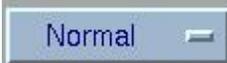
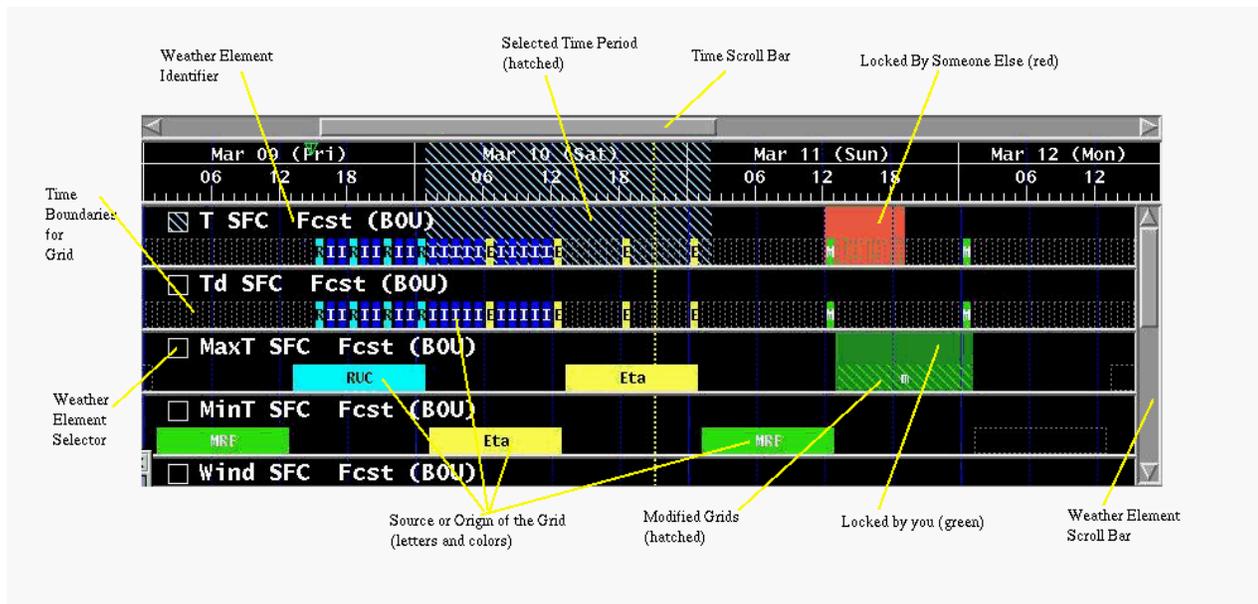


Grid History	Identifies the origin and source of the grid, and whether it has been modified. The origins of the grid include "Interpolated", "Populated from model", "Created from scratch", "Calculated", and "Other".
Editor Time Line	The current Spatial Editor time.
Editable Grid in Spatial Editor	Bright yellow grid block that identifies the grid that is currently editable in the Spatial Editor.
Time Scroll Bar	Allows users to scroll the Grid Manager in time
Pane Scroll Bar	Allows users to scroll vertically to reveal hidden weather elements.
Locked By Someone Else (red background)	Indicates which weather element-time periods that have been edited and not saved by another user and hence not editable by you.
Locked By You (green background)	Indicates which weather element-time periods that you have edited (but not yet saved) and are hence locked by you.

Grid Manager Component Descriptions - History Display Mode

The figure below is an annotated screen snapshot of the Grid Manager in history display mode. The Grid Manager may

be toggled between normal display and history display using the  button on the toolbar. Try toggling the Grid Manager into History Mode and observe the color scheme which indicates the source of the grids.



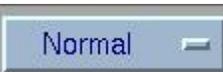
Grid Manager Component Descriptions - History Display Mode

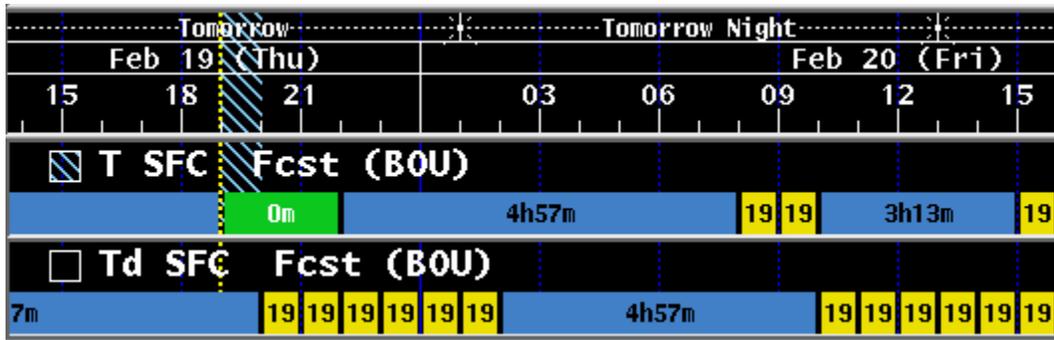
Most of the general components of the Grid Manager do not change when it is toggled into the History mode. However, the grid colors and patterns are used for different purposes as shown in the table below. There is no indication of the editable grid or visible grids.

Grid Block Appearance	Meaning
Solid color	Grid has not been modified by you or anyone else. Grid has been either interpolated, created from scratch, or populated from a model.
Hatching pattern	Indicates that the grid has been modified by you or someone else. If properly configured, the pattern can indicate whether the grid was modified by you, or whether someone else has modified it.
Color	Indicates the origin and source of the grid. Each model source can be assigned a unique color, e.g., NAM can be yellow while grids populated from MRF can be green. Each origin's color can also be set, e.g., Interpolated grids are blue, Calculated grids are red.

Grid Manager Component Descriptions - Last Saved, Modified, Published, Sent Modes

The figure below is an annotated screen snapshot of the Grid Manager in Last Saved mode. The Grid Manager may be

toggled between normal display and other modes using the  button on the toolbar. Try toggling the Grid Manager into Last Saved ("Saved") and observe the color scheme which indicates the last time the grids were saved. A table exists in the gfe configuration that defines the time thresholds and the colors to use.



The labels within each grid block indicate the time since the grids were saved. There are several different "Last" modes available as shown in the following table.

Save	Indicates the time since the grid was saved to the database by any user. If a grid has been modified but not yet saved, the grid will be gray.
------	--

Modified	Indicates the time since the grid was modified by any user. A grid can be modified, but not saved. A grid can be saved, but not modified.
Published	Indicates the time since the grid was published. Once a grid is modified after publishing, the grid is no longer considered published and is shown as "gray".
Sent	Indicates the time since the grid was sent out via intersite coordination. Note that if you publish to official and then send the Official grids out via ISC, the Fcst grids will not indicate that its grids were sent (since they really weren't).

Grid Manager Tool

The Grid Manager contains many functions to manipulate whole grids, but generally not the gridded values inside them. Using the Grid Manager you can:

- Control the Spatial Editor display while selecting a grid to edit
- Copy model-derived grids into your forecast
- Create new grids from scratch
- Delete a grid
- Copy a grid
- Paste a grid
- Split a grid in time
- Fragment a grid in time
- Assign Default Value to every gridpoint in the grid
- Stretch the time over which a grid is valid
- Interpolate new grids based on the grids that already exist
- Run selected Smart Tools
- Send single ISC (intersite coordination grid)

All of this functionality is accomplished by a single tool - the Grid Manager Tool, which is always available. The table below lists each action and the function it performs. The table substitutes the abbreviation MB1 and MB2 for Mouse Button 1 and Mouse Button 2, respectively.

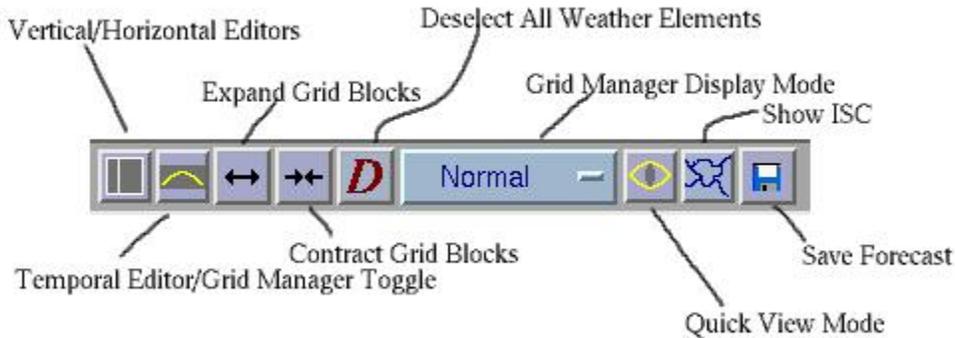
Grid Manager Tool Actions

Actions	Function
MB1 Click	Sets the Spatial Editor time and makes the selected grid visible and editable in the Spatial Editor. All other grids are made invisible.
MB2 Click	Sets the Spatial Editor time and makes the selected grid visible and editable in the Spatial Editor. The visibility of other grids remains unchanged.
MB1 Drag	Selects one or more weather elements/grids for population, interpolation, or deletion. Also deselects all other previously selected weather elements
MB2 Drag	Stretches the selected grid's start time to the left or the grid's end time to the right. Allow the user to change the valid time of a grid.

Grid Manager Pop-up Menu

In addition to the main Grid Manager edit tool actions, the Mouse Button 3 (MB3) pop-up menu offers many more edit operations. When using these operations, keep in mind that they apply to a single grid (or place-holder for a grid) - the grid under the cursor - when you perform the operation. Operations include deleting, fragmenting, splitting, copying, and pasting a grid. Other edit operations permit assigning values to a grid, creating a grid from scratch, and running selected smart tools on the grid. Refer to the Grid Manager Button 3 Popups documentation for more details.

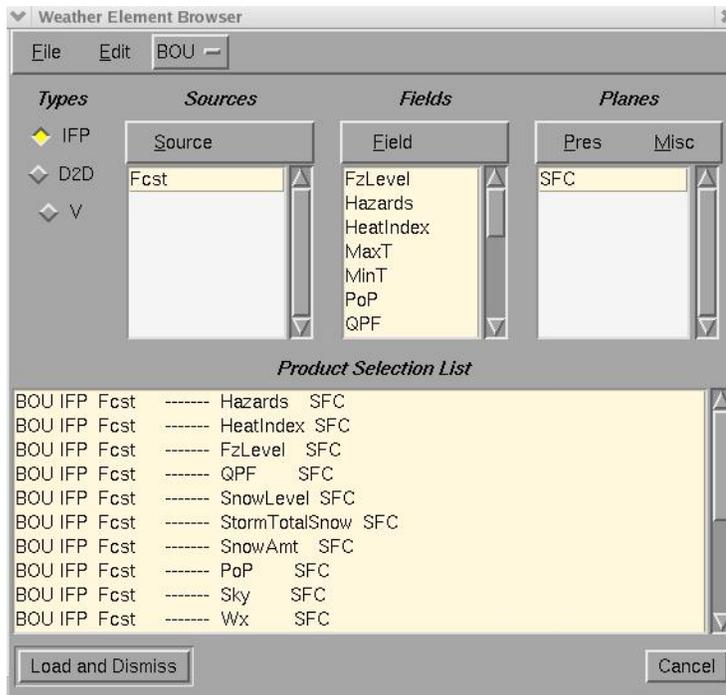
Grid Manager Buttons



The buttons that control the Grid Manager are on the left of the GFE ToolBar. These buttons control various display modes of the Grid Manager and Spatial Editor, as well as specifically controlling the layout of the GFE. Refer to the GFE Toolbar documentation for more details.

Load/Unload Weather Elements

With over a dozen weather elements per database and many databases, displaying all of the available weather elements in the GFE would overly clutter the display. So, you can choose which weather elements you want to view and edit using the Weather Element Browser Dialog. This section describes how to use it.



Before you can begin editing grids of sensible weather, you need to load forecast weather elements into the GFE. The following set of exercises shows you how to load and unload weather elements to and from the GFE.

Purpose: Make weather elements available for viewing and editing.

1. From the main menu bar, select WeatherElement->Weather Element Browser. You should see a dialog appear that looks similar to the figure above.
2. Start from scratch by selecting Edit->Select None located at the top of the Weather Element Browser dialog.
3. Using the Source menu, select Fcst.
4. Using the Field menu, select T, Td, Wind, and Wx. Note that all of the combinations of Fcst and the weather elements you selected now appear in the lower portion of the dialog.
5. Select Load (in the lower left corner.)

Note that the combination of sources (databases) and weather elements listed in the lower portion of the dialog were loaded and are now available for viewing and editing in the GFE. If you are familiar with the AWIPS Volume Browser you may notice some similarities.

Repeat this operation, but this time deselect Wind and Wx in the lower portion of the dialog by clicking with MB1. Note that when parameters are deselected, they are UNLOADED from the GFE. When the Weather Element Browser dialog first appears, the lower portion that lists weather elements reflects the list of weather elements that are currently loaded. Toggling off any weather element will cause that element to unload when you select the Load button.

Continue to load and unload more parameters until you understand how this dialog behaves and how it affects the set of parameters available for viewing and editing in the GFE.

Load/Unload Weather Elements via Weather Element Groups

The Weather Element Browser allows you to load and unload individual weather elements, but generally it is more convenient to load groups of parameters that are related. A Weather Element Group is a named group of weather elements that you can define.

1. From the main menu bar, press and hold MB1 over the Weather Element menu item.
2. Slide the mouse cursor over the Weather Element Groups menu item.
3. Select one of the pre-defined Weather Element groups, such as Public, from the Weather Element Groups cascade menu.

Note that when you selected the Weather Element Group, a new set of weather elements was loaded into the GFE. Also note that the set of weather elements that was loaded is now unloaded.

Any weather elements that were modified will always remain loaded in the Grid Manager. The GFE refuses to unload unsaved weather elements. You must **Save** or **Revert** them before they can be unloaded.

Create a new Weather Element Group

Saving a group of weather elements as a Weather Element Group is done via the Weather Element Browser Dialog. To make your own Weather Element Group, follow the steps below.

Purpose: Create a Weather Element Group

1. From the main menu bar, select WeatherElement->Weather Element Browser.
2. Select any group of weather elements as you did in the previous exercise.
3. From the Weather Element Browser dialog menu bar, select File->Save Weather Element Group....
4. In the dialog that appears, enter a Weather Element Group name of your choice and select Save.

Now your new Weather Element Group has been saved and is ready to be used. Close the weather Element Browser by clicking Cancel in the lower right corner. Move your cursor to the Weather Element menu item and load your newly created Weather Element Group to verify that you correctly created it.

Grid Manager Operations

This section of the training guide covers grid operations that are performed on the Grid Manager.

Select Weather Element and TimeRange

In this section we discuss how to populate your forecast by copying weather element grids based on model output and how to temporally interpolate, which fills in time gaps between grids. But first you need to know how to identify the weather element and time range over which these operations will be performed.

Purpose: Select a TimeRange for edit operations.

1. Press and drag MB1 over any time period of your choice inside one of the weather element panes of the Grid Manager.
2. Release MB1.

As you drag the mouse cursor you should see blue hatched shading appear inside the weather element pane. This is how you identify a time period and weather element to which you will later apply an edit operation. Later, you will encounter exercises that show you how this selected time period and weather element are used in Grid Manager edit operations. You can also select a time period in a slightly different way using the Time Scale (located just above the Grid Manager). After selecting a time period in the Time Scale by dragging MB1, MB1 click in the small box located in the upper-left of each weather element pane. Note that the time period for that pane now becomes selected. Using this method, you can select the same time period for many different weather elements.

There is also a way to extend the currently selected TimeRange by performing a MB1-SHIFT click operation anywhere on the Grid Manager. Hold down the shift key while clicking MB1. The currently selected TimeRange will be extended to the time on which you SHIFT-clicked. If you SHIFT-MB1-click inside the currently selected TimeRange it will have no effect. This works for any WE pane or the TimeScale.

1. Press and hold MB3 over the Grid Manager and pick Deselect All from the pop-up menu. Note that your previously selected Weather Elements/ Time Ranges are now deselected.
2. Select another set of Weather Elements over any time period.

3. Next, press the button  in the button bar to deselect. Note that you can deselect the set of Weather Elements from both the button bar and the pop-up menu.

Copy from Derived Model Grids

One of the GFESuite of programs derives surface-based weather elements from numerical models such as NAM. Since it would be too time consuming for forecasters to create all forecast grids from scratch, these derived model grids provide a starting point on which your gridded forecast is based. The next section shows you how to copy these model-based grids into your forecast.

Purpose: Add new grids to your forecast from a model.

Select a time period and one or more weather elements using the technique described in the previous exercise.

1. Select from the main menu Bar: Populate->Copy Selected Grids From...
2. Select one of the model sources listed in the dialog, such as NAM12.
3. Select OK.

You should see new grids appear in your forecast. If not, make sure that you have selected a time period that matches at least a portion of the time period of the model you desire and repeat until new grids have been copied into your forecast. Click MB1 on one of the grids in the Grid Manager. The grid will appear in the Spatial Editor.

Note that there are some gaps in your forecast. Because models provide snapshots of the state of the atmosphere, for some weather elements, the system (arbitrarily) assigns a one-hour duration to most grids. However, this duration is model and weather element dependent. For example, a grid representing 6-hour QPF has a 6-hour time duration.

If you want to initialize your entire forecast from a particular model, you are not required to select every weather element for the entire time period of the model. The next exercise shows you how to copy all the grids derived from a model in to your forecast.

1. From the main menu bar select Populate->Copy All Grids From...
2. Select one of the model sources listed in the dialog.
3. Select OK.

Note that Copy All Grids From... ignores the selected time range and the selected weather elements. All of the grids available from that model are copied into your forecast overwriting any grids that existed previously.

Interpolate Grids

Since copying grids from the model-based databases leaves temporal gaps in the forecast, the GFE provides you a way to fill in those gaps. This next exercise show you how to interpolate over a time period and weather element that you select.

Purpose: Fill in forecast gaps with grids to provide a smooth transition.

1. Select any time period and weather element that contains gaps in the forecast (except Wx).
2. From the main menu bar, select Grids->Interpolate... The Interpolate Dialog is displayed. Choose "By Gaps" and click on OK.

You should see new grids that appear and fill in the gaps that you identified in step 1. If you visualize these grids in sequence by stepping through them using an MB1 click (or the animator), you will notice that the values at each grid point progressively change in time to provide a smooth transition from one original grid to the next.

Interpolating By Gaps uses all grids in the selected time range to calculate new grids to fill the gaps. The other method of interpolation uses only the grids that you modified to calculate the new grids and replaces any grids you did not modify with interpolated grids (grids that you have modified are identified in the grid block by an "m"). For example, if you edit two of three grids copied from a model, select these grids in the Grid manager and choose Grids->Interpolate... and then the "Based on Editing Data" from the Interpolation Dialog, new interpolated grids will fill the gaps, the unedited model grids will be replaced by interpolated grids, and the edited grids will remain unmodified.

The interpolation algorithm may be changed through the GFE->Editing Preferences->Interpolation Algorithm... menu entry. This brings up the Interpolation Algorithm Dialog, from which the type of interpolation may be selected.

Copy Grid

Now and then it is useful to copy a grid from one time period to another. The next exercise shows you how to copy individual grids from one time to another.

Purpose: Copy a grid from one time period to another.

The method described in this exercise allows you to copy any grid that is in the Grid Manager to any other weather element, provided that the destination weather element shares the same units (e.g., Temperature and Dew Point) or the units can be converted automatically.

1. Make sure there is a weather element with at least one grid block and one gap visible.
2. MB3 press over the grid you wish to copy and select from the pop-up menu Copy Grid.
3. Now move your cursor to a gap in the same Weather Element. Press and hold down MB3 again, and this time select Paste Grid.

When you executed the Copy Grid operation, a copy of that grid was placed in a paste buffer. Selecting Paste Grid over a gap or another grid replaces that gap or grid with the contents of the copy buffer.

Load T (temperature) and Td (dewpoint) into the GFE (if they are not already loaded). Repeat this exercise using one of the T grids as the source and Td as the destination. Note that you may copy a grid from one weather element to a different weather element as long as they both share the same units (in this case degrees F) or the units can be converted automatically.

Paste Grid

Now that you learned to copy a grid, you can paste the same grid into a gap or over an existing grid.

Purpose: Paste a previously copied grid into a new time period.

1. Perform the Copy Grid exercise above, if you have not already done so.
2. Move the cursor over to a gap in the same weather element.
3. MB3 press and select Paste Grid.

Note the the grid that you copied in the previous exercise has now been pasted into a different time period.

Stretch a grid's valid time period

Purpose: Modify a grid's valid period by stretching

Some weather elements such as Wx, frequently change very little over long time periods. In this case, rather than repeating the same grid over and over, it is useful to define a single grid that is valid over the entire (longer) time period. This operation shows you how to extend the time period over which a grid is valid.

1. Press and hold MB2 over a grid block that is adjacent to a gap.
2. While holding down MB2, drag the cursor to the left or right until you see the grid block stretch.
3. Release MB2

As you drag MB2 left and right, you should notice that you are extending the end time of the grid forward in time (right) or extending the start time backwards in time (left). There is no way to directly shrink a grid block in time. An indirect method is to Split the grid, and then delete the unneeded grid.

Repeat this exercise, but this time stretch the grid block so that it overlaps into one or more existing grid blocks. Once you release the mouse button, any grid blocks that overlapped the new grid block (or portions thereof) are removed from the inventory. This is one way to shorten the time over which a grid block is valid.

Create Grid from Scratch

Purpose: Create a brand new grid without using the "Copy From..." capability.

Occasionally, you may want to create a new grid from scratch instead of copying one from a model, or another parameter, or by using interpolation. The Create From Scratch feature was made for this situation.

1. Press and hold MB3 over a gap (a place with no grid block) within an editable weather element.
2. Select Create From Scratch from the pop-up menu.

A new grid should appear over the gap block that you selected. This new grid has the minimum time period allowed for that weather element, but it can always be stretched or copied to a new time period. The default value of this grid varies by parameter, but is usually the minimum value allowed (e.g., temperature, value = -30F). Generally the next step is to define the values of the grid points using one of the Spatial Editor tools described in the Spatial Edit tools section.

Note that you can also create grids from scratch through the GFE Main Menu's Grid's entry.

Delete Grids

Purpose: Remove one or more grids from the forecast.

1. Using MB1, select a time period for any weather element that contains some grid blocks.
2. From the main menu bar select **Grids->Delete Grids**.

Note that the grids that you identified were removed from that weather element's inventory. Now try a variation on the previous exercise.

1. Find a grid block and stretch it until its duration is many hours long.
2. Select a time period that corresponds to a portion of that same time block using MB2,
3. From the main menu bar select Grids->Delete Grids.

This time, since you only selected a portion of the grid block, only that portion was deleted. This is another way that you can shorten the time period over which a grid is valid.

Another technique can be used to delete a single grid.

1. Find a grid block.
2. MB3 popup over the grid block and select Delete Grid from the popup.

Split Grids

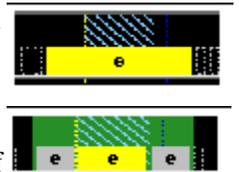
Purpose: Divide a grid into two or three separate grids.

The Split operation is used to divide a single grid into two or three parts in time. The resulting parts may then be edited independently, providing more temporal detail to the forecast. This particular split operation is invoked from the GFE main menu by selecting Grids->Split Grids. There is another Spilt Grids operation that can be executed from the MB3 Pop-up menu as well. See the section Split Grids to learn how to split grids using the MB3 Pop-up option.

1. Select a new time period over a single grid with such that only a portion of the grid is selected.
2. From the main menu select **Grids->Split Grids**.

You should end up with something that looks like the figure to the right.

Note that the grid was severed at the edges of the selection. There are three separate grids now, each of which have gridded values identical to the original grid.



Fragment Grids

Purpose: Divide a grid into its smallest possible temporal parts

The Fragment Grids operation also splits grids into smaller temporal parts. But Fragment differs from Split in that it divides grids into their smallest possible time blocks.

1. Find or make a long duration T (temperature) time block as in the previous exercise and select it using the MB1 drag operation. It should look something like this.
2. From the main menu select **Grids->Fragment Grids**.



You should now see that over the time period that was selected, many smaller duration grids have replaced the long duration grid. If you select just a portion of the grid, only that portion will be fragmented. Each of the grids has the same gridded values as the original. The result should look something like this:



Another technique can be used to fragment a single grid from the MB3 Pop-up menu. See the section on the Grid Manager Button 3 Pop-up options for more information on how to Fragment grids using the MB3 Pop-up Menu.

Assign Pickup Value

Occasionally you might find it useful to set the gridded values of a group of grids to the pickup value, as if you were starting from scratch. The Assign Pickup Value function was made for this situation.

1. Select one or more grids using the MB1 drag operation.
2. From the main menu select **Grids->Assign Pickup Value**. Note that the menu doesn't actually say "Pickup Value". The actual pickup value is displayed instead of the words.

All of the gridded values of the grid that were selected now have the current pickup value, which is indicated in the color bar.

Note that the Assign Default Pickup operation is also available from the MB3 pop-up menu in the Grid Manager, but as with all MB3 pop-up menus the operation applies only to the grid under the cursor, not to the set of selected grids.

To quickly set the pickup value to a single grid, use this technique:

1. Position the cursor over the grid block you wish to assign the pickup value to.
2. MB3 pop-up over the grid block, and select Assign [x], where x is the pickup value.

Assign Default Value

Occasionally you might find it useful to set the gridded values of a group of grids to a single default value, as if you were starting from scratch. The Assign Default Value function was made for this situation.

1. Select one or more grids using the MB1 drag operation.
2. From the main menu select Grids->Assign Default Value. Note that the menu doesn't actually say "Default Value". The actual default value is displayed instead of the words.

All of the gridded values of the grid that were selected now have the default value, which varies for each Weather Element. Generally, this value is the minimum allowed value for that Weather Element (e.g., Temperature = -60 F). Note that the Assign Default Value operation is also available from the MB3 pop-up menu in the Grid Manager, but as with all MB3 pop-up menus the operation applies only to the grid under the cursor, not to the set of selected grids.

To quickly set the value of a single grid to the default value, use this technique:

1. Position the cursor over the grid block you wish to assign the default value to.

MB3 popup over the grid block, and select Assign [x], where x is the default value.

Run Smart Tools

A set of smart tools (specified via gfeConfig) may appear. The default set is "Show_ISC_Area", "Show_ISC_Grid" and "Show_ISC_Highlight". These tools are described in the Intersite Coordination Training Guide.

Send ISC Grid

The Send ISC Grid popup entry appears for grids in your Fcst database, if you have enabled the ISC capability of the GFE. Selecting this item will send this single grid to all offices defined in your configuration file. Refer to the Intersite Coordination Training Guide for more details.