

AFPS Quarterly Report (96Q2)

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1. Introduction

The AWIPS Forecast Preparation System (AFPS) is being developed jointly by the Enhanced Forecaster Tools (EFT) Branch of the Forecast Systems Laboratory (FSL) Modernization Division and some of the staff of the NWS Office of Systems Development Techniques Development Laboratory (TDL).

Most of this report covers FSL work; "we" here generally refers to FSL. The TDL Activities section is based on information provided by Matt Peroutka of TDL.

2. Accomplishments

EFT staff concentrated their efforts on four principal activities this quarter:

- Defining the specifications for the new graphical forecast editor (GFE)
- Participating in NWS planning for further development and implementation of Interactive Forecast Preparation (IFP) activities
- Assessing AFPS initialization quality
- Exploratory development of graphical/gridded forecast products and grid-based text formatters

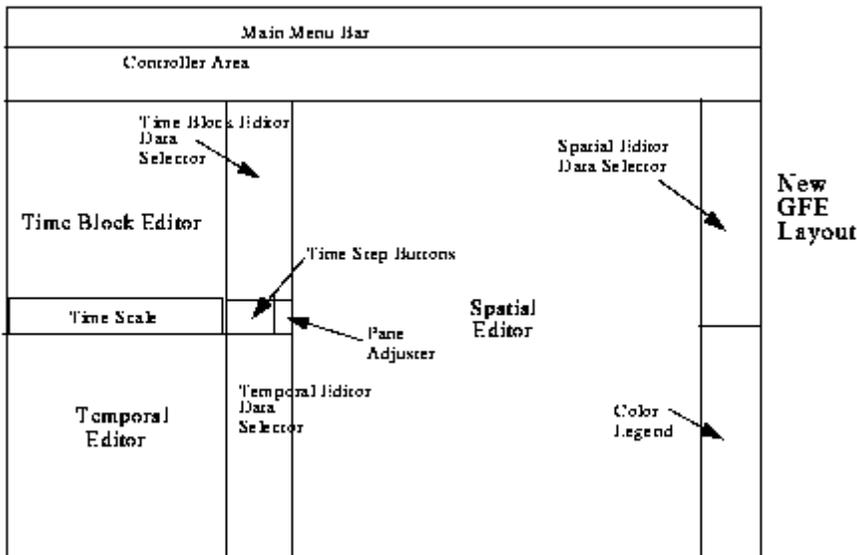
2.1 The New GFE

This fall, we received over 400 participant comments and improvement suggestions at the last AFWG meeting and the FSL real-time exercise.

This quarter, we have spent a significant amount of time considering these comments. Most are being included in our next GFE development cycle. The specifications for the new GFE are now finished. It is available via mail or on the AFPS WWW page. Highlights of the changes are summarized below:

- **NEW OVERALL GFE APPEARANCE** - The GFE main window will be the entire screen size and will be the forecaster's view into the data. The GFE main window will always contain a tiled view of all three editors: the time block editor (formerly known as the worksheet), the temporal editor, and the spatial editor. This redesign is the primary solution to the concerns of window organization and clutter.
- **LINKED EDITORS** - Generally, the editors will be linked so that changes made in one editor are reflected in the other editors' displays, without the need for the forecaster to manually "sync" the editors. Additionally, the forecaster will be able to pass the mouse position over time blocks within the time block editor or temporal editor and have the spatial editor automatically display the corresponding data. This redesign is the primary solution to the concerns of keeping the temporal editor and spatial editor in sync.
- **NO SEGRAGATION OF DATA BY SOURCE (MODEL)** - Since AFPS will contain only one time block editor, all forecast and model parameters will be loaded into this single time block editor. This will facilitate copying forecast data from model data and allow simultaneous data display from various models in the temporal and spatial editors.

- NO TIME EDITING OF TIME BLOCKS - Time editing (stretching/shrinking) of time blocks will no longer be necessary. An operation will allow data duplication from one time block to an adjoining time period.
- COPYING BETWEEN PARAMETERS UTILIZING THE SAME UNITS - Copying data between different parameters that use the same scale (ex. dewpoint to temp, max temp to temp) will be supported.
- UNDO - The forecaster will be able to reverse most operations that modify data, such as copying and erasing. Initially undo will be one level deep.
- ANIMATION - The forecaster will be able to animate (loop) the spatial editor views of the data, as well as manually step through these views.
- MORE DIRECT ACCESS TO CONTROL SYSTEM SETTINGS - A controller area will provide more direct access to system settings.
- LOCATOR MAP REMOVED - Previously, a locator map was used to establish the location and area of influence for edits on the temporal editor. These settings will now be accomplished directly on the spatial editor, allowing the forecaster a better view of the location being selected.
- DEFINE REFERENCE SET FLEXIBILITY - Forecasters will be able to more easily define reference sets based on gridpoint values via a query-like language. These query definitions can be saved and applied to different data sets as needed.
- SPATIAL EDITOR/LEGEND INTEGRATION- A legend will always be visible for the current edited parameter in the spatial editor.
- IMPROVEMENTS TO SPATIAL EDITOR TOOLS - Various improvements will be made to several spatial editor tools to make them easier and more predictable to use. The pencil tool will be enhanced to support modification of types other than scalar. Multi-paint will let the forecaster make simultaneous changes to multiple parameters.



2.2 IFP Development and Implementation Plans

A Interactive Forecast Preparation (IFP) Development Alternatives meeting was held in Silver Spring on February 13-14. The meeting objectives were to establish consensus on agency IFP goals, understand the relationships among IFP goals and proposed alternatives, and to identify areas of agreement among the meeting's participants.

Three recommendations came out of the meeting:

- Integrate AFPS grid editing capability into the ICWF framework
- Implement ICWF as soon as possible in AWIPS. Continue field testing and development of AFPS
- Devote full IFP development resources to the formulation of a TDL/FSL integrated IFP

The results of this meeting were presented at the MAR meeting on March 27th by Wendy Wolf. A resource assessment for all recommended solutions will be performed over the next few weeks. NWS will then consider which solution(s) best meets the agency's modernization goals.

(Most recipients of this report have received a copy of the IFP Development Alternatives meeting summary, issued by Wendy Wolf March 15th (copies are available)).

2.3 Initialization Quality

We made extensive tests of our initial surface forecasts derived directly from numerical weather model output, by comparing them to observations at 100 SAO stations around the lower 48 states. We find that in many cases the initial forecasts are suitable for preliminary operational use in AFPS. Test results have also been used to improve forecast generation.

A report describing exactly how the surface forecasts are derived from model output is available by mail, and will soon be available on the AFPS WWW pages. The report also shows the test results comparing these automatic forecasts to surface observations (Wier).

2.4 Exploratory Product Development

[Graphical Forecast Viewer \(GFV\)](#)

We have been investigating the creation of new graphical/gridded forecast products and their dissemination. We currently are using Java-based interactivity on the World Wide Web (WWW). This technology is now available to almost everyone with a personal computer.

The GFV allows interactive graphical weather forecast viewing using a Java enabled web browser. The display consists of a two-dimensional spatial view of the data, a temporal view, a color legend, and a control panel. The displayed weather forecast is generated from the AFPS database data. (Bacco, Romberg)

Anyone with a Java-enabled web browser (e.g., Netscape version 2) can access our graphical forecast viewer from our home page.

[Grid-Based Text Formatters](#)

A recommendation from the (IFP) Development Alternatives meeting requested FSL grid-based formatters exploration. As we mentioned in the last report, the matrix-based text formatters designed for ICWF do not work well with the gridded database; i.e., the AFPS forecaster includes more detail than the matrix-based formatters can extract.

Preliminary work using a rule-based language (CLIPS) has been started, and initial results look promising. The forecasts are representative of the gridded data, the words are modifiable, and details can be presented. An example of a forecast is shown at the bottom of this page.

(Romberg)

2.5 Other Activities

An FSL lab-wide AFPS Technical Review was held on January 16th (entire AFPS staff included).

We conducted performance analysis of the AFPS level 2a system to discover where bottlenecks occurred. The findings will be incorporated into our new design. (LeFebvre).

AFPS level 2a was shown at the 12th AMS IIPS conference held in Atlanta during the week of January 29th (Mathewson, Wakefield).

Papers titled Using the AWIPS Forecast Preparation System (Mathewson) and Using numerical model output to provide initial forecasts of surface weather for the AFPS (Wier, Wakefield) were presented at the 12th AMS IIPS conference.

Joyce Watkins, our new quality assurance specialist, was hired in February. She is responsible for user documentation and training materials.

An overall project and documentation plan for the next year was created (Howard, Watkins).

Work has begun on sampling gridded forecast data to determine representative values for areas and local effects (Longstaff).

3. Presentations/Visitors/Travel

Visitors:

- Navy Capts. Robert Plante and Dick Hillyer - January 25th. The former is the head of FNOG in Monterey, and the latter is from the Space and Naval Warfare Systems Command.
- Stefan Nilsson, Hakan Hultberg, and Torbjorn Pettersson from the Swedish Meteorological and Hydrological Institute - March 11-13; to learn about AFPS. Sweden is considering using an AFPS-like system as part of their modernization efforts.
- Dale Browne, PRC Chief AWIPS Engineer - March 12th.
- Todd Dankers, WSFO Denver - March 18th; to provide guidance for the grid-based formatter development.

- Richard Verret, Dennis Gosselin, Michael Baltazar of the Canadian Meteorological Centre - March 19th.
- Mike Conger, Lead Forecaster at WSFO Salt Lake City - March 21st.
- Bob Embleton, John VanCurran, Larry Tyminski, and Ken Davidson from Office of Systems Operation, NWS - March 28th.

Travel and presentations:

- Mark Mathewson and Joe Wakefield to Atlanta in late January for the AMS IIPS conference.
- Mark Mathewson and Joe Wakefield to Silver Spring in mid-February for the IFP Development Alternatives Meeting.

4. TDL Activities

TDL and FSL developers worked toward integrating TDL's MOS ingest and product formatting code into the AFPS development system. Almost all of the source code has been checked in. A few of the programs have been successfully built.

TDL continued work expanding the product suite into aviation and fire weather areas. Product generation software for TAFs has been successfully tested, and a graphic editor for aviation elements is under development.

TDL developers worked closely with the staff at the Boise Forecast Office (BOI) to design an approach to Fire Weather Forecasts generation. These techniques will be developed jointly by TDL and BOI.

Work continued to enhance the Zone Forecast program to generate local effect phrases.

5. Plans Next Quarter

Our main effort for the next quarter will be the detailed design for the new GFE. The design should be finished late in the quarter.

By the end of the quarter, we will have finished our investigation of grid-based product formatters.

We will enhance the graphical forecast viewer (GFV) to include vector, discrete, and precipitation fields. The GFV will be redesigned to improve performance.

Initialization algorithms will continued to be improved.

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