TRANS-92-2

NATIONAL IMPLEMENTATION PLAN FOR THE MODERNIZATION AND ASSOCIATED RESTRUCTURING OF THE NATIONAL WEATHER SERVICE

Fiscal Year 1992 Annual Update

Department of Commerce

National Oceanic and Atmospheric Administration

June 1992

THE SECRETARY OF COMMERCE
Washington, D.C. 20230

June 29, 1992

In accordance with Section 407(b) of Public Law 100-685, I am transmitting the fiscal year 1992 annual update of the National Implementation Plan for the Modernization and Associated Restructuring of the National Weather Service for consideration by the Congress. This modernization of our Nation's weather warning and forecast program will provide improved services to the public and save lives and property.

Sincerely,

Rockwell A. Schnabel
Acting Secretary of Commerce

NATIONAL IMPLEMENTATION PLAN FOR THE MODERNIZATION AND ASSOCIATED RESTRUCTURING OF THE NATIONAL WEATHER SERVICE

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EXECUTIVE SUMMARY

Thunderstorms and lightning, tornadoes, hurricanes, blizzards, and floods pose serious hazards to life and property. Hundreds of lives and billions of dollars are lost every year from these ravages of nature. Weather and flood conditions also affect the entire economy in many direct and indirect ways. Some of the most destructive weather events are short-lived, relatively local disturbances. Until now, the operations of the National Weather Service (NWS) have focused on more slowly changing, larger-scale features of the atmosphere. The impetus for major changes in NWS are twofold. First, the existing technological base for weather observations, information processing and communication is obsolete and highly costly to maintain. Second, new scientific and technological breakthroughs provide, for the first time, the opportunity to analyze and predict the most destructive weather patterns -- a clear mandate for substantial service improvements.

Modernization and associated restructuring of NWS will usher in a new era for severe weather and flood warning and forecast services in the United States. Important advances in the science of meteorology, coupled with major new technological capabilities for observing and analyzing the atmosphere, will provide unprecedented weather service improvements in the next decade. The NWS of the 1990s and beyond will operate one of the most advanced hydrometeorological warning and forecast systems in the world.

As described in the Strategic Plan for National Weather Service Modernization and Associated Restructuring, the NWS of the 1990s will consist of 115 Weather Forecast Offices (WFO), 13 River Forecast Centers (RFC) and the National Centers. The WFOs will replace the current field structure to provide a uniform level of warning and forecast services. WFOs will be responsible for issuing watches, warnings, and forecasts, and will concentrate meteorological expertise to provide quick analysis, accurate forecasts of mesoscale weather phenomena, and rapid dissemination of products. Improved coordination and integration of meteorological information into hydrologic products and services will be essential. As a result, RFCs will have to update hydrologic guidance and information for use in WFO flash flood procedures more frequently than today. Operational coordination with other water resource agencies is another critical dimension of RFC functions. The emphasis on short range and local area forecasting in

the WFOs will require that National Centers provide improved guidance on long range and large area forecasts to the WFOs.

Transition to the modernized NWS will be driven by service requirements and accomplished in two distinct stages. The first stage is associated with the deployment of new observational systems such as the Next Generation Weather Radar (NEXRAD) and the Automated Surface Observing System (ASOS); the second with the new information processing and communications system, the Advanced Weather Interactive Processing System (AWIPS).

The first stage, Stage 1, will be characterized by an improvement in severe weather detection capability. This will result from professional interpretation of new and enhanced observational data made available by the deployment of the new observational technologies. The second stage, Stage 2, will be characterized by actual operation of the predictive warning program. The forecaster will have all the tools to assist in acquiring, integrating, analyzing, and interpreting all the various data sets, and rapidly disseminating products. For the first time, the NWS will have the ability to reliably forecast severe weather events with lead times of tens of minutes and increased geographical specificity.

The National Weather Service has never undertaken a systematic modernization and associated restructuring effort of the magnitude described in this National Implementation Plan (NIP). Virtually every NWS activity will change in some way during the transition period. The overall management approach to the transition will be to organize, plan, schedule, execute, monitor, and report on the essential activities necessary to effect modernization and associated restructuring of the NWS. All NWS organizational units will be involved in the planning, execution, reporting, and management of transition activities. Because changes required for modernization and associated restructuring are so far reaching, transition management will be unavoidably and necessarily an integral part of day-to-day NWS management at all levels.

As a matter of policy, the NWS has adopted a management philosophy for the transition that has two important features: 1) to the maximum extent possible, the existing organizational structure and management authority of NWS will be utilized to plan and implement all transition activities; and 2) transition planning and implementation must maintain operations and service delivery without disruption. Public Law 100-685 imposes a certification requirement to ensure operations and services are not degraded during the transition. The NWS is formulating a detailed process for compliance which will be contained in regulations to be published for public comment.

Transition planning recognizes the fact that the service improvement objectives and productivity and efficiency targets described in the Strategic Plan for National Weather Service Modernization and Associated Restructuring are goals based on expected systems capabilities and operational concepts that must be demonstrated in the field environment. Such demonstrations will include local operational demonstrations upon delivery of new technologies. The observational and operational data from the new technologies will be compiled and analyzed before the new technologies are commissioned, and before current equipment is decommissioned. These demonstrations are in addition to a national demonstration referred to as the Modernization and Associated Restructuring Demonstration (MARD) which will precede Stage 2 of the modernization - the "national implementation". The local operational demonstrations will be used to certify to Congress that no degradation of services to local areas will occur.

MARD will be conducted to demonstrate the WFO concept from a national structure perspective and to evaluate possible additional organizational efficiencies. Actual system performance and the results of demonstrations of various aspects of modernized operations will force a periodic re-examination and possible adjustment of these end targets. Results of ongoing hydrometeorological research programs within the National Oceanic and Atmospheric Administration (NOAA), the academic community and other Government agencies will provide for the transfer of scientific and technological advances to the NWS modernization program. Plans for transition must therefore be incremental in nature, focusing on near-term events that are fairly certain, e.g., NEXRAD implementation. This does not mean the end goals of full modernization and associated restructuring will be forgotten; far from it. No planning efforts can be undertaken without the end goals of full modernization and associated restructuring firmly in mind. Plans must be flexible and updated frequently as longer-range events become more certain.

Transition plans will be tiered in an hierarchal arrangement with this document, the National Implementation Plan as the top level plan. Based on the Strategic Plan, the NIP is a broad guidance document for both internal and external use, and describes major objectives to be accomplished over the next three years. However, the NIP is not intended to be a stand-alone document in the sense that it will contain all the numerous details one needs to know about transition. Rather it is intended to be the top level guidance document supported by much more detailed transition planning and implementation activities carried on throughout all levels of the entire agency.

The fundamental transition strategy that will be used is an integrated, incremental step-by-step, office-by-office approach. The changes in operations and services related to modernization and associated restructuring are the ultimate guiding force of the transition. Future services will define the system outputs, the staffing type and mix of an office, and the field structure needed to efficiently provide these services. These, in turn, set requirements for training and education, facility preparation, and guide a myriad of other dimensions of the modernization and associated restructuring. A realistic view of technology capabilities, schedules and the NWS environment will help shape the scope and pace of service changes.

The breadth of future operations and services is bounded by the agency mission, science and technologic capability. The transition strategy recognizes and incorporates these factors and must retain sufficient flexibility to respond to these dynamics. The approach acknowledges that plans for future operations and services may well require adjustments as implementation proceeds. The NWS must be able to accommodate and capitalize upon the new knowledge and understanding that it will acquire throughout the transition period.

The agency must acquire both internal and external support by fully informing affected individuals and organizations of the goals and objectives of NWS modernization and associated restructuring, and the changes that are planned, and by providing a demonstration of the capability to attain these goals. This can be accomplished through careful planning, good management, and close coordination between all levels of staff and users.

1.0 INTRODUCTION

As the National Weather Service enters its second century as a civilian agency, a new era will begin for severe weather and flood warning and forecast services in the United States. Important advances in the science of meteorology, coupled with major new technological capabilities for observing and analyzing the atmosphere, will provide unprecedented weather service improvements in the next ten years. The NWS of the 1990s and beyond will operate one of the most advanced hydrometeorological warning and forecast systems in the world.

This document, the National Implementation Plan, is required by Public Law 100-685 and provides the basic framework for modernization and associated restructuring of NWS. The transition from today's mode of operation to the modernized NWS of the 1990s will ultimately require a complete transformation of the entire agency. Systematic retooling of all major systems, staffing changes at all field stations, and implementation of a new service and product line that focuses on the mesoscale level of meteorology will be accomplished by the end of the transition. During the entire transition period the NWS will maintain its public service responsibilities.

1.1 NWS Mission Statement

The mission of the National Weather Service is:

> **To provide weather and flood warnings, public forecasts and advisories for all of the United States, its territories, adjacent waters and ocean areas, primarily for the protection of life and property. NWS data and products are provided to private meteorologists for the provision of all specialized services.**

In accordance with its mission, the National Weather Service in the 1990s must fulfill the following requirements associated with weather services in the United States:

- As the principal civilian agency responsible for hydrometeorological weather services in the federal government, the NWS will coordinate its programs with other federal agencies involved with meteorology and hydrology to attain maximum cost effectiveness (for example, aviation safety or forest fire prevention and management);

- Cooperation between the NWS and the private hydrometeorological community will continue to provide a spectrum of weather services;

- The NWS data and products will continue to be provided to the private sector;

- The NWS will continue to rely heavily on the mass media as its major method of dissemination of weather and flood warnings and forecasts to the public;

- The NWS will continue to fulfill all its international hydrometeorological obligations; and

- The NWS will maintain a continuing program of applied research in cooperation with other agencies and the external scientific community to improve warnings and forecasts based upon scientific and technological advances.

1.2 Improved Service Mandate

Thunderstorms and lightning, tornadoes, hurricanes, blizzards, and floods pose serious hazards to life and property. Hundreds of lives and billions of dollars are lost every year from these ravages of nature. Weather and flood conditions also affect the entire economy in many direct and indirect ways.

Some of the most destructive weather events are short-lived, relatively local disturbances. Until now, the operations of the NWS have focused on more slowly changing, larger-scale features of the atmosphere. This emphasis on the synoptic scale of weather is a reflection of the fundamental limitations of the operational systems currently employed to routinely observe atmospheric characteristics and the current state of scientific understanding of the atmosphere. Moreover, the forecaster has had only rudimentary technological systems to assimilate, analyze and communicate complex weather information on a near real-time basis. In fact, the basic NWS mission of providing public warnings of severe weather or flash floods is now accomplished in most cases after actual detection of these events or after a collection of reports of visual sightings, i.e., the current warnings are reactionary. Prediction of small scale violent weather has been very difficult, and lead times for warnings are correspondingly short.

Looking to the 1990s, the impetus for major changes in NWS are twofold. First, the existing technological base for weather observations, information processing and communication is obsolete and highly costly to maintain. Second, new scientific and technological breakthroughs provide, for the first time, the opportunity to analyze and predict the most destructive weather patterns -- a clear mandate for substantial service improvements.

Experimental applications of new observational and information processing systems for weather prediction have demonstrated that current services can be improved. The results of these experimental applications have yielded new operational concepts for the NWS of the 1990s. These new operational concepts require restructuring of all NWS field offices. For the first time, all warnings and forecasts will be prepared by meteorologists and hydrologists based on new, sophisticated data assimilation and prediction processes. The new prediction process has several distinct features.

First, forecasters on duty at a field office will be better able to integrate knowledge from meteorology and hydrology. Prediction of severe storms and flood probabilities must be based upon knowledge of both disciplines. Second, forecasters working with assistance from technical staff will focus on meteorological and hydrological events developing within the next 36-hour time frame. Warning and forecast products will be prepared in an integrated mode of

operation. This contrasts with the current approach in which responsibilities are divided among forecasters for various programs such as public warnings, aviation weather, etc. Third, each field office will have timely and rapid access to all sources of meteorological and hydrological data pertinent to that office.

As a result of advances in technology and substantial development efforts over the last 10 years, new hydrometeorological observation, information processing and collection systems will provide data and the tools required by the forecaster of the future. The following new systems will become interlocking components of the NWS in the 1990s:

- Next Generation Weather Radar A network of advanced Doppler radars to measure the motion of the atmosphere responsible for severe weather such as tornadoes, to detect heavy rainfall, and to increase lead times for predictions of severe weather events.

- Automated Surface Observing System An automated electronic sensor instrument system to replace manual weather observations now taken at 250 NWS sites.

- Advanced Weather Interactive Processing System/NOAAPORT An advanced computer/telecommunication system to help the forecasters integrate all sources of weather data at field offices, to assist them in analyzing fast breaking storms, and to aid in the timely preparation and dissemination of warnings and forecasts. The NOAAPORT component of the system will provide the direct broadcast link between the national guidance center and NWS field offices, and will be the source of NWS data and information to external, private sector users.

- Satellite Upgrades A new series of geostationary meteorological satellites to provide higher spatial and temporal resolution imagery and data to aid shorter-range warnings and forecasts; a new series of polar orbiting meteorological satellites to provide improved, all-weather atmospheric data to assist in longer-term forecasting.

- National Center Computer Upgrades New super computers to allow more complex numerical modeling of the atmosphere that will improve national guidance for short-range warnings and forecasts, as well as more reliable guidance for medium and long-range forecasts.

1.3 General Approach to Transition Planning

Transition planning recognizes the fact that the service improvement objectives and productivity and efficiency targets described in the Strategic Plan for National Weather Service Modernization and Associated Restructuring are goals based on expected systems capabilities and operational concepts must be fully demonstrated in the field environment. Actual system performance and the results of demonstrations of various aspects of modernized operations will force a periodic re-examination and possible adjustment of these end targets. Plans for transition must therefore be incremental in nature, focusing on near-term events that are fairly certain, e.g., NEXRAD implementation. And these planning efforts will be undertaken with

the end goals of full modernization and associated restructuring firmly in mind. Plans must be flexible and updated frequently as longer-range events become more certain.

The incremental planning for transition will be accomplished through a sliding time window concept consisting of a series of long, medium, and short-range views taken in parallel. The long-range outlook covering a 6-year time window will provide a broad prospective look at full modernization and associated restructuring targets with appropriate recognition of where the greatest uncertainties lie. The medium-range projection covering a 3-year time window will be a more detailed view at events that will occur with much greater certainty. The medium-range projection will form the basis for the short-range action plans. The short-range action plan detailing the immediate 1-year time frame will list specific activities based on known events. As required by Public Law 100-685, details on activities planned for the next three years are documented in Section 6 of this National Implementation Plan.

Overall transition planning and implementation activities will be depicted in a Master Transition Schedule (MTS) which the Deputy Assistant Administrator for Modernization and the Transition Director will prepare and maintain. The MTS will be the official vehicle used by the agency to assess and report progress on transition to the modernized NWS. The MTS is described in more detail in Section 5.3 and contained in Appendix A.

1.4 Hierarchy of Transition Plans

Transition plans will be tiered hierarchically with this document, the National Implementation Plan as the top level plan. The Deputy Assistant Administrator for Modernization and the Transition Director have the responsibility for preparing and updating the National Implementation Plan annually, and coordinating it with the rest of the agency.

The National Implementation Plan is a broad guidance document for both internal and external use, and is based on the Strategic Plan for National Weather Service Modernization and Associated Restructuring. Internally, the National Implementation Plan will be used to guide the entire agency in planning for and then accomplishing the transition to the modernized NWS of the 1990s by:

- setting forth the fundamental goals and objectives;
- providing a planning framework and general strategies for accomplishing the transition; and
- establishing the basic transition management principles that will be used throughout the entire transition period.

The National Implementation Plan is not intended to be a stand-alone document in the sense that it will contain all the details about transition. Rather it is intended to be the top level guidance document supported by much more detailed transition planning and implementation activities carried on throughout all levels of the entire agency.

Externally, the National Implementation Plan will initially be used to provide the Executive Branch, Congress, cooperating agencies, users and the public with both an overview of what modernization and associated restructuring is, and how NWS will accomplish the transition to it. Eventually, the National Implementation Plan will be used as one means to provide routine progress reports to these external parties.

The next tier in the planning hierarchy is the Regional Transition Plan (RTP). These transition plans provide management flexibility and recognize both the decentralized nature of NWS, and the Regions' responsibility to maintain ongoing operations throughout the transition period. The RTP must set a course that will ultimately achieve the modernization and associated restructuring goals/objectives set forth in the National Implementation Plan, while taking into account differences between the Regions and the unique conditions at each site within a Region. Each NWS Region has responsibility for preparing and updating their RTP annually. RTPs are approved by the Transition Director.

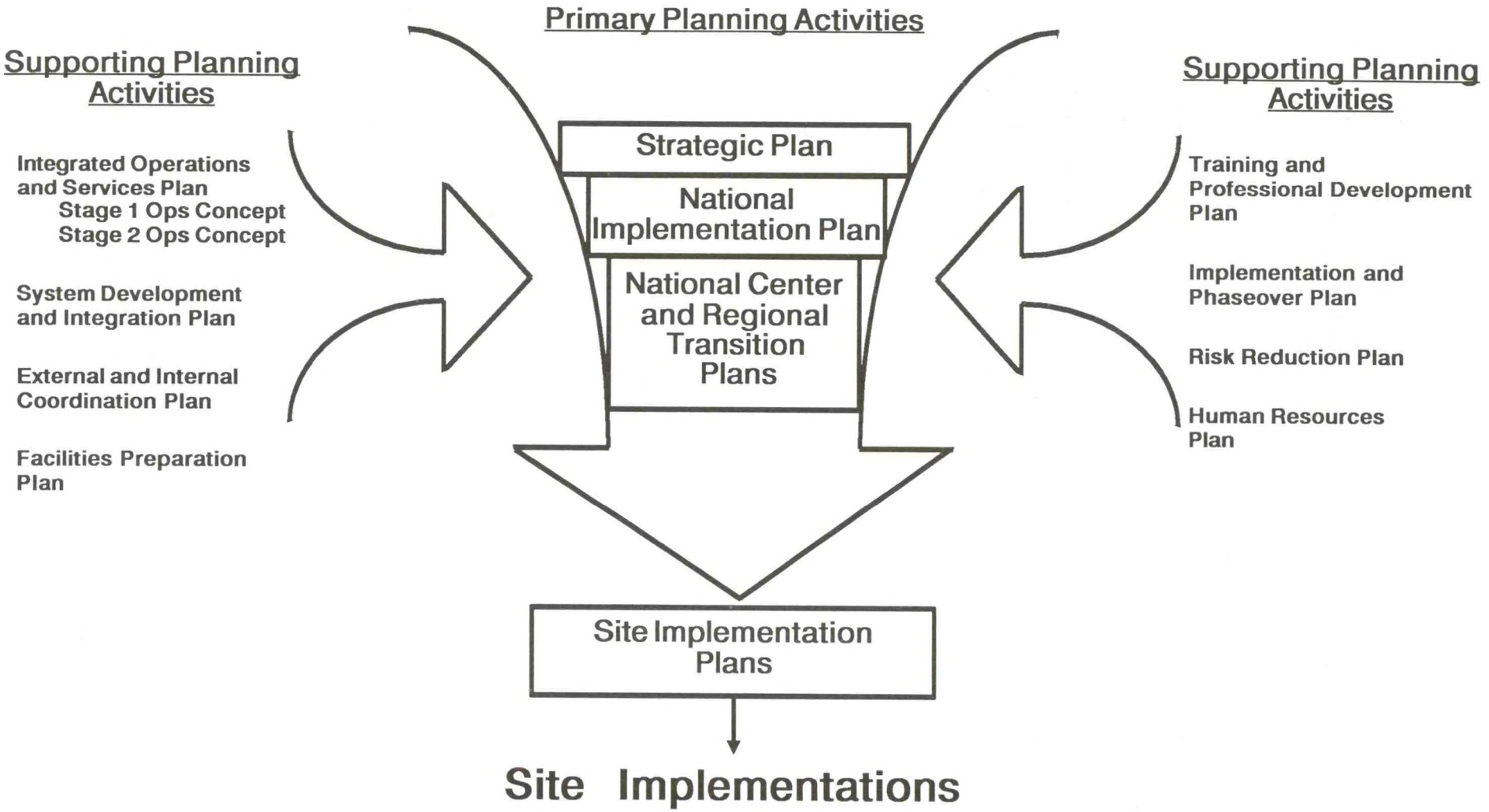
The final tier in the planning hierarchy is the Site Implementation Plan (SIP) which contains specific, detailed actions and schedules for accomplishment. The SIP is subordinate to, and set within the framework of the RTP, and more generally, the National Implementation Plan. A separate SIP will be prepared for each planned WFO or WFO/RFC, and will address transition of all sites in its area of responsibility. Individual SIPs may require modification to accommodate the requirements and timing of activities in other SIPs. Site implementation plans will be approved by the cognizant Regional Director and contained in the appropriate RTP. Standardized outlines for Regional transition and site implementation plans are provided in Appendix B.

A similar transition planning hierarchy will be used by the National Centers. A National Centers Transition Plan will be prepared by the National Meteorological Center (NMC) as a counterpart to the RTP. Site implementation plans for each of the individual National Centers: NMC, National Hurricane Center (NHC), National Severe Storms Forecast Center (NSSFC), etc. will address detailed transition activities and schedules for accomplishment, and will be embodied in the National Centers Transition Plan.

National, Regional/National Center and site level plans form the primary planning path, and, as depicted in Figure 1 at the end of this section, integrate the results of supporting planning efforts that focus on specific functional areas of NWS operations such as future operations and services, training and professional development, staffing, system development and integration, implementation and phaseover, etc. Appendix C provides a more detailed list of related transition planning documents that support the primary planning path.

Other specific information pertinent to transition planning, such as WFO, RFC, NEXRAD and ASOS maps and locations are provided in Appendix D.

Figure 1:
HIERARCHY OF TRANSITION PLANS



2.0 MODERNIZATION GOALS AND OBJECTIVES

The Department of Commerce has set an ambitious goal for the National Oceanic and Atmospheric Administration's agency, the National Weather Service:

> **To modernize the NWS through the deployment of proven observational, information processing and communications technologies, and to establish an associated cost effective operational structure. The modernization and associated restructuring of NWS shall assure that the major advances which have been made in our ability to observe and understand the atmosphere are applied to the practical problems of providing weather and hydrologic services to the Nation.**

Within this context, more specific goals of the NWS modernization and associated restructuring can be broadly stated as:

- Operational realization of a predictive warning program focusing on mesoscale meteorology and hydrology;
- Advancement of the science of meteorology and hydrology;
- Development of NWS human resources to achieve maximum benefit from recent scientific and technological advances;
- User acceptance and support of NWS modernization and associated restructuring service improvement objectives;
- Strengthening cooperation with the mass media, universities, the research community and the private hydrometeorological sector to collectively fulfill the nation's weather information needs from provision of severe weather warnings and general forecasts for the public as a whole, which is a Government responsibility; to provision of detailed and customer specific weather information, which is a private sector responsibility;
- Achievement of productivity gains through automation and replacement of obsolete technological systems; and
- Operation of the optimum NWS warning and forecast system consistent with service requirements, user acceptability, and affordability.

Transition to the modernized NWS will be driven by service requirements and accomplished in two distinct stages. Stage 1 is associated with the deployment of new observational systems such as ASOS and NEXRAD; the second with the new information processing and communications system, AWIPS. This staging provides a stabilization period to allow field offices

to adjust to, and gain familiarity with the new doppler radar and high resolution surface observation data.

The first stage, Stage 1, will be characterized by an improvement in severe weather detection capability. This will result from meteorological interpretation of new and enhanced observational data made available by the deployment of NEXRAD, ASOS, etc. This observational and operational data will be complied and analyzed before new weather service technologies are commissioned.

The second stage, Stage 2, will be characterized by operation of the predictive warning program. The forecaster will have the tools necessary to integrate, analyze, and interpret all the various data sets, and rapidly disseminate products. For the first time, the NWS will have the ability to forecast severe weather events with lead times of tens of minutes and increased geographical specificity.

2.1 Stage 1 Goals and Objectives

During Stage 1 there will be an immense increase in both the quantity and quality of data available to NWS. The primary goal of Stage 1 is to take advantage of this enhanced data and improve detection of severe weather events to the greatest extent possible in the absence of all the new technologies and other changes planned as part of Stage 2.

In Stage 1, NWS will continue its two-tier field office structure. State-wide forecast responsibility will be carried out by the 52 Weather Service Forecast Offices (WSFO) each of which will receive a NEXRAD to become a NEXRAD WSFO (NWSFO). Severe weather warnings will be provided by the NWSFOs and NEXRAD Weather Service Offices (NWSO). Hydrologic guidance will continue to be provided by the 13 RFCs. National level guidance and numerical modeling products will continue to be the responsibility of the National Centers. System support for NWS field offices is a critical factor in maintaining reliable warning and forecast operations 24 hours a day. This support involves the entire spectrum of hardware and software systems.

More specific Stage 1 objectives are given below for the various categories of field offices and centers. This is not an all inclusive list of office types, but represents the preponderance of NWS offices. Specific Stage 1 objectives for office types not listed below such as Tsunami Warning Centers, the Nuclear Support Office, etc. are detailed in the appropriate Regional Transition Plan.

<u>NEXRAD Weather Service Forecast Offices (NWSFO)</u>

- Continue all current programs;
- Increase the number of meteorologists (see Table 1 at the end of this section) and provide training to enable all staff to more fully utilize the new technologies and the new observational data;

- Participate in the individual site calibration of the NEXRAD;
- Compile and analyze observational and operational data from the new technologies during the commissioning process;
- Support station program of radar coded and data interpretation messages;
- Utilize the new technologies to improve detection of severe weather and to produce effective and timely warnings and forecasts for assigned area of responsibility;
- At selected locations, accept or transfer responsibility for observational and other programs; and
- Prepare for Stage 2.

Weather Service Forecast Offices (WSFO)

- Receive NEXRAD, continue as an NWSFO (see above).

NEXRAD Weather Service Offices (NWSO)

- Continue all current programs;
- Increase the number of meteorologists (see Table 2 at the end of this section) and provide training to enable all staff to more fully utilize the new technologies and the new observational data;
- Participate in the individual site calibration of the NEXRAD;
- Compile and analyze observational and operational data from the new technologies during the commissioning process;
- Support station program of radar coded and data interpretation messages;
- Utilize the new technologies to improve detection of severe weather and to produce effective and timely warnings and forecasts for assigned area of responsibility;
- At selected locations, accept or transfer responsibility for observational and other programs; and
- Prepare for Stage 2.

Weather Service Offices (WSO)

- Automate the surface observation program using ASOS;

- Support the planning and smooth transfer of assigned warning and forecast responsibility as well as the upper air, local warning radar, NOAA Weather Radio (NWR), and other programs to designated WSFOs and NWSOs;

- Submit a certification to Congress that no degradation of service will result from an automation and/or consolidation; and

- Adjust staffing as required to operate community preparedness, liaison and other local community support programs.

Weather Service Meteorological Observatories (WSMO)

- Automate or transfer observing functions.

Weather Service Contract Meteorological Observatories (WSCMO)

- Automate or transfer observing functions.

River Forecast Centers

- Continue all current programs;

- Establish Hydrometeorological Analysis and Support (HAS) Groups at each collocated WFO/RFC facility to facilitate integration of meteorological information into hydrologic products and services, and vice versa;

- Utilize NEXRAD and ASOS data to enhance products and services to the greatest extent possible given the limitations of staff as well as existing information processing systems; and

- Prepare for Stage 2.

National Centers

- Continue all current programs;

- Assume responsibility for high seas forecast program as follows:
  - NMC will have an area of responsibility in the Atlantic Ocean west of 35 degrees west longitude between 30 and 60 degrees north latitude, and in the Pacific Ocean east of 160 degrees east longitude between 30 and 60 degrees north latitude
  - NHC will have an area of responsibility in the Atlantic Ocean west of 35 degrees west longitude between 3 and 30 degrees north latitude, and in the Pacific Ocean east of 140 degrees west longitude between the equator and 30 degrees north latitude

- WSFO Honolulu's area of responsibility in the Pacific Ocean will remain unchanged

- Prepare and disseminate national NEXRAD products; and

- Prepare for Stage 2.

Center Weather Service Units (CWSU)

- Continue support to Federal Aviation Administration (FAA) Air Route Traffic Control Centers and prepare for Stage 2.

2.2 Stage 2 Goals and Objectives

The primary goal of Stage 2 is to take advantage of all the new technologies and a trained staff to operate a fully modernized NWS, and deliver improved warning and forecast services nationwide.

As described in the Strategic Plan for National Weather Service Modernization and Associated Restructuring, the NWS of the 1990s will consist of 115 WFOs, 13 RFCs and the National Centers. The WFOs will replace the current structure of WSFOs and NWSOs to provide a uniform level of warning and forecast services. WFOs will be responsible for issuing watches, warnings, and forecasts. A WFO will concentrate meteorological expertise to provide products and services for its assigned area of responsibility. A WFO will provide quick analysis, accurate forecasts of mesoscale weather and flood phenomena and rapid dissemination of warnings and forecasts.

In Stage 2, operations of the RFCs will change in several ways. The WFO flash flood procedures will be considerably more sophisticated than the manual approach taken today. Improved coordination and integration of meteorological information into hydrologic products and services will be essential. As a result, RFCs will have to update hydrologic guidance and information for use in WFO flash flood procedures more frequently than today. Operational coordination with other water resource agencies is another critical dimension of RFC functions. The emphasis on short range and local area forecasting in the WFOs will require that National Centers provide improved guidance on long range and large area forecasts to the WFOs.

During Stage 2, several factors will shift system support toward a greater degree of centralization. With the new systems of the modernized NWS, more consistency in hardware and software in the field offices will exist. This greater consistency of systems will permit increased uniformity and standardization of technical support procedures. The major goal in the system support area is obtaining maximum cost effectiveness through utilization of the most efficient integrated maintenance and logistics support concepts and achieving the most appropriate mix of Government and private industry system support.

More specific Stage 2 objectives are given below for the various categories of field offices and centers. This is not an all inclusive list of office types, but represents the preponderance of NWS offices. Specific Stage 2 objectives for office types not listed below such as Tsunami Warning Centers, the Nuclear Support Office, etc. are detailed in the appropriate Regional Transition Plan.

Weather Forecast Offices

- Operate a reliable predictive warning program, and issue all watches, warnings and forecasts;
- Deliver warning and forecast services at an improved level over that provided currently;
- Operate the WFO with staff (see Table 3 at the end of this section) trained in mesoscale meteorology and in the application of the new technologies;
- Prepare warning and forecast products using the integrated forecast mode of operation;
- Achieve more effective means for rapid warning dissemination in cooperation with the media;
- Cooperate with emergency agency officials and municipalities to anticipate and conduct weather-related disaster response operations for public safety;
- Provide effective management of observational data networks operated by cooperators and volunteers; and
- Ensure modernized NWS warning and forecast products and services meet public and user needs.

Weather Service Offices

- Submit a certification to Congress that no degradation of service will result from closure of a non-NEXRAD WSO; and
- Close the non-NEXRAD WSO.

Data Collection Offices (Alaska and Hawaii)

- Convert all existing upper air WSOs in Alaska and Hawaii to Data Collection Offices to continue observation programs and provide local service outlets at Barrow, AK; Bethel, AK; Cold Bay, AK; Hilo, HI; Ketchikan, AK; King Salmon, AK; Kodiak, AK; Kotzebue, AK; Lihue, HI; McGrath, Ak; Nome, AK; St. Paul Island, AK; and Yakutat, AK.

River Forecast Centers

- Supplement staffing to provide nominal 16 hour a day RFC operations (see Table 4 at the end of this section);
- Implement improved hydrologic models made possible by increased computational power and enhanced data collection and assimilation capabilities;
- Provide hydrologic guidance to WFOs more frequently; and
- Improve analysis and forecasting of hydrometeorological phenomena.

National Centers

- Provide improved guidance products through use of the latest numerical weather prediction models run on advanced super computers;
- Produce digital forecast data bases for use by WFOs in preparing forecasts for time periods of 36 hours and beyond;
- Utilize data available from advanced geostationary and polar orbiting satellites as direct input for numerical weather prediction models, as guidance for high seas and aviation forecasts, and for interpretation and forecasting of hurricanes;
- Provide national severe weather guidance products and issue advisories to WFOs; and
- Improve hurricane forecasts through the use of better numerical models of the atmosphere combined with better atmospheric observations.

Center Weather Service Units

- Provide improved aviation products and services through the use of the FAA provided Meteorologist Weather Processor and high resolution mesoscale data available from the WFOs.

Table 1:
STAGE 1 NEXRAD WSFO STAFFING TARGETS

CURRENT STAFFING PLUS:	NO.	APPROVED GRADE	REPORT
Science and Operations Officer	1*	13	7 Mo. Prior to NEXRAD Delivery
Warning Coordination Meteorologist	1*	13	7 Mo. Prior to NEXRAD Delivery
Core Meteorologists (shift)	1-2*	12	4 Mo. Prior to NEXRAD Delivery
Service Hydrologist	1**	13	4 Mo. Prior to NEXRAD Delivery
Data Acquisition Program Manager	1	12	6 Mo. Prior to NEXRAD Delivery

* Number of meteorologists to be added dependent on whether a WSFO already has a Warning Coordination Meteorologist. At network radar WSFOs, three existing positions will be reprogrammed into three meteorologist positions (including a Science and Operations Officer and a Warning Coordination Meteorologist.

** As assigned; some WSFOs already have this position.

Table 2:
STAGE 1 NEXRAD WSO STAFFING TARGETS

	NO.	APPROVED GRADE	REPORT
Meteorologist-In-Charge (MIC)	1	13/14	12 Mo. Prior to NEXRAD Delivery
Science and Operations Officer	1	13	7 Mo. Prior to NEXRAD Delivery
Warning Coordination Meteorologist	1	13	7 Mo. Prior to NEXRAD Delivery
Core Meteorologists (shift)	5	11/12	4 Mo. Prior to NEXRAD Delivery
Service Hydrologist	1*	13	4 Mo. Prior to NEXRAD Delivery
Data Acquisition Program Manager	1	12	6 Mo. Prior to NEXRAD Delivery
Hydrometeorological Technicians (shift)	5**	9/11	On Station
Electronics Systems Analyst	1	12	9 Mo. Prior to NEXRAD Delivery
TOTAL	16		

*** As assigned.**

**** Most NEXRAD WSOs have these positions on station; if not, these positions will be added by the time of NEXRAD delivery.**

Table 3:
STAGE 2 WFO STAFFING TARGETS

	NO.	APPROVED GRADE
Meteorologist-In-Charge (MIC)	1	14/15
Science and Operations Officer	1	13/14
Warning Coordination Meteorologist	1	13/14
Core Meteorologists (shift)	8*	12/13
Data Acquisition Program Manager	1	12
Hydrometeorological Technicians (shift)	5	9/11
Electronic Systems Analyst	1**	12/13
TOTAL	18***	

* Actual number of meteorologists may vary depending on WFO responsibilities.

** Most WFOs will also have one Electronics Technician. Total electronic technician staffing will be based on the most cost effective mix of contractor and Government maintenance.

*** Some WFOs will have additional base staff (i.e., Service Hydrologist, Secretary).

Table 4:
*STAGE 2 RFC STAFFING TARGETS**

COMMON BASE STAFF FOR RFCs IN THE CONTERMINOUS 48 STATES

	NO.	APPROVED GRADE
Hydrologist-In-Charge (HIC)	1	15
Development and Operations Hydrologist	1	14
Hydrologists/Hydrometeorologists (Hydrologic Forecasters)	8-13	12/13
Secretary and/or Technician	1-2	5/6, 7/8
Hydrometeorologists (HAS Forecasters)	3	12/13
TOTAL	14-19	

* The positions in this table also exist at RFCs during Stage 1. However, the current complement of hydrologic forecasters will not be augmented until six months prior to AWIPS delivery for extended 16 hr/day operations (nominal) with one to two hydrologic forecasters on shift in accordance with the Strategic Plan. The number of staff performing the non-real-time operations will depend on the number of hydrologic forecasters per shift and total RFC staff at individual sites.

3.0 TRANSITION STRATEGY

This section defines the general transition strategy that will be used to effect the modernization and associated restructuring of NWS. Transition strategies for Stage 1 and Stage 2 are presented. This section introduces the terms risk reduction and demonstration as forms of internal and external validation, respectively. The importance of risk reduction activities and demonstration programs as key ingredients in ensuring a successful transition are emphasized. The process that will be utilized to comply with the certification requirement of Public Law 100-685 will be described in regulations that will be published for public comment.

3.1 General Transition Strategy

The fundamental transition strategy is an integrated, incremental step-by-step, office-by-office approach. The changes in operations and services related to modernization and associated restructuring are the ultimate guiding force of the transition. Future services will define the system outputs, the staffing type and mix of an office, and the field structure needed to efficiently provide these services. These, in turn, set requirements for training and education, facility preparation, and guide a myriad of other dimensions of the modernization and associated restructuring. A realistic view of technology capabilities, schedules and the NWS environment will help shape the scope and pace of service changes.

The breadth of future operations and services is bounded by the agency mission, science and technologic capability. The transition strategy recognizes and incorporates these factors and must retain sufficient flexibility to respond to these dynamics. The approach acknowledges that plans for future operations and services may well require adjustments as implementation proceeds. The NWS must be able to accommodate and capitalize upon the new knowledge and understanding that it will acquire throughout the transition period.

Restructuring of the NWS field organization, offices, and staff can best be realized through both internal and external support. The agency will acquire this support by providing information to individuals and organizations of the goals and improvements sought within the modernization and associated restructuring. Support from staff and users requires a knowledge of the ultimate goals of modernization and associated restructuring and a demonstration of the capability to attain these goals. This can only be accomplished through careful planning, good management, and close coordination between all levels of staff and users. A comprehensive external and internal coordination program is being planned to:

- Ensure users are made aware of changes in a timely manner;
- Provide continuous information regarding the progress of modernization:

- Establish external and internal communications and maintain them for the duration of the transition;
- Delineate realistic and substantial improvements in weather services; and
- Exchange attitudes and expectations for the implementation of the modernization program.

The generalized Stage 1 and Stage 2 transition strategies described in the following sections address primarily WSFOs, WSOs and meteorological observatories. While these form the preponderance of the offices, the absence of transition strategies for other types of offices is not meant to imply that RFCs, National Centers, etc. will not be undergoing substantial changes during the transition period. Indeed, related transition activities will also be taking place concurrently at RFCs, National Centers, Tsunami Warning Centers, CWSUs, future Data Collection Offices in Alaska and Hawaii, and other types of field offices. Transition activities for these offices are detailed in the appropriate National Center transition, Regional transition, and site implementation plans.

3.2 Stage 1 Transition Strategy

Stage 1 targets the efficient use of NEXRAD technology at RFCs, WSFOs, and NWSOs. These offices will undergo a transformation in the first stage of modernized operations. Services and operations will be the impetus for this transformation. The transition of offices to Stage 1 will be paced, primarily, by delivery schedules of systems needed to support those services and operations. The timing of staffing changes and training also will be based on the delivery schedules with the dual goals of providing the necessary people to perform the job when the systems are ready for operation and of maintaining uninterrupted weather services at all offices.

NEXRAD offices will generally require additional staff to perform Stage 1 operations. To the extent possible, these additional positions will be drawn from WSOs not scheduled to receive NEXRAD, without degrading current services. Non-NEXRAD WSOs with surface observation and/or local warning radar programs will not have their staffs reduced below levels required to carry out these programs until ASOS is commissioned at the site and/or NEXRAD coverage has proved satisfactory for the WSO's area of responsibility. In any reduction of a WSO's responsibilities, the Region will ensure that community leaders and affected organizations are kept informed of significant changes, as well as provide evidence that warning services and required observations will not be degraded.

The transformation of non-NEXRAD offices will be carried out in a step-wise fashion. First, surface observations in these WSOs will be automated. Freed resources will then be used in the development of NEXRAD offices. Secondly, any further WSO reduction will only occur when a NEXRAD office(s) assumes operational responsibility for the area formerly served by the WSO. Any reduction or transfer of programs, and reallocation of staff will be dependent upon NWS service requirements. It is expected that staffing at NEXRAD offices generally cannot be supplemented by positions coming from non-NEXRAD WSOs in the area the

NEXRAD office will serve, because NEXRAD coverage may be a prerequisite for WSO draw-down. This factor suggests that ASOS and NEXRAD deployment schedules can be used to optimize personnel assignments and moves.

National oversight will be maintained during transition to Stage 1, but extensive planning and close Regional management will be required. National standards will be developed to define all the operational capabilities that must be confirmed. A successful transition requires assurance that services will continue during transition to Stage 1, and that offices will be fully capable of performing all Stage 1 operations and services. This assurance will be in the form of reports that will confirm operational capabilities. Regions will ensure these national standards are met through a confirmation of operational capabilities program.

A list of activities necessary to effect transition to Stage 1 is given below, followed by a checklist of operational capabilities that must be confirmed. These lists are not all inclusive, but provide a representative sampling of the major preparatory activities and conditions that must be met for Stage 1 operations. The complete list of preparatory activities will be contained in site implementation plans, and will be derived from various transition plans for future operations and services, systems development and integration, training and professional development, implementation and phaseover, etc.

Stage 1 Preparation Activities

- Non-NEXRAD WSO Activities
  - Coordinate with external users
  - Automate surface observations
  - Transfer programs:
    - Upper Air
    - Radar Observations
    - Warnings
    - NOAA Weather Radio
    - Local Forecasts
    - Other
  - Decommission existing systems
  - Submit a certification to Congress that no degradation of service will result from an automation and/or consolidation
  - Reallocate staff/positions consistent with maintaining current service levels
- NEXRAD Site Activities
  - Add Stage 1 staff
  - Provide training
  - Deploy NEXRAD, ASOS and other systems
  - Calibrate NEXRAD specifically for each site
  - Commission new systems
  - Accept responsibility for programs transferred from non-NEXRAD WSOs
  - Confirm that services to users are maintained

- RFC Activities
  - Phase-in HAS Group
  - Provide training (including Hydromet)
  - Implement NEXRAD data procedures
  - Implement Hydromet products and procedures
  - Implement verification procedures
  - Conduct on-site model execution (PROTEUS sites only)
- Deploy Automation of Field Operations and Services (AFOS) System Z
- Decommission network and local warning radars
- Decommission WSMOs and WSCMOs

Stage 1 NEXRAD Site Operational Capabilities Checklist

- Facility preparation completed;
- Stage 1 staff on site;
- System training and hydrometeorological training and education completed;
- Stage 1 technologies commissioned;
- System support mechanisms in place and maintenance training completed;
- Operations directives and procedures in place;
- Staff and office have demonstrated capability of providing defined Stage 1 operations and services; and
- Coordination with external cooperators and users has been accomplished.

Stage 1 RFC Operational Capabilities Checklist

- Facility preparation completed;
- Stage 1 staff on site;
- System training and hydrometeorological training and education completed;
- Stage 1 technologies commissioned;
- System support mechanisms in place and maintenance training completed;
- Operations directives and procedures in place;

- Staff and office have demonstrated capability of providing defined Stage 1 operations and services; and

- Coordination with external cooperators and users has been accomplished.

3.3 Stage 2 Transition Strategy

This stage of operations and services is based on full attainment of modernization and associated restructuring goals. This includes complete restructuring to WFO and modernized RFC operations, deployment of the full suite of new technologies, and complete integration of systems and operations. The transition strategy does continue to treat this as a fully defined goal, but it may need to be adjusted to reflect changes in resources, schedules, technology capabilities, and/or the supporting sciences.

Transition to Stage 2 will generally follow the same strategy outlined above for Stage 1. The final resolution of Stage 1 and work accomplished in that stage will be directed toward the attainment of Stage 2 goals. WFO operations and WSO program changes will be synchronized with system acquisition, deployment, and commissioning. The important elements of staff allocation and training will be timed and adjusted to the goal of having NWS personnel in place and prepared to use the new technologies when they are available. Future operations and services will again be the impetus for Stage 2 transition planning.

At the outset of Stage 2, WFOs and RFCs will be operating with systems that will have been deployed with an initial operating capability (IOC). This portion of Stage 2 will be referred to as Initial Stage 2. Deferred capabilities, i.e., system capabilities not included in the IOC, but required to achieve the full benefits of the modernization, will be part of an integrated systems upgrade required for full Stage 2 operations. This phased introduction of system capabilities will provide the opportunity to assess system maturity and allow sufficient time for development and validation of the deferred capabilities, while the forecaster is becoming familiar with operational use of the new systems.

As with Stage 1, national oversight will be maintained during transition to Stage 2, but extensive planning and close Regional management will be required. National standards will be developed to define all the operational capabilities that must be confirmed. A successful transition requires assurance that services will continue during transition to Stage 2, and that offices will be fully capable of performing all Stage 2 operations and services. This assurance will be in the form of reports that will confirm operational capabilities. Regions will ensure these national standards are met through a confirmation of operational capabilities program which will precede the certification of no degradation of services for each non-NEXRAD WSO closure.

A list of activities necessary to effect transition to Stage 2 is given below, followed by a checklist of operational capabilities that must be confirmed. These lists are not all inclusive, but provide a representative sampling of the major preparatory activities and conditions that must be met for Stage 2 operations. The complete list of preparatory activities will be contained in site implementation plans, and will be derived from various transition plans for future operations

and services, systems development and integration, training and professional development, implementation and phaseover, etc.

Stage 2 Preparation Activities

- Non-NEXRAD WSO Activities
  - Coordinate with external users
  - Submit a certification to Congress that no degradation of service will result from closure of a non-NEXRAD WSO
  - Close the non-NEXRAD WSO
- WFO Activities
  - Adjust staffing levels
  - Deploy AWIPS
  - Provide AWIPS training
  - Commission AWIPS
  - Confirm that services to users are maintained
- RFC Activities
  - Supplement staff
  - Establish 16 hr/day operations
  - Deploy AWIPS
  - Provide AWIPS training
- Decommission AFOS System Z

Stage 2 WFO Operational Capabilities Checklist

- Facility preparation completed;
- Stage 2 staff on site;
- System training and hydrometeorological training and education completed;
- Stage 2 technologies commissioned;
- System support mechanisms in place and maintenance training completed;
- Operations directives and procedures in place;
- Staff and office have demonstrated capability of providing defined Stage 2 operations and services; and
- Coordination with external cooperators and users has been accomplished.

Stage 2 RFC Operational Capabilities Checklist

- Facility preparation completed;
- Stage 2 staff on site;
- System training and hydrometeorological training and education completed;
- Stage 2 technologies commissioned;
- System support mechanisms in place and maintenance training completed;
- Operations directives and procedures in place;
- Staff and office have demonstrated capability of providing defined Stage 2 operations and services; and
- Coordination with external cooperators and users has been accomplished.

3.4 Site Transition Model

The Site Transition Model, shown in Figure 2 at the end of this section, depicts the chronological order in which events are expected to occur at non-NEXRAD WSOs and NEXRAD sites for both Stage 1 and Stage 2. Not all events need occur in the order given. For example, some sites may receive NEXRAD before ASOS. There are, however, specific events that must occur before others. A facility must be completed before the staff and the new technology arrive. ASOS must be available at non-NEXRAD WSOs before surface observations can be automated, programs can be transferred, and staff reallocated.

3.5 Risk Reduction

The NWS modernization and restructuring requires the accomplishment of Stage 1 and 2 objectives without degrading services to users. To a great extent, the future service programs rely on new systems developed with highly advanced science and technology. The capabilities and applications of these systems are being refined and updated, even as the transition begins. Some of the new operational concepts for the 1990s have had only limited operational testing. This is recognized in the system acquisition plan for AWIPS which allows for staged development. At each stage of development, opportunities exist for incorporation of new scientific understanding and the latest NWS requirements. On the other hand, systems such as NEXRAD, are based on known and existing technology, well supported by theory, and, in some cases, have undergone extensive field testing.

The risks involved with bringing the major new systems on line are obvious. To mitigate these risks and uncertainties extensive testing, development, and demonstration are being, and will continue to be pursued. For example, some areas of risk are currently being addressed by the joint NWS and Environmental Research Laboratory's (ERL) Denver AWIPS Risk Reduction and Requirements Evaluation (DARE) project in Colorado; the development of a prototype

WFO at Norman; and the Prototype RFC Operational Test, Evaluation and User Simulation (PROTEUS) project. It is expected that additional risk reduction projects will be needed throughout the entire transition period, and even beyond. To date, risk reduction efforts have primarily been directed to questions concerning technology. Other questions remain unanswered in equally critical areas. These range from appropriate staffing levels at Stage 1 and Stage 2 offices, to the feasibility of totally integrating all warning and forecast functions in future WFOs.

The early stage of modernized operations and the transition process itself will certainly reveal other areas where risk can be mitigated. Well defined risk reduction projects are critical to a successful transition. This transition strategy calls for agency support and response to significant risk reduction activities and their associated results.

3.6 Demonstration

The modernization and associated restructuring of NWS will provide improved services through the effective and efficient use of new technologies operated by trained staff. Aspects of this objective imply significant change both internally and externally. Active participation by NWS and external users is imperative for a successful transition. Support will be enhanced if there is an understanding of what changes are planned and why these changes are needed. Demonstrations of the service improvements that will result from changes are a critical element in obtaining user support.

Demonstrations of improved capabilities and services will take place through a wide range of activities. For example, the operational capabilities of the new technologies will be demonstrated and tested as part of the system commissioning process at each site. These demonstrations and tests will be compiled and analyzed as part of the commissioning process, and will form a significant part of the basis for certifications to Congress that there will not be a degradation of service. Additionally, prior to Stage 2, the Modernization and Associated Restructuring Demonstration will be conducted and will demonstrate the fully modernized NWS of the 1990s.

Modernization and Associated Restructuring Demonstration

An operational demonstration of service delivery from weather service offices equipped with the technological systems of the 1990s will serve as a model for transition to national operations of the modernized and restructured NWS during Stage 2.

The operational MARD must involve the application of new technologies and techniques, and the conversion of existing offices into Weather Forecast Offices. Some WFOs will be collocated with a River Forecast Center. Hydrologic Analysis and Support groups will be implemented in each RFC to facilitate hydrometeorological support and interactions and to ensure continuity in hydrologic forecasts across WFO boundaries. The RFCs will reap the benefits of the new technologies for main stem river flooding forecasts and flash flood guidance and to provide full support to WFOs.

The proposed demonstration area and the overall design of MARD are responsive to Section 407 of Public Law 100-685. The MARD is a cost effective approach to verify the service improvements expected in the Strategic Plan without restructuring the entire country. The participating field offices are shown in Figure 3 at the end of this section. This area was chosen for its high probability of severe weather and also because of the advanced scientific and technological capabilities at facilities in Denver/Boulder, Kansas City, and Oklahoma City/Norman. Valuable experience with the current demonstration of the new ASOS technology in the state of Kansas is also an important factor in the selection of this region.

Several basic criteria must be met to test the new operating configuration. These criteria include the integration of NEXRAD coverage from several contiguous sites, not just the data from a single NEXRAD collocated with a WFO; inclusion of a sufficient number of WFO and RFC offices to test the coordination and interactive support functions in realistic situations; involvement of a sufficient number of WFOs and RFCs to test the implementation of new hydrometeorological support and forecasting operations; involvement of a sufficient number of offices to test a true communications network; and provision of warning and forecast services over a major area that encompasses important geographical entities, i.e., here, at least two complete states.

In order to ensure a successful Modernization and Associated Restructuring Demonstration, a number of preparatory activities must be accomplished prior to the actual demonstration. MARD offices will be staffed with meteorologists and hydrologists that have received scientific education on the interpretation of new data sources such as doppler radar, and mesoscale forecasting techniques. In addition, the new technology systems must be deployed, integrated with not only each other, but also existing systems at the MARD offices, and commissioned to ensure each performs its unique, but complementary role in supporting modernized operations. After a stabilization period, including initial testing and evaluation of the new operations, adjustments necessary to begin the MARD will be accomplished. Based on the current scheduled deliveries of NEXRAD and the availability of AWIPS, the selected offices will be configured for the operational demonstration during 1991 through 1994. MARD will begin during the latter part of calendar year 1995. The schedule for MARD is shown in Figure 4, Principal Path for Modernization, at the end of this section.

In the process of preparing for, and conducting the operational demonstration, the NWS will:

- Deploy and commission new technologies and integrate them into modernized operations;
- Staff the restructured offices with the proper number and mix of personnel;
- Develop and apply operational procedures related to warnings and forecasts in the modernized and restructured environment;
- Train the staff to fully use the new technologies and scientific advances in order to provide improved services;

- Restructure selected NWS field offices into WFOs, and realign geographical areas of service responsibilities in close coordination with emergency management organizations and other groups; and

- Evaluate service performance and responses of users.

3.7 Certification Process

Public Law 100-685 requires that the Secretary of Commerce certify to the Congress that closure, consolidation, automation, or relocation of any WSFO or WSO pursuant to implementation of the Strategic Plan will not result in degradation of services to the affected area. Such certification shall include:

- a detailed comparison of the services provided to the affected area and the services to be provided after such action;

- any recent or expected modernization of National Weather Services operations which will enhance services in the affected area; and

- evidence, based upon operational demonstration of modernized National Weather Service operations, which supports the conclusion that no degradation in services will result from such action.

This National Implementation Plan is the vehicle for informing Congress and users of agency services when certifications will occur.

During the past year, as the NWS approached the actual implementation of Stage 1 of the modernization, it recognized that the certification process set forth in earlier editions of this National Implementation Plan required modification. As previously envisioned, this process would have involved a single certification for each relevant office taking place at the end of the full transition to modernized operations. Since the results of the MARD will be available by this time, it was assumed that the MARD would constitute the "operational demonstration" called for by section 408 of Public Law 100-685.

However, it became apparent that many of the early steps in the transition will constitute consolidations, automations, or relocations and will, therefore, require certification. It was equally evident that these interim certifications could not utilize the results of the MARD. With the concurrence of General Counsel and the Department of Justice, the NWS concluded that these certifications should be supported through a series of local operational demonstrations which are different from and in addition to the "multi-station operational demonstration" required by section 407 of Public Law 100-685.

Consequently, the NWS has developed the following process for certifying no degradation of services during Stage 1 of the modernization.

During Stage 1, the pivotal events will be the commissioning of a NEXRAD and/or an ASOS unit and the decommissioning of the obsolete technology. The introduction of these tech-

nologies will lead not only to enhanced weather services but also to consolidation of some operations from existing field offices to NEXRAD offices and/or automation of surface observations at existing field offices.

These technologies and the resultant changes in operations must be shown to be at least as accurate and reliable as the old equipment or the replaced surface observations. In the case of NEXRAD, the technology must provide at least equal coverage. Additionally, employees operating the new equipment must be adequately trained both in operations and in maintenance; and equal services must continue to be provided to users. Consequently, during Stage 1, the certifications that are required by section 408 of Public Law 100-685 will be based on the commissioning and decommissioning process, data and analyses thereof, and the confirmation of services with users.

After installation of a NEXRAD or ASOS unit therefore, the NWS will perform the "operational demonstration" required by section 408 of Public Law 100-685 as part of the process of commissioning that unit. This demonstration is to confirm the capabilities of the new unit in a field setting. After completing this demonstration, but prior to commissioning any unit, the relevant meteorologist-in-charge will prepare a Commissioning Report which will review the engineering and performance tests for the system, document the field results for this unit, and also document the findings that the employees are adequately trained and that maintenance support is in place.

After commissioning, but prior to decommissioning, or any reassignment of personnel, the meteorologist-in-charge will prepare a second report, the Confirmation of Services Report. This report will confirm, by a review of actual operations of the new system, that the transfer or reassignment of personnel made possible by the decommissioning of an existing radar or termination of manual observations will not degrade services to users. It will document, after the necessary interaction with affected users, that services remain intact and accessible.

Based on these two reports, and adding any other information needed to address the requirements of section 408 of Public Law 100-685, the responsible meteorologist-in-charge will prepare a certification recommendation to be reviewed by the Secretary (or a designee) and submitted to Congress before the consolidation, relocation or automation occurs.

In summary, the sequence of events leading to a certification of "no degradation" for a typical Stage 1 action following the commissioning of a NEXRAD and the decommissioning of an obsolete radar will be.

(1) installation and acceptance testing of the NEXRAD unit; (2) operational demonstration of the NEXRAD unit and technical coordination with users; (3) preparation of the Commissioning Report; (4) commissioning of the NEXRAD unit and its subsequent fully operational use; (5) transfer of service responsibility from a non-NEXRAD field office to the NEXRAD field office without changing staffing levels of the non-NEXRAD office; (6) confirmation that services to users are maintained and preparation of Confirmation of Services Report; (7) preparation of Decommissioning Report; (8) decommissioning of the obsolete radar; (9) certification of "No Degradation"; and (10) occurrence of the Stage 1 transition action (the personnel action which constitutes the consolidation, relocation or automation).

No WSO or WSFO will be closed during the Stage 1 of modernization. Although Public Law 100-685 does not impose any certification requirements for the closure of an office that exceed those for any transition action, certifications of closures that will occur during Stage 2 will be made with the benefit of the results of the MARD.

No actions requiring certification will take place during fiscal year 1992. Prior to taking any such actions in fiscal year 1993, the NWS will publish proposed regulations for public comment detailing the process outlined above, and will then publish the final regulations. Prior notification of such actions will be contained in the National Implementation Plan.

Figure 2:

SITE TRANSITION MODEL

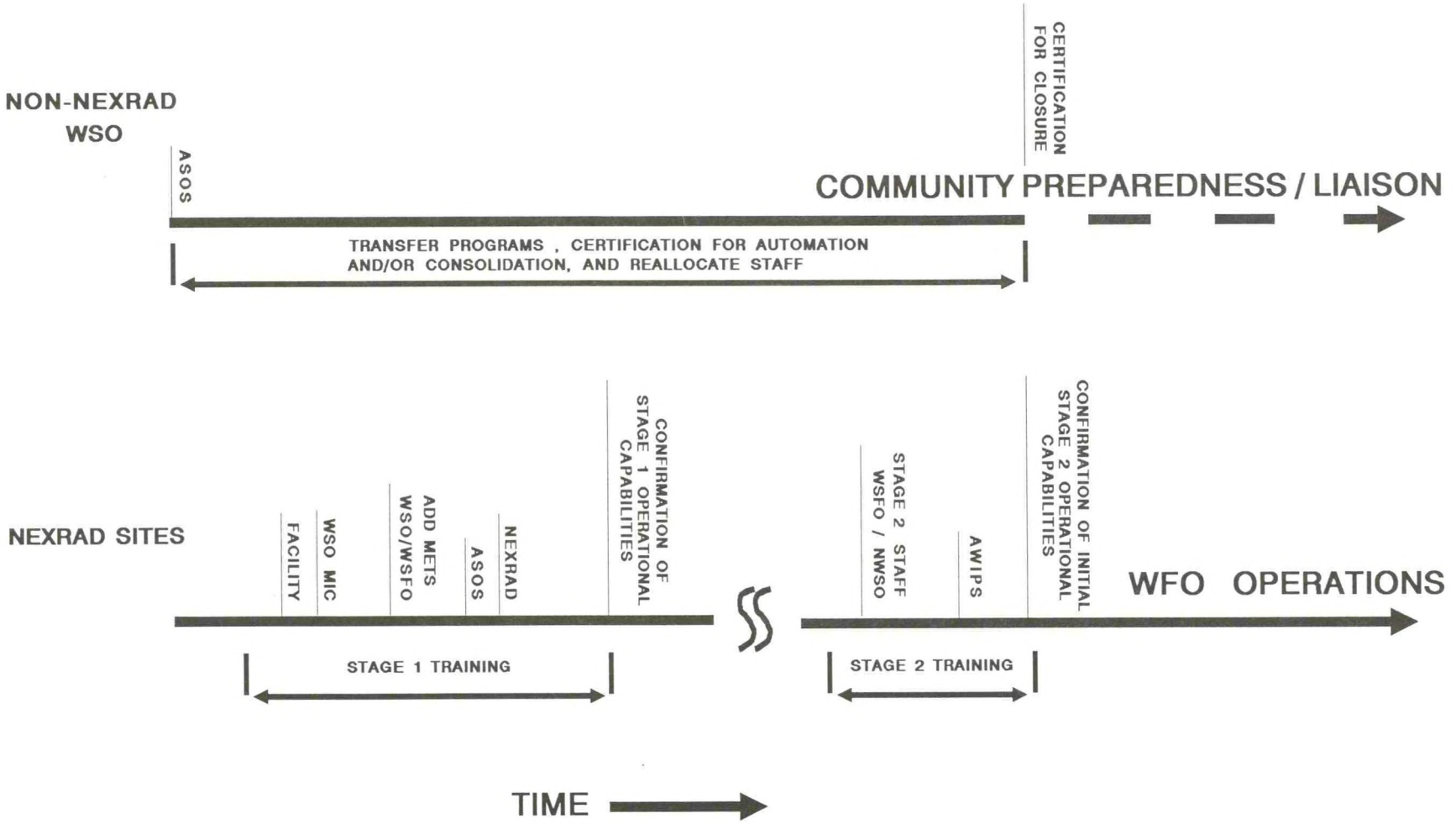
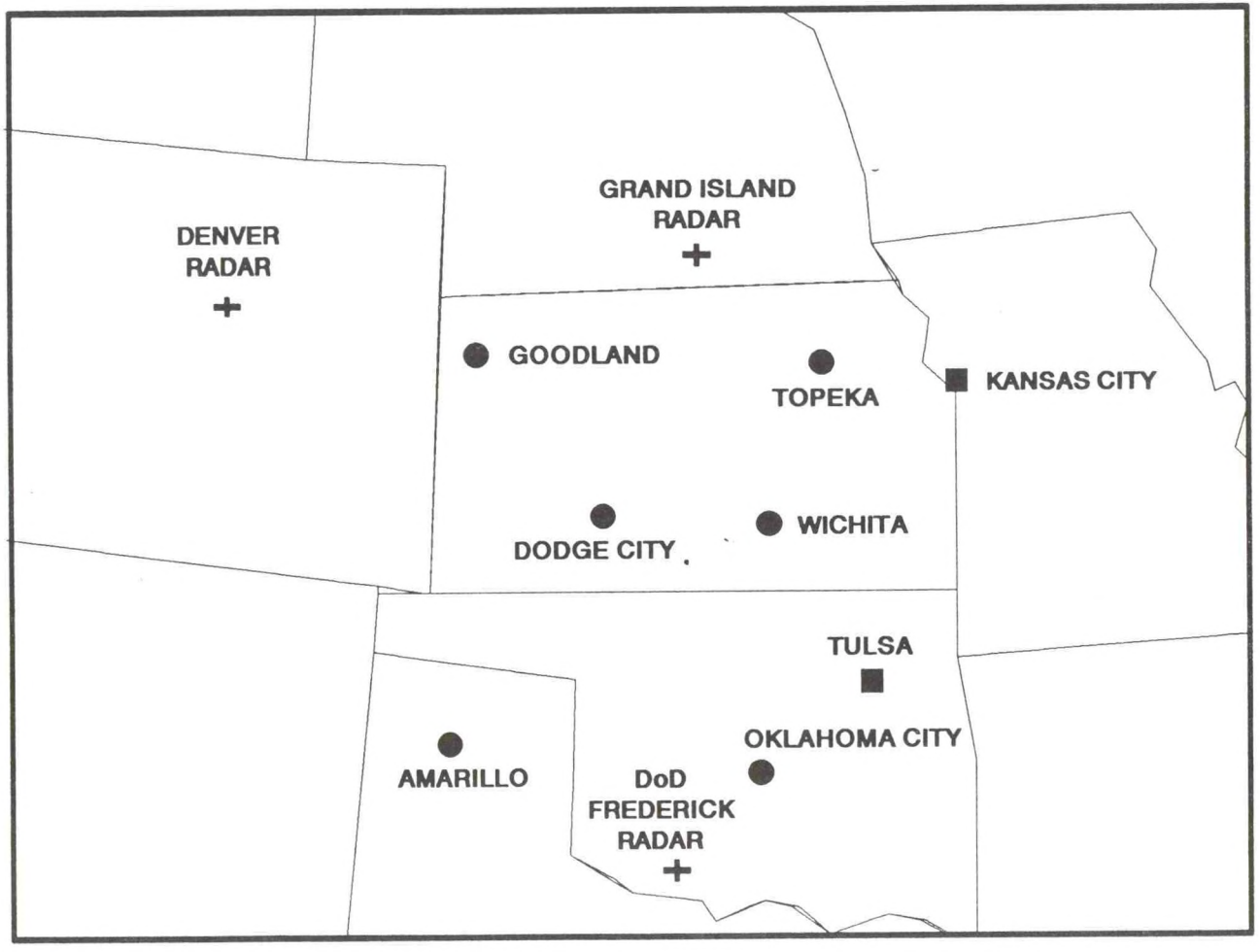


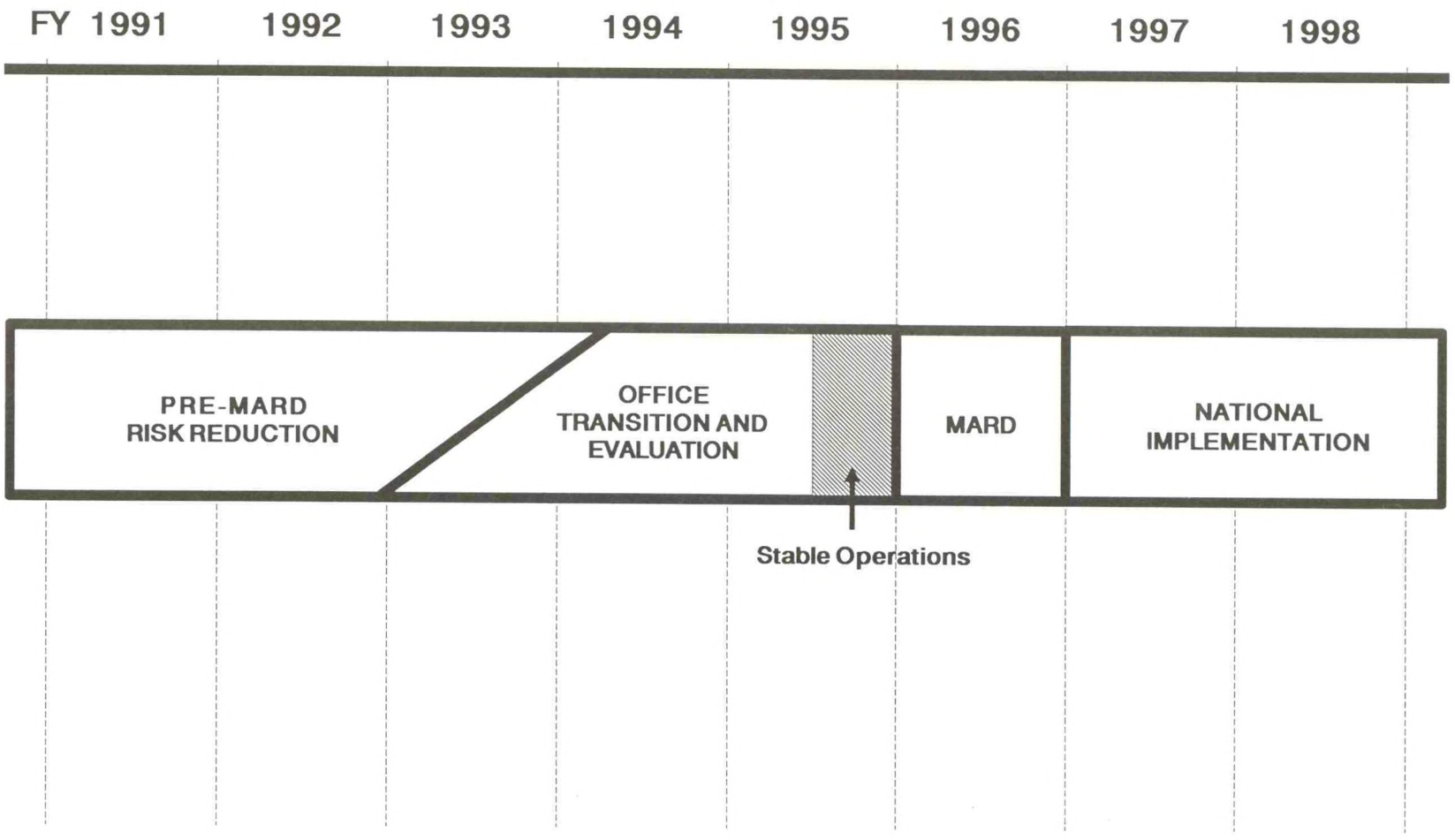
Figure 3:
MODERNIZATION AND ASSOCIATED RESTRUCTURING DEMONSTRATION AREA



● WFO
■ WFO/RFC
+ NEXRAD

CENTRALLY PREPARED
GUIDANCE WILL BE PROVIDED
BY THE NATIONAL CENTERS.

Figure 4:
PRINCIPAL PATH FOR MODERNIZATION



4.0 RESEARCH PROGRAMS

A wide range of research programs are in place, within the NOAA organization and in cooperation with academic communities and other agencies of the federal government, that provide for the transfer of scientific and technological knowledge to the NWS modernization program. These research programs cover a spectrum of activities that include, on one end of the scale, research in the atmospheric and hydrologic sciences, and on the other end of the scale, the development of specific products and techniques for direct use at NWS field offices in support of the warnings and forecast programs. Research programs are also playing important roles in developing techniques for assimilating data from the diverse observational systems that are coming into operational use, both on a national scale as input to numerical prediction scales and on the local level for short-term mesoscale forecasting at NWS field offices. The bulk of the NOAA research program that supports the NWS modernization is concentrated within three components of the organization - the Environmental Research Laboratory, the National Weather Service, and the National Environmental Satellite, Data and Information Service (NESDIS). Budgets for research programs associated with NWS modernization and restructuring are addressed in Section 6 of this National Implementation Plan. Research program activity schedules are shown, along with schedules for the other major components of modernization and restructuring, in a series of figures at the end of Section 6.

4.1 Environmental Research Laboratory Research Programs

ERL provides fundamental research to develop technology and improve NOAA services to the public. ERL provides this support through dedicated laboratory facilities across the nation. Programs include research on observational systems, modeling and prediction, severe storms, hurricanes, clouds and precipitation processes, and synoptic and mesoscale meteorology.

Forecast Systems Laboratory

The ERL Forecast Systems Laboratory (FSL), located in Boulder, Colorado is one of the major contributors to the NWS modernization program. The FSL mission is to improve operational weather services by testing and transferring advances in science and technology to the NWS. One of the principal FSL activities has been support to the DARE risk reduction programs. Personnel from FSL participate in the planning, design, implementation and support of the advanced interactive forecaster workstation to provide NWS with a system requirements test-bed for many of the functional capabilities to be provided by AWIPS. The first phase of the DARE program, DARE-I, was completed at the end of fiscal year 1989, and an expanded program, DARE-II, to cover all phases of the Denver forecast and warning operations, began in early fiscal year 1990.

The FSL programs also include the evaluation of new observational technology that will be available to the NWS forecaster of the future. New and improved forecast products are being developed that include algorithms for Doppler radar data, atmospheric sounding data from geostationary satellites, and vertical wind data from ground based atmospheric profilers.

In addition, FSL has under development two data assimilation and prediction programs that are scheduled to be transferred to the NWS for operational forecasting use when the development efforts have been successfully completed. These efforts address the incorporation of diverse observational data sets, such as radar, satellite, and profiler data, on the regional and local scale. The Mesoscale Analysis and Prediction System (MAPS) provides frequent and highly detailed analyses of meteorological parameters and very short term numerical forecasts in support of aviation and local forecast and warning services. MAPS is designed to run on medium-sized computers in national center environments. The initial phase of the MAPS system, the objective analysis program, was ported to NMC in May 1990 and the forecast code was ported in September 1990. Testing and evaluation of the MAPS system in the operational NMC environment is scheduled to begin in 1992 to support the forecast and warning services of the modernized NWS.

In addition FSL has under development the Local Analysis and Prediction System (LAPS) that is primarily designed for local NWS office use on AWIPS workstations. LAPS is designed to use local data networks, NEXRAD wind data, and profiler output, to provide very high-resolution three dimensional hourly analyses of winds, temperature, and moisture. These hourly fields would then feed diagnostic and predictive models to enhance short range forecasting at NWS field offices. The target date for completing development of an operational version of the LAPS system is the mid-1990s.

Research programs to develop ground based sensors to provide observations of vertical profiles of the atmosphere have been conducted at ERL's Wave Propagation Laboratory for a number of years. As a result of this successful effort, a demonstration network of vertical wind profilers is being installed across the central part of the nation. The responsibility for managing this demonstration program lies with the Demonstration Division of the Forecast Systems Laboratory. A total of 23 profiler systems were installed and accepted during fiscal year 1991 and the wind data from these systems were made available to NWS offices on an hourly basis. These data will be available as often as every six minutes for use in providing short range forecasts when the AWIPS systems are installed and operational. The remaining seven profiler systems will be installed in fiscal year 1992. Research on thermodynamic profilers continues.

National Severe Storms Laboratory

The National Severe Storms Laboratory (NSSL) located in Norman, Oklahoma, develops means for improving weather forecasting through studies of storm processes, numerical and conceptual modeling of storm phenomena, and applications of new remote-sensing technologies in the severe weather environment. The work at NSSL, probably the most significant contributor to the development of doppler techniques, continues to support the NEXRAD

program, and major efforts in NSSL are directed toward scientific support of the National Weather Service Modernization.

The Mesoscale Research Division of NSSL, situated in Boulder, Colorado, gives heavy emphasis to studies of mesoscale convective systems based on data gathered during field programs. Integration of observations from the NOAA P-3 research aircraft, satellites, ground based radars, and lightning strike networks contributes substantially to Mesoscale Research Division research. Substantial data were gathered (using doppler radar, wind and thermodynamic profilers, radar acoustic sounding systems and the P-3 aircraft) during the Spring of 1991 that will support studies of the mesoscale environment of tornadic storms.

Through numerous relationships with other government agencies and universities, NSSL constitutes a resource for severe-storm data examined by researchers around the country and overseas. During coming years, increased emphasis will be given to the expansion of research to include larger scales of meteorological phenomena, and to the incorporation of modern research workstations, wind profilers, and digital satellite data into both case study analyses and the development of conceptual and numerical models. The NSSL has recently agreed, in collaboration with the NEXRAD Operational Support Facility and the NWS Forecast office at Norman, to establish formally a Norman Experimental Forecast facility. Staff from the three participating agencies will work together in applied research problems of direct relevance to improving forecasting techniques within the NWS Modernization Program.

Atlantic Oceanographic and Meteorological Laboratory

ERL's Atlantic Oceanographic and Meteorological Laboratory (AOML) is organized to pursue basic and applied research in oceanography and tropical meteorology. Hurricane research conducted at AOML supports the hurricane forecasting program carried out by the National Hurricane Center of NWS. To achieve improvement over existing operational hurricane prediction models, the Hurricane Research Division of AOML is engaged in the development of complex hurricane models using high resolution movable grids. Models with fine-scale resolution down to the 10 kilometer scale are under development. AOML also supports NHC through its research and development activities to improve the performance of hurricane tracking models. Revised tracking models that demonstrated improvements were developed and provided to NHC. AOML continues to support the hurricane forecasting services through ongoing studies that include an examination of precipitation features in mature hurricanes, hurricane air-sea interaction, and mesoscale structure of landfalling hurricanes.

Wave Propagation Laboratory

The mission of the Wave Propagation Laboratory includes the development of remote sensors to measure atmospheric parameters required to understand and predict severe weather. The Wave Propagation Laboratory participated in developing the radar techniques that are being used in the NEXRAD Program, in evaluating dual polarization radar technology to observe cloud parameters important in forecasting icing and hail versus rain conditions in clouds, and in developing and improving the wind profiling and thermodynamic technology that will lead

to remote, automated profiling of the atmosphere. The Wave Propagation Laboratory also performs research that could be applied to continuing the improvement of weather services to the nation. This research includes over-the-horizon radar to map ocean surface conditions and surface winds and light detection and ranging (lidar) applications to observe small scale turbulence such as microbursts and severe wind gusts.

Geophysical Fluid Dynamics Laboratory

The mission of the Geophysical Fluid Dynamics Laboratory includes the development, testing, and evaluation of mesoscale and synoptic scale atmospheric models. The Geophysical Fluid Dynamics Laboratory is cooperating with the National Meteorological Center of the NWS in upgrading the operational analysis and prediction models and recent projects are the improved physics and hurricane algorithms in the forecast models, and the development of a state of the ocean forecast model.

4.2 NWS Research Programs

Research supporting the modernization program within the NWS is concentrated in three groups - the Hydrologic Research Laboratory (HRL) of the Office of Hydrology, the Development Division of the National Meteorological Center and the Techniques Development Laboratory of the Office of Systems Development.

Hydrologic Research Laboratory

The Hydrologic Research Laboratory of the NWS Office of Hydrology serves as the nucleus for applied hydrologic research and development activities in support of operational hydrologic forecasts. The Hydrologic Research Laboratory works in cooperation with the Office of Hydrology's Hydrologic Operations Division, the River Forecast Centers, and to a smaller extent with the FSL and the Office of Atmospheric Research's Weather Research Program for mesoscale studies. Most of these research and development activities have been undertaken to capitalize on the new data collection and analysis technologies of the modernized era. Significantly more emphasis is being placed on hydrometeorology, a hybrid science dealing with interrelationships between hydrology and meteorology. NEXRAD, ASOS, and the automated sensors from other programs will greatly increase the volume of available hydrometeorological data, and AWIPS will provide enhanced computational power for hydrologic modeling and data management. PROTEUS, a project managed under HRL, directly supports the NWS modernization with activities designed to reduce the risk associated with implementation of these new technologies. The critical components of PROTEUS include data handling and quality control procedures, NEXRAD precipitation processing algorithms, and an on-site interactive version of the NWS River Forecast System (NWSRFS). Other NWSRFS enhancements include improved snow melt and rainfall-runoff models and river mechanics procedures.

The considerable efforts currently underway to develop initial operational capabilities for hydrometeorological operations, will continue in the 1990s to capitalize on the new tech-

nologies. In parallel with this work, a new emphasis will be placed on more complete modeling of the hydrologic cycle. Investigations will range from efforts to model the transfer of soil moisture to the atmosphere (for use in both short-range numerical weather prediction models, long-range global climate models, and for predicting the impacts of global climate change on water resources), to improved forecasts and warnings for shorter time scale, mesoscale, events. We will use advances in computer technology and the use of graphical user interfaces and geographical information systems to complement the new data technologies. These new data technologies coupled with improved understanding of mesoscale weather processes will make possible the implementation of improved hydrologic forecasting tools and distributed forecast models to forecast smaller areas such as flash flood prone watersheds and urban areas.

National Meteorological Center

The Development Division of NMC conducts research and development in the techniques of numerical weather prediction. Activities include refining the atmospheric models already in operational use and constructing new and better models. To support these objectives, research is concentrated in three major areas: global weather and climate modeling, regional and mesoscale modeling, and marine prediction. Specifically, global modeling research includes program areas such as: 1) four-dimensional data assimilation of satellite and conventional observations (including quality control), 2) advanced numerical techniques for modeling the atmosphere and the ocean, 3) extended range prediction, (4) the development of a climate data assimilation system, and (5) conducting reanalyses for climate diagnostic studies. The research in the area of regional modeling includes: 1) regional four-dimensional data assimilation using satellite, conventional, and high frequency ground based observational systems, 2) advanced numerical techniques for providing short-range regional and mesoscale forecasts, and 3) applied research studies to evaluate the potential improvement in forecast skill using advanced satellite and ground based observing systems. The marine products research includes the assimilation of satellite ocean surface wind data into the operational global data assimilation systems and prediction models and the development of global and regional wave forecasts.

In conducting research in the above areas, the NMC Development Division focuses its efforts on forecasting in the short range (12 to 72 hours) both over limited domains, such as regional and hurricane prediction models, and over global domains. The medium range (3 to 10 days) is concerned with the entire globe while the extended range (10 to 30 days) deals with regional, hemispheric and global domains. The research programs to support these activities concentrate on utilizing the diverse data sources of new observing systems in more complex and sophisticated atmospheric models to improve forecast performance. These observing systems include or will include operational systems, such as NEXRAD, ASOS, ACARS, as well as PROTEUS, the Geostationary Operational Environmental Satellite (GOES), and also will integrate data from experimental satellite cloud and oceanographic remote sensing programs. The target system for the operational use of these prediction model enhancements is the advanced super computer system.

Office of Systems Development

The Techniques Development Laboratory of the NWS Office of Systems Development conducts applied research aimed at developing techniques that have promise in application to weather forecasting and analysis. Techniques are developed for objectively forecasting basic weather elements used in public and aviation forecasts, such as clouds, temperature, and visibility. Also emphasis is given to marine related forecasts, to those forecasts associated with mesoscale processes, and to techniques targeted for implementation at AWIPS equipped NWS field offices. The supporting research at the Techniques Development Laboratory covers areas of synoptic scale weather prediction, mesoscale weather prediction, marine environmental prediction, and local field office forecast applications. The synoptic activities are directed towards procedures to be run on centralized computer systems in contrast to mesoscale weather techniques and local applications designed for use at the modernized NWS field offices. Local applications include interactive techniques to support a digital database, product formatters to prepare specific products from the digital database, data deciders, and verification techniques. Mesoscale weather prediction efforts include techniques for the prediction of short lived thunderstorms, severe local storms, and heavy precipitation forecasting. Short term forecasting techniques involve the application of sensor produced data, such as from NEXRAD, the GOES satellites, and the experimental profiler system, to develop thunderstorm forecasting procedures and specialized radar algorithms.

The marine prediction activities support NWS field offices, the NHC, and local emergency management officials during the hurricane season. A numerical model was developed by the Techniques Development Laboratory that produces forecasts for oceanic flooding over coastal areas during hurricane landfall situations. This storm surge model has been implemented operationally at NHC and provides critical guidance on expected flooding in advance of the hurricane. The program has also been used extensively as a tool for hurricane evacuation planning through the use of a series of computer simulations of hypothetical hurricanes that delineate areas of potential flooding.

4.3 NESDIS Research Programs

NESDIS research programs are carried out by its Office of Research and Application. Programs are directed toward the improvement of meteorological prediction capabilities to support the modernization of the NWS. The focus of this activity is directed towards providing information derived from satellite sensors to support all levels of NWS analysis and prediction models. These satellite applications span the spectrum of NWS observational and forecast needs ranging from the lower levels of the atmospheric boundary layer to the tracking and monitoring of synoptic and mesoscale systems for estimating precipitation rates. Numerical weather prediction efforts at NESDIS have concentrated on developing enhanced moisture products, wind fields, and three dimensional vertical soundings of temperature and moisture. Work is underway to develop surface vegetation, temperature, and snow cover products from satellite sensors for use in the initialization of boundary conditions for the models. Data from various satellites, e.g. GOES, NOAA, and the Defense Meteorological Satellite, are being processed and evaluated as potential new "blended" products for the future. Research to improve Sea Surface Temperature products has resulted in a new atmospheric aerosol product.

Warming and cooling effects resulting from volcanic eruptions and airborne sand can be tracked and adjustments/corrections can be made to the Sea Surface Temperature products which are key to numerical model initialization. A satellite cloud observation algorithm to supplement ASOS is also being developed.

Support to the NWS warning and forecast program includes research and development work on rapidly deepening storms, tropical storms, clear air turbulence, wind downbursts and microbursts, improved detection of nighttime fog over oceanic and land areas, and quantitative precipitation estimates in support of flash flood warnings. Scientists recently completed an extensive publication on the use of water vapor imagery. This publication and others are part of an intensive training program that ranges from visits to NWS forecast office to workshops and the development of training modules in the Cooperative Program for Operational Meteorology and Education and Training (COMET).

New multichannel products are under development in preparation for the data stream from the GOES I-M satellites. Increased emphasis is being placed on quantitative products that can be used to assist forecast operations both at National Centers and the local forecast office.

5.0 TRANSITION PROGRAM MANAGEMENT

The National Weather Service has never undertaken a systematic modernization and associated restructuring effort of the magnitude described in this National Implementation Plan. Virtually every NWS activity will change in some way during the transition period. Management of the transition will be complex, involving all levels of the NWS.

An Office of the Deputy Assistant Administrator for Modernization has been established in the National Weather Service Headquarters. Reporting to the Assistant Administrator for Weather Services, the Deputy Assistant Administrator for Modernization's responsibility is to provide a sustained organizational focus on the Modernization and Associated Restructuring Program for the entire transition period. Supporting the Deputy Assistant Administrator for Modernization is a Transition Director and transition program staff. As an extension of the Transition Director, Transition Representatives have been designated in each Headquarters Office and Region. These representatives provide a focus for transition activities within their organizational unit.

NOAA has established a Systems Program Office (SPO) reporting to the Deputy Under Secretary for Oceans and Atmosphere. The SPO has management responsibility for the development and acquisition of the major new systems: NEXRAD, ASOS, AWIPS, and GOES required for the modernization and associated restructuring program.

The following subsections present the management philosophy that has been adopted for the transition. They describe the management aspects of the systematic transition.

5.1 Introduction

As a matter of policy, the NWS has adopted a management philosophy for the transition that has two important features:

- to the maximum extent possible, the existing organizational structure and management authority of NWS will be utilized to plan and implement all transition activities; and

- transition planning and implementation must maintain operations and service delivery without disruption.

The Assistant Administrator for Weather Services and Deputy Assistant Administrator for Modernization already have extensive statutory and procedural authority. Procedures for budgeting, staffing, field office modification, etc. already exist. Every action required to modernize the NWS can, in theory, be accomplished by existing mandated procedures. In practice, certain approvals such as a particular field office status change in the context of the annual appropriations process may be difficult to achieve. However, the service improvements

of the modernization and associated restructuring provide substantial leverage on a case-by-case basis in establishing the merits of proposed changes.

5.2 Transition Work Breakdown Structure

The overall management approach to the transition is to organize, plan, schedule, execute, monitor, and report on the essential activities necessary to effect modernization and associated restructuring of the NWS. All NWS organizational units are involved in the planning, implementation/execution, reporting, and management of transition activities. A formal work breakdown structure (WBS) is used to systematically plan and manage all of these activities. The major elements comprising the Transition Work Breakdown Structure are shown in Figure 5 at the end of this section.

The elements of the work breakdown structure represent different aspects of the overall transition program that pertain to activities such as planning, execution or implementation, project management and control, and reporting. Not all elements are presented for the same purpose, nor is the assignment of lead office responsibilities necessarily fully consistent with normal organizational responsibilities. The work breakdown structure is designed to facilitate coordination and cross fertilization in work planning and implementation, afford management insight in the monitoring of major activities during the implementation process. The complete Transition Work Breakdown Structure description document and dictionary is available for reference.

5.3 Master Transition Schedule

The Master Transition Schedule is the official vehicle that is used by the agency to assess and report progress on transition to the modernized NWS. The Master Transition Schedule is maintained by the Transition Director and uses the Transition Work Breakdown Structure as the reporting framework.

The Master Transition Schedule takes the form of a Program Evaluation and Review Technique (PERT) chart. The PERT chart (also called a PERT network) shows the major transition activities and their dependencies to each other plotted against time. The critical path on the Master Transition Schedule determines the total duration of the transition. The Master Transition Schedule is also the means by which any proposed schedule changes are evaluated. The evaluation determines how the proposed change impacts the critical path. Approval of any change is dependent on its impact on the critical path.

The current Master Transition Schedule is provided in Appendix A.

5.4 Transition Program Monitoring and Control System

A transition program monitoring and control system has been established to provide concise, accurate, and timely transition status information. The following modes of communication

are used to disseminate transition status information throughout the agency and to external audiences.

- Regular transition program reviews are conducted by the Transition Director with the Assistant Administrator, Deputy Assistant Administrators for Modernization and Operations, and Office Directors, as well as with the Transition Representatives;

- Periodic progress and technical reports are published and distributed throughout the agency to provide all NWS employees with transition information;

- Semi-annual Transition Management Meetings conducted by the Transition Director involving the Assistant Administrator, Deputy Assistant Administrators for Modernization and Operations, and Office/Regional Directors are devoted entirely to transition related matters; and

- Transition progress reports are a standard agenda item for the Spring and Fall Directors' Conferences.

A transition program status room has been established and is maintained in NWS Headquarters by the Transition Director to display the latest version of the Master Transition Schedule and other more detailed transition information so progress can be reported to NWS management and visitors. The heart of the program monitoring and control system is a computer based project management system. The information contained in this project management system is accessible to all parts of the agency. Appropriate security measures have been instituted to restrict access to sensitive data. The complete Transition Program Monitoring and Control System description and procedures document is available for reference.

5.5 Transition Change Management

Transition to the modernized NWS consists of a complex series of separable, but tightly interrelated activities. Once plans are approved and actions set in motion, requests to amend plans and the need to adjust implementation actions will be the rule rather than the exception. Such requests for change must be handled in a disciplined and coordinated manner. The Transition Change Management process is the official vehicle for systematically dealing with proposed changes that have transition impact. The Transition Director operates the Transition Change Management process with support from the Transition Representatives in each Headquarters Office and Region.

The Transition Change Management process has the following features:

- evaluation of the impact on all areas potentially affected by proposed transition changes;

- considerations of implementation, schedule, and cost aspects in evaluating the merits of proposed transition changes;

- maximum utilization of existing agency change/configuration management systems for screening and evaluating proposed transition changes;

- appropriate organizational levels of approval: changes with major impact are approved by the Deputy Assistant Administrator for Modernization after concurrence by the Transition Change Management Board which consists of the Transition Director and Office/Regional Directors; changes with minor impact are approved by the cognizant Office/Regional Director or Program Manager; and

- documentation and communication of the disposition of all change requests, as well as status reporting on change requests while they are under evaluation or implementation.

The complete Transition Change Management policy document is available for reference.

5.6 Transition Management Meetings

An integral part of the transition management process will be Transition Management Meetings that will be organized and conducted by the Transition Director, and attended by the Assistant Administrator, Deputy Assistant Administrators for Modernization and Operations, and all Office and Regional Directors. These meetings are devoted exclusively to transition related matters and are held semi-annually, in addition to the Spring and Fall Directors' Conferences.

Standard agenda items for the transition management meetings are to:

- review transition progress;

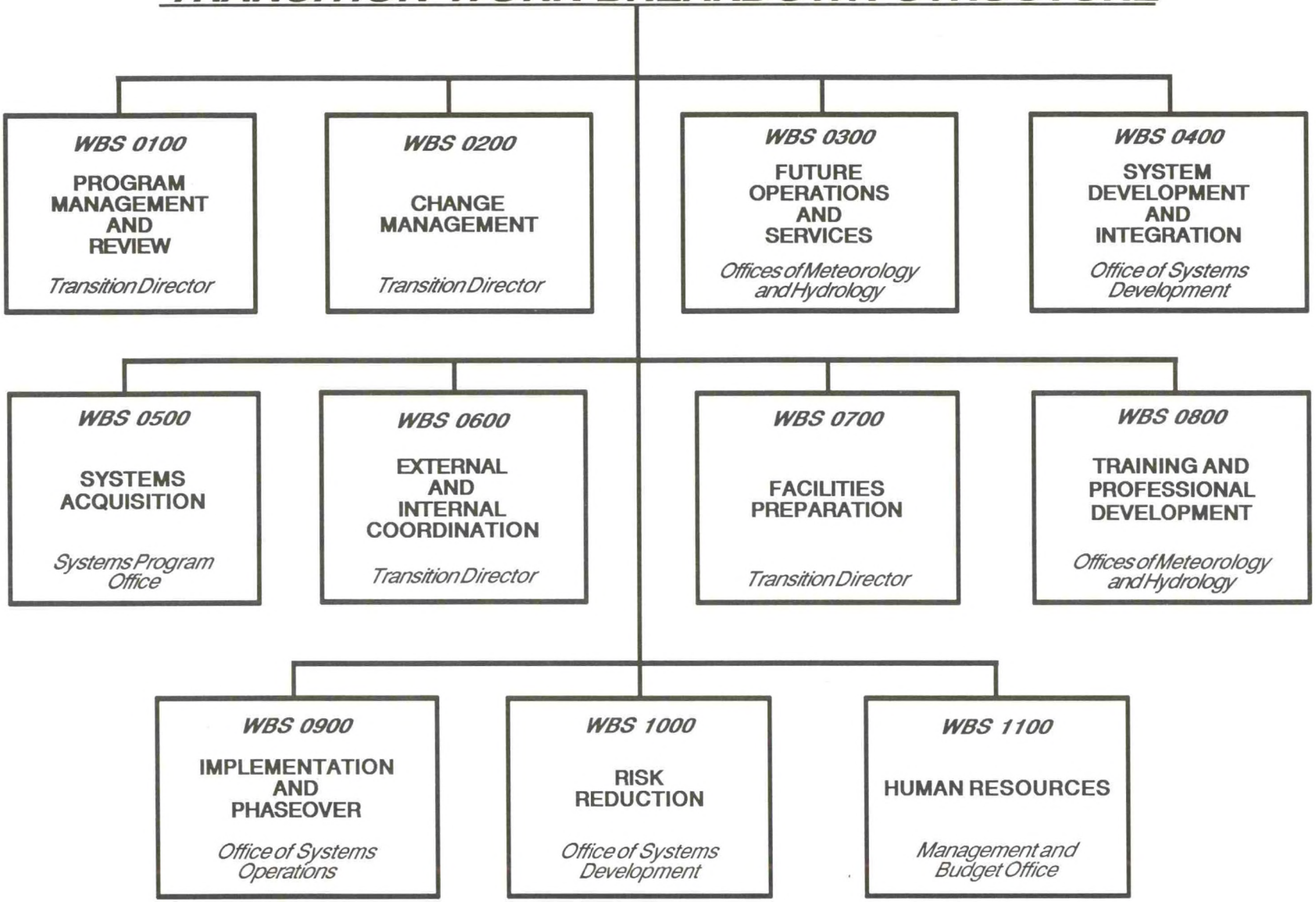
- focus on specific transition problems/issues;

- review/approve transition change proposals; and

- define/adjust 3-year outlooks and 1-year action plans, setting the agency's course for the coming year.

Figure 5:

TRANSITION WORK BREAKDOWN STRUCTURE



6.0 TRANSITION PROGRAM STATUS AND OUTLOOK

This section of the National Implementation Plan addresses the status and outlook of the transition program. The section first addresses the status of the program as of the end of fiscal year 1991, then proceeds with discussions of plans for fiscal years 1992, 1993 and 1994. Detailed budgets for fiscal years 1992 and 1993, and the budgetary planning ceilings for fiscal year 1994 for each of the major components of the modernization and restructuring program are shown in Table 5 at the end of this section. Table 5 is not intended to portray the total cost of the modernization and associated restructuring program. Programmatic schedules for each of the major components are shown in Figures 6 through 16, and site-by-site schedules for facilities, ASOS and NEXRAD are shown in Tables 6 through 8 at the end of this section.

6.1 Current Status of the Transition Program

During the past year, significant progress has been made in accomplishing the transition program. Much of the effort has been directed toward development of integrated program plans to ensure that the transition is coordinated throughout the NWS and NOAA, and with the end users of the products and services. In addition, fiscal year 1991 saw field deployment of the first ASOS and NEXRAD systems. Specifically, the following describes the status of the transition program as of the end of fiscal year 1991.

Funding Status

The NWS modernization and associated restructuring is primarily funded through the modernization technology programs which have received cumulative appropriations through fiscal year 1991 of $351 million for NEXRAD, $57 million for ASOS, and $85 million for AWIPS/NOAAPORT. Modernization and associated restructuring elements not funded through these major technology programs are funded through the NWS Transition program budget, which to date has been $13.4 million.

Transition Program Management

The transition program is being managed and coordinated through the efforts of the Transition Program Office which was established within the NWS in 1986. To this end, the Transition Program Office has identified and developed tools described in earlier parts of this plan, including the hierarchy of plans, the Transition Work Breakdown Structure, the Master Transition Schedule, and a program monitoring and control system.

During fiscal year 1991, four Regional Transition Plans were completed and approved, and all Site Implementation Plans were completed at least through a first draft level, with a total of 17 Site Implementation Plans having been approved.

The MARD Plan has been drafted and an initial review by the agency has been completed. The MARD Plan will be the baseline for all future MARD activities. It will reference the Site Implementation Plan for each of the participating field offices. The plan will also address the involvement of the National Meteorological Center and the National Severe Storms Forecast Center.

Regulations are being developed to implement the certification requirements of Public Law 100-685. These regulations will be published as a proposed rule for public comment.

In March 1991, the National Research Council released its first report. Entitled, "Toward a New National Weather Service -- A First Report," the report generally endorsed the modernization and associated restructuring and NWS's approach to accomplishing the transition, and made a number of recommendations. In May 1991, the report was printed and distributed to all members of Congress; all Governors; NWS National, Regional and Field Managers; all NWS field offices; selected offices in NOAA and DOC; other Federal Agencies; and external audiences. A NOAA response to the report was released in September 1991 and distributed to the same audiences as the report was.

Systematic reviews of all transition activities were conducted through bi-weekly transition meetings, semi-annual Transition Management Meetings and Directors' Conferences, and periodic program reviews in the various Offices and Regions.

A Transition Information System has been developed that provides an electronic mail/bulletin board capability throughout NWS to facilitate exchanges of transition information, and will provide a National Transition Database to make transition data available for use in planning and implementation tracking. The electronic mail/bulletin board system is operational for all National and Regional Headquarters's and field office users.

Transition Change Management

A Transition Change Management process has been established within NWS. The process ensures an orderly transition program by instituting procedures through which NWS management can carefully consider and evaluate all policies, plans, and schedules and proposed changes to them which impact the modernization.

Future Operations and Services

Future Operations and Services Plans have been completed for all NWS service program areas. The Public Services and Warnings, Hydrological Operations and Services, Fire Weather, and Agricultural Services plans have been approved.

System Development and Integration

During fiscal year 1991, NOAA established a Systems Program Office reporting to the Deputy Under Secretary for Oceans and Atmosphere. The SPO has management responsibility for the development and acquisition of the major new systems: NEXRAD, ASOS, AWIPS, and GOES required for the modernization and associated restructuring program.

The ASOS production contract was awarded in fiscal year 1991 and the first ASOS units were delivered to offices in the MARD area starting in August 1991.

A comprehensive NEXRAD contract settlement was reached between the Government and the Unisys Corporation, and the delivery of limited production NEXRAD systems was started. At the end of fiscal year 1991 three NWS sites (Norman, OK, Melbourne, FL, and Sterling, VA) had completed the Installation and Checkout phase of systems implementation and NWS began to routinely use the NEXRAD systems in support of station operations.

The AWIPS program continued in the definition phase, with heavy emphasis on evaluation of proposals submitted by the two competing contractors for succeeding phases of the contract effort.

Wind profilers were installed at 22 sites of the station demonstration network and 9 of them were routinely providing data through the NWS Telecommunications Gateway to NWS offices and other users at the end of fiscal year 1991.

External and Internal Coordination

External and internal coordination activities continued to be defined and schedules developed for approved activities. Activities which have been completed are:

- Communication tools (slide presentations, brochures, fact sheets, etc.) for field managers to effectively communicate the modernization within their areas of responsibility are being developed. A slide briefing package was produced that provides an introduction to, and explanation of the NWS modernization plans and goals. A narrative script accompanies the slide presentation.

- Four editions of the employees' technical report, the "Critical Path," were produced and distributed.

- Informational and educational video tapes have been sent to field offices. A general orientation to the modernization ("A Look Into the Future") was distributed to all offices and is to be used for both internal and external audiences. Two additional videos have been distributed that illustrate recent accomplishments. The first, "NEXRAD is Now," was sent out in June. The second, distributed in July, focused on the performance of the Twin Lakes, OK NEXRAD radar during the outbreak of storms in Kansas and Oklahoma in the spring of 1991.

- NWS managers continued briefing Congressional delegations and Governors' staffs.

Facilities Preparation

Facilities preparation activities have been in progress for some time in order to accommodate the delivery and installation of NEXRAD systems. Construction of future WFOs continues at a number of NWS sites. A cumulative total of 12 future WFO facilities had been completed by the end of fiscal year 1991, with 4 of those facilities completed during fiscal year 1991. Site requirements and economic analyses for all future WFOs were completed.

Training and Professional Development

The Integrated Training and Professional Development Plan was completed and approved.

Preparations continued for conducting the first COMET Operational Mesoscale Analysis and Prediction Course early in fiscal year 1992. Development of the first several computer based learning modules also continued at COMET.

With the comprehensive NEXRAD contract settlement reached, preparations for resumption of NEXRAD operations training for NWS meteorologists and hydrologists at the Operational Support Facility in Norman, Oklahoma were initiated.

Implementation and Phase Over

The Implementation and Phase Over Plan, which provides an overall strategy for the operational implementation of ASOS, NEXRAD and AWIPS into existing NWS operations was completed in September 1991. Plans specific to the commissioning of ASOS and NEXRAD installations were completed in September 1991.

A coordinated draft of a proposed Systems Decommissioning Policy, for those systems replaced by ASOS, NEXRAD and AWIPS was disseminated in September 1991 for NWS review. Draft plans for the disposal of systems replaced by ASOS and NEXRAD were distributed for NWS review in July 1991.

Risk Reduction

The following major transition risk reduction projects are currently ongoing within the NWS:

DARE - The Denver AWIPS Risk Reduction and Requirements Evaluation project, a joint effort between the NWS and the NOAA Office of Atmospheric Research, was started in 1986. The objective of this project is to demonstrate and test fundamental AWIPS systems and operational concepts. The DARE-II program began in April 1990. DARE-II involves multiple work stations, as opposed to the single work station used in DARE-I. All forecast and

warning functions of the Denver WSFO were supported by the DARE-II system for the entire year. The system was expanded to support the Enhanced Terminal Forecast Risk reduction project. Overall system stability and performance were improved through several software upgrades made during the year.

Norman - The primary objective of the Norman, OK risk reduction project is to measure the capability of a WFO to provide required services, to develop interfaces to the new observing systems, particularly NEXRAD, and to validate the capability to ingest centralized data streams into the advanced pre-AWIPS work station installed at Norman. Two major events occurred at WSFO Norman during fiscal year 1991. The pre-AWIPS was delivered in January and went through several modifications. Currently, the forecast staff use the pre-AWIPS almost exclusively for operations. The Norman staff have been using the NEXRAD with impressive results. Using the high resolution reflectivity data and radial velocity information, the Norman staff have issued tornado warnings, which were later verified, with significant lead times--generally greater than 20 minutes, with some warnings having lead times over 30 minutes.

PROTEUS - The Prototype River Forecast Center Operational Test, Evaluation and User Simulation project is designed to demonstrate enhanced computer hardware and software applications required by RFCs to operate in the AWIPS environment. Initial Operating Capability RFC software is being developed by the Office of Hydrology at NWS Headquarters and is being demonstrated and refined based on the experience gained using the applications at the RFCs participating in the PROTEUS Project. The PROTEUS project has implemented systems at RFCs in Harrisburg, PA; Salt Lake City, UT; Kansas City, MO; Anchorage, AK; and Tulsa, OK. PROTEUS operations began at the Tulsa RFC during 1990, augmenting activities already underway at the other RFCs. Due to the unique role played by the NWS Southern Region in the pre-MARD and MARD risk reduction activities, primary emphasis in the PROTEUS project has shifted to the Tulsa RFC.

Tulsa RFC - A project parallel to the Norman risk reduction project, the primary objective of the Tulsa RFC risk reduction project is to investigate future hydrologic operations before national implementation. Tulsa RFC will approach the level of hydrologic operations of a fully modernized RFC prior to MARD, including providing modernized hydrologic support for the Norman WFO. Interaction between the two offices will define potential issues to be addressed prior to MARD and subsequent national implementation.

Sterling - In order to develop and demonstrate the benefits of supplementing ASOS observations with data from various new technologies, a risk reduction project is underway at the Washington, D.C. area WSFO in Sterling, VA. For example, the identification, intensity, and movement of thunderstorms and/or precipitation within about 30 miles of an airport is important for both aviation operations and forecasting, but this information will not be available from ASOS. The plan is to produce automatic supplementary products to complement the ASOS observation by using data from other NWS observing systems--primarily lightning detection networks, the NEXRAD, and GOES satellites. Procurement and installation of the initial computer hardware and data sources have been completed. The hardware and interfaces are up and running; considerable progress has been made with software development. A preliminary experimental lightning/radar product has been produced.

Human Resources

Staffing issues for the modernized and restructured NWS will continue to be resolved in accordance with the guidance provided by the DOC advisory committee for human resources issues. Position descriptions for all positions to be filled during the modernization and associated restructuring were completed, and all but a few were approved. Work on a draft Human Resources Plan continued during the year.

6.2 Outlook for Fiscal Year 1992

Major objectives for fiscal year 1992 include completing facilities at the MARD sites, completing delivery of ASOS systems to the MARD sites, commissioning these ASOSs, and completing installation and checkout of limited production NEXRADs. These activities will culminate with the start of the OT&E period at the MARD sites. Other fiscal year 1992 activities will be directed toward completion, review, and approval of the transition plans and implementation of long lead activities.

Funding Requirements for Fiscal Year 1992

Fiscal year 1992 funding will continue the production phase of the NEXRAD contract and continue land acquisition and associated activities. Funds will support NOAA's share of tri-agency operating costs for managerial and engineering functions required to implement the program; i.e., training and site survey activities. Funding appropriated for fiscal year 1992 will support NOAA's full share of the tri-agency production contract as required through fiscal year 1992. Funds will support preparation of NWS NEXRAD user sites to ensure readiness for acceptance of NEXRAD equipment deliveries. Funding will also be required to continue the build-up of the logistics support program to sustain NEXRAD equipment performance.

Funding appropriated for fiscal year 1992 will fund the NWS share of the ASOS full-scale production contract. Funds will be used to prepare sites for installation; to produce ASOS systems and depot spares; to provide communications for data transmission and archiving; and to install and maintain ASOS systems.

Funding for maintenance costs associated with the Cray YMP8/832 computer installed at NMC during fiscal year 1990 will be required during fiscal year 1992. The acquisition process for the advanced super computer will begin.

Funding in fiscal year 1992 will be required to continue the development of the NOAAPORT master ground station and the communications interfaces required between the Government and the AWIPS contractor and to maintain the new hardware and software used for the central processing and remapping functions.

The NWS Transition program will require funds in fiscal year 1992 to:

- Supplement MARD offices and staffs at other offices receiving NEXRADs with additional meteorologists and hydrologists.

- Support an increase in the number of office and personnel relocations over that which NWS normally experiences. These increased costs are directly related to the magnitude of the modernization and associated restructuring program.

- Continue risk reduction efforts to derive critical information needed to define, analyze and assess technical trade-offs and impacts on operations and services, and continue RFC prototyping and precipitation processing risk reduction activities.

- Support continued development and implementation of scientific education on the interpretation of new data sources such as doppler radar and mesoscale forecasting techniques which must be provided for meteorologists and hydrologists at NWS field offices.

- Begin development of a formal MARD evaluation program.

Transition Program Management

All Regional Transition and Site Implementation Plans will be completed. An annual update process will be initiated for these plans. The MARD Plan will be completed and approved. The Certification Plan will be completed and coordinated within NWS. The contract with the National Research Council has been renewed and work with them will continue.

Systematic reviews of all transition activities will continue to be conducted through bi-weekly transition meetings, semi-annual Transition Management Meetings and Directors' Conferences, and periodic program reviews in the various Offices and Regions.

Work on the transition program monitoring and control system, including operational implementation of the National Transition Database will be sustained during fiscal year 1992.

Transition Change Management

The Transition Change Management will continue to support the planning and implementation of the modernization.

Future Operations and Services

The remaining Future Operations and Services plans will be approved and all plans will be reviewed to establish that they remain consistent with modernization and associated restructuring goals. Schedules will be developed for the implementation of services.

System Development and Integration

The ASOS systems deployment at NWS and FAA sites that began in fiscal year 1991 will continue. In fiscal year 1992 approximately 160 ASOS sites will be installed and accepted including all systems planned to support MARD operations.

The NEXRAD limited production deployment will be completed and systems accepted at the following NWS sites - Norman, Melbourne, Sterling, Dodge City, Houston, and St. Louis. Deployment of the full-scale production systems is scheduled to begin in July 1992.

AWIPS definition phase activities will continue as well as will preparations for award of the development phase contract in fiscal year 1993.

External and Internal Coordination

A final draft of the External and Internal Coordination Plan will be produced and reviewed by NWS.

A "NWS Modernization Public Relations Guide" will be developed. The guide will be a comprehensive on-station resource reference for field managers engaged in modernization communication and coordination.

As part of the slide presentation on the modernization, technical modules on specific aspects of the modernization (i.e., new technology, certification, benefits to user groups, etc.) will be developed.

A communication and coordination plan for the local level will be defined and implemented. A reporting mechanism will be developed to account for the constituents reached. This documentation will be essential for the certification process.

Information repositories, containing all relevant modernization plans and documents, will be compiled and distributed to selected communities.

Facilities Preparation

Site selection, land acquisition and facilities construction will continue during fiscal year 1992 to accommodate installation of NEXRAD systems. Construction or lease of 9 additional WFOs will be accomplished, and 24 additional sites will be in the design phase.

Training and Professional Development

The first COMET Operational Mesoscale Analysis and Prediction Course will be conducted. Completion of the first 4 computer based learning modules will also be completed by COMET.

Planning for new courses at the National Weather Service Training Center will continue. The courses include: a MAR management course, a basic operational hydrology course and a course for hydrometeorological technicians. The first courses on ASOS and NEXRAD maintenance will be conducted at the Training Center.

NEXRAD operations training for NWS meteorologists and hydrologists at the Operational Support Facility in Norman, Oklahoma will continue, with dual classes commencing midway through the year.

Implementation and Phase Over

The Implementation and Phase Over Plan will be updated. Updated guidance to the field on procedures and strategies to be followed when addressing the implementation of ASOS, NEXRAD and AWIPS in the Site Implementation Plans will be distributed. Commissioning plans for ASOS and NEXRAD will be completed and approved. Plans for the field operational demonstrations for ASOS and NEXRAD will be completed, and an ASOS field operational demonstration will be completed.

The Systems Decommissioning policy will be completed, as well as will System Disposal Plans for those systems that will be replaced by ASOS and NEXRAD.

Risk Reduction

DARE - Fiscal year 1992 work will focus on transitioning the source of national data from the Forecast Systems Laboratory to the Information Stream Project for AWIPS/NOAAPORT central data feed. This is an important step in verifying the readiness of the NWS and NESDIS to support the MARD. In addition, installation of the Denver NEXRAD is expected during fiscal year 1992. DARE will interface to this new radar and integrate the data into the work stations.

Norman - During fiscal year 1992, 11 risk reduction evaluations will be underway in the Norman Risk Reduction Project. In addition, approximately 10 other activities will be documented. During fiscal year 1992, the staff at WSFO Norman will begin to issue new products commensurate with implementation of the new technology.

PROTEUS - Fiscal year 1992 work will focus on development, delivery and refinement of the major RFC software components of the pre-AWIPS system. This integrated software system will be available for use by the Tulsa RFC staff early in fiscal year 1992. In addition, PROTEUS will continue to provide training for the Tulsa RFC in computer and communications systems and in the use of the application software components.

Tulsa RFC - During fiscal year 1992, the Tulsa RFC will move to the new RFC facility and implement required communications with the Office of Hydrology, the National Meteorological Center, and WSFO Norman. The pre-AWIPS software applications developed by PROTEUS will be implemented together with initiating the transition to modernized RFC

operations. Preparation for the beginning of pre-MARD operations in early fiscal year 1992, will proceed in stages. Early in fiscal year 1992, operational familiarization of the application software will begin. Experimental RFC operations will begin toward the middle of fiscal year 1992, including initial delivery of modernized river forecast products to Norman. Near the end of fiscal year 1992, routine NEXRAD precipitation analysis will be achieved and routine delivery of modernized flash flood guidance to Norman will begin.

Sterling - Work will continue with hardware procurement and software development. Experimental supplemental products to complement ASOS will be refined by using lightning and NEXRAD radar data. Field offices within WSFO Washington DC's area of responsibility will evaluate the operational suitability of these new products.

Human Resources

Staffing issues for the modernized and restructured NWS will continue to be resolved in accordance with the guidance provided by the DOC advisory committee for human resources issues. Approval of the outstanding position descriptions will be obtained. The Human Resources Plan will be completed and approved.

Notification of Intent to Certify for Fiscal Year 1992

As part of the certification process described in section 3.7, Notification of Intent to Certify will be provided in the annual submission of this National Implementation Plan. No actions that will require certification under Section 408 of Public Law 100-685 are planned for fiscal year 1992.

6.3 Outlook for Fiscal Year 1993

Major objectives for fiscal year 1993 include completing delivery of NEXRADs to MARD sites, beginning commissioning of MARD NEXRADs, installing ASOSs across the country, awarding the AWIPS development phase contract, acquiring an advanced super computer for installation at the NMC, continuing systems training and scientific education, and continuing the OT&E.

Funding Requirements for Fiscal Year 1993

Fiscal year 1993 funding will be required to continue the NEXRAD tri-agency production contract to maintain scheduled deliveries for this economic quantity buy. NWS will continue with modification and construction of NEXRAD user sites to meet scheduled contractual commitments for site readiness. Funding will also be required to continue establishment of initial central depot repair capabilities.

Fiscal year 1993 funding will be required to continue the full-scale production contract for ASOS and to cover the NWS share of the central depot maintenance support operations and logistics.

In order to permit the National Meteorological Center to implement fully the centralized forecast and mesoscale guidance products required for the NWS modernization, it will be necessary to acquire an advanced super computer in fiscal year 1993. Funding also will provide for a major improvement of the electrical power systems that support the site of the advanced super computer system, including the acquisition and installation of an uninterruptible power system to prevent system interruptions due to power anomalies. Funding will also permit initiating procurements of a new supporting computing system and of scientific workstations and a terabyte mass storage system, and contracting for meteorological/computer experts to ensure efficient and effective use of the advanced super computer and supporting systems.

Fiscal year 1993 funding will be required to initiate the AWIPS development phase contract. This phase includes all contractor support that will be centered on the establishment of central network control and communications capabilities, the development of a pre-production AWIPS system at the contractor's facility, and the development and implementation of AWIPS MARD systems at the MARD sites.

The NWS Transition program will require funds in fiscal year 1993 to:

- Supplement MARD offices and staffs at other offices receiving NEXRADs with additional meteorologists and hydrologists.

- Support an increase in the number of office and personnel relocations over that which NWS normally experiences. These increased costs are directly related to the magnitude of the modernization and associated restructuring program.

- Continue risk reduction efforts to derive critical information needed to define, analyze and assess technical trade-offs and impacts on operations and services, and continue RFC prototyping and precipitation processing risk reduction activities.

- Support continued development and implementation of scientific education on the interpretation of new data sources such as doppler radar and mesoscale forecasting techniques which must be provided for meteorologists and hydrologists at NWS field offices.

- Support the development of the NOAA Weather Radio Console Replacement System.

- Continue to support MARD preparation activities and development of operational procedures and evaluation guidelines, begin preparations for conducting before and after user surveys in the MARD area, and continue development of materials to support technical coordination with external users by NWS field managers at all sites.

6.4 Outlook for Fiscal Year 1994

Major objectives for fiscal year 1994 include completing commissioning of MARD NEXRADs, preparing for delivery of AWIPS MARD systems, continuing ASOS deliveries, continuing systems training and scientific education, and continuing the OT&E.

Funding Requirements for Fiscal Year 1994

Fiscal year 1994 funding will be required to continue the NEXRAD tri-agency production contract to maintain scheduled deliveries for this economic quantity buy. NWS will continue with modification and construction of NEXRAD user sites to meet scheduled contractual commitments for site readiness.

Fiscal year 1994 funding will be required to continue the full-scale production contract for ASOS and to cover the NWS share of the central depot maintenance support operations and logistics.

Fiscal year 1994 funding is required to continue the development phase of the AWIPS contract.

The NWS Transition program will require funds in fiscal year 1994 to:

- Supplement staffs at offices receiving NEXRADs with additional meteorologists and hydrologists in order to ensure no delays in NEXRAD commissionings.

- Support an increase in the number of office and personnel relocations over that which NWS normally experiences. These increased costs are directly related to the magnitude of the modernization and associated restructuring program.

- Continue risk reduction efforts to derive critical information needed to define, analyze and assess technical trade-offs and impacts on operations and services, and continue RFC prototyping and precipitation processing risk reduction activities.

- Support continued development and implementation of scientific education on the interpretation of new data sources such as doppler radar and mesoscale forecasting techniques which must be provided for meteorologists and hydrologists at NWS field offices.

- Continue the development of the NOAA Weather Radio Console Replacement System.

- Continue to support MARD preparation activities and development of operational procedures and evaluation guidelines, continue preparations for conducting before and after user surveys in the MARD area, and continue development of materials to support technical coordination with external users by NWS field managers at all sites.

Table 5:

MODERNIZATION BUDGETS (Fiscal Year 1992- 1994)

	FY 92	FY 93	Planning Level FY 94
MODERNIZATION INITIATIVES ($M)			
NEXRAD	83.4	84.5	84.5
ASOS	13.8	19.0	19.0
AWIPS/NOAAPORT	19.8	14.3	14.3
SATELLITE UPGRADE	118.0	128.9	128.9
NATIONAL CENTER COMPUTER UPGRADE	15.0	11.8	11.8
NWS TRANSITION (MARDI)	9.0	29.3	29.3
WFO FACILITIES*	25.6	47.4	47.4
HUMAN RESOURCES (FTE)			
NWS BASE	4518	4409	4386
STAFFING AUGMENTATION	120	194	217
	4638	4603	4603
RESEARCH ($M)			
ERL	9.6	12.1	12.1
NWS	9.0	9.0	9.0
NESDIS	8.2	8.2	8.2

* - Beginning in fiscal year 1992, funding for WFO facilities, including land acquisition and construction/management costs, was moved from the NEXRAD line item to the "Construction" account.

Figure 6:
FACILITIES PREPARATION SCHEDULE

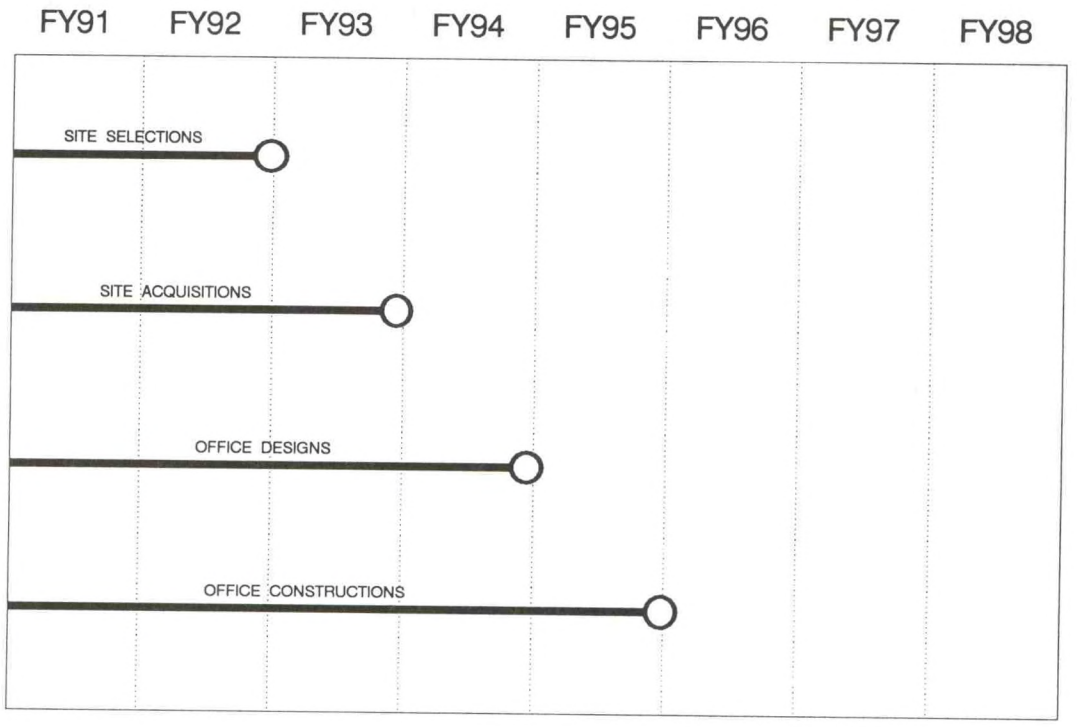


Figure 7:
NEXRAD SCHEDULE

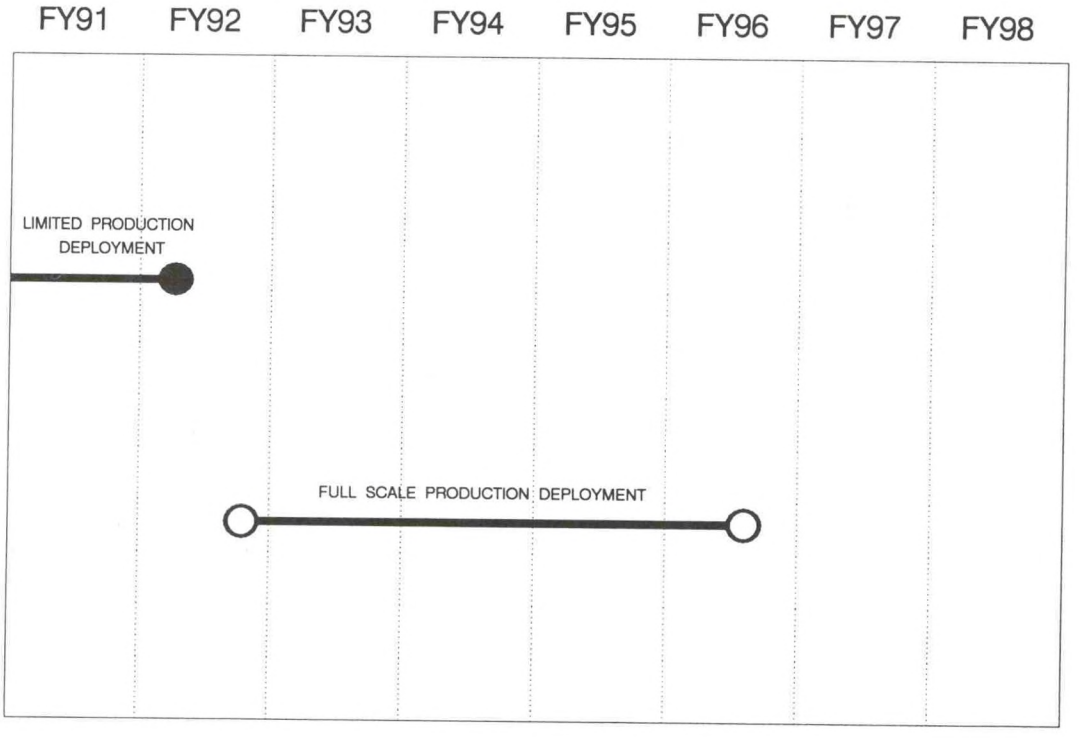


Figure 8:

ASOS SCHEDULE

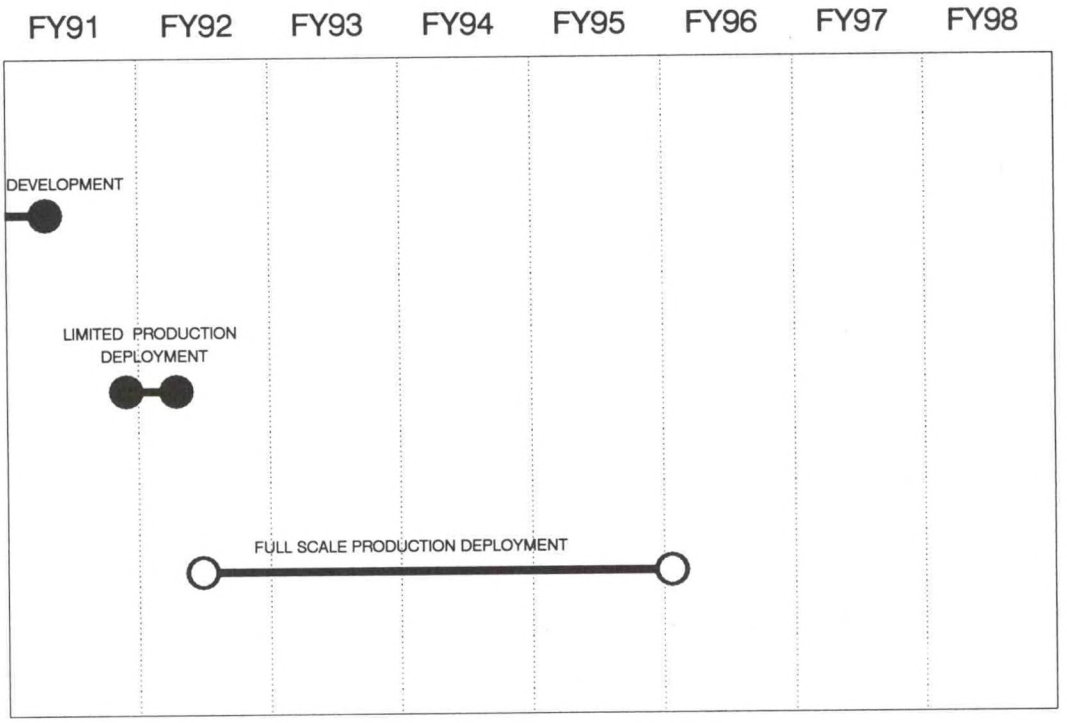


Figure 9:

AWIPS/NOAAPORT SCHEDULE

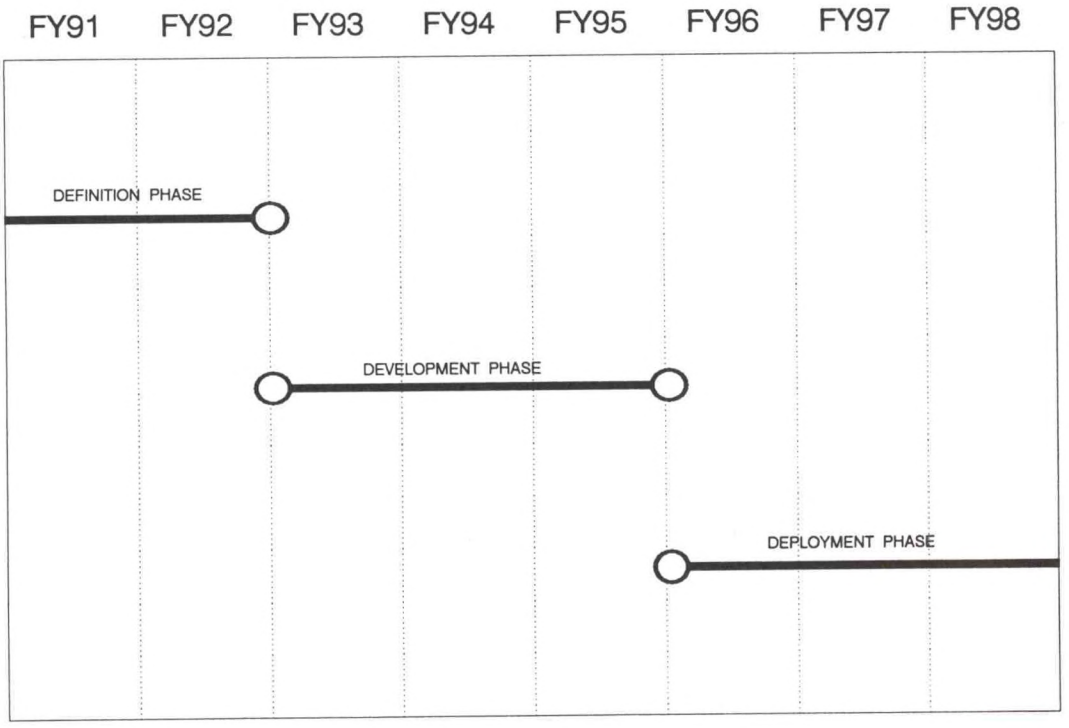


Figure 10:

SATELLITE UPGRADE SCHEDULE

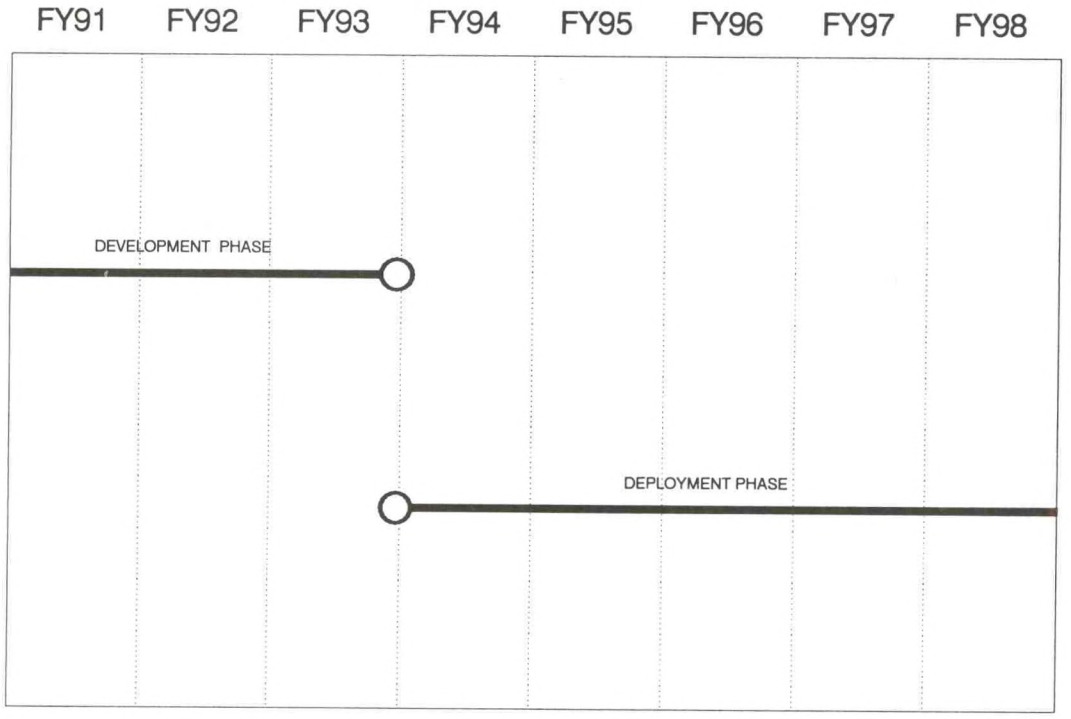


Figure 11:

NATIONAL CENTER COMPUTER UPGRADE SCHEDULE

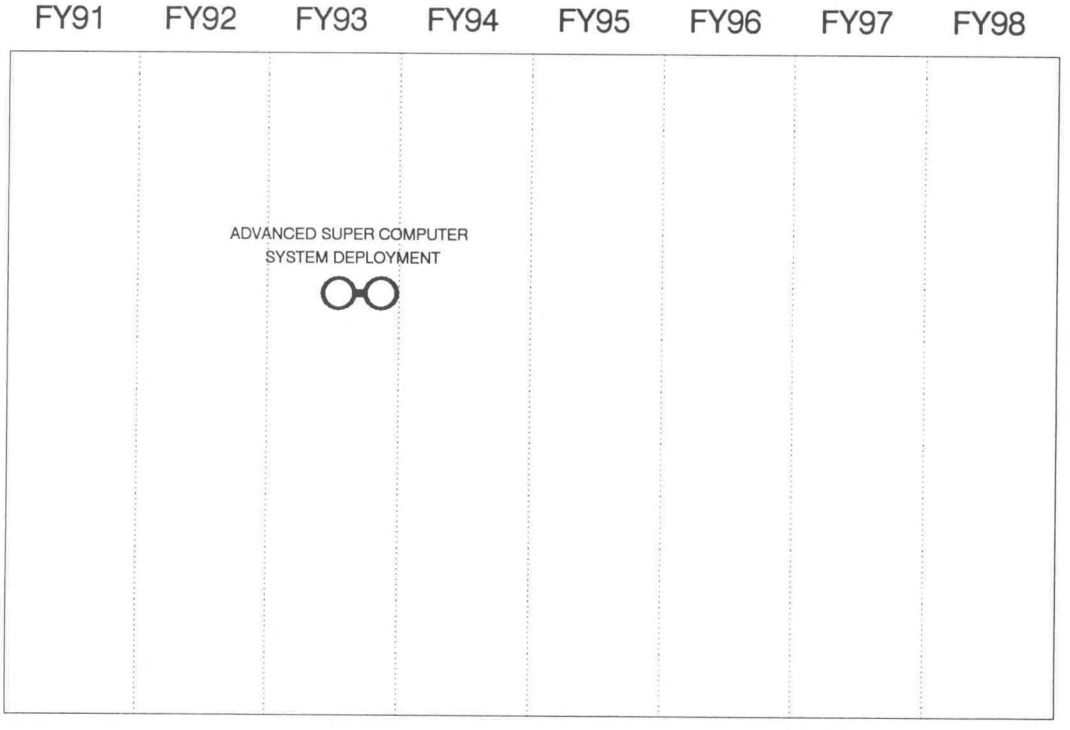


Figure 12:

SCIENTIFIC EDUCATION AND PROFESSIONAL DEVELOPMENT SCHEDULE

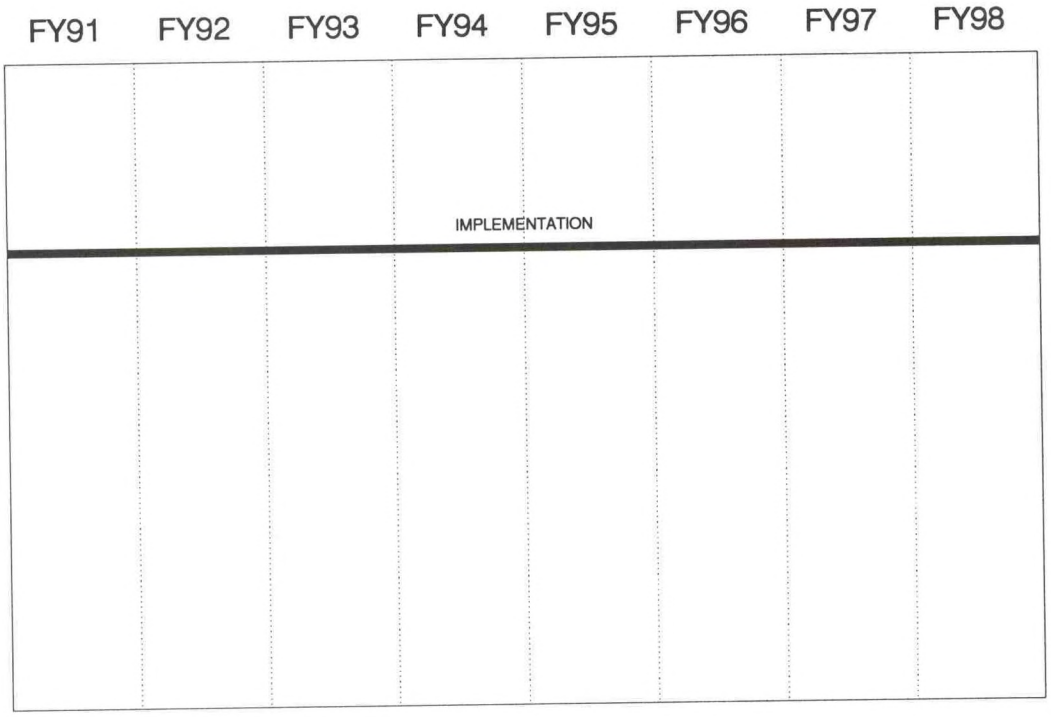


Figure 13:

MARD SCHEDULE

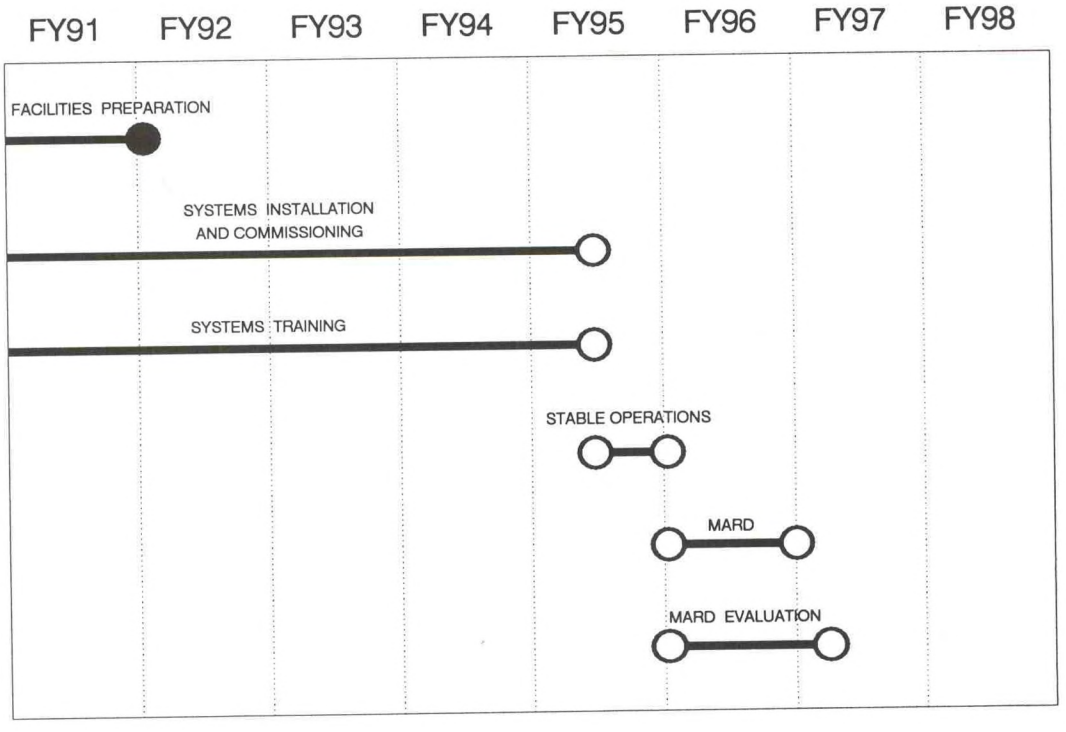


Figure 14:
ERL RESEARCH PROGRAM SCHEDULE

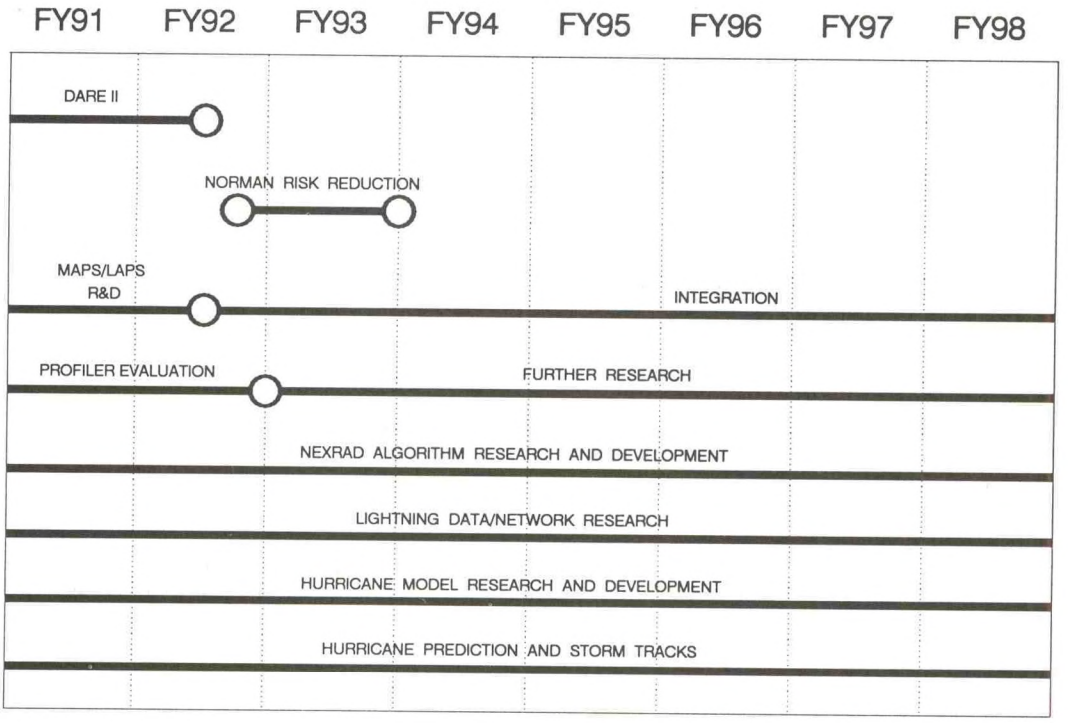


Figure 15:
NWS RESEARCH PROGRAM SCHEDULE

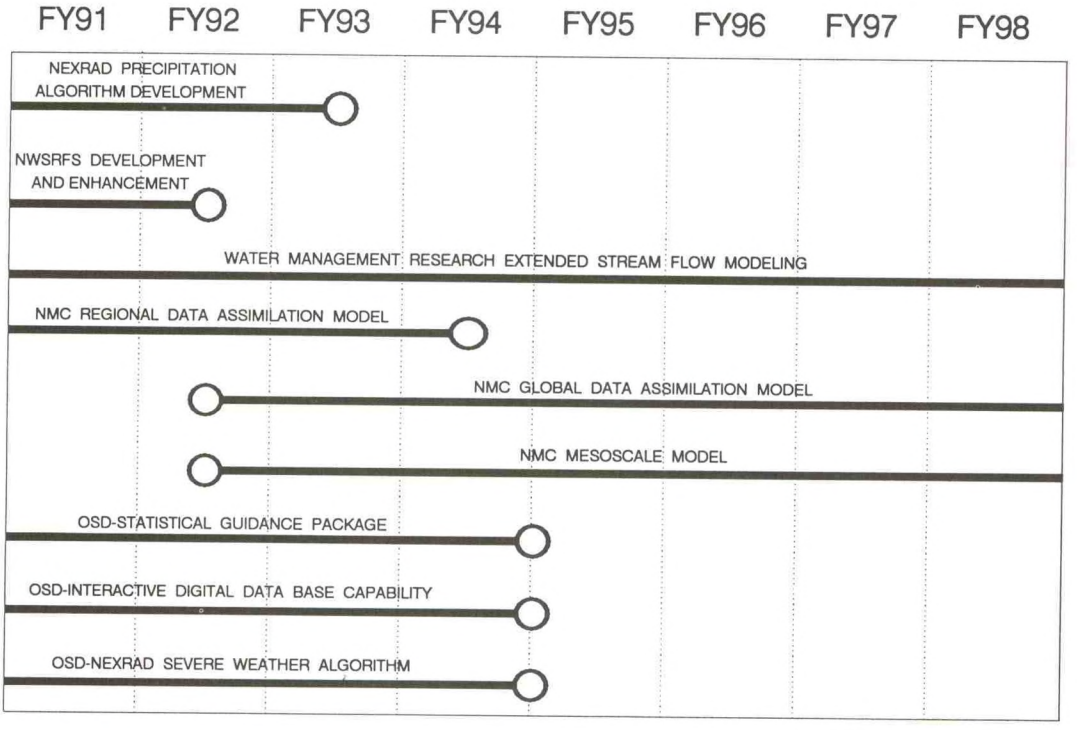


Figure 16:

NESDIS RESEARCH PROGRAM SCHEDULE

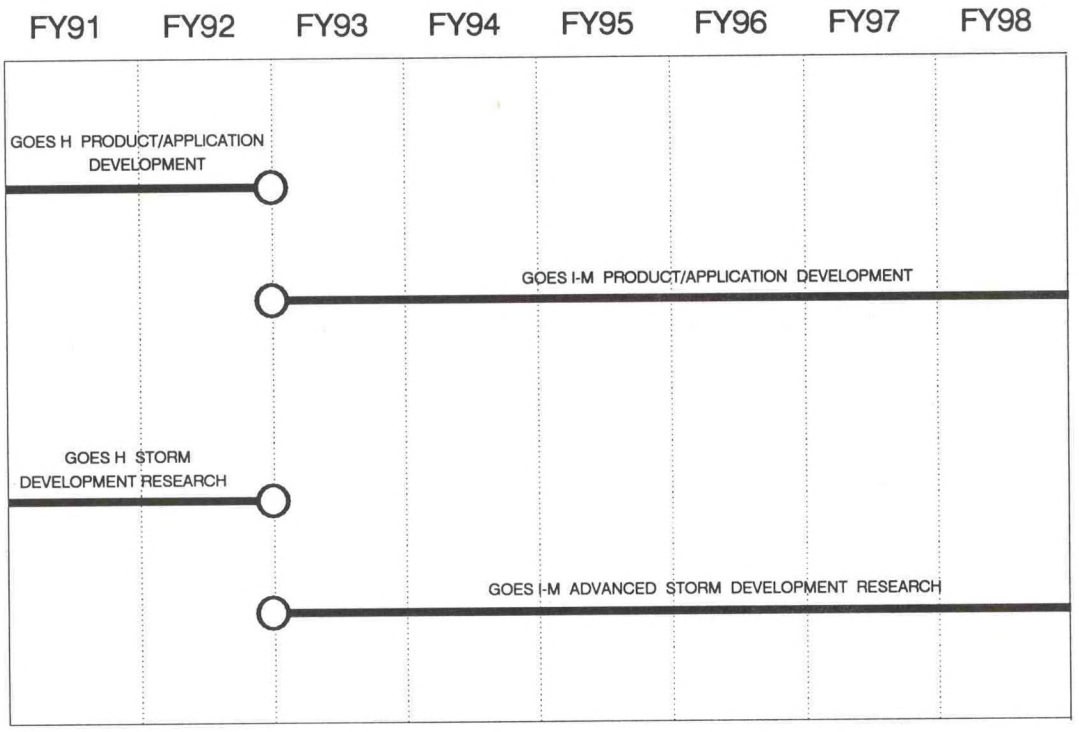


TABLE 6:

SITE-BY-SITE FACILITIES ACCEPTANCE SCHEDULE

Aberdeen, SD	Mar-94
Albany, NY	May-93
Albuquerque, NM	Jan-94
Alpena, MI	Jan-95
Amarillo, TX	Completed
Anchorage, AK	Apr-95
Atlanta, GA	Dec-93
Austin/San Antonio, TX	Jan-94
Baltimore, MD/Washington, DC	Completed
Billings, MT	May-95
Binghamton, NY	Jun-92
Birmingham, AL	Sep-93
Bismarck, ND	Apr-94
Boise, ID	Apr-93
Boston, MA	May-93
Brownsville, TX	Oct-94
Buffalo, NY	Feb-94
Burlington, VT	Apr-95
Central Illinois, IL	Nov-94
Central Pennsylvania, PA	Dec-92
Charleston, SC	Oct-94
Charleston, WV	Mar-94
Cheyenne, WY	May-93
Chicago, IL	Completed
Cincinnati, OH	Dec-93
Cleveland, OH	Apr-93
Columbia, SC	Aug-93
Corpus Christi, TX	Jul-95
Dallas/Ft Worth, TX	Sep-93
Denver, CO	Dec-94
Des Moines, IA	Mar-93
Detroit, MI	Completed
Dodge City, KS	Completed
Duluth, MN	Feb-95
El Paso, TX	Jul-95
Elko, NV	Feb-95
Eureka, CA	Sep-94
Fairbanks, AK	Feb-95
Fargo/Grand Forks, ND	May-95
Flagstaff, AZ	Feb-95
Glasgow, MT	Jun-95
Goodland, KS	Completed
Grand Island, NE	Completed
Grand Junction, CO	Feb-95
Grand Rapids/Muskegon, MI	Feb-95
Great Falls, MT	Feb-94
Green Bay, WI	Feb-94
Honolulu, HI	Nov-94
Houston/Galveston, TX	Completed
Indianapolis, IN	Apr-93
Jackson, MS	Feb-93
Jacksonville, FL	Aug-94
Juneau, AK	Apr-95
Kansas City, MO	Completed
Knoxville/Tri Cities, TN	Jun-94
La Crosse, WI	Apr-95
Lake Charles, LA	Nov-93
Las Vegas, NV	Dec-94
Little Rock, AR	Oct-92
Los Angeles, CA	Jun-93
Louisville, KY	Completed
Lubbock, TX	Aug-93
Marquette, MI	Dec-94
Medford, OR	Nov-94
Melbourne, FL	Completed
Memphis, TN	Aug-93
Miami, FL	Sep-94
Midland/Odessa, TX	Jul-94
Milwaukee, WI	Completed
Minneapolis/St Paul, MN	Mar-94
Missoula, MT	Feb-94
Mobile, AL	Aug-94

SITE-BY-SITE FACILITIES ACCEPTANCE SCHEDULE
(continued)

Morehead City, NC	Jul-93
Nashville, TN	Aug-94
New Orleans/Baton Rouge, LA	Oct-93
New York City, NY	May-93
Norfolk/Richmond, VA	Aug-94
North Platte, NE	Jan-95
Oklahoma City, OK	Completed
Omaha, NE	Jan-94
Paducah, KY	Jun-93
Pendleton, OR	Apr-95
Philadelphia, PA	May-93
Phoenix, AZ	Completed
Pittsburgh, PA	Apr-93
Pocatello/Idaho Falls, ID	Feb-95
Portland, ME	Jun-93
Portland, OR	Aug-94
Pueblo, CO	May-94
Quad Cities, IA	Jul-94
Raleigh/Durham, NC	Nov-93
Rapid City, SD	Mar-95
Reno, NV	Jul-94
Riverton, WY	Mar-95
Roanoke, VA	Jun-94
Sacramento, CA	May-94
Salt Lake City, UT	Apr-94
San Angelo, TX	Jul-95
San Diego, CA	Dec-94
San Francisco Bay, CA	Jul-93
San Joaquin Valley, CA	Oct-94
San Juan, PR	Feb-94
Seattle/Tacoma, WA	Oct-93
Shreveport, LA	Oct-94
Sioux Falls, SD	Jun-93
Spokane, WA	May-95
Springfield, MO	Oct-94
St Louis, MO	Completed
Tallahassee, FL	Sep-94
Tampa Bay Area, FL	Jul-94
Topeka, KS	Completed
Tucson, AZ	Sep-94
Tulsa, OK	Feb-92
Wichita, KS	Completed
Wilmington, NC	Aug-94

TABLE 7:

SITE-BY-SITE NEXRAD DELIVERY SCHEDULE

Aberdeen, SD	Oct-94
Albany, NY	Sep-93
Albuquerque, NM	May-94
Alpena, MI	May-95
Amarillo, TX	Dec-92
Anchorage, AK	Jun-95
Atlanta, GA	Apr-94
Austin/San Antonio, TX	May-94
Baltimore, MD/Washington, DC	Delivered
Beale Air Force Base, CA	Jan-95
Bering Sea, AK	May-96
Bethel, AK	May-96
Billings, MT	Nov-95
Binghamton, NY	Jul-93
Birmingham, AL	Apr-94
Bismarck, ND	Sep-94
Boise, ID	Oct-93
Boston, MA	Sep-93
Brownsville, TX	Feb-95
Buffalo, NY	Jun-94
Burlington, VT	Aug-95
Cannon Air Force Base, NM	Apr-94
Cedar City, UT	Jul-95
Central Illinois, IL	Dec-94
Central Pennsylvania, PA	Jul-93
Central Texas (Granger), TX	Feb-93
Charleston, SC	Jan-95
Charleston, WV	Jul-94
Cheyenne, WY	Aug-94
Chicago, IL	May-93
Cincinnati, OH	Apr-94
Cleveland, OH	Jun-93
Columbia, SC	Nov-93
Columbus Air Force Base, MS	Mar-94
Corpus Christi, TX	Dec-95
Dallas/Ft Worth, TX	Dec-93
Denver, CO	Apr-93
Des Moines, IA	Oct-93
Detroit, MI	Apr-93
Dodge City, KS	Delivered
Dover Air Force Base, DE	Nov-92
Duluth, MN	Jun-95
Dyess Air Force Base, TX	Sep-93
East Alabama (Carrville), AL	Dec-92
Edwards Air Force Base, CA	May-94
El Paso, TX	Dec-95
Elko, NV	Jul-95
Eureka, CA	Nov-94
Fairbanks, AK	Sep-95
Fargo/Grand Forks, ND	Nov-95
Flagstaff, AZ	Aug-95
Frederick, OK	Delivered
Ft. Campbell, KY	Feb-94
Ft. Rucker, AL	Oct-93
Glasgow, MT	Dec-95
Goodland, KS	Sep-92
Grand Island, NE	May-93
Grand Junction, CO	Sep-95
Grand Rapids/Muskegon, MI	May-95
Great Falls, MT	Jun-94
Green Bay, WI	Sep-94
Griffiss Air Force Base, NY	Oct-92
Holloman Air Force Base, NM	Mar-95
Houston/Galveston, TX	Delivered
Indianapolis, IN	Jun-93
Jackson, MS	Feb-93
Jacksonville, FL	Dec-94
Kamuela, HI	Mar-95
Kansas City, MO	Oct-92
Key West, FL	Dec-95
King Salmon, AK	Apr-96
Knoxville/Tri Cities, TN	Jul-94

SITE-BY-SITE NEXRAD DELIVERY SCHEDULE
(continued)

La Crosse, WI	Oct-95
Lake Charles, LA	Mar-94
Las Vegas, NV	Apr-95
Laughlin Air Force Base, TX	Jan-94
Little Rock, AR	Jan-93
Loring Air Force Base, ME	May-95
Los Angeles, CA	Jan-94
Louisville, KY	Aug-93
Lubbock, TX	Dec-93
March Air Force Base, CA	Jan-94
Marquette, MI	Apr-95
McGrath, AK	Apr-96
Medford, OR	Aug-95
Melbourne, FL	Delivered
Memphis, TN	Sep-93
Miami, FL	Mar-94
Middleton Island, AK	Jul-95
Midland/Odessa, TX	Jan-95
Milwaukee, WI	Aug-93
Minneapolis/St Paul, MN	Jul-94
Minot Air Force Base, ND	Jun-94
Missoula, MT	Aug-94
Mobile, AL	Dec-94
Molokai, HI	Apr-95
Moody Air Force Base, GA	Mar-96
Morehead City, NC	Nov-93
Nashville, TN	Oct-94
New Orleans/Baton Rouge, LA	Mar-94
New York City, NY	Aug-93
Nome, AK	May-96
Norfolk/Richmond, VA	Sep-94
North Platte, NE	Jun-95
Northwest Florida (Red Bay), FL	Delivered
Oklahoma City, OK	Delivered
Omaha, NE	May-94
Paducah, KY	Jan-95
Pendleton, OR	Oct-95
Philadelphia, PA	Aug-93
Phoenix, AZ	Jan-93
Pittsburgh, PA	Jun-93
Pocatello/Idaho Falls, ID	Jul-95
Portland, ME	Oct-93
Portland, OR	Nov-94
Pueblo, CO	Oct-94
Quad Cities, IA	Nov-94
Raleigh/Durham, NC	Feb-94
Rapid City, SD	Sep-95
Reno, NV	Aug-94
Riverton, WY	Sep-95
Roanoke, VA	Oct-94
Robins Air Force Base, GA	Dec-93
Sacramento, CA	Jan-94
Salt Lake City, UT	Aug-94
San Angelo, TX	Jan-96
San Diego, CA	Jun-95
San Francisco Bay, CA	Feb-94
San Joaquin Valley, CA	Feb-95
San Juan, PR	Jun-94
Seattle/Tacoma, WA	Feb-94
Shreveport, LA	Feb-95
Sioux Falls, SD	Nov-93
Sitka, AK	Aug-95
South Kauai, HI	May-95
Spokane, WA	Nov-95
Springfield, MO	Nov-94
St Louis, MO	Delivered
Tallahassee, FL	Dec-94
Tampa Bay Area, FL	Feb-95
Topeka, KS	Apr-93
Tucson, AZ	Mar-95
Tulsa, OK	Mar-93
Vance Air Force Base, OK	Nov-93
Vandenberg Air Force Base, CA	Mar-93
Wichita, KS	Aug-92
Wilmington, NC	Sep-94
Yuma, AZ	Oct-95

TABLE 8:

SITE-BY-SITE ASOS ACCEPTANCE SCHEDULE (NWS SITES ONLY)

AK	Anchorage	Jun-93
AK	Annette	Aug-92
AK	Barrow	Sep-92
AK	Bethel	Aug-92
AK	Cold Bay	Sep-92
AK	Fairbanks	Jul-92
AK	Homer	Jul-92
AK	King Salmon	Aug-92
AK	Kodiak	Jul-92
AK	Kotzebue	Sep-92
AK	McGrath	Jul-92
AK	Nenana	Aug-93
AK	Nome	Aug-92
AK	St Paul Island	Sep-92
AK	Talkeetna	Aug-94
AK	Yakutat	Sep-92
AL	Huntsville	Jan-93
AL	Mobile	Apr-95
AL	Montgomery	Jan-93
AR	Fort Smith	Jan-93
AZ	Flagstaff	Feb-95
AZ	Kingman	Dec-94
AZ	Page	Jul-95
AZ	Phoenix	Jul-94
AZ	Tucson	Jul-95
AZ	Winslow	Mar-95
CA	Bakersfield	Feb-93
CA	Bishop	Apr-94
CA	Emigrant Gap	Dec-94
CA	Fresno	Sep-94
CA	Long Beach	Mar-93
CA	Los Angeles	Oct-94
CA	Mt Shasta	Dec-94
CA	Red Bluff	Jan-95
CA	Redding	Jan-95
CA	San Diego	Nov-94
CA	San Diego	Nov-94
CA	San Francisco	Dec-94
CA	Sandberg	Feb-95
CA	Santa Maria	Oct-92
CA	Stockton	Aug-92
CO	Alamosa	Jun-92
CO	Colorado Springs	Jun-92
CO	Denver	Jun-92
CO	Grand Junction	Oct-94
CO	Limon	Oct-94
CO	Pueblo	Jun-92
CT	Bridgeport	May-94
CT	Windsor Locks	Jun-93
DC	Washington	Aug-94
DC	Washington	Jun-94
DE	Wilmington	Jul-93
FL	Daytona Beach	Jul-92
FL	Jacksonville	May-95
FL	Key West	May-95
FL	Miami	Mar-95
FL	Orlando	Jul-92
FL	Tallahassee	Jun-95
FL	Tampa	Jul-95
FL	West Palm Beach	Jul-92
GA	Athens	Sep-92
GA	Atlanta	Oct-92
GA	Augusta	Sep-93
GA	Columbus	Oct-92
GA	Macon	Oct-92
GA	Savannah	Jun-95
HI	Hilo	Jun-93
HI	Honolulu	Jun-93
HI	Kahului	Jul-93
HI	Lihue	Jul-93
IA	Des Moines	Dec-92
IA	Dubuque	Aug-95
IA	Sioux City	Dec-92
IA	Waterloo	Jul-95
ID	Boise	Dec-94
ID	Lewiston	Oct-92
ID	Pocatello	Jan-95
IL	Chicago	Mar-93
IL	Moline	Jul-95
IL	Peoria	Jan-93
IL	Rockford	Jul-92
IL	Springfield	Apr-93
IN	Evansville	Apr-95
IN	Fort Wayne	Apr-94
IN	Indianapolis	May-94
IN	South Bend	May-94
KS	Concordia	Jun-92
KS	Dodge City	Jun-92
KS	Goodland	Jun-92
KS	Topeka	Jun-92

SITE-BY-SITE ASOS ACCEPTANCE SCHEDULE (NWS SITWS ONLY)
(continued)

KS	Wichita	Jun-92
KY	Covington/Cincinnati	Mar-95
KY	Jackson	Jun-93
KY	Lexington	Jun-93
KY	Louisville	Aug-94
KY	Paducah	Jul-94
LA	Baton Rouge	Jan-93
LA	Lake Charles	Dec-93
LA	New Orleans	Aug-95
LA	Shreveport	Jan-94
MA	Boston	Oct-95
MA	Worcester	Mar-93
MD	Baltimore	Aug-93
ME	Caribou	Oct-95
ME	Portland	Nov-95
MI	Alpena	Sep-93
MI	Detroit	Jul-92
MI	Flint	Jul-92
MI	Grand Rapids	Dec-93
MI	Houghton Lake	Dec-93
MI	Lansing	Jan-94
MI	Muskegon	Feb-94
MN	Duluth	Jul-94
MN	International Falls	Jul-94
MN	Minneapolis	Jul-94
MN	Rochester	Aug-95
MN	St Cloud	Aug-94
MO	Columbia	Jun-95
MO	Kansas City	Jun-92
MO	Springfield	Jun-92
MO	St Louis	Aug-95
MS	Jackson	Mar-93
MS	Meridian	Mar-93
MS	Tupelo	Mar-93
MT	Billings	Nov-93
MT	Glasgow	Nov-93
MT	Great Falls	Nov-92
MT	Havre	Dec-93
MT	Helena	Nov-92
MT	Kalispell	Oct-92
MT	Missoula	Dec-92
NC	Asheville	Nov-94
NC	Charlotte	Dec-94
NC	Greensboro	Feb-95
NC	Hatteras	Mar-95
NC	Raleigh/Durham	Jun-94
NC	Wilmington	Apr-95
ND	Bismarck	Jul-92
ND	Fargo	Aug-94
ND	Williston	May-95
NE	Grand Island	Jun-92
NE	Lincoln	Jun-92
NE	Norfolk	Oct-93
NE	North Platte	Sep-94
NE	Scottsbluff	Nov-92
NE	Valentine	Sep-94
NH	Concord	Oct-95
NJ	Atlantic City	Jun-92
NJ	Newark	Oct-94
NJ	Teterboro	Nov-94
NM	Albuquerque	Jan-95
NM	Clayton	Jun-95
NM	Roswell	Mar-95
NM	Truth or Consequence	Nov-94
NV	Ely	Apr-94
NV	Las Vegas	May-94
NV	Mercury	Apr-94
NV	Reno	Jun-94
NV	Winnemucca	Jun-94
NY	Albany	Sep-95
NY	Binghamton	Oct-92
NY	Buffalo	Aug-94
NY	New York	May-95
NY	New York	Jun-95
NY	Rochester	Apr-93
NY	Syracuse	Nov-92
OH	Akron	Jul-93
OH	Cleveland	Aug-93
OH	Columbus	Feb-95
OH	Dayton	Feb-95
OH	Mansfield	Sep-93
OH	Toledo	Sep-93
OH	Youngstown	Aug-93
OK	Oklahoma City	Jun-92
OK	Tulsa	Jun-92
OR	Astoria	Jan-93
OR	Burns	Mar-94
OR	Eugene	Aug-92
OR	Medford	Aug-94
OR	Pendleton	Mar-94

SITE-BY-SITE ASOS ACCEPTANCE SCHEDULE (NWS SITWS ONLY)
(continued)

OR	Portland	Apr-95
OR	Salem	Sep-92
OR	Sexton Summit	Sep-94
PA	Allentown	Feb-93
PA	Erie	Mar-93
PA	Philadelphia	Jan-95
PA	Philadelphia	Dec-94
PA	Pittsburgh	Jan-95
PA	Wilkesbarre-Scranton	Oct-92
PA	Williamsport	Mar-93
PR	San Juan	May-93
RI	Providence	May-93
SC	Charleston	Aug-94
SC	Columbia	Aug-94
SC	Greer	Oct-94
SD	Aberdeen	Sep-93
SD	Huron	Oct-93
SD	Rapid City	Aug-94
SD	Sioux Falls	Oct-93
TN	Bristol/Johnson	Jun-94
TN	Chattanooga	Jun-94
TN	Knoxville	Jul-94
TN	Nashville	Nov-94
TX	Abilene	Apr-93
TX	Amarillo	Jun-92
TX	Austin	May-93
TX	Beaumont/Port Arthur	May-93
TX	Brownsville	Mar-95
TX	Corpus Christi	Mar-95
TX	Dallas/Fort Worth	Feb-95
TX	Del Rio	May-93
TX	El Paso	Jun-93
TX	Houston	May-95
TX	Lubbock	Jun-93
TX	Midland	Dec-94
TX	San Angelo	Jan-95
TX	San Antonio	Oct-93
TX	Victoria	Apr-95
TX	Waco	Dec-92
TX	Wichita Falls	Dec-92
UT	Milford	Feb-95
UT	Salt Lake City	Jan-95
VA	Lynchburg	Aug-94
VA	Norfolk	Sep-94
VA	Richmond	Oct-94
VA	Roanoke	Oct-94
VA	Wallops Island	Nov-94
VT	Burlington	Sep-95
WA	Olympia	Sep-92
WA	Quillayute	Aug-92
WA	Seattle	Jul-94
WA	Spokane	Dec-92
WA	Stampede Pass	Dec-92
WA	Yakima	Jan-93
WI	Green Bay	Jul-94
WI	Madison	Aug-95
WI	Milwaukee	Jul-92
WV	Beckley	Jun-93
WV	Charleston	Jun-93
WV	Elkins	Jul-93
WV	Huntington	Jul-93
WY	Casper	Nov-94
WY	Cheyenne	Aug-92
WY	Riverton	Nov-94
WY	Sheridan	Oct-92

Appendix A

MASTER TRANSITION SCHEDULE

The Master Transition Schedule (MTS) is the official document for review and evaluation of progress of the transition to the modernized NWS. It shows the schedules for major activities and events identified in the transition work breakdown structure, and their interdependencies. In addition to the major systems acquisition phases, such as the limited production and full scale production phases of NEXRAD and the development and production phases of ASOS, the MTS shows related activities in future operations and services, training and professional development, facilities preparation, implementation and phaseover, human resources, etc., as defined by the Work Breakdown Structure (WBS). Changes to the MTS will be controlled through the transition change management process.

The current approved Master Transition Schedule is attached. An explanation of the symbols used on the MTS and description of the activities depicted on the MTS follows.

Explanation of MTS Symbols

The MTS is a Program Evaluation and Review Technique chart, also called a PERT network, and shows the duration of various transition activities that must be accomplished against a time scale as well as the logical order in which these activities must occur.

The basic elements that comprise the MTS are shown in Figure A1. Each activity is shown as a horizontal rectangular box with an activity title below it. The vertical lines connecting activities together represent linkages, also called dependencies between activities. In Figure A1, Activity B is dependent on Activity A. That is, Activity A must be completed before Activity B can start. This is called a "finish-to-start" type dependency. Activities may also be linked as "start-to-start" (which means that the start of one activity triggers the start of another,) and "finish-to-finish" (which means that two activities must be completed at the same time). The numbers on the left and right side of Figure A1 are reference line numbers for locating activities.

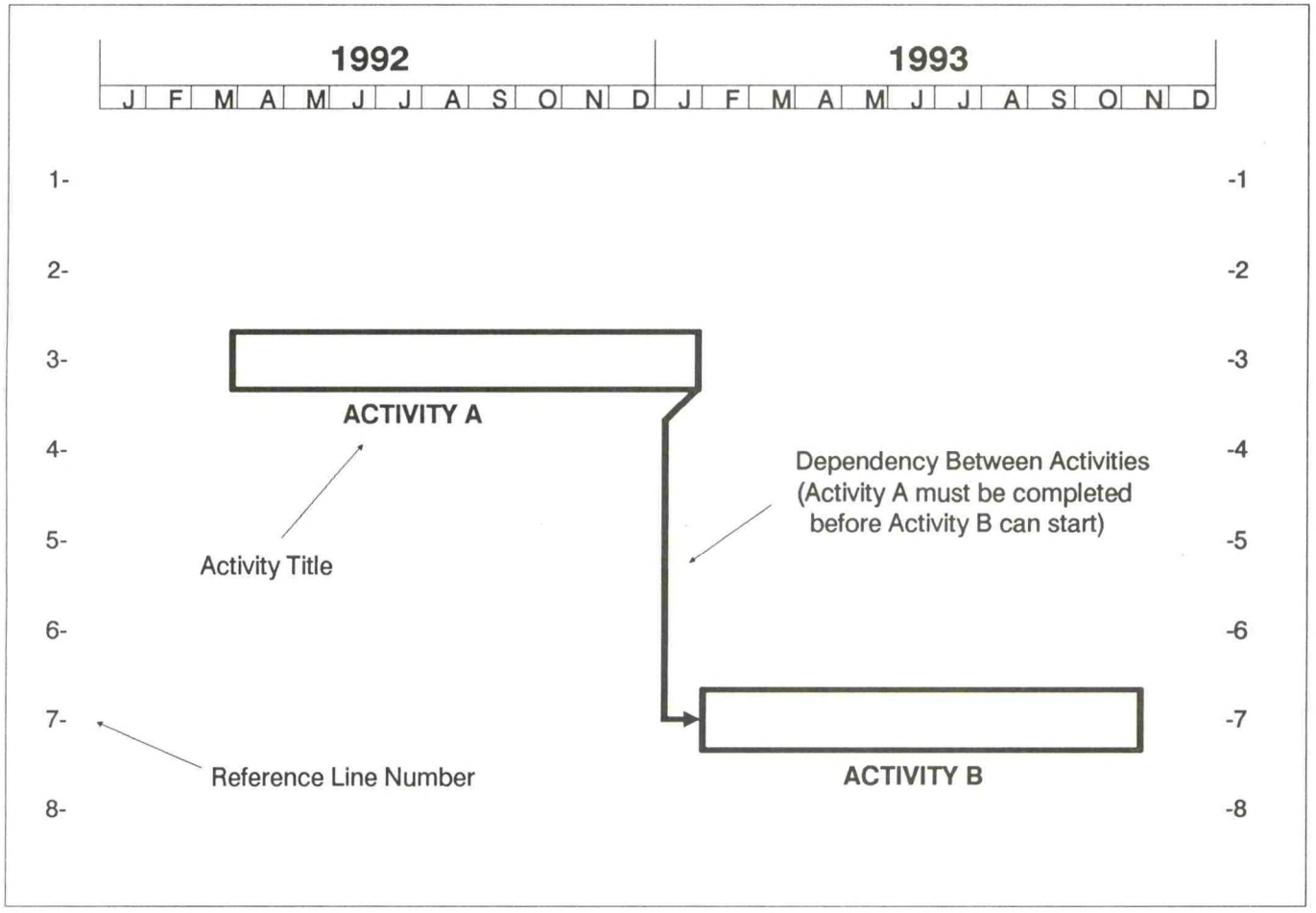


Figure A1

Figure A2 illustrates the concept of float. The start of Activity B is dependent on completion of both Activity A and C. Since Activity C is scheduled to be completed before Activity A, the period of time between the scheduled completion of Activity C and the scheduled completion of Activity A is called "float." Float represents an allowance for slippage of scheduled completion of an activity that does not affect the overall time it takes to complete the set of activities. Thus in Figure A2, completion of Activity C could slip until the completion of Activity A without increasing the total time to complete all three activities.

The longest path in time through all the activities in the network is called the "critical path" and represents the total time required to complete the entire project. Any schedule slippage in an activity on the critical path will delay completion of the overall project correspondingly.

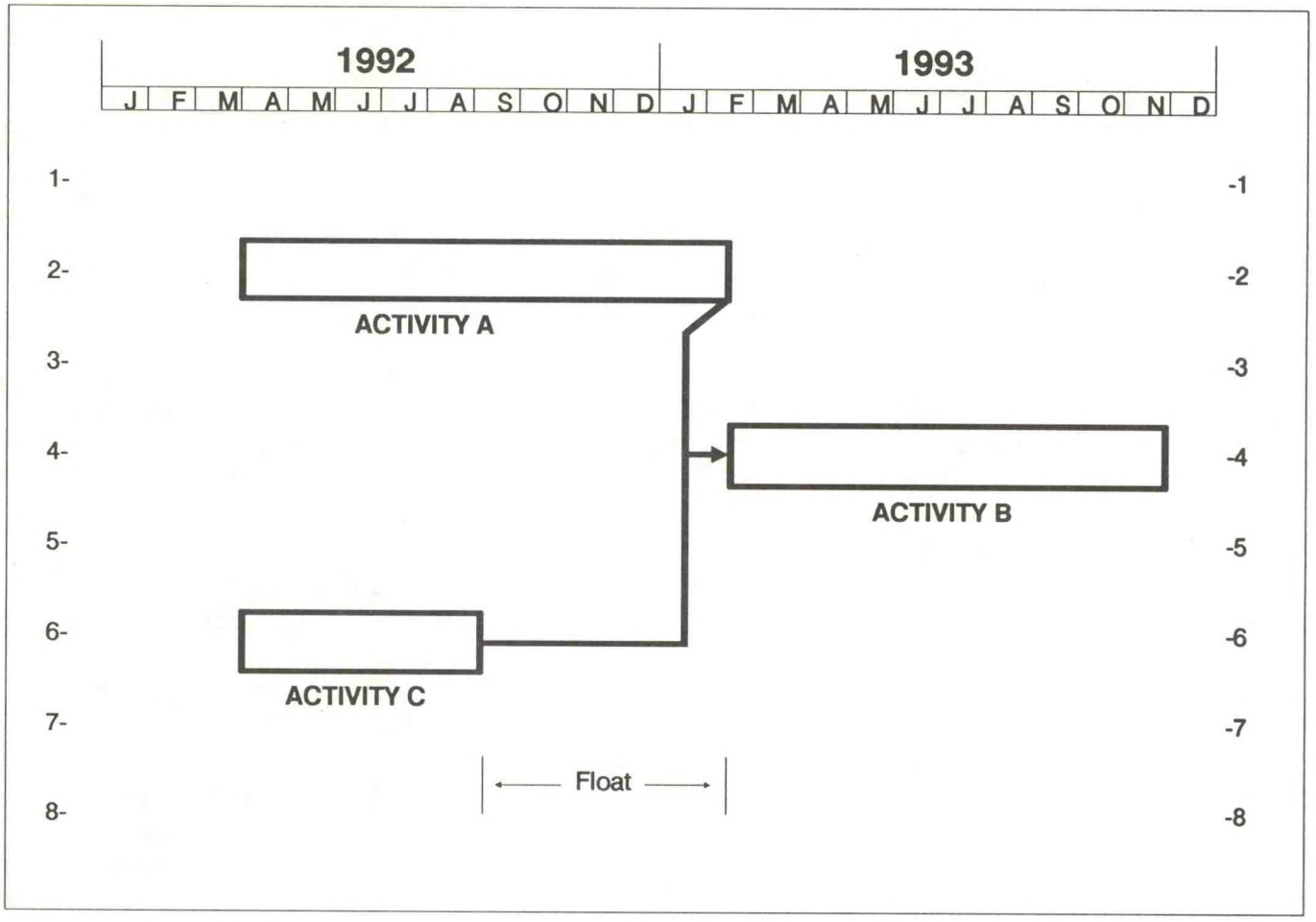


Figure A2

Description of the Activities Depicted on the MTS

The activities shown on the MTS comprise the major steps in transition to the modernized and restructured National Weather Service. These activities fall into logical groupings and are described below. Reference line numbers are given to help locate the various activities on the MTS.

Principal Path - The Principal Path, described in Section 3.6 of the National Implementation Plan, consists of Pre-MARD Risk Reduction Programs (reference line #3); an Office Transition & Evaluation period for MARD (reference line #3); the MARD - Modernization and Associated Restructuring Demonstration (reference line #2); and Initial Stage 2 Service Implementation nationwide (reference line #3). At the end of the Office Transition & Evaluation period is a MARD Sites Stable Operations Period (reference line #3). A MARD Evaluation activity (reference line #4) runs in parallel with the MARD. The Principal Path activities are dependent on the other major sets of transition activities described below.

Transition Planning - Planning activities include: completion of the Strategic Plan (not shown) and initial National Implementation Plan (not shown) which were submitted to Congress in

March 1989 and March 1990 respectively; completion of the next annual update to the National Implementation Plan (reference line #1); completion of Regional Transition and Site Implementation Plans (reference line #1); completion of certifications that no degradation of services will result (not shown); and completion of the MARD Plan (reference line #2).

Facilities Preparation - Facilities activities in the first several years consist of Site Design for the MARD sites (completed, not shown); Construction of the MARD offices (completed, not shown); and Office BOD - Beneficial Occupancy Date (reference line #10) which is defined as availability of the MARD site offices for occupancy.

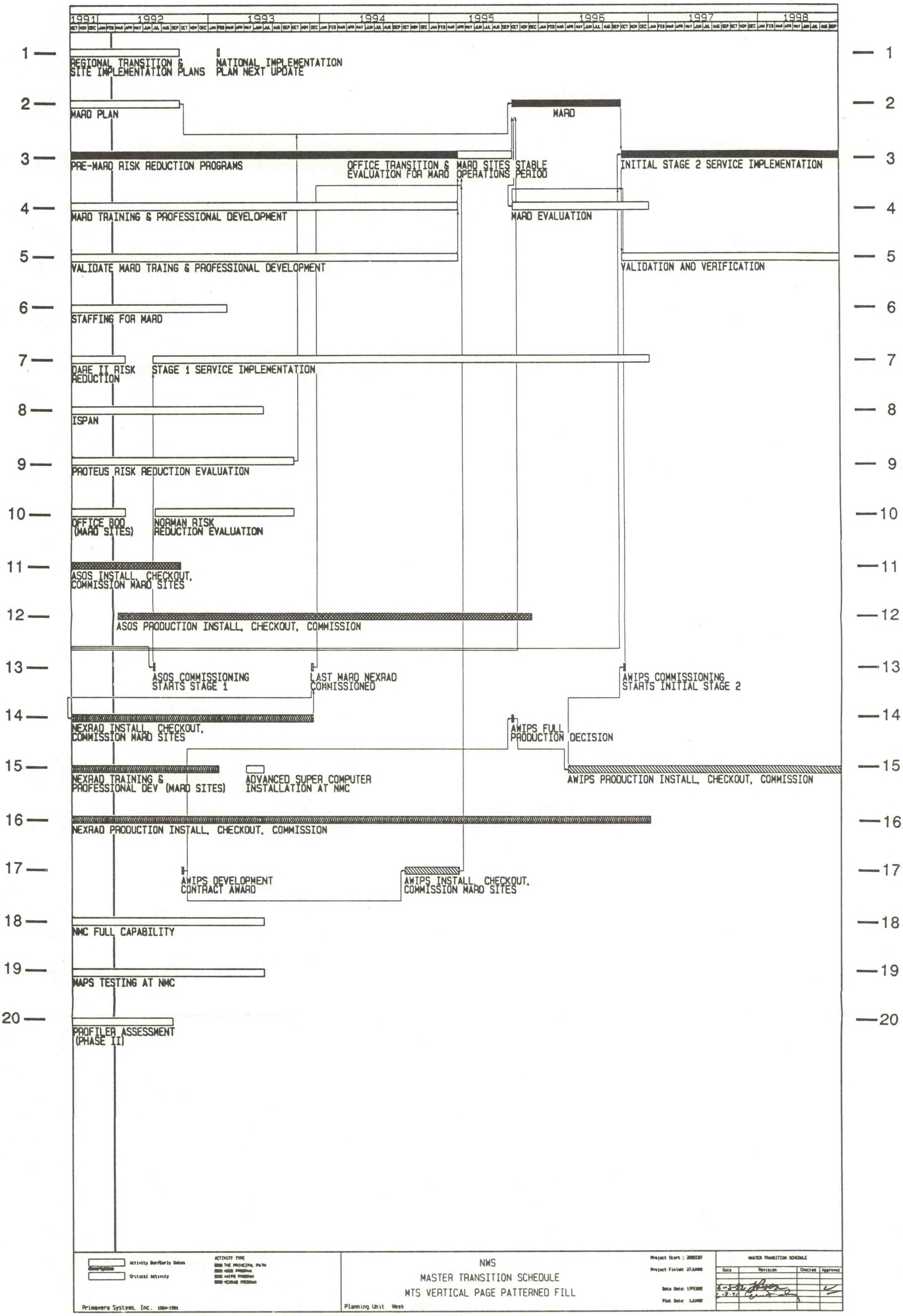
Risk Reduction - Risk reduction activities in the first several years include: the DARE II project (reference line #7); ISPAN -Information Stream Project for AWIPS and NOAAPORT (reference line #8); the PROTEUS project (reference line #9); and the Norman project (reference line #10).

Research Programs - Research activities shown include: MAPS - Mesoscale Analysis and Prediction System Testing at NMC (reference line #19); and Profiler Production and Assessment Phase I (completed, not shown) and Assessment Phase II (reference line #20).

New Technologies - Activities associated with implementation and commissioning of the various new technologies required for the MARD include: ASOS installation, checkout and commissioning for the MARD sites (reference line #11); NEXRAD installation, checkout and commissioning for the MARD sites (reference line #14); AWIPS installation, checkout and commissioning for the MARD sites (reference line #17); and installation of the Cray YMP8 computer system (completed, not shown) and the advanced super computer system for NMC (reference line #15). Activities associated with implementation and commissioning of the various new technologies required for modernization nationwide include: ASOS installation, checkout and commissioning (reference line #12); NEXRAD installation, checkout and commissioning (reference line #16); and AWIPS installation, checkout and commissioning (reference line #15).

Staffing, Training and Professional Development - Staffing for the MARD sites (reference line #6) is followed by both MARD and NEXRAD Training & Professional Development (reference lines #4 and 15) for the personnel at the MARD sites, and subsequent Validation of the MARD Training & Professional Development (reference line #5).

Services - Activities associated with operational services include: NMC Full Capability (reference line #18) which is provision of centrally prepared guidance products to field offices; Stage 1 Service Implementation (reference line #7); Initial Stage 2 Service Implementation (reference line #3); and Validation and Verification (reference line #5) of services.


1991
1992
1993
1994
1995
1996
1997
1998
1 REGIONAL TRANSITION & SITE IMPLEMENTATION PLANS
NATIONAL IMPLEMENTATION PLAN NEXT UPDATE
2 MARD PLAN
MARD
3 PRE-MARD RISK REDUCTION PROGRAMS
OFFICE TRANSITION & EVALUATION FOR MARD
MARD SITES STABLE OPERATIONS PERIOD
INITIAL STAGE 2 SERVICE IMPLEMENTATION
4 MARD TRAINING & PROFESSIONAL DEVELOPMENT
MARD EVALUATION
5 VALIDATE MARD TRAING & PROFESSIONAL DEVELOPMENT
VALIDATION AND VERIFICATION
6 STAFFING FOR MARD
7 DARE II RISK REDUCTION
STAGE 1 SERVICE IMPLEMENTATION
8 ISPAN
9 PROTEUS RISK REDUCTION EVALUATION
10 OFFICE BOD (MARD SITES)
NORMAN RISK REDUCTION EVALUATION
11 ASOS INSTALL, CHECKOUT, COMMISSION MARD SITES
12 ASOS PRODUCTION INSTALL, CHECKOUT, COMMISSION
13 ASOS COMMISSIONING STARTS STAGE 1
LAST MARD NEXRAD COMMISSIONED
AWIPS COMMISSIONING STARTS INITIAL STAGE 2
14 NEXRAD INSTALL, CHECKOUT, COMMISSION MARD SITES
AWIPS FULL PRODUCTION DECISION
15 NEXRAD TRAINING & PROFESSIONAL DEV (MARD SITES)
ADVANCED SUPER COMPUTER INSTALLATION AT NMC
AWIPS PRODUCTION INSTALL, CHECKOUT, COMMISSION
16 NEXRAD PRODUCTION INSTALL, CHECKOUT, COMMISSION
17 AWIPS DEVELOPMENT CONTRACT AWARD
AWIPS INSTALL, CHECKOUT, COMMISSION MARD SITES
18 NMC FULL CAPABILITY
19 MAPS TESTING AT NMC
20 PROFILER ASSESSMENT (PHASE II)
Activity Bar/Early Dates
Critical Activity
ACTIVITY TYPE
THE PRINCIPAL PATH
NEXRAD PROGRAM
AWIPS PROGRAM
MODERNIZATION PROGRAM
Primavera Systems, Inc. 1984-1991
NWS
MASTER TRANSITION SCHEDULE
MTS VERTICAL PAGE PATTERNED FILL
Planning Unit Week
Project Start : 28DEC87
Project Finish: 27JAN98
Data Date: 17FEB92
Plot Date: 13JAN92
MASTER TRANSITION SCHEDULE
Date
Revision
Checked
Approved

Appendix B

OUTLINES FOR REGIONAL TRANSITION AND SITE IMPLEMENTATION PLANS

This appendix provides detailed outlines for use by the Regions in preparing Regional Transition Plans and Site Implementation Plans. Attached are the following:

REGIONAL TRANSITION PLAN OUTLINE

SECTION 1 INTRODUCTION

1.1 Purpose and Scope of RTP
1.2 Relationship of RTP to NIP and SIPs

SECTION 2 REGION LEVEL ACTIVITIES

2.1 Responsibility
2.1.1 Regional Transition Plan Updates
2.1.2 Site Implementation Plans and Updates
2.1.3 Internal and External Coordination
2.1.4 Establish Operational Readiness
2.1.5 Certification
2.2 Overview of Personnel Actions
2.3 Strategies
2.3.1 Office operations
2.3.2 Staffing
2.3.3 Technology
2.3.4 Programs
2.3.5 Internal & External Coordination
2.3.6 Establishing Operational Readiness
2.3.7 Certification Process
- Notification of Significant Events
- Notification of Intent to Certify
- Certification

2.4 Guidance
2.4.1 Stage 1 ROMLS For WSOM Chapter - When
2.4.2 Initial Stage 2 ROMLS For WSOM Chapter - When
2.4.3 Stage 2 ROMLS For WSOM Chapter - When

SECTION 3 OFFICE RESOURCES INVENTORY

3.1 Staff: Number/Title - Date/Update
3.2 Technology: Type - Date/Update
3.3 Programs: Type - Date/Update
3.4 Dissemination
3.5 Communications

SECTION 4 OFFICE SCHEDULES

4.1	Future Office Locations: Office name(s), city/town
4.2	Facility Schedules: Completion Date (Build/Renovate)
4.3	Technology Schedules
4.3.1	System Z: Delivery Date
4.3.2	ASOS: Implementation Schedule
4.3.3	NEXRAD: Delivery Date
4.3.4	Profiler: Delivery Date
4.3.5	AWIPS: Delivery Date
4.3.6	Other Technology
4.4	SIP Schedule: Due Date
4.5	Coordination schedule: Internal: Date required External: Date required
4.6	Program Change Schedule:
4.6.1	Warnings: What - Where - When
4.6.2	Public: What - Where - When
4.6.3	Aviation: What - Where - When
4.6.4	Marine: What - Where - When
4.6.5	Applied Services: What - Where - When
4.6.6	Hydrology: What - Where - When

SECTION 5 OFFICE IMPLEMENTATION AND PHASEOVER

5.1	General Implementation and Phaseover Strategy
5.2	Risk Reduction: What/When
5.3	Stage 1 Activities
5.3.1	Staffing: Increase/Decrease - Who/When
5.3.2	Training: Type - Who/When
5.3.3	Technology: Type - Add/Transfer - From/To/When
5.3.4	Programs: Type - Add/Transfer - From/To/When
5.3.5	Stage 1: Commissioning/Decommissioning - When
5.4	Initial Stage 2 Activities
5.4.1	Staffing: Increase/Decrease - When
5.4.2	Training: Type - When
5.4.3	Technology: Type - Add/Transfer - From/To/When
5.4.4	Programs: Type - Add/Transfer - From/To/When
5.4.5	Initial Stage 2: WFO Commissioning - When
5.5	Stage 2 Activities
5.5.1	Staffing Changes - When
5.5.2	Training: Type - When
5.5.3	Technology: Type - Add/Transfer - From/To/When
5.5.4	Programs: Type - Add/Transfer - From/To/When

SITE IMPLEMENTATION PLAN OUTLINE

SECTION 1 INTRODUCTION

1.1 Purpose of the Site Implementation Plan

The National Weather Service is engaged in the Modernization and Associated Restructuring (MAR) of the agency. The accomplishment of this goal requires a major transition from current to MAR operations while maintaining an adequate level of services. The bulk of this transition will occur at the NWS field offices. This document will identify the specific activities, schedules, and procedures required to accomplish transition at the NWS field offices in future WFO _____'s area of responsibility. This document will also provide site level information for the agency, new technology contractors, and Meteorologist-In-Charge for the no degradation of service certification.

1.2 Relationship of the Site Implementation Plan to the National Implementation Plan and the Regional Transition Plan

This plan employs the strategies developed in the National Implementation Plan and refined in the Regional Transition Plan to implement transition at the field offices which are located in WFO _____'s area of responsibility. Specific activities and schedules included in the plan are obtained from the Transition Work Breakdown Schedule, defined in the National Implementation Plan, the Regional Transition Plan, and from the actual field offices.

1.3 Scope of Site Implementation Plan

This document includes all the activities required to achieve full modernization and associated restructuring at the field offices which are located in WFO _____'s area of responsibility. These offices include;

WFO _____,
The _____ River Forecast Center (RFC),
(if the WFO is colocated with an RFC)
CWSU _____,
(if there is a CWSU in WFO's area of responsibility)
Other _____,
(if there is some "other" type office in WFOs area)
WSOs _____, _____, etc..,
WSMOs _____, _____, etc.., and
WSCMOs _____, _____, etc...

1.4 Major Site Transition Milestones

SECTION 2 OFFICE RESOURCES INVENTORY

2.1 WSFO/WSO (To Become WFO)
2.1.1 Staff
2.1.2 Technology
2.1.3 Programs
Warnings
Warning Preparedness
Public
Marine
Aviation
Observations
Surface
Synoptic
Upper air
Hydrologic
Radar
Climate
Other
NOAA Weather Radio
Air Pollution
Fire Weather
Agriculture
Hydrology
Hazardous Materials (spills, etc.)
Miscellaneous (Avalanche, etc.)
2.1.4 Dissemination
2.1.5 Communications
2.1.6 Applications Software
2.1.7 Miscellaneous Inventory
2.2 RFC
2.2.1 Staff
2.2.2 Technology
2.2.3 Programs
Short-Range Forecasting
Flash Flood Guidance
Extended-Range Forecasting
Observed Hydrometeorological Data Assimilation
Hydrometeorological Forecast Assimilation
Hydrometeorological Discussions
Intra-Agency Support Activities
Interagency Support Activities
2.2.4 Dissemination
2.2.5 Communications
2.2.6 Applications Software
2.3 CWSU
2.3.1 Staff
2.3.2 Technology
2.3.3 Programs
2.3.4 Dissemination

2.3.5 Communications
2.3.6 Applications Software
2.4 Other Offices (AWSC, NSO, TWS, Etc.)
2.4.1 Staff
2.4.2 Technology
2.4.3 Programs
2.4.4 Dissemination
2.4.5 Communications
2.4.6 Applications Software
2.5 Other Offices (WSO, WSMO, WSCMO - Continue With 2.6, 2.7, 2.8... 2.n to Account For All Other Offices in WFO area)
2.5.1 Staff
2.5.2 Technology
2.5.3 Programs
2.5.4 Dissemination
2.5.5 Communications

SECTION 3 OFFICE TRANSITION ACTIVITIES

3.1 Site (WSFO/WSO to NWSFO/NWSO to WFO)
3.1.1 Facility
3.1.1.1 Facility Preparation Activities For Stage 1
New Facility:
- Leave Old Facility/Terminate Lease
- Acquire Mailing Address
- Access
- Completion Date
- Acceptance Date
- Occupancy Date

Modify Existing Facility:
- Modifications Required
- Interim Furniture/Equipment Configuration
- Completion Date
- Acceptance Date
- Re-occupancy Date

Floor Plan Design
Office and Equipment Layout
Install and Accept Signal and Power Runs
Utility Requirements
- Water and Sewer
- Electric
- Auxiliary/Emergency Power

Furniture Acquisition
Facility Maintenance
3.1.1.2 Facility Preparation Activities For Initial Stage 2
AWIPS Installation
3.1.1.3 Upper Air Inflation Building
Design

Design Approval
Prepare SOW
Let Contract
Begin Construction
Acceptance

3.1.2 Staffing

3.1.2.1 Staff Changes For Stage 1

NWSFO
- MIC
- SOO
- WCM
- Meteorologists
- Service Hydrologists
- DAPM
- Hydromet Techs
- ESA
- Electronics Techs
- Other

NWSO
- MIC
- SOO
- WCM
- Meteorologists
- Service Hydrologists
- DAPM
- Hydromet Techs
- ESA
- Electronics Techs
- Other

3.1.2.2 Staff Changes For Initial Stage 2

NWSFO to WFO
- Meteorologists (+/-)
- Hydromet Techs (+/-)
- Electronics Techs(+/-)
- Other

NWSO to WFO
- Meteorologists (+)
- Hydromet Techs (+/-)
- Electronics Techs (+/-)
- Other

3.1.2.3 Staff Changes For Stage 2

3.1.3 Training and Professional Development (T & PD)

3.1.3.1 T & PD For Stage 1

NEXRAD
ASOS
Maintenance
Hydromet Tech.
Other

3.1.3.2 T & PD For Initial Stage 2

AWIPS

	Other
3.1.3.3	T & PD For Stage 2
	AWIPS Advanced Capabilities
	Other
3.1.4	Technology
3.1.4.1a	Pre-MAR Technology - Activities For Stage 1
	Surface Observing Equipment
	HO-83
	F-420
	LBC
	Sunshine Switch & Recorder
	Special Use Equip (Solirad, etc)
	Other Observing Systems
	Radar
	Upper Air
	Helium/Hydrogen Contracts
	AFOS
	ABT
	SWIS/MicroSWIS
	RADID/KAVOURIS/RAPID II/ICRAD
	Other
3.1.4.1b	Pre-MAR Technology - Activities For Initial Stage 2
	AFOS
	ABT
	SWIS/MicroSWIS
	Other
3.1.4.1c	Pre-MAR Technology - Activities For Stage 2
	Other
3.1.4.2a	New MAR Technology - Activities For Stage 1
	System Z
	ASOS
	Micro-ART
	NEXRAD
	LDADS
	NWR Upgrade
	Other
3.1.4.2b	New MAR Technology - Activities For Initial Stage 2
	AWIPS
	Other
3.1.4.2c	New MAR Technology - Upgrades For Stage 2
3.1.5	Programs
3.1.5.1	Program Changes For Stage 1
	Warnings
	Warning Preparedness
	Public
	Marine
	Aviation
	Observations
	Surface
	Synoptic

Upper air
Hydrologic
Radar
Climate
Other
NOAA Weather Radio
Air Pollution
Fire Weather
Agriculture
Hydrology
Hazardous Materials (spills, etc.)
Miscellaneous (Avalanche, etc.)

3.1.5.2 Program Changes For Initial Stage 2

Warnings
Warning Preparedness
Public
Marine
Aviation
Observations
Surface
Synoptic
Upper air
Hydrologic
Radar
Climate
Other
NOAA Weather Radio
Air Pollution
Fire Weather
Agriculture
Hydrology
Hazardous Materials (spills, etc.)
Miscellaneous (Avalanche, etc.)

3.1.5.3 Program Changes For Stage 2

Warnings
Warning Preparedness
Public
Marine
Aviation
Observations
Surface
Synoptic
Upper air
Hydrologic
Radar
Climate
Other
NOAA Weather Radio
Air Pollution
Fire Weather

Agriculture
Hydrology
Hazardous Materials (spills, etc.)
Miscellaneous (Avalanche, etc.)

3.1.6 Dissemination

3.1.6.1 Dissemination Activities For Stage 1
NWR Consoles
NWWS
Other

3.1.6.2 Dissemination Activities For Initial Stage 2
Additions
Changes

3.1.6.3 Dissemination Activities For Stage 2
Additions
Changes

3.1.7 Communications

3.1.7.1 Communications Activities For Stage 1
Telephone Systems
- Office Phone System
- Telephone Recording Devices
- WATTS Lines

NAWAS
RDC/SDC Communications
S-140
Alert Systems
IFLOWS
ROSA
FAA Electrowriter
Communications Lines
- Type
- Disconnect/Connect/Transfer

3.1.7.2 Communications Activities For Initial Stage 2
Communications Lines
- Type - Disconnect/Connect/Transfer

3.1.7.3 Communications Activities For Stage 2
Communications Lines
- Type - Disconnect/Connect/Transfer

3.1.8 Maintenance

3.1.8.1 Maintenance Changes For Stage 1

3.1.8.2 Maintenance Changes For Initial Stage 2

3.1.8.3 Maintenance Changes For Stage 2

3.1.9 Coordination

3.1.9.1a Internal Coordination For Stage 1
Regional Headquarters
NWS Headquarters
Union

3.1.9.1b Internal Coordination For Initial Stage 2
Regional Headquarters
NWS Headquarters
Union

3.1.9.1c	Internal Coordination For Stage 2
	Regional Headquarters
	NWS Headquarters
	Union
3.1.9.2a	External Coordination For Stage 1
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
	Private Meteorologists
3.1.9.2b	External Coordination For Initial Stage 2
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
	Private Meteorologists
3.1.9.2c	External Coordination For Stage 2
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
	Private Meteorologists
3.1.10	Other Changes
3.1.10.1	Other Changes For Stage 1
3.1.10.2	Other Changes For Initial Stage 2
3.1.10.3	Other Changes For Stage 2
3.1.11	Station Duty Manual
3.1.11.1	Stage 1 Station Duty Manual
3.1.11.2	Initial Stage 2 Station Duty Manual
3.1.11.3	Stage 2 Station Duty Manual
3.1.12	Site Operational Readiness
3.1.12.1	Establish Stage 1 Operational Readiness
3.1.12.2	Establish Initial Stage 2 Operational Readiness
3.1.12.3	Establish Stage 2 Operational Readiness
3.2	River Forecast Center (RFC)
3.2.1	Facility
3.2.1.1	Facility Preparation Activities For Stage 1
	Equipment Inventory
	Floor Plan Requirements -
	Coordinate With MIC/Regional/National HQ

Office and Equipment Layout -
Coordinate With MIC/Regional/National HQ
Plan Furniture/Equipment to Dispose/Move
Furniture Acquisition
Utility Requirements - Coordinate with Region
Facility Maintenance - Coordinate with MIC
New Facility:
Leave Old Facility - Terminate Lease, Utilities
Occupancy Date
Modify Existing Facility:
Interim Furniture/Equipment Configuration
Re-occupancy Date

3.2.1.2 Facility Preparation Activities For Initial Stage 2
Modifications To Layout For AWIPS

3.2.2 Staffing

3.2.2.1 Staff Changes For Stage 1
Hydrologist In Charge (HIC)
Development and Operations Hydrologist (DOH)
Senior HAS Forecaster
HAS Forecasters (2)
Other

3.2.2.2 Staff Changes For Initial Stage 2
Senior Hydrologic Forecasters
Hydrologic Forecasters
Hydrologic Interns
Other

3.2.3 Training and Professional Development (T & PD)

3.2.3.1 T & PD For Stage 1
NEXRAD
Other

3.2.3.2 T & PD For Initial Stage 2
AWIPS
Other

3.2.3.3 T & PD For Stage 2
Upgraded Operational Capabilities

3.2.4 Technology

3.2.4.1a Pre-MAR Technology - Activities For Stage 1
AFOS
RJE System
RFC Gateway II
Other

3.2.4.1b Pre-MAR Technology - Activities For Initial Stage 2
AFOS (decommission)
RJE System (decommission)
RFC Gateway II
Other

3.2.4.1c Pre-MAR Technology - Activities For Stage 2
RFC Gateway II
Other

3.2.4.2a New MAR Technology - Activities For Stage 1

	NEXRAD PUP
	Other
3.2.4.2b	New MAR Technology - Activities For Initial Stage 2
	AWIPS
	Other
3.2.4.2c	New MAR Technology - Upgrades For Stage 2
	AWIPS Upgrade
	Other
3.2.4.3a	Operational Forecast System - Activities For Stage 1
	Conversion to NWSRFS
3.2.4.3b	Operational Forecast System - Activities For Initial Stage 2
	Input of Gridded Precipitation Estimates
	On Site, Interactive NWSRFS
3.2.4.3c	Operational Forecast System - Activities For Stage 2
	Forecast System Upgrades
3.2.5	Programs
3.2.5.1	Program Changes For Stage 1
3.2.5.1a	Short-Range Forecasting
3.2.5.1b	Flash Flood Guidance
3.2.5.1c	Extended-Range Forecasting
3.2.5.1d	Observed Hydrometeorological Data Assimilation
3.2.5.1e	Hydrometeorological Forecast Assimilation
3.2.5.1f	Hydrometeorological Discussions
3.2.5.1g	Intra-Agency Support Activities
3.2.5.1h	Interagency Support Activities
3.2.5.2	Program Changes For Initial Stage 2
3.2.5.2a	Short-Range Forecasting
3.2.5.2b	Flash Flood Guidance
3.2.5.2c	Extended-Range Forecasting
3.2.5.2d	Observed Hydrometeorological Data Assimilation
3.2.5.2e	Hydrometeorological Forecast Assimilation
3.2.5.2f	Hydrometeorological Discussions
3.2.5.2g	Intra-Agency Support Activities
3.2.5.2h	Interagency Support Activities
3.2.5.3	Program Changes For Stage 2
3.2.5.3a	Short-Range Forecasting
3.2.5.3b	Flash Flood Guidance
3.2.5.3c	Extended-Range Forecasting
3.2.5.3d	Observed Hydrometeorological Data Assimilation
3.2.5.3e	Hydrometeorological Forecast Assimilation
3.2.5.3f	Hydrometeorological Discussions
3.2.5.3g	Intra-Agency Support Activities
3.2.5.3h	Interagency Support Activities
3.2.6	Dissemination
3.2.6.1	Dissemination Changes For Stage 1
3.2.6.2	Dissemination Changes For Initial Stage 2
3.2.6.3	Dissemination Changes For Stage 2
3.2.7	Communications
3.2.7.1	Communications Activities For Stage 1
	Telephone Systems

	Communications Lines - Type
3.2.7.2	Communications Activities For Initial Stage 2
3.2.7.3	Communications Activities For Stage 2
3.2.8	Maintenance
3.2.8.1	Maintenance Changes For Stage 1
3.2.8.2	Maintenance Changes For Initial Stage 2
3.2.8.3	Maintenance Changes For Stage 2
3.2.9	Coordination
3.2.9.1a	Internal Coordination For Stage 1
	NWSFOs/NWSOs
	Regional Headquarters
	NWS Headquarters
	Union
3.2.9.1b	Internal Coordination For Initial Stage 2
	WFOs
	Regional Headquarters
	NWS Headquarters
	Union
3.2.9.1c	Internal Coordination For Stage 2
	WFOs
	Regional Headquarters
	NWS Headquarters
	Union
3.2.9.2a	External Coordination For Stage 1
	Congressional
	State
	County
	Media
	Water Resources Cooperators
	Other Federal Agencies
3.2.9.2b	External Coordination For Initial Stage 2
	Congressional
	State
	County
	Media
	Water Resources Cooperators
	Other Federal Agencies
3.2.9.2c	External coordination For Stage 2
	State
	County
	Media
	Water Resources Cooperators
	Other Federal Agencies
3.2.10	Other Changes
3.2.10.1	Other Changes For Stage 1
3.2.10.2	Other Changes For Initial Stage 2
3.2.10.3	Other Changes For Stage 2
3.2.11	Station Duty Manual
3.2.11.1	Stage 1 Station Duty Manual
3.2.11.2	Initial Stage 2 Station Duty Manual

3.2.11.3	Stage 2 Station Duty Manual
3.2.12	Site Operational Readiness
3.2.12.1	Establish Stage 1 Operational Readiness
3.2.12.2	Establish Initial Stage 2 Operational Readiness
3.2.12.3	Establish Stage 2 Operational Readiness
3.3	CWSU
3.3.1	Facility Changes
3.3.1a	Facility Changes For Stage 1
3.3.1b	Facility Changes For Initial Stage 2
3.3.1c	Facility Changes For Stage 2
3.3.2	Staffing
3.3.2a	Staffing Changes For Stage 1
3.3.2b	Staffing Changes For Initial Stage 2
3.3.2c	Staffing Changes For Stage 2
3.3.3	Training and Professional Development (T & PD)
3.3.3a	T & PD For Stage 1
	NEXRAD
	Other
3.3.3b	T & PD For Initial Stage 2
	CWSU Workstation
	Other
3.3.3c	T & PD For Stage 2
3.3.4	Technology
3.3.4.1a	Use of Pre-MAR Technology in Stage 1
	Decommission/Dispose
3.3.4.1b	Use of Pre-MAR Technology in Initial Stage 2
	Decommission/Dispose
3.3.4.1c	Use of Pre-MAR Technology in Stage 2
3.3.4.2a	New Stage 1 Technologies
3.3.4.2b	New Initial Stage 2 Technologies
	CWSU Workstation
	Other
3.3.4.2c	New Stage 2 Technologies
3.3.5	Programs
3.3.5.1	Program Changes For Stage 1
3.3.5.2	Program Changes For Initial Stage 2
3.3.5.3	Program Changes For Stage 2
3.3.6	Dissemination
3.3.6.1	Dissemination Changes For Stage 1
3.3.6.2	Dissemination Changes For Initial Stage 2
3.3.6.3	Dissemination Changes For Stage 2
3.3.7	Communications
3.3.7.1	Communications Changes For Stage 1
3.3.7.2	Communications Changes For Initial Stage 2
3.3.7.3	Communications Changes For Stage 2
3.3.8	Maintenance
3.3.8.1	Maintenance Changes For Stage 1
3.3.8.2	Maintenance Changes For Initial Stage 2
3.3.8.3	Maintenance Changes For Stage 2

3.3.9	Coordination
3.3.9.1a	Internal Coordination For Stage 1 Regional Headquarters NWS Headquarters Union
3.3.9.1b	Internal Coordination For Initial Stage 2 Regional Headquarters NWS Headquarters Union
3.3.9.1c	Internal Coordination For Stage 2 Regional Headquarters NWS Headquarters Union
3.3.9.2a	External Coordination For Stage 1 FAA
3.3.9.2b	External Coordination For Initial Stage 2 FAA
3.3.9.2c	External Coordination For Stage 2
3.3.10	Other Changes
3.3.10.1	Other Changes For Stage 1
3.3.10.2	Other Changes For Initial Stage 2
3.3.10.3	Other Changes For Stage 2
3.3.11	Station Duty Manual
3.3.11.1	Stage 1 Station Duty Manual
3.3.11.2	Initial Stage 2 Station Duty Manual
3.3.11.3	Stage 2 Station Duty Manual
3.3.12	Site Operational Readiness
3.3.12.1	Establish Stage 1 Operational Readiness
3.3.12.2	Establish Initial Stage 2 Operational Readiness
3.3.12.3	Establish Stage 2 Operational Readiness
3.4	Other Offices (AWSC, NSO, TWS, Etc.)
3.4.1	Facility
3.4.1.1	Facility Changes For Stage 1
3.4.1.2	Facility Changes For Initial Stage 2
3.4.1.3	Facility Changes For Stage 2
3.4.2	Staffing
3.4.2.1	Staffing Changes For Stage 1
3.4.2.2	Staffing Changes For Initial Stage 2
3.4.3	Training and Professional Development
3.4.3.1	T & PD For Stage 1
3.4.3.2	T & PD For Initial Stage 2
3.4.3.3	T & PD For Stage 2
3.4.4	Technology
3.4.4.1a	Use of Pre-MAR Technology in Stage 1
3.4.4.1b	Use of Pre-MAR Technology in Initial Stage 2
3.4.4.1c	Use of Pre-MAR Technology in Stage 2
3.4.4.2a	New Stage 1 Technologies
3.4.4.2b	New Initial Stage 2 Technologies
3.4.4.2c	New Stage 2 Technologies

3.4.5	Programs
3.4.5.1	Program Changes For Stage 1
3.4.5.2	Program Changes For Initial Stage 2
3.4.5.3	Program Changes For Stage 2
3.4.6	Dissemination
3.4.6.1	Dissemination Changes For Stage 1
3.4.6.2	Dissemination Changes For Initial Stage 2
3.4.6.3	Dissemination Changes For Stage 2
3.4.7	Communications
3.4.7.1	Communications Changes For Stage 1
3.4.7.2	Communications Changes For Initial Stage 2
3.4.7.3	Communications Changes For Stage 2
3.4.8	Maintenance
3.4.8.1	Maintenance Changes For Stage 1
3.4.8.2	Maintenance Changes For Initial Stage 2
3.4.8.3	Maintenance Changes For Stage 2
3.4.9	Coordination
3.4.9.1a	Internal Coordination For Stage 1 Regional Headquarters NWS Headquarters Union
3.4.9.1b	Internal Coordination For Initial Stage 2 Regional Headquarters NWS Headquarters Union
3.4.9.1c	Internal Coordination For Stage 2 Regional Headquarters NWS Headquarters Union
3.4.9.2a	External Coordination For Stage 1
3.4.9.2b	External Coordination For Initial Stage 2
3.4.9.2c	External Coordination For Stage 2
3.4.10	Other Changes
3.4.11	Station Duty Manual
3.4.11.1	Stage 1 Station Duty Manual
3.4.11.2	Initial Stage 2 Station Duty Manual
3.4.11.3	Stage 2 Station Duty Manual
3.4.12	Site Operational Readiness
3.4.12.1	Establish Stage 1 Operational Readiness
3.4.12.2	Establish Initial Stage 2 Operational Readiness
3.4.12.3	Establish Stage 2 Operational Readiness
3.5	Office (WSO, WSMO, WSCMO - Continue With 3.6, 3.7, 3.8... 3.n to Account For All Offices in WFO area)
3.5.1	Facility
3.5.1.1	Facility Activities For Stage 1 Lease Termination/Modification Office Furniture/Equipment Utilities
3.5.1.2	Facility Activities For Initial Stage 2

	Lease Termination/Modification
	Office Furniture/Equipment
	Utilities
3.5.2	Staffing
3.5.2.1	Staffing Changes For Stage 1
	OIC/MIC
	Met Techs
	Interns
	Electronics Techs
	Other
3.5.2.2	Staffing Changes For Initial Stage 2
	OIC/MIC
	Met Techs
	Interns
	Electronics Techs
	Other
3.5.3	Training and Professional Development (T & PD)
3.5.3.1	T & PD Enroute New Assignment For Stage 1
3.5.3.2	T & PD Enroute New Assignment For Initial Stage 2
3.5.4	Technology
3.5.4.1a	Pre-MAR Technology - Activities For Stage 1
	Surface Observing Equipment
	HO-83
	F-420
	LBC
	Sunshine Switch & Recorder
	Special Use Equip (Solirad, etc)
	Other Observing Systems
	Radar
	Upper Air
	Helium/Hydrogen Contract
	AFOS
3.5.4.1b	Pre-MAR Technology - Activities For Initial Stage 2
	AFOS
3.5.4.2a	New Technology - Activities For Stage 1
	ASOS
3.5.4.2b	New Technology - Activities For Initial Stage 2
3.5.5	Programs
3.5.5.1	Program Changes For Stage 1
	Observations
	Surface
	Radar
	Upper Air
	Climatological Services
	Warnings
	County
	Winter Storm
	Public
	Local
	Aviation

PWB
Marine
Coastal
Applied Services
Agricultural
Forestry
Hydrological
Collect/Disseminate
Climatological Services
Other

3.5.5.2 Program Changes For Initial Stage 2

Observations
Surface
Radar
Upper Air
Climatological Services
Warnings
County
Winter Storm
Public
Local
Aviation
PWB
Marine
Coastal
Applied Services
Agricultural
Forestry
Hydrological
Collect/Disseminate
Climatological Services
Other

3.5.6 Dissemination

3.5.6.1 Dissemination Activities For Stage 1

NWR Consoles
Remove/Transfer

3.5.6.2 Dissemination Activities For Initial Stage 2

NWR Consoles
Remove/Transfer

3.5.7 Communications

3.5.7.1 Communications Activities For Stage 1

Telephone Systems
Telephone Recording Devices
Communications Lines

3.5.7.2 Communications Activities For Initial Stage 2

Telephone Systems
Telephone Recording Devices
Communications Lines

3.5.8 Maintenance

3.5.8.1 Maintenance Changes For Stage 1

3.5.8.2	Maintenance Changes For Initial Stage 2
3.5.9	Coordination
3.5.9.1a	Internal Coordination For Stage 1
	Regional Headquarters
	NWS Headquarters
	Union
3.5.9.1b	Internal Coordination For Initial Stage 2
	Regional Headquarters
	NWS Headquarters
	Union
3.5.9.2a	External Coordination For Stage 1
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
	Private Meteorologists
3.5.9.2b	External Coordination For Initial Stage 2
	Congressional
	State
	County
	Local Community
	Media
	Federal Agencies
	Federal Cooperators
	Private Meteorologists
3.5.10	Other Changes
3.5.10.1	Other Changes For Stage 1
3.5.10.2	Other Changes For Initial Stage 2
3.5.11	Station Duty Manual
3.5.11.1	Stage 1 Station Duty Manual
3.5.11.2	Initial Stage 2 Station Duty Manual
3.5.12	Site Deactivation
3.5.12.1	Stage 1
3.5.12.2	Initial Stage 2

SECTION 4 RISK REDUCTION

4.1	Future WFO
4.2	Other Office (RFC, CWSU, WSO, etc.)

Appendices

Appendix C

RELATED TRANSITION PLANNING DOCUMENTS

In order to ensure an orderly transition to the modernized NWS, a number of transition planning documents and associated publications are required. Given below is the current list of related transition planning documents along with their effective date. A blank date indicates the plan or document is still under development.

Document Title	Effective Date
Section 408 Certification Procedures (Proposed)	
MARD Plan (Draft)	Oct 91
Office Transition & Evaluation Plan	
Integrated Operations and Services Plan	
Stage 1 Operations Concept (Draft)	Dec 88
Stage 2 Operations Concept	Jan 90
Public Services Plan	Sep 91
Marine Services Plan	Oct 91
Aviation Plan	Dec 91
Fire Weather Operations and Services Plan	Sep 91
Agriculture Plan	May 91
Tsunami Warning Program Plan	
Air Pollution Plan	
Climatology Plan	
Hazardous Spills Plan	
Spaceflight Support Plan	
Hydrologic Services Plan	
National Backup Plan (Draft)	Dec 89
Forecast and Warning Verification Plan	
System Development and Integration Plan	Apr 89
ASOS Deployment Schedule	Jan 92
NEXRAD Deployment Schedule	Oct 91
AWIPS Deployment Schedule	
External and Internal Coordination Plan (Draft)	Jan 90
Facilities Preparation Plan	
Integrated Training and Professional Development Plan	Jan 92
Implementation and Phaseover Plan	Nov 91
Risk Reduction Plan	
Human Resources Plan (Draft)	Jan 92

Documents incorporated in NIP by reference:

WBS Description Document and Dictionary ..... Jan 89
(Section 5.2)
Program Monitoring and Control System ..... Jul 88
Description Document (Section 5.4)
Transition Change Management Policy Document ..... Mar 89
(Section 5.5)

Appendix D

OTHER SPECIFIC INFORMATION

This appendix is intended to be an expandable appendix, and will be used to provide specific information concerning modernization and associated restructuring of NWS, as it becomes available for release. Attached are the following:

LOCATIONS OF THE WEATHER FORECAST OFFICES

LIST OF THE WEATHER FORECAST OFFICE LOCATIONS

Metropolitan Area	Proposed Office Location
Aberdeen, SD	Aberdeen Regional Airport
Albany, NY	(not yet determined)
Albuquerque, NM	Albuquerque, NM
Alpena, MI	Green Township, Alpena County
Amarillo, TX	Amarillo International Airport
Anchorage, AK	Anchorage, AK
Atlanta, GA	Falcon Field, Peachtree City
Austin/San Antonio, TX	New Braunfels Municipal Airport
Baltimore, MD/Washington, DC	Sterling, VA
Billings, MT	Billings-Logan Int'l Airport
Binghamton, NY	Broome County Airport
Birmingham, AL	Shelby County Airport
Bismarck, ND	Bismarck Municipal Airport
Boise, ID	Boise Interagency Fire Center
Boston, MA	Taunton, MA
Brownsville, TX	Brownsville International Airport
Buffalo, NY	Batavia, NY
Burlington, VT	Burlington International Airport
Central Illinois, IL	Logan County Airport
Central Pennsylvania, PA	State College, PA
Charleston, SC	Charleston International Airport
Charleston, WV	Ruthdale, WV
Cheyenne, WY	Cheyenne Municipal Airport
Chicago, IL	Lewis University Airport
Cincinnati, OH	Wilmington, OH
Cleveland, OH	Cleveland-Hopkins Int'l Airport
Columbia, SC	Columbia Metropolitan Airport
Corpus Christi, TX	Corpus Christi Int'l Airport
Dallas/Fort Worth, TX	Fort Worth, TX
Denver, CO	Boulder, CO
Des Moines, IA	Acorn Valley Recreation Area
Detroit, MI	Indian Springs Metropark, Pontiac
Dodge City, KS	Dodge City Municipal Airport
Duluth, MN	Duluth International Airport
El Paso, TX	Santa Teresa Airport, NM
Elko, NV	East Elko, NV
Eureka, CA	Eureka, CA
Fairbanks, AK	Fairbanks, AK
Fargo/Grand Forks, ND	Mayville, ND
Flagstaff, AZ	(not yet determined)
Glasgow, MT	Glasgow International Airport

LIST OF THE WEATHER FORECAST OFFICE LOCATIONS
(continued)

Metropolitan Area	Proposed Office Location
Goodland, KS	Goodland Municipal Airport
Grand Island, NE	Hastings, NE
Grand Junction, CO	Walker Field
Grand Rapids/Muskegon, MI	Kent County International Airport
Great Falls, MT	near Great Falls Int'l Airport
Green Bay, WI	Austin-Straubel Field
Honolulu, HI	(not yet determined)
Houston/Galveston, TX	League City, TX
Indianapolis, IN	Indianapolis International Airport
Jackson, MS	Jackson Municipal Airport
Jacksonville, FL	Jacksonville International Airport
Juneau, AK	Juneau, AK
Kansas City, MO	Pleasant Hill, MO
Knoxville/Tri Cities, TN	Morristown Airport Indus. District
La Crosse, WI	La Crosse Ridge, La Crosse County
Lake Charles, LA	Lake Charles Municipal Airport
Las Vegas, NV	Las Vegas, NV
Little Rock, AR	North Little Rock Airport
Los Angeles, CA	Oxnard, CA
Louisville, KY	Louisville, KY
Lubbock, TX	Lubbock, TX
Marquette, MI	Marquette County Airport
Medford, OR	Medford-Jackson County Airport
Melbourne, FL	Melbourne Regional Airport
Memphis, TN	Memphis Agricenter Int'l Complex
Miami, FL	(not yet determined)
Midland/Odessa, TX	Midland International Airport
Milwaukee, WI	Sullivan Township, Jefferson County
Minneapolis/St. Paul, MN	Chanhassen Township
Missoula, MT	near Missoula County Airport
Mobile, AL	Mobile Municipal Airport
Morehead City, NC	Newport, NC
Nashville, TN	Old Hickory Mountain, TN
New Orleans/Baton Rouge, LA	Slidell Airport
New York City, NY	Brookhaven National Lab, Upton, NY
Norfolk/Richmond, VA	Wakefield, VA
North Platte, NE	Lincoln County
Oklahoma City, OK	Norman, OK
Omaha, NE	Valley, NE
Paducah, KY	Barkley Regional Airport
Pendleton, OR	Pendleton Municipal Airport

LIST OF THE WEATHER FORECAST OFFICES
(continued)

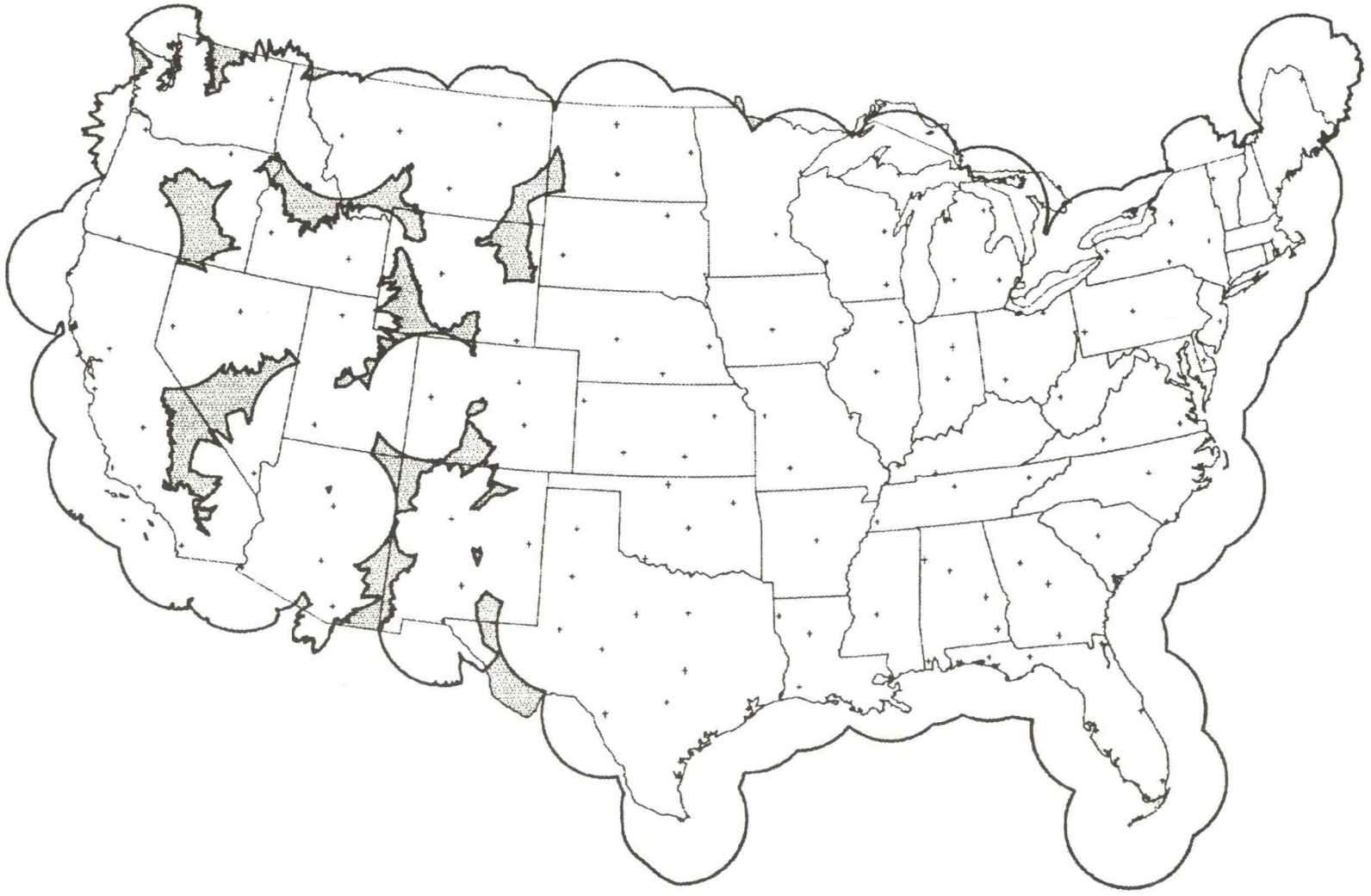
Metropolitan Area	Proposed Office Location
Philadelphia, PA	Mt. Holly, NJ
Phoenix, AZ	Phoenix, AZ
Pittsburgh, PA	Coraopolis, PA
Pocatello/Idaho Falls, ID	Pocatello, ID
Portland, ME	Gray, ME
Portland, OR	Portland International Airport
Pueblo, CO	Pueblo Memorial Airport
Quad Cities, IA	(not yet determined)
Raleigh/Durham, NC	N.C. State Univ., Raleigh, NC
Rapid City, SD	New Underwood, SD
Reno, NV	Reno, NV
Riverton, WY	Riverton Regional Airport
Roanoke, VA	(not yet determined)
Sacramento, CA	Sacramento, CA
Salt Lake City, UT	Salt Lake City Int'l Airport
San Angelo, TX	San Angelo Municipal Airport
San Diego, CA	Miramar Naval Air Station
San Francisco Bay Area, CA	Monterey, CA
San Joaquin Valley, CA	Hanford, CA
San Juan, PR	Luis Munoz Marin Int'l Airport
Seattle/Tacoma, WA	Sand Point, WA
Shreveport, LA	Shreveport Regional Airport
Sioux Falls, SD	Sioux Falls Municipal Airport
Spokane, WA	Rambo Road, Spokane, WA
Springfield, MO	Springfield Regional Airport
St. Louis, MO	Research Park, St. Charles County
Tallahassee, FL	Tallahassee Regional Airport
Tampa Bay Area, FL	Ruskin, FL
Topeka, KS	Philip Billard Municipal Airport
Tucson, AZ	Tucson, AZ
Tulsa, OK	Tulsa International Airport
Wichita, KS	Wichita Mid-Continent Airport
Wilmington, NC	New Hanover County Airport

LIST OF THE RIVER FORECAST CENTERS

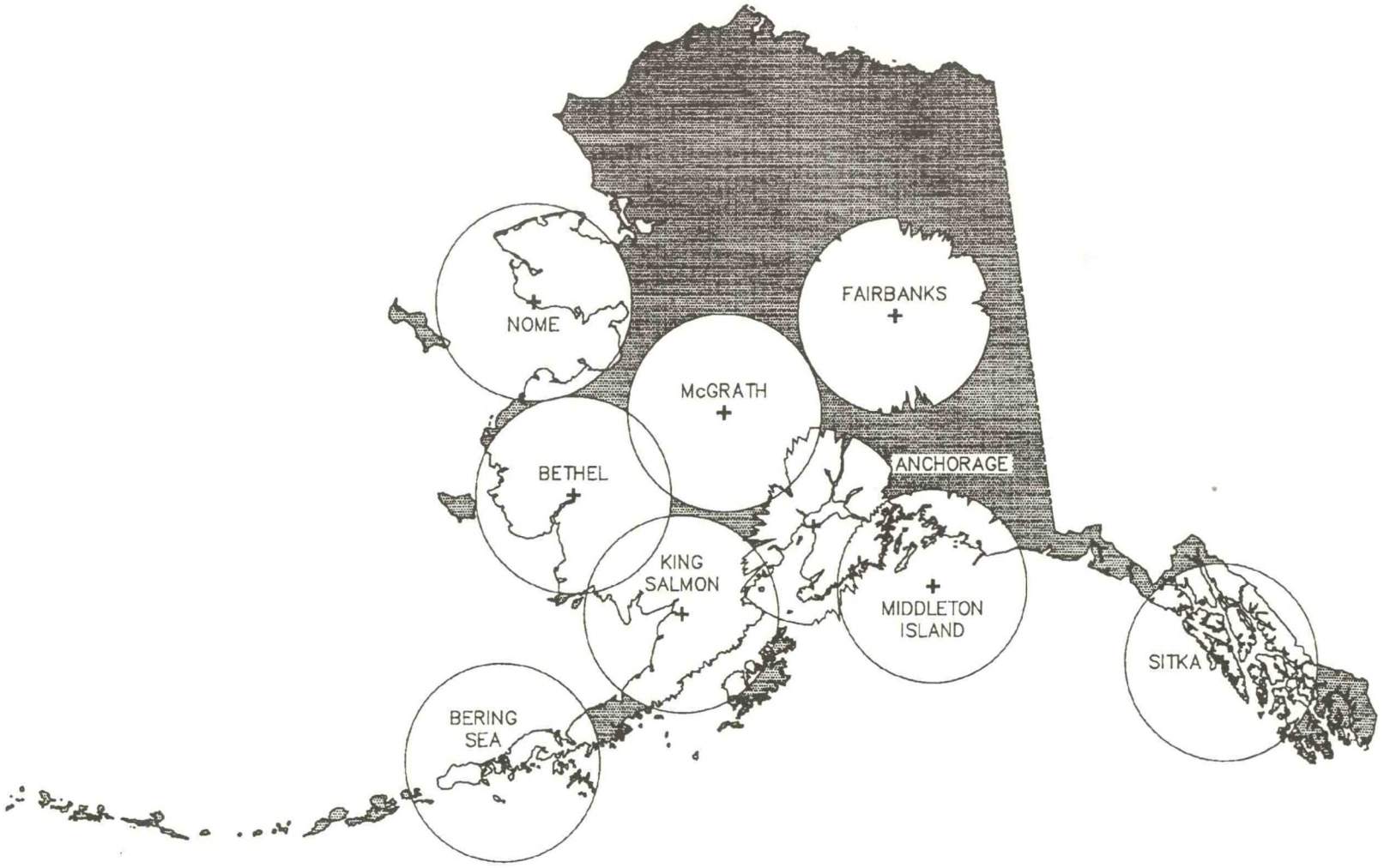
River Forecast Center Name	Colocated Weather Forecast Office
Southeast RFC	Atlanta, GA
Lower Mississippi RFC	New Orleans/Baton Rouge, LA
Arkansas-Red Basin RFC	Tulsa, OK
West Gulf RFC	Dallas/Fort Worth, TX
Ohio RFC	Cincinnati, OH
Middle Atlantic RFC	Central Pennsylvania, PA
Northeast RFC	Boston, MA
Colorado Basin RFC	Salt Lake City, UT
California-Nevada RFC	Sacramento, CA
Northwest RFC	Portland, OR
North Central RFC	Minneapolis/St. Paul, MN
Missouri Basin RFC	Kansas City, MO
Alaska RFC	Anchorage, AK

DEPICTION OF THE TOTAL COVERAGE (AT 10,000 FT ELEVATION) PROVIDED BY THE COMPLETED NATIONAL NEXRAD NETWORK.

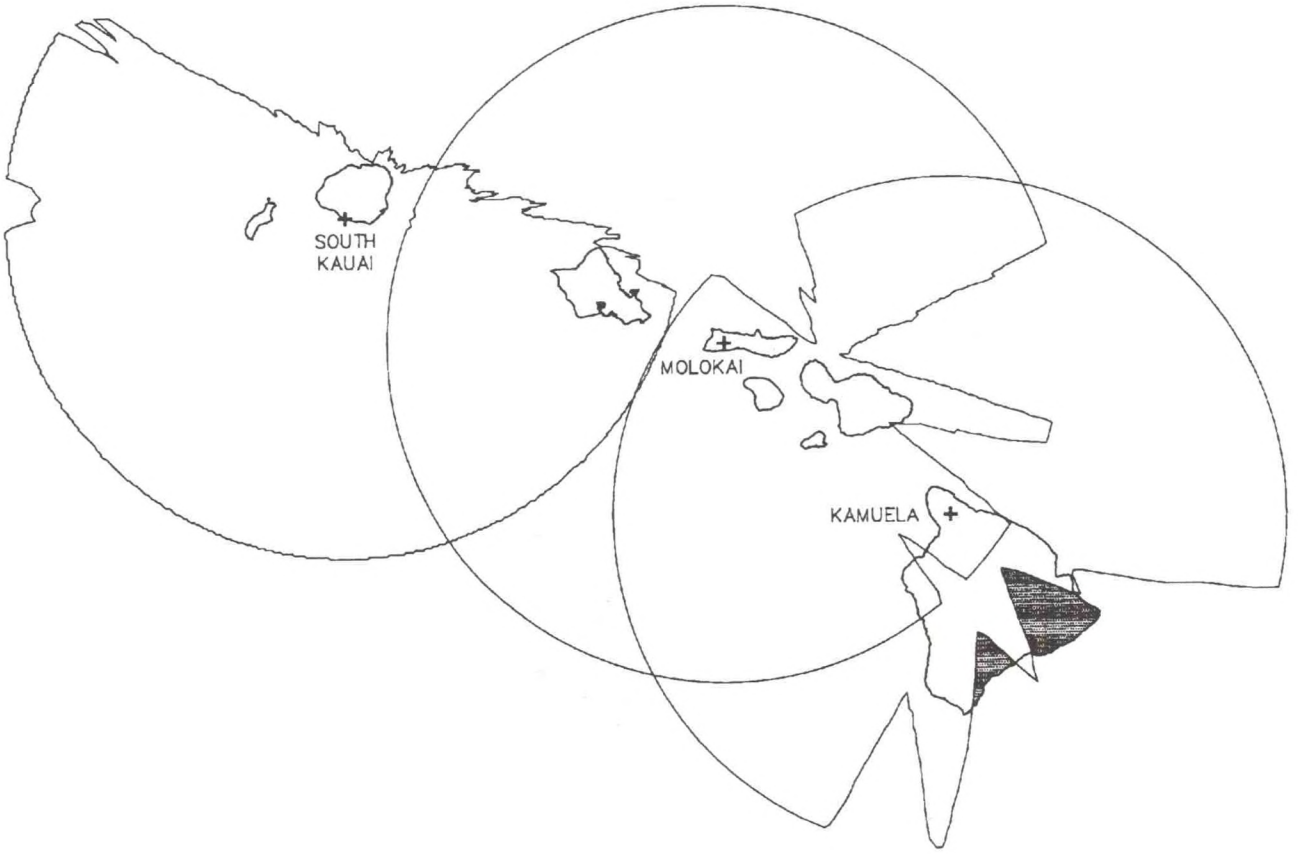
DARKENED AREAS OVER THE ROCKY MOUNTAINS ARE GAPS IN COVERAGE AT THE 10,000 FT LEVEL.



NEXRAD SITES AND ESTIMATED COVERAGE (AT 10,000 FT ELEVATION) FOR ALASKA.



NEXRAD SITES AND ESTIMATED COVERAGE (AT 10,000 FT ELEVATION) FOR HAWAII.



LIST OF THE NEXRAD LOCATIONS

National Weather Service NEXRADs:

Metropolitan Area	Proposed NEXRAD Location
Aberdeen, SD	Aberdeen Regional Airport
Albany, NY	Berne, NY
Albuquerque, NM	La Mesita Negra, Bernalillo County
Alpena, MI	Green Township, Alpena County
Amarillo, TX	Amarillo International Airport
Atlanta, GA	Falcon Field, Peachtree City
Austin/San Antonio, TX	New Braunfels Municipal Airport
Baltimore, MD/Washington, DC	Sterling, VA
Billings, MT	Alkali Creek Rd, Yellowstone County
Binghamton, NY	Broome County Airport
Birmingham, AL	near Shelby County Airport
Bismarck, ND	Bismarck Municipal Airport
Boise, ID	Wild Horse Corral, Ada County
Boston, MA	Taunton, MA
Brownsville, TX	Brownsville International Airport
Buffalo, NY	Batavia, NY
Burlington, VT	Burlington International Airport
Cedar City, UT	Blowhard Mountain, Iron County
Central Illinois, IL	Logan County Airport
Central Pennsylvania, PA	Moshannon State Forest
Charleston, SC	Sheldon, SC
Charleston, WV	Ruthdale, WV
Cheyenne, WY	Cheyenne Municipal Airport
Chicago, IL	Lewis University Airport
Cincinnati, OH	Wilmington, OH
Cleveland, OH	Cleveland-Hopkins Int'l Airport
Columbia, SC	Columbia Metropolitan Airport
Corpus Christi, TX	Corpus Christi Int'l Airport
Dallas/Fort Worth, TX	Fort Worth Spinks Airport
Denver, CO	Front Range Airport
Des Moines, IA	Camp Dodge Mil Reserv, Polk County
Detroit, MI	Indian Springs Metropark
Dodge City, KS	Dodge City Municipal Airport
Duluth, MN	Duluth International Airport
El Paso, TX	Santa Teresa Airport, NM
Elko, NV	Sheep Creek Mountain, Lander County
Eureka, CA	Bunker Hill, Humboldt County
Fargo/Grand Forks, ND	Lindas Township, Traill County
Flagstaff, AZ	Anderson Mesa, Coconino County

LIST OF THE NEXRAD LOCATIONS
(continued)

Metropolitan Area	Proposed NEXRAD Location
Glasgow, MT	Glasgow International Airport
Goodland, KS	Goodland Municipal Airport
Grand Island, NE	Blue Hill, NE
Grand Junction, CO	Grand Mesa, Mesa County
Grand Rapids/Muskegon, MI	Kent County International Airport
Great Falls, MT	near Great Falls Int'l Airport
Green Bay, WI	Austin-Straubel Field
Houston/Galveston, TX	League City, TX
Indianapolis, IN	Indianapolis International Airport
Jackson, MS	Jackson Municipal Airport
Jacksonville, FL	Jacksonville International Airport
Kansas City, MO	Pleasant Hill, MO
Key West, FL	Key West International Airport
Knoxville/Tri Cities, TN	Morristown Airport Indus. District
La Crosse, WI	La Crosse Ridge, La Crosse County
Lake Charles, LA	Lake Charles Municipal Airport
Las Vegas, NV	Opal Mountain, Nelson, NV
Little Rock, AR	near Camp Robinson, Pulaski County
Los Angeles, CA	Sulphur Mountain, Ventura County
Louisville, KY	Fort Knox Military Reservation
Lubbock, TX	Lubbock International Airport
Marquette, MI	Marquette County Airport
Medford, OR	Mount Ashland, Jackson County
Melbourne, FL	Melbourne Regional Airport
Memphis, TN	Millington Naval Air Station
Miami, FL	Richmond Heights Naval Air Station
Midland/Odessa, TX	Midland International Airport
Milwaukee, WI	Sullivan Township, Jefferson County
Minneapolis/St. Paul, MN	Chanhassen Township
Missoula, MT	Pt. Six Mountain, Missoula County
Mobile, AL	Mobile Municipal Airport
Morehead City, NC	Newport, NC
Nashville, TN	Old Hickory Mountain, TN
New Orleans/Baton Rouge, LA	Slidell Airport
New York City, NY	Brookhaven National Lab, Upton, NY
Norfolk/Richmond, VA	Wakefield, VA
North Platte, NE	Smith Ranch, Logan County
Oklahoma City, OK	Twin Lakes Airport
Omaha, NE	Valley, NE
Paducah, KY	Barkley Regional Airport
Pendleton, OR	Pendleton Municipal Airport

LIST OF THE NEXRAD LOCATIONS
(continued)

Metropolitan Area	Proposed NEXRAD Location
Philadelphia, PA	Fort Dix, NJ
Phoenix, AZ	Williams Air Force Base
Pittsburgh, PA	Coraopolis, PA
Pocatello/Idaho Falls, ID	Springfield, ID
Portland, ME	Gray, ME
Portland, OR	Dixie Mountain, Washington County
Pueblo, CO	Boone/Highland Roads, Pueblo County
Quad Cities, IA	Davenport Municipal Airport
Raleigh/Durham, NC	Clayton, NC
Rapid City, SD	New Underwood, SD
Reno, NV	Virginia Peak, Washoe County
Riverton, WY	Riverton Regional Airport
Roanoke, VA	Coles Knob, Floyd County
Sacramento, CA	(not yet determined)
Salt Lake City, UT	Promontory Point, Box Elder County
San Angelo, TX	San Angelo Municipal Airport
San Diego, CA	Miramar Naval Air Station
San Francisco Bay Area, CA	Mt. Umunhum, Santa Clara County
San Joaquin Valley, CA	Hanford Municipal Airport
Seattle/Tacoma, WA	(not yet determined)
Shreveport, LA	Shreveport Regional Airport
Sioux Falls, SD	Sioux Falls Municipal Airport
Spokane, WA	Rambo Road, Spokane, WA
Springfield, MO	Springfield Regional Airport
St. Louis, MO	Research Park, St. Charles County
Tallahassee, FL	Tallahassee Regional Airport
Tampa Bay Area, FL	Ruskin, FL
Topeka, KS	Wabaunsee County
Tucson, AZ	near Sahuarita, AZ
Tulsa, OK	Shreck Farm, Rogers County
Wichita, KS	Wichita Mid-Continent Airport
Wilmington, NC	Shallotte, NC
Yuma, AZ	near Yuma International Airport

LIST OF THE NEXRAD LOCATIONS
(continued)

NEXRADs in Alaska and Hawaii:

Metropolitan Area	Proposed NEXRAD Location
Anchorage, AK	Kenai Peninsula
Bering Sea, AK	(not yet determined)
Bethel, AK	(not yet determined)
Fairbanks, AK	Pedro Dome
Kamuela, HI	Puu Lapalapa
King Salmon, AK	(not yet determined)
McGrath, AK	(not yet determined)
Middleton Island, AK	(not yet determined)
Molokai, HI	Mauna Loa Ridge, "B" site
Nome, AK	(not yet determined)
Sitka, AK	Biorka Island
South Kauai, HI	Salt Pond Road, Burns Field site

NOTE:

NEXRAD coverage will be provided for Puerto Rico.

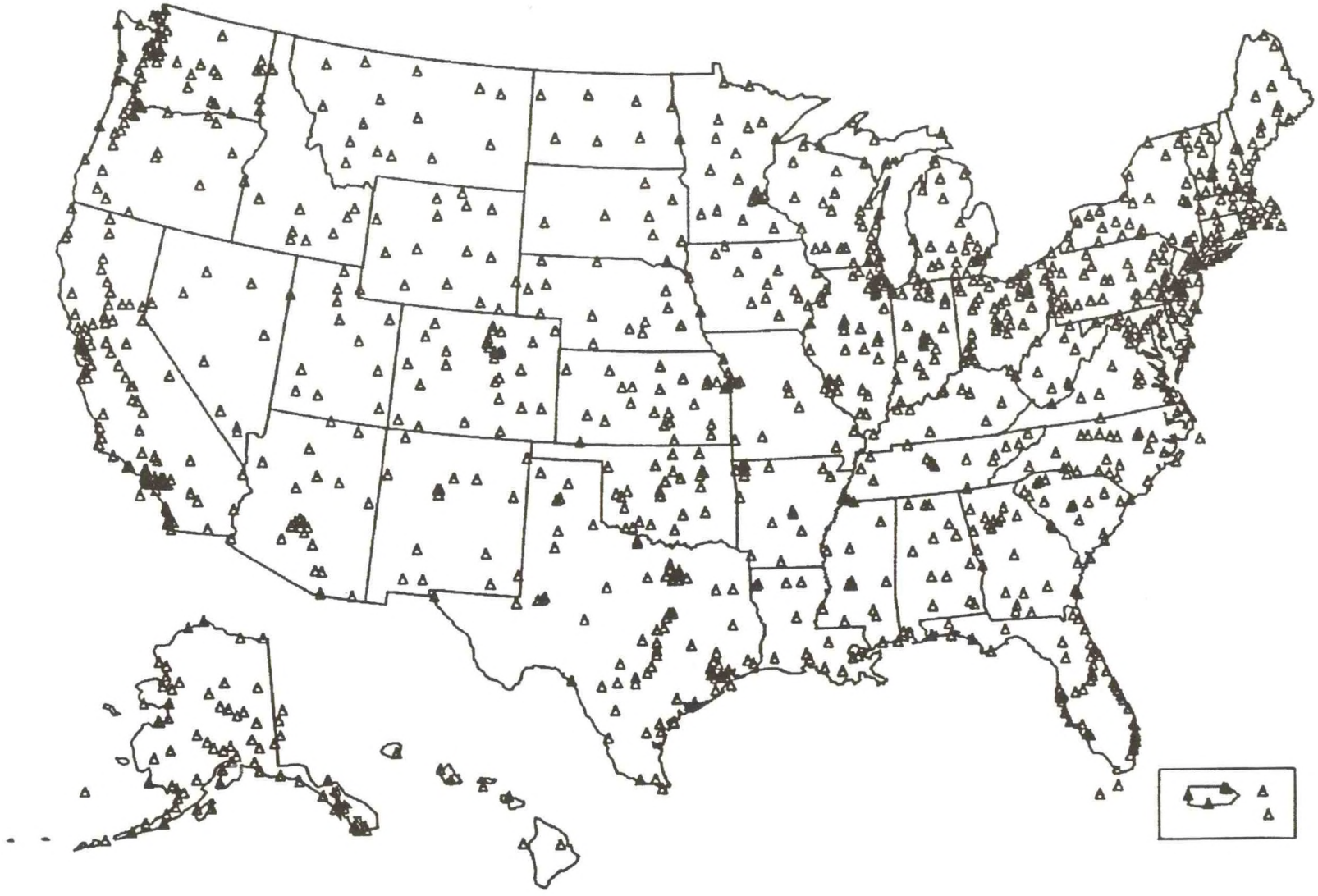
LIST OF THE NEXRAD LOCATIONS
(continued)

Department of Defense Supplemental NEXRADs:

Beale Air Force Base, CA
Cannon Air Force Base, NM
Central Texas (Granger), TX
Columbus Air Force Base, MS
Dover Air Force Base, DE
Dyess Air Force Base, TX
East Alabama (Carrville), AL
Edwards Air Force Base, CA
Frederick, OK
Ft. Campbell, KY
Ft. Rucker, AL
Griffiss Air Force Base, NY
Holloman Air Force Base, NM
Laughlin Air Force Base, TX
Loring Air Force Base, ME*
March Air Force Base, CA
Minot Air Force Base, ND
Moody Air Force Base, GA
Northwest Florida (Red Bay), FL
Robins Air Force Base, GA
Vandenberg Air Force Base, CA
Vance Air Force Base, OK

* - Ownership of this NEXRAD will be transferred to the NWS.

CANDIDATE NWS AND FAA ASOS LOCATIONS



LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)

AK	Akutan	FAA
AK	Anchorage	FAA
AK	Anchorage	NWS
AK	Annette	NWS
AK	Barrow	NWS
AK	Bethel	NWS
AK	Bettles	FAA
AK	Chevak	FAA
AK	Chicken	FAA
AK	Chignik Lake	FAA
AK	Cold Bay	NWS
AK	Cordova	FAA
AK	Deadhorse	FAA
AK	Delta Jnct/Ft Greely	FAA
AK	Fairbanks	NWS
AK	Farewell	FAA
AK	Galena	FAA
AK	Gulkana	FAA
AK	Homer	NWS
AK	Iliamna	FAA
AK	Juneau	FAA
AK	Kaltag	FAA
AK	Kenai	FAA
AK	Ketchikan	FAA
AK	King Salmon	NWS
AK	Kodiak	NWS
AK	Kotzebue	NWS
AK	McGrath	NWS
AK	Minchumina	FAA
AK	Nenana	NWS
AK	New Stuyahok	FAA
AK	Nome	NWS
AK	Northway	FAA
AK	Nuiqsut	FAA
AK	Palmer	FAA
AK	Perryville	FAA
AK	Portage	FAA
AK	Puntilla Lake	FAA
AK	Seldovia	FAA
AK	Sitka	FAA
AK	St Michael	FAA
AK	St Paul Island	NWS
AK	Talkeetna	NWS
AK	Tanana	FAA
AK	Yakutat	NWS
AL	Alabaster	FAA
AL	Anniston	FAA
AL	Birmingham	FAA
AL	Decatur	FAA
AL	Dothan	FAA
AL	Evergreen	FAA
AL	Huntsville	NWS
AL	Mobile	FAA
AL	Mobile	NWS
AL	Montgomery	NWS
AL	Muscle Shoals	FAA
AL	Ozark	FAA
AL	Selma	FAA
AL	Tuscaloosa	FAA
AR	Blytheville	FAA
AR	Camden	FAA
AR	De Queen	FAA
AR	El Dorado	FAA
AR	Fayetteville	FAA
AR	Fort Smith	NWS
AR	Harrison	FAA
AR	Hot Springs	FAA
AR	Jonesboro	FAA
AR	Little Rock	FAA
AR	Monticello	FAA
AR	Mountain Home	FAA
AR	North Little Rock	FAA
AR	Pine Bluff	FAA
AR	Russellville	FAA
AR	Texarkana	FAA
AR	West Memphis	FAA
AZ	Chandler	FAA
AZ	Coolidge	FAA
AZ	Douglas Bisbee	FAA
AZ	Flagstaff	NWS
AZ	Gila Bend	FAA
AZ	Glendale	FAA
AZ	Goodyear	FAA
AZ	Grand Canyon	FAA
AZ	Kayenta	FAA
AZ	Kingman	NWS
AZ	Mesa	FAA
AZ	Nogales	FAA
AZ	Page	NWS
AZ	Phoenix	FAA
AZ	Phoenix	NWS
AZ	Prescott	FAA
AZ	Scottsdale	FAA
AZ	St Johns	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

AZ	Tucson	NWS
AZ	Winslow	NWS
CA	Arcata/Eureka	FAA
CA	Avalon	FAA
CA	Bakersfield	NWS
CA	Bishop	NWS
CA	Blythe	FAA
CA	Burbank	FAA
CA	Carlsbad	FAA
CA	Chico	FAA
CA	Chino	FAA
CA	Compton	FAA
CA	Concord	FAA
CA	Daggett	FAA
CA	El Monte	FAA
CA	Emigrant Gap	NWS
CA	Eureka	FAA
CA	Fresno	FAA
CA	Fresno	NWS
CA	Fullerton	FAA
CA	Grass Valley	FAA
CA	Hanford	FAA
CA	Hawthorne	FAA
CA	Hayward	FAA
CA	Imperial	FAA
CA	La Verne	FAA
CA	Livermore	FAA
CA	Long Beach	NWS
CA	Los Angeles	FAA
CA	Los Angeles	NWS
CA	Madera	FAA
CA	Marysville	FAA
CA	Merced	FAA
CA	Modesto	FAA
CA	Monterey	FAA
CA	Mt Shasta	NWS
CA	Napa	FAA
CA	Needles	FAA
CA	Novato	FAA
CA	Oakland	FAA
CA	Oceanside	FAA
CA	Ontario	FAA
CA	Oroville	FAA
CA	Oxnard	FAA
CA	Palm Springs	FAA
CA	Palmdale	FAA
CA	Palo Alto	FAA
CA	Paso Robles	FAA
CA	Red Bluff	NWS
CA	Redding	NWS
CA	Rialto	FAA
CA	Riverside	FAA
CA	Sacramento	FAA
CA	Sacramento	FAA
CA	Salinas	FAA
CA	San Carlos	FAA
CA	San Diego	FAA
CA	San Diego	NWS
CA	San Diego	NWS
CA	San Diego/El Cajon	FAA
CA	San Francisco	NWS
CA	San Jose	FAA
CA	San Jose	FAA
CA	San Luis Obispo	FAA
CA	Sandberg	NWS
CA	Santa Ana	FAA
CA	Santa Barbara	FAA
CA	Santa Maria	NWS
CA	Santa Monica	FAA
CA	Santa Rosa	FAA
CA	Santa Ynez	FAA
CA	South Lake Tahoe	FAA
CA	Stockton	NWS
CA	Thermal	FAA
CA	Torrance	FAA
CA	Upland	FAA
CA	Vacaville	FAA
CA	Van Nuys	FAA
CA	Watsonville	FAA
CO	Akron	FAA
CO	Alamosa	NWS
CO	Aspen	FAA
CO	Aurora	FAA
CO	Boulder	FAA
CO	Burlington	FAA
CO	Colorado Springs	NWS
CO	Cortez	FAA
CO	Craig	FAA
CO	Denver	FAA
CO	Denver	FAA
CO	Denver	NWS
CO	Falcon	FAA
CO	Grand Junction	NWS
CO	Holyoke	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA) (continued)

CO	La Junta	FAA
CO	Lamar	FAA
CO	Limon	NWS
CO	Longmont	FAA
CO	Meeker	FAA
CO	Montrose	FAA
CO	Pueblo	NWS
CO	Rifle	FAA
CO	Telluride	FAA
CT	Bridgeport	NWS
CT	Danbury	FAA
CT	Groton/New London	FAA
CT	Hartford	FAA
CT	Meriden	FAA
CT	New Haven	FAA
CT	Willimantic	FAA
CT	Windsor Locks	NWS
DC	Washington	NWS
DC	Washington	NWS
DE	Dover/Cheswold	FAA
DE	Georgetown	FAA
DE	Wilmington	NWS
FL	Bartow	FAA
FL	Boca Raton	FAA
FL	Brooksville	FAA
FL	Bunnell	FAA
FL	Crestview	FAA
FL	Daytona Beach	NWS
FL	Deland	FAA
FL	Destin	FAA
FL	Fort Lauderdale	FAA
FL	Fort Lauderdale	FAA
FL	Fort Myers	FAA
FL	Fort Myers	FAA
FL	Fort Pierce	FAA
FL	Gainesville	FAA
FL	Hollywood	FAA
FL	Jacksonville	FAA
FL	Jacksonville	NWS
FL	Key West	NWS
FL	Lakeland	FAA
FL	Leesburg	FAA
FL	Marathon	FAA
FL	Marianna	FAA
FL	Melbourne	FAA
FL	Miami	FAA
FL	Miami	FAA
FL	Miami	NWS
FL	New Port Richey	FAA
FL	New Smyrna Beach	FAA
FL	Orlando	FAA
FL	Orlando	FAA
FL	Orlando	NWS
FL	Ormond Beach	FAA
FL	Panama City	FAA
FL	Pensacola	FAA
FL	Pompano Beach	FAA
FL	Punta Gorda	FAA
FL	Sarasota/Bradenton	FAA
FL	Sebastian	FAA
FL	St Petersburg	FAA
FL	St Petersburg	FAA
FL	Stuart	FAA
FL	Tallahassee	NWS
FL	Tampa	NWS
FL	Titusville	FAA
FL	Valkaria	FAA
FL	Vero Beach	FAA
FL	West Palm Beach	FAA
FL	West Palm Beach	NWS
FL	Winter Haven	FAA
GA	Albany	FAA
GA	Alma	FAA
GA	Athens	NWS
GA	Atlanta	FAA
GA	Atlanta	FAA
GA	Atlanta	FAA
GA	Atlanta	NWS
GA	Augusta	FAA
GA	Augusta	NWS
GA	Brunswick	FAA
GA	Cartersville	FAA
GA	Columbus	NWS
GA	Gainesville	FAA
GA	Macon	NWS
GA	Moultrie	FAA
GA	Savannah	NWS
GA	Stone Mountain	FAA
GA	Tifton	FAA
GA	Valdosta	FAA
HI	Hilo	NWS
HI	Honolulu	NWS
HI	Kahului	NWS
HI	Kailua/Kona	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

HI	Kaunakakai	FAA
HI	Lanai City	FAA
HI	Lihue	NWS
IA	Ames	FAA
IA	Boone	FAA
IA	Burlington	FAA
IA	Cedar Rapids	FAA
IA	Davenport	FAA
IA	Des Moines	NWS
IA	Dubuque	NWS
IA	Estherville	FAA
IA	Iowa City	FAA
IA	Marshalltown	FAA
IA	Mason City	FAA
IA	Muscatine	FAA
IA	Newton	FAA
IA	Ottumwa	FAA
IA	Sioux City	NWS
IA	Spencer	FAA
IA	Waterloo	NWS
ID	Boise	NWS
ID	Burley	FAA
ID	Hailey	FAA
ID	Idaho Falls	FAA
ID	Jerome	FAA
ID	Lewiston	NWS
ID	Mullan Pass	FAA
ID	Pocatello	NWS
ID	Rexburg	FAA
ID	Twin Falls	FAA
IL	Alton/St Louis	FAA
IL	Belvidere	FAA
IL	Bloomington/Normal	FAA
IL	Cahokia/St Louis	FAA
IL	Carbondale	FAA
IL	Centralia	FAA
IL	Champaign/Urbana	FAA
IL	Chicago	FAA
IL	Chicago	FAA
IL	Chicago	NWS
IL	Chicago/Aurora	FAA
IL	Chicago/Schaumburg	FAA
IL	Chicago/Waukegan	FAA
IL	Chicago/West Chicago	FAA
IL	Chicago/Wheeling	FAA
IL	Danville	FAA
IL	Decatur	FAA
IL	Galesburg	FAA
IL	Joliet	FAA
IL	Kankakee	FAA
IL	Lake in the Hills	FAA
IL	Lawrenceville	FAA
IL	Marion	FAA
IL	Mattoon/Charleston	FAA
IL	Moline	NWS
IL	Pekin	FAA
IL	Peoria	FAA
IL	Peoria	NWS
IL	Plainfield	FAA
IL	Rockford	NWS
IL	Romeoville	FAA
IL	Springfield	NWS
IL	Urbana	FAA
IN	Bedford	FAA
IN	Bloomington	FAA
IN	Columbus	FAA
IN	Elkhart	FAA
IN	Evansville	NWS
IN	Fort Wayne	FAA
IN	Fort Wayne	NWS
IN	Gary	FAA
IN	Goshen	FAA
IN	Griffith	FAA
IN	Indianapolis	FAA
IN	Indianapolis	FAA
IN	Indianapolis	FAA
IN	Indianapolis	FAA
IN	Indianapolis	NWS
IN	Jeffersonville	FAA
IN	Lafayette	FAA
IN	Muncie	FAA
IN	Plymouth	FAA
IN	Shelbyville	FAA
IN	South Bend	NWS
IN	Terre Haute	FAA
IN	Valparaiso	FAA
IN	Warsaw	FAA
KS	Chanute	FAA
KS	Coffeyville	FAA
KS	Concordia	NWS
KS	Dodge City	NWS
KS	Emporia	FAA
KS	Garden City	FAA
KS	Goodland	NWS

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA) (continued)

KS	Hill City	FAA
KS	Hutchinson	FAA
KS	Lawrence	FAA
KS	Manhattan	FAA
KS	Olathe	FAA
KS	Olathe	FAA
KS	Parsons	FAA
KS	Russell	FAA
KS	Salina	FAA
KS	Topeka	FAA
KS	Topeka	NWS
KS	Wichita	FAA
KS	Wichita	NWS
KS	Winfield	FAA
KY	Bowling Green	FAA
KY	Covington/Cincinnati	NWS
KY	Frankfort	FAA
KY	Jackson	NWS
KY	Lexington	NWS
KY	London	FAA
KY	Louisville	FAA
KY	Louisville	NWS
KY	Owensboro	FAA
KY	Paducah	NWS
LA	Alexandria	FAA
LA	Baton Rouge	NWS
LA	De Ridder	FAA
LA	Houma	FAA
LA	Lafayette	FAA
LA	Lake Charles	NWS
LA	Monroe	FAA
LA	New Iberia	FAA
LA	New Orleans	FAA
LA	New Orleans	NWS
LA	Shreveport	FAA
LA	Shreveport	NWS
LA	Slidell	FAA
MA	Bedford	FAA
MA	Beverly	FAA
MA	Boston	NWS
MA	Chatham	FAA
MA	Fitchburg	FAA
MA	Hyannis	FAA
MA	Lawrence	FAA
MA	Marthas Vineyard	FAA
MA	Nantucket	FAA
MA	New Bedford	FAA
MA	North Adams	FAA
MA	Norwood	FAA
MA	Orange	FAA
MA	Pittsfield	FAA
MA	Plymouth	FAA
MA	Taunton	FAA
MA	Westfield	FAA
MA	Worcester	NWS
MD	Baltimore	FAA
MD	Baltimore	NWS
MD	Hagerstown	FAA
MD	Ocean City	FAA
MD	Salisbury	FAA
ME	Augusta	FAA
ME	Bangor	FAA
ME	Caribou	NWS
ME	Frenchville	FAA
ME	Fryeburg	FAA
ME	Houlton	FAA
ME	Millinocket	FAA
ME	Portland	NWS
ME	Wiscasset	FAA
MI	Adrian	FAA
MI	Alpena	NWS
MI	Ann Arbor	FAA
MI	Battle Creek	FAA
MI	Bellaire	FAA
MI	Benton Harbor	FAA
MI	Detroit	FAA
MI	Detroit	FAA
MI	Detroit	NWS
MI	Flint	NWS
MI	Gaylord	FAA
MI	Grand Rapids	NWS
MI	Hancock	FAA
MI	Hillsdale	FAA
MI	Holland	FAA
MI	Houghton Lake	NWS
MI	Howell	FAA
MI	Iron Mountain	FAA
MI	Jackson	FAA
MI	Kalamazoo	FAA
MI	Lansing	NWS
MI	Muskegon	NWS
MI	Niles	FAA
MI	Pellston	FAA
MI	Plymouth	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

MI	Pontiac	FAA
MI	Saginaw	FAA
MI	Traverse City	FAA
MN	Alexandria	FAA
MN	Baudette	FAA
MN	Brainerd	FAA
MN	Duluth	NWS
MN	Hibbing	FAA
MN	International Falls	NWS
MN	Minneapolis	FAA
MN	Minneapolis	FAA
MN	Minneapolis	FAA
MN	Minneapolis	NWS
MN	Park Rapids	FAA
MN	Redwood Falls	FAA
MN	Rochester	NWS
MN	South St Paul	FAA
MN	St Cloud	NWS
MN	St Paul	FAA
MN	St Paul	FAA
MO	Cape Girardeau	FAA
MO	Columbia	NWS
MO	Grain Valley	FAA
MO	Jefferson City	FAA
MO	Joplin	FAA
MO	Kansas City	FAA
MO	Kansas City	FAA
MO	Kansas City	NWS
MO	Lee's Summit	FAA
MO	Poplar Bluff	FAA
MO	Rolla/Vichy	FAA
MO	Sedalia	FAA
MO	Springfield	NWS
MO	St Charles	FAA
MO	St Joseph	FAA
MO	St Louis	FAA
MO	St Louis	FAA
MO	St Louis	NWS
MO	West Plains	FAA
MS	Greenville	FAA
MS	Greenwood	FAA
MS	Gulfport	FAA
MS	Hattiesburg	FAA
MS	Jackson	FAA
MS	Jackson	NWS
MS	Madison	FAA
MS	McComb	FAA
MS	Meridian	NWS
MS	Olive Branch	FAA
MS	Pascagoula	FAA
MS	Tupelo	NWS
MS	Vicksburg	FAA
MT	Baker	FAA
MT	Billings	NWS
MT	Bozeman	FAA
MT	Butte	FAA
MT	Dillon	FAA
MT	Glasgow	NWS
MT	Great Falls	NWS
MT	Havre	NWS
MT	Helena	NWS
MT	Kalispell	NWS
MT	Livingston	FAA
MT	Miles City	FAA
MT	Missoula	NWS
MT	Wolf Point	FAA
NC	Asheville	NWS
NC	Beaufort	FAA
NC	Burlington	FAA
NC	Chapel Hill	FAA
NC	Charlotte	NWS
NC	Elizabeth City	FAA
NC	Fayetteville	FAA
NC	Gastonia	FAA
NC	Greensboro	NWS
NC	Greenville	FAA
NC	Hatteras	NWS
NC	Hickory	FAA
NC	Kinston	FAA
NC	Lumberton	FAA
NC	Maxton	FAA
NC	Monroe	FAA
NC	New Bern	FAA
NC	Raleigh/Durham	NWS
NC	Roanoke Rapids	FAA
NC	Rockingham	FAA
NC	Rocky Mount	FAA
NC	Wilmington	NWS
NC	Wilson	FAA
NC	Winston Salem	FAA
ND	Bismarck	NWS
ND	Dickinson	FAA
ND	Fargo	NWS
ND	Grand Forks	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA) (continued)

ND	Hettinger	FAA
ND	Jamestown	FAA
ND	Minot	FAA
ND	Williston	NWS
NE	Alliance	FAA
NE	Chadron	FAA
NE	Grand Island	NWS
NE	Hastings	FAA
NE	Lincoln	NWS
NE	McCook	FAA
NE	Norfolk	NWS
NE	North Platte	NWS
NE	Omaha	FAA
NE	Scottsbluff	NWS
NE	Sidney	FAA
NE	Tekamah	FAA
NE	Valentine	NWS
NH	Berlin	FAA
NH	Claremont	FAA
NH	Concord	NWS
NH	Jaffrey	FAA
NH	Lebanon	FAA
NH	Manchester	FAA
NH	Nashua	FAA
NH	Rochester	FAA
NH	Whitefield	FAA
NJ	Atlantic City	FAA
NJ	Atlantic City	NWS
NJ	Berlin	FAA
NJ	Caldwell	FAA
NJ	Lincoln Park	FAA
NJ	Linden	FAA
NJ	Millville	FAA
NJ	Morristown	FAA
NJ	Mount Holly	FAA
NJ	Newark	NWS
NJ	Robbinsville	FAA
NJ	Somerville	FAA
NJ	Sussex	FAA
NJ	Teterboro	NWS
NJ	Trenton	FAA
NM	Albuquerque	FAA
NM	Albuquerque	NWS
NM	Carlsbad	FAA
NM	Clayton	NWS
NM	Deming	FAA
NM	Farmington	FAA
NM	Gallup	FAA
NM	Hobbs	FAA
NM	Las Vegas	FAA
NM	Roswell	NWS
NM	Santa Fe	FAA
NM	Truth or Consequence	NWS
NM	Tucumcari	FAA
NV	Ely	NWS
NV	Las Vegas	FAA
NV	Las Vegas	NWS
NV	Lovelock	FAA
NV	Mercury	NWS
NV	Reno	NWS
NV	Tonopah	FAA
NV	Winnemucca	NWS
NY	Albany	NWS
NY	Binghamton	NWS
NY	Buffalo	FAA
NY	Buffalo	NWS
NY	Dansville	FAA
NY	Dunkirk	FAA
NY	Elmira	FAA
NY	Endicott	FAA
NY	Farmingdale	FAA
NY	Fulton	FAA
NY	Glens Falls	FAA
NY	Hornell	FAA
NY	Islip	FAA
NY	Ithaca	FAA
NY	Massena	FAA
NY	Montgomery	FAA
NY	Monticello	FAA
NY	New York	NWS
NY	New York	NWS
NY	Newburgh	FAA
NY	Penn Yan	FAA
NY	Plattsburgh	FAA
NY	Poughkeepsie	FAA
NY	Rochester	NWS
NY	Saranac Lake	FAA
NY	Schenectady	FAA
NY	Shirley	FAA
NY	Syracuse	NWS
NY	Utica	FAA
NY	Watertown	FAA
NY	Wellsville	FAA
NY	Westhampton Beach	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

NY	White Plains	FAA
OH	Akron	FAA
OH	Akron	NWS
OH	Ashtabula	FAA
OH	Batavia	FAA
OH	Bluffton	FAA
OH	Bryan	FAA
OH	Cincinnati	FAA
OH	Cincinnati	FAA
OH	Cleveland	FAA
OH	Cleveland	FAA
OH	Cleveland	NWS
OH	Columbus	FAA
OH	Columbus	FAA
OH	Columbus	NWS
OH	Dayton	FAA
OH	Dayton	NWS
OH	Defiance	FAA
OH	Delaware	FAA
OH	Fremont	FAA
OH	Galion	FAA
OH	Hamilton	FAA
OH	Kent	FAA
OH	Lancaster	FAA
OH	Lima	FAA
OH	Lorain/Elyria	FAA
OH	Mansfield	NWS
OH	Marion	FAA
OH	Medina	FAA
OH	Middletown	FAA
OH	Mount Vernon	FAA
OH	New Philadelphia	FAA
OH	Newark	FAA
OH	Toledo	FAA
OH	Toledo	NWS
OH	Willoughby	FAA
OH	Wooster	FAA
OH	Youngstown	NWS
OH	Zanesville	FAA
OK	Ardmore	FAA
OK	Bartlesville	FAA
OK	Chattanooga	FAA
OK	Clinton	FAA
OK	Clinton	FAA
OK	Cushing	FAA
OK	Duncan	FAA
OK	Elk City	FAA
OK	Enid	FAA
OK	Frederick	FAA
OK	Gage	FAA
OK	Guthrie	FAA
OK	Hobart	FAA
OK	Lawton	FAA
OK	Mc Alester	FAA
OK	Muskogee	FAA
OK	Oklahoma City	FAA
OK	Oklahoma City	NWS
OK	Okmulgee	FAA
OK	Ponca City	FAA
OK	Stillwater	FAA
OK	Tulsa	FAA
OK	Tulsa	FAA
OK	Tulsa	NWS
OR	Albany	FAA
OR	Astoria	NWS
OR	Aurora	FAA
OR	Baker	FAA
OR	Bend	FAA
OR	Burns	NWS
OR	Eugene	NWS
OR	Hermiston	FAA
OR	Klamath Falls	FAA
OR	McMinnville	FAA
OR	Medford	NWS
OR	Mulino	FAA
OR	Ontario	FAA
OR	Pendleton	NWS
OR	Portland	FAA
OR	Portland	FAA
OR	Portland	NWS
OR	Roseburg	FAA
OR	Salem	NWS
OR	Scappoose	FAA
OR	Sexton Summit	NWS
OR	The Dalles	FAA
PA	Allentown	FAA
PA	Allentown	NWS
PA	Altoona	FAA
PA	Beaver Falls	FAA
PA	Bradford	FAA
PA	Clearfield	FAA
PA	Downingtown	FAA
PA	Doylestown	FAA
PA	Erie	NWS

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

PA	Greenville	FAA
PA	Harrisburg	FAA
PA	Harrisburg	FAA
PA	Honesdale	FAA
PA	Johnstown	FAA
PA	Lancaster	FAA
PA	Meadville	FAA
PA	Monongahela	FAA
PA	Mt Pocono	FAA
PA	New Castle	FAA
PA	Philadelphia	NWS
PA	Philadelphia	NWS
PA	Philipsburg	FAA
PA	Pittsburgh	FAA
PA	Pittsburgh	NWS
PA	Pottstown	FAA
PA	Pottstown	FAA
PA	Reading	FAA
PA	Selinsgrove	FAA
PA	St Marys	FAA
PA	Wilkesbarre-Scranton	NWS
PA	Williamsport	NWS
PA	York	FAA
PR	Aguadilla	FAA
PR	Mayaguez	FAA
PR	Ponce	FAA
PR	San Juan	FAA
PR	San Juan	NWS
RI	Newport	FAA
RI	Providence	NWS
RI	Westerly	FAA
SC	Anderson	FAA
SC	Charleston	FAA
SC	Charleston	NWS
SC	Clemson	FAA
SC	Columbia	FAA
SC	Columbia	NWS
SC	Conway	FAA
SC	Florence	FAA
SC	Greenville	FAA
SC	Greenwood	FAA
SC	Greer	NWS
SC	North Myrtle Beach	FAA
SC	Orangeburg	FAA
SC	Rock Hill	FAA
SC	Spartanburg	FAA
SC	Sumter	FAA
SD	Aberdeen	NWS
SD	Huron	NWS
SD	Pierre	FAA
SD	Pine Ridge	FAA
SD	Rapid City	NWS
SD	Sioux Falls	NWS
SD	Watertown	FAA
SD	Winner	FAA
TN	Bristol/Johnson	NWS
TN	Chattanooga	NWS
TN	Clarksville	FAA
TN	Crossville	FAA
TN	Jackson	FAA
TN	Knoxville	NWS
TN	Memphis	FAA
TN	Morristown	FAA
TN	Murfreesboro	FAA
TN	Nashville	NWS
TN	Smyrna	FAA
TX	Abilene	NWS
TX	Alice	FAA
TX	Amarillo	FAA
TX	Amarillo	NWS
TX	Angleton/Lk Jackson	FAA
TX	Arlington	FAA
TX	Austin	FAA
TX	Austin	NWS
TX	Baytown	FAA
TX	Beaumont	FAA
TX	Beaumont/Port Arthur	NWS
TX	Borger	FAA
TX	Brownsville	NWS
TX	Burnet	FAA
TX	Childress	FAA
TX	College Station	FAA
TX	Conroe	FAA
TX	Corpus Christi	NWS
TX	Corsicana	FAA
TX	Cotulla	FAA
TX	Dalhart	FAA
TX	Dallas	FAA
TX	Dallas	FAA
TX	Dallas	FAA
TX	Dallas	FAA
TX	Dallas/Fort Worth	NWS
TX	Del Rio	NWS
TX	Denton	FAA

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

TX	El Paso	NWS
TX	Fort Stockton	FAA
TX	Fort Worth	FAA
TX	Fort Worth	FAA
TX	Galveston	FAA
TX	Grand Prairie	FAA
TX	Harlingen	FAA
TX	Hondo	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	FAA
TX	Houston	NWS
TX	Huntsville	FAA
TX	Kerrville	FAA
TX	La Porte	FAA
TX	Laredo	FAA
TX	Longview	FAA
TX	Lubbock	NWS
TX	Lufkin	FAA
TX	McAllen	FAA
TX	McKinney	FAA
TX	Mesquite	FAA
TX	Midland	FAA
TX	Midland	NWS
TX	Mineral Wells	FAA
TX	New Braunfels	FAA
TX	Odessa	FAA
TX	Palacios	FAA
TX	Pearland	FAA
TX	Plainview	FAA
TX	Port Isabel	FAA
TX	Roanoke	FAA
TX	Rockport	FAA
TX	San Angelo	NWS
TX	San Antonio	FAA
TX	San Antonio	NWS
TX	Sinton	FAA
TX	Terrell	FAA
TX	Tyler	FAA
TX	Uvalde	FAA
TX	Victoria	NWS
TX	Waco	FAA
TX	Waco	NWS
TX	Wichita Falls	FAA
TX	Wichita Falls	NWS
TX	Wink	FAA
UT	Bryce Canyon	FAA
UT	Cedar City	FAA
UT	Logan	FAA
UT	Milford	NWS
UT	Moab	FAA
UT	Ogden	FAA
UT	Price	FAA
UT	Salt Lake City	NWS
UT	Vernal	FAA
VA	Charlottesville	FAA
VA	Danville	FAA
VA	Leesburg	FAA
VA	Lynchburg	NWS
VA	Newport News	FAA
VA	Norfolk	NWS
VA	Richmond	FAA
VA	Richmond	NWS
VA	Roanoke	NWS
VA	South Boston	FAA
VA	Wallops Island	NWS
VI	Charlotte Amalie	FAA
VI	Christiansted	FAA
VT	Barre-Montpelier	FAA
VT	Bennington	FAA
VT	Burlington	NWS
VT	Highgate	FAA
VT	Lyndonville	FAA
VT	Morrisville	FAA
VT	Newport	FAA
VT	Springfield	FAA
WA	Anacortes	FAA
WA	Auburn	FAA
WA	Bellingham	FAA
WA	Chehalis	FAA
WA	Deer Park Airport	FAA
WA	Ellensburg	FAA
WA	Ephrata	FAA
WA	Everett	FAA
WA	Friday Harbor	FAA
WA	Hoquiam	FAA
WA	Moses Lake	FAA
WA	Olympia	NWS

LIST OF CANDIDATE ASOS LOCATIONS (NWS and FAA)
(continued)

WA	Omak	FAA
WA	Pasco	FAA
WA	Port Angeles	FAA
WA	Pullman/Moscow	FAA
WA	Puyallup	FAA
WA	Quillayute	NWS
WA	Renton	FAA
WA	Richland	FAA
WA	Seattle	FAA
WA	Seattle	NWS
WA	Spokane	FAA
WA	Spokane	NWS
WA	Stampede Pass	NWS
WA	Tacoma	FAA
WA	Toledo	FAA
WA	Vancouver	FAA
WA	Vancouver	FAA
WA	Walla Walla	FAA
WA	Yakima	NWS
WI	Appleton	FAA
WI	Ashland	FAA
WI	Boscobel	FAA
WI	Burlington	FAA
WI	Fond du Lac	FAA
WI	Green Bay	NWS
WI	Hayward	FAA
WI	Janesville	FAA
WI	Kenosha	FAA
WI	La Crosse	FAA
WI	Lake Geneva	FAA
WI	Lone Rock	FAA
WI	Madison	FAA
WI	Madison	NWS
WI	Marshfield	FAA
WI	Milwaukee	FAA
WI	Milwaukee	NWS
WI	Oshkosh	FAA
WI	Racine	FAA
WI	Rhinelander	FAA
WI	Sheboygan	FAA
WI	Waukesha	FAA
WI	Wausau	FAA
WI	West Bend	FAA
WI	Wisconsin Rapids	FAA
WV	Beckley	NWS
WV	Bluefield	FAA
WV	Charleston	NWS
WV	Clarksburg	FAA
WV	Elkins	NWS
WV	Huntington	NWS
WV	Lewisburg	FAA
WV	Martinsburg	FAA
WV	Morgantown	FAA
WV	Summersville	FAA
WV	Wheeling	FAA
WY	Big Piney	FAA
WY	Buffalo	FAA
WY	Casper	NWS
WY	Cheyenne	NWS
WY	Douglas	FAA
WY	Evanston	FAA
WY	Gillette	FAA
WY	Greybull	FAA
WY	Laramie	FAA
WY	Rawlins	FAA
WY	Riverton	NWS
WY	Saratoga	FAA
WY	Sheridan	NWS
WY	Torrington	FAA
WY	Worland	FAA

Appendix E

LIST OF ACRONYMS

AFOS	Automation of Field Operations and Services
AOML	Atlantic Oceanographic and Meteorological Laboratory
ASOS	Automated Surface Observing System
AWIPS	Advanced Weather Interactive Processing System
COMET	Cooperative Program for Operational Meteorology Education and Training
CWSU	Center Weather Service Unit
DARE	Denver AWIPS Risk Reduction and Requirements Evaluation
ERL	Environmental Research Laboratory
FAA	Federal Aviation Administration
FSL	Forecast Systems Laboratory
GOES	Geostationary Operational Environmental Satellite
HAS	Hydrometeorological Analysis and Support
HRL	Hydrologic Research Laboratory
IOC	Initial Operating Capability
LAPS	Local Analysis and Prediction System
MAPS	Mesoscale Analysis and Prediction System
MARD	Modernization and Associated Restructuring Demonstration
MTS	Master Transition Schedule
NESDIS	National Environmental Satellite, Data and Information Service
NEXRAD	Next Generation Weather Radar
NHC	National Hurricane Center
NIP	National Implementation Plan
NMC	National Meteorological Center
NOAA	National Oceanic and Atmospheric Administration
NSSFC	National Severe Storms Forecast Center
NSSL	National Severe Storms Laboratory
NWR	NOAA Weather Radio
NWS	National Weather Service
NWSFO	NEXRAD Weather Service Forecast Office
NWSO	NEXRAD Weather Service Office

NWSRFS	National Weather Service River Forecast System
PERT	Program Evaluation and Review Technique
PROTEUS	Prototype RFC Operational Test, Evaluation and User Simulation
RFC	River Forecast Center
RTP	Regional Transition Plan
SIP	Site Implementation Plan
SPO	Systems Program Office
WBS	Work Breakdown Structure
WFO	Weather Forecast Office
WSCMO	Weather Service Contract Meteorological Observatory
WSFO	Weather Service Forecast Office
WSMO	Weather Service Meteorological Observatory
WSO	Weather Service Office

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