Quick-start Guide to the GeoWRSI v3.8

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Introduction

The GeoWRSI is a Windows application that runs crop-specific water balance models using climatic data, and produces a range of outputs that can either be used to help assess and monitor crop conditions during the crop growing season, or to conduct historical analysis of the impact of seasonal rainfall deficits on crop performance, for a series of years, and for a variety of crops

Step 1: Selecting a region for the first time

The first time you run the GeoWRSI, you are prompted to select the region you are going to be working with.
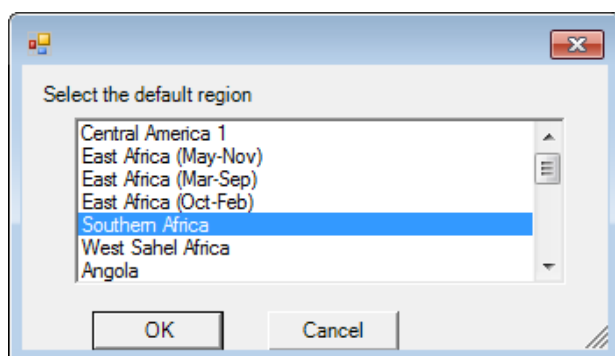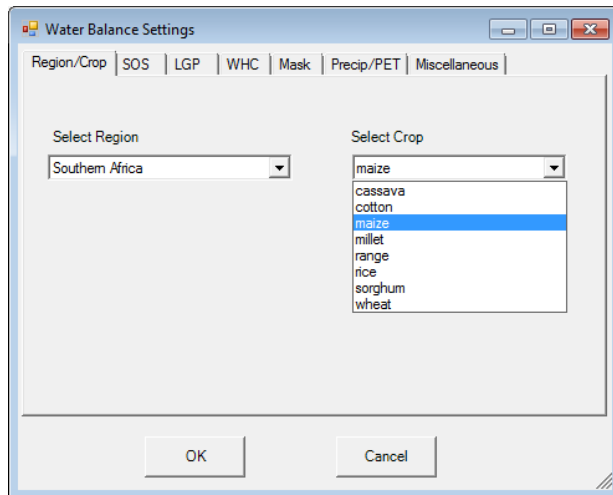

Select the region. If the region you wish to use is not available, you can create it in an advanced procedure (see appendix B).

You will get a message that the default crop was set to maize. You can change the crop and the region later by clicking on the Setup "Spanner" tool on the toolbar (see appendix A).


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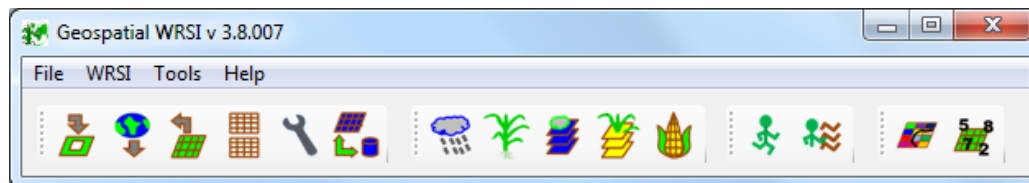
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Step 2: Importing the historical data archives

The next step is to import rainfall and evaptranspiration archives into the GeoWRSI. GeoWRSI can read GeoCLIM datasets, so if you have already installed and set up dekadal rainfall and evapotranspiration datasets in GeoCLIM, you can skip this step.

To import climate archives, use the import button on the toolbar.
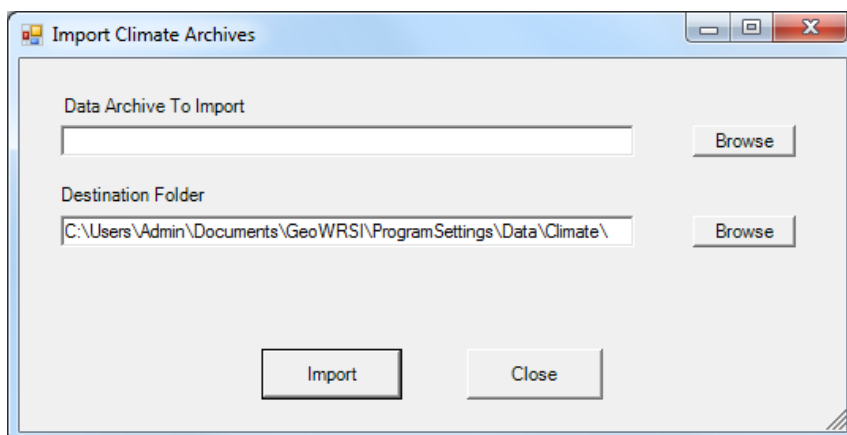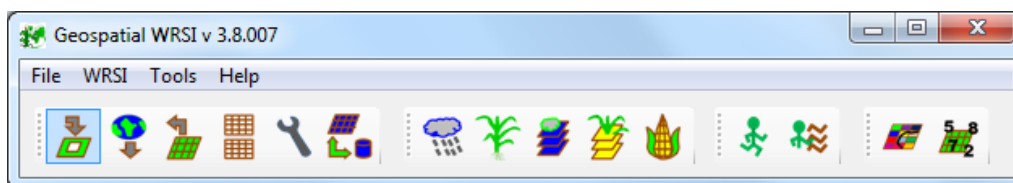
Start by importing dekadal rainfall. Under the *Data Archive To Import* section, click on the browse button, and select the *.climdata archive to import. dekadal precip archives, which should be in the GeoWRSI_Training Folder, under the path:

\GeoWRSI_Training\Installation\Archives

The filenames of the archives to be imported will be in the format:

*.climdata

While the data is importing, you will see a "GeoWRSI Processing Console" screen showing you the progress of the operation. When the importing is finished, a message, "Done", will be displayed at the bottom of the Processing Console, and the *Cancel* button will change to a *Close* button.
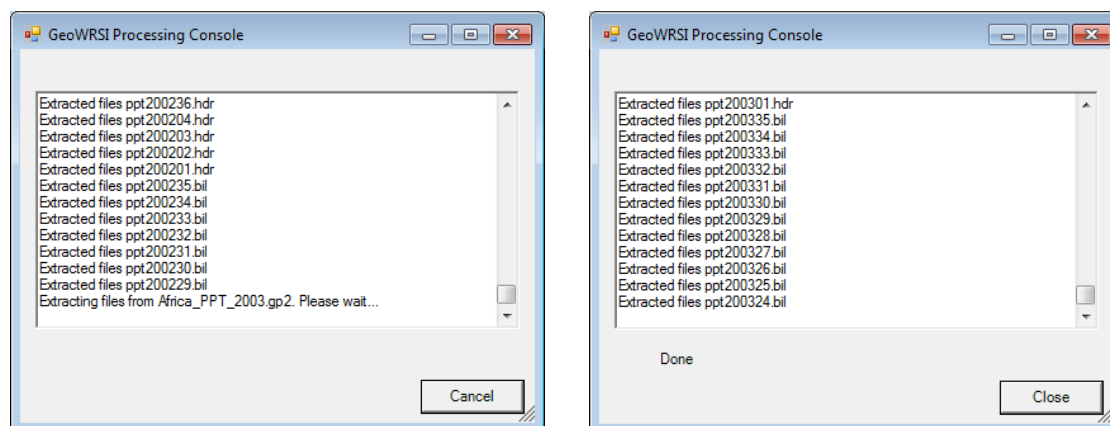

Next, import the PET (evapotranspiration) using the same technique

If the files are not found in the folders above you can download the archived data from ftp://chg-ftpout.geog.ucsb.edu/pub/org/chg/products/geowrsi/archives/.

Step 3: Viewing Data Available in the GeoWRSI

After importing the data archives, check the GeoWRSI database to see which datasets you now have. To do this, click on the *View Available Data* button on the toolbar.
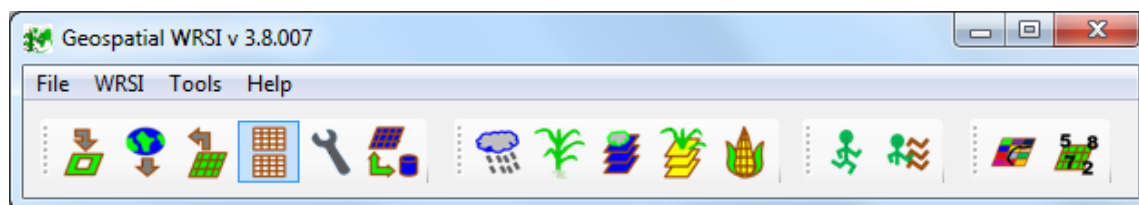

This will give you a table listing the dates for which data is available in the GeoWRSI, and whether the data covers your selected region or not. If you slide the slider all the way down to the bottom, you will

see the latest data that is available. If you want to see the evapotranspiration, click on the *Evapotranspiration* View Option in the top right corner, then click *View Data List*
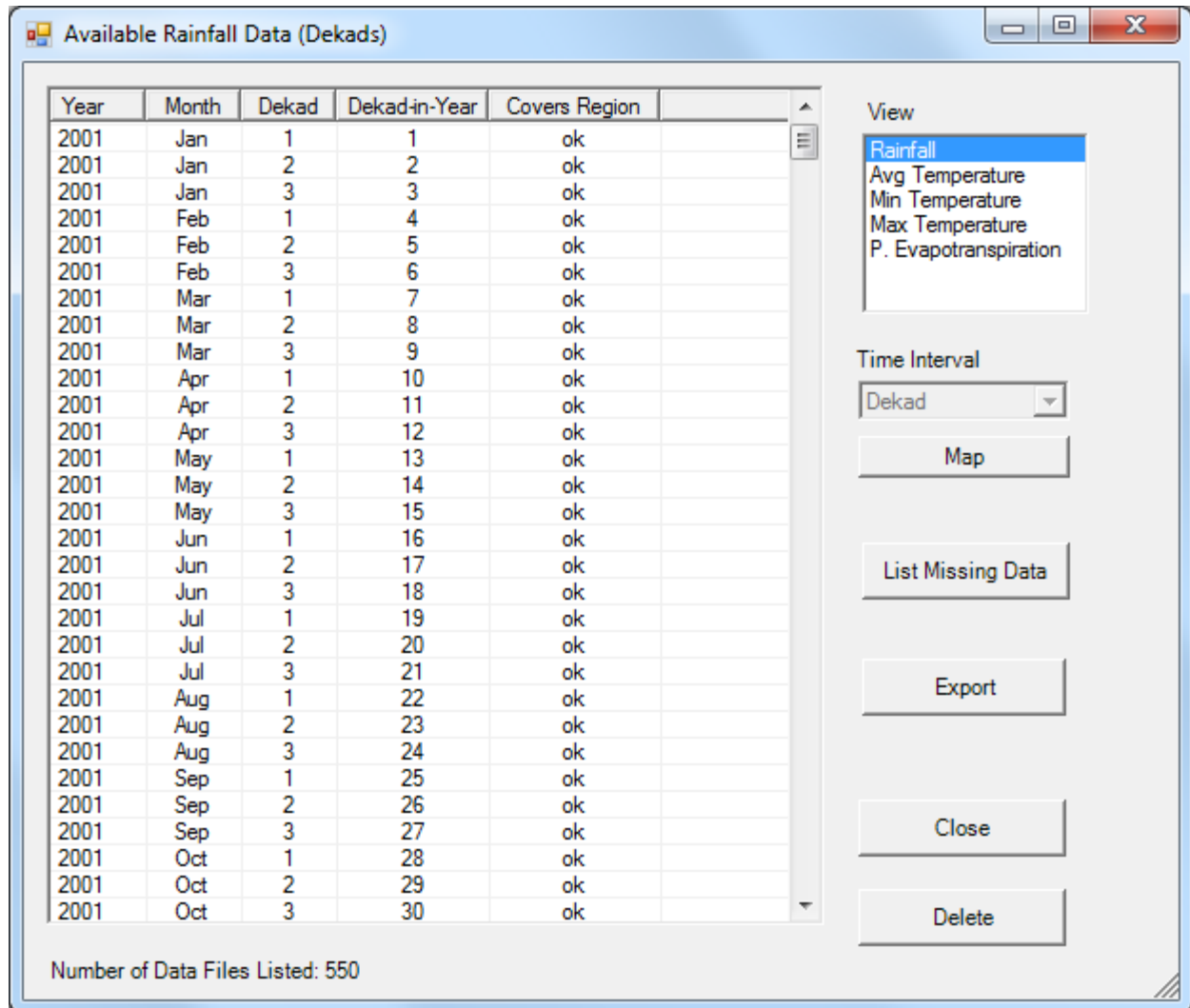

Step 4: Download the latest datasets

Once you know which data is available, you can download the latest data so that your GeoWRSI dataset will be up to date. Click on the Download button on the toolbar.
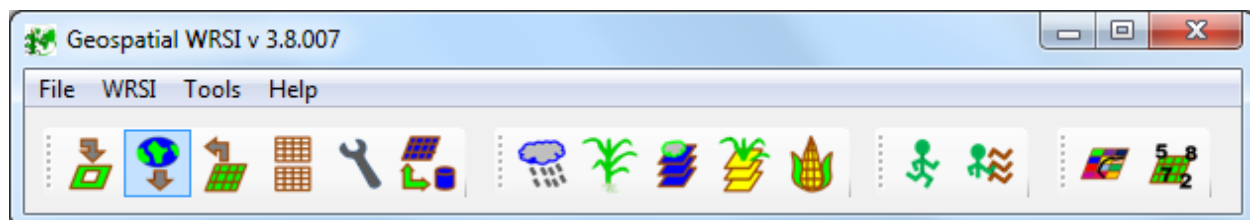
You will be presented with a dialog box which allows you to select the dates for which you want to download data. Select the data to be downloaded to cover the time period from the first dekad for which you don't have data to the latest available dekad (the previous-to-now dekad). In the example that we are working with from above, that would be all the data from dekad 1 of January 2016 to dekad 1 of April 2012. Depending on the dataset that is selected, some of the dates selected for download may not be available.
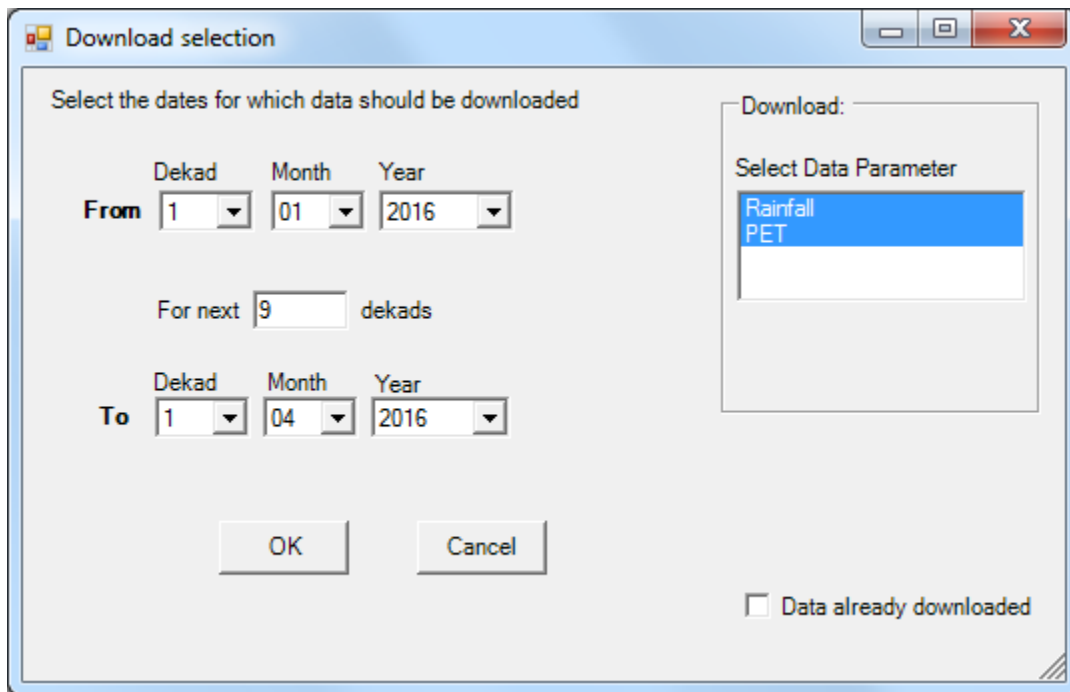

When you have selected your dekads to be downloaded, click OK to start downloading. When the download is complete, and there is a *Done* message on the processing console, press *Close*
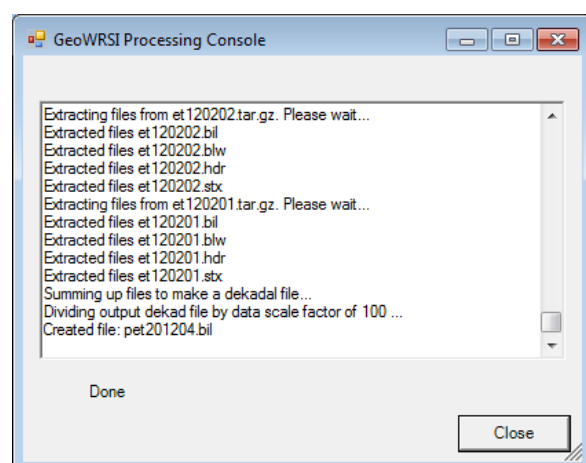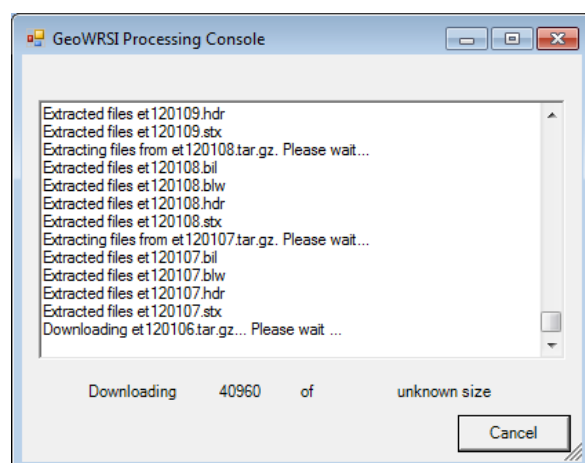
Step 5. Setting the outputs

Before running the WRSI model, you need to make sure that all the outputs are set properly. Once the outputs have been set, they will not be reset again unless they are changed manually or programmatically using the GeoWRSI scripts. To set the outputs, click on the *Water Balance Output Options* button.
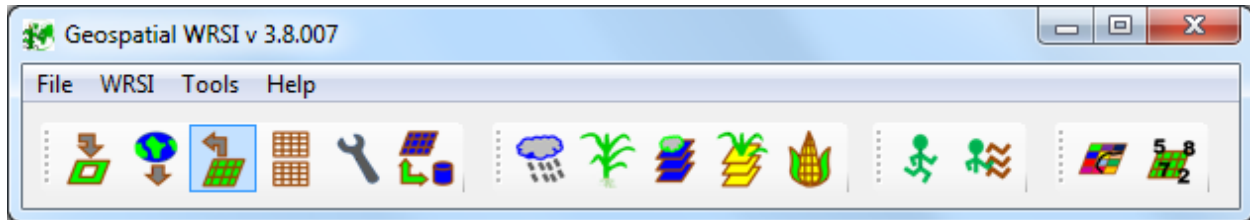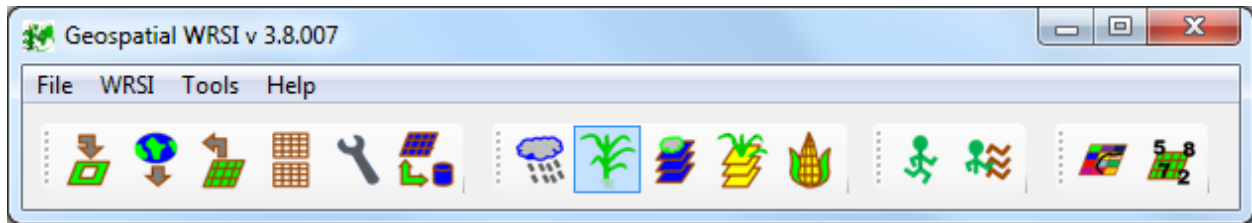

When you click this button, you will get a box that looks like this:
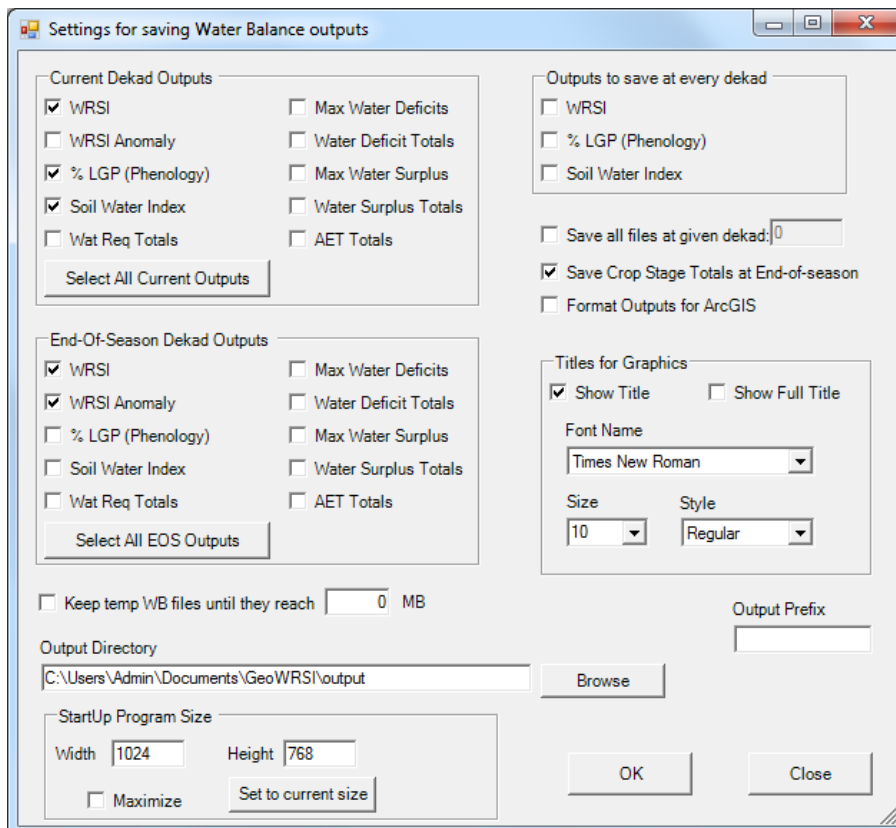
The portions of this box are self-explanatory. The first 2 sections are very important. The *Current Dekad* is the last current dekad for which data was available within the season being run. The End of Season Dekad Outputs is what the crop water satisfaction looks like, or may look like at the end of the season. The most important thing to be noted is the Output Directory. You can change this by clicking on the *Browse* button, for simplicity purposes, when saving the outputs, save each crop to its own output folder, this will make things easier when/if you need to change crops. When you have made any changes, click OK to save the changes.

Step 6: Running the WRSI water balance model

Once you have all the data available in the WRSI, the next step is to run the WRSI model. This can be done by clicking on the *Run WRSI* button on the tool bar.


Clicking on the Run WRSI tool will give you a dialog box in which you can select the season/year for which to run the WRSI. The year in this example indicates the year the WRSI run is supposed to start.

When you click on the button, you will get a dialog box which will allow you to choose the year for which the model starts running. So for example, it the modeler wants to run the WRSI for 2010/2011, he/she can click 2010, then click ok. The Water Balance model will start running. When it's running, you will see a progress bar.
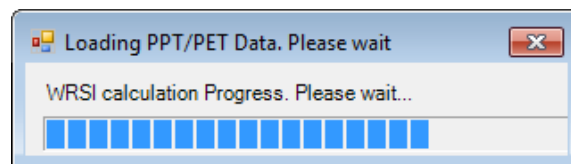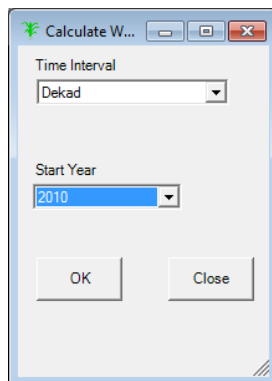
Step 7: Viewing the Outputs

When the model has finished running, you will see the WRSI Viewer pop up. All the outputs you specified will have been saved in the Output Directory. From the viewer, you can see the different outputs by clicking on them. You can also advance forward and backward in time by clicking on the forward and backward buttons. You can save specific data for specific dekads by clicking on the *Save* button while the specific data of interest are being displayed. When viewing the outputs, if you come across an error saying the WRSI Anomaly was not calculated because of a missing file for the crops WRSI medium, follow the directions in Appedix A: Changing a crop in GeoWRSI to remedy this situation. You may not necessarily want to change the crop but you will still need to calculate the median value.
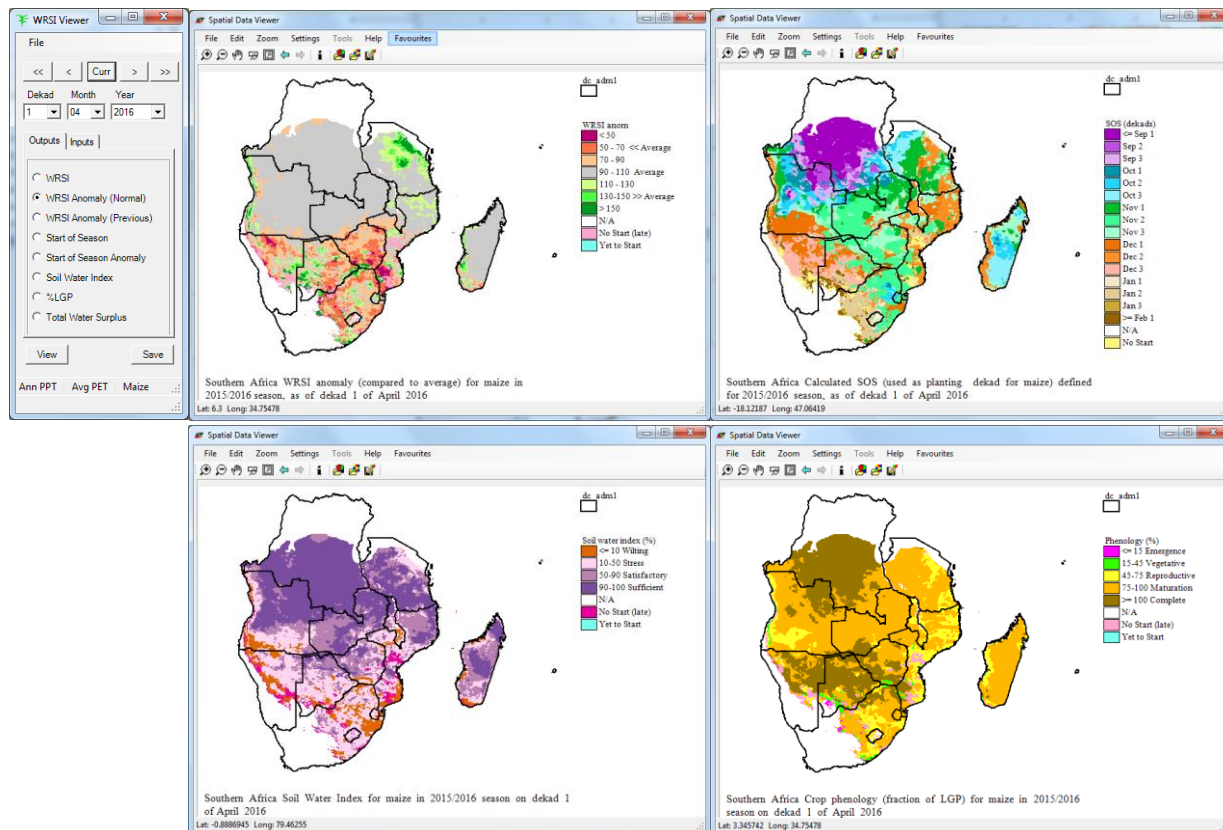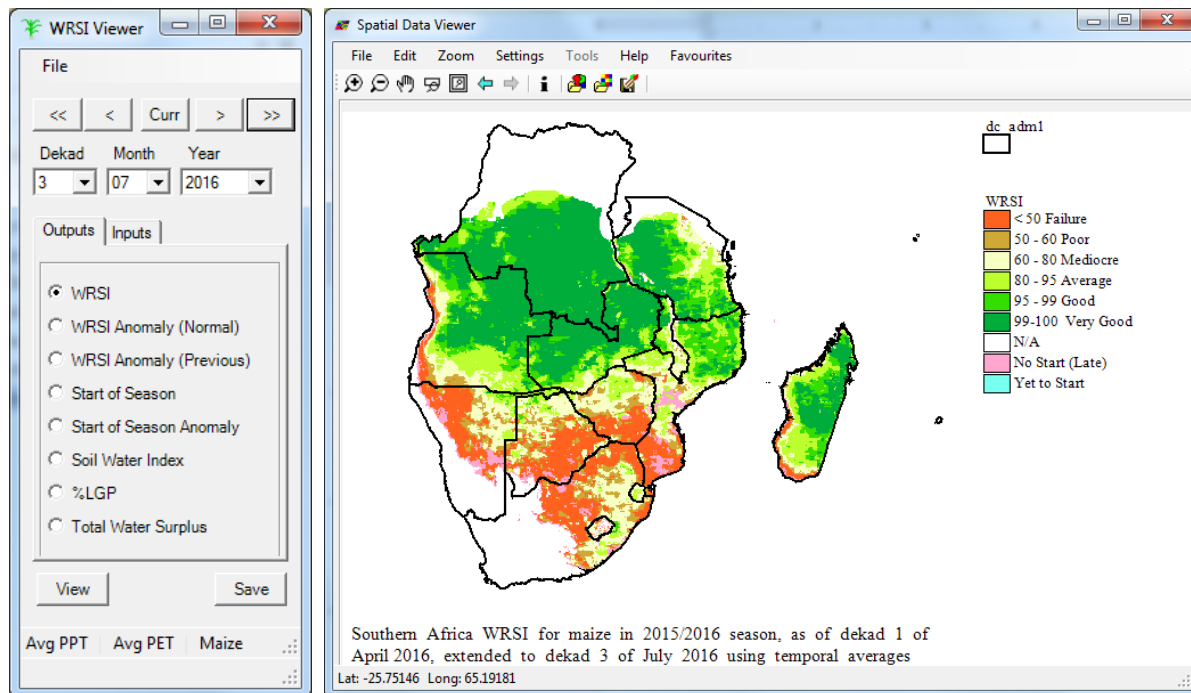
Close the WRSI Viewer when you have finished viewing the data.

Appendix A: Changing Crops in WRSI

When changing crops within GeoWRSI, it helps to have saved each crop in its own individual folder in

the ![icon] output settings. To use the spanner tool ![icon] to change crops in GeoWRSI, simply click the tool and select the crop you wish to analyze. Doing this will calculate all outputs to the selected crop *except* for the WRSI Anomaly.

If you would like to calculate the WRSI Anomaly for the new crop, you must run GeoWRSI ![icon] for all the years of data you have (the corn stalk icon). Once you've done this, you can then go to the Climatological WRSI/SOS analysis tool to calculate the WRSI median needed for the WRSI Anomaly calculation.
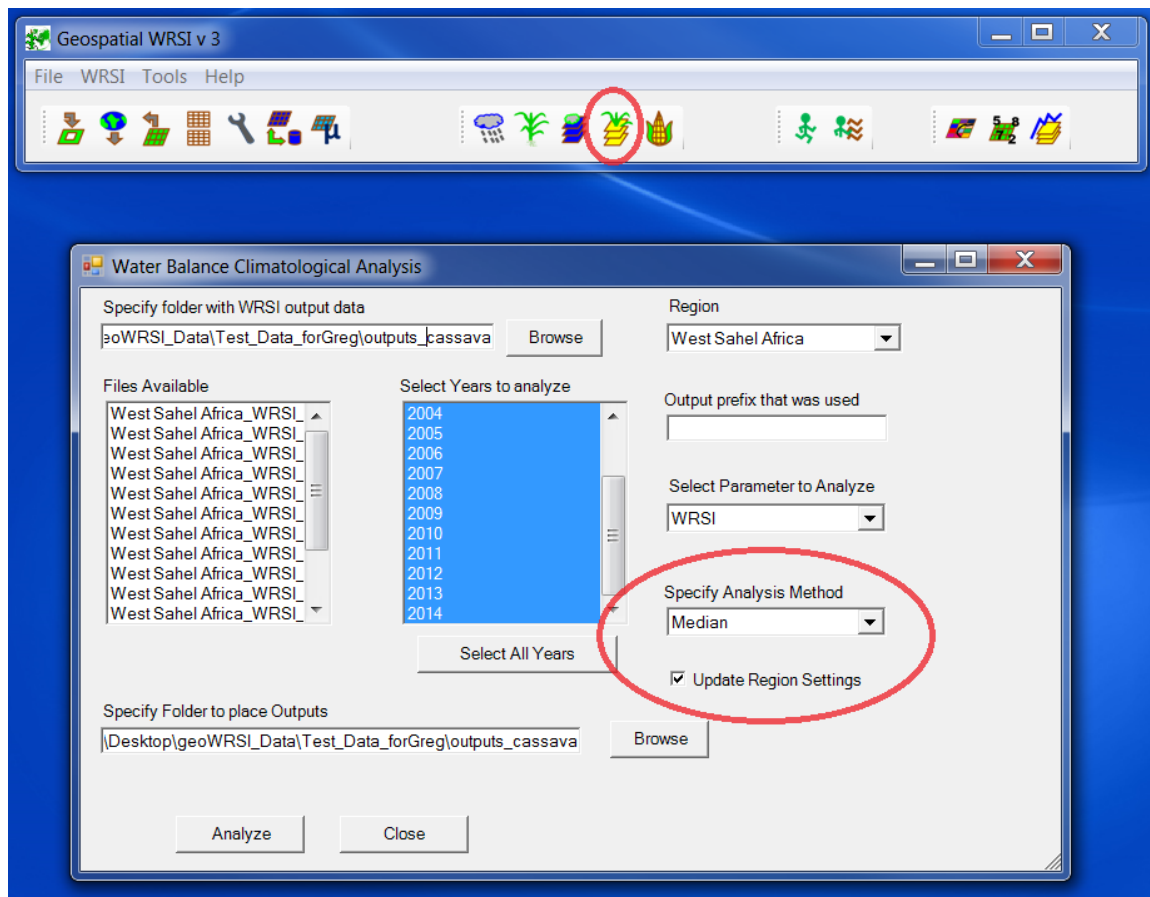

When using this tool, be sure to be reading the correct folder where you have stored the data which was generated from the GeoWRSI runs. This will allow you to select the proper years to analyze, select all that is available (a 30 year dataset is ideal but however many is available is fine). Do not worry about specifying a Files Available. Specify the median for the Specify Analysis Method bar and make sure the Update Region Settings is checked. Note the folder you save your outputs to is the same as the folder with WRSI output data. Once this step is complete, rerun GeoWRSI for the year you'd like and now all outputs, including WRSI anomaly, will be available to view.

Appendix B: Creating a New Region in WRSI

To change the region of interest for a GeoWRSI run, simply click the spanner tool and select the region provided to you in the drop down.

If you'd like to edit a region given to you to make your output more focused on a specific area that can be done as well. There are two ways to go about this; 1 – edit a current region supplied by the GeoWRSI software (after you save a copy of the original file) or 2 – create a new region using information from GeoWRSI default files but changing the extent of the focus. The region files can be found in the ProgramSettings folder for GeoWRSI (C:\Users\USER\Documents\GeoWRSI\ProgramSettings\regions) – note this is a hidden folder so you need to adjust your settings to be able to see it or just copy that link with the proper user in place of USER. If you saved the files elsewhere, navigate to where they are stored and copy the end of the link.
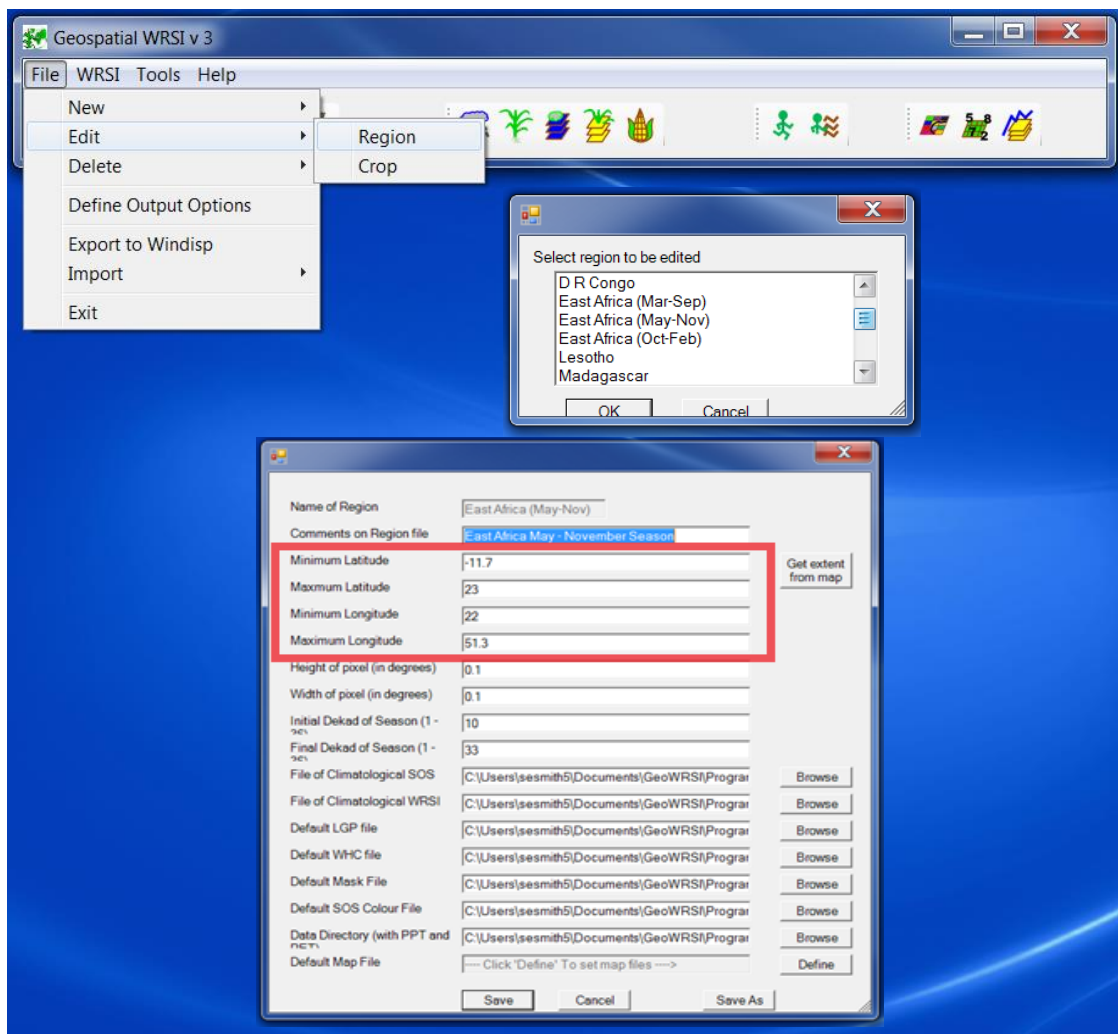
To edit a current region, simply click file, edit, region and when prompted select the region you would like to edit. Again remember to save a copy of the original .region file to use for these purposes so the original .region file will still be available to use as well. Adjust the minimum and maximum latitudes and

longitudes to the area you are interested in, keeping in mind it must be *smaller* than the current region, and save.
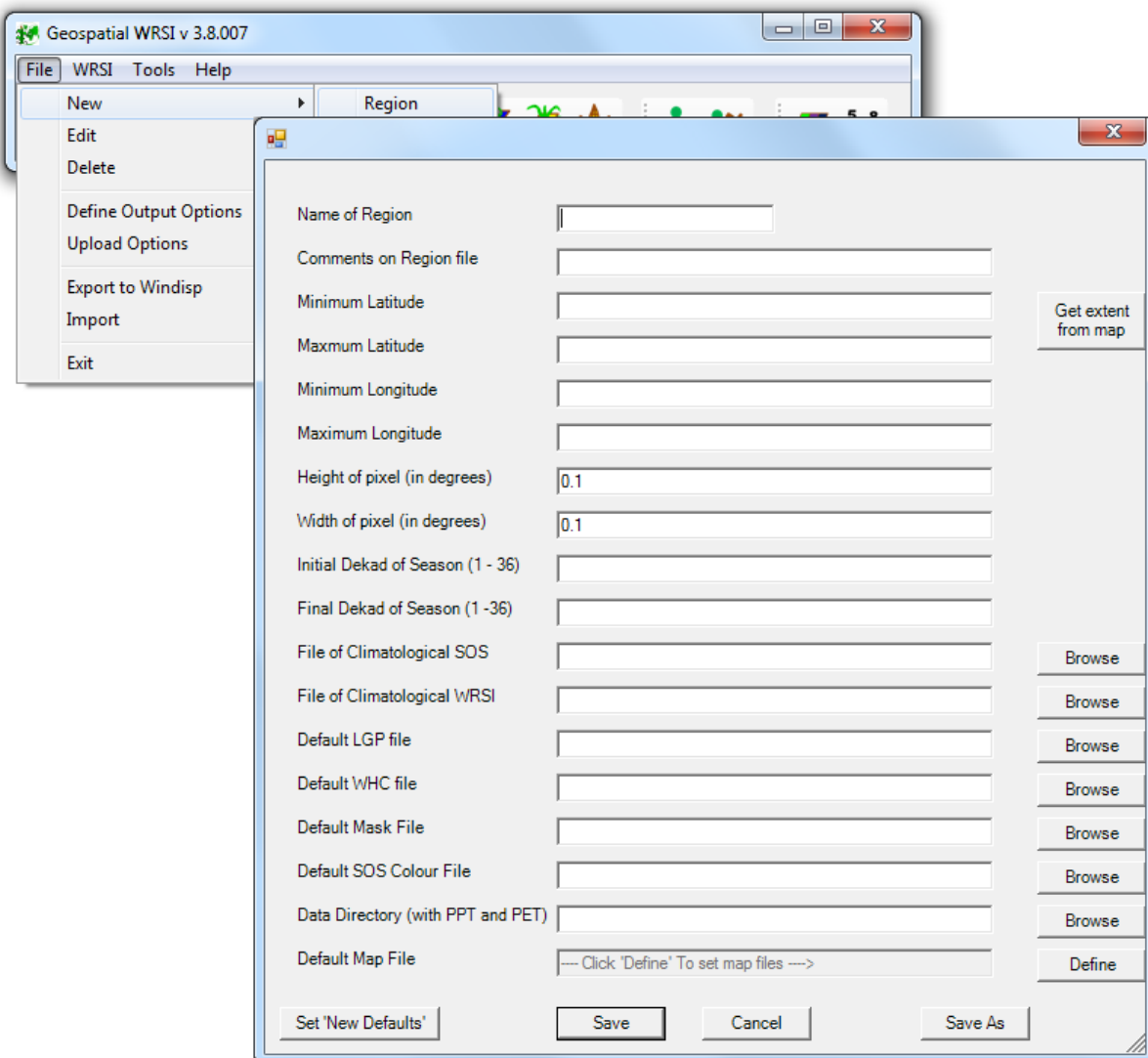
To create a new region you will need to fill in all missing information. When creating a new region that is a smaller subset of an already existing region, you can simply fill in the missing data values with the information found in the larger .region file. Alternatively, click the "Set 'New Defaults'" button, and some 'temporary placeholders' for most of the parameters will be filled in for you but you will have to replace them once you have calculated the proper parameters. Fill in your needed minimum and maximum latitude and longitude values and a name for the new region then save the file. The file will now be available in the list of .regions to choose from within GeoWRSI.

Appendix C: Changing datasets

GeoWRSI allows the selection of several different datasets to choose from. Several data management tools are also available. These datasets and data management tools can be accessed from the setup tool.