NOTES FOR ANALYSIS

1. Meaning of the first nine (index) fields:
   1. The PrimaryRecord field numbers the records, basically in chronological order
   2. DESIGN: Observer/Arena Type. See note 10. These are called “observer/arena” types because we made a best-possible effort to position each observer at an equivalent arena during all Runs. For example, Pedro was to be observing the arena immediately downstream from the odorant release point.
   3. DESIGN: Treatment. See note 8.
   4. Run is the number of the episode of data-gathering. There were 20 Runs. With three observers per Run, that means three records per Run.
   5. Study Date is the date.
   6. Site is the reef location in which the study took place. There were two Sites.
   7. Arena is a subpart of a Site. The arenas are shown in Figure 1, although the Arenas are called A, B, and C on the figure and are numbered 1, 2, and 3 here.
   8. Observer is the observer (Aaron, Dick, or Pedro).
   9. Treatment is the type of odorant solution released: seawater (control), DMSP solution, or betaine solution.
2. Missing values in the fish counts are coded 9999
3. When data for an observer could not be used (and therefore are missing), Observer/Arena Type is coded 999
4. For each fish species, there are 6 columns. To take an example, for the ocean surgeonfish, there are columns OcSurg 1, OcSurg 2, OcSurg 3, OcSurg 4, OcSurg 5, and OcSurg 6. These refer to the six temporally sequential observation periods. CRITICAL: During the first observation period (e.g., OcSurg 1), odorant release had *not* been started. Odorant release started immediately after the first observation period and then continued without interruption at a steady rate through periods 2, 3, 4, 5, and 6. Each observation period was 10 minutes long, with counts being made during 5 of those minutes.
5. The number recorded for each species in each observation period is the number of individuals observed. We tried hard to avoid counting a particular individual twice during a single observation period. However, there was no way we could avoid counting a particular individual repeatedly in successive observation periods (i.e., in a given observation period, then again in the next observation period, then again in the next, etc.). Within a species in a particular Record, lots of autocorrelation is to be expected among the observation periods, and therefore the results for two or more observation periods must not be summed.
6. After a lot of pondering, I decided (despite our earlier conversation) to combine the data on adults and juveniles in the species for which we gathered separate adult and juvenile numbers. There were only about 10 such species. If you decide you want the separate adult and juvenile numbers for those species, just say so. For all species except the Brown Chromis (discussed below), the numbers provided now are total numbers of individuals observed, regardless of whether individuals were adult or juvenile.
7. The design is coded in two columns: “DESIGN: Observer/Arena Type” and “DESIGN: Treatment”
8. ***Note on DESIGN: Treatment:*** Treatment = 1 means a control test in which simply seawater was released. Treatment = 2 means DMSP was released. Treatment = 3 means Betaine was released.
9. There are strong between-observer differences. Thus, analysis must be *within* observer (i.e., blocked on observer). Operationally, this means analysis must be *within* each DESIGN: Observer/Arena Type.
10. ***Notes on DESIGN: Observer/Arena Type and hypotheses:*** Type = 3 means Dick observing an arena not expected to receive odorant. The *a priori* hypothesis is that there are no differences among Treatments. Observer/Arena Type = 1 means Pedro observing the arena just downstream from the odorant release point, whereas Type = 2 means Aaron observing the 2nd arena downstream from the odorant release point. The *a priori* alternative hypothesis for Types 2 and 3 is that fish counts are *different* (which could mean higher or lower) for Treatment 2 than for Treatment 1, and/or are *different* for Treatment 3 than for Treatment 1.
11. It’s always conceivable that the two study Sites (Sites 1 and 2) were different. Right now I’ll be content to proceed on the assumption that we don’t need to distinguish them (after all, the design is blocked).
12. To make N as high as possible, I’ve included slightly unorthodox (but presumptively valid) numbers from three Runs, namely Runs 3, 19, and 20. Conceivably we should also run the statistics excluding those three Runs entirely.
13. The BrChrJu group (i.e., Brown Chromis juveniles) is fraught with challenges. We did not record them for the three Runs at the start. Also, these fish were often so incredibly numerous that counting them was impossible, meaning the three of us were doing subjective surveys using individualistic terminology (for example, one of us wrote “hundreds” or “thousands,” whereas another wrote “countless” at times). I have coded all the data numerically in a way that is not blatantly inconsistent. However, it will be crucial to block on observer. The numbers of one observer are not at all compatible with the numbers of the other observers.
14. In the single case of the Brown Chromis, I am reporting separate data for adults (BrChrAd) and juveniles (BrChrJu). The adult numbers are basically rigorous and objective. Adding the adult and juvenile numbers together would simply make everything subjective (see note 13). My recommendation is to do our principal analysis using all the other species (in which case, numbers are adults + juveniles) and the BrChrAd – omitting BrChrJu. Then we can do a separate analysis on the Brown Chromis alone, in which we can do what’s possible to include both adult and juvenile numbers.