BACTERIAL DIVERSITY AT AN ACID MINE DRAINAGE SITE IN MAINE. J. Gaynor[1], T. Sawyer[1], F.E. Riley[1], K.D. Moulton[1], L.J. Rothschild[2], and S. M. Duboise[1]. [1]University of Southern Maine, 96 Falmouth Street, Portland, ME 04104-9300, (jefferson.gaynor@maine.edu); [2]NASA Ames Research Center, Moffet Field, CA 94035-1000.

Iron and sulfur rich terrestrial environments can be regarded as potentially informative analogues in the search for evidence of life on Mars. One such site is Katahdin Iron Works (KIW) near Brownville Junction, Maine, a historic mining site that was last actively mined in the nineteenth century. Iron rich deposits remain exposed at the surface and drainage from the site is typically at a pH range of 2.0-2.5. Initial studies of microbial diversity have been performed by both culture-dependent and culture-independent methods. Here we report our initial culture-independent survey of bacterial diversity determined by polymerase chain reaction denaturing gradient gel electrophoresis (PCR-DGGE). Water samples (pH 2.0-2.5) were aseptically collected from standing pools of runoff at the former KIW mining site. Following direct extraction of genomic DNA, the hypervariable V3 region of the 16S rRNA gene was amplified by PCR and the mixed population sample was resolved on denaturing gradient polyacrylamide gels. DNA bands observed were excised from the gel, reamplified, and sequenced. Resolution by DGGE yielded at least 12 distinct DNA bands representing the bacterial diversity in the acidic drainage from this metal-rich environment. V3 region rRNA gene sequence information from selected bands demonstrated the presence of *Leptospirillum ferrooxidans*, as well as potentially novel sequences related to *Acetobacteria, Acidobacteria, Acidiphilium*, and *Actinobacteria*. This analysis by PCR-DGGE is an integral component of a larger, polyphasic approach, which aims to characterize some of the adaptations of these organisms to their acidic metal-rich environment, and to further understanding of the microbial ecology of this Katahdin Iron Works acid mine drainage site. Study of microbial communities in this interesting metal rich environment may provide insights relevant to biological processes and evolution in other environments rich in iron and other metals.