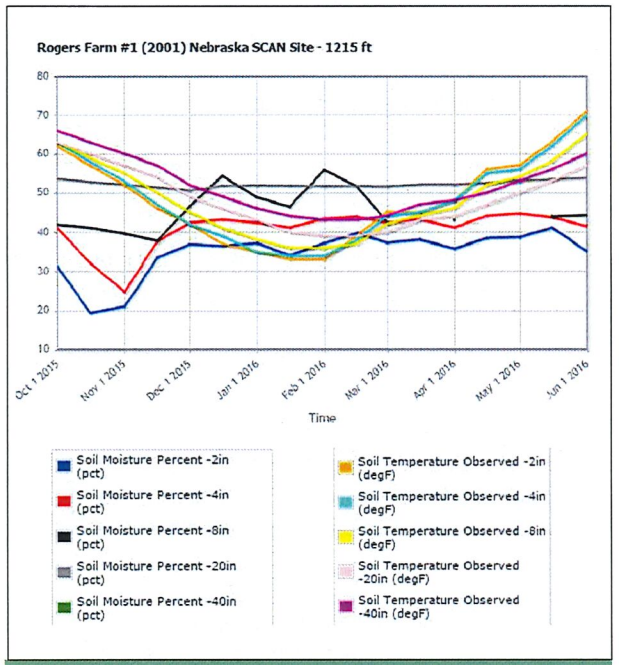


**Soil moisture and soil temperature data for the Rogers Farm SCAN site in Nebraska. Elevation at this site is 1215 ft.**

## Data transmission

SCAN uses a variety of methods to transmit remote station data. The majority of stations in the eastern U.S. use cellular modems for data transmission. Other forms of telemetry include meteor burst radio wave communications, and satellite communications technology.

## Data management

SCAN data management is performed in two stages. When the remote station data are received at the National Water and Climate Center's Water and Climate Information System (WCIS), the system automatically validates the incoming values against limits and flags any that fall outside preset limits.

A statistical assistant then examines any flagged values to determine their accuracy. All parameters are graphed and comparisons are made between sensors to verify that the data are within an acceptable range.

## Data access

All SCAN data are available at the National Water and Climate Center website at www.wcc.nrcs.usda.gov/scan.

The website contains the current and historic data for each site. In addition to the data, each site contains all soil pedon information, a site photo, and a link to the National Soil Survey Laboratory database. This database contains all of the site characterization (chemical, physical, and mineralogical) information.

## Contact us

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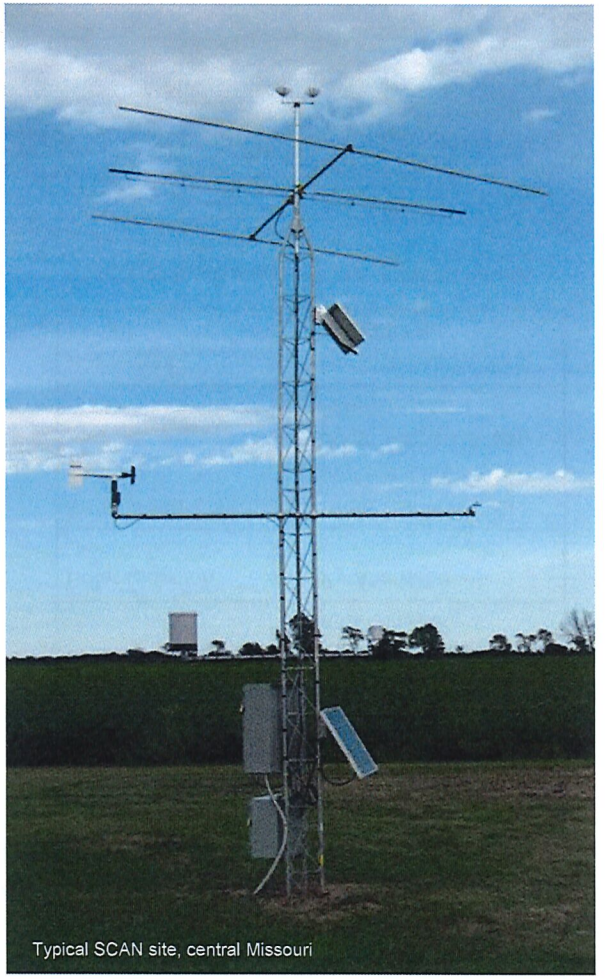
Typical SCAN site, central Missouri

# Soil Climate Analysis Network (SCAN)

USDA
National Water and Climate Center
Natural Resources Conservation Service

Blue Creek SCAN site, northern Utah.

## Overview

The Natural Resources Conservation Service (NRCS) operates a comprehensive, nationwide soil moisture and climate information network. The Soil Climate Analysis Network, also known as SCAN, supports natural resource assessments and conservation activities through its network of automated climate monitoring and data collection sites.

SCAN focuses primarily on agricultural areas of the U.S., Puerto Rico and the Virgin Islands. The network consists of over 200 stations in almost every state, and is growing every year.

## History

In the early 1990s, NRCS realized that its ability to make sound resource and drought assessments and watershed decisions was limited by a lack of quality, historic, and real-time soil climate information.

Existing data from other networks were limited, and tended to be application-specific, incomplete, short term, or narrow in coverage.

With this need in focus, NRCS started a pilot Soil Moisture/Soil Temperature project (now known as SCAN) in 1991. Significant knowledge and experience about the type of sensors, required maintenance, network operation, quality control and data delivery was gained from this pilot project.

## How are SCAN data used?

Uses of long-term soil climate information are extensive, including:

- Monitoring drought development, triggering plans, and mitigation policies.
- Investigating and documenting climate change trends.
- Predicting the long-term sustainability of cropping systems and watershed health.
- Monitoring and predicting changes in crop, range and woodland productivity.
- Predicting regional shifts in irrigation water requirements.
- Predicting changes in runoff that affect flooding and flood control systems.

SCAN sites are located across the U.S., Puerto Rico and the Virgin Islands.

## Standard site configuration

| Parameter measured | Description |
|---|---|
| Soil moisture | Dielectric constant measuring device. Measurements are at 2", 4", 8", 20", and 40" where possible. |
| Soil temperature | Encapsulated thermistor. Measurements are at 2", 4", 8", 20", and 40" where possible. |
| Precipitation | Tipping bucket gage |
| Air temperature | Shielded thermistor |
| Relative humidity | Thin film capacitance-type sensor |
| Wind speed/direction | Propeller-type anemometer |
| Solar radiation | Pyranometer |
| Snow water equivalent | Snow pillow device and pressure transducer (not on all stations). |
| Snow depth | Sonic sensor (not on all stations). |

All sensor measurements are reported hourly.