Hadopelagic microbial communities are distinct from those above them. L. M. Peoples[1] and D. H. Bartlett[1], [1]Marine Biology Research Division, Scripps Institution of Oceanography, University of California San Diego, CA.

Deep-ocean trenches, with hydrostatic pressures of up to 110 MPa and temperatures of 2°C, represent useful analogs for locations beyond Earth with liquid oceans. However, our understanding of trenches has been limited due to their relative inaccessibility. Here, we describe the pelagic microbial communities within the Mariana and Kermadec Trenches using high throughput 16S rRNA gene sequencing and culturing under *in situ* conditions. Our analysis shows that hadal zones, sites deeper than 6000m, are distinct from the abyssal zones above them. Estimates of microbial activity suggest these communities are increasingly adapted to hydrostatic pressure with increasing depth. Hadal communities are enriched in microbes likely adapted to high pressures, such as the Marinimicrobia, *Aquibacter*, *Colwellia*, and *Shewanella*. These microbes are most similar to those from other trenches, suggesting deep-ocean piezophiles are not limited in their distribution. Hadal communities are also enriched in heterotrophic Gammaproteobacteria, which we hypothesize are inactive and have sunk from shallower depths thanks to topographic funneling. Trenches are therefore home to distinct communities thanks to a mixture of deep-ocean adapted microbes and an abundant, potentially inactive population. Further understanding of these communities and their adaptations to one of the most extreme locations on Earth can help us predict other potential habitable locations and develop tools for detecting life there.