CHAPTER 5

SUMMARY

Wind profilers have proved to be a valuable observing system for numerous applications. These include research and operational weather and climate analyses and forecasts, numerical modeling, pollution monitoring, measuring aviation winds, and test range support. Whether as stand alone instruments or as networks, profilers economically and automatically provide continuous high-resolution measurements that are not possible with other techniques. Because of these unique capabilities, it is likely that the profiler's role in both research and operations will expand and become even more important for mesoscale and smaller scale applications.

Whereas profilers have proved their worth in many areas, the pace of future expanded use is somewhat dependent on the speed with which remaining limitations can be overcome. Profiler data can be contaminated by returns from things other than the atmosphere. Progress has been made in signal processing that can reduce the negative impact of this contamination, but much remains to be done before all profilers are optimally equipped.

Profilers are not likely to achieve their full potential until we gain a better understanding of how they fit with the overall observing system. The NPN has demonstrated that they have an operational impact, but the issue of how profiler data merge with data from radiosondes, aircraft, and satellites is only now being addressed by programs such as the North American Atmospheric Observing System (NAOS). The research community is also going through this learning process and has already produced such innovative techniques as RASS and instrument combinations that measure moisture profiles. It is encouraging to see that there are few field experiments that do not now include a complement of wind profilers along with a host of other sensors, and that the NPN is to be used to help calibrate/validate measurements made by the spaceborne Doppler wind lidar (WDL) planned for a Space Shuttle mission in 2000. This leadership from the research community should pave the way for increasingly effective ways to combine datasets for operational weather services, and to produce more complete understanding of the complex physical processes that contribute to the creation of mesoscale weather phenomena.