MICROBIAL ACTIVITY IN THE SERPENTINIZING SUBSURFACE OF ATLANTIS MASSIF: INITIAL RESULTS FROM IODP EXPEDITION 357. Beth N. Orcutt[1], Timothy D'Angelo[1], Jessica Labonté[1,2], Jacqueline Goordial[1], Markus Bergenthal[3], Tim Freudenthal[3], Dave Smith[4], Marvin Lilley[5], Gretchen Fruh-Green[6], and the IODP Expedition 357 Science Party, [1]Bigelow Laboratory for Ocean Sciences (borcutt@bigelow.org), [2]Texas A&M University-Galveston, [3]University of Bremen, [4]British Geological Survey, [5]University of Washington, [6]ETH Zürich

Introduction: IODP Expedition 357 utilized seabed rock drills for the first time in the history of the ocean drilling program, with the aim of collecting intact core of shallow mantle sequences from the Atlantis Massif to examine serpentinization processes and the deep biosphere. This new drilling approach required the development of a new system for delivering synthetic tracers during drilling to assess for possible sample contamination. Here, we describe this new tracer delivery system, assess the performance of the system during the expedition, provide an overview of the quality of the core samples collected for deep biosphere investigations based on tracer concentrations, and make recommendations for future applications of the system. We will also present initial results of extracellular enzyme activity in incubations of subseafloor rocks from Atlantis Massif, and describe new single cell approaches for examining activity in subseafloor rocks.