

AFPS Quarterly Report (95Q2)

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AFPS Quarterly Report FY95 Q2: January - March 1995

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The FSL AFPS Team

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1. Introduction

The Enhanced Forecaster Tools 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) are jointly developing the AWIPS Forecast Preparation System (AFPS).

Most of this report covers FSL work. Except in the TDL Activities section (based on information provided by Matt Peroutka of TDL), the use of "we" below refers to FSL staff.

As noted in the last report, we established a quality assurance position, which has been filled by David Howard. Dave, who comes to FSL from several years in quality assurance and testing at IBM, is working in the areas of configuration management, requirements and bug tracking, testing and integration, and reviews. He already has established a bug-tracking system, which we have been using for our recent development work. Dave has degrees from the University of Miami, Florida International University, and the University of Colorado, and taught high school mathematics and computer science for several years.

2. Accomplishments

Highlights this quarter included the completion of the AFPS worksheet, delivery of database interfaces to TDL, editor design and initial coding, and the fourth meeting of the AFPS Forecaster Working Group (AFWG).

As we have discussed in several reports, the worksheet is a key component of AFPS, providing access to the forecast database and serving as a control center for graphical editing work.

During this quarter, the first version of the AFPS worksheet was completed, and was presented to the AFWG at a meeting in Silver Spring, 7 - 9 March. An annotated picture of a worksheet is shown at the end of the report.

An initial version of a set of database interface routines was delivered to TDL in late January (Mathewson, Romberg). This provides the means for TDL developers to write grids initialized from Model Output Statistics (MOS) to the AFPS database, and to retrieve forecaster-modified data for use in generating text forecast products.

Editor design began in earnest at the end of January (Mathewson, LeFebvre). While the basic editor functions have been worked out over the past several months in consultation with members of the AFWG, the advent of the worksheet and experience with earlier prototypes require that the user interface (Mayer, Romberg) and internal details of editor operation be considerably modified. By the end of the quarter, initial implementation of the new editors was under way (Mathewson, LeFebvre, Mayer, Romberg, Longstaff, Wier).

As noted, we met with members of our forecaster working group in March. This meeting was held in Silver Spring to allow TDL developers to meet AFWG members and to increase their understanding of the AFPS "big picture." This was, once again, a productive meeting. In addition to discussing and testing the worksheet (LeFebvre), topics included progress reports on AFPS and Interactive Computer Worded Forecast (ICWF) development (ICWF demo by Dave Ruth), initialization techniques (from MOS - Peroutka, and from numerical model grids - Wier), data extraction and summarization for zone forecast generation (Mark Oberfield), aviation forecast issues (Mathewson, Carl DeSpiegelaere), cloud display concepts (Wier), interpolation work (Wier), and plans for testing AFPS as part of FSL's WFO-Advanced system (Wakefield). As usual, AFWG members (including new members Craig Bauer of WSFO ANC and Bruce Smith of WSFO DTX) offered many insightful and useful comments and suggestions to the FSL and TDL development staffs.

Other activities:

- We began to develop code to initialize weather elements from RUC grids (Wier). By the end of the quarter, a test version of this was running twice a day, producing grids of temperature, dew point, wind, visibility, QPF (quantitative precipitation), PoP (probability of precipitation), and cloud cover.
- The gatekeeper is a process manager to connect clients to database services. It is the means by which we can open multiple databases simultaneously, so forecasters can review guidance from several sources. Design and initial implementation of the gatekeeper were completed (Bacco), with testing continuing at the end of the quarter.
- We developed preliminary plans for the TAF database (LeFebvre).
- An interpolation server was designed (Mathewson, Wier), which will accept forecaster requests to fill holes in time series and return complete grids for those times.
- We continued our commitment to preparing high-quality software by conducting a number of design reviews and submitting code for peer review. Though this somewhat slows the initial development process, we strongly believe that it is a time-saver in the long run. We also have developed a bug-reporting and -tracking system using gnats, a freely-available problem report management system (Howard).
- We contributed to the combined NWS-FSL response to the GAO report on AFPS software development practices.
- At long last our new HP server was commissioned 23 February. We also doubled the memory in our development workstations, bringing them to 64 MB each. This additional memory has increased our productivity by allowing staff to continue work while compiling and building portions of the AFPS prototypes.

3. Presentations/Visitors/Travel

Visitors:

- Richard Verret of the Canadian Meteorological Centre (Montreal) visited the 23rd of January to discuss and present a seminar on SCRIBE (an ICWF-like forecast generation system). We were favorably impressed with Richard's work, and saw a number of similarities between it and the ICWF.
- Eric Mandel (Deputy Director) and Jim Schaeffer (Chief Systems Engineer) of the AAO visited 29 March to become familiar with AFPS development work and to discuss FSL's software development and testing methods.

Travel and presentations:

- Tom LeFebvre and Stuart Wier attended the AMS IIPS conference in Dallas to present the papers that have been mentioned in recent reports. (Both of these papers are now available on EFT's Web page; see the URL on the last page of this report.) They also demonstrated the current state of AFPS development to many visitors to the NOAA booth at the conference.
- In February, Joe Wakefield attended the first meeting of a committee on Interactive Forecast Preparation (IFP) Implementation. This group is considering the impact of proposed IFP methods (ICWF and AFPS) on NWS operations, and recommended a course of education and training for NWS field staff.
- As noted above, four of our staff attended the AFWG meeting in Silver Spring the first week of March.
- Mark Mathewson reported on the status of AFPS development at an FSL Technical Review of the WFO-Advanced project (described in URL <http://www-md.fsl.noaa.gov/~jwake/WFO-A-intro.html>).
- As part of the initial IFP education effort, Carl Bullock graciously agreed to represent EFT at the recent NWS Field Managers' meeting in Baltimore. He gave a number of demonstrations, and distributed copies of a brochure which gives an overview of AFPS (Wier, Wakefield). This brochure is also available via EFT's Web page.

4. TDL activities

Testing of TDL's initialization and formatting modules continued at the NWS Forecast Office in Charleston, WV. The programs which initialize grids from MOS continued to ingest Nested Grid Model MOS fields. Additional programs were added to ingest MOS from the Medium Range Forecast Model as well. These grids have all been successfully loaded into the AFPS database. The next set of initialization data will come from TDL's Local AWIPS MOS Program (LAMP), which will provide aviation variables.

WFO-Advanced developers have been working with TDL to provide initialization data. These data will eventually flow into AFPS' reference worksheets.

Todd Dankers, the Denver AFPS focal point, worked with AFPS developers to specify the initial set of grid points which would be used. He will be providing TDL guidance on how to use station-based forecasts to initialize a grid field.

The Charleston forecasters are also evaluating a number of product generation programs which will be useful in AFPS. The product list has been expanded to include most public and closely related products (Zone Forecast, Agricultural Forecast, Coded Cities Forecast, and a variety of coded and tabular products).

TDL developers are working on initializing aviation variables, and they are rethinking the software which recommends zone combinations.

5. Plans for the next quarter

Our primary activity this next quarter will be completing the design and implementation of the new graphical editors to be used with the worksheet. Our present schedule calls for this work to be substantially complete by the end of April, with informal and formal testing and debugging continuing through May. At that point, we will be prepared to use TDL's MOS initialization to create and edit an AFPS database.

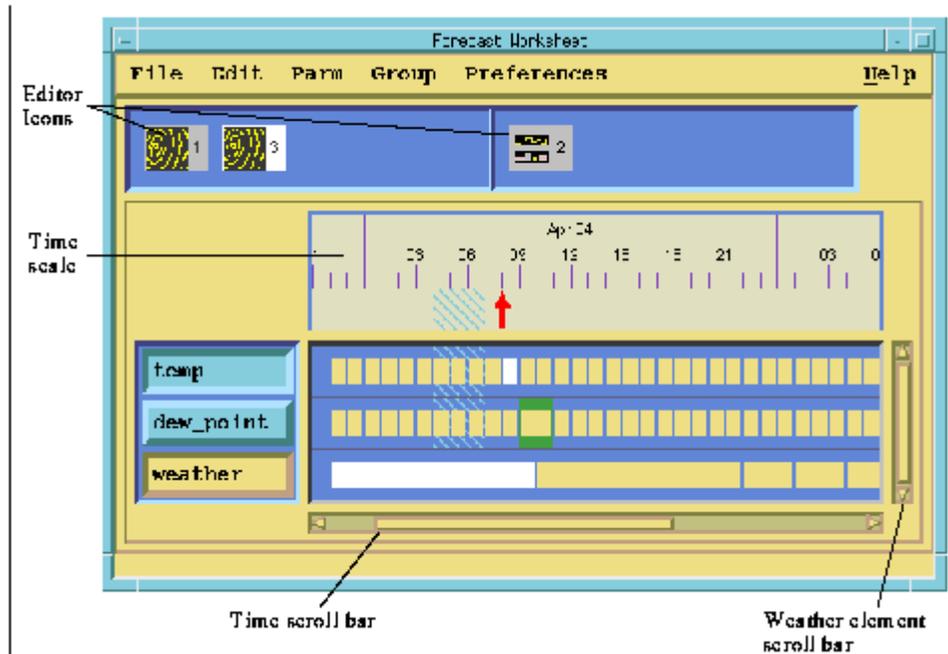
Interpolation code will be written, based on the algorithms developed over the past several months. Separate methods are used for scalar, vector, and weather fields.

Work on initialization from models will continue. By the end of the quarter, RUC initialization will be running every 3 hours (i.e., all RUC model runs), and grids of these weather elements will be stored in the AFPS database. We also will be generating AFPS weather elements from LAPS (FSL's Local Analysis and Prediction System) grids.

With the completion of the gatekeeper, the database interface routines provided to TDL in January will be updated. These same routines will also be used for LAPS and the FSL-developed NOAA Emergency Management Weather Dissemination System, which in the future will provide AFPS forecast grids to state and local governments for emergency preparedness.

Joe Wakefield and Mark Mathewson will travel to Silver Spring 17-18 April for presentations of FSL's WFO-Advanced work, including AFPS.

Annotated worksheet



This is the Forecast Worksheet, with which I work to generate my forecasts. The rectangles in each row are called time blocks. Each time block shows the valid period of a single weather element grid. In this example, the database contains numerous temperature grids, each containing data for a single hour. The first two weather grids span 12 hours each, followed by several 3-hour grids.

I've opened three editors, two spatial and one temporal, which are numbered in the order in which I opened them. Spatial Editor 3 is active in this example, with its display time set to 08 UTC 4 Apr. Elements temp and weather are selected, and the grids that are displayed in the editor (not shown) are highlighted. Note that the whole 12-hour weather grid is highlighted, since all of it necessarily is displayed at once.

The dark area around dew_point 09-11 UTC indicates that I've locked this particular time block (either by modifying its valid period or by editing the contents of the grid). Since I've changed something about this particular element, my partner forecaster sharing the database is not allowed to modify it until I release it by storing the modified information in the database.

Finally, the cross-hatching between 04 and 07 UTC shows that I've selected temp and dew_point for possible modification, on a per-grid basis. That is, I may plan to copy this evening's data to tomorrow, or may delete them, to fill the gap by interpolation.

I have other worksheets available that contain first-guess information from numerical models. I can look at the weather elements in those worksheets and use them as a guide while editing the

official grids, or I can copy them to the Forecast Worksheet, using them as the basis for my work.

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