WDSS DESCRIPTION AND SUPPORT AGREEMENT

As part of the agreement to deploy the Warning Decision Support System (WDSS), the WSR-88D Operational Support Facility (OSF) will fund the NSSL to install and maintain the equipment in working order for the duration of the WDSS deployment. The parties to which the unit resides agree to operate the equipment and provide quantitative feedback on algorithm performance suitable for making algorithm implementation decisions.

WARNING DECISION SUPPORT SYSTEM

The NSSL developed WDSS provides information to warning meteorologists in support of severe weather decision-making. It consists of existing and proposed WSR-88D severe weather detection and prediction algorithms as well as innovative display capabilities. Some of the proposed algorithms are scheduled to replace current baseline algorithms in the WSR-88D system during the next few years.

The WDSS consists of the following three parts:

1. Real-time Ingest and Data Dissemination System (RIDDS): Real-time radar data are ingested from a wideband port on the WSR-88D Radar Products Generator (RPG) into a RISC-based workstation.

2. Radar Utilities for Doppler Data Streams (RUDDS): A UNIX workstation that processes the data received from the RIDDS. The RUDDS acts as an RPG for the WDSS and processes the algorithms using the Severe Storm Analysis Program (SSAP).

3. Radar and Algorithm Display System (RADS): A graphical user interface used to display high-resolution radar images, and algorithm output in the form of overlays, tables, and trends. Many users are already familiar with RADS as it is also the display system used for the WSR-88D Algorithm Testing and Display System (WATADS). A RADS Display Operator's Guide has been developed which contains complete information about all the RADS features and instructions on how to use the software.

PRIMARY OBJECTIVES

The OSF's primary objectives for the WDSS deployment are as follows:

1. To evaluate the skill and the operational use of developmental and existing Doppler radar-based algorithms in various weather environment regions during real-time operational warning situations. Specific emphasis may be placed on certain algorithms in relation to the severe storm varieties common to each location. The results of this evaluation will be used when making algorithm implementation decisions.

2. To foster collaboration between NSSL/OSF scientists and NWS operational meteorologists.

The synergistic interaction between NSSL/OSF scientists and operational meteorologists will promote collaborations which will lead to improvements in future products. The operational meteorologists will gain first-hand experience with next-generation severe-weather detection algorithms and product display concepts. NSSL/OSF scientists will receive knowledge of user requirements in an operational setting.

3. To collect high quality ground verification data.

NSSL/OSF staff may assist the NWS staff in collecting real-time verification data and conducting post-storm damage surveys to enhance the quality and quantity of ground truth for future algorithm evaluations.

DEPLOYMENT DECISION PROCESS

The Chief, OSF Applications Branch makes decisions regarding where and when to deploy a WDSS using the following criteria.

1. Climatology of Location

The relative chances that appropriate weather will occur to test required algorithms' performance.

2. Desire and willingness of forecast office to contribute to WDSS deployment goals by performing quantitative evaluation of selected algorithms and to conduct in depth damage surveys.

If you would like your location to be considered for a WDSS deployment, contact Scott Saul at the OSF. ssaul@osf.noaa.gov (405) 366-6530 ext 2269

OPERATIONAL PLAN

To meet the objectives of the WDSS proof-of-concept tests, it is essential that the WDSS be used during the warning operations process by NWS personnel. The WDSS needs to be used in conjunction with the WSR-88D Principle User Processor workstation (PUP)/AWIPS, rather than "in competition" with the PUP/AWIPS. Although there are many enhancements to algorithms and algorithm product displays contained within the WDSS, the WDSS does not provide every function or product that is available to the WSR-88D PUP user. The OSF also realizes that the NWSFO staff are much more familiar with the PUP/AWIPS. With time, during the Operations Period for each site, the OSF hopes that the NWSFO staff will become comfortable working with the WDSS, and that the system will provide a valuable addition to the tools currently being used for warning operations.

1. Equipment Deployment and Installation

The hardware required for the WDSS proof-of-concept tests will be deployed to the sites and installed by NSSL staff. A connection will be made to the WSR-88D Radar Products Generator (RPG) VME interface with a DSU modem and the radar base data will be passed from the RPG to the ingest machine, a SUN SPARC-5. Another SUN workstation, known as the algorithm machine, will run the SSAP and RUDDS. The rapid update cycle (RUC) near storm environment (NSE) gridded data will be available from NSSL via the Internet. Another SUN workstation, the display machine, will be located in the forecast office operations area (preferably near the PUP/AWIPS). The display machine will run the RADS software. The RADS display configuration and overlay maps will be tailored for that particular site.

2. Operations shakedown and training period

For one week the WDSS will be tested in real-time to identify and correct any existing bugs in the system. During this same period, NWSFO staff training will be conducted on the use of the WDSS. The training will include contact information for WDSS malfunctions or outages and a seminar on the algorithms, their performance, strengths and limitations. NSSL will provide a RADS Operators Manual and a demo of a severe storm case study on the WDSS. RADS training can be expedited by the use of the WSR-88D Algorithm Testing And Display System (WATADS) software, which also contains RADS.

3. Operations Period

The remaining part of the operations period will consist of approximately 6 months during which the NWSFO staff will have the opportunity to utilize the WDSS. An NSSL/OSF scientist will visit occasionally to ensure the smooth running of the WDSS and to assist the NWS staff in conducting real-time verification, post-storm damage surveys, and algorithm scoring.

a. Daily WDSS Operations

For a proper evaluation of the WDSS algorithms, OSF requests that at least one NWSFO meteorologist be positioned at the display machine running the RADS software. When on-site, the visiting NSSL/OSF Operations Person may, at the discretion of the SOO or NWSFO staff, be positioned at the display machine, to assist in the warning operations using the WDSS.

b. Verification

OSF requests that the NWSFO make a concerted effort to conduct follow up damage surveys of significant events and provide the resulting information to OSF. While on-site, the NSSL/OSF Operations Person will be available to assist in damage surveys, storm verification, and algorithm scoring. OSF's primary desire is to enhance the verification effort by:

1. performing on site damage surveys,

2. making calls in the vicinity of un-warned storms, and

3. making real-time follow up calls to storms which have already verified to determine if severe weather is continuing.

The OSF requests the NWSFO provide copies of all severe weather logs/verification data for use by OSF scientists for post-test algorithm evaluation. This includes all spotter and warning verification forms.

c. Data Archiving

The WSR-88D radar data will be archived both by the current WSR-88D Level-II recorder and by the WDSS. The WDSS radar data archive will be used for post-analysis.

EVALUATION

Algorithm Performance

A post event questionnaire will be made available for the NWSFO to determine forecaster impressions of algorithm performance, however, in order to meet the objective of determining algorithm skill, a quantitative evaluation and scoring of selected algorithms will be necessary. The scoring results should suitable for use in a conference paper in order to be useful when making algorithm implementation decisions.