

USING

# SOILS DATA

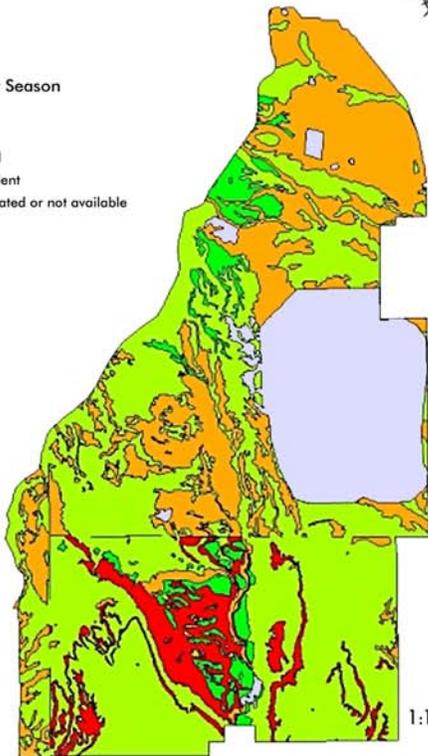
TO IMPROVE DECISION MAKING AT YOUR INSTALLATION

## Fort Carson

Abrams - Wet Season

### Legend

Abrams Wet Season



By George Teachman - Based on NRCS Soils Data

0 1,200 400 4,800 7,200 9,600 Meters

This customized map was developed by the NRCS Liaison at Fort Carson's request. It displays the rating for soils (poor, fair, good, or excellent) to support the maneuver of an Abrams tank during the wet season. Range Officers can use a map like this to identify areas where maneuver lands could be damaged.



Natural Resources  
Conservation Service



For more information

U.S. Army Environmental Command  
NRCS Liaison

Range & Technology Division  
410-436-2245, fax 410-436-7505  
<http://aec.army.mil>

Army Installation Geospatial Information &  
Services (IGI&S) Portal on AKO

<https://www.us.army.mil/suite/page/392069>

The U.S. Army Environmental Command (USAEC) and the Natural Resources Conservation Service (NRCS) have been working together for 13 years in support of a common goal: to repair, sustain, and enhance Army training and testing lands to support realistic training conditions. One of the products of this relationship is the development and maintenance of over 30 soils-related geospatial data layers for 300 Active Army and Reserve installations and training sites.

The 30+ data layers are derived from the best available soils data and can be used by range officers and land managers to help make informed decisions in support of installation management.

This brochure contains descriptions of some of the many soils interpretation data layers that are available today to installations at no cost. In addition to the data layers described in this brochure, the USAEC NRCS liaison will develop customized data layers and maps for installations by request.

Please contact the USAEC NRCS liaison to find out how to obtain the soils interpretation data layers or maps and to find answers to your soils data questions.



Photo courtesy of NRCS

# Soils Interpretation Data Layers Helpful to Land Managers

## Soil Rutting Hazard

This layer displays the potential hazard for surface rut formation resulting from the operation of large equipment.

## Erosion Hazard (Road, Trail) and Erosion Hazard (Off-Road, Off-Trail)

This layer displays the potential hazard of soil loss from road and trail land management operations and off-road and off-trail land management operations.

## Harvest Equipment Operability

This layer displays the suitability of soils for use by forestland harvesting equipment.

## Mechanical Site Preparation (Surface) & Mechanical Site Preparation (Deep)

These two layers display the suitability of using surface-altering and deep soil tillage equipment during site preparation in forested areas.

## Suitability for Roads (Natural Surface)

The ratings in this interpretation indicate the suitability for using the natural surface of the soil for roads. The ratings are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification of the soil, depth to a water table, ponding, flooding, and the hazard of soil slippage.

## Potential for Damage by Fire

This layer displays the potential impact of prescribed fires or wildfires that are intense enough to remove the duff layer and consume organic matter in the surface layer.

## Potential for Seedling Mortality

This layer displays the potential likelihood of death of naturally or artificially propagated tree seedlings, as influenced by soil characteristics, physiographic features, and climatic conditions.

## Suitability for Hand Planting

This layer displays the expected difficulty in planting forestland plants by hand. The ratings are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding.

## Suitability for Mechanical Planting

The ratings in this interpretation indicate the expected difficulty of planting trees or shrubs using a mechanical planter. The ratings are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding.

## Suitability for Log Landings

This interpretation shows the suitability of soils for use as log landings in forested areas. Log landings are the areas where logs are processed, sorted, and loaded prior to shipping.

## Construction Limitations for Haul Roads and Log Landings

This layer displays the limitations caused by soil factors for construction of haul roads and log landings.



Photo courtesy of the Army Forestry Program. Photo taken at Blue Grass Army Depot.

## Highly Erodible Lands

This layer rates the susceptibility of soils to erosion. Combining the information from this layer with the installation training plan can help pinpoint areas that may need repair in the future.

## Hydric Rating by Map Unit

Hydric soils are defined by the National Technical Committee for Hydric Soils as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Hydric soils are an indicator of the presence of wetlands.

## Source of Gravel

This layer displays a rating of soils as potential sources of gravel in suitable quantities. Gravel is defined as natural aggregates, 2 to 75 millimeters in diameter, suitable for commercial use with a minimum of processing.

## Source of Roadfill

This layer displays a rating of soils as potential sources of roadfill in suitable quantities. Roadfill is soil material that is to be used in road embankments.

## Depth to Water Table

This layer displays the depth to the water table of the various soil map units.

## Flooding Frequency Class

This layer displays the frequency that flooding can occur over a given time period. Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

## Ponding Frequency Class

This layer displays the frequency that ponding can occur over a given time period. Ponding is defined as standing water in a closed depression. The water is removed only by deep percolation, transpiration, or evaporation or by a combination of these processes.

## Surface pH (1 to 1 Water)

This layer displays the pH (reaction) of the soil surface. Soil reaction is a measure of acidity or alkalinity. It is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion. In general, soils that are either highly alkaline or highly acid are likely to be very corrosive to steel.



*Photo courtesy of NRCS*

## Available Water Supply, 0 to 150 cm

This layer displays the available water supply from 0 to 150 centimeters in depth. Available water supply is the total volume of water that should be available to plants when the soil, inclusive of rock fragments, is at field capacity.

## Percent Clay

This layer displays the distribution of the weighted percent clay within the top 12 inches of the soil. The estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to absorb cations and to retain moisture. They influence shrink-swell potential, saturated hydraulic conductivity, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

## Soils Interpretation Data Layers Helpful to Range Officers

**Vehicle Trafficability, Type 5, 50 Passes, Wet Season**  
This layer displays a rating of soils to support maneuvering of Type 5 vehicles during the wet season. Military category Type 5 vehicles, e.g., Strykers, are most all-wheel-drive trucks, trail vehicles, and heavy tanks. Range Officers can use this layer to identify portions of training areas that should be placed off-limits to tracked and wheeled vehicles during the wet season to prevent damage to the land and to ensure Soldier safety.

**Depth to Lithic Bedrock**  
This layer displays the distribution of the depth to lithic bedrock and represents the depth at which hand digging becomes impractical. This data layer may be used to determine where vehicle fighting positions and individual firing positions are practical.

## Soils Interpretation Data Layers Helpful for Ag Leasing

**Range Production (Normal Year)**  
This layer displays the total range production that can be expected during a normal year. Total range production is the amount of vegetation that can be expected to grow annually in a well managed area that is supporting the potential natural plant community.

## Soils Interpretation Data Layers Helpful for Disaster Recovery Planning

**Rubble and Debris Disposal, Large-Scale Event**  
This layer shows the degree and kind of limitations present in an area being considered for a landfill for the burial of rubble and debris created by a large-scale disaster.

**Catastrophic Mortality, Large Animal Disposal, Pit and Catastrophic Mortality, Large Animal Disposal, Trench**  
These two layers display the extent to which the soils are limited for use as a large animal disposal trench or pit.

**Composting Facility – Surface and Composting Facility – Subsurface**  
These layers display the degree and kind of limitations that affect the siting of a surface and subsurface composting facility to stabilize vegetative debris produced as a result of a major disaster.

**Composting Medium and Final Cover**  
This layer displays the degree and kinds of properties that make soil material suitable for use as composting medium and final cover material.

**Clay Liner Material Source**  
Using natural clayey soil material to line the bottom of a landfill pit is a method of assist in the sealing the pit that may have excessively high water transmission capabilities in the soil layer below the excavation. This interpretation shows the degree and kinds of properties that make soil material suitable for use as a clay liner.



Photo courtesy of NRCS



For more information

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