April 3, 2018

Response to questions from Rachel Silverstein regarding Precht et al. (2016) Scientific Reports manuscript.

1) In 20% of the corals (23/115), we see that specific corals are listed as being different species on different dates. Of course, we can go back to the photos and see which is the correct species ID, but it seems that sometimes this is a data entry error rather than a coral ID error. Can you possibly help us track down the correct entry for these dates/species?
We are attaching a list of all of these conflicts that we identified, described in more detail below:

For example: The R2SC1 transect 2 coral 1 is a Solenastrea (based on photos). However, on CW21, it's listed as Stephanocoenia, and on CW49 it's listed as a Diploria. We could, of course, just change the species ID back to Solenastrea, but we're not sure whether the species ID is the error or whether the site/transect/coral number is the source of the error -- and if the data are, in fact, referring to that Solenastrea or to another coral.

On other weeks, it seems that the entire transect is recorded in error. For example, on CW44, all of the 10 coral species listed for Site R2NC1-Transect 1 do not match the photos. Likely, in that case, the transect number was entered incorrectly, but we have no way to know which transect this should be and to which data the conditions code refers.

RESPONSE: For R2SC1 transect 2 coral 1 is a SBOU coral. For CW 21 the diver misidentified the coral in the field as SINT and it was entered as such and not caught during the original QA/QC. Photographs of the colony show that the data was taken on the correct SBOU colony. In CW 49 the diver in the field identified the coral correctly as SBOU and data was taken on the correct colony so in this case the inconsistency was a data entry error (likely the species name was copied down from R2SC1 T1 C10 that is a *Diploria [Pseudodiploria]*).

For CW 44 at R2NC1 T1, the condition data are correct but the species codes entered were those of transect 2 instead of transect 1. So the following species should have been entered for transect 1 (C1=PAST, C2=DSTO, C3=SSID, C4= MCAV, C5=PAST, C6=PAST, C7=SSID, C8=PAST, C9=PAST, C10=SSID). The rest of the data entered for R2NC1 appears to be correct.

As for the other inconsistencies you have noted where species ID's may have changed on specific dates we have included an excel table showing the 52 cases where inconsistencies are noted. While performing QA/QC checks of field ID's taken by different observers during the course of the project we noted the most common mistake was between small colonies of

SINT and SBOU. This was due to the fact that both of these species show large variation in corallite size and diameter, both usually have their polyps extended during the day, and both blush when touched. For this reason we developed a specific guide to assist in field ID of these species (see attached PDF).

FYI – For the Reef 2 tagged coral project controls there were 6,535 actual in-situ coral observations made during the course of the project. These in-situ observations were then matched with over 12,000 underwater photographs in the lab for verification. Thus, the accuracy rate of our in-water observations was 99.2%. Please note that these data on species composition do not affect the total colony bleaching or WPD prevalence data. Also, species-specific information by week was not used in the Scientific Reports paper.

2) Your paper states that on July 7, 2015, 22 out of 55 corals (40%) surveyed showed signs of white plague disease infection. However, we only find that 3 out of 55 corals were recorded as WP on that date. If we count all corals that had WP and those that died after having been recorded as WP (as Brooke notes in her email), we still only get 17 out of 55 corals (27%). Can you help us reconstruct how you calculated a 40% WP prevalence on that date?

RESPONSE: The attached excel file is a record of the 22 (out of 55) corals that were estimated as being affected by WP disease on the survey date 7/7/2015. The enumeration of WP affected corals included corals with active disease, those with previous WP activity that had subsequently died, and any corals that suffered complete mortality consistent with the WP epidemic. Due to the rapidity of the mortality caused by white-plague disease and the period between surveys, active disease was not always visible on tagged coral colonies (see figure below showing the rapidity of WPD related mortality).

Three (3) of the corals on 7/7/2015 had active WP with an additional 14 colonies that previously been noted with active white-plague that had subsequently died. The combined count of active WP and those previously noted with WP infection that had subsequently died was 17/55 colonies (31%). The remaining five (5) corals that were also included in the enumeration of WP disease were either confirmed through photographs to have died from

white-plague or their complete mortality was consistent with the WP disease epidemic. All corals that were included in the accounting of the effects of WP disease that were not directly observed with active disease were included if: 1) the coral was a WP susceptible species, 2) total colony mortality occurred during the WP disease epidemic timeframe, 3) WP was active and killing susceptible corals at the survey site, and 4) no other obvious signs or causes of mortality (i.e. competition, white band disease, black band, etc.) were noted.

Whole colony mortality due to factors other than white-plague was rare at the southern middle reef control sites. Three colonies of *A. cervicornis* died from white band disease at R2SC2. White-band and white-plague diseases were the only two sources of total colony mortality that had been noted by divers at either R2SC1 or R2SC2 in over a year and a half of monitoring, and since white-band disease only affects acroporid corals it was not the cause of mortality for the WP susceptible corals. The mortality of the three *A. cervicornis* corals from white-band disease was not included in our estimate of the effect of WP disease. Thus, the total number of corals estimated to be affected by WP on 7/7/2015 was 22 out of 55 corals (40%). BTW – 17 out of 55 corals is 31% - not 27% as you noted above in question #2.

The inclusion of recently dead corals in the enumeration of WP disease was modeled after the work of Miller and Williams (2007), where both corals with active disease and those that had recently died were used to quantify the total impact of white-plague disease in Navassa. From Miller and Williams (2007): "*(White Plague) disease state was scored as either 'active' disease signs, 'recent mortality', or unaffected. 'Active disease' designation was used for colonies with very bright white exposed skeleton with no (or very little) algal colonization and sharp corallite structure adjacent to live tissues. 'Recent mortality' included colonies with areas of skeleton having minimal to moderate colonization by algal turf but with intact corallite structure and including those colonies that had undergone complete recent mortality*."

We also stated the following in our in our Scientific Reports paper: "*Disease prevalence includes colonies with both active signs of white-plague disease and those that were identified as recently killed as a direct result of the disease. The strong coupling between disease prevalence and total coral mortality suggests that disease prevalence was a useful proxy of mortality.*"

3) Similarly, the paper then states, "Of the white-plague impacted species, the overall disease prevalence was 51% (35 of 69 corals surveyed)." However, we only find that 28 of the 69 disease-susceptible corals were ever noted as having WP (40.6%). Can you help us to figure out this disparity too?

RESPONSE: As noted above disease prevalence was calculated by counting colonies with both active signs of white-plague disease and those that were identified as recently killed as a

direct result of the disease. Because many of the corals died rapidly, we often did not see active disease between monitoring events. Thus, all corals that were included in the accounting of the effects of WP disease that were not directly observed with active disease were included if: 1) the coral was a WP susceptible species, 2) total colony mortality occurred during the WP disease epidemic timeframe, 3) WP was active and killing susceptible corals at the survey site, and 4) no other obvious signs or causes of mortality (i.e. competition, white band disease, black band, etc.) were noted. When you include these dead corals in the calculation there is no longer a disparity.

It was for these reasons that we only used Reef 2 control corals in our analysis for the Scientific Reports manuscript because of the potential confounding influences of the dredging project.

Four (4) attachments are included as attachments to this document:

1) **Prevalence data from 7/7/15 for Reef 2 tagged control corals**
2) **Pivot table of raw data from Reef 2 tagged control corals**
3) **ID discrepancy information with correct species**
4) **Coral species ID – SINT vs SBOU**

WFP, BG, and RF.