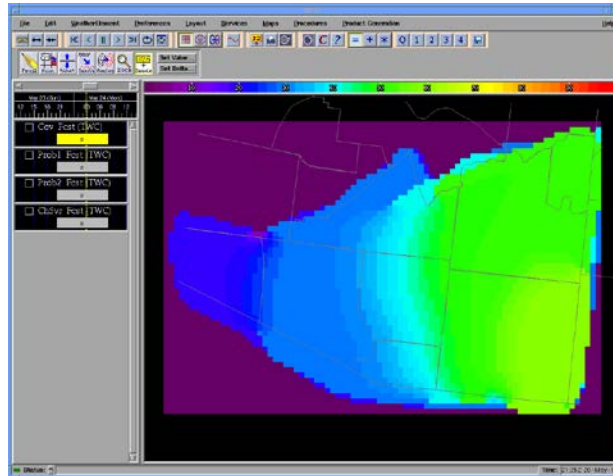# An IFPS and Graphical Forecast Editor (GFE) Summary

AWIPS, the modernized U. S. National Weather Service data display system, now in operation across the U.S., provides forecasters with the best possible tools to *view and understand* the past and present state of the atmosphere, and future guidance, using the abundant data and new computer technology now available.

The Interactive Forecast Preparation System (**IFPS**) will allow the forecaster to *prepare forecasts*, the best description of the future state of the atmosphere, as effectively as possible. The IFPS is expected to be fielded in 2000.

With the IFPS, forecasters prepare graphical depictions of predicted weather, using interactive displays of initial forecasts. Forecasters no longer type text messages. Using the graphical description of future conditions prepared by the forecaster (actually, the underlaying numerical data), IFPS will automaticaly create all routinely scheduled forecast products for public, aviation, fire-weather, and marine services.

The **Graphical Forecast Editor (GFE)** is a central part of the IFPS. The GFE is the actual graphical on-screen editor that allows forecasts to create detailed graphical depictions of coming weather, while at the same time creating a numerical database of weather information ("grids") representing the same forecast. The GFE is in development at NOAA's Forecast Systems Laboratory in Boulder, Colorado, by the Enhanced Forecaster Tools Branch of FSL.

Forecast products are made automatically from the "grids" after the forecaster has finished creating the forecast. Forecast products can be in text, tables, grids, graphics, and voice.

Advantages of Interactive Forecast Preparation

IFP will free the forecaster from typing several text messages that describe the same weather for different clients.

In times of severe weather, IFP largely frees forecasters from preparing routine products, letting them concentrate on watches and warnings.

The IFP approach ensures consistency among all forecasts supporting different services for the same area and time.

The existence of a gridded database of forecast weather elements will permit automatic monitoring of incoming weather observations, alerting the forecaster to observations which differ significantly from the current forecast.

The forecast database will support enhanced verification procedures, and resolution of differences in forecasts at the boundaries between offices.

Service Backup is as easy as possible. In such a case a simple reset of the IFPS coordinate system will have a workstation running as if it were the office being backed up.

The very general nature of the IFPS database -- not built for any particular forecast product -- means IFPS is completely adaptable for all present and future NWS products. Using the IFPS graphical displays and tools, creation of highly detailed, graphical, text, voice and tabular products will be very easy. They can be tailored for different users locations and needs.

The Forecaster does forecasting. The computers makes numerous different products, automatically and very quickly, from the single database of complete forecasts. Products are made from the general overall forecast.

Possible future products that can be automatically generated by the IFPS include

- color graphic maps for all weather elements (available via television and/or WWW sites),
- time-line plots (meteograms) of weather values for user-selected locations (WWW)
- travelers forecasts with weather conditions for moving location as time changes (available via WWW site),
- specialized plots and graphs for emergency management and public services,
- automatic voice forecasts for NOAA weather radio.

• Here's some forward-looking forecast product ideas made possible with a single digital database of forecast data:
- Individual voice forecasts by telephone. The voice messages and content would be automatically adjusted for each caller's exact location, identified by the caller's telephone number.

- Forest fire in the Rockies. The forecaster back in the office switches his GFE from the 10-km resolution grid to 1 km mode for the area around the fire. He prepares graphs, tables, and text if necessary, of expected conditions. Near the fire the crew plugs into the nearest phone line (or use cellular phone) and downloads the same information onto a laptop computer. The forecast graphics and data are updated by the forecaster as conditions change.

Forecasting with the IFP GFE

The forecaster prepares the forecast by editing selected guidance, where necessary, using the IFPS Graphical Forecast Editor.

The editor provides simple tools to quickly and effectively prepare depictions of forecasted weather conditions, as *detailed or as simple as is required* by the situation. In some cases a broad simple picture will be correct and forecast preparation will be very quick. In cases of severe or complex weather the GFE allows the forecaster to include as much detail as is possible in the forecast.

The forecaster controls the time intervals over which forecast conditions are valid, from minutes to days, depending on how quickly conditions change. The forecaster selects which model runs or other guidance to use for first-guess initial forecasts in the editors.

Providing the best possible initial forecast conditions is essential for the success of IFPS. IFPS will offer the forecaster a choice of initial conditions based on MOS and LAMP, NCEP manually-prepared grids, Eta, NGM, AVN, RUC, MRF, and, if available, local models. Grids based on yesterday's observations or forecasts, will also be available. The forecaster can select weather elements from one or more of these sources to use as starting conditions in the GFE. The process of providing starting values from model output and other sources is called Initialization.

The process of using IFP is designed to be similar to the present mental process forecasters use to select which features of guidance to include in the forecast. Design of powerful, easy to use editing tools for the GFE is key to the success of IFP. We are developing a suite of "smart tools" that will allow the forecaster to create the forecasts desired quickly. One method is linking several parameters together to reduce editing required and ensure meteorological consistency and balance, such as linking temeprature and dewpoint through relative humidity or other measure of moisture content at a point.

When the forecaster has prepared a complete description of weather in the forecast area, consistency checking and product generation is requested. All products are generated and become available for inspection. Limited editing for wording style is permitted in text messages. Significant wording or text content changes would render the text forecasts inconsistent with graphics, tables, and other forecast products,a nd should be avoided.

The digital database, or grids of weather elements (temperature, winds, precip, weather type, clouds, etc.), contains the entire forecast. Text messages are only one representation of the forecast. Some others are charts, graphs, and tables.