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AWIPS-90 ACTIVITIES
PHASED IMPLEMENTATION OF A DIGITAL FORECAST
DATABASE AND AUTOMATED PRODUCT GENERATION

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Between now and the end of this calendar year, many offices within Headquarters and the Regions will be assembling the second AWIPS RFP. This effort, led by the AWIPS Program Office, is for the Development Phase, during which one contractor will design and build AWIPS. An important aspect of this work is defining what the Initial Operating Capability (IOC) will be. For applications, this means identifying which programs will be provided by the contractor when AWIPS is delivered to a Weather Forecast Office (WFO). At the same time, we are identifying those applications that will be part of the First Planned Upgrade, approximately two years after IOC.

One of the capabilities planned for IOC is the automatic generation of forecast products from a comprehensive digital forecast database. The concept is for the forecaster to enter the forecast at an AWIPS workstation using interactive graphical techniques. The entered information would then become part of the digital forecast database. Applications programs would automatically prepare and format products to support agriculture, aviation, fire weather, marine, and public programs. Examples are the local, zone, and state forecasts products.

This concept really embodies three important components: guidance, graphical entry techniques, and programs to generate the products. The amount of information necessary to produce routine official forecasts in this manner is large. The elements include temperature, humidity, wind speed and direction, clouds, visibility, weather, and precipitation. These elements must be forecasted for at least 48 hours because the afternoon public forecast is for four 12-h periods. Because of the volume of information to be forecasted, forecast fields must be initialized with guidance.

Graphical entry techniques are necessary to facilitate the entry and editing of large amounts of information. There are at least two approaches that can be taken; forecasts can be entered at points or they can be entered over an area represented by a grid. Forecasts elements at points can be entered directly or selected from lists of acceptable values. Entering the information over an area can be accomplished by drawing contours or by encircling areas and assigning values to the areas. Either way, the input devices will likely be keyboard and mouse (or similar input device) with the results displayed on a CRT. It is important that the graphical entry techniques be easy to use.

The techniques to generate the forecasts must provide accurate renditions of what is in the digital forecast database. The machine worded or coded forecasts must produce grammatically acceptable forecasts; they must follow the rules of WSOM chapters and include the important forecast elements. Changing weather events and the sequence of how they are coded must emphasize the important weather of the day.

Needless to say, accomplishing these goals as part of the AWIPS IOC is a tall order to fill, particularly since we are not using computer assisted preparation today. For this reason, the Weather Service will reduce its expectations for IOC. Rather than attempt to implement techniques to construct a complete forecast database, the NWS will focus on those forecast elements used in public and closely related products such as the agriculture forecasts. And rather than attempt to implement techniques to enter forecasts over grids, we will initially enter the forecasts at selected stations, such as where we have point guidance.

We will not give up on the idea of a complete numerical forecast database nor the idea of formatting all of the routinely generated products. We will simply defer the complete set until we are capable of doing so, in all likelihood the First Planned Upgrade of AWIPS. To ensure that this happens, the proper hooks and entry points will be built into the software to facilitate this evolution.

During the next decade, forecasters are going to experience the greatest number of changes in observing systems, automation, and they way they do their job in the history of the Weather Service. We know its going to take some time for forecasters to become comfortable with the computer assisted product generation techniques. We must ensure that the field has adequate time and preparation to take advantage of the remote sensed data to improve our warning products and services. The phased approach to automated product generation will facilitate that.

Since we are focusing on public products, we don't plan to automatically generate FT's initially. Aviation forecasts present special problems because of their higher time resolution requirements and their need for guidance forecasts for cloud layers and amounts.

However, the aviation program in the IOC will be supported by applications to at least the level they are supported today. Forecasters will still enter their terminal forecasts manually. The FT's will then be completely decoded to allow them to be quality controlled, to obtain the information necessary for verification, and to assist in formatting of other aviation products such as the TAF.

The above plan was presented to the NWS Office Directors in June and was subsequently approved. The plan includes demonstrations and evaluations at Norman and Denver as part of NWS risk reduction activities. Backup procedures will be established should the plan not pan out as envisioned.