**Benthic REA - diver vs. diver comparisons**

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Benthic REA inter-diver comparisons are based off of fish REA inter-diver comparisons. Currently, code is developed to conduct inter-diver comparisons for: 1) coral colony density (adults and juvs), 2) coral colony size (adults and juvs), 3) % old dead (adults), and 4) % recent dead (adults). The code developed for benthic REA inter-diver comparisons is based on comparisons between 2+ divers at a site (doing different segments on 1+ transects at a site). Divers are compared against each other when surveying the same site(s) over a several days or a given period. The assumption is that diver estimates should be fairly similar on same dive at a site (segments within a site don’t vary too much), and more importantly, that on average a diver’s estimates should be higher than their buddy about half the time and lower about half the time. For each boxplot comparison, we look at the median and spread of a diver’s counts relative to their buddy, with the aim that each diver’s estimates are centered on zero, and that they are not too widely spread. Note that there will inherently be outliers (black dots in boxplot) for each diver in each comparative plot. Red ‘jittered’ dots on each plot are the average estimate for each diver at a site.

The ultimate idea of these inter-diver comparative plots is to visualize differences in estimates between divers. The key point is not that you expect divers to be identical (they are certainly doing different areas), but (i) they should be higher than their buddy half the time and lower half the time; and (ii) - way less important - the differences between segments of a transect are smaller than between sites (it’s best to do diver comparisons within a site, not between sites). The comparisons aren’t meant to determine which individual or set of diver estimates are “right” or “wrong” but, rather, the comparisons can allow us to see trends or anomalies in a diver’s data. Based off anomalies you see in a diver’s data after running comparisons (after a few days of diving), its good practice to investigate that diver’s data to see if their estimates are off or if something is wrong with the data they are collecting. For example, Diver 1’s colony density estimates are consistently higher than their buddy(ies) (more than 50% of the time)…this could allude to Diver 1 seeing more colonies than there actually are. This can happen when it’s difficult to tell where a colony begins and ends and when large colonies are separated by bits of CCA , etc. (encrusting Montipora species comes to mind). These can be recorded as being several different colonies when they are actually the same colony. The idea is to catch these errors earlier rather than later in order to correct how divers’ collect data. It’s also good practice to switch up buddy pairs/trios during each leg of the cruise.