**1. Brief text description (and images, if available) describing the dataset:**

The dataset contains data collected to evaluate variation in the performance of different types of carbon dioxide-baited traps used to collect blood-feeding arthropods (e.g., mosquitoes, ticks). An experimental flume apparatus was constructed in the NEON, Inc. shipping/receiving warehouse for use in data collection (photo attached). We measured the performance of all combinations of three trap types, two forms of dry ice, and three wind speeds by placing a trap in one of the flume and measuring the concentration of carbon dioxide released over a period of up to 24 hours. Additionally, we measured the performance of carbon dioxide traps baited with CO2 released from compressed gas cylinders, and compared these results to the measured performance of dry ice-baited trap types.

As indicated, the experimental flume apparatus was built in the NEON, Inc. shipping/receiving warehouse, and all data were collected at this location (latitude: 40.016511, longitude: -105.245762)

Data were collected during a period from February 27, 2012 through September 28, 2012. The date and time that each datum was collected is reported as the value for the variable “Timestamp” in each of the two data files associated with this study (files attached).

**2. NEON Protocol document that describes how the samples were collected:**

These data were collected as part of a methods development/refinement exercise. As such, there is no formal NEON document or protocol that describes how the data were collected. The most relevant NEON documents would be the TOS Protocol and Procedure: Mosquito Sampling (NEON.DOC.014049), the TOS Science Design for Mosquito Abundance, Diversity, and Phenology (NEON.DOC.000910), and the TOS Science Design for Vectors and Pathogens (NEON.DOC.000911). All methods of data collection and analysis will be described in forthcoming publication that can eventually be referenced as the source for this information.

**3. Summary of results:**

1. Trials involving wire basket traps (raw dry ice) had the shortest mean duration (7.03 hrs) followed by shipping envelope traps (12.69 hrs) and insulated cooler traps (all trails lasted the allotted 24 hours).
2. Trials involving wire basket traps (raw dry ice) had the highest mean maximum baiting intensity (3379.43ppm) followed by shipping envelope traps (1209.16ppm) and insulated cooler traps (507.59ppm).
3. Among trials involving traps baited with dry ice, those using dry ice in block form tended to have a longer duration and lower maximum baiting intensity, although this effect varied in magnitude among trap types (greatest for wire basket traps, lowest for insulated cooler traps).
4. Among trials involving traps baiting with dry ice, there tended to be a negative relationship between sampling duration and wind speed, although this this effect varied in magnitude among trap types (greatest for wire basket traps, lowest for insulated cooler traps).
5. Among trials involving traps baited with dry ice, there was a non-linear relationship between mean maximum baiting intensity and wind speed. On average, the highest mean maximum baiting intensity was observed at intermediate wind speed, with intermediate values at low wind speed and the lowest values at high wind speed.
6. Among trials involving traps baited with dry ice, the change in carbon dioxide release rates during trials exhibited an exponential signature for all three trap types tested, but the signature was most pronounced (more exponential) for wire basket traps, intermediate for shipping envelope traps, and least pronounced (least exponential, most linear) for wire basket traps).
7. Trials involving traps baited with carbon dioxide released from compressed gas cylinders (“five pounders”) had an average sampling duration of 24.40 hrs and a mean maximum baiting intensity of 180.38ppm. The was no effect of wind speed on sampling duration, and the effect of wind speed on mean maximum baiting intensity was linear, with highest mean maximum baiting intensity observed at low wind speed and lowest mean maximum baiting intensity observed at high wind speed.
8. Based on these results, the performance of traps baited with compressed gas carbon dioxide was most similar to that of dry ice-baited traps involving insulated coolers. We found that a single 24-hour deployment of the former would cost roughly 5 times as much as sampling using the latter ($17.56 versus $3.58)

**4. Summary of recommendations:**

Among the three dry-ice baited trap types tested, traps involving insulated coolers are recommended. These were the only traps capable of sampling for continuous 24-hour periods when baited with 1,400g of dry ice. They were associated with a relatively low but consistent level of baiting intensity throughout the trials. This performance was matched and slightly exceeded by traps baited with carbon dioxide from compressed gas cylinders. Trials involving these traps lasted for roughly the same duration and were associated with slightly lower values of both mean maximum baiting intensity and variation in baiting intensity during trials. These minor improvements, however, do not outweigh the significant cost differential between dry ice and compressed gas carbon dioxide. Dry ice-baited insulated cooler traps clearly represent the best balance of performance and price. Further, insulated cooler traps exhibit little if any variation in performance related to dry ice form (pellet versus block) and wind speed, indicating that they are likely to provide greater standardization in the face of variation in environmental conditions and sampling supplies sometimes encountered in the field.