**7/20/17**

In Remy’s version of MyLake model

* Uncommented lines 143-241 in MyL-application.m
* Imported modelinputs\_v12.m into v12\_1 folder

Raoul suggested I take the working v1 model for the Vansjo example and modify it for Lake 227. So, I referred to the user manual for MyLake v1.2 and set up a folder on my desktop that mimics the MyLake\_public\_master repository in GitHub (KRS ELA Model). This includes a folder for v12 containing the MyLake script files, a folder containing the air\_sea toolbox, and a folder for the specific L227 application that contains init, input, and param files for L227. I have taken these from the IO folder in the ELA\_MyLake repository and have ensured that they match the Vansjo example (column headings, formatting, etc.). I duplicated the working code for running MyLake for Lake Vansjo and put it into the L227\_application folder as well. I replaced path names and files to match the corresponding files for the L227 model and commented out the “observed” data from Vansjo (including script within figures that calls out observed data). Once the model is up and running, I plan to add in observed data from L227. The reason I haven’t done this yet is because the observed data for Vansjo and L227 are not in the same format (i.e., I will need to either re-format L227 spreadsheets or amend script files to fit the L227 spreadsheets).

I got the model to run (!!!), but the outputs in the graphs will require comparisons to observed data. I will start on this next time.

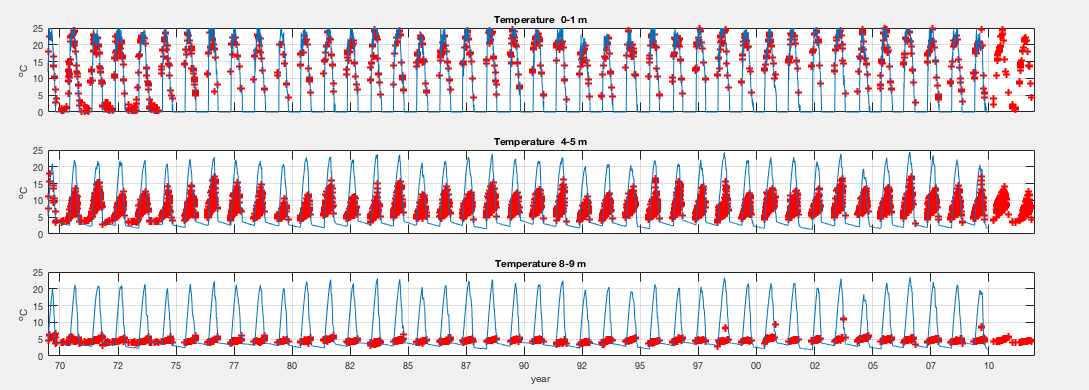
**7/22/17**

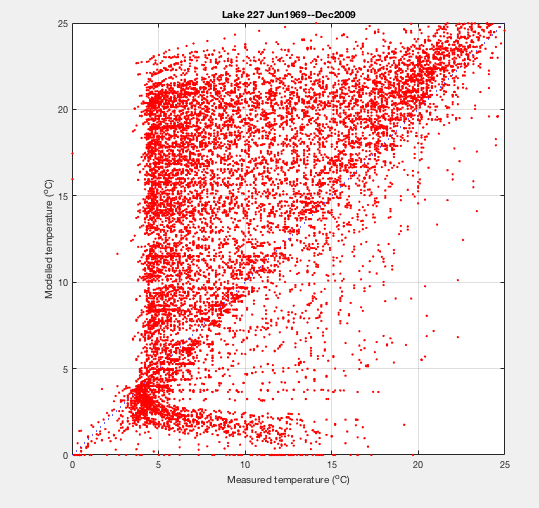
The first priorities for the model are to get the physical parameters correct: lake hydraulic residence time, temperature, ice cover, and wind. It will thus be key to get the input file correct, as this is the file from which the outputs are generated (along with the previous day’s outputs). I see that some of the variables written into the input matrix (e.g., inflow volume) are made by multiplying another variable (e.g., precip) by a scaling factor. This might be a good place to target changes to get the water level and temperature right.

Today, my goal is to generate observation matrices for physical parameters that can be compared to modeled outputs. I will start with temperature profiles.

I started by looking at the vansjotemp file, which has four columns: the first is a date column formatted as yyyymmdd, the second I think is time of day (the model doesn’t use this column), the third is the depth in the water column, and the fourth is temperature. I took the L227 temperature profile file from the historical data and made a new file in .xls and .txt called “L227temp” and put it into an Observations folder. I un-commented the lines of code that use observed temperature and updated the source file code. I also changed the code for figure 22 to display temperature at 4-5 m depth and 8-9 m depth rather than 10-11 and 30-31 m depth (Vansjo example comes from a deep lake). The model now runs, and I am able to compare modeled vs observed temperatures, visualized in figures 2, 3, 4, and 22. The model now runs between m\_start =[1969,6,27] and m\_stop=[2009,12,31]. It ran into an error (“undefined function or variable ‘z0’”) when I put m\_stop=2011,12,31].

By a visual comparison, the model predicts surface temperature pretty well, but has issues with the metalimnion and hypolimnion. Perhaps this has something to do with the parameters that control diffusion?





I’m not sure how I will model the water level or hydraulic residence time, as this is not listed as an output for the model. I know getting the water volume mass balance right will enable getting the nutrients right, so this is a question I will need to ask Raoul or Jason.

I noticed that the input file for the L227 does not contain any chemistry/biology for the inflows (passive and sedimenting tracer, total P, dissolved organic P, chl a). This will need to be taken from the Lake 239 inflow data (NW and NE inflows, perhaps averaged) and written into the matrix for the inputs (using the ImportInputs script in the Input\_generator folder from Remy and written to the IO folder). This may be tricky, since the rest of the inputs are taken from the climate dataset, which provides daily measurements of each variable. Scaling the inputs based on when they were measured will require some interpolating across the dataset (transferring weekly or biweekly measurements into daily estimates). This can wait for now.