

Thought Process for Issuing a Short-Term Warning Using WarnGen

Todd Dankers - Boulder WFO

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The thought process for issuing a short-term warning using D2D's WarnGen is outlined below/ WarnGen is a tool developed to aid the forecaster in issuing warnings to the public in a timely fashion, in order to preserve life and property.

1. Situational Awareness

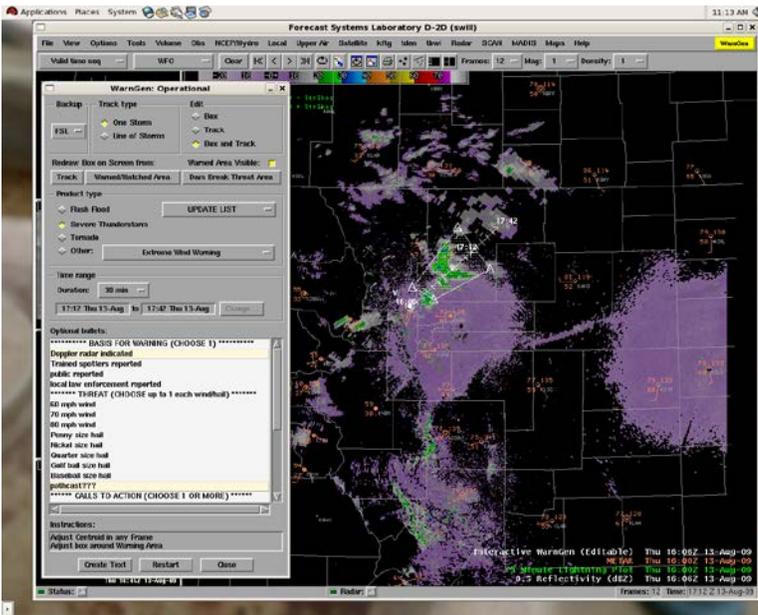
- When a forecaster comes on shift, he will get a feel for what the weather is doing that day by looking at the models, satellite (IR, WV, etc.), and for changes in the air mass on the large scale (for example, CONUS).
- The forecaster then turns his attention to the more regional area. Here the forecaster looks at the surface observations, looking for boundary layers, convergence in the wind fields and the model analysis to name a few, to acquire an idea as what may or may not be happening on his shift.

2. Local Focus

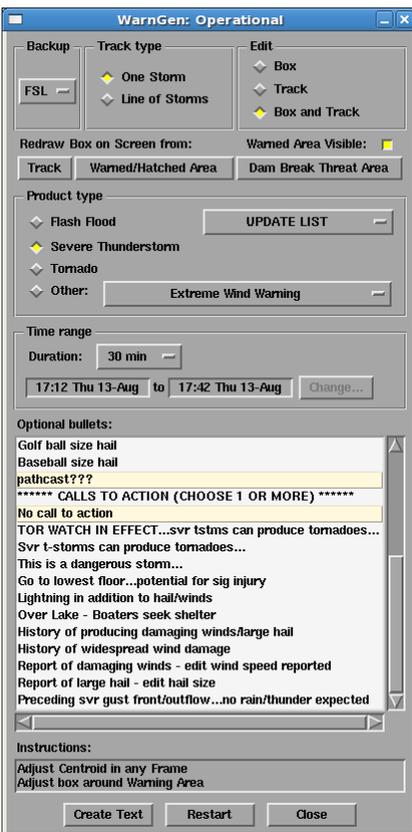
- After getting a feel for day, the forecaster centers his attention, using D2D, on the model output for the next few hours. Many models are available to the forecaster, designed for the local, state, regional, CONUS United States, or the Northern Hemisphere scale. Using D2D, the forecaster can zoom, pan and animate the displayed products, looking for weather systems that may be approaching the area for which the Weather Forecast Office (WFO) is responsible. In particular the forecaster may be looking at upper level troughs, signatures in the low level wind fields, jet stream location, and relative humidity to mention a few.
- Looking at several of the available models, the forecaster can see if there is a consensus amongst the models, and if so, give the forecaster some confidence as to what the models are forecasting. In addition, forecaster's knowledge of the local area is invaluable when interpreting the models for the zones that the WFO may warned for.
- As the shift progresses, the forecaster will monitor satellite and radar imagery to acquire a focus for the days activities. Using the 4-panel radar to look simultaneously at the vertical structure of potential storms, the ability to sample the data using D2D, and the auto-updating of the imagery, is invaluable to the forecaster. Looking at the the radar reflectivity and velocity for a particular storm cell, helps the forecaster recognize tornadic signatures. As the storm strengthens, spotter reports, law enforcement and emergency managers updates aid the forecaster in verifying the weather conditions and making the decision to issue a warning(s).
- The AWIPS tool SCAN is also invoked during a potential hazardous situation. SCAN is launched from D2D and gives information regarding the elevation of the top of the cells, vertically integrated liquid (VIL), storm direction, to name a few. Looking a time series of the imagery, increasing VIL (which may indicate the potential for hail), or a decrease in VIL (which may indicate that hail has formed), also helps the forecaster in making the decision to issue a warning.

3. Issuing the Warning

- Once the decision has been made to issue a warning, the forecaster launches WarnGen from the AWIPS D2D interface. Here is an example of the WarnGen user interface:



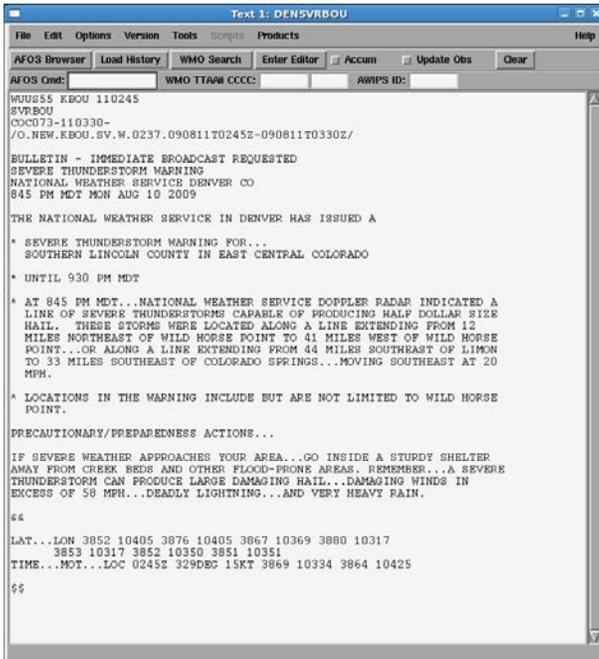
- In looking at the above radar and WarnGen display, the forecaster positions the centroid where he thinks the storm will be. By stepping back in time on the display the forecaster is able to 'tweak' the hashed warning area (pictured above) to better estimate where the storm will go. The forecast must quickly determine his best guess to storm track and must spend some time on this determination so as not to over warn the public.
- On the WarnGen user interface, the forecaster selects the following:



- Product Type - in the example, a Severe Thunderstorm is selected
- Time Range - including the Duration
- Optional Bullets - These selections are used to better communicate to the public the characteristics of the storm including:
 - Basis for Warning
 - Threat
 - Calls to Action
- When the forecaster is pleased with the selection in the WarnGen user interface, Create Text is selected. The generated warning appears on the text workstation, which in a typical forecast office is adjacent to the workstation screen, and at this point the warning is in Edit mode. At this point, the forecaster may choose to edit the warning, and in some cases, is required to edit portions of the text. When the editing is complete, the forecaster selects Send and the warning is disseminated, including the NOAA Weather Radio. The warning reflects the selection the forecaster chose in the WarnGen user interface. In the generated warning, the following are found:
 - Location of the storm
 - Storm motion
 - Cities/landmarks

- Threat Type
- Calls to Action

The text is generated using "templates" that are filled in with information specific to the particular warning. An example of a WarnGen generated warning looks like this:



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AT 845 PM MDT...NATIONAL WEATHER SERVICE DENVER RADAR
Text 1: DENSVRBOU
File Edit Options Version Tools Scripts Products Help
AFOS Browser Load History WMO Search Enter Editor Accum Update Obs Clear
AFOS Onid: WMO TTAW CCCC: AWIPS ID:
WUUS55 KBOU 110245
SVRBOU
CCCC03-110330-
/O.NEW.KBOU.SV.W.0237.090811T0245Z-090811T0330Z/
BULLETIN - IMMEDIATE BROADCAST REQUESTED
SEVERE THUNDERSTORM WARNING
NATIONAL WEATHER SERVICE DENVER CO
845 PM MDT MON AUG 10 2009
THE NATIONAL WEATHER SERVICE IN DENVER HAS ISSUED A
* SEVERE THUNDERSTORM WARNING FOR...
SOUTHERN LINCOLN COUNTY IN EAST CENTRAL COLORADO
* UNTIL 930 PM MDT
* AT 845 PM MDT...NATIONAL WEATHER SERVICE DOPPLER RADAR INDICATED A
LINE OF SEVERE THUNDERSTORMS CAPABLE OF PRODUCING HALF DOLLAR SIZE
HAIL. THESE STORMS WERE LOCATED ALONG A LINE EXTENDING FROM 12
MILES NORTHEAST OF WILD HORSE POINT TO 41 MILES WEST OF WILD HORSE
POINT...OR ALONG A LINE EXTENDING FROM 44 MILES SOUTHEAST OF LIPEN
TO 33 MILES SOUTHEAST OF COLORADO SPRINGS...MOVING SOUTHEAST AT 20
MPH.
* LOCATIONS IN THE WARNING INCLUDE BUT ARE NOT LIMITED TO WILD HORSE
POINT.
PRECAUTIONARY/PREPAREDNESS ACTIONS...
IF SEVERE WEATHER APPROACHES YOUR AREA...GO INSIDE A STURDY SHELTER
AWAY FROM CREEK BEDS AND OTHER FLOOD-PRONE AREAS. REMEMBER...A SEVERE
THUNDERSTORM CAN PRODUCE LARGE DAMAGING HAIL...DAMAGING WINDS IN
EXCESS OF 50 MPH...DEADLY LIGHTNING...AND VERY HEAVY RAIN.
@@
LAT...LON 3852 10405 3876 10405 3867 10369 3880 10317
3853 10317 3852 10350 3851 10351
TIME...MOT...LOC 0245Z 329DEC 15KT 3869 10334 3864 10425
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After the warning is issued, the forecaster continues to monitor the event and may issue a follow-up to the initial warning. In addition, the forecaster can cancel the warning or issue other statements regarding the event. When issuing a continuance or to cancel the warning, again the WarnGen user interface is utilized. On the interface, the forecaster would select UPDATE LIST to issue these types of statements and select the appropriate statement to disseminate via the text workstation as described above.