Christopher Webster, Michael Daniels, Greg Stossmeister

Real-time data and communications services of NCAR's Earth Observing Laboratory

Near real-time information is critical for mission management of atmospheric observing systems. Advances in satellite communications and Internet distribution have allowed the Earth Observing Laboratory (EOL) of NCAR to provide data, information and imagery to the scientists during evolving weather situations. Real-time data are necessary for updating interactive displays that show products from forecast models and many disparate observation systems (e.g. satellite, soundings, surface radars and aircraft in-situ observations). At the same time, network-based collaborative tools such as *chat* and web conferencing facilitate interactive participation between remote groups of scientists, engineers, operations centers and the observing platforms.

In the PREDICT deployment of the NSF/NCAR GV research aircraft, dropsondes were released from the aircraft at 45,000 ft over a 1000 km x 1000 km area to give profiles of pressure, temperature, humidity and wind below the aircraft. Real-time data from the sondes was collected by the aircraft and relayed by satcom into the Global Telecommunications System (GTS) and assimilated into forecast models. The model forecast results were then fed back into ground-based and airborne displays (along with a multitude of observations) for enhanced decision-making and mission guidance.

Mission coordinator display showing real-time overlays of satellite information (visible and infrared), model forecast output (grey streamlines in the right part of the figure), planned flight track with dropsonde release positions (triangles), aircraft flight track (red and yellow curve) and current aircraft position (airplane symbol), as well as forward camera view from the aircraft. Using a web browser, this live display was available simultaneously in the aircraft and world-wide on the ground.

This environment of streaming data in real-time also allows more experts to look at data and compare it with other measurements. One particular benefit is that it alerts instrument operators on the ground and in the air to instrument problems, which can then be addressed very rapidly. The resulting communications and collaborations infrastructure results in unprecedented improvements to our data quality and rapid targeting of mission resources to important weather events.