

# **Detrital Zircon Dating of Sediments in the proposed Mesozoic Birdsboro Basin of the Central Atlantic U.S. margin (CAUSM)**

**Lynnette Eichenlaub<sup>1</sup>**

<sup>1</sup>West Virginia University, Sedimentology, Morgantown, WV USA  
laeichenlaub@mix.wvu.edu

## **ABSTRACT**

During the Triassic period, the Mid-Atlantic region of the United States experienced active rifting generated by an unknown source. Two competing hypotheses offer an explanation of the cause(s) of rifting. One hypothesis states that rifting occurred from north to south, generating several discrete basins. The second hypothesis argues that even though rifting occurred from north to south, there was an upwelling of a mantle plume that yielded one extensive basin, termed the Birdsboro Basin. Since structural analyses are unable to validate either hypothesis due to deformation overprinting the early record of rifting, the sedimentary record will provide the key evidence for investigating this discrepancy.

The goal of this study is to use U-Pb dating of detrital zircon to conclude which hypothesis is correct. If the first hypothesis, suggesting several discrete basins is correct, then the basin-centered deposits will reflect detrital zircon provenance signatures from different sources. In contrast, if the rifting was generated by a mantle plume, creating one large basin (the Birdsboro Basin), then the basin-centered deposits will reflect integrated detrital zircon provenance signatures. Findings from this research can be used to gain a more thorough understanding of the processes that shaped the Mid-Atlantic region, and therefore their suitability as petroleum reservoirs. Samples will be strategically collected from the Catharpin, Emmitsburg, and Furnace Hill subbasins (Leesburg, VA, Gettysburg, and Lancaster, PA respectively), and will be analyzed using laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Preliminary findings from the Emmitsburg subbasin show zircon ages of 300-600 million years. Additional ages from the Catharpin and Furnace Hill samples will be compared to the Emmitsburg samples to detect any similarities or discrepancies in basin ages, and thereby prove which hypothesis is correct.