**51 similar to decompression sickness that can lead to injury or death (Bernaldo de Quirós et**

**52 al., 2019). For example, research on Blainville’s beaked whales *(Mesoplodon densirostris)* on**

*Tag data show beaked whales ascending slowly at a shallow angle in response to sonar. Also, Zc tag data show back-to-back dives at SCORE. Once stranded, is nitrogen from saturated blood released causing the pathology that is recorded. Not sure it matters since they die, but it may in regards to how you treat mitigation. Just saying…..*

**93 to be lower and more variable than at AUTEC (REF NEEDED), our methods needed to**

**4 explicitly account for differences in underlying beaked whale presence across the range. An**

*Not sure there is such a document. May be able to compare Fleet reports for AUTEC and PMRF. Maybe: “as illustrated in the annual U.S. Navy Fleet monitoring reports (https://www.navymarinespeciesmonitoring.us/).”*

**122 The data were then aggregated to indicate the presence or absence of the start of a GVP for**

**123 each hydrophone within each half-hour period.**

*Might* *want to mention that this 30 min period was chosen to roughly match the GVP duration. Could reference the AUTEC Risk paper or my dissertation.*

**143 sonar (3.5 kHz). A nominal source level of 235 dB re. 1 *μ* Pa @ 1 m was assumed. The**

*Might want to add a reference such as : “U.S. Fleet Forces Command, 2008. Atlantic Fleet active sonar training environmental impact statement/ overseas environmental impact statement. United States Department of the Navy, Norfolk, VA.”*

**This distance was based on the maximum**

**184 detection distance of individual Blainville’s beaked whale clicks at a U.S. Naval range in the**

**185 Bahamas (Marques, Thomas, Ward, DiMarzio, and Tyack, 2009). Different combinations of**

**186 hydrophones were recorded during different SCCs, so separate tessellations were created for**

**187 each SCC.**

*Might want to acknowledge that we recognize this is a rough approximation given the different hydrophone sensitivities, range geometries and bathymetry etc.*

**216 vessels were present on the range during this period and other noise sources, including**

**217 torpedoes and submarines, may have been present.**

*Range tracking pingers at a frequency of roughly 13 kHz are likely the most prevalent loud sound source during these operations. These pingers are routinely used on the range for tracking of undersea vehicles. (Moretti D.J., 2019. Estimating the Effect of Mid-Frequency Active Sonar on the Population Health of Blainville’s Beaked Whales (Mesoplodon densirotris) in the Tongue of the Ocean, (PhD Dissertation). University of St. Andrews.)*

**Initially, we tried to use low-frequency noise**

**220 levels in the 10-999 Hz range measured on range hydrophones as a covariate in this model,**

**221 but found that the measured noise levels were not consistent with known locations of naval**

**222 training activities.**

*Not sure what the point of this is since it wasn’t used and I am not sure why it would be relevant unless it was being used as a proxy for the presence of ships. Remember, on Navy range, there are still likely other noise sources present well within the Md hearing BW even if no sonar is present. Also, even if they are not doing ship-based MFAS, there could be active sonobuoys, though I assume the sonar detector would detect these transmissions and the range tracks would show dipping helos and other such ops. Also, countermeasures might be used which are loud, broadband sources. They were ignored here and at AUTEC because they are messy.*

**Table 1: Number of hydrophones used and number of observations made (no. 30-min periods)**

**for each SCC before the exercise began, when naval activity was present, and when Naval**

**activity and MFAS were present**.

*Would it be worth adding columns with some normalized measure? GVPS per hour or probability of a GVP per hydrophone per 30 min period or some such? It is shown graphically in Figure 2 below I guess.*

**The**

**288 average probability of detecting a GVP was therefore 1%.**

*1% of what? Per 30 min?*

**293 Based on the observed data, the probability of detecting a GVP changed by -57% when**

**294 general naval training activity was present compared to when naval activity was absent, by**

**295 -47% when naval activity and MFAS were present compared to when only naval activity was**

**296 present, and by -77% when naval activity and MFAS were present compared to when neither**

**297 naval activity nor sonar were present (Fig. S2.2).**

*Remember operations but no sonar likely means tracking pingers if undersea vehicles were present. One thing that could be looked at in the future is ship noise, though in general the ships are not excessively loud by design.*

**Figure 4: Median (black line) and 95% CIs (gray shading) expected change in the probability of**

**detecting a group vocal period (vertical axis) with increasing MFAS received level (horizontal**

**axis) relative to when naval training activity but no MFAS is present on the range.**

*Assume CI blows up on low end for lack of low level MFAS data??*

348 fields for the spatial term is useful for cases where exact distance **data is** not available,

349 the use of continuous smoothers when true location **data is** not available

*Data are*

**369 training activities that did not include MFAS. Their baseline period consisted of 19 hours of**

**370 data before the onset of MFAS; as**

*The period before was extended in my dissertation*

**The reduction in detection of foraging dives could be a response**

**376 to general Naval training activity on the range, or to specific sound sources that have not**

**377 previously been studied.**

*Including such sources as acoustic countermeasures. (could reference the U.S. Fleet EIS listed above)*