Site Trivia from the Southern Great Plains Cloud and Radiation Testbed Site

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Introduction

The purpose and existence of the Southern Great Plains (SGP) Cloud and Radiation Testbed (CART) Site is to provide Atmospheric Radiation Measurement (ARM) Program scientists with data streams they need in order to meet the U.S. Department of Energy's goal of improving the performance of general circulation models of the atmosphere as tools for predicting global and regional change. However, there is another view of the SGP CART Site that is not seen by many, and that is the logistics of the day-to-day operation of a 55,000-mi^2 research facility that has no walls or roof. Presented here are a few bits of trivia that might provide a different view of the SGP CART Site.

The SGP CART Site first came on-line on May 17, 1992, with the placement of the Standard Meteorology Observation System (SMOS) at the central cluster at the 160-acre central facility. The data tape was changed once every two weeks by one site operator running out to the data logger (the first use of the term "sneaker net") and then overnight-shipping (the first use of the term "fed ex net") the tape to the Experiment Center for processing.

Today, the SGP CART Site comprises 21 extended facilities, 4 boundary facilities, 3 intermediate facilities, and 1 central facility. The site operations staff numbers 24 full-time equivalents (FTEs) during routine operations (Monday through Friday, 0430 to 1630 and 2230 to 0230 local time, including holidays). Each site operator is trained in cardio-pulmonary resuscitation and first aid. During intensive operating periods (IOPs), the site is manned 24 hours per day, 7 days per week. During IOPs, the site operations staff numbers 47 FTEs. Ninety-five percent of the site operations staff is hired locally.

The site operations staff maintain 28 trailers, shelters, or sea-tainers that house personnel and instruments. There are two large tornado shelters at the central facility and one modest tornado shelter at each of the four boundary facilities. Site operations staff operate a fleet of five trucks, one sedan, and one all-terrain vehicle to traverse the 55,000-mi^2 SGP CART Site, visiting each of the instrument locations every two weeks. There have been over 400 trips to each of the extended, boundary, and intermediate facilities to service instruments since 1995. Each trip is 1200 miles.

The Site Program Manager's Office includes four FTEs. Since March of 1992, over 1350 purchase orders or contracts have been issued. Twenty-nine land lease or license agreements have been negotiated with landowners. Monthly bills are processed from 20 different rural power co-ops, 12 different local telephone co-ops, and 1 water co-op.

Currently, the SGP CART Site consists of a total of 240 instruments that comprise a total of 931 sensors. The information from each of the sensors is "stuffed" into 226 netcdf files or data streams that are transmitted each day via T-1 lines to the ARM Experiment Center (EC) and the ARM Data Archive (DA). In addition, the EC and DA receive 11 data streams from site operations staff (hourly weather observations, surface conditions, etc.), 42 value-added products data streams (i.e., data streams computed from other data streams not directly measured), and 21 external data streams (i.e., data streams obtained from outside the SGP CART Site instrumentation, such as satellite data). Although the 290 data streams received each day do not seem like much, they represent 750 megabytes of data received at the EC and DA each day from the SGP CART Site during routine periods and over 1 gigabyte of data per day during IOPs. In addition, the EC and DA receive over 1.5 gigabytes of external data per day.

During routine operations, 45 radiosondes are launched per week. During IOPs, 840 radionsondes are launched per week. During the past year, over 3200 radiosondes were released. Since May of 1992, over 10,000 radiosondes have been launched from the central and four boundary facilities.

Although the site plans for and conducts three Single Column Model (SCM) IOPs per year, a number of other experiments have piggybacked SCM IOPs. To date, the site has hosted

35 IOPs. The Ground-Based Remote Sensing, the ARM Enhanced Shortwave Experiment (ARESE), and the Water Vapor IOPs are some of the more notable studies. The Water Vapor IOP brought 73 scientists to the SGP CART Site's central facility during a four-week period. Since 1992, there have been 1125 first-time visitors to the central facility. The number of first-time visitors has escalated significantly over recent years, with 425 visitors in 1996.

Work performed at the central facility is managed through a work order database system that was initiated over four years ago. From May 1993 through February 26, 1997, 2073 work orders have been issued and completed. In addition to the 14 Sparc stations that make up the SGP CART Site data system, site operations staff manage and operate a local area network of 24 PCs that site operators use to populate over 75 databases containing information about part inventories, the maintenance and repairs to instruments, as well as their calibrations, etc. This does not include maintaining any of the computers that are associated with instruments in the field.

Site operations staff at the central facility have gone to tornado shelters once during five years, and a rotating wall cloud passed directly over the central facility. Considering the fact that the central facility comprises mobile homes on a ridge line located 3 miles from the geometric center of tornado alley through Oklahoma, an area that receives over 200 tornadoes on average each year, we have been fortunate in not experiencing a "closer look" at tornadoes.

Finally, estimates indicated that the central facility should receive three major cloud-to-ground lightning flashes per year, and each extended, boundary, and intermediate facility should receive one major cloud-to-ground lightning flash per year. During the past five years, instruments and towers have sustained only two major lightning strikes at the central facility and two major strikes at all other remaining facilities. Our lightning protection program seems to be working.

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