Chapter 4 Selecting Hurricane Hazards

This chapter presents guidelines for applying hurricane hazards to selected portfolios. Three types of analyses are available in ***USWIND***.

- **Deterministic analyses** using scenario hurricanes based upon past historical events or user-defined inputs.
- **Probabilistic analyses** using a database representing simulations of approximately one half million events along the East Coast and Gulf Coast of the United States.
- **Landfall Series analyses** for scenario hurricanes landfalling at 35, 10, or 1 mile intervals along the U.S. coastline.

The impact that an event has on a portfolio is determined using the extensive reporting capabilities described in Chapter 6.

This chapter includes the following sections:

4.1 **Selecting a Historical or User-Defined Storm** – Selecting an existing storm to apply to the current portfolio.

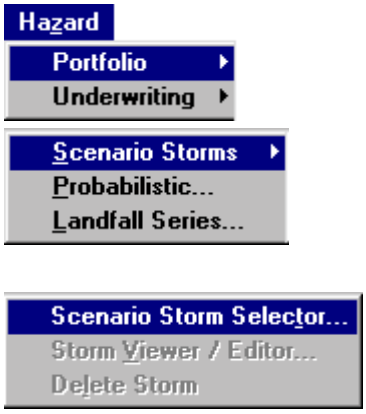
4.2 **Editing or Drawing a User-Defined Storm** – Changing parameters or modifying the path of the selected storm, then saving this as a new storm scenario; or drawing a new storm by clicking on the map and establishing a set of storm parameters.

4.3 **Setting Up Probabilistic Loss Calculation** – Enabling ***USWIND*** to estimate exposure based on overall statistical calculations rather than particular storms.

4.4 **Selecting Landfall Series Storms** – Selecting particular mileposts and storm intensities at landfall to apply to current portfolio.

4.1 Selecting a Historical or User-Defined Storm

This section contains procedures for selecting an existing storm to apply to the selected portfolio (see Chapter 3). To select a storm for the current portfolio:



⇒ Select Scenario Storm Selector from Scenario Storm submenu of the Hazard menu.

*If you have previously selected Probabilistic or Landfall Series storms (see sections 4.3 and 4.4), **USWIND** displays the following message:*

Clear all [probabilistic or *landfall series*] settings and results?

⇒ Click on **Yes**.

The Storm Selection Criteria Dialog Box displays to filter the list of storms.

In the *Storm Selection Criteria* Dialog Box, options display for you to narrow down the list of available hurricanes, as follows:

- **Storm Type** – Either **Historical** storms, from the ***USWIND*** database, or **User Defined** storms that you have created previously (see the following section).
- **Wind Region** – Storms affecting the **US Mainland**, **Puerto Rico**, or **Hawaii**.
- **Display [SSI]** – Storms of one or more levels (**1 - 5**) of Saffir-Simpson Intensity (SSI).
- **Primary Sort By** and **Secondary Sort By** – Storms are listed alphabetically by **Name**, numerically by **SSI**, or chronologically by **Date**, for the primary and secondary sorts.

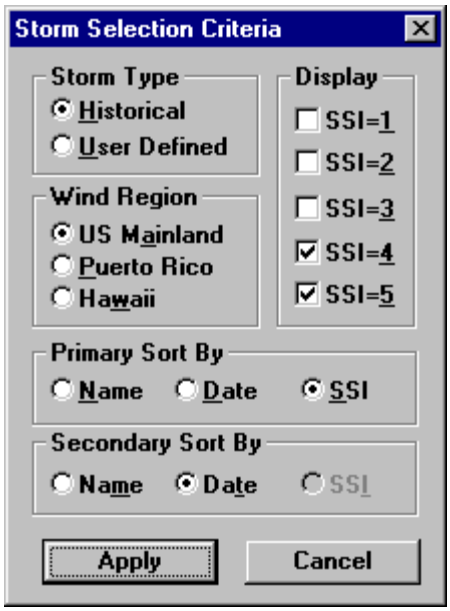


Figure 4-60: Storm Selection Criteria Dialog Box

⇒ Click on the criteria for the list of selectable storms (in this case, Storm Type - **Historical**, and Display - **SSI=4** & **SSI=5**); then click on **Apply**.

The Storm Selector Dialog Box appears.

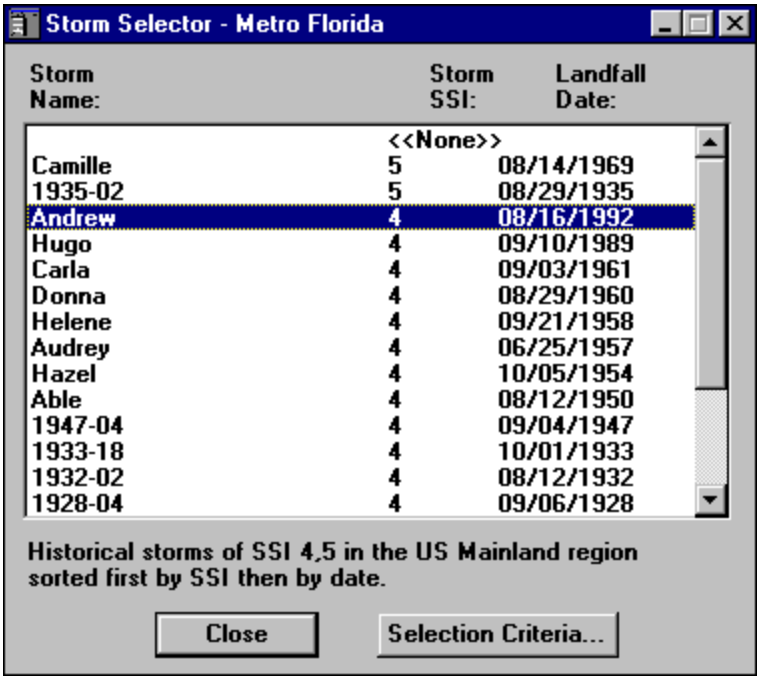


Figure 4-61: Storm Selector Dialog Box

The preceding example (Figure 4-61) lists all **Historical** storms having landfalls on the **US Mainland** with an SSI of **4** or **5**, sorted by **Date** within **SSI**.

⇒ Click on a particular storm you want to select in the dialog box list.

OR

⇒ Click on a storm path on the map, which interactively highlights that storm in the dialog box list.

⇒ Then click on **Close**.

The Portfolio Map redisplays, leaving the selected storm path only.

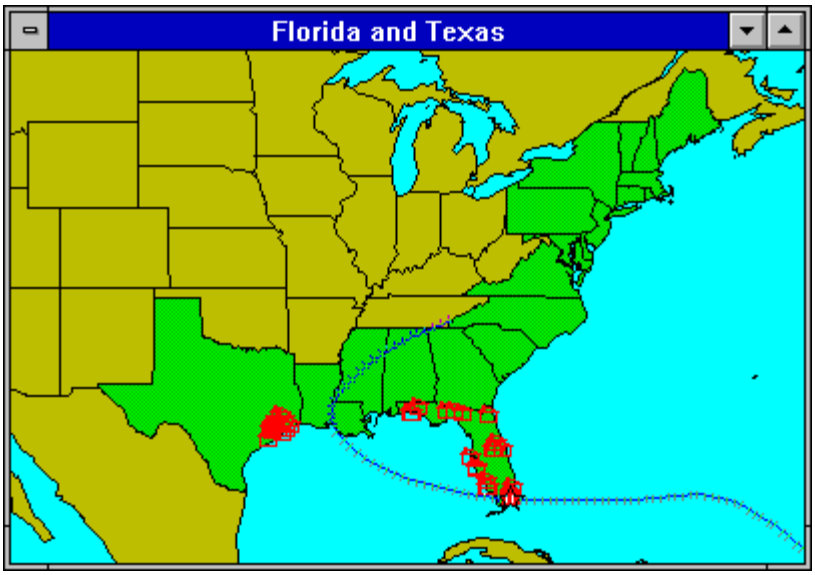


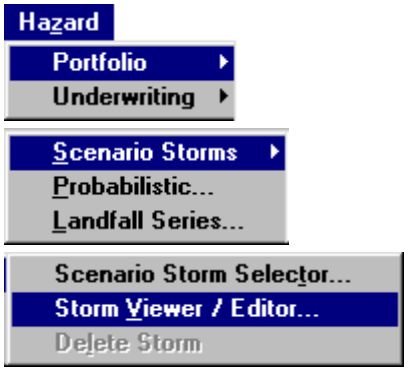
Figure 4-62: Portfolio Map – Storm Selected

4.2 Editing a User-Defined Storm

Once you have selected a storm (see Section 4.1), you can edit it either by inputting different data or by modifying the storm path on the map. Then, you can save your changes as a user-defined storm for future use.

4.2.1 Changing Storm Parameters

To edit the selected storm by modifying storm parameters, the first step is to access the *Storm Viewer/Editor* Dialog Box:



⇒ Select **Storm Viewer/Editor** from the **Scenario Storms** submenu of the **Portfolio** submenu of the **Hazard** menu.

The Storm Viewer/Editor Dialog Box displays.

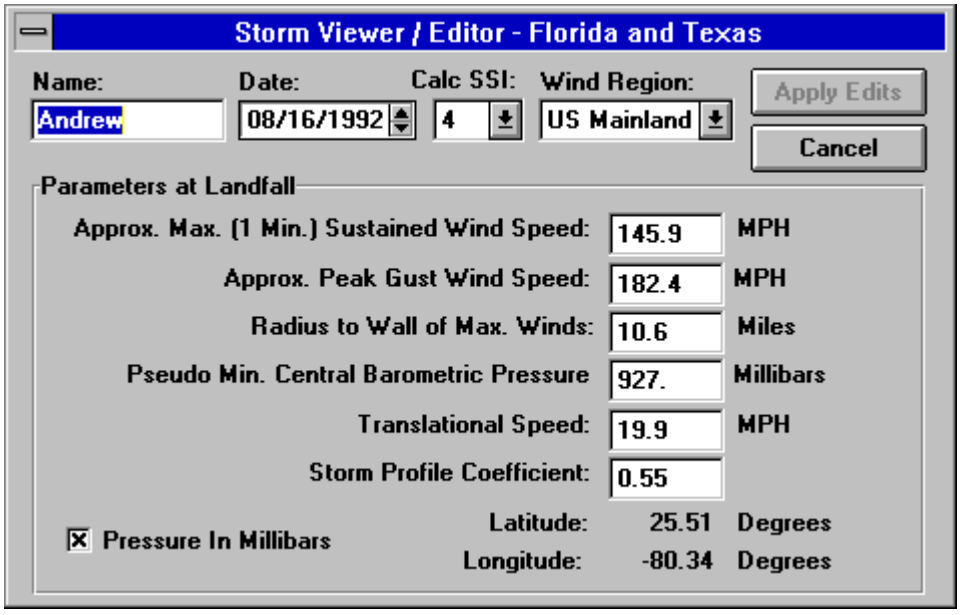


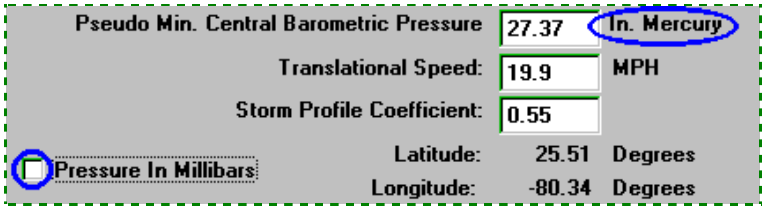
*Figure 4-63: Storm Viewer Editor – [*Portfolio Name*] Dialog Box*

Apply Edits

⇒ Type over or reselect data from the drop-down lists; then click on **Apply Edits**.

Note

If you deselect the **Pressure in Millibars** checkbox, pressure is instead measured in **Inches Mercury**.



Note

If the **Calc SSI** field is changed (e.g., to "5") the various parameters at Landfall will change to maintain a consistency with the desired intensity. Similarly, if the **Barometric Pressure** is lowered, the **Max Sustained Wind Speed** will also change to maintain consistency.

The Portfolio Map redisplays with the storm modified according to your specifications.

Note

If you modify a Historical storm, ***USWIND*** displays the following message:

```
Save changed copy of Historical Storm as User Storm?
```

⇒ Click on **OK** to save your changes.

If you rename a storm, or save a changed historical storm as a new user-defined storm, that storm is available the next time you select from the list of user-defined storms (see Section 4.1).

4.2.2 Modifying a Storm Path

Storms are graphically represented in ***USWIND*** by a line tracing the storm path, with *nodes* wherever the path changes direction. As detailed in the following sections, ***USWIND*** lets you change the selected storm path on the map by moving, adding, or deleting nodes, or by moving the entire path to a different landfall point.

Moving Nodes

From the *Portfolio Map* with a storm selected (see page 1):

⇒ Click on the Reshape **Storm** tool.

⇒ Click on a node. (Click again to deselect a node. Press **Shift** and consecutively click to select more than one node.)

⇒ Hold down the mouse button and drag the node(s) to the new location; then release the mouse button.

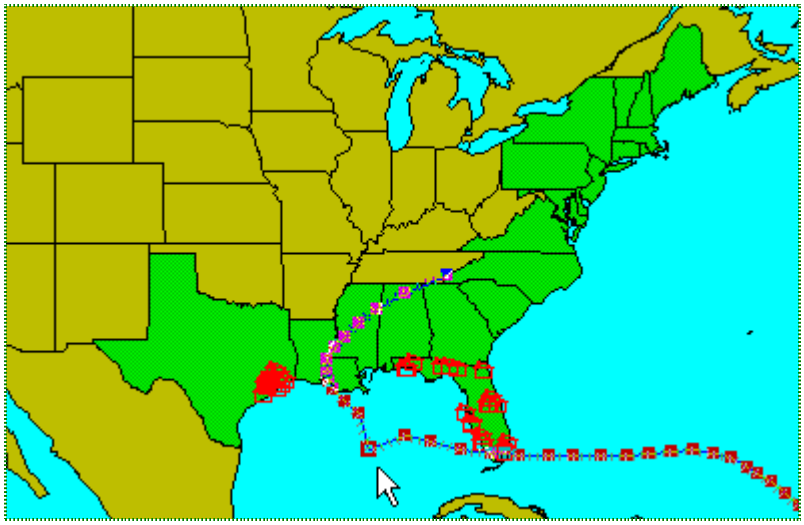


Figure 4-64: Portfolio Map – Reshaping

⇒ To save the modified path, see *Saving Map Edits*, page 4-11.

Adding Nodes

From the *Portfolio Map* with a storm selected (see page 1):

⇒ Click on the **Reshape Storm** tool to display existing nodes (see the preceding subsection).

⇒ Click on the **Insert Nodes** tool.

⇒ Move to where you want to add a node on the existing storm path, then click on that location.

USWIND *adds a node to the selected storm where specified.*

⇒ To save the added node as part of the user-defined storm, see *Saving Map Edits*, page 4-11.

Once a node has been added to the storm path, it can be moved as described previously.

Deleting Nodes

From the *Portfolio Map* with a storm selected (see page 1):

⇒ Click on the **Reshape Storm** tool.

⇒ Move to the node you want to delete; then click on that node. (Click again to deselect a node. Press **Shift** and consecutively click to select more than one node.)

⇒ Press the **Delete** key.

USWIND *deletes the selected node(s).*

⇒ To permanently delete the node from the selected storm, see *Saving Map Edits*, page 4-11.

Moving the Storm Path

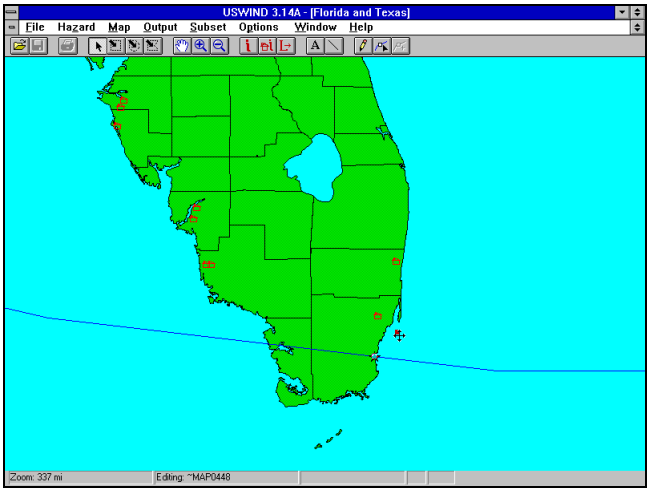
To move the storm path without changing any of the nodes:

⇒ Click on the landfall point on the storm.

⇒ Hold the mouse button down and drag the path to the new location.

⇒ Release the mouse button.

In the illustration below, the landfall point, represented by a star, is dragged up the coast.



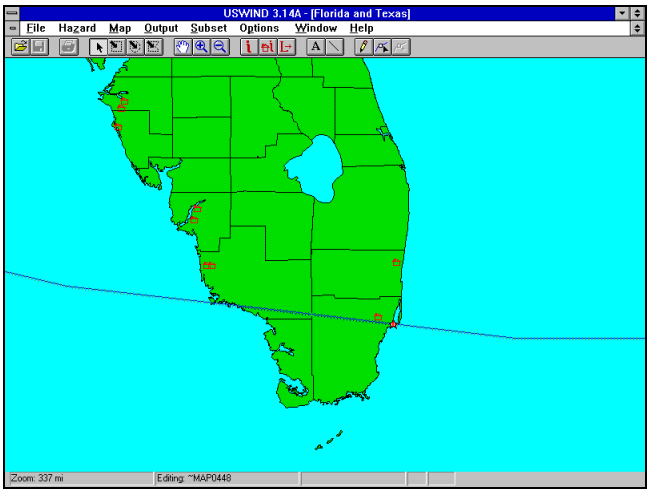


Figure 4-65: Landfall Point Moved

After moving the path of an historical storm, the Storm Name Dialog Box displays for you to save the modified storm under a new name.

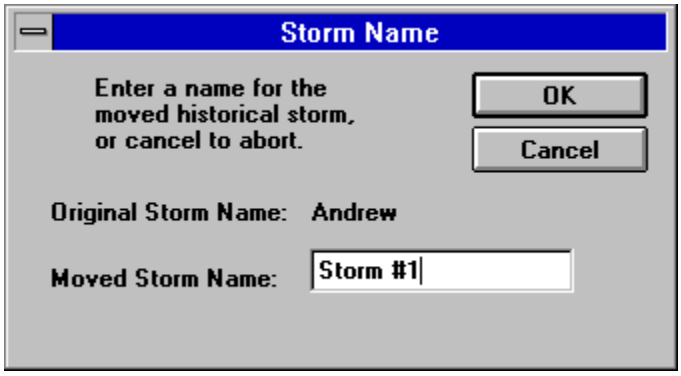


Figure 4-66: Storm Name Dialog Box

⇒ Type a new name for the storm; then click on **OK**.

Saving Map Edits

After adding, moving, or deleting nodes from a map:

⇒ Click anywhere on the map outside the storm path.

The Reshaped Storm Parameters Dialog Box displays.

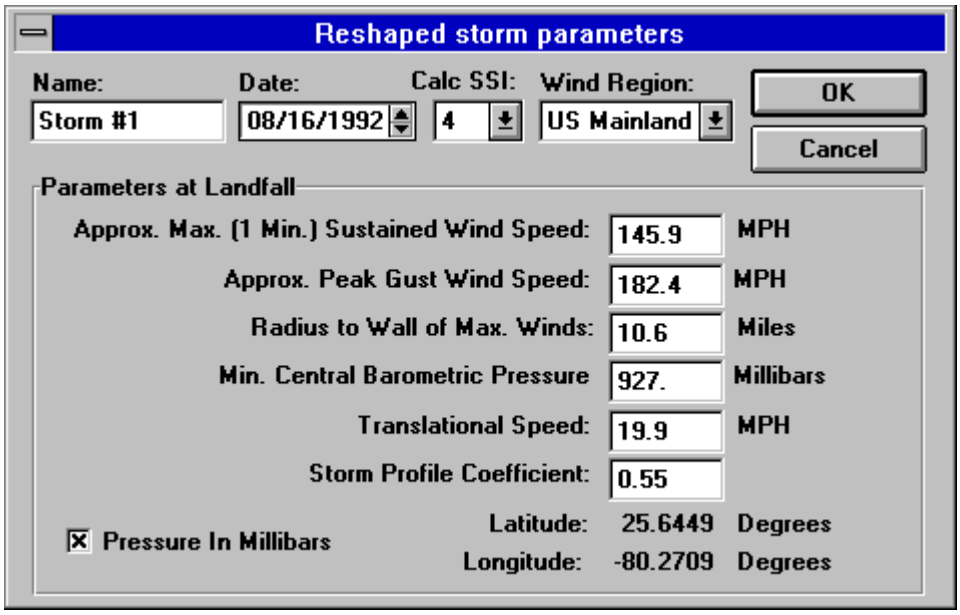


Figure 4-67: Reshaped Storm Parameters Dialog Box

⇒ You can optionally save the changed storm under a new name by typing over the **Name** field (you can also change any other parameters at this point); then click on **OK**.

***USWIND** saves your edits.*

Once you have created a new file name for the changed storm, when you select a new storm, the *Storm Selector* Dialog Box (see Figure 4-61) will include the renamed or newly named storm when you click on **User Defined** (see Figure 4-60).

4.2.3 Drawing a New Storm

To create a new user-defined storm:

⇒ Click on the **Draw Storm** tool.

⇒ Move to where you want to insert the first node; then click on that location.

⇒ Continue to move and then click for each node to be included in the storm.

⇒ When you are finished, double-click on the node you want to be the end of the storm path; or press **Esc**.

The Storm Editor Dialog Box displays.

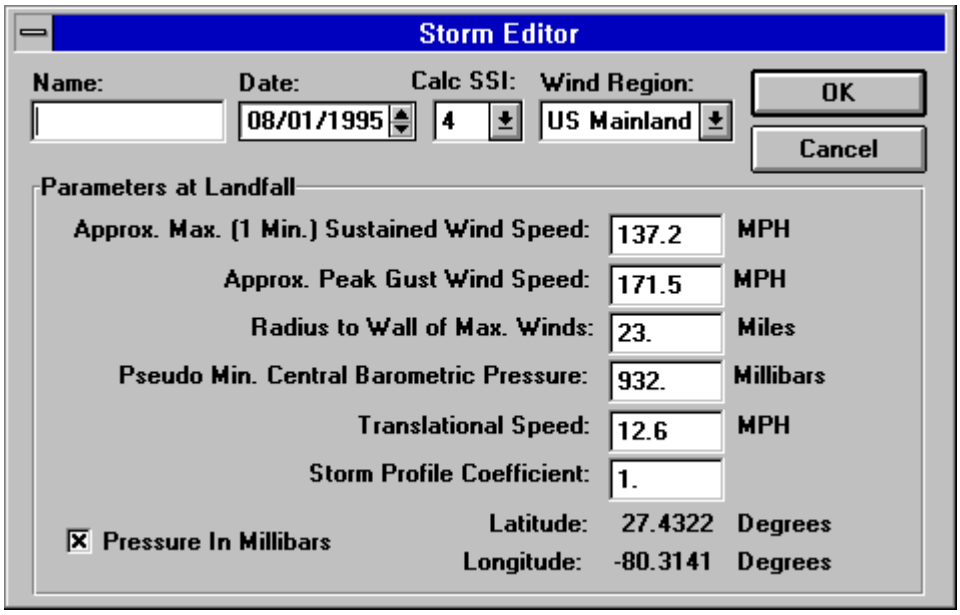


Figure 4-68: Storm Editor Dialog Box

⇒ Type or select fields from the drop-down lists (including a **Name** for the new storm); then click on **OK**.

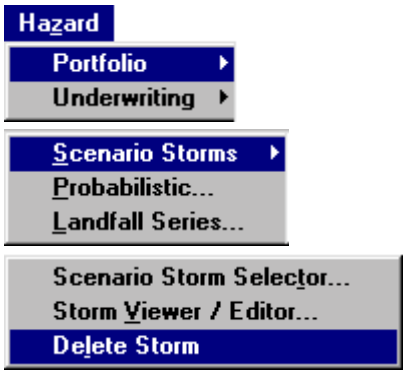
***USWIND** saves the new storm under the specified name.*

To automatically insert the current date when entering the **Date** field:

⇒ Press **F3**.

4.2.4 Deleting the Selected User-Defined Storm

To delete the selected user-defined storm:



⇒ Select **Delete Storm** from the **Scenario Storms** submenu of the **Portfolio** submenu of the **Hazard** menu.

USWIND *displays the following message:*

```
Delete selected storm?
```

⇒ Click on **Yes** to delete the storm.

The **Delete Storm** menu selection is only enabled if the selected storm is a user-defined storm.

4.3 Setting Up Probabilistic Loss Calculation

To switch to Probabilistic mode (for ***USWIND*** to estimate exposure based on statistical probabilities rather than specific storm scenarios or landfall series):

⇒ Select **Probabilistic** from the **Portfolio** submenu on the **Hazard** menu

*If you have previously selected Scenario Storms or Landfall Series storms (see sections 4.1 and 4.4), **USWIND** displays the following message:*

```
Clear all [scenario storms or landfall
    series] settings and results?
```

⇒ Click on **Yes**.

USWIND *displays the following message:*

```
Probabilistic Mode Enabled
```

⇒ Click on **OK.**

See Chapter 6 for instructions on generating Probabilistic reports.

4.4 Selecting Landfall Series Storms

To select specific landfall sites and storm intensities to apply to the current portfolio:

⇒ Select **Landfall Series** on the **Portfolio** submenu on the **Hazard** menu

*If you have previously selected Scenario Storms or Probabilistic storms (see sections 4.1 and 4.3), **USWIND** displays the following message:*

```
Clear all [scenario storms or probabilistic]
          settings and results?
```

⇒ Click on **Yes**.

The Landfall Series Types Dialog Box displays.

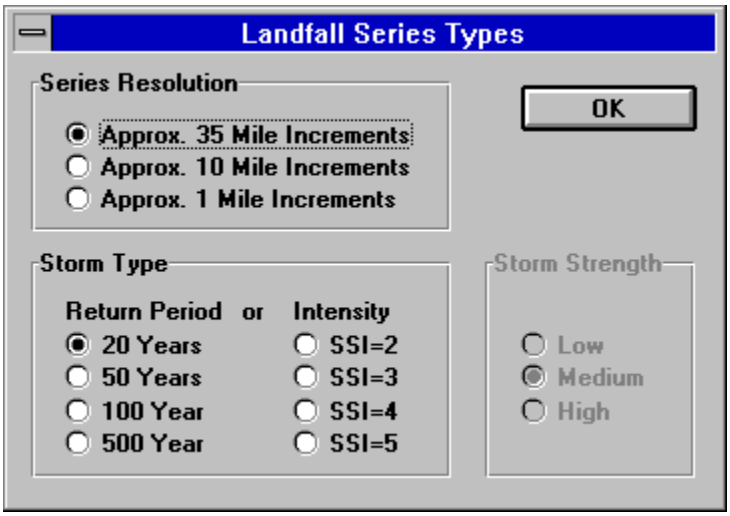


Figure 4-69: Landfall Series Types Dialog Box

⇒ Select the **Series Resolution** (approximately 35, 10, or 1 mile increments), **Storm Type** (Return Period 20, 50, 100, or 500 years; or Intensity SSI 2, 3, 4, or 5), and/or **Storm Strength** (Low, Medium, or High); then click on **OK**.

If you select a **Return Period** (as opposed to an **Intensity**) for the **Storm Type**, the **Storm Strength** parameter is no longer available.

The Landfall Series Selector [Portfolio] Dialog Box displays.

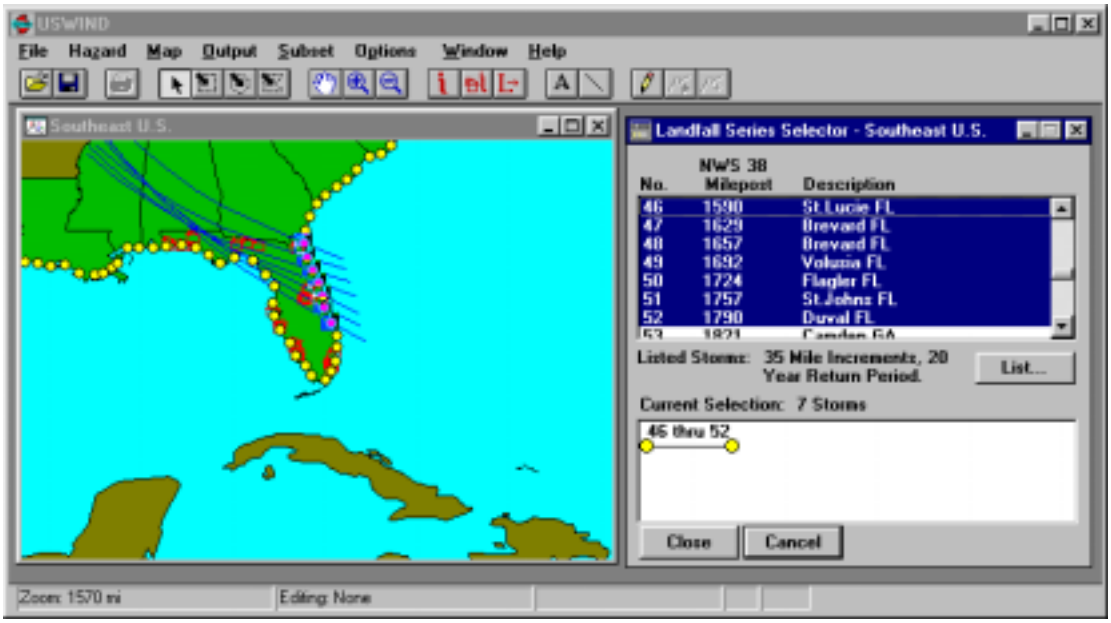


Figure 4-70: Landfall Series Selector - [Portfolio] Dialog Box

The *Landfall Series Selector [Portfolio]* Dialog Box contains a list of landfalls based on your input in the *Landfall Series Types* Dialog Box (see Figure 4-69), and the portfolio map displays yellow circles representing each landfall. (Landfalls are numbered in increments starting from the U.S.-Mexico border.)

⇒ To select landfalls, click to highlight the landfalls using the scrollbar to move through the list, or click on the corresponding path of the landfall on the portfolio map; then click on **Close**.

To respecify landfall series options:

⇒ Click on **List**.

The Landfall Series Types Dialog Box redisplays (see page 4-15).