

[From Winter 2004-2005]

NASA to Study Migratory Songbirds

Two of our neighbors, NASA Wallops Flight Facility and the Nature Conservancy, have formed a partnership to study migratory birds on Virginia's Eastern Shore. The study will be conducted using NASA's Polarimetric radar (N-POL) one of the most advanced radar systems available. Millions of neo-tropical songbirds may fill the skies over a given area during spring and fall migrations. However, these enormous flocks take flight only after sunset. Consequently, most people are literally in the dark when it comes to this spectacular natural phenomenon. The flights are practically invisible to the human eye - but not to radar.

NASA's N-POL radar was developed by a research team from Goddard Space Flight Center's Wallops' Flight Facility to measure the characteristics of various forms of precipitation within rain and snow storms. The radar allows researchers to conduct more extensive ground measurements to support orbiting satellites and enhance their data gathering capabilities. A little over a year ago, searching for a site roughly midway between existing radar facilities at Wallops Island and Wakefield, Virginia, NASA Wallops researchers homed in on Oyster, where the Conservancy owns Cobb Island Station and some 1,400 acres. In approaching the Nature Conservancy's Virginia Coastal Reserve (VCR) about the possibility of placing the radar on its property, NASA scientists described their intent to study rainfall.



NASA's Polarimetric Radar

Photo by Betty Flowers

Barry Truitt, the project's research coordinator and chief conservation scientist for the VCR, learned that radar technicians studying precipitation normally apply filters to screen out birds and insects. He recognized this provided an opportunity to take the Conservancy's bird program to higher levels. "The radar project will help us make the most efficient use of our resources and has the potential to advance the whole science of radar ornithology," said Truitt. Information gathered from radar observations will guide the Conservancy's future protection and restoration work along the Eastern Shore.

Cold fronts tend to trigger a mass exodus of songbirds that take advantage of prevailing tailwinds. Shortly after sunset, when the songbirds begin to ascend, they circle around and around, gaining altitude before continuing their southerly migration. "This makes for a perfect radar target," Truitt said. As signals emitted from the radar tower bounce off the birds and return to the 18-foot flat-panel antenna, computer software creates onscreen loops that show the movement in swirling patterns of vivid color. With only a little imagination, suggested Truitt, "The sky looks like a river of birds."

In the short term, the most significant conservation impact entails researchers identifying stopover sites that migratory songbirds depend on for resting and feeding. In addition, field research partners are conducting point counts and netting and banding birds at ground level, helping to validate data and determine the types of habitat beneath the birds' radar "exit signatures." Calibrating the radar and evaluating its effectiveness as a remote sensing tool are long-term goals. "N-POL is NASA's only portable polarimetric precipitation research radar," said John Gerlach, Head of NASA's Observational Science Branch. "We are delighted to work with and to share resources with the Nature Conservancy." The project also involves researchers from North Carolina State University,

the College of William & Mary's Center for Conservation Biology, U.S. Geological Survey and the Virginia Department of Game and Inland Fisheries.