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R.P. Dziak[1], H. Matsumoto[2], R. W. Embley[1], S. G. Merle[2], T-K Lau[2], T. Baumberger[1], S. R. Hammond[3], N. Raineault[4]

[1]NOAA/Pacific Marine Environmental Laboratory, Hatfield Marine Science Center, Newport, OR 97386 U.S.A.

[2]Cooperative Institute for Marine Resource Studies, Oregon State University/NOAA, Hatfield Marine Science Center, Newport, OR 97365, U.S.A.

[3]Earth Resources Technology, Inc, Laurel, MD, 20707, U.S.A.

[4]Ocean Exploration Trust, 215 South Ferry Road, Narragansett, RI 02882. U.S.A.

Abstract

We present acoustic records of methane bubble streams recorded ~10 km southwest of Heceta Bank on the Oregon continental margin using an autonomous hydrophone. The hydrophone was deployed at 1228 m water depth via a Remotely Operated Vehicle (ROV) during the E/V *Nautilus* expedition (NA072) in June 2016. Bubble sound is produced by detachment of the gas bubble from the end of a tube or conduit which causes the bubble to oscillate, producing a sound signal. Despite persistent ship propeller and ROV noise, the acoustic signature of the bubble-plume can be seen in the hydrophone record as a broadband (1.0 – 45 kHz) series of short duration (~0.2-0.5 msec) pulses that occur in clusters of dozens of pulses lasting 2-3 secs. The frequency of a bubble's oscillation is proportional to the bubble's radius; calculated estimates of bubble radii are consistent with bubble sizes observed in ROV still images. Acoustic signal loss models imply bubble sounds might be recorded over an area of seafloor from ~300 – 3.2 x10^4 m^2.

Keywords: Passive acoustics, methane seep, bubble streams, gas flux, E/V *Nautilus* Cruise ID NA072