Soil Science Division

Soil Survey Region 2

Hanford MLRA Soil Survey Office

First TSCAN Station Installed in California

Purpose

In June 2018, the Hanford MLRA Soil Survey Office assisted in the installation of a TSCAN (Tribal Soil Climate Analysis Network) monitoring station at the Tule River Indian Reservation in the Sierra Nevada Foothills, near Porterville, California. This TSCAN station was the first of 25 to 30 stations to be installed on federally recognized tribal lands throughout the United States. The project was conceived and developed by Suzanne Baker (NRCS, New York) in 2017 while serving on a yearlong detail to the Northeast Climate Hub as NRCS Project Liaison. It is co-funded by USDA-NRCS and the USDI Bureau of Indian Affairs. The TSCAN stations will not only add needed monitoring sites to the existing Soil Climate Analysis Network (SCAN), they will also provide more direct, local, and relevant data for natural resource managers on tribal lands.

Location of Tule River Indian Reservation.

The TSCAN station, which is powered by solar panels, will measure air temperature, rainfall, solar radiation, wind speed, and wind direction as well as soil temperature and moisture. Sensors were placed in the soil at depths of 2, 4, 8, 20, and 40 inches. All data will be transmitted via satellite to the Water and Climate Information System database.

In an area adjacent to the TSCAN station, the soil survey team described and sampled a soil profile for laboratory characterization of physical and chemical properties, including particle size distribution, organic matter, and bulk density. This information will be used to properly interpret soil temperature and moisture sensor data returns.

Foreground.—The Hanford Soils Team describes and samples an Auberry pedon. Background.—Scientists from the National Water and Climate Center install the TSCAN station.

Key Outcomes and Products

The TSCAN installation and soil sampling was a great opportunity for USDA scientists to interact with tribal members and provide them training on the functions of the TSCAN system. The soil survey staff also shared their knowledge on soil descriptions, sampling, classification, and interpretations to tribal members as well as soil science student interns. The interns gained valuable on-the-job training and experience.

In the long term, the TSCAN station will produce real-time climate monitoring data, which will improve conservation planning on the reservation. It will enhance the monitoring of resource and environmental concerns, such as forage production, grazing management, fire vulnerability and modeling, plant stress, and livestock stress, as well as weather safety issues for workers. In addition, the collected data will compliment current climate monitoring networks and research programs.

Sean Day (left) and Aldo Garcia (right), students at California State University, Fresno, stand by the first TSCAN monitoring station. As soil science interns for the Hanford MLRA Soil Survey Office, they helped to install the station.

Future Goals and Conclusions

The Tule River Indian Reservation TSCAN station is the first of 25 to 30 stations to be installed on tribal lands nationwide. As more TSCAN and SCAN stations, along with other soil climate monitoring projects, are deployed, the knowledge and understanding of climate and soils will be enhanced. As a result, the development of soil survey interpretations and ecological site descriptions will be improved and, ultimately, the management of natural resources will be better and the benefits to land users and future generations will be greater.