOIR

NSF HIGHLIGHTS—TRACK 2 EDUCATION & OUTREACH



TITLE

Visualizing the Bathymetry of Conchas Reservoir at Mesalands Community College, New Mexico

OUTCOME

Mesalands Community College Natural Sciences Instructor Gretchen Gurtler leveraged resources from WC-WAVE and the U.S. Army Corps of Engineers (USACE) to design a problem-based experience for her students to learn geographic, hydrologic and geologic concepts. To answer the question: “How has sedimentation of Conchas Reservoir changed over the last 75 years?” students collected bathymetric data at Conchas Reservoir and acquired historical data and maps from the USACE. Then, they used digital tools like QGIS, WebPlotDigitizer, Photoscape, MS Excel, Logger Pro, and Google Earth to prepare the data and visualize sedimentation of the reservoir.

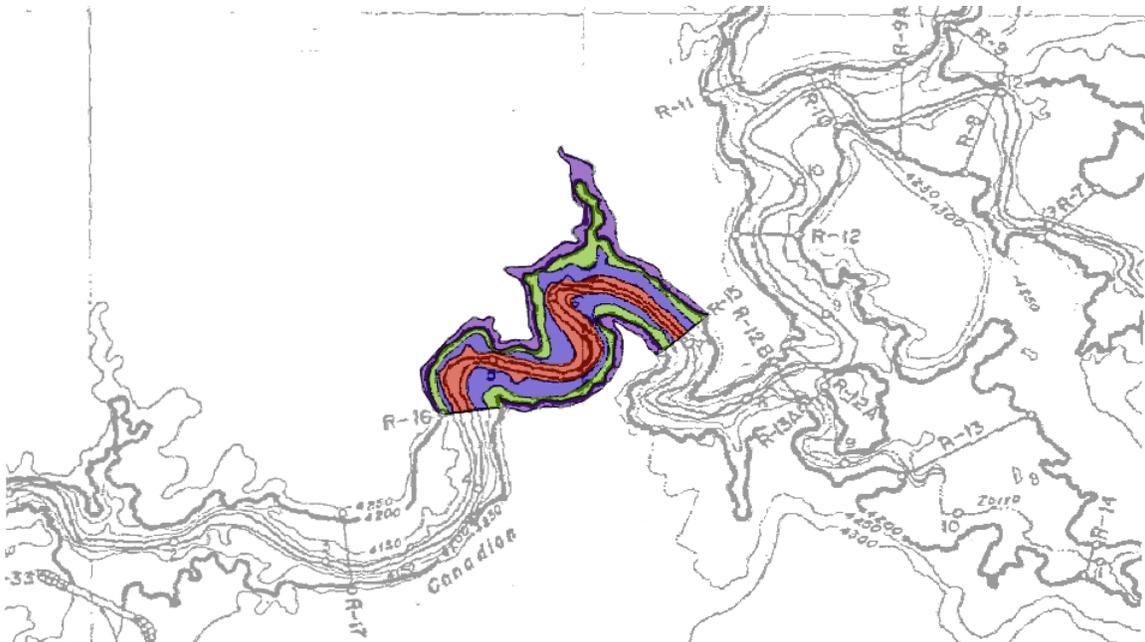
IMPACT/BENEFITS

Participating students have gained valuable knowledge and skills related to topography, bathymetry and software tools which will help them in future coursework and potential natural resource careers. Ms. Gurtler has developed an environmental science course module that she can use with future students and as a model for incorporating fieldwork and problem-based learning into other courses. The results of this project will help to inform future USACE work at Conchas Dam, including modeling the effects of severe drought and flash floods on future sedimentation.

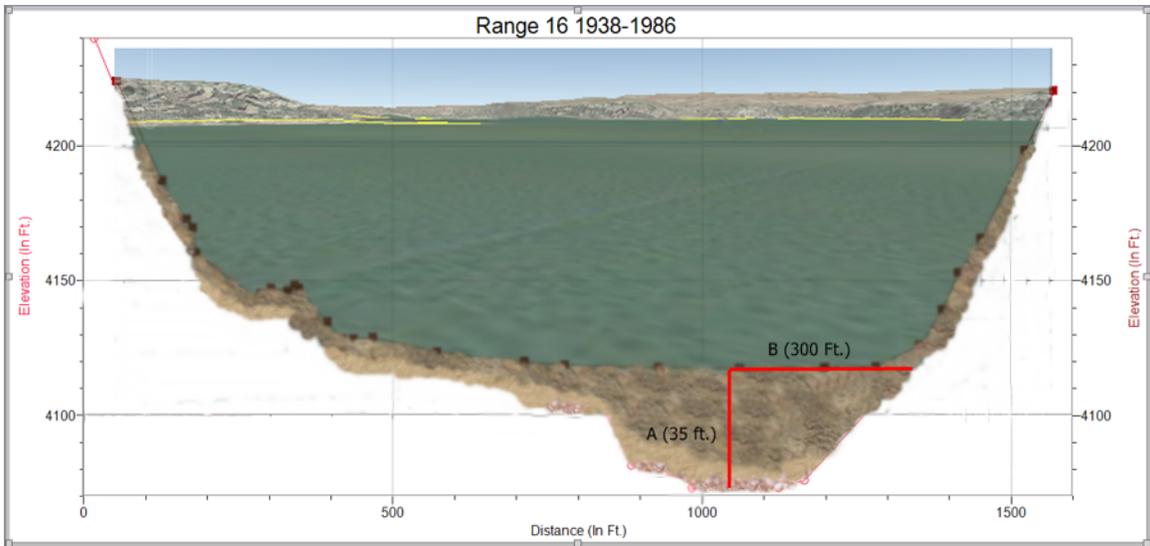
EXPLANATION

In addition to providing Ms. Gurtler's students a hands-on experience with the real-life problem of reservoir sedimentation, this project will have an on-going impact on visitors to the Mesalands' Dinosaur Museum through an augmented reality sandbox, also developed through the support of WC-WAVE. The sandbox is powered by an X-box Kinect 3D camera and a Linux computer and was constructed by Ms. Gurtler and her students after an Undergraduate Visualization and Modeling Network (UVMN) training in Albuquerque, NM in June 2014. The sandbox is on display at the museum, where it is accessible to both museum visitors and Mesalands students to learn about catchment areas and watersheds as well as sedimentation at Conchas Reservoir.





Jose Maria Canyon, Conchas Reservoir in 1986. The red strip represents the sedimentation of the canyon since the opening of the dam in 1939.



Visualization of sedimentation in Conchas Reservoir, 1938-1986