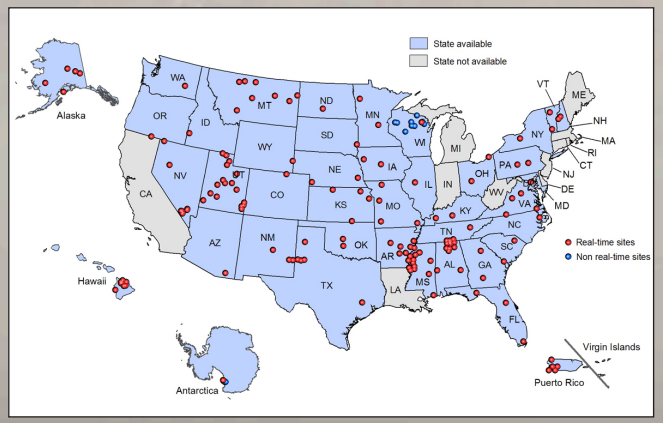
WHAT IS SCAN?

The Soil Climate Analysis Network (SCAN) is a comprehensive, nationwide soil moisture and climate information system designed to provide data to support natural resource assessments and conservation activities. Administered by the United States Department of Agriculture Natural Resources Conservation Service (NRCS) through the National Water and Climate Center (NWCC), in cooperation with the NRCS National Soil Survey Center, the system focuses on agricultural areas of the U.S. monitoring soil temperature and soil moisture content at several depths, soil water level, air temperature, relative humidity, solar radiation, wind, precipitation, barometric pressure, and more.

SCAN began as a Soil Moisture/Soil Temperature pilot project in 1991. Significant knowledge and experience has been gained regarding network operation, quality control, product analysis, and the dissemination of information to users. Sites operate in cooperation with Federal, State, local, and tribal entities. There currently are more than 150 stations in 39 States and an ever-growing list of requests for new sites across the nation.



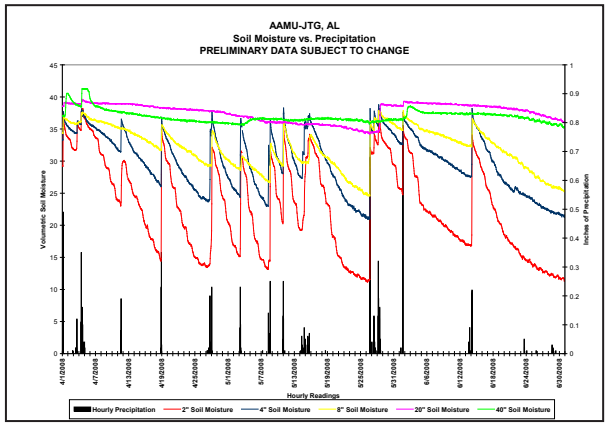
Previously, the ability of NRCS and its partners to make sound resource assessments and watershed decisions has been limited by the lack of quality, historic, and real time soil/climate information. Other network data tended to be application specific, short-term, incomplete, limited in the area of coverage, and often were non-standard. SCAN has provided a long-term, national network of standardized data that allows NRCS to build, operate, maintain, and develop models and products that result in sound resource management decisions.

USES OF SCAN DATA

SCAN data are used by global climate modelers, soil scientists, ecologists, drought managers, and farmers to support various activities including soil surveys, water management and irrigation schedules, crop production models, planting schedules, and other natural resource management issues such as:

- Monitor drought development and develop plans and policies for mitigation
- Investigate climate change scenarios
- Predict the long-term sustainability of cropping systems as well as watershed health
- Monitor and predict changes in crop, range, and woodland productivity relative to soil moisture-temperature changes
- Predict regional shifts in irrigation water requirements
- Predict shifts in wetlands
- Develop new soil moisture accounting and risk assessments
- Predict changes in runoff that affect flooding and flood control structures.

Example of Soil Moisture vs Precipitation plot for AAMU station near Huntsville, AL



DATA TRANSMISSION

SCAN uses a variety of methods to transmit remote station data in near real time. The majority of stations use meteor burst telemetry which is extremely reliable and cost effective. Some use either line-of-sight or GOES satellite technology to obtain remote station information.

DATA MANAGEMENT/VALIDATION

When remote station data are received at the NWCC Computer Center, incoming sensor values are automatically validated against limits. Any that fall outside preset windows are flagged and examined to determine accuracy, then edits are made. All parameters are graphed and compared to verify data are within an acceptable range.

DATA ACCESS

Current and historical data for each SCAN site are on the NWCC Internet homepage at www.wcc.nrcs.usda.gov. Some sites contain soil pedon information, a site picture, and a link to the National Soil Survey Center database which contains all of the site characterization (chemical, physical, and mineralogical) information.

Information Collected from a Standard SCAN Site

Parameter Measured	Description
Precipitation	Storage-type gage or tipping bucket.
Air Temperature	Collected by a shielded thermistor.
Relative Humidity	Collected by a thin film capacitance-type sensor.
Wind Speed and Direction	Collected by a propeller-type anemometer.
Solar Radiation	Collected by a pyranometer.
Barometric Pressure	Measured by a silicon capacitive pressure sensor.
Snow Water Content	Measured using a snow pillow device and a pressure transducer. (Not on all stations)
Snow Depth	Measurement is by a sonic sensor. (Not on all stations)
Soil Moisture	Collected by a dielectric constant measuring device. Typical measurements are at 2", 4", 8", 20", and 40" where possible.
Soil Temperature	Collected by an encapsulated thermistor. Typical measurements are at 2", 4", 8", 20", and 40" where possible.

All sensor measurements are reported hourly.

www.wcc.nrcs.usda.gov

The Soil Climate Analysis Network is operated by the USDA NRCS National Water and Climate Center in Portland, OR with assistance from the USDA NRCS National Soil Survey Center in Lincoln, NE. For more information on this Program, please contact the following individuals.

Policy Information:
Michael Strobel, Director
National Water and Climate Center
503-414-3055
michael.strobel@por.usda.gov

Technical Information:
Garry Schaefer, Monitoring Branch Leader
National Water and Climate Center
503-414-3068
garry.schaefer@por.usda.gov

Deb Harms, Soil Scientist
National Soil Survey Center
402-437-5324
deb.harms@lin.usda.gov

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United States Department of Agriculture
Natural Resources Conservation Service

National Water & Climate Center
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SCAN
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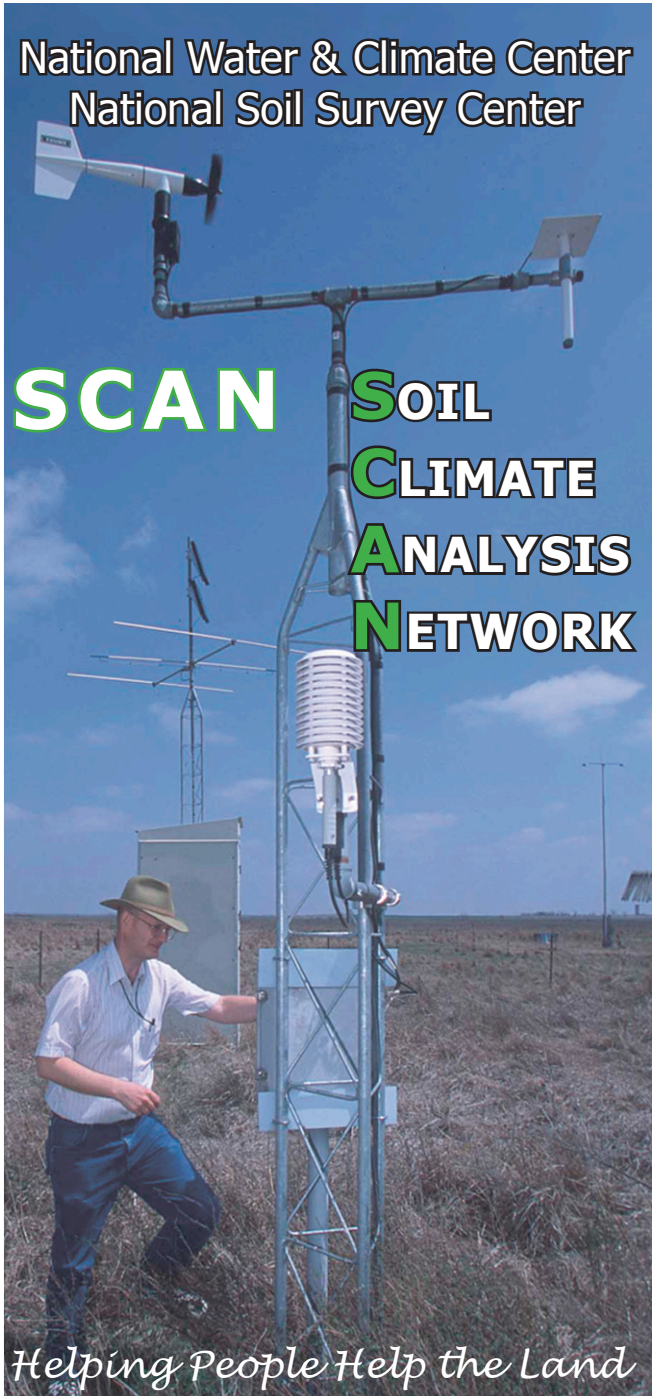

Helping People Help the Land