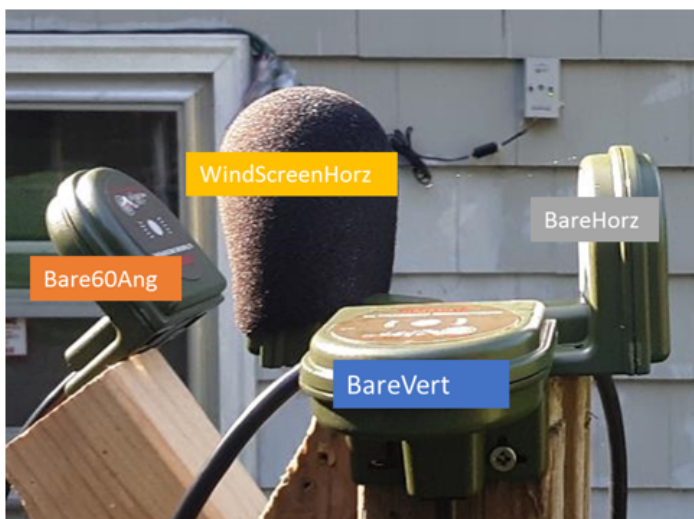


April 7th, 2020
SMM-U2 Mics

Recording Bats in Wet Conditions with the SMM-U2

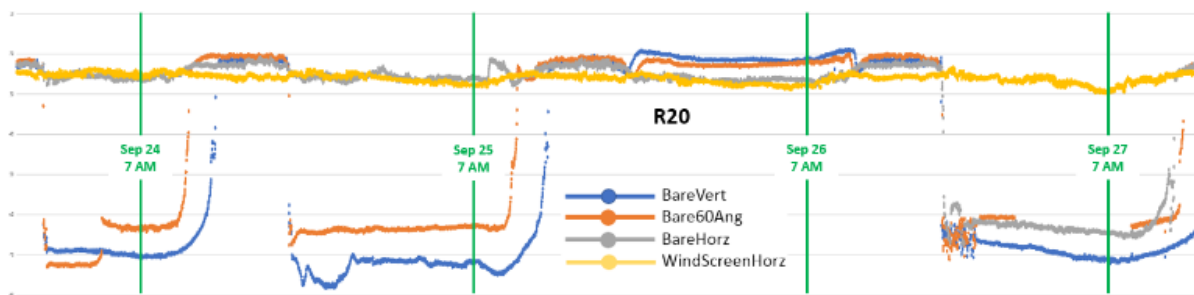
The weather protection in the SMM-U2 ultrasonic microphone is significantly improved over our older microphones and others on the market, meaning that it can withstand direct rain and even submersion in water without suffering permanent damage. However, like most other microphones, water can prevent effective recording by temporarily blocking the SMM-U2's mic element. The SMM-U2 is protected from debris and animals by a stainless steel mesh. If water gets into this mesh, ultrasound will be prevented from reaching the microphone until the water evaporates.



We found that orienting the SMM-U2 so the sensor is aimed horizontally, so that water cannot pool on top of the mic, will improve wet-weather recording when compared to orienting the SMM-U2 so the sensor is facing the sky. However, windblown rain or condensation can still cause water to collect in the mesh, resulting in attenuation.

To mitigate this further, we found that adding an acoustically transparent windscreen around the SMM-U2 can prevent water from building up on the mesh. Instead, water tends to stay within the pores of the foam and wick away toward the bottom of the windscreen due to gravity.

The image above shows several SMM-U2s in different orientations. A 40kHz signal was broadcast at these microphones and their sensitivity was measured through several rain events. The chart below shows the attenuation caused by water filling the mesh and blocking ultrasound. As you can see, the horizontally-oriented microphone with a windscreen never lost any significant sensitivity. The horizontally-oriented microphone without a windscreen was able to record for two out of three of the rain events shown. The microphones oriented straight up or at approximately 45 degrees to vertical both experienced significant signal loss during the rain events until evaporation occurred.



Our recommendation for recording bats in the rain is to stretch a 1” inner-diameter acoustically transparent foam windscreen over the SMM-U2, as shown in the image above, and to orient the SMM-U2 so the sensor is facing parallel to the ground. The WT600 Extra large windscreen is recommended and available on our [website store](#) under “Replacement Parts” for US \$10.

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