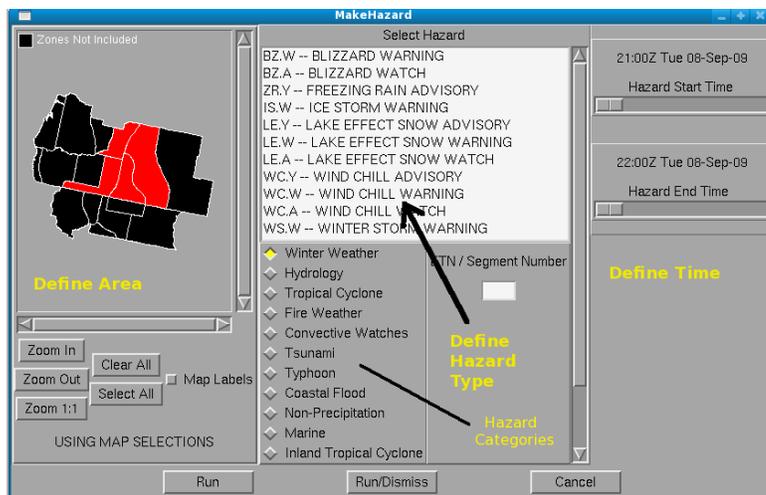


# Process for Issuing Long-Term Watches, Advisories, and Warnings Using the Graphical Hazards Generator (GHG)

National Weather Service (NWS) forecaster duties include issuing longer term (12-48 hours) watches, advisories, and warnings that advise the public about potentially hazardous weather. These hazards cover the entire spectrum of weather conditions that place the public at a higher risk including: winter weather, wind, flooding, and heat, among others. Typically forecasters initially express these forecasts graphically. Text formatters then interpret these graphical forecasts and generate text products that describe the weather hazard, area over which the watch, advisory, or warning is valid, and its time period. This document describes the process that forecasters execute to issue a hazard product.

Forecasters examine various sets of model guidance and observations before deciding to officially issue a watch, advisory, or warning. Once the decision is made, forecasters invoke the GHG process to define the hazard parameters: hazard area, type, and time period. While there are several ways to accomplish this, most forecasters use the MakeHazards tool which is included as part of the Graphical Forecast Editor (GFE) software package.

## Using MakeHazards to Create a Graphical Watch, Advisory, or Warning



*Figure 1: The MakeHazard user interface.*

The image above shows the MakeHazard graphical user interface. This interface allows the forecaster to define the area, hazard type, and time period for any watch, advisory, or warning. On the far left side of Figure 1, the map displays the Weather Forecast Office's (WFO) area of responsibility with the pertinent map background that tells forecasters the areas that can be selected. The particular map background displayed depends on the current hazard category. Many hazard products are issued for a specific set of counties, while others may be issued by forecast zone, for example, fire weather

hazards such as Red Flag Warnings. Forecasters use the mouse to identify a set of areas (zones or counties) and as they do so, the area turns the color red.

The particular hazard type is identified using the middle of the MakeHazards dialog (labeled "Define Hazard Type"). The list of hazards is shown with the white background. Forecasters may choose a different hazard category to change the set of hazards listed. Hazards are organized by category so that forecasters can find them more easily. Clicking on one of the hazards listed, selects that hazard. Only one hazard may be selected from this list at a time.

Forecasters define the time period over which the hazard will be valid by using the widgets on the far right of the MakeHazards user interface. Forecasters move the two sliders to define the start time and the end time of the hazard. When each of the three components have been defined (area, type, and time), the forecaster selects "Run/Dismiss" and a graphical depiction of the hazard appears in the GFE display.

Forecasters may define more than one hazard using the MakeHazards interface. Selecting "Run" leaves the interface displayed so that forecasters may define another set of hazard parameters. Selecting a hazard grid on

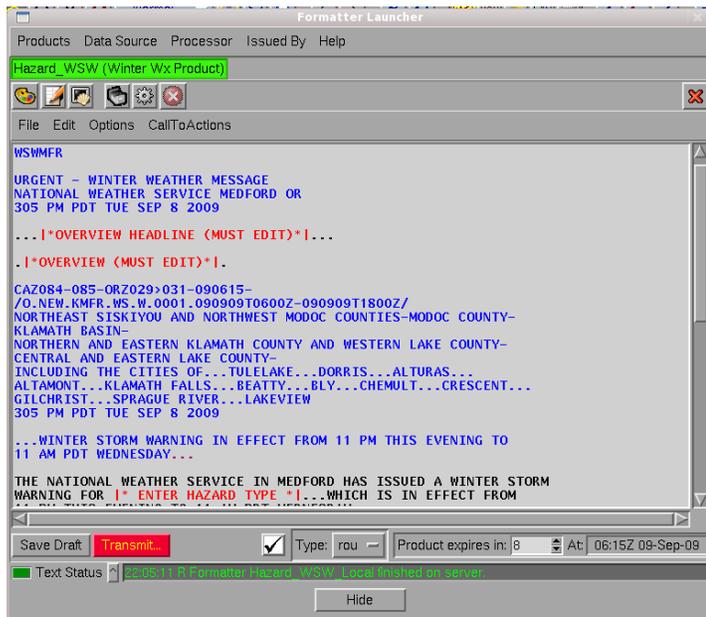
the GFE first and then starting the MakeHazards tool causes the tool to display the area, hazard type, and time parameters as they are defined for that grid. This allows forecasters to more easily adjust an existing hazard. Hazards of different types are displayed as different sub-elements so that they can be more easily distinguished. Once forecasters are finished creating all their graphical hazards, they merge them into a single "Hazards" weather element using a tool designed for this purpose. Areas where merged hazards overlap in space and time are displayed in a hatching pattern to indicate that more than one hazard is defined for that area/time.

## Generating Text Products Based on Graphical Hazards

Since all hazard watches, advisories, and warning are officially issued as a text product, a series of text formatters built in to the GFE reads the gridded representation of each hazard and formats text according to NWS specifications. All of the hazard information is included in the draft of the product so that forecasters need not waste time repeating the information entered graphically. The figure below shows the interface forecasters use to launch the text formatter.

*Figure 2: The Formatter Launcher user interface*

After identifying the particular product (in this example a Winter Weather message), forecasters launch the formatter. The text formatter uses the graphical hazards generated in the first step and formats text that includes the hazard type, area, and time period over which the hazard is valid. The formatters are written in a very powerful and flexible programming language, called Python. They are set up in such a way that the offices can



make adjustments and customize them to meet their local requirements. Also included in the product is the Valid Time Event Code (VTEC). This machine-readable code expresses all of the pertinent information so that it can be decoded by computer software.

The text of the product is shown in the text editor widget in Figure 2. The red text indicates the parts of the product that forecasters must fill in by hand. This includes a headline and overview section, which give the forecaster a place to highlight unique attributes of the event such as a more refined description of the area, specific impacts, or call to action statements. Once this event-specific information has been inserted, the forecaster transmits the products to NWS customers. A dialog allows the forecaster to confirm transmission of the product.