P1.29 INTERACTIVE FORECAST PREPARATION SYSTEM TRAINING IN THE NATIONAL WEATHER SERVICE

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1. INTRODUCTION

The National Weather Service (NWS) has completed an initial implementation of a software system that allows graphical editing of forecasts based on model and observed data. The new software system is known as the Interactive Forecast Preparation System (IFPS) and contains two major parts. One part is a grid editor that allows graphical depiction of weather variables while the other contains climatology and product formatting programs in an effort to automate most product formatting and generation tasks. This new, more graphical, forecasting approach opens many favorable opportunities to improve service but also presents implementation and rapid software development/improvement challenges.

The National Oceanic and Atmospheric Administration (NOAA)/Forecast Systems Lab (FSL) developed a project to produce rapid prototype software which could be used for grid editing. Workshops were held at the FSL to help get NWS field personnel acquainted with installing and configuring the software at the Warning and Forecast Offices (WFOs).

2. FORMING A PROFESSIONAL DEVELOPMENT SERIES

A team of forecasters and managers from local, regional, and national NWS offices met to define the training required by the new IFPS grid-based forecasting system. An IFPS Professional Development Series (PDS) (Lamos, 1997) was established to describe the areas where training is and will be needed. The PDS describes the scope of needed training and forms a curriculum into which courses and other instructional components can be mapped.

Using several discovery and grouping techniques, the IFPS training was grouped into eight major topic areas.

These topics are:

1) Vision,
2) Operator Interface,
3) Forecast Methodology,
4) Collaboration,
5) Operations Management,
6) Local Applications,
7) Focal Point Duties,
8) Applications of IFPS Techniques.

Each topic area, also called a Professional Competency Unit (PCU), consists of four basic sections. The first section is “Description of Job Duty Competency to be Achieved.” This is a general goal for that topic area. The second section is titled “Description of Need” and discusses the motivation(s) for the training. The third section of the PCU describes specific job task skills and knowledge. These skills and knowledge items are related to the fourth and final section which contains descriptions and links to training materials called Instructional Components (ICs). The instructional components then address specific job tasks, skills and knowledge. There are also instructional components that may be listed by more than one PDS if appropriate. For instance, a training module on marine forecasting may be applicable to both the marine forecasting PDS and the IFPS PDS.

Recent dialog between a group of field experts focusing on the applications and science/technology infusion into the existing graphical forecasting process and the NWS

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Headquarters Office of Climate, Water, and Weather Services is expected to result in the addition of a new set of training requirements focused on customers. The IFPS Science Steering Team and the IFPS Training Team have identified the need for additional interaction and documentation between the NWS and its customers as the implementation of digital forecasting continues. The NWS strongly values its customers/partners and the management, outreach staff and forecasters consistently seek feedback from groups large and small to improve their forecast services in their local/regional areas as well as the national scale forecast grids. To better foster communication with the NWS, customers and partners have been invited to workshops to learn about the processes being established and give feedback on the quality, number, and availability of forecast products and services that will become operational in the next year. Efforts to capture and communicate customer and partner product evaluations and quality feedback will lead to closure of the forecast product cycle and allow for a successful path of learning and continuous product and service improvement.

3. RAPID DEVELOPMENT AND DEPLOYMENT

While the overall graphical forecasting effort has been in a development and prototype phase for a few years, there has been a significant amount of software development/evolution occurring rapidly in the last year as field offices began using the software to issue operational products (transitioning creation of products from a completely manual typing process to a mostly grid-driven product generation process).

Much of the initial effort in deployment was directed at installation and configuration issues. Training topics were addressed in a series of classes, teletraining, WWW, and residence workshops and via E-mail list servers. The classes provided a mechanism for "hands-on" learning while the other learning opportunities allowed the staff to interact and share information continuously. This knowledge sharing was and is an important aspect of successful implementation and evolution of rapidly evolving software deployments. The rapid development and deployment concept was broadened to the whole IFPS program in an effort called the Rapid Alpha Project. This involves an initial set of forecast offices which identify any conflicts or issues in new software builds before they are deployed nationwide.

Training is also developed from these earlier releases as new configuration items, capabilities or functionality are added or changed. An important part of the training for rapid development and deployment is to use different training modes based on the material. One prime example of training delivered "just-in-time" for software deployment was the teletraining sessions conducted for the Graphical Forecast Editor text formatters. Training was developed and delivered to forecast offices across the continental United States as well as the NWS offices in Alaska, Guam, Hawaii, and Puerto Rico.

4. TRAINING MODES FOR RAPID UPDATES

While the training venues have been classes and workshops initially, the training team is using distance learning techniques and software developed by Whittaker (Whittaker, 1999) as part of the Virtual Institute for Satellite Integration and Training (VISIT). Initial distance learning activities have involved communicating the reasons and motivations for such a significant change in the NWS forecasting process. This initial training was made available via several delivery methods to address concerns related to access, time management, and uniform product availability.

The modes used included presentation slides with documentation, web-based training modules, teletraining, E-mail list servers, web-based discussion forums, and recorded presentations with audio. In addition, many of the materials developed for documentation and training, are used locally and customized for on-station or on-the-job training. We expect to accelerate and prioritize training in order to follow the evolution of the software and field practices as they are developed and fielded. In addition, the implementation of the National Digital Forecast Database (NDFD) also requires training and customization of the IFPS software. An excellent example of NDFD training is the recorded presentation on forecast collaboration. This training complements the training provided by the National Centers For Environmental Prediction (NCEP)/Hydrometeorological Prediction Center and the Tropical Prediction Center for their guidance and forecast products for winter storms, tropical storms/hurricanes, and other major weather events. Additionally, collaboration activities have had participation from the NCEP's Storm Prediction Center in Norman, Oklahoma. Important collaborative efforts with field offices in the areas of severe weather prediction and fire weather forecasting

have occurred over the last year.

5. CONCLUDING REMARKS

One of the main challenges in developing and delivering training for this major change in NWS operations has been the rapid development process. The NWS Meteorological Development Laboratory and the NOAA Forecast Systems Lab are producing software updates at a rapid pace to provide incremental development steps but produce a flexible and adaptable grid-editing software package that will meet the needs of operational forecasters. With regard to the training activities, the NWS also seeks to provide a foundation of material which can then be augmented by several modes of training to include WWW modules, teletraining, recorded presentations, and documentation.

Significant interaction with NWS WFOs takes place during the development of and during these training sessions. We look forward to continuing those interactions. The IFPS team also plans to help coordinate training developed at WFOs and regional headquarters to assist in the expansion of distance learning efforts. The software used for the recorded and teletraining versions of these presentations and briefings is evolving to meet the needs of the IFPS training environment.

The IFPS training and professional development materials and activities are available via the training team's WWW pages located at http://www.nwstc.noaa.gov/nwstrn/ifps_met.htm These pages link to the PDS, instructional components, e-mail lists and other valuable learning resources for IFPS and the NDFD.

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7. REFERENCES

Lamos, J., 1997: Operational Forecasters' Professional Development Series. Cooperative program for Operational Meteorological Education and Training Process Definition Committee. Boulder, CO. http://www.comet.ucar.edu/pds/PDS_V3.htm

Whittaker, Thomas M., 1999: VISITVIEW- A Collaborative Distance Learning Tool for the Virtual Institute for Satellite Integration Training (VISIT). Preprints 15th IIPS, Dallas, Texas, AMS.