Fiscal Year 2009
IMPLEMENTATION PLAN FOR
NATIONAL WEATHER SERVICE TRAINING AND EDUCATION

In Support of the
NOAA and National Weather Service Human Capital Strategic Plans and Goals
(8/11/08)

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1. Executive Summary

"It's all to do with the training: you can do a lot if you're properly trained." - *Elizabeth II*

This Implementation Plan is the guiding document for the national training and education activities within the National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS) for Fiscal Year 2009 (FY 2009; hereafter referred to as FY09). The purpose of this plan is to specify the expected national training activities to be coordinated and executed by the Office of Climate, Water, and Weather Services (OCWWS) Training Division for the upcoming fiscal year. It includes detailed resource cost analyses including allocations for Division full-time equivalent (FTE) time and course dollar costs, as well as the unfunded training gap requirements.

The FY09 budget of $9 million funded 93 of 171 (54 percent) National Strategic Training and Education Plan (NSTEP) process derived requirements. This is a direct result of limited resources due to lack of funding or FTEs. The process facilitates both mandated requirements such as Occupational Safety and Health Administration (OSHA) safety training, and the highest priority training needs identified. Prioritization of training needs is determined independent of financial and manpower limitation while recommended solutions were based on assumed FY 2008 Level funding and the FY 2009 President's Budget.

As the pace of science and technology change continues to increase, the ability to maintain a highly trained workforce may be compromised, as a result of constrained budget levels. Additionally, as the NWS explores new initiatives to enhance critical services, new training needs will be identified. This rise in training requirements increases the training gap thereby putting the NWS mission at risk. Program funds mitigate some impacts of continued level funding by supporting specific program needs for systems such as the Advanced Weather Interactive Processing System (AWIPS), Dual-Polarization (Dual-Pol) radar, the Automated Surface Observing System (ASOS) and the Radiosonde Replacement System (RRS).

2. National Strategic Training and Education Plan (NSTEP) Process

The FY09 Implementation Plan for NWS Training and Education (IP09) is the end result of the NSTEP process. The NSTEP Team's Field Requirements Group (FRG), consisting of Regional Scientific Services Division (SSD) Chiefs/Regional Scientists or their designate(s), and the Operations Officer for the National Centers for Environmental Prediction (NCEP), prioritized FY09 training requirements. The Heads of Training Group (HOTG), composed of the Directors of the NWS Training Center (NWSTC), the Forecast Decision Training Branch (FDTB), the Warning Decision Training Branch (WDTB), and the Cooperative Program for Operational Meteorology, Education, and Training (COMET), recommended the execution methods of the prioritized training

requirements, taking into account available FTE and non-FTE staff resources. FY09 training requirements were determined and prioritized during a series of meetings and conference calls which included the OCWWS NSTEP Program Leader, the FRG, HOTG, select NOAA Planning, Programming, Budgeting and Execution System (PPBES) Program Managers, and representatives from training and hydrology.

The FY09 NSTEP process began with soliciting training requirements submitted in the form of a Training Needs Statement (TNS). A total of 171 TNSs were submitted for both existing and new training requirements. The HOTG analyzed all 171 requirements to determine the best delivery method (in-residence, distance learning (DL), blended, etc., along with the training needs analysis). Based on the HOTG analyses and the priority guidance listed below, the FRG proposed which training activities would be conducted using available funding and Training Division FTE resources.

The priority guidance used for the development of this IP was:

1. Preserve infrastructure (capabilities and staffing) to develop and deliver training
2. Health and safety of NWS staff
3. Maintain current operations and services to meet agency Government Performance and Results Act (GPRA) performance levels
4. New funded technologies with deployment schedules
5. New science advances, service improvements and GPRA performance improvement
6. Staff development and succession planning

3. Improvements to the NSTEP Process

In a successful attempt to improve the NSTEP process, the HOTG met with NOAA PPBES Program Managers and other NOAA representatives in March, 2008. The purpose of these meetings was to encourage their participation in NSTEP process by engaging them in the TNS definition and prioritization process. The Local Forecasts and Warnings, Hydrology and Aviation Program Managers included applicable training gaps in their Program Operating Plans for the FY 2011 to FY 2015 PPBES process. Future coordination efforts with PPBES Program Managers will ensure that training requirements continue to be identified and addressed in the out year planning cycles.

4. Challenges

The NWS' ability to maintain and enhance the workforce knowledge and skills necessary to execute the agency's critical mission is in jeopardy. Rapidly changing advances in science, information technology, communication, and structure continue, while there is insufficient financial and workforce resources available to adequately train the workforce. The pace of change dictates the generation of new training requirements and shortens the lifespan of existing training material. These two effects necessitate not only the development of new training courses but their continuous revision. The accelerated updates impact the training of both developers and users, who are faced with the increasing challenge of reallocating operational time to training.

5. Training Infrastructure and Mandatory Training for Fiscal Year 2009

Each year, OCWWS allocates a portion of the overall training budget for items that are considered training infrastructure (support for operations of Training Division), and items which are mandated by NOAA or NWS official policy. Funding for these items is summarized in Table 3. A listing of these items and a brief description of each is provided below.

5.1 Training Division Infrastructure Items

a. Administrative Budgets for each of the Branches within Training Division (NWS Headquarters, NWSTC, FDTB, and WDTB): Provides day-to-day operating funds.

b. American Meteorological Society (AMS) Journal Access: Training Division annually pays for NWS access to three AMS online journals: Monthly Weather Review, Weather and Forecasting, and a new Journal scheduled to begin publishing during FY09 – *Weather, Climate and Society*, which will replace NWS access to the Journal of Hydrometeorology. Training Division is working with NOAA to pursue NOAA-wide access to these and other AMS Journals. If successful, the NWS financial obligation to such access would be reduced, and the subsequent savings could be reinvested to meet unfunded training requirements.

c. NWS Learning Management System (LMS) Charges: Training Division pays for the NWS LEARN Center on the Department of Commerce Learning Center (CLC) in addition to redirecting the work of two Training Division instructors. Funds are set aside for system administration support staff at WDTB.

d. Telecommunications Charges: Pays for Division conference call costs.

e. GoToMeeting Licenses: A critical and cost effective tool used by Training Division for its training and meeting activities is GoToMeeting, a World Wide Web (WEB) conferencing tool used to view real-time applications from any computer, anywhere in the world. Funding is provided for Training Division license costs, which are managed by WDTB.

f. COMET Grant Core Funding: Per NOAA cooperative agreement with the University Corporation for Atmospheric Research (UCAR), OS6 annually provides the core funding for the COMET Program. This funding supports the following costs:

- Infrastructure and administrative costs
- A specialized DL training team delivering WEB-based training modules
- Support for the COMET Meteorology, Education, and Training (MetEd) WEB site
- Support for NOAA/NWS residence training

Other COMET activities in Table 3 are the Hydrology Team, which is cost-shared between Training Division and Office of Hydrologic Development (OHD) Base funds, the Numerical Weather Prediction team sponsored by AWIPS, and the Aviation Team sponsored by the OCWWS Aviation Weather Services Branch.

g. Annual NSTEP Meetings: Travel funds are set aside for annual NSTEP meetings. NSTEP travel is minimized by conducting weekly teleconferences.

h. HOTG Meetings: Travel funds are set aside for annual HOTG meetings. HOTG travel is minimized by conducting weekly teleconferences.

i. AWIPS / National Centers AWIPS (N-AWIPS) Development: The AWIPS program funds two project scientists through UCAR to develop and conduct Numerical Weather Prediction training for new AWIPS and N-AWIPS Builds. Their activities will be further specified in Section 6.14.

j. VISIT Salaries: Training Division provides funds for staff at the Virtual Institute for Satellite Integration (VISIT) in Fort Collins, CO and Madison, WI. VISIT is a joint effort involving NOAA-National Environmental Satellite Data and Information Service (NESDIS) and the NWS to accelerate the transfer of research results based on space based remote sensing data into NWS operations using DL techniques.

k. International Weather and Water Leadership: Each year, there are unforeseen training needs and requests for Training Division support. For instance, Training Division has often been asked by the NWS International Activities Office to support visiting foreign delegations. To be better prepared for this, funding and FTE resources are set aside at FDTB, NWSTC and WDTB to quickly respond to these needs and requests.

l. Training Division Buffer Fund: A small amount of funds are set aside to be allocated as needed during FY09.

5.2 Mandated Training Activities

a. Incident Meteorologist (IMET) Workshop: NWS policy mandates that IMETs receive yearly training to fulfill their duties in the NWS and within NOAA. This is an annual workshop hosted in Boise, ID by the OCWWS Fire and Public Weather Services Branch.

b. Mandated Environmental and Safety Training Courses: NWS is required by OSHA to provide in-residence environmental and safety training courses for staff serving as environmental and safety focal points, as well as those who climb towers to maintain equipment: Environmental Compliance, Safety Training, Initial/Attrition Fall Protection and Rescue Training, and Fall Protection and Rescue Recertification. This training is in-residence and mostly managed by the NWSTC via contract instructors. To save costs, there are Fall Protection and Rescue Recertification training classes held in Alaska and Pacific Regions, and at the National Data Buoy Center in Stennis, MS, with the other classes held at the NWSTC.

c. CPR/First Aid Training: Provides funds to the NWS Regional Headquarters to fund Cardiopulmonary Resuscitation (CPR)/First Aid training at their local offices. OSHA dictates that people who need to do search and rescue or work in confined spaces

must receive annual training, which is provided onsite by the American Red Cross or the American Heart Association.

6. Recommended Training for Fiscal Year 2009

Recommended training activities for FY09 are given below for the program areas defined in the NSTEP process. Regional Training Funds, which are associated with many program areas, are described in Section 6.19. Refer to Tables 2a, 2b, 2c and 2d for training activities associated with discretionary funds and prioritized by the FRG. Note: recommended training for FY09 is outlined in the bulleted lists below. New training initiatives for FY09 are denoted in *italics*, and are accompanied by a brief description. For all initiatives, the Training Branch responsible for coordinating its execution is defined.

6.1 Administration

NWS administrative personnel are responsible for implementing and sustaining a wide range of administrative/budget programs including budget formulation and execution, travel, human resources, property, and procurement. Training will be required on new processes to ensure current standards are met within the multiple program areas. In many cases, administrative/budget personnel will be expected to train other personnel on these new processes. Due to continued tight budgets, no dedicated funds were allocated for this area in FY09. However, technology such as GoToMeeting, and the many off the shelf online learning modules available via the Commerce Learning Center, can effectively handle this training along with "train-the-trainer" sessions at national Financial Management Center (FMC) conferences.

6.2 Advanced Weather Interactive Processing System (AWIPS) / Digital Services

For FY09, training development for AWIPS-II will ramp up in preparation for its deployment, scheduled for the spring of FY10. As such, training for the existing AWIPS (AWIPS-I) will ramp down. AWIPS-II Procurement, Acquisitions and Construction (PAC) funds in the President's FY09 budget request will be used to fund WDTB's Weather Event Simulator (WES) Development and Support item listed below.

6.2.1 AWIPS-I / Digital Services Training Activities. Note: Hydrology Section 6.9 has additional training activities related to AWIPS-I:

a. FDTB:
   (1) GFE New Build Training
   (2) WarnGen Delta Training
   (3) Satellite Products (Total Precipitable Water (TPW), High Density Winds)
   (4) *BOIVerify Learning Path and Gridded Verification Short Course*: A short course of methodologies to produce required metrics for forecast improvement will be developed that shows how forecasters can best use the BOIVerify program. Currently available training will be reviewed and augmented as necessary.

b. NWSTC:

(1) AWIPS-I System Manager Course

(2) AWIPS-I Hydrometeorology Software Update Training

(3) River Forecast Center (RFC) AWIPS-I Software Update Training

(4) Integrated Forecast Preparation System (IFPS) / Graphical Forecast Editor (GFE) Focal Point Training

(5) *Smart Tools and Smart Initializations Training*: A series of short on-line training videos produced by the NWSTC showing the use and value of many of the nationally recommended smart tools used by Weather Forecast Offices (WFOs) and RFCs. Note: Digital Services and IFPS training can be found online at http://www.nwstc.noaa.gov/nwstrn/ifps_met.htm, and at the NWS LEARN center (part of the CLC) catalog under **IFPS/GFE**.

c. WDTB:

(1) AWIPS-I Warning-Related Delta Training

(2) Weather Event Simulator (WES) Development and Support

6.2.2 AWIPS-II Training Activities:

a. FDTB:

(1) *AWIPS-II Variance Training*: Develop and deliver distance learning modules as necessary to address identified variances in the user interface as AWIPS-I is migrated to AWIPS-II.

(2) *AWIPS-II OT&E Support Training*: Provides funds for collaboration between the AWIPS contractor (Raytheon) and NWSTC staff / SMEs on application configuration and localization, and system administration of AWIPS-II, Version 1.

(3) *AWIPS-II Focal Point Deployment:* Develop focal point training for the OT&E System Testing in late FY09. Focal points will be taught how to optimally configure the components of AWIPS-II.

b. NWSTC:

(1) *AWIPS-II Developer Training*: Provides funds for AWIPS-II development organizations (OHD, Meteorological Development Laboratory (MDL), Global Systems Division (GSD), NCEP and the Systems Engineering Center (SEC)) to obtain specialized training.

(2) *AWIPS-II Variance Training*: Develop and deliver distance learning modules as necessary to address identified variances in the user interface as AWIPS-I is migrated to AWIPS-II.

(3) *AWIPS-II Operational Test and Evaluation (OT&E) Support Training*: Provides funds for collaboration between the AWIPS contractor (Raytheon) and NWSTC staff / Subject Matter Experts (SMEs) on application configuration and localization, and system administration of AWIPS-II, Version 1.

(4) *AWIPS-II Focal Point Development:* Develop focal point training for the OT&E System Testing in late FY09. Focal points will be taught how to optimally configure the components of AWIPS-II.
(5) AWIPS-II Local Applications Development
(6) AWIPS-II System Administration Deployment

c. WDTB:
(1) *WES Capabilities in AWIPS-II (AWIPS PAC funded)*: Provides resources for design and initial development work. Includes four primary deliverables:
- WES-II Sandbox: A tested re-release of current AWIPS-II and selected and stable WES-II functionality. It is intended to provide WFO local application developers with a place to learn the environment.
- WES-II: Provides case review and playback capabilities in the AWIPS-II environment.
- CaseConverter: Allows for the conversion of existing WES cases to the new AWIPS-II data storage format.
- WES Scripting Language (WESSL)-II: Provides simulation scripting capabilities in the AWIPS-II environment.

6.3 Aviation

NOAA's Aviation Program and NSTEP will continue to support a DL team at COMET which collaborates with WDTB in the development of Aviation training. The focus of this team will be the continued development of the second Distance Learning Aviation Course (DLAC)-II: Building an Effective Terminal Aerodrome Forecast (TAF) with the production of a final module and corresponding WES cases. If time permits, work will begin on initiating the development of DLAC-III, the topic of which is still being determined.

The other NSTEP-related aviation training effort focuses on the Federal Aviation Administration's (FAA's) Air Traffic Control System Command Center in Herndon, VA. If this Center becomes fully staffed, the personnel assigned to the unit will have unique training needs tailored to the support function they provide to the Nation's Airspace System. To keep abreast of this effort, the Aviation Program's Next Generation Air Transportation System (NextGen), and its associated 4-Dimensional Cube concept, the NWSTC will participate in the Department of Commerce Joint Planning and Development Office (JPDO) activities. The JPDO's task is to create and execute an integrated plan for NextGen, spearhead planning, and coordinate research, demonstrations and development, in conjunction with relevant programs of other departments and agencies, and the private sector.

Additional training needs will be defined based on the FAA's decision on the future of the Center Weather Service Units (CWSUs). Training Division will address these requirements once they are specified and as resources are provided.

6.4 Climate

Due to higher priority training items, NSTEP-funded climate activities were scaled back for FY09. Funds will be allocated for Pacific Region (PR) to hold a Climate Services Operations course in Hawaii. This course, modeled after the Climate Services Operations courses held recently at the NWSTC, addresses the many PR climate specificities, and is partially funded by PR. It is more cost efficient to send the instructors to Hawaii to teach this course than to send PR staff to the mainland U.S.

Work will begin to convert an in-residence Climate Variability Symposium, previously held at COMET, to a DL course. There continues to be a UCAR Project Scientist working in the OCWWS Climate Services Division who develops climate related training modules. Training Division will provide instructional design and publishing support for these modules as time and resources permit. Training Division will continue dialogue with the Climate PPBES Goal Team Lead and the NOAA Climate Office on leveraging resources for future training needs.

All current climate materials, and new modules as they are developed, are available on the WEB at:

http://www.weather.gov/om/csd/pds/index.shtml

6.5 Diversity/Equal Employment Opportunity (EEO)

Diversity training in our workforce enhances teamwork, recognizes differences and similarities in people, and develops better working relationships on an individual and organizational level. For FY09, Training Division will work with the Office of EEO and Diversity Management to convert an existing Diversity presentation to an online module, and coordinate its inclusion as a course in the CLC. There are many EEO-related online courses available to all staff within the CLC, and in existing NWSTC residence courses, especially Field Operations Management and Management and Supervision (described in Section 6.13).

6.6 Engineering/Electronics

6.6.1 In-Residence Maintenance Training

Training Division will continue to offer existing in-residence maintenance training courses at the NWSTC. The following attrition courses will be offered in FY09:

- Automated Surface Observing System (ASOS) Maintenance
- Automated Radio Theodolite (ART) Rawinsonde System Maintenance
- Console Replacement System (CRS) Maintenance
- CRS Network Operations
- NOAA Weather Radio (NWR) Armstrong Transmitter Maintenance
- NWR Crown Transmitter Maintenance

- NWR Scientific Radio Services (SRS) Transmitter Maintenance
- NWS Doppler Weather Radar (WSR-88D) Maintenance
- WSR-88D Open Systems Radar Data Acquisition (ORDA) Maintenance
- WSR-88D Microwave Line of Sight (MLOS) Maintenance
- Radiosonde Replacement System (RRS) Maintenance. Training will be offered in support of RRS deployments (funded by the RRS Program), as well as attrition training (funded by NSTEP).

6.6.2 Additional Development and Support

An updated Introduction to NWS Systems DL course will be offered to provide systems specific knowledge to maintain systems and provide preventative maintenance to meet systems availability goals and meet operational systems needs. Other engineering/electronics activities at the NWSTC in FY09 are:

(a) *Wind Profiler Deployment Support*: Support for the maintenance and operation of the new (449 Megahertz) Wind Profiler Network.
(b) *Weather Radio Improvement Plan (WRIP) Deployment Support*: Support activities in the development/deployment of WRIP.
(c) *Transition Power and Maintenance Shelter (TPMS) Maintenance*: Funds are provided to send selected electronics staff to a vendor course – Powerware Maintenance - to competently and safely maintain the WSR-88D TPMS Uninterruptable Power System (UPS).

Finally, training development will begin in support of the deployment of WSR-88D Dual-Polarization radar scheduled for FY10. Funding provided by the Dual-Polarization Program ensures Dual-Polarization technical support of system development and training materials will occur in FY09.

6.7 Fire Weather

In addition to the IMET Workshop described in Section 5.2, funds will be provided to COMET to continue resource and instructional support for the fire weather program. One of COMET's primary activities has been the conversion of the S-290 Intermediate Wildland Fire Behavior Course to a DL course. The S-290 course, once a 30-hour in-residence course, provides participants the means to obtain certification as a fire weather forecaster (per NWS Directive 10-405, Fire Weather Services Training and Professional Development), and a better understanding of wildland fire behavior.

COMET will also update the S-591 Advanced Fire Weather Course, which provides a comprehensive overview of the three main dimensions of the fire environment triangle: fuels, topography, and weather. A yearly roundtable discussion/webinar on fire weather is part of this module.

6.8 Homeland Security/Emergency Response

Since September 11, 2001, NWS field offices have been asked to play an ever increasing role in providing important support to the emergency management community and other federal/state/local agencies during and after major emergencies. NWS Senior Management has stated that there will continue to be a high emphasis on the Emergency Management program. As with the Aviation program, if this emphasis includes training, requirements will be examined as they are defined and funded.

If FY09 funds are provided for the implementation of Operations and Services Improvement Plan (OSIP) Project #07-039, COMET, in partnership with WDTB, will develop training on Improved HYSPLIT (HYbrid Single-Particle Lagrangian Integrated Trajectory model) Model Depiction and Delivery. A 3-hour DL course with WES cases will teach students to run the PC-based HYSPLIT routine, and demonstrate reductions in response times to requests for support from emergency management/first responders. Currently, this item is unfunded by NSTEP.

6.9 Hydrology

The Training Division and the NWS OHD will continue to cost-share a hydrology development DL team at COMET. The following training courses and new initiatives will be offered in FY09:

a. COMET/FDTB:

(1) *Quantitative Precipitation Forecasting (QPF) for Hydrologic Modeling* (COMET): COMET will begin to develop a DL course based on materials from the RFC/Hydrometeorological Prediction Center (HPC) Hydromet course last offered in 2003. The training will focus on the people performing the Hydrometeorological Analysis and Support (HAS) function.

(2) *Deterministic and Probabilistic Verification* (COMET): Hydrologists and hydrology focal points will be able to understand the methodologies and tools used to verify deterministic and probabilistic hydrologic forecasts.

(3) *Short and Long Term Ensembles (FDTB)*: A series of online modules to demonstrate the necessary inputs, pre-processing techniques, post-processing techniques, and resultant output related to hydrologic ensemble prediction.

(4) *Vertical Datums* (FDTB): An online module based on an existing Central Region training presentation to demonstrate how customers use NWS products affected by vertical datums.

(5) *QPF Verification* (COMET/FDTB): Develop an online module series to explain the different ways to verify QPF and improve forecasts.

b. NWSTC:

(1) *WFO Hydrologic Applications DL Course* (AWIPS-I): A DL course based on materials from the WFO Hydrologic Forecast System (WHFS) Workshop and the current Advanced Hydrologic Applications course. The course provides training on the tools and techniques implemented in AWIPS to support the WFO Hydrology Program.

(2) Advanced Hydrologic Applications residence course (AWIPS-I): Develops an operational understanding of the various software available to assist in the hydrologic forecast and warning decision process.

(3) AWIPS Hydrometeorology Software Update Training (AWIPS-I)
(4) RFC AWIPS Software Changes DL Modules (AWIPS-I)
(5) AWIPS Hydromet Distance Learning Modules (AWIPS-I)

The three items above provide a series of short, focused, DL courses to address changes in AWIPS-I hydrometeorology with Operational Build (OB) release changes and additions in capabilities.

(6) *WFO Hydrologic Operations DL Series (AWIPS-I)*: DL modules will be developed to teach how to fully utilize the capabilities of the WFO AWIPS-I hydrologic applications.

(7) Static Flood Inundation Mapping (NWSTC and FDTB): Provides a series of live WEBcasts and online modules to train the methodologies which produce the hydraulic information rendered onto the Advanced Hydrologic Prediction System (AHPS) WEB page.

c. Other Training Coordinated by the OCWWS Hydrologic Services Division:

(1) RFC Workshops: Provide training for RFC staff focused on operational tools and techniques.
(2) *Hydraulic Modeling/Hydrologic Engineering Center River Analysis System (HEC-RAS) Training*: Funds for RFC forecasters to attend HEC-RAS training classes, offered external to the NWS.

6.10 Information Technology

Information Technology (IT) training ensures operational continuity of IT networks and services. Much of this training is accomplished locally on a Region by Region basis using Regional Training Funds, which are discussed in Section 6.19. The NWSTC offers an Introduction to NWS Systems course (described in Section 6.6.2) which offers basic information on the different platforms used in the NWS. In addition, a Linux Administration for WFOs/RFCs in-residence training course will continue to be offered by the NWSTC.

6.11 Integrated Sensor Training

Funding is again provided by NSTEP to support NOAA's Virtual Institute for Satellite Integration Training (VISIT) program (see Section 5.1, part j). The VISIT team includes staff from NWS, NESDIS, and two NOAA Cooperative Institutes: The Cooperative Institute for Research in the Atmosphere (CIRA) and the Cooperative Institute for Mesoscale Meteorological Studies (CIMMS). The VISIT team supports satellite and related remote sensing training and provides assistance with live and recorded teletraining.

All additional funding for integrated sensor training is provided by other parts of NOAA. In collaboration with the VISIT program, NESDIS continues funding the expansion of the Satellite Hydrometeorology (SHyMet) courses for NWS interns and forecasters. Both the Geostationary Orbiting Environmental Satellite (GOES) and the National Polar-Orbiting Operational Environmental Satellite System (NPOESS) Programs provide funding for development of satellite training modules on COMET's MetEd Satellite WEBsite with needs identified at an annual satellite training workshop. A new activity funded by the NESDIS/GOES Program in FY09 provides the framework for a NOAA satellite proving ground, in which NWS Users can interact with NOAA research scientists and product developers. NWS offices will interact with the satellite proving ground to provide forecasters access to new and advanced data and products from various satellites in preparation for GOES-R+ series.

6.12 Integrated Warning Process Training

Training addressed by the Integrated Warning Process is directed at NWS field forecasters with the goal of increasing scientific understanding of the elements involved in the warning and decision making process. Expected results from this training include improved skills in decision making and ultimately better service in the issuance of mission-critical warnings.

The following activities will continue in FY09:

WDTB:

(1) WSR-88D initial radar operator training via the WSR-88D Distance Learning Operations Course (DLOC).

(2) WSR-88D Radar Build Training – DL training to allow forecasters to keep pace with WSR-88D software and hardware upgrades.

(3) Advanced Warning Operations Course (AWOC). The Core, Severe and Winter Weather Tracks will be updated and offered.

6.12.1 Dual-Polarization Upgrade to the WSR-88D

Training development will begin in support of the deployment of WSR-88D Dual-Polarization (Dual-Pol) radar scheduled for FY 2010. Funding provided by the Dual-Pol Program ensures the following:

(1) *Dual-Pol Operations Course*: To be primarily delivered as online modules through the LMS with support from local facilitators, the course will address principles of Dual-Pol radar, base and derived Dual-Pol product interpretation, convective and winter storm structure and evolution using Dual-Pol products, Dual-Pol radar applications using AWIPS, basic microphysics for precipitation type and formation, and any yet-to-be-discovered operationally relevant applications of the data.

(2) *Dual-Pol Education and Outreach:* Provide WEB-based module(s) addressing the capabilities and limitations of the various WSR-88D Dual-Pol products which will be made available to the public.

6.12.2 Other New Training Activities

Other new training activities which WDTB will conduct include:

(1) *Advanced Storm-Based Warning Training*: DL training designed to share best practices and improve forecasters' ability to issue effective storm-based warnings.

(2) *Optimizing WSR-88D Effectiveness through Volume Coverage Pattern (VCP) Selection*: A DL module to address the strengths and limitations of the available VCPs, with an emphasis on the appropriate VCP(s) for a given weather environment.

(3) *Using the Integrated Warning Team to Improve Weather Warning Performance*: This will provide support for a 2009 Severe Weather Annual Workshop to be held in Norman, OK. WDTB will capture the outcomes from this workshop, and create two distance learning modules applying the workshop outcomes to two key learning objectives: identify key operational pressures and limitations of other warning partners; and develop plans to mitigate potential loss in shared situation awareness among warning partners.

The first module will target NWS forecasters and will be integrated into the AWOC starting in FY 2010. The second module will be an education and outreach module for use by NWS WCMs in their local Emergency Manager and Broadcaster outreach program.

This effort is also supported by the NOAA SeaGrant Program, which will provide matching funding to allow WDTB to present WES cases and other

warning information at conferences in North Carolina and Vail, CO during FY09.

6.13 Management/Leadership

The NWSTC offers management and leadership training for NWS, NOAA, and external agencies through its Leadership Academy. In FY09, NWSTC will continue to offer the Management and Supervision course, which provides new supervisors foundational knowledge and skills to effectively manage operations and lead people. This course meets the Office of Personnel Management mandate for 80 hours of supervisory training within the first year of becoming a new supervisor. The Field Operations Management course provides introductory management and leadership knowledge and skills to shift supervisors and office personnel who manage an office or operation in the absence of the permanent supervisor. Field Operations Management is open to all staff regardless of bargaining unit status, whereas Management and Supervision is only open to non-bargaining unit personnel.

The third Leadership Academy course, the Executive Leadership Seminar (ELS), will not be offered in FY09 due in part to budget constraints and the reduced number of NWS slots required by the Regions. To retain the agency emphasis on the operational importance of leader development and succession planning, the ELS funding was shifted to deliver additional course offerings of Management and Supervision and Field Operations Management. ELS is slated to be offered again in the second quarter of FY 2010.

In addition, the NWSTC will host a Warning Coordination Meteorologist (WCM)/Service Coordination Hydrologist (SCH) Course in the first quarter of FY09. This biannual course, which trains new WCMs on strategies on the WFO Programs they are required to manage, has been expanded to include the new SCH position at NWS RFCs due to their identical role with customer service, outreach and education.

6.14 Numerical Weather Prediction

The accuracy of NWS forecasts is largely driven by the forecaster's ability to correctly interpret and understand operational numerical weather prediction (NWP) guidance. To maintain and improve forecaster proficiency in a period of rapidly evolving NWP systems, two project scientists are dedicated to NWP training development under the COMET non-discretionary funding outlined in Table 3. FDTB provides one dedicated FTE in support of Weather Research and Forecasting (WRF) Environmental Modeling Systems (EMS) development, training and support (both domestic and international). FDTB also supports the Science and Operations Officer (SOO) Science and Training Resource Center (STRC).

The following training will be conducted by COMET and FDTB in FY09:

(1) Integrating NWP into the Forecast Process (INForP): An 8- to 12- hour DL course modeled after WDTB's successful AWOC courses, will be delivered via the LMS/CLC and via WES simulations provided by WDTB. The INForP course will cover the application of NWP in the forecast process, how to glean useful information from the plethora of available model output, and using model data to investigate forecasting challenges/problems. On-station delivery of the course will be facilitated by the SOO or training facilitator.

(2) NWP Operational Matrix Maintenance/Updates: Update the COMET Operational Models Matrix as the models change. The matrix is designed as "1-stop-shopping", quick-look-up, reference material which answers common NWP questions. In FY09, there will be fewer updates required while NCEP is moving to its new building and transitioning its codes to the Earth System Modeling Framework.

(3) *Rapid Refresh WRF*: WEBcasts and teletraining will be given on the analysis and forecast impacts of the model change from the Rapid Update Cycle (RUC) to Rapid Refresh WRF. Development will occur in the 4th quarter of FY09 for delivery at time of model implementation.

6.15 Observing and Data Acquisition

Two residence courses will again be offered in FY09 by the NWSTC to support NWS observation and data acquisition programs:

(1) Data Acquisition and Operations (DATAC)
(2) Cooperative Network Operations

Training requirements for the NWS data acquisition process are met by both courses, while the Cooperative Network Operations course also supports the NWS Cooperative Observer Program.

A new training initiative, *Data Acquisition for Management*, will be developed and delivered in FY09 as a DL course to provide a sufficient level of understanding of the NWS data acquisition programs, including the Cooperative Observer Program.

An analysis will be conducted to determine if these three activities could be effectively combined into one revamped residence course, a DL course, or a combination thereof, for discussion during the FY 2010 process.

6.16 Safety/Environmental

Safety and environmental focal points in NWS offices promote the critical value of safety and environmental compliance to all employees, and focal points must ensure that applicable laws and regulations are being followed. Since this training is mandated by

OSHA and NOAA/NWS policy, the following courses are considered part of the Training Division's "Mandated" Training Activities (described in Section 5.2):

(1) Safety Training
(2) Environmental Compliance
(3) Fall Protection and Rescue (initial/attrition)
(4) Fall Protection and Rescue (re-certification)
(5) CPR/First Aid Training

There were several other safety and environmental initiatives proposed for FY09 that were not funded due to budget constraints. This training can be funded, at the Regions' discretion, through the limited pot of Regional Training Funds (described in Section 6.19).

6.17 Uncertainty Training

Improving the assessment and communication of uncertainty is a very high priority for the NWS and is receiving increasing attention in the training community. In 2005, the NWS commissioned the National Research Council (NRC) to provide recommendations on how the NWS can more effectively estimate and communicate forecast uncertainty. The resulting report (NRC, 2006) identified several recommendations, from which the NWS is addressing, through a coordination group called the NOAA/NWS Forecast Uncertainty Steering (NFUSE) Team.

The NFUSE Team submitted a series of training requirements for FY09. A primary requirement is to set up a forecast uncertainty learning path, which allows students to take training in a sequential manner, building upon skills in an organized approach to meet a final set of competencies. This learning path identifies the training required to reach a baseline competency to improve forecast decisions regarding high impact events, and to communicate the uncertainty regarding these forecast decisions, within the current forecast process.

Training Division will provide instructional design and publishing support to the NFUSE Team to help establish this learning path, which consists of the following performance goals:

(1) Explain the need for assessing and communicating uncertainty.
(2) Identify the practical statistical and guidance knowledge relevant to uncertainty forecasts.
(3) Apply uncertainty guidance (both within AWIPS/N-AWIPS and on the WEB) to the current forecast process.
(4) Effectively communicate uncertainty to Emergency Managers and other decision makers.

To assure such a learning path has maximum benefit, an introductory module explaining the motivation for uncertainty training is required. The weather enterprise's efforts to

address uncertainty needs, and identifying uncertainty training resources is also necessary. This effort will begin in FY09.

A NOAA/University of Oklahoma Social Science Initiative for the weather community in Norman, OK will commence. Social scientists will help develop technology-relevant outreach activities for WDTB. Due to budget constraints, NSTEP was unable to allocate additional funds for this effort. WDTB staff will participate, as time permits, in this initiative to try to glean useful information which can be integrated into NWS course development.

6.18 Winter Weather

Winter weather training requirements will be addressed in FY09 with the offering of:

(1) MSC/COMET Winter Weather Workshop (mostly outside funding)
(2) WDTB's Advanced Warning Operations Course (AWOC) – Winter Weather Track

NSTEP will continue to provide support for the MSC/COMET Winter Weather Workshop, held at COMET and hosted by the Meteorological Service of Canada (MSC). As has been the case for the last several years, NSTEP will provide funding for up to three guest instructors, and up to five students, to attend the course. The AWOC – Winter Weather Track will also continue. This AWOC course, offered via WEB modules and WES simulations, addresses forecast/warning/climatological tools and methodologies for operational winter weather products and customer service issues.

6.19 Regional Training Funds

A small portion of NSTEP Base and AWIPS training funds are allocated directly to the Regions for their use. These are often the only available resource to meet unique training requirements in mission-critical areas. These funds, which have been significantly cut in the last several years, are maintained at the FY 2008 funding level. Without this source of funds, the Regions/NCEP would lose all flexibility in meeting their unique high priority training items. The Regional Training Funds are typically used for the following areas of training, which did not receive sufficient funding in the FY09 NSTEP process:

- Local facilities training
- Local IT training such as system administration, networking, security, etc.
- Specialized safety training
- Additional scientific training from local universities
- Training for administrative personnel
- Travel for NWS/university projects and workshops supporting collaborative research
- Purchase of innovative software to support and enhance distance education and training
- Project and Program Management training, Contracting Officers Technical Representative (COTR) training

The Regions and NCEP are required to submit spend plans for these funds to the Training Division, which then transfers money directly to them. These plans provide useful information on local training needs, and ensures accountability.

7. Mission Impact

With major deployments of new software and equipment (i.e., AWIPS-II, Wind Profiler, Dual-Pol, WRIP, etc), providing the necessary training to the workforce is a mission imperative. However, the total unfunded training activities projected for FY09 is $2.6 million based on all submitted requirements. This training gap of unfunded needs continues to compromise the NWS' ability to maintain a highly trained workforce and could also impact the agency's ability to meet NWS GPRA and NOAA Strategic goals. Most of the new initiatives and some existing training were either funded at significantly reduced levels or not funded at all. Some examples of mission-critical training not being offered in FY09 are:

(1) Executive Leadership Seminar (ELS) –This annual course has been deferred to the second quarter of FY 2010.

(2) Fire Weather Training – Funds are not provided for NWS Incident Support Specialists (ISS) to attend training provided by the Department of Homeland Security and other external agencies. Failure to implement this training will result in NWS IMETs and ISS having a knowledge gap when working an incident. This will result in degradation in service support provided to responders.

(3) Climate Training Workshops (the Climate Variability Symposium at COMET and the Climate Operations Course at the NWSTC) are not being held in FY09. Work will begin on converting the Climate Variability Workshop to a DL course in FY09; not having this training will hinder local staff in their ability to use their climate knowledge to provide effective, high value climate services. This includes the interpretation of NWS climate products, both national and local, and the proper use of climate tools and methodologies into the local office climate services program.

Unfunded training amounts are summarized in Tables 4 and 4a, which contains a list of all submitted training activities for FY09.

8. Cost Advantage Training Initiatives

Training Division is exploring cost advantage training solution initiatives beyond the ongoing expansion of distance learning solutions and blended curricula solutions. A pilot program for FY09 reverses the traditional wisdom which holds that field subject matter expertise is brought to the Training Division for development. While the process is effective, it is limited based on the availability of the training staff. Reversing this process and providing basic instructional design guidance, remote consulting, course development tool guidance and review services to the field may provide a means to increase training development and updates.

The FY09 pilot will work in cooperation with the NOAA Office of Education to leverage its FY09 release of a distance learning curriculum on "Designing Educational Projects". Cost savings can be realized by utilizing the most relevant components of this new curriculum and minimizing travel by using remote consultation and review services. Advantages in empowering field experts with instructional design knowledge and formal methods to develop and validate products will enhance training material productivity.

Four topics are under consideration for the pilot program: Hydrology Vertical Datums, BOIVerify, Smart Tool and Diversity training. Release of the Office of Education online curricula and NWSTC staff availability will determine the number of pilot projects for FY09. The Training Division outcome is to field the best training and educational products and to continue to explore alternative methods to minimize the current training gap.

9. Summary

Effective training is vital to maintain a proficient and highly effective NWS workforce. The budget environment, combined with the pace and magnitude of scientific, technological, and cultural change, continues to challenge our ability to provide our employees with the knowledge, skills, and abilities they need to execute the mission of NOAA and NWS. The Training Division has pledged to leverage technology in the use of innovative distance learning and blended learning solutions. While these methodologies offer dramatic cost reduction per student, it is important for system deployment and manpower planning purposes to recognize they carry a significant increase in development and maintenance time and do not eliminate the need for residence training. The 2006-2010 Human Capital Strategic Plan, approved in 2005 by the NWS Corporate Board, continues to be a guiding document to move training in the NWS forward. The plan lays out specific training strategies objectives and outcomes for establishing a world-class workforce. This includes requiring Training Division sign-off on training adequacy before implementing new systems or major upgrades. While these goals are deliberately ambitious, they must be incorporated into the NSTEP and PPBES processes to ensure we retain our focus on training as a priority. As stated in the Plan, we are directed to "maintain excellence in the face of change by safeguarding the most valuable asset of NOAA's National Weather Service – the NWS workforce."

10. Acknowledgments

The OCWWS Training Division's NSTEP Program Leader acknowledges the efforts of those who significantly contributed to the FY09 NSTEP process. First, thanks to WDTB Chief Ed Mahoney and FDTB Chief Tony Mostek for their development of an interactive spreadsheet which allows for complete training budget and FTE resource allocation tracking. The Program Area Team Leads worked tirelessly and under severe time constraints to produce NWS training requirements for FY09. Their technical expertise and the results of their efforts were important contributions to the process. The efforts of the HOTG and their staffs are also greatly appreciated. They performed the difficult task of evaluating the training initiatives in terms of appropriate methodologies and required resources. The FRG is gratefully acknowledged for their ongoing efforts and dedication throughout the NSTEP process. The FRG in concert with the HOTG and select NWSH representatives reviewed all the training initiatives, and then prioritized and recommended the training to be offered to NWS employees in FY09.

Special thanks goes out to Michael T. Smith of the OCWWS Resource Management Staff, who quickly developed the online database which allowed TNS entry, analysis and prioritization.

Appendix 1: International Training Plans

COMET International Training

NOAA's NWS International Activities Office (IAO) provides funds to the COMET Program for translation of their online training materials. NWS/IAO intends to fund Spanish translations again for FY09. Additional international activities will be identified and conducted as funding is provided in FY09.

Appendix 2: Out Year Training Needs (FY 2010)

One of the shortfalls of the NSTEP process has been the lack of multi-year strategic planning (the "S" in NSTEP). For the past several years, NSTEP and its companion Implementation Plan has been mainly a single year, tactical document, not explicitly linked to any out year planning processes such as NOAA's PPBES and NWS' OSIP. Another consequence of focusing on single year training needs is the possibility that a training effort may not be seen through to completion. For instance, for a new course with a large target audience, training must occur over several fiscal years in order to train everyone in that target audience.

In FY09, Training Division and the HOTG have taken steps to "put the "S" back into NSTEP". The HOTG held a series of meetings with key NOAA PPBES Program Managers to educate them about existing NWS training activities within their programs, planned training activities, and to ensure they account for training in their Program Operating Plan (POP) submissions. We expect to have a continuing dialogue with these key decision makers to find ways to resource needed training for the next several years. In fact, for the first time, these managers will be afforded the opportunity to review this Implementation Plan and provide feedback before it is signed by the OCWWS Director.

In addition, Training Division examined all current OSIP projects, and have indicated which projects will have current and future training needs if they are implemented. Finally, Training Division has committed to better tracking its training, especially new initiatives, to ensure sufficient resources are allocated to see it through to completion.

Based on discussions at the May 2008 NSTEP meeting, the following training items were agreed to be deferred to, or must be held in FY 2010:

- ELS
- COMET Mesoscale Analysis and Prediction (COMAP) Course
- Dual-Pol Training
- AWIPS-II Training
- Safety Training

Table 1 - FY09 In-Residence Training

						Course Slots										Costs per Course							
		Funding	Students /	# Days /	Courses								Reqstd	Course	Class	Class	Instructor	Instructor			Single	Total
		Source	Course	Course	Funded	AR	CR	ER	PR	SR	WR	NCEP	Other	Slots	Need	Hotel	PerDiem	Hotel	Per Diem	Contracts	Supplies	Course	Cost
TNS ID	**NWSTC**																						
EE01	ASOS Maintenance	ASOS	8	13	3	2	6	5	2	8	10	0	2	35	4.38	$ 14,072	$ 12,600				$ 1,334	$ 28,006	**$ 84,018**
EE02	ART Rawinsonde System Maintenance	Base	7	12	1	1	0	1	3	1	1	0	1	8	1.14	$ 11,629	$ 10,150				$ 1,000	$ 22,779	**$ 22,779**
EE03	CRS Maintenance	Base	8	6	3	2	6	4	2	8	7	0	1	30	3.75	$ 7,036	$ 9,000				$ 802	$ 16,838	**$ 50,514**
EE05	NWR / Armstrong Transmitter Maintenance	Base	5	3	5	0	8	8	3	6	10	0	0	35	7.00	$ 1,954	$ 4,375				$ 316	$ 6,646	**$ 33,230**
EE06	NWR / Crown Transmitter Maintenance	Base	5	3	5	1	8	6	0	6	1	0	0	22	4.40	$ 1,954	$ 4,375				$ 316	$ 6,646	**$ 33,230**
EE07	NWR / SRS Transmitter Maintenance	Base	4	3	1	0	0	1	0	1	2	0	0	4	1.00	$ 1,564	$ 3,500				$ 253	$ 5,317	**$ 5,317**
EE10	RRS Maintenance (attrition)	Base	6	7	2	0	6	6	0	10	5	0	0	27	4.50	$ 5,863	$ 7,050				$ 646	$ 13,559	**$ 27,118**
ME47	CRS Network Operations	Base	8	3	3	1	6	2	1	9	5	0	1	25	3.13	$ 3,127	$ 7,000				$ 506	$ 10,633	**$ 31,899**
OB01	Data Acquisition Operations	Base	16	3.5	1	4	12	8	3	12	4	0	0	43	2.69	$ 6,254	$ 14,000	$ 391	$ 875		$ 1,076	$ 22,596	**$ 22,596**
OB03	Cooperative Network Operations	Base	16	8	2	2	10	8	6	15	7	0	0	48	3.00	$ 17,199	$ 19,600	$ 2,736	$ 3,425		$ 2,148	$ 45,108	**$ 90,216**
LE01	Management and Supervision	Base	20	9.5	2	2	10	8	3	5	6	4	5	43	2.15	$ 23,453	$ 25,500	$ 391	$ 1,550	$ 5,539	$ 4,592	$ 61,025	**$ 122,050**
LE05	Field Operations Management	Base	24	4.5	2				5				4	9	0.38	$ 11,726	$ 22,200			$ 5,000	$ 1,946	$ 40,873	**$ 81,746**
SA01	Environmental Compliance (attrition)	Base	26	3.5	1	4	3	5	3	5	4	1	1	26	1.00	$ 10,554	$ 23,625			$ 36,000	$ 3,509	$ 73,688	**$ 73,688**
SA03	Fall Protection & Rescue (initial/attrition)	Base	19	2.5	2	3	5	5	3	6	12	0	5	39	2.05	$ 5,570	$ 15,675			$ 14,288	$ 1,777	$ 37,310	**$ 74,620**
SA04	Fall Protection & Rescue (recertification)	Base	16	2.5	9	10	28	36	12	15	15	0	41	157	9.81	$ 9,381	$ 15,600			$ 12,032	$ 1,851	$ 38,864	**$ 349,776**
SA05	Safety Training (attrition)	Base	28	3.5	1	4	3	8	3	5	4	0	1	28	1.00	$ 11,336	$ 25,375			$ 36,000	$ 3,636	$ 76,347	**$ 76,347**
WM04	WCM/SCH Course	Base	33	8	1	2	6	9	2	6	6	2	0	33	1.00	$ 37,622	$ 42,875	$ 782	$ 5,125	$ 3,700	$ 4,505	$ 94,609	**$ 94,609**
HY03	Advanced Hydrologic Applications	AWIPS	8	3	3	1	6	4	1	7	4	0	2	25	3.13	$ 3,127	$ 7,000	$ 391	$ 875		$ 1,300	$ 12,693	**$ 38,079**
IT01	AWIPS-I System Manager	AWIPS	16	12	1	3	3	5	1	6	4	0	2	24	1.50	$ 26,580	$ 24,400				$ 2,549	$ 53,529	**$ 53,529**
IT04	Linux for WFOs/RFCs	AWIPS	12	8	2	6	15	3	3	10	8	0	3	48	4.00	$ 12,899	$ 14,700				$ 1,380	$ 28,979	**$ 57,958**
EE08	WSR-88D Maintenance	NEXRAD	8	25	3	0	6	4	0	4	8	0	2	24	3.00	$ 28,925	$ 20,200				$ 2,456	$ 51,581	**$ 154,743**
EE09	WSR-88D Open RDA Maintenance	NEXRAD	12	6	3	0	5	12	0	10	3	0	2	35	2.92	$ 10,554	$ 13,500				$ 1,203	$ 25,257	**$ 75,771**
EE12	WSR-88D Refresher Training	NEXRAD																					
EE21	WSR-88D MLOS Maintenance	NEXRAD	2	3	1	0	0	0	0	0	2	0	0	2	1.00	$ 2,932	$ 3,525				$ 646	$ 7,103	**$ 7,103**
EE23	RRS Maintenance (deployment)	RRS	6	7	5	TBD - Based on Deployment Schedule									5.00	$ 5,863	$ 7,050				$ 646	$ 13,559	**$ 67,795**
	Total NWSTC Residence																						**$ 1,728,731**
	WDTB																						
ME01	WSR-88D Distance Learning Operations Course	NEXRAD	24	4.5	5									120	5.00	$ 9,000	$ 23,664				$ 2,800	$ 35,464	**$ 177,320**
	COMET																						
ME49	Canada Winter Weather Workshop	Base	5	8	1	2	1	1	0	0	1	0	0	5	1.00							$13,000	**$13,000**
	Total Base Funded Residence Courses		**$ 1,202,735**																				
	Total AWIPS Funded Residence Courses		**$ 149,566**																				
	Total NEXRAD Funded Residence Courses		**$ 414,937**																				
	Total ASOS Funded Residence Courses		**$ 84,018**																				
	Total RRS Funded Residence Courses		**$ 67,795**																				

Table 2a - FY09 BASE Resourced Training - by Training Facility

Note: C=COMET, F=FDTB, N=NWSTC, W=WDTB, OS6=NWS HQ

DL = Distance Learning; Res = In-residence training

Branch	Method	TNS ID	TNS Requirement	Cost (K)	Comments
ALL	Support	IA01	International Weather and Water Leadership	$ 72	$51K COMET; $21K WDTB
F/N/W	Support	IN01	Support NWS LEARN Center and Sub LEARN Centers	$ 85	$85K to WDTB; The NWS LMS focal point and CIMMS support staff
F/N	Support	HY22	Vertical Datums	$ -	Online module development from existing CR presentation
COMET	DL	CL01	Virtual Climate Variability Symposium Development/Offering	$ 6	Costs cover NWS instructor to develop virtual course
	DL	FW02	S-591 Advanced Fire Weather Course	$ -	Funds for COMET to update S-591 - part of COMET Grant
	DL	FW08	S-290 Intermediate Wildland Fire Behavior Course	$ 401	Part of NWS COMET core funding
	Res	ME49	Canada Winter Weather Workshop	$ 13	Funds to send 3 NWS Instructors and up to 5 NWS Students
	DL	NP01	Effective Use of Numerical Weather Prediction (AWIPS-I)	$ 90	NWP Team
FDTB	Support	IS02	Observing and Forecasting Satellite - VISIT Salaries	$ 377	
	DL	ME21	WarnGen Training for OB9+	$ 3	Online course development
	Support	ME34	Introduction to Forecast Uncertainty	$ -	Work with NFUSE Team to develop Learning Path
NWSTC	Support	AV01	FAA's Next Generation Air Transportation System	$ -	NWSTC participation in DOC JPDO activities
	Res	EE02	ART Rawinsonde System Maintenance	$ 23	1 offering
	Res	EE03	Console Replacement System (CRS) Maintenance	$ 51	3 offerings
	Res	EE05	NWR Armstrong Transmitter Maintenance	$ 33	5 offerings
	Res	EE06	NWR Crown Transmitter Maintenance	$ 33	5 offerings
	Res	EE07	NWR SRS Transmitter Maintenance	$ 5	1 offering
	Res	EE10	RRS Maintenance course (Attrition)	$ 27	2 offerings. This is in addition to RRS Maintenance courses in support of deployment
	DL	EE11	Introduction to NWS Systems	$ -	Update existing DL course
	Support	EE19	Weather Radio Improvement Plan (WRIP) Deployment Support	$ -	Required to support deployment training
	Support	HY28	Service Coordination Hydrologist (SCH) Training	$ -	Form a Field Requirements Team (FRT) to explore what training is needed for SCHs
	Res	LE01	Management and Supervision (2 offerings)	$ 122	$61K per course
	Res	LE05	Field Operations Management (2 offerings)	$ 82	$41K per course
	Res	ME47	CRS Network Operations	$ 32	3 offerings
	Res	OB01	Data Acquisition Operations	$ 23	1 offering
	DL	OB02	Data Acquisition for Management	$ -	Development of DL course
	Res	OB03	Cooperative Network Operations	$ 90	2 offerings
	Res	SA01	Environmental Compliance (Attrition)	$ 74	1 offering
	Res	SA03	Fall Protection and Rescue (Initial/Attrition)	$ 75	2 offerings
	Res	SA04	Fall Protection and Rescue Recertification	$ 350	9 offerings - 1 at NDBC in Stennis, MS; 1 each in Alaska and Hawaii; 6 at NWSTC
	Res	SA05	Safety Program Management (Attrition)	$ 76	1 offering
	Res	WM04	WCM/SCH Course	$ 95	1 offering
OS6	Support	CL11	Operational Climate Course in Pacific Region	$ 11	Pacific Region is also providing $11K. Managed by OCWWS Climate Services Division
	Support	FW01	Incident Meteorologist (IMET) Workshop	$ 192	Held in Boise, ID. Managed by OCWWS Fire Weather Program Manager
	Support	HY25	Hydraulic Modeling (HEC-RAS) Training	$ 35	For NWS staff to attend external vendor training
	Support	HY26	River Forecast Center (RFC) Workshops	$ 60	Managed by OCWWS Hydrologic Services Division
	Support	SA08	CPR/First Aid Training	$ 64	To be distributed as supplement to Regional Training Funds

TOTAL BASE FUNDING - TABLE 2A	
COMET	$ 561
FDTB	$ 380
NWSTC	$ 1,190
WDTB	$ 106
OS6	$ 362
	$ 2,598

Table 2b - FY09 AWIPS Resourced Training - by Training Facility

Note: C=COMET, F=FDTB, N=NWSTC, W=WDTB, OS6=NWS HQ

DL = Distance Learning; Res = In-residence training

Note 2: All funds are AWIPS O&M Funds EXCEPT IT09, which are AWIPS PAC funds

Branch	Method	TNS ID	TNS Requirement	Cost (K)	Comments
F/N	DL	IT06	AWIPS-II Focal Point Deployment Training	$ 36	Funds to NWSTC; GFE/IFPS, Gridded MOS, Station-Based MOS, GFS LAMP, WarnGen
F/N/W	DL	IT17	AWIPS-II Variance Training	$ 26	Funds to WDTB (.2 FTE and .3 CIMMS)
C/F/W	DL	NP01	Effective Use of Numerical Weather Prediction (AWIPS-I)	$ 161	NWP Team. $26K to WDTB (to provide Inst Design Support), and $135K to COMET
C/F	DL	NP05	NWP Operational Matrix Management (AWIPS-I)	$ 75	Add assimilations to matrix. NWP Team. Funds to COMET
COMET	DL	NP06	Rapid Refresh WRF (AWIPS-I)	$ 15	NWP Team
FDTB	DL	DS02	Graphical Forecast Editor (GFE) New Build Training	$ -	Web-based training
	DL	ME29	BOIVerify Training	$ -	Learning Path of modules
NWSTC	DL	DS03	NWSTC IFPS/GFE Focal Point Course	$ -	
	DL	DS05	Smart Tools and Initializations Training	$ -	
	DL	HY02	WFO Hydrologic Applications DL Course (AWIPS-I)	$ 5	
	Res	HY03	Advanced Hydrologic Applications (AWIPS-I)	$ 38	
	DL	HY04	AWIPS-I Hydrometeorology Software Update Training	$ 5	
	DL	HY05	RFC AWIPS-I Software Changes DL Modules	$ -	
	DL	HY06	AWIPS-I Hydromet Distance Learning Modules	$ 4	
	DL	HY23	WFO Hydrologic Operations DL Series (AWIPS-I)	$ -	
	Res	IT01	AWIPS-I System Manager Course	$ 54	Transitioning to AWIPS-II, only one class
	Res	IT04	Linux for WFOs/RFCs	$ 87	
	Support	IT05	AWIPS-II Developer Training	$ 46	Required to complete development lab training
	DL	IT07	AWIPS-II System Administration Deployment	$ 13	
	DL	IT08	AWIPS-II Local Applications Development	$ 20	
	DL	IT10	AWIPS-II OT&E Support Training	$ 45	
OS6	Support	IT18	WES-II Raytheon Collaboration (AWIPS-II)	$ 75	Mandated to ensure WES-II meets training needs
WDTB	DL	IT06	AWIPS-II Focal Point Training (Warning Related)	$ 68	FFMP, Radar, SCAN, GUARDIAN, Prep for Svr Wx, Snow, TOA
	DL	IT09	WES-II incorporating AWIPS-II	$ 131	**PAC Funding**; Moving WES into the AWIPS Baseline
	DL	ME20	AWIPS-I Warning-Related Delta Training	$ 106	For AWIPS Training Development
	DL	ME22	WES Development and Support (AWIPS-I)	$ 137	

TOTAL AWIPS O&M FUNDING - TABLE 2B	
COMET	$ 225
FDTB	$ -
NWSTC	$ 353
OS6	$ 75
WDTB	$ 363
	$ 1,016

TOTAL AWIPS PAC FUNDING - TABLE 2B	
WDTB	$ 131

Table 2c - FY09 NEXRAD Resourced Training - by Training Facility

DL = Distance Learning; Res = In-residence training

Branch	Method	TNS ID	TNS Requirement	Cost (K)	Comments
NWSTC	Res	EE08	WSR-88D Maintenance	$ 155	
	Res	EE09	WSR-88D ORDA Maintenance	$ 76	
	Res	EE12	WSR-88D Refresher Training	$ 20	Pilot Course to be offered
	Support	EE15	Terminal Doppler Weather Radar Program Support	$ -	
	Support	EE18	TPMS Maintenance - Powerware Course	$ 16	
	Support	EE20	Wind Profiler Deployment Support	$ 5	
	Res	EE21	WSR-88D MLOS Maintenance	$ 7	
	Support	EE22	NEXRAD Dual-Polarization Development Support	$ 5	
WDTB	Blended	ME01	Initial Radar Operations Training (DLOC)	$ 279	Distance Learning and Workshops - Capacity 120 Slots (5 workshops)
	DL	ME12	AWOC - Core Decision Making	$ 30	AWOC Core Track
	DL	ME13	AWOC - Severe Weather Warnings	$ 28	AWOC Severe Track
	DL	ME15	AWOC - Winter Weather Warnings	$ 15	AWOC Winter Track
	Blended	ME28	WSR-88D Operations Build Training	$ 28	Blended Learning Approach. Build Training
	DL	ME45	Effective WSR-88D Operations through VCP Selection	$ 17	
			TOTAL NEXRAD FUNDING - TABLE 2C		
			NWSTC	$ 283	
			WDTB	$ 396	
				$ 679	

Table 2d - FY09 OTHER Resourced Training - by Training Facility

Note: C=COMET, F=FDTB

DL = Distance Learning; Res = In-residence training

Branch	TNS ID	Method	Source	TNS Requirement	Cost (K)	Comments
C/F	IS03	DL	NESDIS	Earth Observing and Forecasting Satellite - GOES-R+	$ 300	
	IS04	DL	NPOESS	Earth Observing and Forecasting Satellite - NPOESS	$ 268	
COMET	AV04	DL	Aviation	DLAC-II - Producing Customer-Focused TAFs	$ 263	
	HY19	DL	Hydro+	QPF for Hydrologic Modeling	$ 112	Hydro Team. Previously RFC/HPC Hydromet Course
	HY20	DL	Hydro+	Short and Long Term Ensembles	$ 11	For module development and COMET support
	HY21	DL	Hydro+	Deterministic and Probabilistic Verification	$ 130	Hydro Team.
	HY29	DL	Hydro+	Quantitative Precipitation Forecast (QPF) Verification	$ 144	Hydro Team. Develop two 2-hour modules
FDTB	IS01	Blended	NESDIS	Observing and Forecasting Satellite - SHyMet	$ 164	
	IS05	Support	NESDIS	Observing and Forecasting Satellite - Proving Ground	$ 11	
NWSTC	AV02	Support	Aviation	Air Traffic Control System Command Center Weather Unit	$ -	Participate in DOC JPDO activities
	EE01	Res	ASOS	ASOS Maintenance	$ 84	3 offerings
	EE01	Support	N/A	ASOS Maintenance (Military)	$ -	FTE support to teach ASOS Maintenance course for military
	EE23	Res	RRS	RRS Maintenance (Deployment)	$ 68	5 offerings
WDTB	AV10w	DL	Aviation	Distance Learning Aviation Course (DLAC)-II - Simulations	$ 74	Support DLAC-II Training Modules (See AV04)
	ME23	DL	Dual-Pol	WSR-88D Dual-Polarization Operations Course	$ 161	LMS Online Module Development
	ME39	DL	Dual-Pol	WSR-88D Dual-Pol Education and Outreach	$ 46	Web-based Module Development
	ME41	DL	FY08	Using the Integrated Warning Team	$ 25	$12.5K for Matching Sea Grant Funds + $13K from FY08/Hydro+ (8K FY08 + 5K Hydro+)
	ME41	Support	SeaGrant	Using the Integrated Warning Team	$ 13	FY09 Norman Severe Weather Workshop Support. SeaGrant Funding.
	ME43	DL	FY08	Advanced Storm-Based Warnings Training	$ 17	FY08 end-of-year funds used

TOTAL OTHER FUNDING TABLE 2D	
Aviation	$ 337
ASOS	$ 84
Dual-Pol	$ 207
FY08	$ 50
Hydro+	$ 401
NESDIS	$ 475
NPOESS	$ 268
RRS	$ 68
SeaGrant	$ 13
	$ 1,901

Table 3 - FY09 Training Division Infrastructure and Mandated Training					
	FY09 Funding				
	BASE	AWIPS	NEXRAD	OTHER	Comments
Total Training Budget (from PPBES Local Forecasts and Warnings)	**$ 5,119,000**	**$ 1,163,700**			Assumes level funding from FY08
Training Division Headquarters (OS6) Infrastructure					
OS6 HQ Base Operating Budget	**$ 40,000**				
Communications for Teletraining/Teleconferencing	**$ 10,000**				
AMS Journals	**$ 130,995**				Reflects change from JHM to Weather and Society
Learning Management System Charges	**$ 144,000**				
NSTEP Meeting	**$ 30,000**				
HOTG Planning Meetings (2)	**$ 20,000**				1 in Silver Spring; 1 offsite
IMET Workshop (required for IMETs - Annual)	**$ 191,900**				Boise Residence Course
Training Division Buffer Fund	**$ 38,760**				
NWSTC Managed Infrastructure					
NWSTC (OS61) Base Operating Budget	**$ 317,000**				
NWS Leadership Academy: Breakouts in Table 1. 1 course of each is funded:					
Management and Supervision (mandated by OPM via new supervisor training) (1)	**$ 61,025**				Also in Table 1
Field Operations Management (1)	**$ 40,873**				Also in Table 1
Safety Related Courses - Mandated by OSHA - Costs are Estimates					
Fall Protection and Rescue Initial (fund based on Olga's estimate)	**$ 74,620**				Also in Table 1
Fall Protection and Rescue Recertification	**$ 349,776**				Also in Table 1
Environmental Compliance	**$ 73,688**				Also in Table 1
Safety Training	**$ 76,347**				Also in Table 1
Total Base Residence Courses	**$ 676,329**				
CPR/First Aid Training	**$ 64,000**				Divide amongst Regions
Equipment Maintenance Training - Fund Based on Program Estimates					
ASOS Maintenance				**$ 84,018**	ASOS funded - Also in Table 1
RRS Maintenance				**$ 67,795**	RRS funded for new RRS deployment sites - Table 1
Open RDA Maintenance			**$ 75,771**		NEXRAD funded - Also in Table 1
WSR-88D Maintenance			**$ 154,743**		NEXRAD funded - Also in Table 1
WDTB Managed Infrastructure					
WDTB NEXRAD Operating Budget			**$ 538,000**		
GoToMeeting Licenses - Managed by WDTB for all OS6	**$ 11,250**				$450. each license
FDTB Managed Infrastructure					
AWIPS-I/AWIPS-II/N-AWIPS Development		**$ 315,000**			Will not be paid for out of AWIPS in FY10
COMET Grant Core Funding (BASE) - Also includes Hydrology Team (OHD and NSTEP contribution)	**$ 2,188,000**				
FDTB (OS63) Base Operating Budget	**$ 47,744**				
AWIPS Support		**$ 5,000**			Instructor Travel
VISIT Salaries - Integrated Sensor Training	**$ 390,000**				restores 07 and 08 cuts
Totals	**$ 4,299,978**	**$ 320,000**	**$ 768,514**	**$ 151,813**	
Remaining in Base & AWIPS	**$ 819,022**	**$ 848,700**			

Table 4 - Prioritized FY09 Unfunded or Not FTE- Staffed Training Requirements (7/30/08)

Note: Items in Italics have no cost, but do require FTEs above and beyond OS6 current resources

N=NWSTC, F=FDTB, V=VISIT, W=WDTB, CI=CIMMS

#	Branch	TNS ID/Requirement Title	FRG Pri	$$ (K)	Sum $$	OS6 FTE Need	Comments
1	**NWSTC**	LE02 Executive Leadership Seminar	**0.67**	$ 138	$ 138	0.10 N	**MUST KNOW BY OCT IF FUNDS ARE AVAILABLE**
2	**OS6**	FW06 DHS Incident Support Specialist Required Training	**1.33**	$ 75	$ 213	0	$ to send NWS IMETs to DHS training
3	**OS6**	FW03 HAZWOPER Training For Incident Support Specialists	**1.50**	$ 20	$ 233	0	$ to send NWS IMETs to HAZWOPER training
4	**COMET**	ME30 National and Great Lakes Marine Training Virtual Course	**1.63**	$ 26	$ 259	0.2 F	Depends upon the number of optional workshops.
5	**NWSTC**	OB01 Data Acquisition Operations residence course (09 2nd offering)	**1.67**	$ 30	$ 289	0.1 N	Would fund second offering of course for FY09; 0.05 FTE outside SME
6	**COMET**	ME07 Boundary Layer Processes Virtual Course	**1.83**	$ 10	$ 299	0.1 F	COMET - repeat of current virtual course; Facilitated at National Weather Center
7	**NWSTC**	CL02 Operational Climate Services Residence Course	**1.83**	$ 48	$ 347	0	Would fund 1 course offering; 0.05 FTE from Climate
8	**COMET**	ME11 Mountain Meteorology Virtual Course	**1.83**	$ 30	$ 377	0.2 F	Depends upon the number of optional workshops.
9	**COMET**	CL03 Climate Services and Outreach (web module)	**2.00**	$ 30	$ 407	0	Liaison between climate office & NOAA Office of Education for Outreach Sprt - FTE short
10	**COMET**	ME09 New SOO Training - QPF & Flash Flood Forecasting	**2.00**	$ 24	$ 431	0	Develop a virtual course
11	**OS6**	HY24 Cold Regions Hydrology Workshop	**2.00**	$ 40	$ 471	0	Run and Coordinated by OCWWS HSD
12	**NWSTC**	HY13 WFO Hydrology Program Manager Residence Course	**2.00**	$ 46	$ 517	0.2 N	0.1 external SME
13	**COMET**	HY11 Flash Flood Operations (FF/QPE Residence Course)	**2.17**	$ 67	$ 584	0.1 F	Continue COMET Flash Flood/QPE residence course
14	**COMET**	CL01 Cli Variability Symp at COMET (2 Virtual FY09 offerings)	**2.33**	$ 17	$ 601	0	
15	**COMET**	TS03 Tsunami Science and Warning Service Training	**2.33**	$ 135	$ 736	0.05 N	Develop web modules on Tsunami Science and TWC Operations
16	**NWSTC**	LE06 Support for Leadership Programs (Regions/Hdqts)	**2.33**	$ 80	$ 816	0.05 N	Help CR, ER, PR, AR, NWS HQ begin programs modeled after BLAST, LIFT
17	**NWSTC**	FW07 GIS Fundamental Distance Learning Modules (Virtual)	**2.33**	$ 37	$ 853	0.05 N	Module Development
18	**FDTB**	ME18 Graphical Forecast Editor (GFE) Tropical Training	**2.50**	$ 3	$ 856	0.2 F	Also covers ME33 - Trop Cyc Hazards Graphics; Online course with possible webinars
19	**NWSTC**	SA10 Specialized Safety Training for Remote NWS Personnel	**2.50**	$ 40	$ 896	0	Module Development
20	**COMET**	ME35 Uncertainty Statistics Basics	**2.60**	$ 75	$ 971	0	FTE Shortage; Develop course with support from WR and SOOs
21	**COMET**	ME36 Uncertainty Guidance Application Basics	**2.67**	$ 96	$ 1,067	0.2 F, 0.2V	FTE Shortage; Develop Articulate Presentations of SOO-provided cases
22	**FDTB**	WM01 WCM Designing Education Projects (DEP)	**2.67**	$ 35	$ 1,102	0.2 F	Course being converted to DL. Approach applicable to support other needs
23	**NWSTC**	SA11 Spill Prevention, Control and Countermeasures Course	**2.67**	$ 23	$ 1,124	0	Module Development
24	**FDTB**	HY27 Static Flood Inundation Mapping	**2.67**	$ 20	$ 1,144	0.1 F	Webcast/Online module development
25	**COMET**	ME31 Forecast Process Online Course	**2.67**	$ 140	$ 1,284	0	Update dated COMET module
26	**WDTB**	ME03 AWOC - Tropical (Virtual Course)	**2.67**	$ 2	$ 1,286	0.05 W	FTE Shortage; AWOC Tropical Track
27	**COMET**	WM02 National SKYWARN Spotter Training	**2.67**	$ 150	$ 1,436	0	Develop online module for basic and advanced spotters. Convert from print materials
28	***FDTB***	*DS01 Real Time Mesoscale Analysis and Analysis of Record*	**2.67**	*$ -*	$ 1,436	*0.05 F*	*FTE Shortage; Develop web-based training. Companion to ME29*
29	**OS6**	IT13 COTR Training Program	**2.67**	$ 50	$ 1,486		ESI International - Vendor Course
30	**COMET**	NP02 NWP, Part I: Application of NWP Forecasting	**2.71**	$ 75	$ 1,561	0.1 F	FTE Shortage; NWP Team.
31	**COMET**	CL10 Volcanic Ash Monitoring and Climate	**2.71**	$ 26	$ 1,587	0	Web Module Development
32	**WDTB**	AV11 Aviation Training for Forecasters (Virtual Course)	**2.83**	$ 17	$ 1,604	.05 W, 0.2CI	For AWIPS Training Development; 1.0 FTE external SME required
33	**NWSTC**	ME38 Communicating Forecast Uncertainty to EMs	**2.83**	$ 1	$ 1,605	0.1 N	Develop Online Module
34	**FDTB**	HY07 Basic Channel Hydraulics	**2.83**	$ 5	$ 1,610	0.25 F	FTE Shortage; Develop Online Module
35	**NWSTC**	SA09 Environmental Refresher Training	**2.83**	$ 22	$ 1,632	0	Module Development
36	***FDTB***	*DS04 Emerging Topics - New Implementations*	**2.83**	*$ -*	*$ 1,632*	*0.5 F*	*FTE Shortage; Series of Web modules*
37	**FDTB**	DS07 Digital Services for NOAA, FEMA, Emergency Managers	**2.83**	$ 20	$ 1,652	0.05 F	FTE Shortage; Series of Web modules
38	**OS6**	IT14 COTR Management of IT Service Contracts	**2.83**	$ 35	$ 1,687		ESI International - Vendor Course
39	**COMET**	NP03 NWP, Part II: Application of NWP Forecasting	**2.86**	$ 84	$ 1,771	0.1 F	FTE Shortage; NWP Team.
		TOTAL PRIORITY 1.0 to 2.99		**$ 1,771**	**$ 1,771**		
40	**COMET**	HY08 Small Basin Customization and Management	**3.00**	$ 102	$ 1,873	0.5 F	FTE Shortage; Hydro Team. Redo previous Basin Customization course at COMET
41	**FDTB**	NP04 NWP, Part III: Investigating the Forecast Problem	**3.00**	$ 84	$ 1,957	0.1 F	FTE Shortage; NWP Team.
42	**COMET**	HY09 Dam Break Modeling (Web Module)	**3.00**	$ 2	$ 1,959	0.1 F	FTE Shortage; Hydro Team.
43	**NWSTC**	CL08 DEP DL Module with Training Development Virtual Support	**3.00**	$ 2	$ 1,961	0.15 N	
44	**WDTB**	ME41 Using the Integrated Warning Team	**3.00**	$ 9	$ 1,969	0.10 CI	FY09 Norman Severe Weather Workshop Support
45	**NWSTC**	EE16 ASOS Refresher Training - Blended Learning	**3.00**	$ 12	$ 1,981	0.3 N	FTE Shortage
46	**WDTB**	ME42 Advanced Watch by County Training	**3.00**	$ 27	$ 2,008	.15 W, .3 CI	FTE Shortage; Develop web-based/WES training
47	**FDTB**	HY30 New Hydrology Forecast Service Outreach Education	**3.00**	$ 65	$ 2,073	0	DEP Module (see WM04) / residence training
		TOTAL OF PRIORITY 3.00		**$ 302**	**$ 2,073**		

48	**NWSTC**	HY01 QPF Forecasting in NDFD	**3.17**	$ 45	$ 2,118	0.1 F, 0.1N	FRT and Residence Course as test of DL material
49	**WDTB**	ME46 Integrating Social Science in Forecast and Warnings	**3.17**	$ 28	$ 2,145	0.3 W, .3 CI	FTE Shortage; Directed by NOAA AA. NOAA and OU providing $528K in SMEs
50	**COMET**	ME37 Using Web Uncertainty Guidance (from Ensembles)	**3.33**	$ 15	$ 2,160	0	FTE Shortage; Form teams to look at existing training
51	**NWSTC**	TS04 DEP DL Module with Training Development Virtual Support	**3.50**	$ 2	$ 2,162	0.05 N	
52	**NWSTC**	LE07 Leadership Development Design and Facilitator Training	**3.50**	$ 41	$ 2,203	0.2 N	
53	**COMET**	CL05 Monsoons (web module)	**3.67**	$ 30	$ 2,233	0	FTE Shortage; DL Module - OS6 Publishing Support
54	**FDTB**	HY12 The Use of GIS in Hydrologic Operations	**3.67**	$ 11	$ 2,244	0.1 F	FTE Shortage; Produce tutorials and webinars (2 per year)
55	**OS6**	IT12 Fundamentals of Earned Value Management (EVM)	**3.67**	$ 40	$ 2,284		ESI International - Vendor Course
56	**OS6**	IT11 Capital Planning & Investment Control (CPIC), & Exhibit 300	**3.67**	$ 30	$ 2,314		ESI International - Vendor Course On-Site
57	**OS6**	IT16 Program Management	**3.83**	$ 25	$ 2,339		ESI International - Vendor Course
58	**OS6**	IT15 Managing Projects / Project Management	**3.83**	$ 45	$ 2,384		ESI International - Vendor Course
59	**COMET**	HY10 Distributed Hydrologic Modeling	**3.83**	$ 12	$ 2,396	0.2 F	FTE Shortage; Hydro Team. Develop online module
60	**FDTB**	DS06 Digital Services Technical Training	**3.83**	$ 25	$ 2,421	0.05 F	National DS Technical Workshop
		TOTAL OF PRIORITY 3.01 TO 3.99		**$ 349**	**$ 2,421**		
61	**OS6**	University Assignment Program	**4.00**	$ 100	$ 2,521	0	Funds for NWS staff to take university courses with time off
62	**NWSTC**	HY17 The Use of GFE in the RFCs	**4.00**	$ 12	$ 2,533	0.1 N, 0.1F	FTE Shortage; Webinar/DL Module Production
63	**NWSTC**	TS01 DEP DL Module with Training Development Virtual Support	**4.00**	$ 2	$ 2,535	0.05 N	
64	**NWSTC**	HY18 RFC Operations	**4.00**	$ 3	$ 2,538	0.2 N	
65	**COMET**	ME32 SOO Training -- Communicating Forecast Uncertainty	**4.00**	$ 36	$ 2,574	0.2 F	FTE Shortage; Develop a virtual course
66	**NWSTC**	SA07 Safety Refresher Training	**4.00**	$ 20	$ 2,594	0	
67	**COMET**	CL09 NCEP Advancements in Climate Modeling	**4.00**	$ 26	$ 2,620	0	Development of Articulate Presenter module
68	**FDTB**	HY15 Hydrologic Model Calibration	**4.00**	$ 37	$ 2,657	0.25 F	FTE Shortage; Develop residence course
		TOTAL OF PRIORITY 4.00		**$ 136**	**$ 2,657**		
68		**GRAND TOTAL $$**			**$ 2,657**		
		FTEs Needed - 0.7F, 0.95 W					

Table 4a - FY09 Unresourced Training by Program Area

Note: F=FDTB, C=COMET, N=NWSTC

DL = Distance Learning; Res = In-residence training

Total Unfunded (K)	Source	TNS ID	Method	Branch	TNS Requirement			Comments
$ 37	Avn	AV03	DL	COMET	Training on Long-Haul Flight Impacts	$	37	COMET Aviation Team. Web module
		AV11	Virtual	NWSTC	Aviation Training for Forecasters	$	-	Goto Webinar for Aviation Focal Points
$ 337	AWIPS	DS06	Res	FDTB	Digital Services Technical Training	$	25	National Digital Services Technical Workshop
		DS07	DL	FDTB	Digital Services for NOAA, FEMA, Emergency Managers	$	20	Series of Web modules
		HY01	DL	F/N	QPF Forecasting in National Digital Forecast Database	$	23	
		IT02	Res	NWSTC	AWIPS-I Operations Support	$	-	Transitioning to AWIPS-II
		IT03	DL	NWSTC	AWIPS-I Local Applications Development	$	-	AWIPS-II DL module available in FY08, new modules to be added in FY09
		ME48	DL	WDTB	AWIPS-II Warning-Related Training	$	26	Blended Learning Approach
		NP02	DL	F/C	NWP, Part I: Application of NWP Forecasting	$	75	COMET NWP Team
		NP03	DL	F/C	NWP, Part II: Gleaning Useful Information from Model Data	$	84	COMET NWP Team
		NP04	DL	FDTB	NWP, Part III: Investigating the Forecast Problem	$	84	COMET NWP Team
$ 2,640	Base	FW06	Support	OS6	DHS Incident Support Specialist Required Training	$	75	
		FW03	Support	OS6	HAZWOPER Training For Incident Support Specialists	$	20	
		ME30	Virtual	F/C	National and Great Lakes Marine Training	$	26	Virtual course; $3K to FDTB; $23K to COMET
		OB01	Res	NWSTC	Data Acquisition Operations residence course (2nd FY09 Offering)	$	30	
		ME07	DL	FDTB	Boundary Layer Processes	$	-	Repeat of current COMET virtual course
		CL02	Res	NWSTC	Operational Climate Services	$	48	0.05 FTE from Climate
		ME11	DL	FDTB	Mountain Meteorology	$	6	Virtual course
		ME09	DL	COMET	New SOO Training - QPF and Flash Flood Forecasting	$	24	Develop a virtual course
		CL03	DL	COMET	Climate Services and Outreach	$	30	Liaison between NOAA Climate Office & NOAA Office of Education for Outreach Support
		HY24	Support	FDTB	Cold Region Hydrology	$	40	For Cold Region Hydrology Workshop
		HY13	Res	NWSTC	WFO Hydrology Program Manager Course	$	46	0.1 external SME
		HY11	Res	F/C	Flash Flood Operations	$	67	Hydro Team. Continue Flash Flood/QPE residence course
		CL01	Virtual	COMET	Climate Variability (Second Virtual Offering)	$	17	Second Course Offering
		TS03	DL	NWSTC	Tsunami Science and Operations Online Courses	$	135	Develop web modules on Tsunami Science and Tsunami Warning Center Operations
		FW07	Virtual	NWSTC	GIS Fundamental Distance Learning Modules (Virtual part only)	$	37	
		LE06	Support	NWSTC	Support for Leadership Programs (Regions/Headquarters)	$	80	
		ME33	DL	FDTB	Tropical Cyclone Hazards Graphics (resources in ME18)	$	-	Online course with possible webinars
		ME18	DL	FDTB	Graphical Forecast Editor (GFE) Tropical Training	$	3	Online course with possible webinars; Possible use of SMEs
		SA10	Support	NWSTC	Specialized Safety Training for Remote NWS Personnel	$	40	
		ME35	DL	COMET	Uncertainty Statistics Basics	$	75	Develop course with support from WR and SOOs
		ME36	DL	F/C	Uncertainty Guidance Application Basics	$	96	Develop Articulate Presentations of SOO-provided cases; $21K to FDTB; $75K to COMET
		WM01	DL	FDTB	WCM Designing Education Projects (DEP)	$	35	Course being converted to DL. Approach applicable to support other needs
		SA11	DL	NWSTC	Spill Prevention, Control and Countermeasures Course	$	23	
		DS01	DL	FDTB	Real Time Mesoscale Analysis and Analysis of Record	$	-	Develop web-based training. Companion to ME29
		IT13	Support	OS6	COTR Training Program	$	50	Costs are estimated
		IT14	Support	OS6	COTR Management of IT Service Contracts	$	35	Costs are estimated
		ME38	DL	NWSTC	Communicating Forecast Uncertainty to Emergency Managers	$	1	
		HY07	DL	FDTB	Basic Channel Hydraulics	$	5	Develop Online Module
		SA09	DL	NWSTC	Environmental Refresher Training	$	22	
		DS04	DL	FDTB	Emerging Topics - New Implementations	$	-	Series of Web modules
		HY08	Res/DL	FDTB	Small Basin Customization and Management	$	-	Hydro Team. Redo previous Basin Customization course
		HY09	DL	F/C	Dam Break Modeling	$	2	Hydro Team. Funds to COMET
		EE13	N/A	NWSTC	Facilities Training Requirements	$	-	
		CL08	DL	NWSTC	Climate Change and IPCC Report	$	2	DEP DL Module with Training Development (Virtual Support)
		ME03	Virtual	WDTB	Advanced Warning Operations Course (AWOC) - Tropical Track	$	2	AWOC Tropical Track
		EE16	DL	NWSTC	ASOS Refresher Training - Blended Learning	$	12	
		ME42	DL	WDTB	Advanced Watch by County Training	$	27	Develop web-based/WES training
		HY30	DL	FDTB	New Hydrology Forecast Service Outreach Education	$	65	DEP Module (see WM04) / residence training
		ME46	DL	WDTB	Integrating Social Science Into Forecast and Warnings	$	28	Directed by NOAA AA. NOAA and OU providing $528K in SMEs
		ME31	Support	COMET	Forecast Process Online Course	$	140	Update dated COMET module
		ME40	DL	COMET	Improved HYSPLIT Model Depiction and Delivery	$	200	Would be addressed by NWP Team at a level to be determined
		DS05	DL	FDTB	Smart Tools and Smart Initialization	$	-	Series of Web modules
		ME37	DL	COMET	Using Web Uncertainty Guidance (from Ensembles)	$	15	
		TS04	DL	NWSTC	Tsunami Warning Center Watchstander Training	$	2	Web Module - Virtual DEP Support
		CL10	DL	COMET	Volcanic Ash Monitoring and Climate	$	26	Development of Articulate Presenter module
		LE07	DL	NWSTC	Leadership Development Design and Facilitator Training	$	41	
		HY12	DL	FDTB	The Use of GIS in Hydrologic Operations	$	11	Produce tutorials and webinars (2 per year)
		CL05	DL	COMET	Monsoons	$	30	DL Module - OS6 Publishing Support
		IT11	Support	OS6	Capital Planning and Investment Control (CPIC), & Exhibit 300	$	30	Costs are estimated

			IT12	Support	OS6	Fundamentals of Earned Value Management (EVM)	$ 40	Costs are estimated
			IT16	Support	OS6	Program Management	$ 25	Costs are estimated
			IT15	Support	OS6	Managing Projects / Project Management	$ 45	Costs are estimated
			HY10	DL	FDTB	Distributed Hydrologic Modeling	$ -	Hydro Team. Develop online module
			HY17	DL	F/N	The Use of GFE in the RFCs	$ 12	Webinar/DL Module Production; Funds to NWSTC
			TS01	Support	NWSTC	Tsunami Warning Center Intern Program	$ 2	DEP DL Module with Training Development (Virtual Support)
			HY18	DL	NWSTC	RFC Operations	$ 3	
			ME32	DL	FDTB	SOO Training -- Communicating Forecast Uncertainty	$ 36	Develop a virtual course; $30K to COMET; $6K to FDTB
			SA07	DL	NWSTC	Safety Refresher Training	$ 20	
			CL09	DL	COMET	NCEP Advancements in Climate Modeling	$ 26	Development of Articulate Presenter module
			HY15	Res/DL	FDTB	Hydrologic Model Calibration	$ 37	Develop residence course
			HY14	Res	C/F	Hydrologic Science	$ 112	Hydro Team. Continue Advanced Hydrologic Science Workshop; Funds to COMET
			LE03	DL	WDTB	Facilitation Skills for SOOs	$ 5	Post COMAP Symposium
			WM03	Support	NWSTC	Field Req Team - ISS follow-on course to WCM/SCH Training	$ 53	0.20 FTE external SME
			N/A	Support	OS6	University Assignment Program	$ 100	
			ME08	Res	C/F	New SOO Training (COMAP)	$ 152	COMAP course and associated module development. Held in FY08; $68K to COMET
			LE02	Res	NWSTC	Executive Leadership Seminar (ELS)	$ 276	2 offerings
$	**254**	**Hydro+**	HY27	DL	FDTB	Static Flood Inundation Mapping	$ 20	Webcast/Online module development
			HY08	Res	COMET	Small Basin Customization and Management	$ 102	Hydro Team. Redo previous Basin Customization course
			HY10	DL	COMET	Distributed Hydrologic Modeling	$ 12	Hydro Team. Develop online module
			HY16	DL	COMET	Precipitation Processing	$ 120	Hydro Team. Continue module development begun in FY08
$	**3,267**					Total Deliverable Costs	$ 3,267	

Table 5 - FY09 Travel Cost Breakdown per Location

Kansas City, MO (NWSTC)	Hotel	First/Last Day	Per Diem	Air/Misc.	TOTAL
1 night stay for guest inst	$97.72	$75.00	$0.00	$650.00	$822.72
2 night stay for guest inst	$195.44	$75.00	$50.00	$650.00	$970.44
2 day class - 3 night stay	$293.16	$75.00	$100.00	$650.00	$1,118.16
3/3.5 day class - 4 night stay	$390.88	$75.00	$150.00	$650.00	$1,265.88
4/4.5 day class - 5 night stay	$488.60	$75.00	$200.00	$650.00	$1,413.60
6 night stay	$586.32	$75.00	$250.00	$650.00	$1,561.32
6 day class - 9 night stay	$879.48	$75.00	$400.00	$650.00	$2,004.48
8/8.5 day class - 11 night stay	$1,074.92	$75.00	$500.00	$650.00	$2,299.92
9.5 day class - 12 night stay	$1,172.64	$75.00	$550.00	$650.00	$2,447.64
10 day class - 15 night stay	$1,465.80	$75.00	$700.00	$650.00	$2,890.80
12 day class - 17 night stay	$1,661.24	$75.00	$800.00	$650.00	$3,186.24
13 day class - 18 night stay	$1,758.96	$75.00	$850.00	$650.00	$3,333.96
25 day class - 37 night stay	$3,615.64	$75.00	$1,800.00	$650.00	$6,140.64
30 day class - 38 night stay	$3,713.36	$75.00	$1,850.00	$650.00	$6,288.36
33 day class - 46 night stay	$4,495.12	$75.00	$2,250.00	$650.00	$7,470.12

Boulder, CO (COMET)	Hotel	First/Last Day	Per Diem	Air/Misc.	TOTAL
1 night stay for guest inst	$103.00	$88.50	$0.00	$650.00	$841.50
2 night stay for guest inst	$206.00	$88.50	$59.00	$650.00	$1,003.50
2 day class - 3 night stay	$309.00	$88.50	$118.00	$650.00	$1,165.50
3/3.5 day class - 4 night stay	$412.00	$88.50	$177.00	$650.00	$1,327.50
4/4.5 day class - 5 night stay	$515.00	$88.50	$236.00	$650.00	$1,489.50
6 day class - 9 night stay	$927.00	$88.50	$472.00	$650.00	$2,137.50
8 day class - 11 night stay	$1,133.00	$88.50	$590.00	$650.00	$2,461.50
10.5 day class - 15 night stay	$1,545.00	$88.50	$826.00	$650.00	$3,109.50
15 day class - 20 night stay	$2,060.00	$88.50	$1,180.00	$650.00	$3,978.50
30 day class - 38 night stay	$3,914.00	$88.50	$2,183.00	$1,300.00	$7,485.50

Norman, OK (WDTB)	Hotel	First/Last Day	Per Diem	Air/Misc.	TOTAL
4.5 day class - 5 night stay	$375.00	$58.50	$117.00	$775.00	$1,325.50

Washington, DC (NWS HQ)	Hotel	First/Last Day	Per Diem	Air/Misc.	TOTAL
9.5 day class - 11 night stay	$2,068.00	$96.00	$640.00	$600.00	$3,404.00

Boise, ID (Fire Weather)	Hotel	First/Last Day	Per Diem	Air/Misc.	TOTAL
3 day class - 4 night stay	$316.00	$73.50	$147.00	$700.00	$1,236.50
4/4.5 day class - 5 night stay	$395.00	$73.50	$196.00	$700.00	$1,364.50