AFPS Quarterly Report (94Q2)

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AFPS Quarterly Report FY94 Q2: January - March 1994

1. Introduction

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

This report in general covers only FSL work. Most of TDL's work is covered in TDL Quarterly Reports. The use of "we" below refers to FSL staff.

Our two visitors from the Peoples' Republic of China, Xu Xiaofeng and Niu Congxiao, have returned home, Mr. Xu after two years, and Mr. Niu after one.

2. Accomplishments

During this quarter, we made significant progress on our Level 1b prototype. Key items include:

- An image depiction of spatial continuous data. Each grid cell is filled with a color which reflects the data value at its grid point. Discrete data (e.g., visibility, which must be one of a fixed set of values) can also be displayed this way. (Mathewson)(1)
- Samples, which continually show the underlying data value as the pointer is dragged across the screen. Samples also may be fixed on the display, which then indicate data values for whatever field is currently active. (LeFebvre)
- Labeled contour fields. While this was available in the Level 1a prototype, this is a new implementation which allows interactive editing of contour fields. (Wier)
- The freehand tools paint, spray, and bulldozer (an interactive smoother). (Mathewson, Young)
- Point and area selection tools, including select-based-on-value. The user can select one or more gridpoints to which gridpoint tools may be applied. Points can be selected individually, by area, or based on one or more values (e.g., all points with temperature below 40&#65533;F and dew point above 32&#65533;F). Gridpoint sets may also be saved and recalled by name. (LeFebvre)
- Some of the gridpoint tools push-pull and a preliminary version of copy. The gridpoint tools operate on a selected set of gridpoints. Values can be increased or decreased, or the data at a set of points can be copied to a new location. (LeFebvre)
- Time series. Again, this was part of the Level 1a prototype, but this version also allows the data to be edited. Several ways of viewing data are included. (Mathewson, Wier)

We have been very pleased with the performance of the freehand tools on our Sun workstations using Xlib. (The port from XGL to Xlib was accomplished early in January in just three days (Mathewson, Mayer).) We had anticipated that performance would be a significant problem until we moved to the HP platform. Especially surprising is the excellent performance with contours. Not only is this type of editing quite fast, but the effect is compelling users find that they can see the effects so well that in many cases the contour view is preferred to the image view.

We also discovered essentially by accident that the paintbrush tool can do a very good job of editing contours, so much so that SIRS (Dave Ruth's Systematic Interpolative Radial Search algorithm for computing grid values from contours) implementation will be deferred pending review of paint performance by our AFPS Forecaster Working Group (AFWG).

We continue to be pleased with our choice of C++. An unsolicited comment from one of our programming staff addressed this issue:

> **Once again I find the fact that all this [a new form of display] works the first time with various parameters, and with both display and editing, very impressive and a validation of the design and coding principles in use.**

The departure of our system administrator on 5 January took a considerable toll on our plans to port our system to the Hewlett-Packard platform. However, we were able to complete the port, and the HP version of the Level 1b prototype was demonstrated on 29 March (Mayer). The port was fairly easy, though time-consuming. Much of the difficulty was due not simply to the change in platforms, but to converting to a new version of the C++ compiler at the same time. On the Sun, we used CFront 2.1, while the HP is outfitted with v3.0. In the long run, of course, the new compiler will be beneficial.

Other activities include:

- Work on map backgrounds continues (Bacco).
- With TDL, we have been developing plans for the work required to merge TDL's extensive ICWF initialization scheme into AFPS (Mathewson, Wakefield).
- The database was extended to support storage of gridpoint sets (e.g., local-effects areas). (LeFebvre)

3. Presentations/Visitors/Travel

We hosted a number of visitors this quarter. In addition to demonstrations to several of our FSL colleagues, we talked with the following outside visitors:

- Keith Ward of GTE visited 10 February. He was interested in our SIRS work.
- We gave an overview and demo to three visitors from Scott AFB, also on 10 February.

- NWS visitors included Eric Thaler, WSFO DEN, & Greg Grosshans, CR SSD, 17 February, Ron Holmes, WSFO DEN, 15 March, and Dave Reynolds, future SOO at the new Monterey office, on 29 March.
- FSL hosted a group from the Taiwan Central Weather Bureau (CWB) for a few days in late February. They were here for a status check on the FSL-CWB joint work, which has included deployment of FSL PC workstations in Taiwan, FSL assistance with radar and profiler issues, and, most recently, cooperative work on FX-ALPHA development. The CWB wanted to learn about AFPS, so we gave a formal presentation of AFPS goals, progress, and plans, as well as a demonstration of Level 1b progress to date.
- Mary desJardins of NMC stopped in for a brief progress report on 4 March.
- Wendel Yale (PRC) and Joe Gofus (AAO) visited FX-ALPHA (FSL X Window System AWIPS-Like Prototype for Hydrometeorological Applications) staff in early March. We had a brief discussion with them and gave a demonstration.
- On 10 March, we demonstrated our prototype to Dave Ruth (TDL), Naba Barkakati (ADDL), George Smith (OH), and Joe Gofus.
- We gave an AFPS overview and demo to a group of five program analysts from the AAO on 31 March.

Joe Wakefield & Mark Mathewson attended the AMS conferences in Nashville, demonstrating the Level 1a prototype and wind and interpolation concepts to numerous visitors to the NOAA booth. They presented a paper at the 10th IIPS conference.

4. Plans for the next quarter

By mid-April, our staff will move from Sun to HP workstations for development. (The Suns will be used by other staff in FSL's Modernization Division, and to support work at Norman and Denver anticipating the replacement of DARE equipment by FX-ALPHA at those sites.) We will continue to explore the possibility of converting our graphics from X to PEX.

We plan to hold a meeting of the AFWG in May. The new Southern Region representative is Al Moeller of WSFO FTW. By the end of April, we will complete our Level 1b work, including

- the balance of the gridpoint tools move, copy, and set value;
- a smoothing function;
- display and editing of vector data, both spatial and temporal;
- preliminary work with image depiction of weather (precipitation and obstructions to vision);
- map backgrounds;
- color bars, legends, and scales; and
- a preliminary implementation of an undo function.

We will finish writing documentation of the Level 1b design and software, and begin design activities for the next round of development. The major items to be considered are the worksheet concept and depictions of weather and clouds. Also, we will be working with TDL to develop and interface between their initialization modules and our database. They have been working on

extraction of explicit weather from MOS and clouds from data grids. (TDL is also working on adapting text generator software for the AWIPS environment; plans call for us to work on an AFPS interface to those modules toward the end of FY94.)

The programmer position mentioned in last quarter's report was re-advertised in February. We have made a tentative selection, and expect the position to be filled in April.

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Footnote

(1) Our AFPS work is very much a team effort. In many cases, several team members contribute to a particular item. The names listed with the various items are those who were most heavily involved with their development. Sue Young provided design and user interface support, and Jennifer Longstaff graphical primitives, for all edit tools.