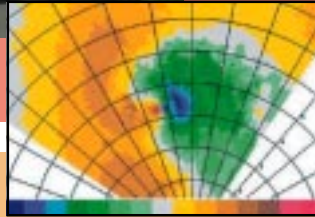


1. Data Acquisition

CAPS has developed the ARPS Data Analysis System (ADAS), which generates objectively analyzed high-resolution background fields for the purpose of model initialization as well as radar data assimilation techniques.



2. Data Assimilation

Because only the radial wind and the reflectivity are directly observed by a single Doppler radar, CAPS has developed and is analyzing several techniques to retrieve all fields necessary for model initiation including the full wind field and all thermodynamic variables from the radar data.

Portable Doppler radar photo and radar plot showing tornadic signature courtesy Drs. J. Wurman, J. Straka, and E. Rasmussen

Technology Transfer

As a Science and Technology Center, CAPS is dedicated to making available its scientific advancements for use in governmental agencies, research groups at educational institutions, and within private industry.

Examples of the use of ARPS include:

- ◆ A fog formation study in Tennessee
- ◆ Air quality control system in France
- ◆ Water shed study for public utility in North Carolina
- ◆ Prototype weather prediction system for use at major hub airports

3. Model Development

CAPS is developing and operationally testing a new prediction model, the Advanced Regional Prediction System (ARPS). Aspects unique to ARPS include:

- ◆ Use of strict coding techniques
- ◆ Extensive documentation external and in the code
- ◆ Easy to learn and use
- ◆ Code is highly portable among a variety of computer architectures, especially scalable-parallel machines
- ◆ Modular for ease of modification
- ◆ Code is entirely self-contained

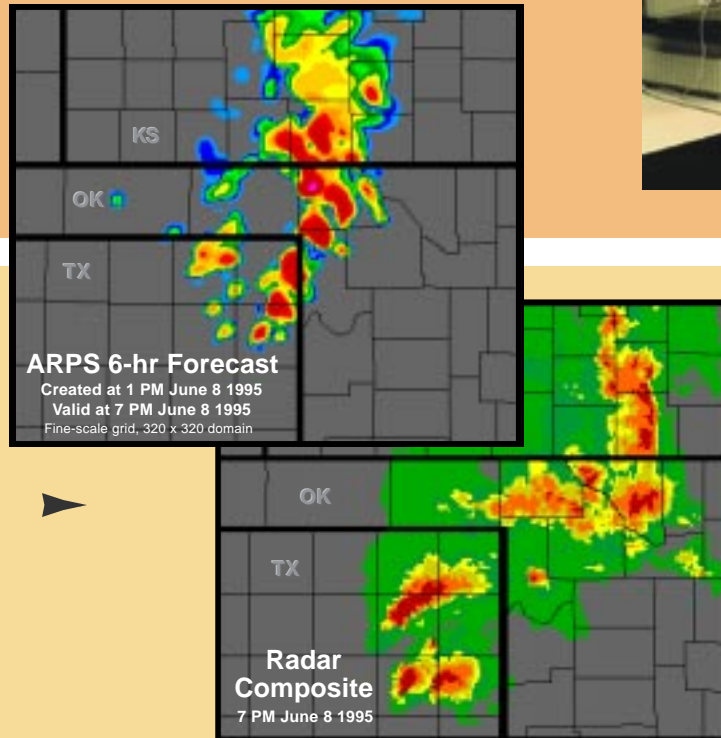
4. Simulation/ Prediction Studies

By simulating convective storms and testing model sensitivity to errors in initial and boundary conditions, it is possible to investigate the viability of weather prediction on the storm-scale.



5. Operational Testing

To gain experience using and integrating the ARPS model into an operational environment, CAPS collaborates yearly with other components of the Oklahoma Weather Center in such field programs as VORTEX (Verification of the Origin of Rotation in Tornadoes EXperiment). In these field tests, ARPS creates a 6-hour forecast for a domain where significant weather is expected; the forecast is later verified.



Prediction Goals

Storm-scale phenomena: 0-6 hours
(cloudbursts, wind shear, severe local storms)
- Location within 10 km
- Timing within 15 min

Microscale phenomena: 0-1 hour
(turbulence, very localized wind field)
- Location within 1 km
- Timing within 5 min

Use of ARPS and Supporting Software

For research purposes:

ARPS is available as freeware if used strictly for research purposes. The code is available on the Web at address:

<http://wwwcaps.ou.edu/ARPS>

Documentation is also available on-line or as hard copy, containing 350 pages of detailed but easy-to-use information.

For proprietary use:

The use of CAPS' intellectual property, including ARPS, for commercial purposes must be negotiated through our industrial liaison.