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Fossils Collected This Summer Will Be Subject of Tests

Winthrop University

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Fossils Collected This Summer Will Be Subject of Tests

Quick Facts

- Boyer and two environmental science majors, Tim Swartz and Ty Robbins, took a 13-day trip in June to Utah and Nevada to collect rock samples on federal lands believed to have been the site of mass extinctions.
- The Winthrop study focuses on comparing the biological and chemical signs before, during and after the extinctions to better understand what caused them.



Faculty member Diana Boyer and two environmental science majors, Tim Swartz, left, and Ty Robbins, took a 13-day trip in June to Utah and Nevada.

ROCK HILL, SOUTH CAROLINA – Winthrop University Associate Professor [Diana Boyer](#) and her geology students hope to answer some questions about **ancient climate change** and **extinction** through tests run on fossils collected this summer out West.

Boyer and two environmental science majors, **Tim Swartz** and **Ty Robbins**, took a 13-day trip in June to Utah and Nevada to collect rock samples on federal lands believed to have been the site of mass extinctions. Along the way they also stopped at the **Great Basin National Park** in Nevada, **Dinosaur National Monument** in Colorado and the **Grand Canyon**.

Geologists have found evidence that there were a series of major and small extinction events about 375 million years ago during a period known as the **Late Devonian**. The extinctions resulted in a dramatic loss of life on a global scale and forever changed marine communities.

"This interval is very exciting to study because it is unclear what caused these extinctions. It could have been **climate change** or associated **low oxygen levels in the oceans**, and we are setting out to test those hypotheses," Boyer said.

This study focuses on comparing the **biological and chemical signs** before, during and after the extinctions to better understand what caused them. Almost all of North America during this period was under a shallow sea where fish and invertebrate shelled critters thrived, said Boyer.

She hopes that Winthrop's research can contribute to a shared body of knowledge, and potentially reveal that the ancient causes of the extinctions have parallels to **current changes** in modern oceans.

At Winthrop since 2016, Boyer conducts research on understanding ancient depositional conditions, in particular those associated with low oxygen conditions preserved in black shales. The June trip was the first geological trip for Boyer out West with students to look at Devonian rocks, though she has studied fossil communities in black shale deposits in New York and Ohio.

"With the number of samples we collected this summer, we can be busy for a few years," Boyer said.

Both students conducted independent studies with Boyer in the spring to prepare for their trip out West, and one is continuing research this fall examining the signal of carbon isotopes through the Hangenberg extinction event. Other research will focus on the types of animal life, preserved as body

and trace fossils, that survived the extinction events and the trace metal composition of the rocks to indicate bottom water oxygen conditions. The three hope to publish and report on their findings.

Boyer also runs an international field course, **Geology of the Bahamas**, with a 10-day field trip to the island of San Salvador, Bahamas.

Boyer's work has been funded through the National Science Foundation and Winthrop's research grants.

For more information, contact **Judy Longshaw**, news and media services manager, at longshawj@winthrop.edu or 803/984-0586.

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