Standard Operating Procedure: Creating appendix graphs in R

First you need to make sure that all of the data is exported from Access and saved in the folder T://Im/KELP/DOCS/Report20XX/Annual Report and Trip reports/Data Tables (It is handy to have this folder open for reference while you make the graphs) (see SOPs “Export data from access” and “Access queries” on how to do this if it is not already done)

* File labels:
  + Species list (**necessary in order to create any graphs**): KFM\_SpeciesName.txt
  + 1mQuadrats: KFM\_1mQuadrat\_Summary\_1982-20XX.txt
  + 5mQuadrats: KFM\_5mQuadrat\_Summary\_1996-20XX.txt
  + Band transects: KFM\_BandTransect\_Summary\_1982-20XX.txt
  + RPC: KFM\_RandomPointContact\_Summary\_1982-20XX.txt
  + Visual fish: KFM\_VisualFishTransect\_NormalizedDataForTransect\_1985-20XX.txt

\*Note: It is crucial that all report folders and all files are labeled EXACTLY the same way among years except for the year number\*

**\*Note: When finished working in R, do not save any changes when you exit the script.\***

1. Open RStudio
2. Click File>open file…
3. Navigate to: T:\Im\KELP\DOCS\R scripts
4. Open “Master code for all appendix graphs - Working”
   1. Note: always make graphs in the working document. If the code gets messed up you can make a copy of the Original Master code.
5. If this is your first time performing this task on this specific computer, you will need to install all of the appropriate packages
   1. Scroll down to line 16: #Install packages
   2. With your mouse, highlight all 5 packages (lines 17-22)
   3. press Ctrl+Enter to execute the code
6. Now you will need to set the working director to the folder that contains the exported data from the current year.
   1. Go to line 31: set the working directory
   2. Change the folder pathway to the current year: All you should need to do is change “Report2017” -> “Report2018” on line 32
7. Now navigate to the section of the graph you are trying to make for specific instruction on what to change in the code

**Making 1m Quadrat graphs**

1. Next you will need to change the variables of the code
   1. Go to line 35, folloing “dataTable <-“ Type in the file name that you will be using to make your graphs: e.g. “KFM\_1mQuadrat\_Summary\_1982-2017.txt” (file name must have quotation marks around it.)
   2. Change the “output prefix1” to the correct methodology on line 36 (the green text) to read “1mQuadrat”
   3. On line 37 change the current year to the year you are working on
2. You will need to specify where you want R to save the graphs
   1. On line 137: following the command “glue” change the R graph folder to the year you are working on, then change the methodology to the correct folder:
      1. Ex: glue(“2017 R graphs/RandomPointContact…”) => glue(“2018 R graphs/1mQuadrat…”)
3. Finally highlight lines 23-148 and press Ctrl+Enter
4. You should be able to see the Console at the bottom of the screen begin to make your graphs, which will now all be saved in the specified folder.

**Making 5m Quadrat graphs**

1. Next you will need to change the variables of the code
   1. Go to line 35, following “dataTable <-“ Type in the file name that you will be using to make your graphs: e.g. “KFM\_5mQuadrat\_Summary\_1996-2017.txt” (file name must have quotation marks around it.)
   2. Change the “output prefix1” to the correct methodology on line 36 (the green text) to read “5mQuadrat”
   3. On line 37 change the current year to the year you are working on
2. You will need to specify where you want R to save the graphs
   1. On line 137: following the command “glue” change the R graph folder to the year you are working on, then change the methodology to the correct folder:
      1. Ex: glue(“2017 R graphs/RandomPointContact…”) => glue(“2018 R graphs/5mQuadrat…”)
3. Finally highlight lines 23-148 and press Ctrl+Enter
4. You should be able to see the Console at the bottom of the screen begin to make your graphs, which will now all be saved in the specified folder.

**Making Band Transect graphs**

1. Next you will need to change the variables of the code
   1. Go to line 35, following “dataTable <-“ Type in the file name that you will be using to make your graphs: e.g. “KFM\_BandTransect\_Summary\_1982-2017.txt” (file name must have quotation marks around it.)
   2. Change the “output prefix1” to the correct methodology on line 36 (the green text) to read “BandTransect”
   3. On line 37 change the current year to the year you are working on
2. You will need to specify where you want R to save the graphs
   1. On line 137: following the command “glue” change the R graph folder to the year you are working on, then change the methodology to the correct folder:
      1. Ex: glue(“2017 R graphs/RandomPointContact…”) => glue(“2018 R graphs/BandTransect…”)
3. You will need to make two extra graphs for red abalone: one graph for just miracle mile, and one graph for all sites excluding miracle mile:
   * 1. Go to line 151: “subset data to just miracle mile and red abalone”
     2. Go to line 238 to change the folder pathway to the correct year
        1. glue(“2017 R graphs/BandTransect…”) -> glue(2018 R graphs/BandTransect…”)
     3. Go to line 252: “Just red abalone excluding MM”
     4. Go to line 345 and change the folder pathway to the correct year
4. Finally highlight lines 23-356 and press Ctrl+Enter
5. You should be able to see the Console at the bottom of the screen begin to make your graphs, which will now all be saved in the specified folder.
6. There will be one extra graph that will be created that will not be used in the annual report and can be deleted: “BandTransect\_9002\_Haliotis rufescens.jpg”

**Making Random Point Contact graphs**

1. Next you will need to change the variables of the code
   1. Go to line 35, following “dataTable <-“ Type in the file name that you will be using to make your graphs: e.g. “KFM\_RandomPointContact\_Summary\_1982-2017.txt” (file name must have quotation marks around it.)
   2. Change the “output prefix1” to the correct methodology on line 36 (the green text) to read “RandomPointContact”
   3. On line 37 change the current year to the year you are working on
2. You will need to specify where you want R to save the graphs
   1. On line 137: following the command “glue” change the R graph folder to the year you are working on, then change the methodology to the correct folder:
      1. Ex: glue(“2017 R graphs/BandTransect…”) => glue(“2018 R graphs/RandomPointContact…”)
3. You will have to change the label of the y axis to read percent cover. To do this go to line 101 (text should be green), delete the #, next add a # to the beginning of line 103 which should turn the text green. **Make sure to reverse this action when finished with RPC graphs (Delete the # on line 103 and add a # on line 101).**
4. You will also need to make two extra graphs for articulated and encrusting coralline algae:
   * 1. Go to line 447 and make sure that the RPC folder is specified to the correct year
     2. Got to line 547 and make sure that the RPC folder is specified to the correct year
5. Finally highlight lines 23-558 and press Ctrl+Enter
6. You should be able to see the Console at the bottom of the screen begin to make your graphs, which will now all be saved in the specified folder.
7. The RPC graphs will have an extra graph that will not be used in the annual report and can be deleted: “RandomPointContact\_3002\_Corallinales.jpg”

**Visual fish transect graphs**

1. Click File>open file…
2. Navigate to: T:\Im\KELP\DOCS\R scripts
3. Open “Manipulate fish data for appendix graphs.R”
4. If you have never installed the packages dplyr and psych, highlight lines 3 and 2 and press Ctrl+Enter. You only ever need to do this once for each computer.
5. Now you will need to set the working director to the folder that contains the exported fish transect (normalized) data from the current year.
   1. On line 12, change the folder pathway to the current year: All you should need to do is change “Report2017” -> “Report2018”
6. On line 13 change the year of the text in green so that R will read the correct file
7. On line 17 change the name of the file to the correct year
8. Highlight lines 5-17 and press Ctrl+Enter
9. Your new txt file will be saved alongside your other exported txt files from Access and is ready to be put into the “Master code for all appendix graphs” script.

*Note: the lines of code 20-25 allow you to take the average of the transects for each year, however, it was decided that this was not appropriate by Josh Sprague and he suggested just taking the data from the last survey date for each year (coded for in lines 9-17). Both sets of code were kept in case this decision is reversed.*

1. Now go to the “Master code for all appendix graphs.R” script, if you have already opened it, click on the tab at the top of the R consol
2. Next you will need to change the variables of the code
   1. Go to line 35, following “dataTable <-“ Type in the file name that you will be using to make your graphs: e.g. “KFM\_VisualFishTransect\_Summary\_1985-2017.txt” (file name must have quotation marks around it.) Note, this is the file you *just* created.
   2. Change the “output prefix1” to the correct methodology on line 36 (the green text) to read “VisualFishTransect”
   3. On line 37 change the current year to the year you are working on
3. You will have to change the label of the y axis. To do this go to line 102 (text should be green), delete the #, next add a # to the beginning of line 103 which should turn the text green. **Make sure to reverse this action when finished with the graphs.**
4. Next you will need to change a few of the variables in the code:
   1. In line 92: you should see: y = MeanDensity\_sqm, change this to read: y = Count\_A,
   2. In line 109: you should see: max(spp\_sub$MeanDensity\_sqm) change this to read: max(spp\_sub$Count\_A)
   3. **Make sure to reverse this action when finished with the graphs**
5. You will need to specify where you want R to save the graphs
   1. On line 137: following the command “glue” change the R graph folder to the year you are working on, then change the methodology to the correct folder:
      1. Ex: glue(“2017 R graphs/RandomPointContact”) => glue(“2018 R graphs/VisualFishTransect”)
6. Finally highlight lines 23-148 and press Ctrl+Enter
7. You should be able to see the Console at the bottom of the screen begin to make your graphs, which will now all be saved in the specified folder.