

Using ArcView 3.x legend files (*.avl) with extracted NDFD GRIB2 files in both ArcView 3.x and ArcGIS 8.x (ArcMap)

- Using the NDFD GRIB2 Decoder & Download Program (1.42), download the desired region (Download tab), click on the GIS tab, and then navigate to the appropriate folder. For example, I want to get the latest NDFD GRIB2 files for the Mid-Atlantic. I make sure I am on the download tab, I click on Mid-Atlantic and make sure it is highlighted and then click on either the FTP or HTTP download button. Once the data is downloaded I click on the GIS tab and navigate to the midatlan folder in the left frame and double-click on it. All the *.bin files should appear in the right frame (12 files).
- Next double-click on the desired GRIB2 file to view the contents in the table window below. Then click on the desired forecast interval to be converted to GIS shapefiles. This will highlight the desired record in the table. For example, I want to extract the Quantitative Precipitation Forecast (qpf.bin) for the date 01/24/2004 at 0600 (UTC), so I double-click on the qpf.bin file and get a list of all the forecast records. I click on the one under the Valid Date (UTC) heading for 01/24/2004 0600 and it will highlight. See figure below.

The screenshot shows the NDFD DataDownload and ImgGen application window. The 'Download' tab is active, and the 'GIS' sub-tab is selected. The path is set to 'c:/ndfd/degrib1.4/data/grib2/midatlan'. The file list on the right shows various .bin files, with 'qpf.bin' highlighted. Below the file list is a table of forecast records.

#	Short name	Long name	Level	Ref. Date (UTC)	Valid Date (UTC)	Val-Ref(hr)
1.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/23/2004 06:00	4.0000
2.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/23/2004 12:00	10.0000
3.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/23/2004 18:00	16.0000
4.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/24/2004 00:00	22.0000
5.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/24/2004 06:00	28.0000
6.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/24/2004 12:00	34.0000
7.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/24/2004 18:00	40.0000
8.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/25/2004 00:00	46.0000
9.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/25/2004 06:00	52.0000
10.0	QPF	Total precipitation [kg/(m ²)]	0[-] SFC="Ground or wa	01/23/2004 02:00	01/25/2004 12:00	58.0000

OUTPUT Filename: c:/ndfd/degrib1.4/output/midatlan/200401240600_qpf.shp

Choose File type: SHP FLT

Type of .shp file: Point Small Polygon Large Polygon

Include Missing Values

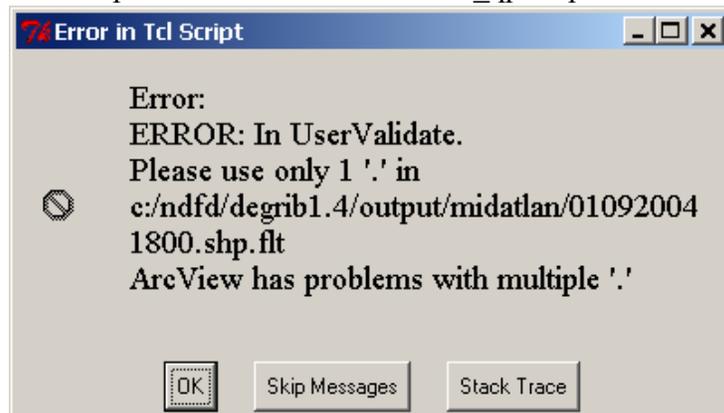
Generate .shp file

Round data to: 1 decimals

Units (when possible): English (F, kts, inch)

Force radius of Earth (NCEP uses: 6371.2) 0 km

- 3.) Once the desired record is highlighted browse to the desired folder to store the GIS shapefile by clicking on the browse button. Name the file by manually typing in the file name. Alternatively, press the “Recommend” button, and it will recommend a naming convention of: “200401240600_qpf.shp” for a shapefile for 01/24/04 0600 (UTC). This will allow one to keep it time specific for later reference. The default is to create a file “sample.shp” in the output folder in the Degrib1.4 directory (eg c:/ndfd/degrib1.4/output/sample.shp) The “Recommend” button will also suggest that you store it in a folder which is the same as the region being downloaded. For example, it will put it in midatlan and store all mid-atlantic shapefiles there. Using the “Recommend button” will result in the following: c:/ndfd/degrib1.4/output/midatlan/200401240600_qpf.shp. NOTE: If you change the filename from the default, make sure that it contains one and only one dot in the file name, otherwise you will get something similar to the following:

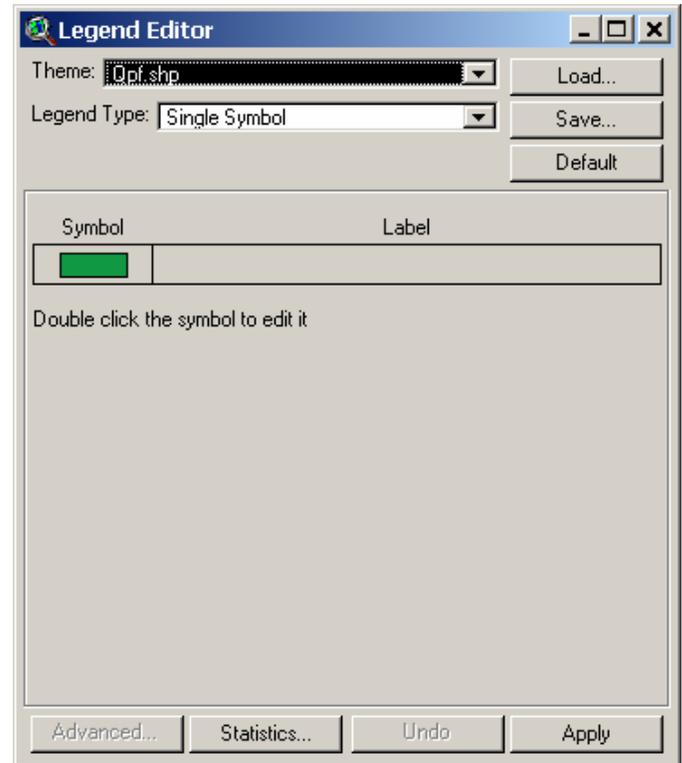


- 4.) Next select the type of shapefile to extract. Options are a point, small polygon, or large polygon. The point shapefile represents the centroids of each NDFD grid cell. The small polygon shapefile represents each individual grid cell and the large polygon represents the dissolved boundaries of the grid cells based on similar values (for example, all similar adjacent temperatures will be included in one polygon). Selecting large polygons will reduce the file size of the shapefile by several times (five is typical) and enable faster loading redraw time. This option is recommended for simple data viewing and analysis.
- 5.) Leave the “Include Missing Values” not checked and make sure to enter in number of decimals in the “Round data to: _____ decimals” field. This specifies the number of decimals the value in the shapefile attribute table will include. For exporting into ArcView and ArcGIS and using predefined legends, always use 0 decimals for all elements except snow, qpf, and waveh. Most of the elements including maxt, mint, pop12, sky, td, temp, wdir, wspd, and wx use 0 decimals because the color tables used for these elements are in whole numbers. Snow, qpf, and waveh use 1 decimal place in the color table, so 1 should be entered for these. Note: The “Recommend” button will also select 1 or 0 depending on the selected variable.

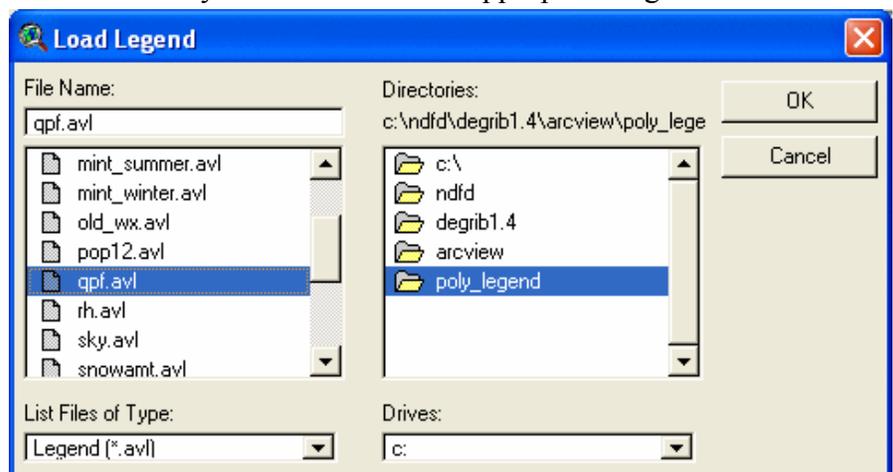
- 6.) Make sure under the “Choose File Type” the file type chosen is SHP and leave the default settings for “Units” as English (F, kts, inch), and “Force radius of the Earth” at 0 km. When all of these parameters are selected click on the “Generate .shp file” button. When the process is done a small “Done” window will pop up. Click on the “OK” button. The shapefile has been created from the GRIB2 file and has been saved to the directory you specified in step 3.

Loading Legends in ArcView 3.x to view GRIB2 Derived Shapefiles

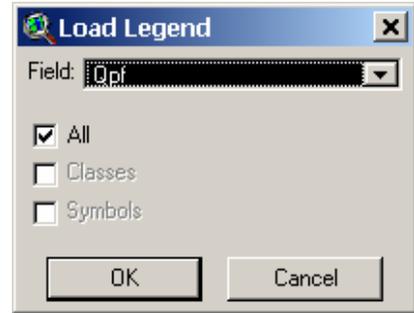
- 1.) Open ArcView and add the desired shapefile as a theme into your view. When a polygon shapefile or point shapefile is loaded, the default legend is a single symbol legend type and an arbitrary color is chosen. If you change the legend properties to display the dataset as a graduated color, ArcView will randomly assign a color ramp to the range of values. The same is true if you select a unique value legend. In order to be consistent with the legends used on the NDFD web pages and the ones created by the SuperImageGen tool, a predefined legend needs to be loaded. Predefined legends in ArcView are stored as ArcView Legend Files or AVL files.



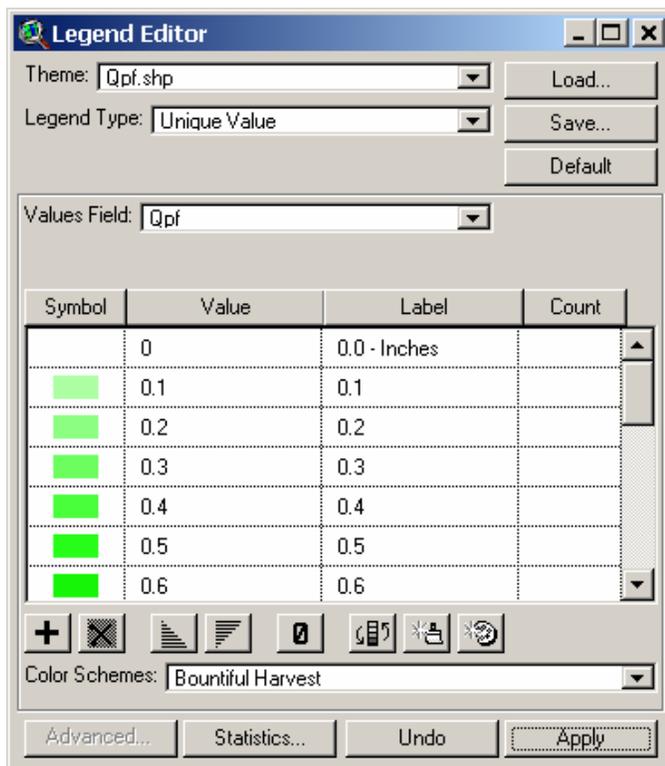
- 2.) Double-click on the polygon or point shapefile theme in the view. A legend window will be displayed. In this example a polygon shapefile for QPF was extracted using the DEGRIB tool and added as a theme to a view in ArcView. Editing the legend is a simple task. After double-clicking on the theme and getting the legend editor window, click on the “Load...” button. This will display the load legend window which enables you to browse to the appropriate legend file and choose the legend. Going back to the example, choosing the qpf.avl file will load in the polygon legend for QPF that is needed.



- 3.) There are two AVL files for each GRIB2 element. One is for either the large or small polygon version, and the other is for points. The point AVL files are denoted by a “_points” extension to the file name. After selecting the correct AVL file and clicking on the “OK” button the legend will begin to be loaded. A small load legend window will pop up letting you select the attribute field to use for the legend. In the example, the qpf field will be the default. The “All” radio button is checked and all you have to do is click on the “OK” button to load the legend.

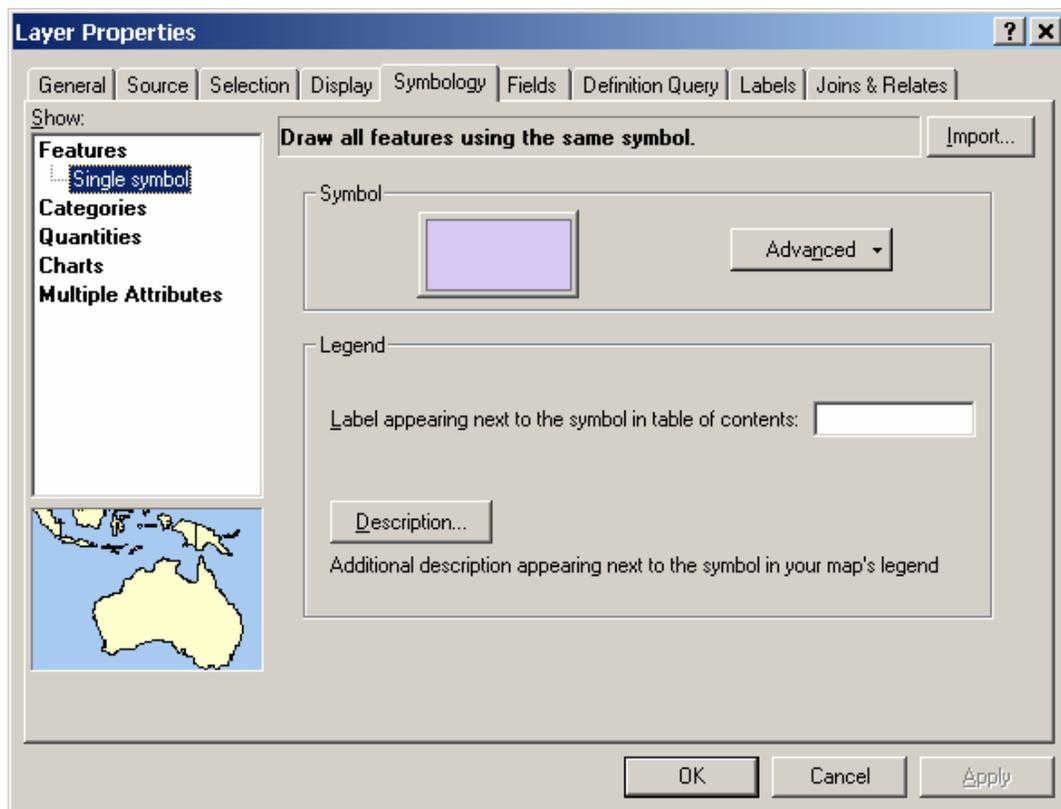


- 4.) Once a legend is selected and loaded, the legend will then be displayed in the legend editor window. You can scroll through the legend to make sure it looks correct and click on the “Apply” button and then close the window by clicking on the X in the upper right hand corner of the window. This legend is based on unique values and because the QPF shapefile values have been rounded to the nearest tenth decimal place the legend reflects this. This will load the legend and display it in the view. For the example, the QPF shapefile can now be viewed in with the same colors and on the NDFD website.

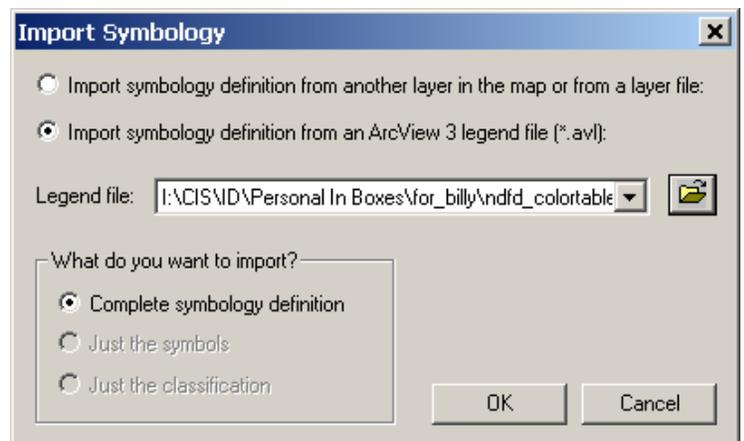


Loading Legends in ArcGIS 9.3 (ArcMap) to view GRIB2 Derived Shapefiles

- 1.) Open ArcMap and add the desired shapefile as a theme to the view. As with ArcView 3.x, ArcMap will assign a single value legend and assign a random color. If you want to view the dataset as graduated colors you can choose from a number of color ramps, but none will match the NDFD color tables. In order to load predefined legends into ArcMap you must import the ArcView legend files (AVLs) into ArcMap using the next steps.
- 2.) In this example, QPF will be used to demonstrate the process. Right-clicking on the QPF theme in the view and choosing properties from the pull-down menu will bring up the layers properties dialog box. Choosing the “Symbology” tab will bring you to the legend definition window. To load in an ArcView legend, click on the “Import” button in the upper right hand corner of the window.

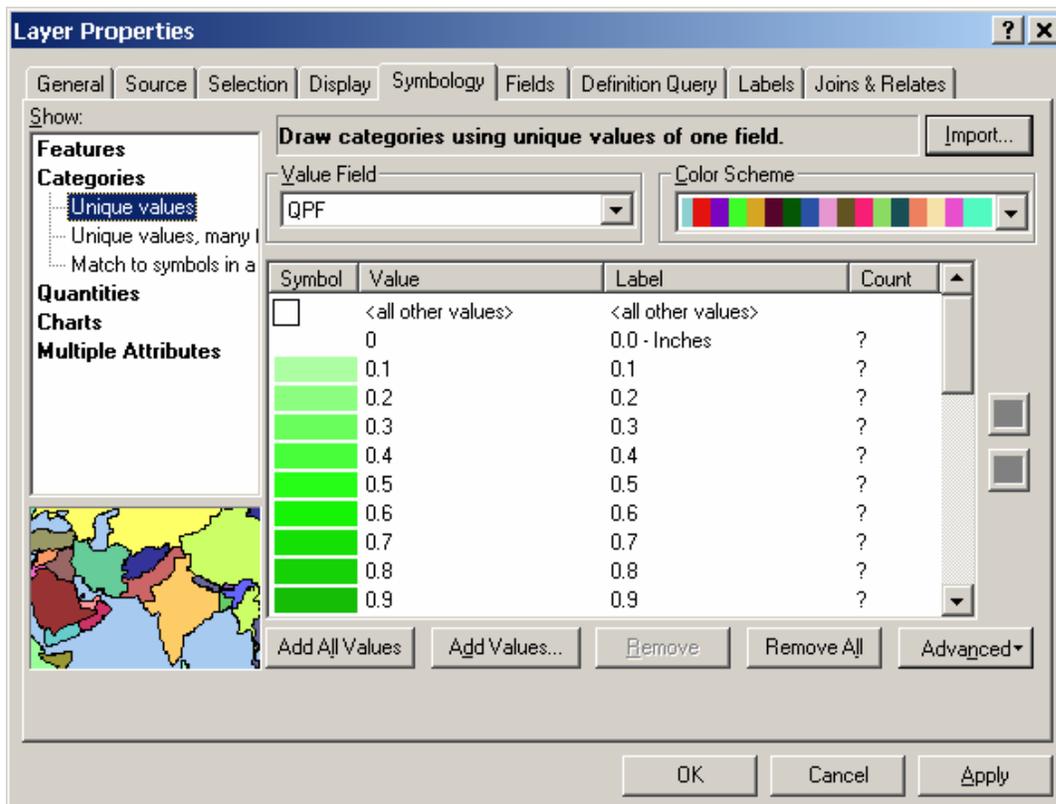
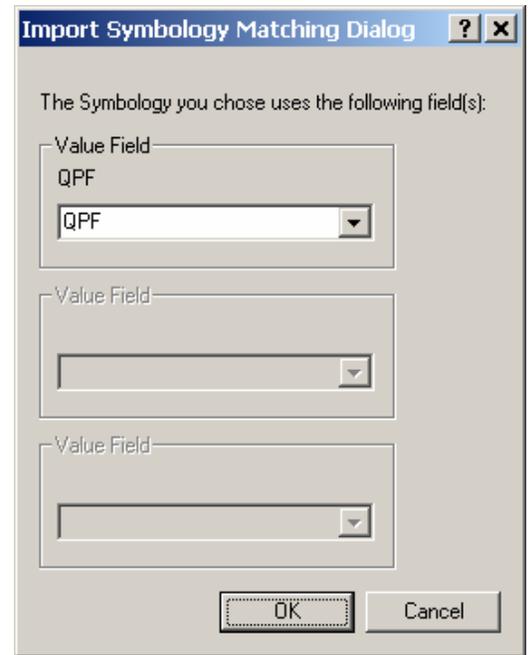


- 3.) An “Import Symbology” window will then pop up prompting you to import a predefined legend. Click on the second radio button to “Import symbology definition from an ArcView 3 legend file (*.avl):”. Then navigate to where the legend file is located by clicking on the browse icon. In the



example, choose the qpf.avl to load the polygon qpf legend. Make sure the “Complete symbology definition” radio button is clicked and then click on the “OK” button. This will display an “Import Symbology Matching Dialog” window. The “Value Field” should display the attribute field ArcMap will use to create the legend. Make sure the correct field is selected. From the example, the QPF field should be selected and then the “OK” button should be clicked.

- 4.) The ArcView 3 legend will be loaded into ArcMap and be displayed in the under the “Symbology” tab. Scroll through the legend to make sure it looks right. Click on the “Apply” button and then click the “OK” button. The legend will be displayed in the map view and will match the NDFD colors for the particular element. In this case, the QPF legend matches the QPF legend for the NDFD web pages.



Index of ArcView Legend Files (“_point” denotes point legend)

Heat Index	heatindex.avl heatindex_point.avl
Max Temp	maxt.avl maxt_point.avl
Max Temp Spring	maxt_springfall.avl maxt_springfall_point.avl
Max Temp Summer	maxt_summer.avl maxt_summer_point.avl
Max Temp Winter	maxt_winter.avl maxt_winter_point.avl
Min Temp	mint.avl mint_point.avl
Min Temp Spring	mint_springfall.avl mint_springfall_point.avl
Min Temp Summer	mint_summer.avl mint_summer_point.avl
Min Temp Winter	mint_winter.avl mint_winter_point.avl
Probability of Precipitation (12hrs)	pop12.avl pop12_point.avl
Quantitative Precipitation Forecast	qpf.avl qpf_point.avl
Relative Humidity	rh.avl rh_point.avl
Sky Cover	sky.avl sky_point.avl
Snow Amount	snowamt.avl snowamt_point.avl
Temp	t.avl t_point.avl
Temp Spring	t_springfall.avl t_springfall_point.avl
Temp Summer	t_summer.avl t_summer_point.avl
Temp Winter	t_winter.avl t_winter_point.avl
Dew Point	td.avl td_point.avl
Dew Point Spring	td_springfall.avl td_springfall_point.avl
Dew Point Summer	td_summer.avl td_summer_point.avl
Dew Point Winter	td_winter.avl td_winter_point.avl
Wave Height	waveheight.avl waveheight_poin.avl
Wind Chill	windchill.avl windchill_point.avl
Weather	wx.avl wx_point.avl