Wetlands Method/Product Proposal

The end product for the Wetlands Project is an interactive dashboard that shows several different trends and visualizations of the water quality standards of the constructed wetland. Our partner wants an easy way to see trends in the data she has collected so that she can make future improvements and decisions on the state of the wetlands, and see how they can apply to a rural, small-scale community or domestic wastewater treatment system. Using a Shiny dashboard is the easiest way to communicate these trends in water quality because we can make separate tabs that show the different visualizations of comparison.

Our first and second tabs in the dashboard are for the overall comparisons of each variable of water quality separated into monthly measurements. We asked our partner which variables in the dataset were of significant importance for comparison and these variables are plotted on the x-axis of the graph. On the y-axis, the units for comparison are plotted, like the monthly average for turbidity. All of the significant variables are listed on the x-axis together, so you can see how the monthly averages compare across every variable. The other visualization in this tab is the individual monthly averages so you can see one variable at a time. The graphs are also separated into blue and green bars which show the comparison of Lagoon C data and Wetlands Basin 3 data. At the bottom of the tab, there are drop-down bars that allow the manipulation of time by month and year, and by variable.

The third tab in our dashboard will be for predictive models and statistical analysis. The first graph will be separated by Wetlands Basin 3 data and Lagoon C data to see how their predictive models compare. Each model will show all of the data in black points by month for the individual variable being shown, and red points will show the monthly averages for each

variable with a line connecting them. This shows the predictive line for each variable and how it compares to every other measurement. Also in this tab, we will put the statistical tests (ANOVA) for each variable. This means we will put each statistical test into a table separated by variable to show how significant each comparison is so that we can see if these comparisons are statistically significant.

The fourth tab in our dashboard will show the comparisons of each variable using boxplots to show variability. The measurements of each variable are on the y-axis and the months are on the x-axis. The plots are separated into Lagoon C and Wetlands Basin 3, and the boxplots show the variability for each month for each variable. This tab is more for our partner so that she can see how her measurements differ for each month and see if any extreme outliers would show her that a mistake was made in data collection or an abnormal fluctuation in the wetlands/lagoon conditions occurred. The dropdown bars at the bottom of the tab allow the manipulation of time by year, site location, and variable selection.

This format for the dashboard is the easiest way to show our comparisons of each variable by the statistical models and analysis needed. It will allow our partner to easily see how her measurements and data are important, and when she continues to update her dataset she will continue to produce easily visualized graphs.