USDA United States Department of Agriculture

Natural Resources Conservation Service

Soil and Plant Science Division

Soil Survey Region 10

Duluth, Minnesota, MLRA Soil Survey Office

Fond du Lac TSCAN Project

Purpose

A cooperative effort to install a TSCAN (Tribal Soil and Climate Analysis Network) station was recently completed by the USDA NRCS (United States Department of Agriculture Natural Resources Conservation Service) and the Fond du Lac Band of Lake Superior Chippewa. A soil pit was dug at the site, a detailed soil description was completed, and soil samples were collected for laboratory analysis. The analysis will include particle size distribution (to determine precise soil texture), bulk density, water holding capacity, organic matter content, and numerous other soil properties.

Background Information

The TSCAN monitoring instruments were installed over 3 days. A TSCAN station monitors soil moisture and climate. It records solar radiation, air temperature, relative humidity, wind direction, wind speed, rainfall, and leaf moisture. It also records soil temperature and soil moisture at 4, 8, and 20 inches below the surface. It is powered by a solar panel and a battery.

NRCS soil scientist Mike Walczynski examines the soil pit.

Phil DeFoe, Mike Rokus, Steve Douglas, Dave Wise, and Larissa Hindman near the completion of the TSCAN instrument installation.

Key Outcomes

This installation is part of a coordinated nationwide effort to collect soil and climate data. Over 200 SCAN stations have been installed throughout the country, of which 13 are on tribal lands. This TSCAN site is in Cloquet, Minnesota, and will monitor the soil temperature and moisture conditions related to weather patterns in the Great Lakes region, which are underrepresented in the SCAN network. The data collection supports conservation activities and natural resource assessments across the country.

Uses of long-term soil climate information are extensive and include:

- Monitoring drought development, triggering plans, and mitigation policy;
- 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; and
- Predicting changes in runoff that affect flooding and flood control structures.

Data transmission is achieved through a cellular modem to the Water and Climate Information System of the National Water and Climate Center. Tribal SCAN data is available at the National Water and Climate Center website at https://www.wcc.nrcs.usda.gov/tribalscan/index.html. The website contains current and historical data for each site. The Center is currently working on getting the Fond du Lac site on the website.

Future Goals/Conclusions

The installation of the TSCAN monitoring station connects the Fond du Lac Band of Lake Superior Chippewa area to the SCAN network and collects information about soil and climate conditions. It was a great opportunity for USDA scientists and Tribal representatives to work together on a collaborative effort. There is interest in correlating the success rate of self-pollination of wild rice to relative humidity during the peak pollination period. Using this facility as an opportunity to introduce the Band's students to an example of a STEM project is being considered as well. Future activities in collecting, analyzing, and applying the data are being planned.