Biophysical/Socioeconomic:

-The first results page should have a box that displays red for decline (ex. abundance of the desired species is less than before the reserve was implemented), yellow for no change, and green for increase. There should be a legend underneath that describes the meaning of each color.

-The challenge of this is to code it so that it only turns green if there is a significant result (ex. positive DD value and p-value <0.05).

-Another issue is that the abundance may be significantly less than what it was before the reserve was established, but the population still may be healthy and this color coding may mislead managers into believing that the population is not healthy. The National Marine Sanctuaries program has colors for dark green (ex. very healthy abundance of a species), green, yellow, red, etc. They will then associate a sign with each of the colors (minus, plus, or nothing for no change) as compared to their baseline, which is data collected 5 years prior to each assessment of the sanctuary aka a shifting baseline (I think we should stick with a comparison of before and after reserve implementation). From what it sounds like, the exact thresholds for the indicators for each sanctuary are determined by local experts (so the actual values for what is considered good and bad differ between sanctuaries), but there is consensus on the language that describes the meaning of each color. I think we are good with just the green, yellow, red for increase, no change, and decrease so long as we put a disclaimer that states that for example, abundance may be declining but the population could still be healthy.

-For the in-depth results page, we should have a line graph of the time series of the biophysical indicator for the control and reserve area and then have a table with the DD estimate and associated p-value.

Covariates (Natural Disturbances):

-We should determine if there is a significant correlation between the time series of the covariates and the time series of the indicator (Ask Sean for the appropriate test). Ex. Is there a significant correlation between oxygen concentration and abundance? Correlations results should only be displayed on the in-depth results page.

-On the in-depth results page, we should have the correlation value and its associated p-value in a table. We should also include a line graph of the time series for the control and reserve area and a time series of the covariates in the same graph. We need to be sure there isn’t any spurious correlation, so we need to be able to compare the covariate time series with the indicator time series.

-On the in-depth results page (or a third page called “explanation of results”), there should be a table that describes the effect of each covariate on each indicator/what the results mean. Ex. If abundance of abalone is going down and there is a significant correlation between abalone abundance and oxygen concentration, then the decline may be due to a hypoxia event (and maybe some other things too).

Explanatory:

-On the in-depth results page (or a third page called “explanation of results”), there should be a section that goes through possible explanations for the results in addition to the covariates. We could have a table that describes how each governance indicator may affect the results. This will be especially useful if a covariate cannot be offered as an explanation (ex. no significant correlation between low abundance and hypoxia).

-Note, I worry about the misuse of the results by managers who may think that if they change a governance indicator, they will get the improvements they want. As JC suggested, we should identify ourselves (through example analysis) that each governance indicator has the effect we expect on the biophysical/socioeconomic indicators. This example analysis could be just a statement of overall trends we see (as they do for the National Marine Sanctuaries program). For example, do we find that reserves with X governance structure are more successful?

