

# Surface Characterization Data for the Atmospheric Radiation Measurement Southern Great Plains Cloud and Radiation Testbed Site

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## Introduction

The Atmospheric Radiation Measurement (ARM) External Data Center (XDC) is continually searching for and attaining surface characterization data for the ARM Cloud and Radiation Testbed (CART) sites. These data can provide a better understanding of geophysical parameters, allowing for more accurate parameterization within General Circulation Models (GCMs), thus improving their predictive power. The emphasis to date has been on collecting data for the Southern Great Plains (SGP) CART Site. However, data collection for the North Slope of Alaska (NSA) and the Tropical Western Pacific (TWP) has begun.

The surface characterization data are maintained in a Geographic Information System (GIS) called ARC/INFO. The data fall under the following main categories: site facilities, land use/land cover, soil, hydrology, transportation and elevation.

The site facilities data include the ARM sites, Oklahoma Mesonet sites, Kansas Mesonet sites, Wind Profiler stations, the National Weather Service surface and upper air stations and the NEXRAD stations. The data are stored in both latitude/longitude (dd:mmm) and Albers geographic projection (meters). Labels are also included with station names.

The land use/land cover data for Oklahoma and Kansas have come from two sources. Oklahoma State University produced the Oklahoma database from county orthophotos. Originally there were 88 covertypes that were generalized to 25. The resolution of the coverage is 200 m x 200 m. The Kansas land use/land cover map was provided by the Kansas Applied Remote Sensing (KARS) Program. The map was produced using a computer classification of Landsat Thematic Mapper (TM) data. Ten classes were identified. The intended use of scale is 1:50,000 with a two-acre minimum mapping unit. Land use/land cover data are also available for the continental United States from the U.S. Geological Survey (USGS), the Simple Biosphere Model (SiB) and the Biosphere-Atmosphere Transfer Scheme (BATS) at 1-km grid cell resolutions.

The soil database for both Oklahoma and Kansas was provided through the Soil Conservation Services (SCS) State Soil Geographic Database (STATSGO). The soil maps for STATSGO were created from a generalization of more detailed soil survey maps. Quadrangle units (1° x 2°) were merged to create statewide coverages. The intended scale of use is 1:250,000.

The hydrography data for Kansas and Oklahoma are available at a scale of 1:250,000. Hydrography data include flowing water, water bodies, and wetlands. The data source is the USGS. Some quadrangle data are also available at scales 1:100,000 and 1:24,000. Data are available for the continental United States at a scale of 1:2,000,000.

Similarly, transportation data are provided by the USGS at a scale of 1:250,000. Roads and trails are distinguished from railroads. Pipelines and transmission lines are also in the database. Selected quadrangles are available at 1:100,000 and 1:24,000 scales.

Digital Elevation Model (DEM) data are available at 1-km grid cell resolution for the continental United States and 1:250,000 for Oklahoma and Kansas. The USGS Earth Resources Observation System (EROS) Data Center (EDC) provides DEM data for the continental United States from 30-arc second data resampled to the Lambert projection with 1-km grid cells. The data were then projected to Albers projection to conform with the other CART site geographic database. The GIS can also be utilized to provide additional information about the CART sites. An example is included which determines soil texture values for centroids of a model grid. The soil texture values would then be used as input to a model run.

An interactive web site is being developed that will allow the user to choose from a set of data coverages (e.g., soil texture), point data (e.g., ARM site facilities), and line data (e.g., hydrology) to create a map "on the fly" and save it as a postscript or gif file.