ArcGIS® 9

Using ArcGIS Tracking Analyst

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Quick-start tutorial

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The best way to learn Tracking Analyst is to try it yourself. This chapter guides you through three exercises that will help you gain some basic skills in adding, symbolizing, and replaying fixed-time temporal data from disk in ArcMap, as well as how to apply actions to the data.

You'll be using data from hurricanes in 2000. You will add the temporal shapefile, customize how you want it to display on the map, and then play back the data. Then you'll use the Actions tab to apply a highlight to a hurricane when its winds reach or exceed a certain velocity.

Exercise 1: Adding and symbolizing temporal data

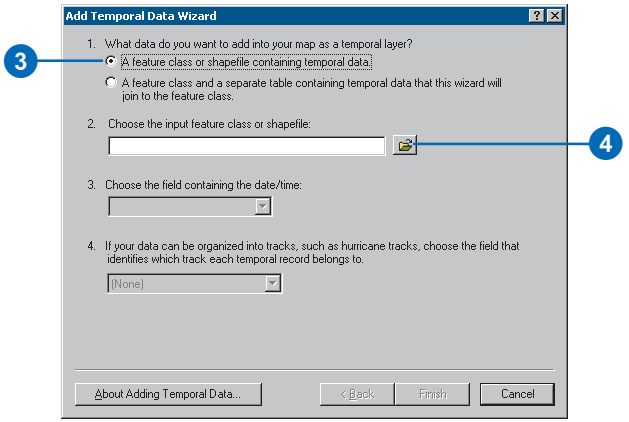
The scenario for the following exercises involves hurricane data from 2000. You'll add a shapefile of hurricanes containing temporal information to an existing ArcMap document (.mxd file) using the Add Temporal Data Wizard. Then you'll symbolize the data to indicate passing time. For procedures for adding real-time data, refer to Chapter 8, 'Working with real-time data'.

Adding a shapefile or feature class

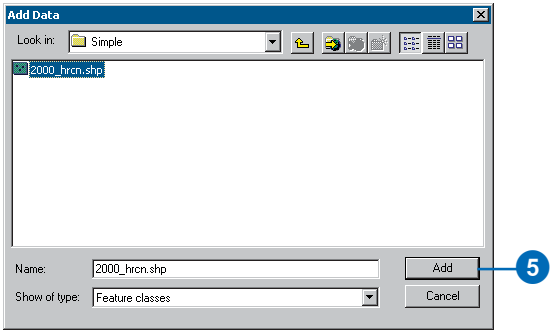
The following exercise leads you through the steps of adding a shapefile containing fixed-time data from disk. This shapefile contains simple temporal event data. For more information on simple and complex events, refer to Chapter 3, 'Working with temporal data'.

1. Start ArcMap and open the hurricanes2000.mxd file from your sample data folder.
2. Click the Add Temporal Data Wizard button on the Tracking Analyst toolbar. The wizard opens within the ArcMap window.

3. Leave the first button clicked to browse for a feature class or shapefile.
4. Click the Browse button to find the shapefile.



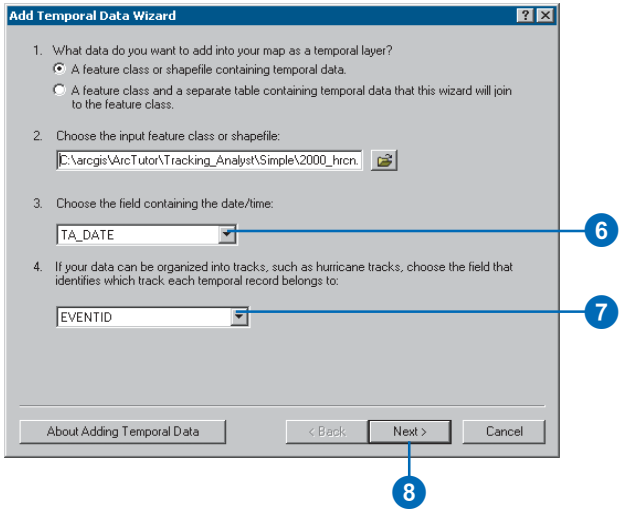
5. Click the 2000_hrcn.shp shapefile in your sample data folder and click Add.



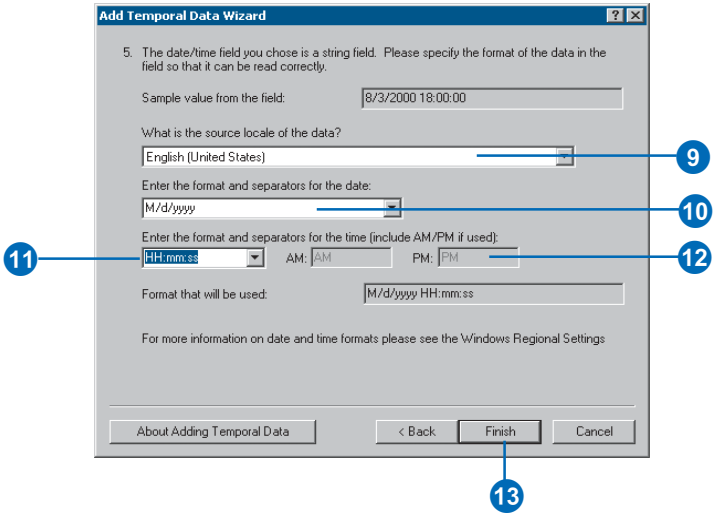
The file's pathname appears in the Add Temporal Data Wizard, and the two text boxes below it are enabled with default values.

6. Click the date/time field dropdown arrow and click TA_DATE. This tells ArcMap to look in this field for the temporal component of the data. Tracking Analyst Symbology settings will also use this field to determine how symbols will draw during playback.
7. Click the track identifier field dropdown arrow and choose EVENTID from the fields listed. The ID field identifies each object in the dataset. Tracking Analyst uses it to apply tracks to data and to join complex temporal events.
8. Click Next.

   Note: If your date and time information resides in a date field, as opposed to a string field, you will see a Finish button instead of Next.



   Note: The first field on the panel is a sample of your data pulled from the first field of the dataset you are adding.



9. Click the dropdown arrow to choose a locale corresponding to the data you are adding. Available date and time formats may update automatically.
10. Click the dropdown arrow to choose a date format that best matches your data. Use the sample record from your data at the top of the dialog box panel for guidance.

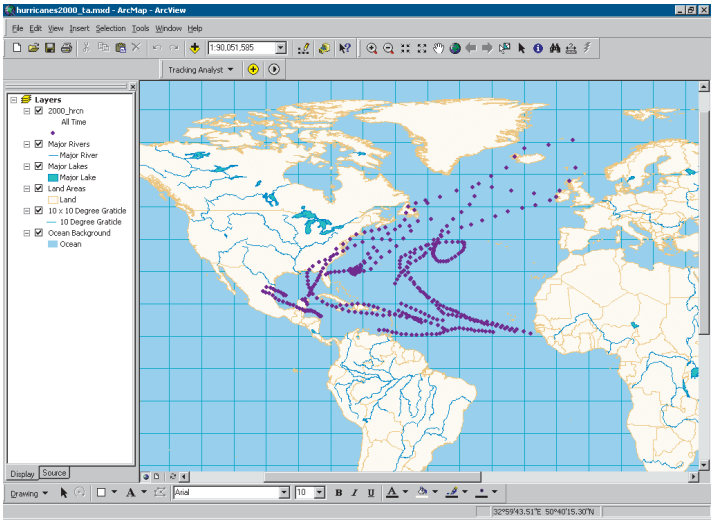
    Note: If this format differs greatly from the Windows short date format, the data may not be evaluated correctly.
11. Click the dropdown arrow to choose a time format that best matches your data. Use the sample record from your data at the top of the dialog box panel for guidance.

    Note: If this format differs greatly from the Windows short date format, the data may not be evaluated correctly.
12. Enter AM and PM designators, if needed.

A preview of the date and time format you have specified appears in the last field fo the panel

13. Click Finish to add the data to your map.

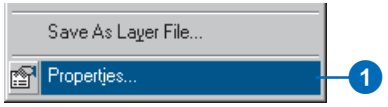
The layer appears in the table of contents with a default base symbol and a label of All Time, and the data appears on the map. In the next procedure, you will modify the data's symbology to indicate the passage of time as the data occurred.



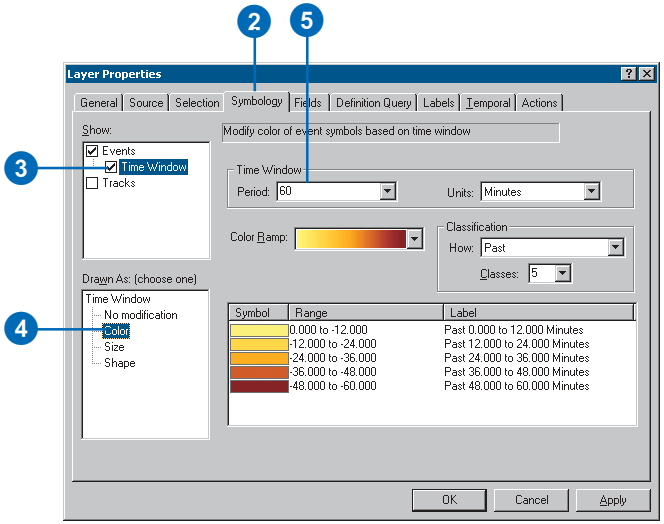
Symbolizing temporal data

The Tracking Analyst extension allows you to set time-specific symbology so your data will display differently depending on its temporal components. Using the Symbology tab in the ArcMap Layer Properties dialog box, you can change color, shape, size, and time ranges.

1. Right-click the temporal layer you just added and click Properties. The Layer Properties dialog box opens.

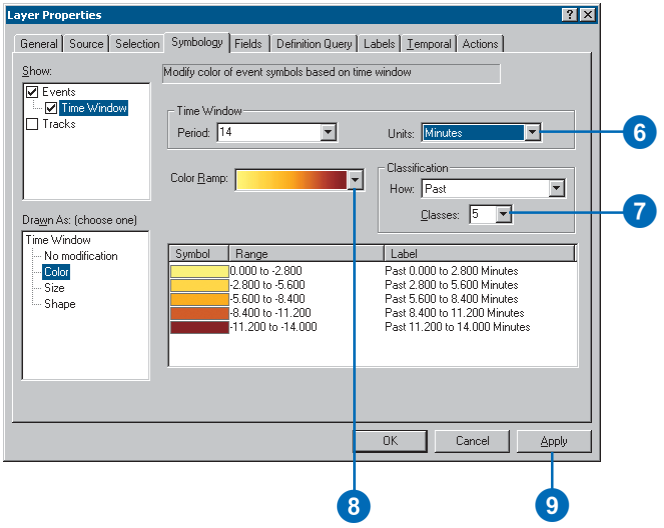


2. Click the Symbology tab.
3. Check the Time Window check box in the Show panel.
4. Click Color in the Drawn As panel.
5. Click in the Period text box and type 14.

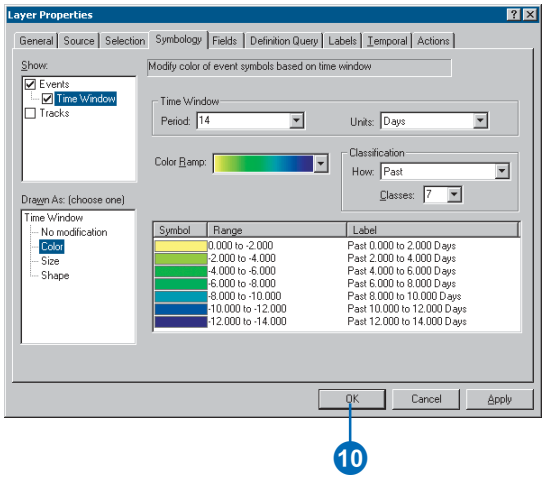


6. Click the Units dropdown arrow and click Days.
7. Click the Classes dropdown arrow and click 7 to divide the color range into seven classes of two days each.
8. Click the Color Ramp dropdown arrow and click on a color range that will show contrast when replaying data.
9. Click Apply to accept these changes, which now appear in the legend panel of the Symbology tab.

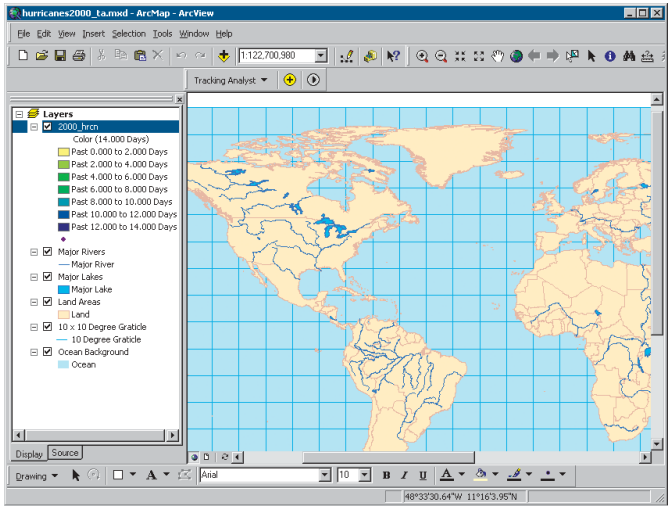
   For more information on the settings in this dialog box, you can click the Help button on the title bar and click on the desired control to activate the Tracking Analyst context-sensitive help.



10. Click OK to accept changes and close the dialog box.



The new color range appears under the layer in the ArcMap table of contents. At this point, you will not see any data displayed on the map, because you have changed its temporal display properties. In the next exercise, you will display the data using the Playback Manager.



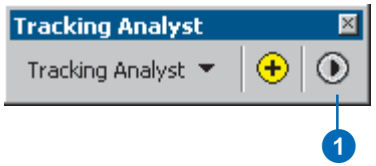
Exercise 2: Replaying temporal data

You've already gone through the procedure for symbolizing data according to its temporal components, including setting time ranges to display, specifying classes, and viewing the new symbology in the ArcMap table of contents. The following procedure takes you through the steps of replaying the data using the Playback Manager.

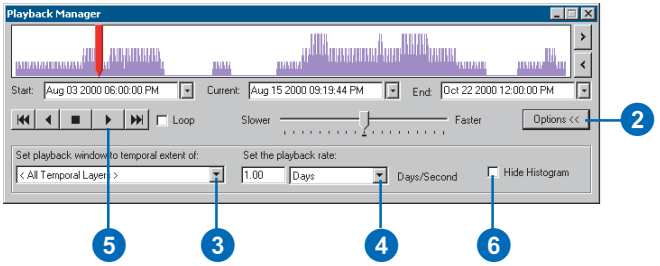
Replaying symbolized temporal data

In the previous exercise, you've indicated that the data's color be modified according to its temporal components. Now you'll use the Playback Manager to replay the data as it occurred. In the Playback Manager, you can set start and end times, the playback window of data to replay, the speed of the playback, and whether you want the data to replay in a continuous loop. For more information on any item in the Playback Manager, you can click the question mark button and then the item to access Tracking Analyst's context-sensitive help.

1. Click the Playback Manager button on the Tracking Analyst toolbar. The Playback Manager opens.



2. Click Options to see a full view of the dialog box.
3. Click the Set playback window to temporal extent of dropdown arrow and click 2000_hrcn, which is the temporal data layer you just added.



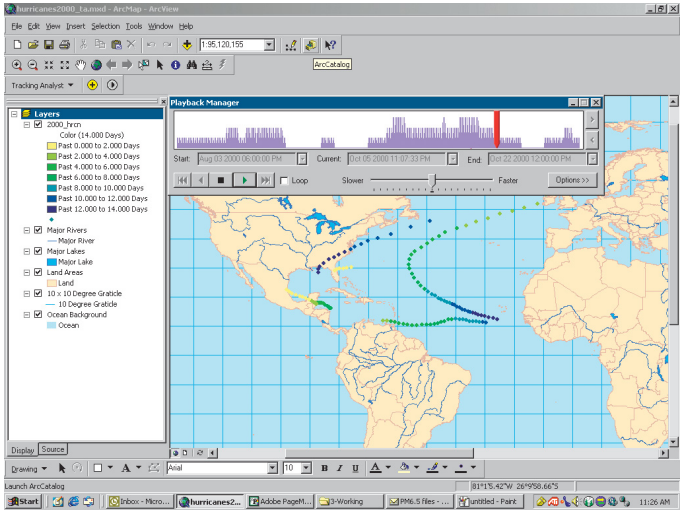
Note: This setting adjusts the start and end times of the playback window to include the temporal information for all data in the selected layer or layers. If you have added more than one temporal layer, you can set the temporal extent—start and end times—to all temporal layers, only those that are visible, or just a single layer.

4. Click the Playback Rate dropdown arrow and choose Days as the unit.
5. Click the Play button. The Playback Manager remains open, indicating progress of the playback, and the data begins to replay on the map.
6. If you want to condense the dialog box, you can click Hide Histogram to show the Playback Manager without the histogram.

   You can speed up or slow down the playback rate by clicking and dragging the speed indicator in the center of the Playback Manager to the Slower or Faster setting. Click the Loop check box to play the data continuously.

   The histogram at the top of the Playback Manager shows the amount of data available at a given time in the set temporal extent. You can change the Start, End, and

Current times by clicking the dropdown arrows beside those fields, or you can click in the fields to edit the date and time settings directly.



If you want to nudge the playback forward or backward while not playing data, you can click on the Next and Previous buttons to the right of the histogram. These buttons adjust the current date being displayed by a set increment, determined by the playback rate, plus any adjustments made to the speed using the slider bar. You can only use the Next and Previous buttons when not playing data.

You can also affect data display by clicking and dragging the time indicator or by clicking on the histogram at any point, which will set that point to the current time.

Note: If you have applied labels to a layer, they will not display on the map when you click and drag the time indicator in this manner for performance reasons.

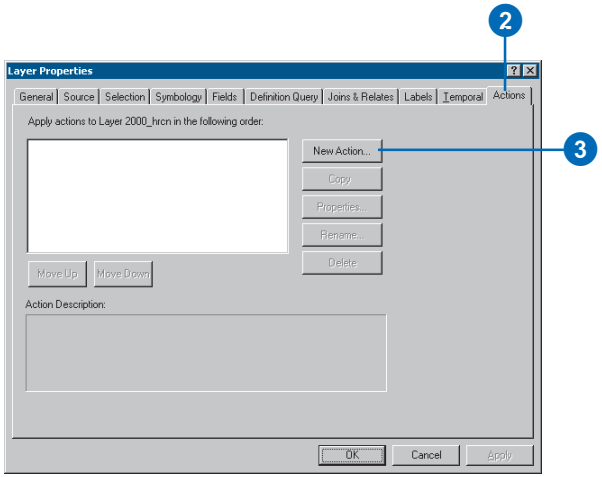
Exercise 3: Applying actions

You can create and apply actions that will affect the data's display or properties. In the following exercise, you will apply a highlight action that will affect the display of the temporal data layer during playback. You will enter parameters in the Action Wizard to highlight a hurricane's path when it meets or exceeds a certain wind speed.

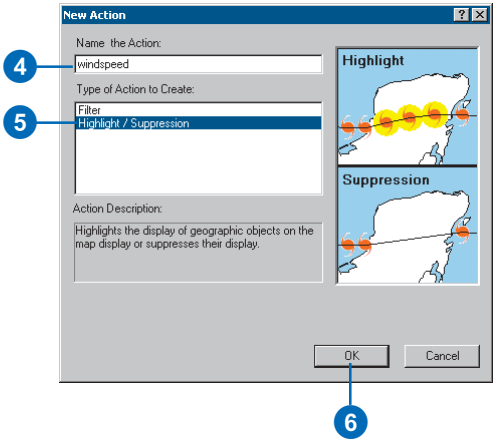
Creating a highlight action for playback

In the previous exercise, you replayed your symbolized data using the Playback Manager. In this exercise, you will add an enhancement to your playback by highlighting wind speeds of 75 mph and higher. You will use the Actions tab in the Layer Properties dialog box to apply the highlight.

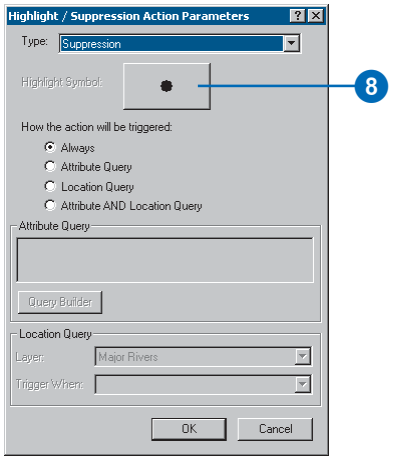
1. Right-click the 2000_hrcn temporal data layer in the table of contents and click Properties.
2. Click the Actions tab in the Layer Properties dialog box.
3. Click New Action. The New Action dialog box opens.



4. Click the text box and type "windspeed" as a name for the action.
5. Click Highlight / Suppression in the Type of Action to Create panel.
6. Click OK. The Highlight / Suppression Action Parameters dialog box opens.

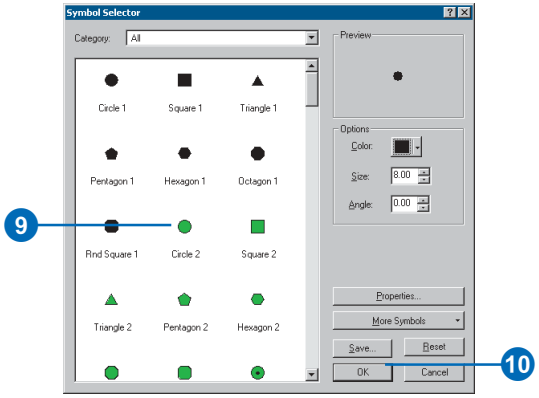


7. Leave the Type dropdown default of Highlight.
8. Click the Highlight Symbol button to open the ArcMap Symbol Selector dialog box.



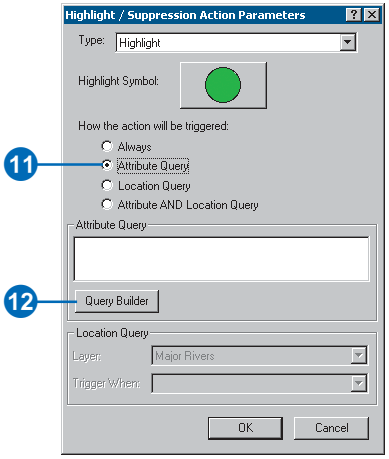
9. Scroll down and click the bright green circle symbol. Then adjust its size in the Options panel to the right.

10. Click OK. The symbol appears on the Highlight Symbol button in the Highlight / Suppression Action Parameters dialog box.

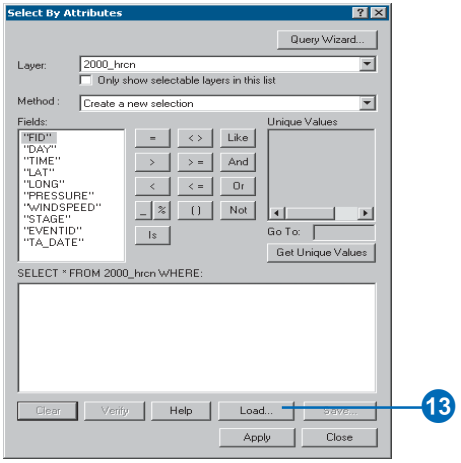


11. Click the Attribute Query button.

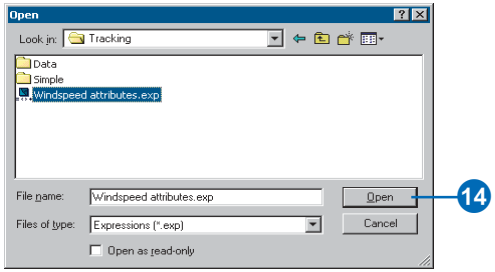
12. Click Query Builder.



13. Click Load to access the Open dialog box.

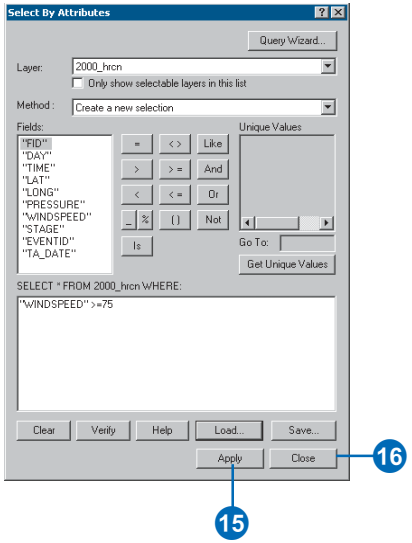


14. Click Windspeed attributes.exp in the sample data folder and click Open.



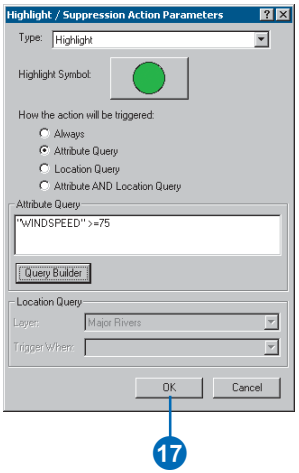
15. Click Apply to apply the new attribute query to the data layer.

16. Click Close.



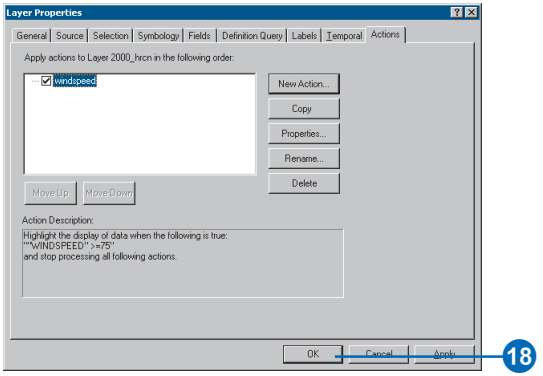
Note: In this example, you're loading an existing expression. If an expression doesn't already exist, you can set up your own expression using the controls in this dialog box.

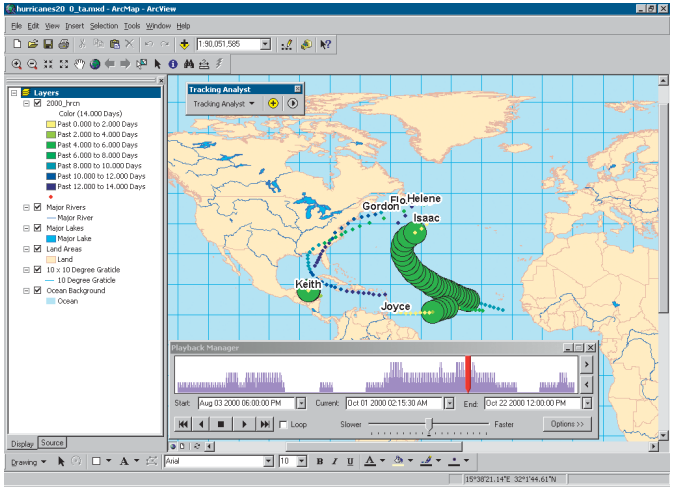
17. Click OK in the Parameters dialog box. The new action appears in the list panel of the Actions tab.



Note: You can highlight any action in the list panel to see more detail about it in the Action Description panel at the bottom of the tab.

18. Click OK.



19. Go through the steps of Exercise 2 to run the Playback Manager and view the changes you've made to the highlight setting.

In the example below, the highlight symbol is a bright green circle, which appears during playback but not in the table of contents. This circle indicates when a given hurricane reached a wind speed of 75 mph or higher.