MJM to DNH; 9th March:

1.           I just don’t understand where the **.sch** files come into play – see highlight below – since neither the Perl script, **run\_mksitesoil.pl**, nor the C program,**mksitesoil.exe**, refer to any **.sch** files, so I don’t know what to do with them. If you could describe to me exactly what data to extract from the **.sch** files and put where or do I need to create new **.sch** files? that’d be really useful.  
  
The script you have been looking at, **run\_mksitesoil.pl**, is used to create some of the input files that the DayCent model needs.  However, it does not run the DayCent model.  You’ll have to create a separate script to run DayCent and save the output you want to look at.  (I can give you some example scripts later).  Each DayCent run requires a schedule file as one of the input files.  I have provided the ones needed for the spinup (equilibrium simulations) so you won’t have to create those or extract any information from them.     
  
These are the main steps to run DayCent for a large area:

1. Create the input files (create the weather files, obtain soils data, regrid the vegetation grid, create a new “run file”, and **run\_mksitesoil** to create the **soils.in** and **site.100** files).
2. If you are going to simulate a land management change, you’ll need to create a new set of schedule files that describes the new land management.
3. Run DayCent spinup runs and save the **.lis** variables you need to evaluate the soil carbon and NPP results intermediate model output.
4. Run DayCent for the land management change by extending form the spinup runs. Save the output files and variables you will need for the analysis.
5. Reformat the DayCent output to analyses map the results
6. This is an iterative process.  If the output doesn’t look good then you might need to adjust some of the parameters and/or the schedule files are rerun DayCent.

2.           Just to make it clear that I have no problem pulling data out of the HWSD for a given latitude/longitude as I am fully conversant with the HWSD and have a Python module specifically to interrogate it. I just need to know where to put it (the data).  
  
That’s great! You’ll need to extract the data required by **mksitesoil** and put the soil properties into a **.csv** file, one line for each grid cell. These are some of the columns you need in your “run file” for **mksitesoil**.  
   
c)       In relation to the file naming, my personal preference would be to create an ID which would indicate the latitude/longitude based on a 30 arc second grid size (same as HWSD), it would mean that the file name would relate to the actual latitudes and longitudes. I can elaborate on this. I am also interested in incorporating the country ID if you thought it useful.   
  
d)      It would be a step forward if you can come up with the re-gridded vegetation map as soon as practicable which I assume would be the 0.25 degree version of **daycent\_epa\_global\_ag\_extended2\_devel.csv**? Do you need any inputs from me for this?  
  
The file I provided (**cltveg.svf**) is the natural vegetation at 0.5 degree resolution.  It is in an ArcGIS asciigrid format and should import easily into ArcGIS.  Then you’ll have to create a finer 0.25 degree grid out of it, and then save the contents of that grid in a .csv file with a grid cell id, latitude, longitude, and vegtype, one row per grid cell. Then you’ll need to append the soil property information to this file to create your “run file”.  You’ll need this “run file” for **run\_mksitesoil** as well as to run DayCent.  I don’t know how to do all this myself because I don’t know ArcGIS, but I’ve asked GIS specialists do these kinds of tasks before.     
  
You should rename your run file to something other than **daycent\_epa\_global\_ag\_extended2\_devel.csv**. Maybe **daycent\_europe.csv**

DNH to MJM; 8th March:

Hi Mike

After reading through and talking with Melannie at CSU, here comes a compilation which I hope is helpful.

Some things get easier, e.g. the weather files.

There is a problem with the weather files.  DayCent only requires the max and min temperature and precipitation.  So the weather files should have a total of 7 columns. Columns 5-7 should be maximum temperature (C), minimum temperature (C) and precipitation (cm).  In the files I looked at all three columns had the same values – where did that data come from, there must be something wrong?  This messed up the weather statistics calculations in the newly generated **site.100** files.  In the new **site.100** files I saw some negative values for PRECIP, and the TMN2M values equaled the TMX2M values.

When you fix the weather files, I'd leave off the last five -99.9.  Just make weather files with those first 7 columns.  Also, I saw many days that have all zeros for maximum temperature (C), minimum temperature (C) and precipitation (cm) – again, I am not sure where the data comes from.  DayCent will error for multiple reasons if these values are all 0.0.  So if we do not have data beyond the last year with values other than 0, we will have to stop there. When you do have missing daily weather, indicate that with ‑999.0.  **Mksitesoil** (or in our case your script) will skip those days when computing weather statistics.

Here some direct feedback from Melannie:

“I think Mike is using the wrong base site.100 files to generate then new site.100  files.  The files you should use were in this folder that I sent to you:

**GLOBAL\_SPINUP\_SITE100\_FILES**

they are named **pnh\_lu2.sch** ... **pnh\_lu35.sch**.  So when the native vegetation is type "2" start with **pnh\_lu2.100**, when the native vegetation is type "13" start with **pnh\_lu13.100**, etc.  Don't use those files with names that look like this: **lu4\_s2.100**. I didn't realize those got sent in the package of files that I sent to you.  You'll need to get sand, silt, and clay from the other soil data that you have (HWSD in our case).  Do not pull and, silt, clay out of a **site.100** file and use that to create **soils.in** files, it will be wrong.

Here is some information about HWSD data:

You can create columns for sand, silt, clay, bulk density, pH, soil\_depth in your run file so that each grid cell. You can use the HWSD values.

I imagine that you would create a run file with the following columns, and use that information to provide **mksitesoil.exe** with the information that it needs:

gridcell\_ID, latitude, longitude, veg\_type, sand, silt, clay, bulkden, pH, soil\_depth

You'd use soil depth to compute the number of soil layers that **mksitesoil** needs as an input.

You might possibly need other columns depending how you want to name your weather files, **soils.in** files, and **site.100** files.  I just used the **gridcell\_id** to name my files.  You might also want a country code or country name for added information about where the cell is located.

You' ll need to associate a native vegetation type with each grid cell you want to simulate.  That is why you need a regridded vegetation map.  You'll need the native vegetation type not only to create **site.100** files, but also to select the correct schedule file for the spinup run from GLOBAL\_SPINUP\_SCH\_FILES.  ”

So, does this make it clearer for you Mike? I for one have the feeling we are making progress. If you can fix the scripts, extract the HWSD data needed and send me everything I will take care of the regridding and after that is done I should be able to create all my files myself and run them.

If you want to talk again at some point, let me know please. Also if you do not have time to work on it anymore because then I would need all the data and GUI and would need to try to fix it myself.

Thank you J

Kind regards

Dagmar

The program **mksitesoil.exe** is a utility to create soils.in files and update the weather statistics and other values in a **<site>.100** file.

To run it, you must have a weather file and **<site>.100** file that begin with the same name. You must also create an input file, let’s call it ***site\_soil.txt*** that has the following nine values.

|  |  |
| --- | --- |
| name | the name of the <site>.100 and weather file, without the extension, one name for both files. |
| latitude | decimal degrees |
| longitude | decimal degrees |
| sand | sand fraction (0.0 - 1.0) |
| silt | silt fraction (0.0 - 1.0) |
| clay | clay fraction (0.0 - 1.0). Note: sand + silt + clay = 1.0 |
| bulk density | g cm-3 |
| soil pH |  |
| nlayer | number of CENTURY layers (see the ADEP(\*) values at the top of fix.100). The CENTURY layers will be split into finer DayCent layers. The maximum value of nlayer is 9. |

To run, type the following command in a DOS cmd window

**mksitesoil.exe site\_soil.txt**

Here is an example of what the file looks like. In this case, **mksitesoil.exe** would expect to find site file ***mysite.100*** and weather file ***mysite.wth***. It reads ***mysite.*wth** and updates ***mysite.100***. The site is located at 40.02N 78.47W. The sand, silt, and clay fractions are 0.20, 0.65, and 0.15 (they need to add to 1.0). The bulk density is 1.33 g cm-3, pH is 5.90, and the program will generate a file that goes as deep as ADEP(9) in **fix.100**.

mysite 40.02 -78.47 0.20 0.65 0.15 1.33 5.90 9