***NATIONAL WEATHER SERVICE WESTERN REGION SUPPLEMENT 04-2003***
***APPLICABLE TO INSTRUCTIONS 20-103***
***MARCH 17, 2009***

***Training and Education***
***Training and Education, NWSPD 20-1***
***Forecaster Development Program Training, NWSI 20-103***

**Forecaster Development Program - Western Region**

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**Type of Issuance:** Routine.

***SUMMARY OF REVISIONS:*** This directive supersedes NWSI 20-103, Forecaster Development Program - Western Region, dated 03/02/04. Changes: New URL section 4.2, updated section 5.3.6, updated Intern Progress Report.

Signed 02/20/09
Robert Tibi Date
Director, Western Region

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1. Introduction. The purpose of this supplement is to provide Western Region supervisors and Meteorologist Interns specific guidance to successfully conduct and participate in the Western Region Forecaster Development Program (FDP). This program is based on the Professional Development Series (PDS) of the National Weather Service (NWS) FDP.

2. Background. The NWS Forecaster Development Program (or training plan) is a seven-phase process geared towards allowing the newly hired Intern to gain the skills and experience needed to fulfill the tasks of an Intern, setting the foundation to become a full performance forecaster (generally 3-5 years after hire). The program is divided into seven phases; 1) Organizational Structure and Administration; 2) Observational Instrumentation, Remote Sensing, Interpretation and Data Management; 3) Forecast Process; 4) Forecast Science and Operational Programs; 5) Operational Applications, Troubleshooting and Dissemination; 6) Customer Service and Outreach; and 7) Professional Development.

The goal of Phase 1 is to be knowledgeable of the overall general mission and structure and administrative aspects of the Federal Government, National Weather Service (NWS) and its parent government agency, the National Oceanic and Atmospheric Administration (NOAA). In Phase 2, students will learn to dentify, operate (as required), and apply various observational data sets to all NWS programs; and be familiar with local data management procedures and participate in data collection processes. Phase 3 teaches an intern to be knowledgeable in the ability to diagnose and analyze the current and future state of the atmosphere to produce products and deliver services to accomplish the mission of the NWS. Phase 4 provides knowledge of NOAA's National Weather Service (NWS) operational programs and the application of meteorological and hydrologic knowledge, skills, and science to the attainment of program goals.
In Phase 5 the Intern will become familiar with and be able to use all NWS systems and software applications used operationally in a NWS Forecast Office or National Center; and be able to interpret, disseminate and perform basic trouble shooting techniques for each. Phase 6 provides instruction to coordinate and communicate effectively with both internal and external customers. And Phase 7 establishes and promotes continuous learning opportunities for growth and development for the Intern and others in the office and the organization. The speed at which the Intern passes through the 7 phases is primarily determined by the MIC and the office staffing situation. If the MIC feels comfortable with the Intern's progress, the MIC can assign the Intern to forecast shifts during any phase. Since this is an Intern "development" plan, the MIC is encouraged to assign the Intern forecast shifts as early as possible.

Additional information about the NWS Forecaster Development Program is contained within the web pages of the NWS Training Center, at *www.nwstc.noaa.gov/nwstrn/d.ntp/fdp/*.

3. Responsibilities

The Western Region FDP leader is the Chief of the Scientific Services Division (SSD), W/WR3. The designated Intern Program Manager, W/WR3x1, is responsible for implementation of the regional program, as well as for the coordination between the NWS Headquarters (NWSH) and the field.

The Meteorologist-in-Charge (MIC) shall be responsible for the FDP within his or her office. Normally, the day-to-day management of the program on station is turned over to the Science and Operations Officer (SOO). Each staff forecaster [as well as the Warning Coordination Meteorologist (WCM), Service Hydrologist, etc.] is encouraged to act as a mentor to one or more Interns, to contribute the added dimension of experience from one who has been through the program and can offer sound advice and training. Local additions are allowed to the NWS FDP as determined by the MIC in consultation with the SOO

Interns are ultimately responsible for their own professional development, and their future advancement will reflect on their degree of commitment and effort. All Interns shall maintain a file of all important administrative papers, certificates of achievement and/or completion, personnel actions, training records, authored publications, and records of other professional development projects.

4. Program Administration

4.1 Performance Plans. The criteria for performance evaluation shall be contained in each Intern's performance plan (General Workforce Performance Appraisal System, or GWPAS), which typically includes such critical elements as Data Acquisition and Quality Control, Service Automation, Information Dissemination, Adaptive Forecasts and Warnings, and Training/Professional Development. The critical elements and their associated activities shall reflect the local office program and needs; current skills of the Intern; and desired knowledge, skills, and abilities.

Within the Training/Professional Development critical element of an Intern's GWPAS or within an Individual Development Plan (IDP), expectations for the completion of specific training activities and modules for the upcoming year shall be listed in detail. Thus, in addition to the minimum training required for promotion laid out in this Supplement, the Intern will have in writing all *additional* training required by his or her supervisor for the coming year.

4.2 Semiannual Intern Progress Reports. In order for the Intern Program Manager to monitor the regional FDP, semi-annual Western Region Intern Training Progress Reports (see Attachment) shall be prepared for all GS-5/7/9 Interns in conjunction with their mid-term and annual performance evaluation. These reports can be included in the semi-annual SOO training report/plan that is submitted to the Chief of the Scientific Services Division. These reports can be used in conjunction with the Individual Development Plan (IDP). For example, the IDP could be virtually the same as the Intern Progress Report, thus eliminating the need for two separate reports. These reports shall indicate the specific training that the Intern has completed to date. The MIC shall be responsible for ensuring that these reports are received by the Intern Program Manager, W/WR3x1, by March 15 and September 15 of each year. The Western Region Intern Training Progress Report form will be updated as necessary and posted to the web at http://ww2.wrh.noaa.gov/ssd/training/files/intern_report.pdf .

4.3 Promotion to GS-7/9/11. When an Intern has satisfied the requirements for promotion to the GS-7, GS-9, and GS-11 levels, the MIC shall submit a *Personnel Action Request* form, or SF-52, to WR ADMIN.

The final decision on promotion rests with the MIC. The MIC should use the Western Region Intern Progress Report to assist in the promotion decision making process. MICs should ensure that an Intern progresses through the seven phases of the FDP at a consistent rate for promotions and in order to complete the entire series in 3 years or less.

For promotion to each successive grade level, the Intern must have 1 year in grade; proof of completion of the minimum required training in the form of the Western Region Intern Training Progress Report (see Attachment); and MIC endorsement, as shown by his or her signature on the required SF-52, or the signature of the Intern's supervisor.

5. Training and Professional Development

5.1 Objectives of Intern Training. The goal of the Intern FDP is to provide uniform training and work experience to prepare meteorologist interns to progress to a full performance forecaster at a Weather Forecast Office (WFO), or equivalent position at a National Centers for Environmental Prediction (NCEP) Service Center, or other NWS office.

5.2 Course Work. Formal course work is achieved three ways: on station, through a local vendor or university, or in residence at another location. On-station training is becoming the primary venue for training in the NWS and takes on many forms, including one-on-one or small-group training with the SOO or other individual; local workshops; self-study courses administered locally or through the Western Region Headquarters (WRH); NWS Training Center (NWSTC) Remote Training Modules (RTM); correspondence courses obtained through, for example, the NWSTC, U.S. Department of Agriculture (USDA), universities, etc.; computer-based training modules; online tutorials and web-based training via the DOC/NOAA/NWS Learning Management System; and teletraining.

Courses for which tuition is a responsibility of the forecast office shall be paid for through the office training budget, as opposed to WRH or the NWSH. In all but a few special cases, tuition is payable with the station Government Purchase card.

5.3 Professional Development. Professional development is a vital, *ongoing* process for all employees in the NWS, not just Interns. Exposure to a wide variety of professional activities and experiences is enlightening, rewarding, and leads to greater critical insight on the job as well as personal depth. Those who have acquired the richest educational and experiential backgrounds are often the most valued employees in any organization.

Professional development means many things, from additional formal training, to informal visits to other offices of operational interest, to research and documentation, and computer activities. Examples include, but are not limited to:

5.3.1 Workshops. The Intern could conduct or participate in workshops, seminars, or technical discussions that cover methodologies or techniques focused on local forecast and warning problems. These could be conducted at the local office, other WFOs, RFCs, or elsewhere.

5.3.2 Computer Application Programs. This activity consists of developing software for local computer systems, or local applications in AWIPS, that will simplify or enhance station operations. If applicable, these computer programs should be generalized for use by other NWS personnel. Intern projects can also include the evaluation of the application programs and possible improvements and/or extensions to them.

5.3.3 Research Projects. The Intern may wish to conduct or participate in research projects that address important forecast or warning problems. The end objective of such an endeavor should be a formal regional publication (such as a Technical Attachment, or Technical Memorandum); a professional journal; or for presentation at a scientific conference (funds permitting). As with all research projects, the Intern should first coordinate any project of interest with the SOO or DOH. Some examples of typical research projects are:

5.3.4 Case Study. This can be either a detailed post analysis of a significant weather or flood event, or a study directed towards a specific local forecast problem. The intern should develop a specific set of guidelines or procedures for handling similar events in the future.

5.3.5 Climatic Study. This is a review and analysis of the local climatic conditions (or a specific aspect thereof) that might make use of statistical techniques to derive charts, tables, summaries, or other useful tools for application to local forecasts.

In addition to research-related projects, there exist a number of other office programs in which the Intern may benefit local operations:

5.3.6 Hydrology Program. The Intern may enhance his or her hydrology background by taking university or correspondence hydrology courses (from the USDA or University of Oklahoma, for example), or hydrology modules from COMET on the NOAA/NWS LMS including Basic Hydrologic Science. The Intern may assist in implementing new hydrology forecast procedures.

5.3.7 Verification Program. Techniques and procedures associated with local forecast verification activities could be devised and implemented.

5.3.8 Warning Preparedness Program. The Intern could conduct preparedness programs, lead spotter training sessions, or assist in other station preparedness efforts.

5.3.9 Local Information Management. The Intern could serve as a focal point for information management for the station library, the office Internet home page, or assist with the management of local computer systems.

5.3.10 Educational Outreach. The Intern could participate in school visits to the office; visits to area schools, churches, festivals, marine and aviation shows, etc.; the preparation of educational materials for the public; and/or the office Equal Employment Opportunity (EEO) or Diversity programs.

5.4. Office Visits. The Intern shall become familiar with other offices that have a working relationship with their forecast office, such as River Forecast Centers (RFC)' Center Weather Service Units (CWSU), and USFS Avalanche Centers, etc.

5.5 Training Shifts. The most important of the knowledge, skills, and abilities that an Intern must ultimately bring to his or her eventual role as a full-performance forecaster, is the ability to staff an operational shift. Regularly scheduled training shifts are a critical part of the Intern's development program, and thorough experience in these shifts must be demonstrated prior to the recommendation for promotion to the forecaster level.

5.6 Summary. This document provides the guidelines that will enable Interns and their supervisors to carry out an effective Forecaster Development Program at their Western Region forecast office. However, no set of instructions can address every situation and problem that may arise during one's internship. Common sense and good judgment may at times be the only guidance to address unusual situations. The staff at the Scientific Services Division in general

(as well as Meteorological Services and Hydrology and Climate Services Divisions), and the regional Intern Program Manager in particular, should always be considered a resource for any needed guidance or suggestions.

# Western Region Intern Progress Report

# Forecaster Development Program

## Instructional Component Checklist

# I. NWS Organizational Structure and Administration

| Description | Due Date | Completion Date | SOO/Trai |
|---|---|---|---|
| NWS Instruction 20-103: Forecaster Development Program | | | |
| New Employee Orientation Page | | | |
| Review of Personnel and Administration Policies | | | |
| Review NOAA policy: Use of Government Computer | | | |
| Review of electronic communication and reporting systems | | | |
| Introduction to NOAA and the NWS [NWSTC - NWS Learning Center] | | | |
| NWS Directives [NWSTC - NWS Learning Center] | | | |

# II. Observational Instrumentation, Remote Sensing, Interpretation and Data Management

| IC | Description | Due Date | Completion Date | SOO/Training Coordinator Initials |
|---|---|---|---|---|
| 2.1 | Quality Control [NWSTC WBT-001] | | | |
| 2.2 | ASOS System and Algorithms [ASOS Users Guide and NWSTC web] | | | |
| 2.3 | SHEF Observations Tutorial [NWSTC - NWS Learning Center] | | | |
| 2.4 | Skew-T Mastery [COMET - NWS Learning Center] | | | |
| 2.5 | WSR-88D DLOC [WDTB] | | | |
| 2.6 | Factors Affecting the Accuracy and Continuity of Climate Observations [Climate Services Division/OCWWS – web (Climate PDS, PCU6)] | | | |
| 2.7 | Rain Gauges: Are They Really Ground Truth? [COMET - NWS Learning Center] | | | |
| 2.8 | Surface Observation Certificate [as required] | | | |
| 2.9 | Upper Air Certification (as required) [Handbook 10, MicroArts/RRS Training Guide, RRS DVD] | | | |
| 2.10 | Cooperative Observing Program [NWSTC RTMs, residence course] (as required) | | | |
| 2.11 | Satellite Training - SHyMet Intern Course [VISIT - NWS Learning Center] | | | |

# III. Forecast Process

| IC | Description | Due Date | Completion Date | SOO/Training Coordinator |
|---|---|---|---|---|
| 3.1 | The Forecast Process [COMET CD – note: it may not be available] | | | |
| 3.2 | Jet Streak Circulations [COMET- NWS Learning Center] | | | |
| 3.3 | Isentropic Analysis [COMET - NWS Learning Center] | | | |
| 3.4 | Model Fundamentals [COMET - NWS Learning Center] | | | |
| 3.5 | Impact of Model Structure and Dynamics [COMET - NWS Learning Center] | | | |
| 3.6 | How Models Produce Precipitation and Clouds [COMET - NWS Learning Center] | | | |
| 3.7 | Influence of Model Physics on NWP Forecasts [COMET - NWS Learning Center] | | | |
| 3.8 | Intelligent Use of Model-Derived Products [COMET - NWS Learning Center] | | | |
| 3.9 | Understanding Data Assimilation [COMET - NWS Learning Center] | | | |
| 3.10 | Introduction to Ensemble Prediction [COMET - NWS Learning Center] | | | |
| 3.11a | Review NWS Directive NWSI 10-504 National Public Weather Products | | | |
| 3.11b | Review NWS Directive NWSI 10-512 National Severe Weather Products | | | |
| 3.11c | Review NWS Directive NWSI 10-514 National Winter Weather Products | | | |
| 3.11d | Review NWS Directive NWSI 10-601 Tropical Products | | | |

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| 3.11e | Review NWS Directive NWSI 10-516 National Non-Precipitation Products | | | |
| 3.11f | Review NWS Directive NWSI 10-518 National Non-Weather Related Emergency | | | |
| 3.11g | Review NWS Directive NWSI 10-930 National Hydrologic Products | | | |
| 3.12 | Gridded Forecasts Methodology Training using the Graphical Forecast Editor (GFE) [NWSTC, local training] | | | |
| 3.13 | Application of GFE Smart Tools [NWSTC, local training] | | | |
| 3.14 | Collaboration Training [local training] | | | |

# IV. Forecast Science and Operational Programs

| IC | Description | Due Date | Completion Date | SOO/Training Coordinator Initials |
|---|---|---|---|---|
| 4.1a | Review NWSI 10-511 WFO Severe Weather Products | | | |
| 4.1b | Principles of Convection I: Buoyance and CAPE [COMET- NWS Learning Center] | | | |
| 4.1c | Principles of Convection II: Using Hodographs [COMET - NWS Learning Center] | | | |
| 4.1d | Principles of Convection III: Shear and Convective Storms [COMET - NWS Learning Center] | | | |
| 4.1e | Severe Convection II: Mesoscale Convective Systems [COMET - NWS Learning Center] | | | |

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| 4.1f | Predicting Super Cell Motion Using Hodograph Techniques [COMET - NWS Learning Center] | | | |
| 4.1g | Lightning Meteorology I [VISITview with audio] | | | |
| 4.1h | Lightning Meteorology II [VISITview with audio] | | | |
| 4.1i | Advanced Warning Operations Course (AWOC – Core, Severe) [WDTB - NWS Learning Center] | | | |
| 4.2a | Review NWSI 10-503 WFO Public Weather Forecast Products | | | |
| 4.2b | Review NWSI 10-506 Digital Data Products or Services | | | |
| 4.2c | Review NWSI 10-515 WFO Non-Precipitation Weather Products | | | |
| 4.2d | Review NWSI 10-517 Multi-purpose Weather Products | | | |
| 4.3 | Introduction to QPF [COMET – NWS Learning Center] | | | |
| 4.4a | The Impact of Weather on Air Traffic Management [COMET - NWS Learning Center] | | | |
| 4.4b | Terminal Aerodrome Forecasts (TAF) [NWSTC - NWS Learning Center] | | | |
| 4.4c | DLAC 1: Fog Forecasting/Low Stratus for Aviation Operations [COMET - NWS Learning Center] | | | |
| 4.4d | DLAC 1 Lesson 3b: Writing Effective TAFs [COMET – NWS Learning Center] | | | |
| 4.4e | DLAC 2: Basic Terminal Forecast Strategies [COMET – NWS Learning Center] | | | |
| 4.4f | DLAC 2: Writing TAFs for Convective Weather [COMET – NWS Learning | | | |

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| | Center] | | | |
| 4.4g | DLAC 2: Writing TAFs for Winds and LLWS [COMET – NWS Learning Center] | | | |
| 4.5a | Review NWSI 10-921 WFO Hydrologic Operations | | | |
| 4.5b | Review NWSI 10-922 WFO Hydrologic Products | | | |
| 4.5c | Understanding the Hydrologic Cycle [COMET/FDTB -NWS Learning Center ] | | | |
| 4.5d | Unit Hydrograph Theory [COMET/FDTB - NWS Learning Center] | | | |
| 4.5e | Runoff Processes [COMET/FDTB - NWS Learning Center] | | | |
| 4.5f | Streamflow Routing [COMET/FDTB - NWS Learning Center] | | | |
| 4.5g | Hydrologic Services Course [available at local office or regional HQs] | | | |
| 4.6a | Climate Data and Services Infrastructure [Climate PDS PCU1 – web] | | | |
| 4.6b | Navigating the Climate Prediction's Website [VISITview with audio] | | | |
| 4.6c | Understanding of Climate Variability…Local Services [Climate PDS PCU2 – web] | | | |
| 4.6d | EL Nino Southern Oscillation (ENSO) [COMET - NWS Learning Center] | | | |
| 4.6e | Should Synopticians Worry About Climate [COMET – MetEd site] | | | |
| 4.6f | Madden-Julian Oscillation Life Cycle [COMET -NWS Learning Center] | | | |
| 4.7a | Review NWSI 10-513 WFO Winter Weather Products | | | |
| 4.7b | AWOC Winter Weather Track [WDTB - | | | |

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| | NWS Learning Center] (as required) | | | |
| 4.8a | NWS Support During Hazardous Materials Emergencies [COMET - NWS Learning Center] | | | |
| 4.8b | Dispersion Basics [COMET - NWS Learning Center] | | | |
| 4.8c | CAMEO/HYSPLIT Dispersion Models[COMET - NWS Learning Center] | | | |
| 4.9a | Space Weather: Welcome SEC [COMET - NWS Learning Center] | | | |
| 4.9b | Space Weather Basics [COMET - NWS Learning Center ] | | | |
| 4.10a | Review NWSI 10-1601 Verification Procedures | | | |
| 4.11a | TPC forecast products, hurricane reconnaissance, etc. (as required) | | | |
| 4.12a | Introduction to Fire Behavior [COMET – NWS Learning Center ] (as required) | | | |
| 4.13a | Wave Types and Characteristics [COMET - NWS Learning Center] (as required) | | | |
| 4.14a | Tsunamis Training [FDTB – NWS Learning Center] (as required) | | | |

# V. Operational Applications, Troubleshooting, and Dissemination

| IC | Description | Due Date | Completion Date | SOO/Training Coordinator |
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| | | | | Initials |
|---|---|---|---|---|
| 5.1 | Review AWIPS D2D Users Guide [ AWIPS OneStop page - see software section for latest awips build and user guides] | | | |
| 5.2 | WarnGen Training [D2D Users Guide, WES scenarios] | | | |
| 5.3 | VTEC Primer [FDTB - NWS Learning Center] | | | |
| 5.4 | Warngen VTEC Training [FDTB - NWS Learning Center] | | | |
| 5.5 | Graphical Forecast Editor (GFE) [training material can be found directly in GFE on AWIPS: In GFE, select Help (upper right corner)>>>Online Table of Contents>>>GFE Training Guide] | | | |
| 5.6 | IFPS Smart Tools Training - [NWSTC - web] | | | |
| 5.7 | Aviation Forecast Preparation System (AvnFPS) Training [ AvnFPS Users Guide] | | | |
| 5.8 | Weather Forecast Office Hydrologic Forecast System (WHFS) | | | |
| 5.9 | All Hazards NOAA Weather Radio [ NOAA Weather Radio User Guide] | | | |

# VI. Customer Service and Outreach

| IC | Description | Due Date | Completion Date | SOO/Training Coordinator Initials |
|---|---|---|---|---|
| 6.1 | Coordinate with Warning Coordination Meteorologist (WCM) Watch/Warning procedures and local spotter networks | | | |
| 6.2 | Discuss with WCM who our customers are | | | |

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| | and how NWS supports them. | | | |
| 6.3 | A Social Science Perspective on Flood Events [COMET – web] | | | |

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# VII. Professional Development

| IC | Description | Due Date | Completion Date | SOO/Training Coordinator Initials |
|---|---|---|---|---|
| 7.1 | NOAA IT Security Training [web] | | | |
| 7.2 | NOAA Travel Credit Card Training [as required - web] | | | |
| 7.3 | NOAA Workplace Safety Training [as required] | | | |
| 7.4 | Complete "No Fears Act" EEO training. | | | |
| 7.5 | Review NOAA's NWS Equal Employment Opportunity (EEO) and Diversity Management web site | | | |
| 7.6 | Focal point or program leader involvement | | | |
| 7.7 | Outreach activities [e.g. school or civic organization talks, career days, trade shows] | | | |
| 7.8 | Conduct a local seminar or research project | | | |
| 7.9 | Give presentations and/or participate in the workshops at professional conferences, regional workshops or local office. | | | |
| 7.10 | Read current scientific literature, particularly journal articles that have application to operational forecasting to maintain a working knowledge of new meteorological and hydrologic concepts. | | | |

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*Last review or update - February 20, 2009*

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