Nonpoint Source Pollution and Erosion Comparison Tool (N-SPECT)

PRISM Guidance Document

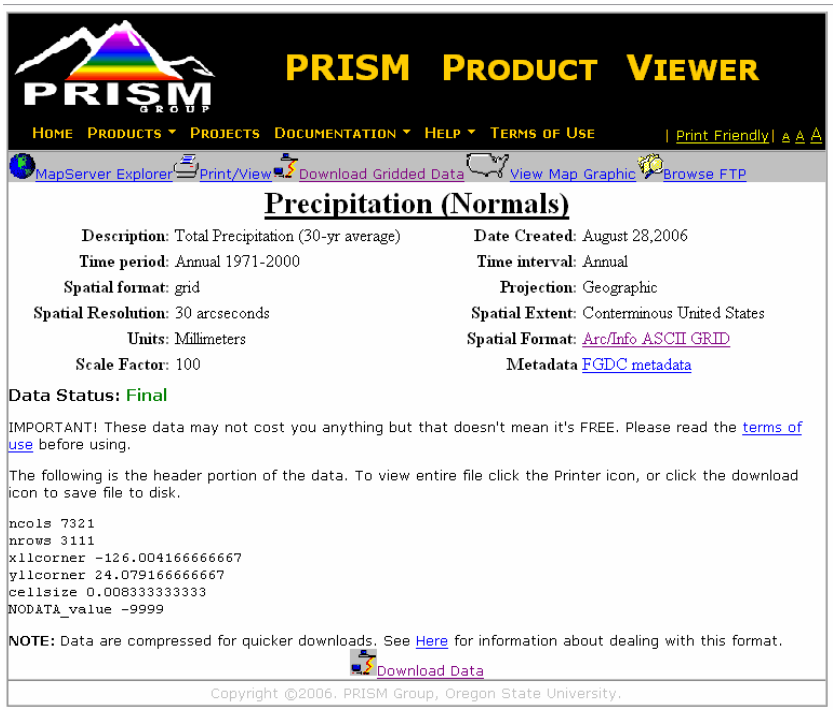
General Procedure

1. Obtain the data.
    a. Download precipitation data from Internet.
2. Preprocess the data.
    a. Convert to raster.
    b. Reproject raster.
    c. Clip raster.
3. Import to N-SPECT.

Obtain the Data

The Oregon Climate Service (OCS) at Oregon State University (OSU) develops and distributes monthly and annual precipitation data for the conterminous United States. OCS uses the PRISM climate mapping system, which incorporates a spatial climate knowledge base that accounts for rain shadows, temperature inversions, coastal effects, and more in the climate mapping process. When using these data, please read the "Terms of Use" on the PRISM Web site and cite the source appropriately.

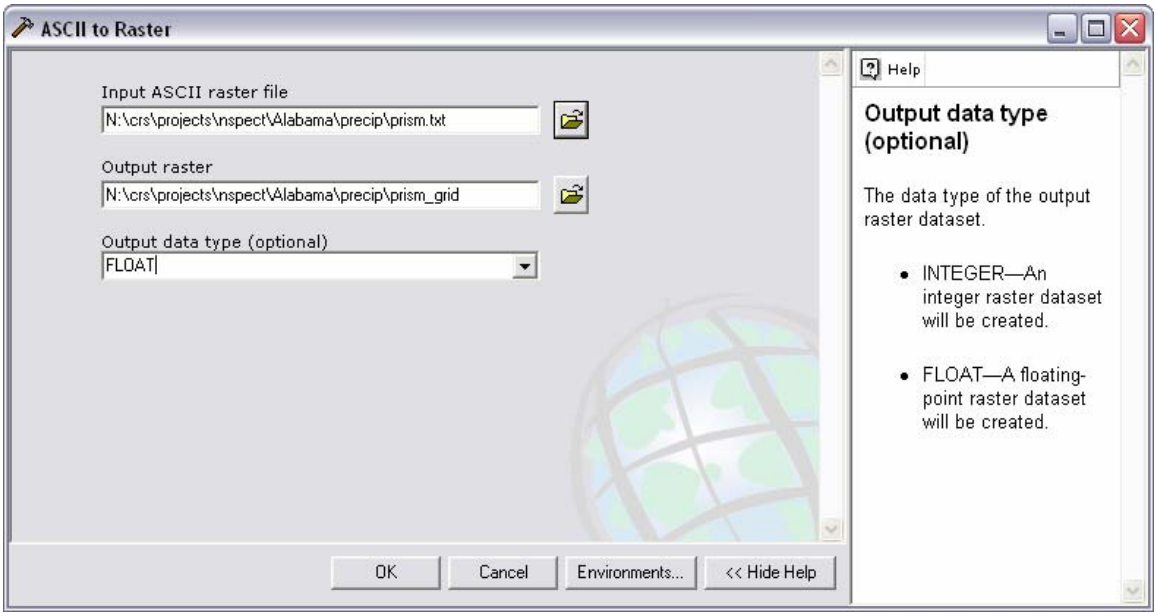
1. Navigate to the **OCS PRISM** site: *http://www.ocs.orst.edu/prism/*
2. Navigate to **Products**, and then **Grids**.
3. Several data sets are available here, including average annual precipitation and total precipitation for several different years. Choose one of interest by clicking the green dot.
4. Select the **Download Data** button at the bottom of the screen.



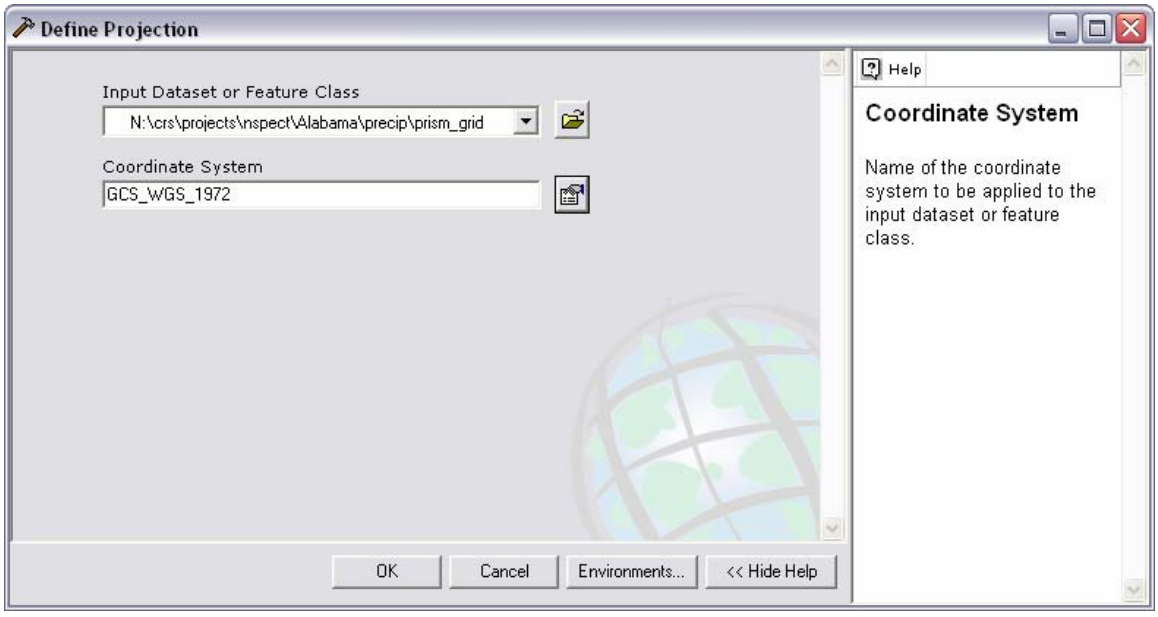
5. Open the zip file that appears in the File Download window. Select **extract** from the tool bar and extract the file to an appropriate folder.
6. Using Windows explorer, change the suffix of the downloaded file to **.txt**

Preprocess the Data

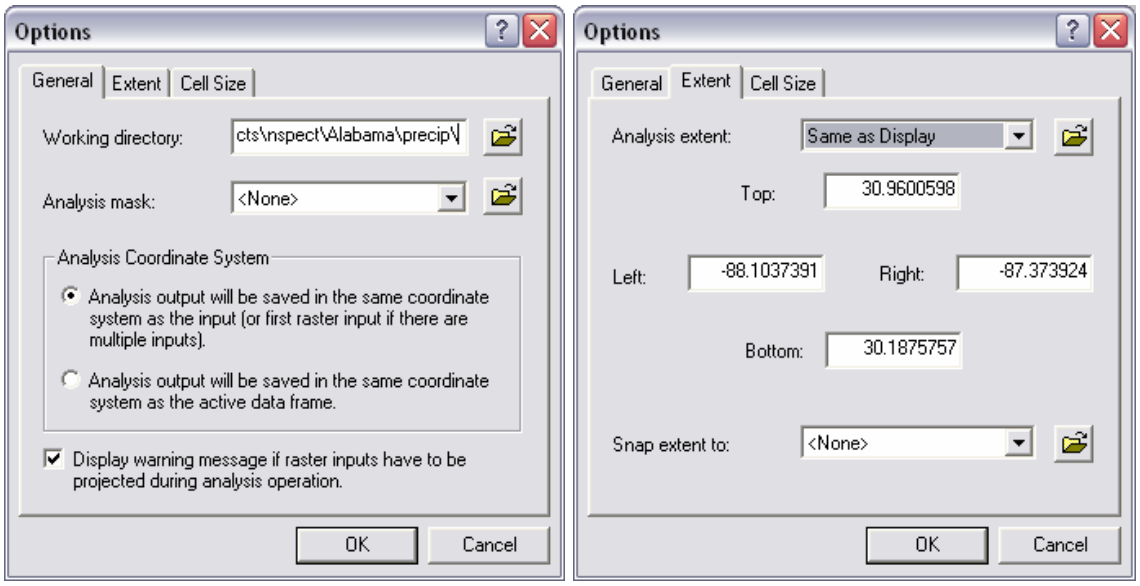
1. Launch ArcGIS.
2. Add the digital elevation model (DEM) that you will be using in N-SPECT.
3. Double-click the **ASCII to Raster** tool (ArcToolbox → Conversion Tools → To Raster).
4. Navigate to your text file in the Input ASCII raster file window.
5. Save the Output raster to an appropriate folder.
6. Change the Output data type to **FLOAT**.
7. Click **OK**.



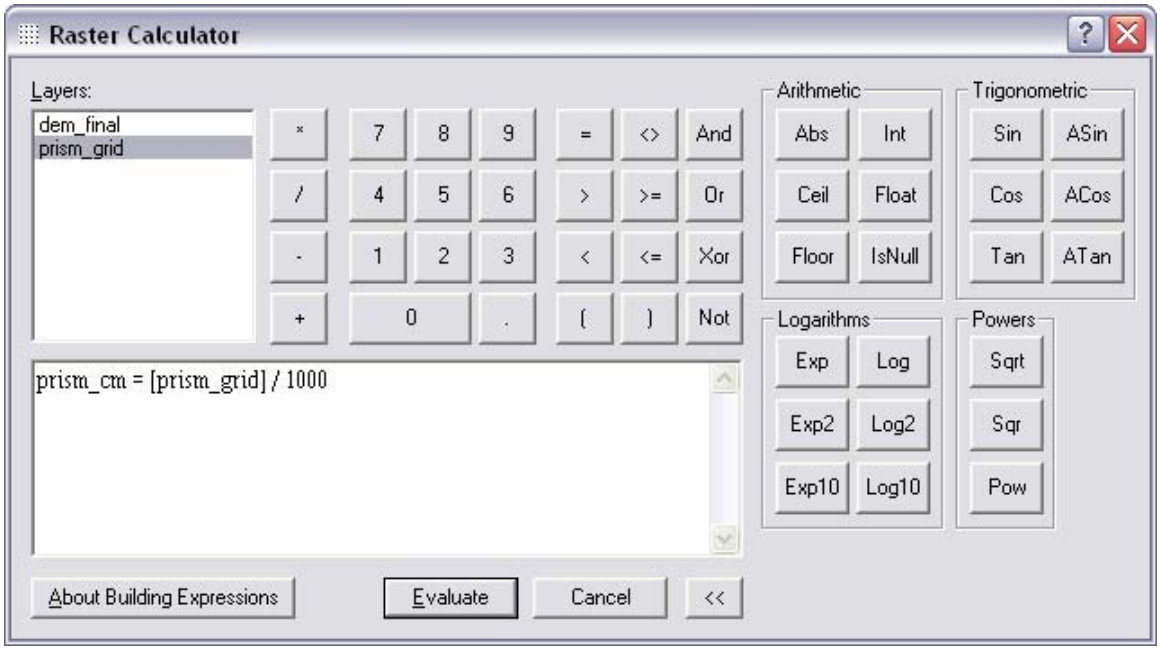
8. Remove the new raster from the table of contents.
9. Double-click the **Define Projection** tool (ArcToolbox → Data Management → Projections and Transformations).
10. Select the new PRISM raster and define the appropriate coordinate system (most likely to be GCS WGS 1972, but look at the metadata first).
11. Click **OK**.
12. Zoom to the extent of the DEM.



13. Select **Options** in the Spatial Analyst extension drop-down menu.
14. Set the working directory.
15. Change the analysis extent to be the same as the display.
16. Click **OK**.

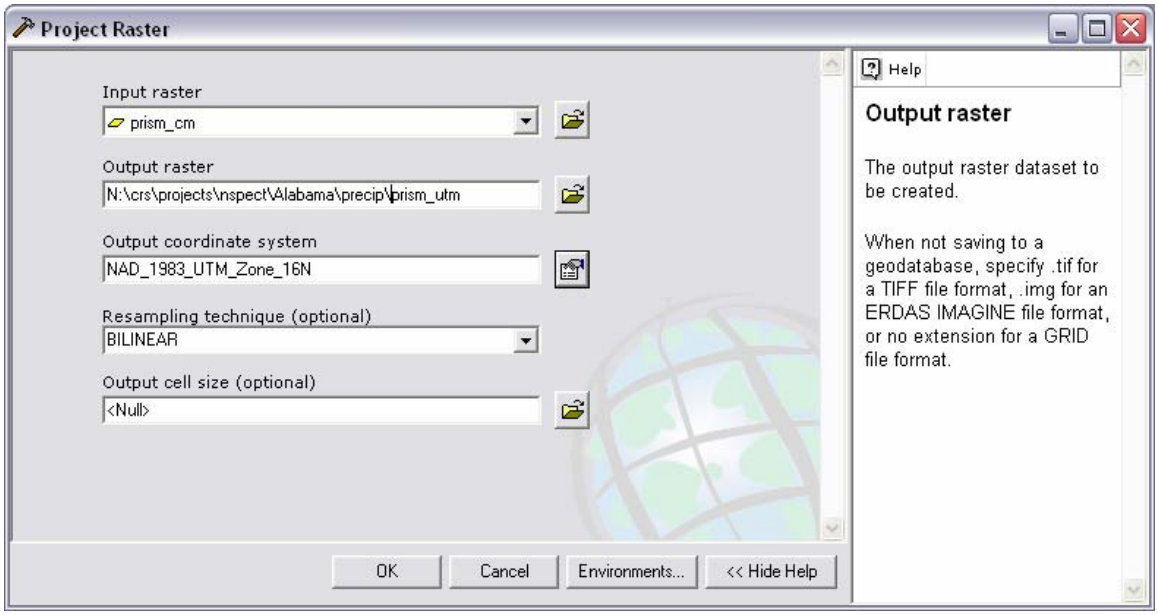


17. Open the **Raster Calculator** in the Spatial Analyst drop-down menu, and enter an expression to divide the PRISM grid by 1000 so that the units are centimeters.

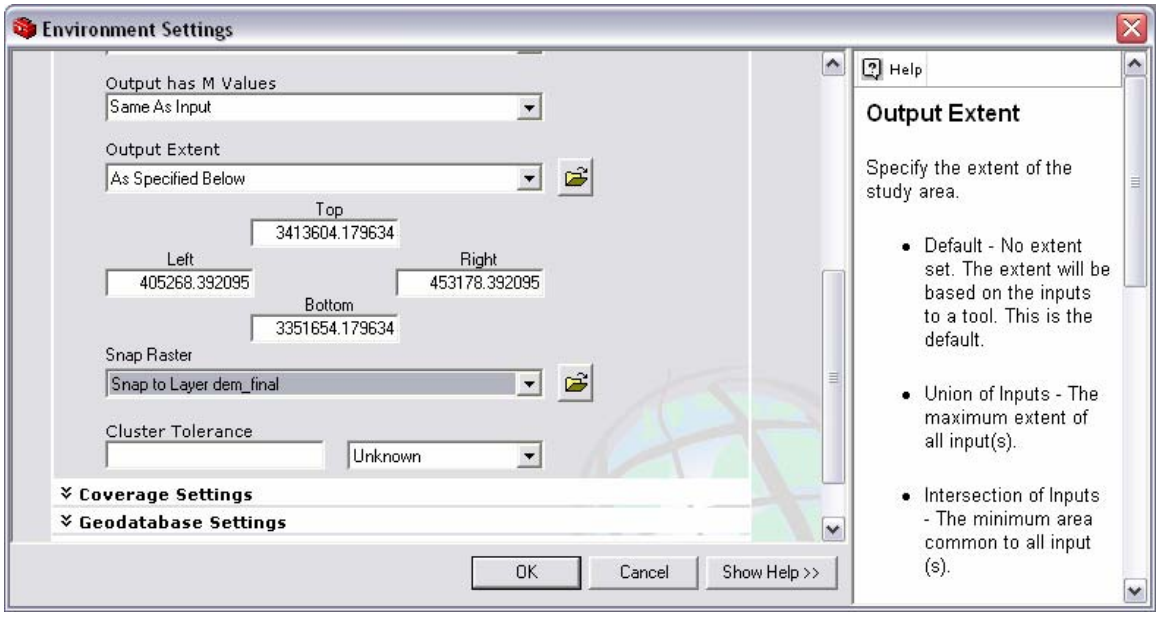


18. The output from this expression will appear in the table of contents as a subset of the original PRISM raster.
19. Double-click the **Project Raster** tool (ArcToolbox → Data Management → Projections and Transformations → Raster).
20. Enter all the appropriate parameters to produce a new raster that uses the same coordinate system as the DEM.

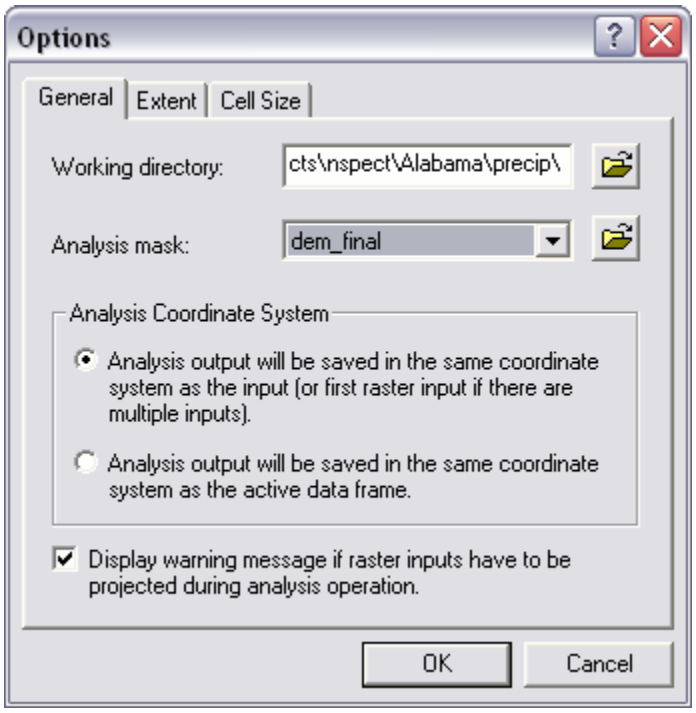
21. Click **OK**.



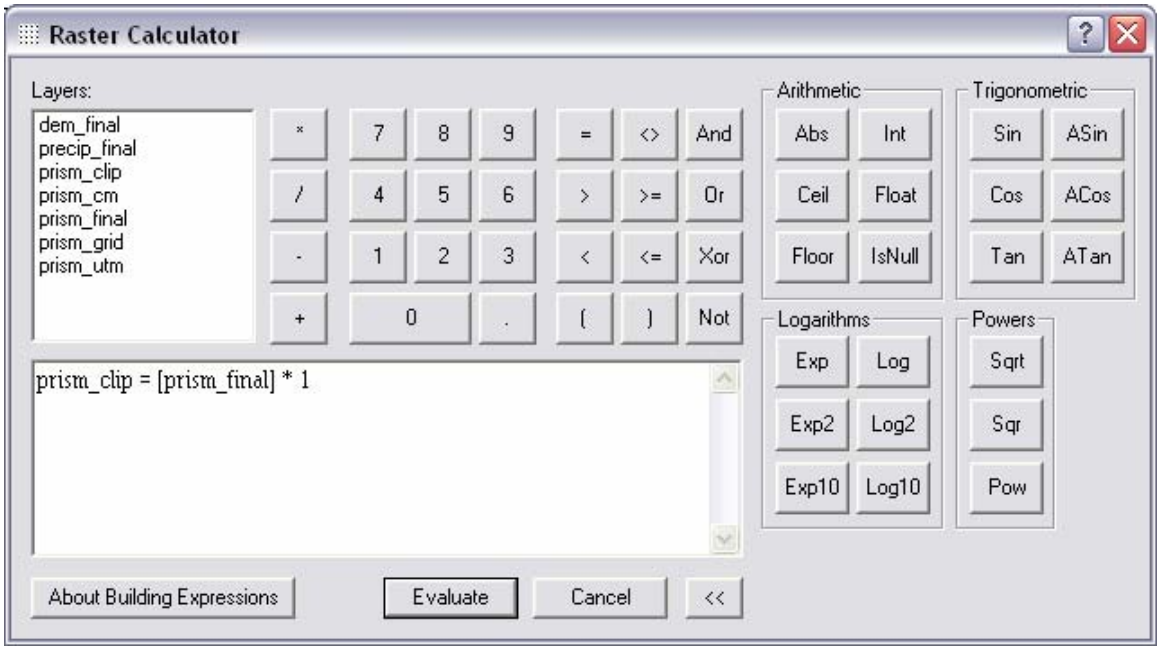
22. Double-click the **Resample** tool (ArcToolbox → Data Management → Raster).
23. Select the new reprojected raster as the input raster.
24. Change the output cell size to match the DEM's cell size.
25. Click the **Environments** button.
26. Expand the General Settings menu.
27. Change the output extent to match the DEM.
28. Select the DEM as the snap raster.
29. Click **OK** twice.



30. Select **Options** in the Spatial Analyst extension drop-down menu.
31. Set the analysis mask to be the DEM.
32. Click **OK**.



33. Open the **Raster Calculator** and enter a simple expression to produce a clipped raster that matches the outline of the DEM.

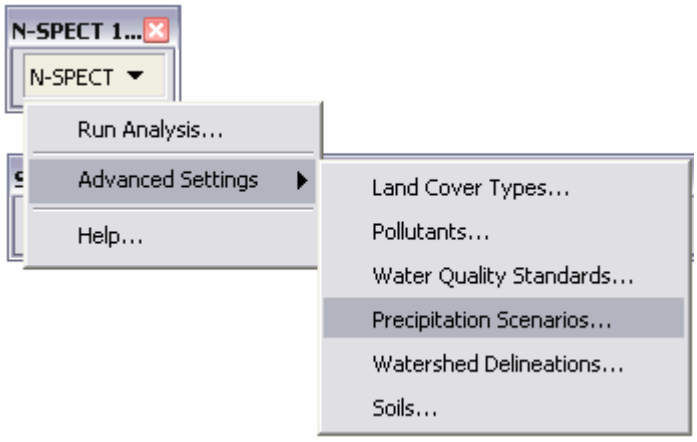


*In this example, the final preprocessed precipitation raster to be used in N-SPECT is called **prism_clip**.*

Import to N-SPECT

The following steps will take you through the process of creating a new precipitation scenario in N-SPECT. The preprocessed precipitation raster created above will be used in this example.

1. Open the **Precipitation Scenarios** window from the N-SPECT toolbar (N-SPECT → Advanced Settings).



2. Create an appropriate name for the new scenario.
3. Create a description of the scenario.
4. Navigate to the precipitation raster.
5. Make sure that the grid units match the coordinate units.
6. Make sure that the precipitation units match the units of the raster.
7. Select the appropriate time period of the data (annual in this case).
8. Enter the number of raining days (see the “Technical Guide Appendix: Guidance for Calculating Raining Days”).
9. Click **OK**.