AFPS Quarterly Report (96Q1)

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AFPS Quarterly Report FY96 Q1: October - December 1995

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:

1. Supporting the WFO-Advanced operations exercise;
2. Completing AFPS Level 2a and making it available to members of the AFPS Forecaster Working Group (AFWG);
3. Participating in NWS planning for further development and implementation of Interactive Forecast Preparation (IFP) activities;
4. Planning for Level 2b and Denver installation.

2.1 WFO-Advanced Exercise

The WFO-Advanced cool-season exercise was carried out in October and November. Forecasters worked three six-hour shifts (6 a.m. to midnight) each day, in a short-term/long-term arrangement. After a three-day training stint, each team worked forecast shifts for three weeks, using AFPS after the first week.

The model initialization and graphical forecast editor (GFE) parts of AFPS worked very well, though additional work is required in both areas to reduce forecaster workload. AFPS uses text generators developed by TDL for the Interactive Computer Worded Forecast (ICWF) system. These proved to be more of a problem, largely because of the inherent incompatibility between AFPS's grids and the ICWF's point/area approach. TDL staff worked diligently to resolve problems.

Staff spent considerable time training visiting forecasters on the use of AFPS, and monitoring shifts during operations. NWS visitors included Norman Hui (Honolulu), Tim Barker (Missoula), Mike Welvaert (Pleasant Hill), Paul Shannon (Juneau), Mike Cammarata (Columbia), Todd Dankers and Eric Thaler (Denver), Jim Moser (New Orleans), Brad Churchill (Norman), Llyle Barker (Goodland), Constantine Pashos (San Antonio), Jim Kosarik (Cleveland), Larry Dunn (Salt Lake City), and Mike Heathfield (Office of Meteorology). Other participants in the exercise were George Lu and Shang Jiunn-Sheng of the Taiwan Central Weather Bureau and FSL staff members Paul Schultz, Carl Bullock, Tracy Smith, Jim Ramer, Ed Szoke, John Brown, Stan Barnes, and Matt Kelsch.

We were pleased at how quickly most forecasters were able to begin using AFPS, and how well they took to the concept.

Exercise participants made many useful comments and suggestions. These will be incorporated with AFWG members' suggestions in our future development.

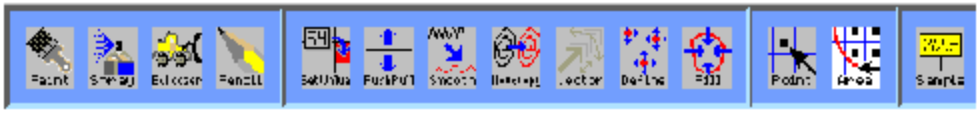
Exercises such as this one are necessary in the preparation of any user system. Though we were able to get some user feedback at our last AFWG meeting, and this will continue at future meetings and via the remote testing of AFPS by AFWG members, there is much to learn from an operational test.

2.2 AFPS Level 2a

The Level 2a software was made available to AFWG members for testing on 14 December. Members run the graphical forecast editor (gfe) on their local machines, but connect to FSL to retrieve data. This has the advantage of reducing disk space requirements on their machines, as well as providing a changing and up-to-date set of data (though of course, all users are looking at Colorado weather). We anticipate that this experience will help us focus our effort on areas of most interest to our users, and where improvements will have the most effective impact on operations support.

Several new/improved user features were added this quarter, including

- Information strings now appear for all areas of the windows (Romberg, LeFebvre). This provides a quick guide to the user regarding the function of each mouse button in the context of the particular area.
- Text was added to the tool icons, showing the name of the tool (Wakefield).
- Color tables were modified (Longstaff, Wier).
- To improve visual feedback, when a particular dataset is toggled off in the display, its identifier turns black (Mathewson). Users had previously had difficulty identifying which datasets were on and which off.



2.3 IFP Development and Implementation Plans

An Operational Risk Reduction meeting was held in Silver Spring on 8 November. Among the items discussed was the relationship between ICWF and AFPS, and how the planned transition from ICWF to AFPS would be effected.

Among the action items from that meeting was for senior NWS management to "review and adjust as needed the relationship of ICWF and AFPS." Toward that end an overview of current IFP work and some alternatives for improving the development and implementation strategy were prepared by NWS and FSL staff. (Most recipients of this report have received a copy of that document, issued by Wendy Wolf 8 December. Copies are available.)

2.4 Level 2b/Denver Plans

At an AFPS planning meeting held 11 - 12 December, FSL staff considered requirements for the next phase of AFPS development. We intend to install a first operational version of AFPS in the Denver Forecast Office by late summer 1996. Several "must have" and "should have" items have been identified, to wit:

"Must haves"

- Support for public and aviation services. The latter includes developing a point-based database and TAF worksheet and editors.(1)
- Complete integration of the text generator with AFPS. This includes data requirements, user controls, local effects, and tuning/tailoring of the formatters.
- A flexible and complete undo facility.
- Numerous efficiency enhancements, to reduce forecaster workload problems. These include reducing repetitive operations, minimizing window-manipulation requirements, and adding some meteorological "smarts" to the system.
- Improved initialization.
- Integration into the WFO-Advanced platform (system tuning).
- Configuration, customer support, and training plans.
- Reference and training documentation.

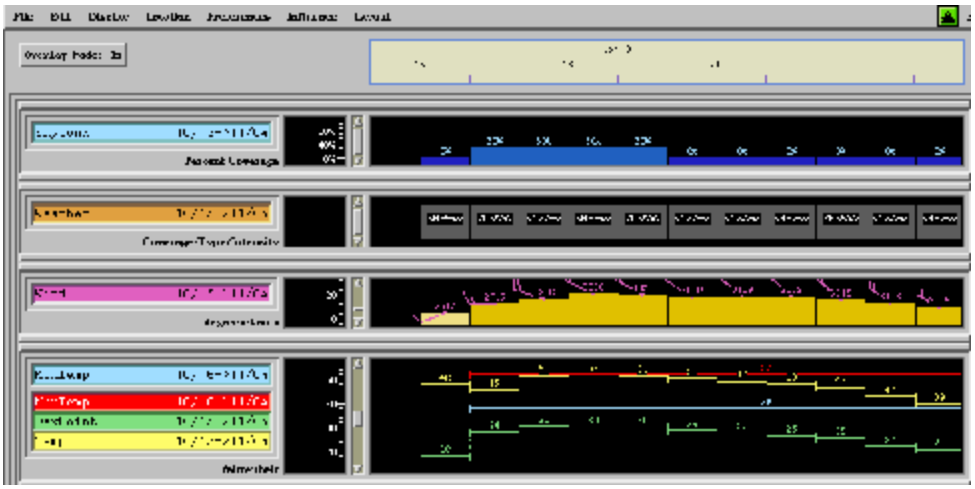
"Should haves"

- New products, including text, graphical, and gridded products.
- Support for the Nowcast and State Forecast products.
- Display of AFPS grids on D2D (WFO-Advanced's 2-dimensional data display) and display of conventional data on the gfe.
- Autosave and recovery, to preserve partially-completed work in the case of a system failure.
- A formatter preview similar to that currently available in the ICWF. This allows forecasters to look at draft text forecasts.
- An improved method of saving the forecast database as the official forecast.

- Model initialization verification statistics, to assess the quality of the AFPS grid initialization.
- Improved interpolation.
- On-line help.
- Consistency checkers, to find forecast inconsistencies such as precipitation forecast but no probability.
- Forecast monitoring. This would alert the forecaster when observations or new guidance differ significantly from the forecast.
- Agriculture and fire weather support.
- A User's Manual, describing how to use AFPS.

2.5 Other Activities

- A suite of system monitor programs was written, to check the status of initialization and scan error logs (Mathewson).
- Initialization work continued (Wier). Eta model initialization was implemented, joining RUC and NGM. A new version of RUC was recently implemented at NCEP; the FSL version was used for testing. Initialization from all NCEP models (NGM, RUC, and Eta) is being verified against observations. We also have been looking into using the meso-eta model.
- Versions of AFPS for Washington, D.C. and Atlanta areas were prepared (Wier). The latter will be used for demonstration at the AMS conferences in January. This work includes initialization and editing (display), but not text generation.
- A high-resolution topography dataset was obtained from the National Geophysical Data Center (Wier). This will be used for initialization and to produce topography reference maps for the gfe.
- Design of the time-series (TAF) database began (LeFebvre, Bacco).
- Worksheet graphics were redesigned to improve scrolling performance (Romberg, Mayer).
- AFPS Level 2a software was released to WSI, Inc. in response to a Freedom of Information Act request (Mathewson).
- The fill-in-hole/pencil tool algorithm was improved (LeFebvre).
- We considered the changes requested by AFWG members, entering accepted items into our bug-tracking system (Howard).



3. Presentations/Visitors/Travel

In addition to the NWS visitors who participated in the WFO-Advanced exercise, several other demonstrations were given this quarter. These include:

- Eighteen members of a COMET COMAP class, 3 October;
- A group from Boise and NWS Western Region Headquarters, 19 October. They were here to discuss the Boise Fire Weather Risk Reduction plans, and to learn about the capabilities of WFO-Advanced (including AFPS) regarding possible support of the program;
- Joe Cione, OAR meteorologist, 23 October;
- Gary Carter, NWS Eastern Region, 15 November;
- Ida Hakkarinen, NOAA Headquarters (on detail from OM), 27 November;
- Sam Williamson, Deputy Director of OSD, 5 December;
- Laszlo Tolgyesi and Gizella Duska, Meteorological Service of the Hungarian Republic, 8 December.

Travel and presentations:

- Tom LeFebvre, Mark Mathewson, and Joe Wakefield traveled to Silver Spring in early November for demonstrations at NWS Headquarters and for the Operational Risk Reduction meeting.
- Corby Bacco and Bob Mayer attended a two-evening seminar on client-server computing.
- Paul Schultz (FSL Forecast Research Division) demonstrated AFPS at an NCEP local modeling meeting in December.

4. TDL activities

TDL developers continued to work closely with FSL to develop the AFPS. During this quarter, MOS initialization and product generation software were grafted into AFPS and used as a part of FSL's WFO-Advanced exercise. The MOS ingest ran in Silver Spring, driven by bulletins received from AFOS. MOS forecasts were applied to the AFPS grid using a scheme devised by the Denver Forecast Office. The statistical forecasts were then used to generate gridded forecasts of sensible weather. These grids were transmitted to the AFPS databases at FSL.

The product generation programs and the Informix database which support them were loaded onto FSL machines. These programs summarize the gridded forecasts by zone and generate a set of text products.

During this quarter, two important techniques were developed to help generate aviation products (TAFs). The first technique uses LAMP cloud layer forecasts to initialize a gridded database. The second technique generates TAF forecasts from digital data.

The Local AWIPS MOS Program (LAMP) is an update to MOS which will run hourly at a WFO, generating statistical guidance based on MOS, the latest hourly observations, and simple

advective models. LAMP generates statistical forecasts for 20 hours for many weather elements. LAMP's aviation elements include total opaque sky cover, ceiling height, and lowest and highest cloud layers. These statistical forecasts can be post-processed to yield hourly cloud layer forecasts.

LAMP forecasts have been available for some years. The new technique uses the LAMP forecasts to update grids of weather elements which were previously initialized from MOS forecasts. Although LAMP is designed to run at Forecast Offices in the AWIPS era, it currently runs centrally at TDL. Forecasts are disseminated from there.

5. Plans for the next quarter

Most of next quarter's plans can be deduced from the list of Level 2b/Denver requirements. Other plans include

- An FSL Technical Review will be presented on 16 January.
- At the end of January, Mark Mathewson and Joe Wakefield will travel to Atlanta to present papers (Mathewson, Wier and Wakefield) at the 12th IIPS conference.
- We are in the process of hiring an additional Quality Assurance staff member, who will focus on customer support, including preparing training and user documentation.
- We are still hoping to add memory and disk to our development computers, although that is mostly on hold pending FY96 budget decisions.
- As mentioned in the last report, we have received an HP J200 (the current AWIPS workstation hardware) for testing. We will continue performance and HP/UX 10 testing.

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