

OPINION

OBSERVATIONS

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This is an abbreviated version of a presentation made by the author at the recent Regional Directors Conference in Anchorage. Mr. Augulis would appreciate any comments readers may have on this paper. Editor

WSFO Fairbanks was one of the last offices implemented under the forecast reorganization program. It also is the office with the largest land mass area, a size of Texas or 1 1/2 Californias. However, I believe it also has some other characteristics which make it unique among the other 49 WSFOs. It is a young office and its personnel are short on experience but long on enthusiasm, motivation, and the interest to do a good job. The average age of the 13 meteorologists comprising the staff is 34 years; take away the two oldest, or better yet, "most experienced," on the staff and the average age drops to 31 years. Six meteorologists are under 30 years old.

The operational forecasting experience at Fairbanks when compared to other forecast offices might equal that of one forecaster!

WSFO Fairbanks is short on experience but long on job motivation and enthusiasm. However, this is not enough to do a good job. Along with this there must be a training program. Because of the inexperience of the staff, I've had to emphasize this program more than might be the case at other WSFOs. Although we've had an active program, I have not been totally satisfied; because of the increased emphasis on training, I have seen a weakness in the NWS training philosophy for young operational forecasters.

The young meteorologist has available to him a vast amount of automated guidance from NMC. During university training he might or might not have had a good synoptic meteorology curriculum along with other courses in meteorology. Invariably the university graduate learns theory but is very weak in the application of this theory to operational forecasting problems. The graduate enters the NWS and immediately is exposed to a vast array of analyses and forecast guidance from NMC. Instead of doing his own analytical thinking and diagnosis of a meteorological problem, he uses someone else's ideas (NMC) and only has to choose at times which answers to accept. With little analytical and diagnostic experience it is only

natural that he accept the centrally prepared product more often than not. Unless the meteorologists work to improve their analytical abilities they will rely more and more on the centrally prepared product. Explanations of why the forecasts are weak and full of in-house jargon, i.e. PVA, vort max, compromise between progs, etc. One can easily become an interpreter of lines and translator of numbers into forecasts.

When a new forecaster comes on duty the emphasis on training too often is making a station routine and forecast deadline. When the person is able to attain this goal, the training aspect is deemphasized. He is able to "stand" shift alone. But is he really? All he can do is write a forecast product by a certain time; but how good is it? Who's to judge on its quality during the training period and afterwards? I'm concerned about this training problem and our weakening analytical abilities because I see this showing up at my station among young and motivated forecasters. I'm also concerned because we in Alaska have less centrally prepared products than other regions, so this problem of dependence on centralized guidance is less than the Lower 48. If it shows up as a problem here, it has to be an even greater problem in other regions.

I think it's time to step back and take a look where we are going. AFOS will soon be here and I can see the NWS forecaster becoming a technician, an interpreter of lines and translator of numbers into words, with diagnostic and analytical potential unused. A more vigorous and active training program in analytical and diagnostic techniques should be started at the WSFO level. Supervisors should find out what the meteorologists know and what they would like to learn so as to upgrade their diagnostic and analytical abilities. The MIC and PA have to be the catalyst for such a program to succeed. There should be more emphasis placed on training aids prepared at the WSFOs. The more experienced forecasters might prepare training aids for the station staff.

Videotape training has great potential. At present, production of this type of training has to be at the Headquarters or R.O. level because of monetary and staff limitations. However, I believe that for this program to really succeed there needs to be input from the field forecasters as to what type of training tapes they would like.

Let the met interns, graduate interns, and journeymen have some say in the videotape program. A majority of the tapes produced so far cover topics dealing with uses of NMC products. Why not tapes made from some of the excellent training papers and technical memorandums already in existence? What about tapes for aviation forecasters covering topics such as forecasting icing, turbulence, and low ceilings, along with climatology of weather patterns over a given area? In this day and age of electronics there is no reason why our interns have to learn by trial and error as much as they do.

Even though there will always be centrally prepared products, we must emphasize and develop original and sound diagnostic techniques. Without a solid diagnosis there is no way consistently good forecasts based on sound meteorological reasoning can be made. Without a solid analytical background and diagnostic techniques, there is no way a forecaster can have an understanding of atmospheric processes which one has to predict. The forecaster will not be able to use NMC guidance to its fullest. Twenty to thirty years ago analytical techniques and diagnostic abilities were major inputs into the forecast problem solutions, while today it seems it has shifted to NMC guidance. We need the proper blending of both. This proper blending or "marriage" of both should become a part of the NWS philosophy. Changes to implement it and training so as to learn to do it need be started as soon as possible.

More emphasis has to be placed on a structured approach to the forecast problem. Met techs are structured in how to take RAOBs, work minicomputers, etc., while electronic technicians have structured approaches to repairing equipment. Meteorologists, on the other hand, all too often go their own way on forecast preparation. Not enough emphasis is placed on teaching a general structured approach to solve the forecast problems. Young interns are left on their own to develop working habits; they get approaches from everyone in the office. How does one know what is best?

I propose a more structured approach with individual variations of the basics; these variations can differ with each forecaster. This type of problem solving technique leads to a better training in diagnoses and analytical techniques. Some general guidelines might come from NWSH and the Regional Office, but it is up to each MIC to develop a basic structured approach to the forecast problem in his area of responsibilities. Possibly small on-station computers might be utilized during the pre-AFOS time frame. It is important that all the forecasters have input into the design of the program. Videotape training could have a significant impact in this area.

I believe it's about time we start implementing a more structured problem approach to weather forecasting in the NWS.

Quality control is another area for improvement. QC on the met techs and the observation program is very tight. As a matter of fact, a large part of a met tech's performance evaluation is based on his observational accuracy. An electronic technician is evaluated through his ability to diagnose problems and repair equipment; if he can't do his job, it sure will become obvious to his supervisor and others. However, what type of QC program is placed on the products prepared by the forecasters? Anyone can prepare a forecast, but how good is the forecast? Is it a product indicating a high degree of professional ability in weather forecasting or a vague statement on expected weather conditions interspersed with a number of qualifiers showing one's uncertainty?

Only through an active quality control program can our products be improved. Quality control should start at the WSFO level. The MIC is the focal point for quality control at his or her station. The WSEO concept is excellent, but staffing levels at a WSFO have to be high enough so the program goals are met.

A necessary ingredient of an active QC program is feedback. There must be more emphasis on feedback to the operational forecasters concerning what the users think of their products. This is not an easy nut to crack, but it needs to be done. All too often forecasters go day after day writing forecasts and never get any feedback on their products. Feedback is a necessity for job motivation and satisfaction. At times we are weak in this area. That is why an active WSEO program is necessary. We need to go out and get this feedback ourselves. Asking others to do it for us or expecting users to come to us will only get minimal results.

No one will always make the perfect forecast, but we must be open to the reception of constructive criticism. All too often a forecaster feels he is not open to any comments on his forecast and that's all. All too often the MIC and PA stay in the background and do not give the technical leadership they should. Constructive postmortems and solutions for improvement are a necessity for a viable forecast program. All MICs should be able to carry a shift at their office, and should do so. They should be open to the same constructive comments as their forecasters. It's time we get our heads out of the sand on on-station daily QC of our forecast products.

A reevaluation of the quality control program at the Headquarters level needs to be made. Is the present program of monthly compilations on microfiche cards meeting its goals? Have we

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PRE-ANALYZED SATELLITE PICTURE

In preparing for the morning map discussion, the briefer was reading the National Environmental Satellite Service (NESS) satellite interpretation message and labeling the key features on the two-mile resolution infrared satellite picture. All was going well until the briefer tried to label a vorticity maximum and associated short-wave trough near 47° north latitude and 164° west longitude (X, Figure 1). About five degrees ahead of the trough was a comma shaped cloud mass produced in the area of upward vertical motion induced by the area of Positive Vorticity Advection (PVA). Between the PVA comma and the short-wave trough there is another cloud mass in the shape of an "L" with a dot to the right of it (see Figure 2 for an enlargement of this area). It appeared as if Mother Nature was trying to tell us that the trough was further ahead than the interpretation message had it. The briefer chose to go along with the location suggested in the NESS message, but he had to commend Mother Nature on her effort to analyze the picture for us.

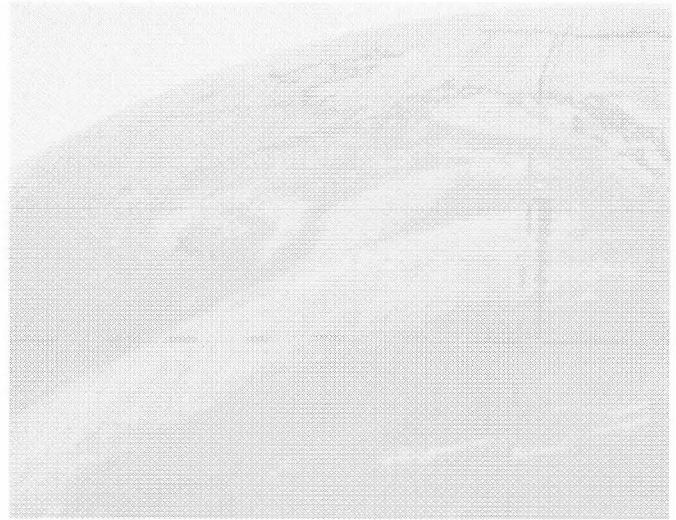


Figure 1 Two-Mile Resolution Infrared Satellite Picture for 1145 GMT November 14, 1977.

Scientific Services Division
National Weather Service - Western Region
Salt Lake City, UT 84717



Figure 2 Enlarged Portion of Figure 1.

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been getting useful information from the program? Has this information been helpful to the field forecasters? If the answers are not yes, then changes should be made. Feedback is the key word in a quality control program.

The operational forecaster has to work and be considered by management as a "professional." There is a tendency to consider him, or he consider himself, as an assembly line producer of weather forecasts. If he meets deadlines, makes satisfactory forecasts, etc., all is well.

Instead of this, the operational forecasters must have time for additional professional development, i.e., shifts for forecast studies, training, visitations, etc. A varied work routine would do much to stimulate self motivation and job satisfaction. Staffing patterns have to be arranged to allow such a work pattern. This philosophy has to be promoted at the station level and follow-through done by the supervisors. Meteorologists have to accept this "professionalism" as a part of the job and actually participate in it.

As a postscript, Mr. Augulis adds that "my comments on training for 'young' operational forecasters are equally applicable to the journeyman or 'experienced' forecasters."