

TECHNICAL NOTE

AGRONOMY TECHNICAL NOTE NO. 17

SEPTEMBER 2015

Determining Potential Leaching Risk to South Dakota (SD) Groundwater SD Leaching Tool

Introduction

To provide the instructions and documentation needed for preliminary groundwater leaching assessments for conservation planning. Groundwater leaching determinations need to be completed to protect the ground water resources of SD for fields where pesticides and organic and inorganic nitrogen will be applied. A new procedure using soil survey data (Saturated Hydraulic Conductivity [Ksat]) and SD Department of Environment and Natural Resources (DENR), United States Geological Survey (USGS), "First Occurrence of Aquifer Material" maps have been developed to determine the vulnerability for leaching to groundwater, for conservation planning, which have replaced the Ksat method. This change was made to more accurately reflect the relationship of soils with inherent leaching tendencies within areas with potential shallow aquifers.

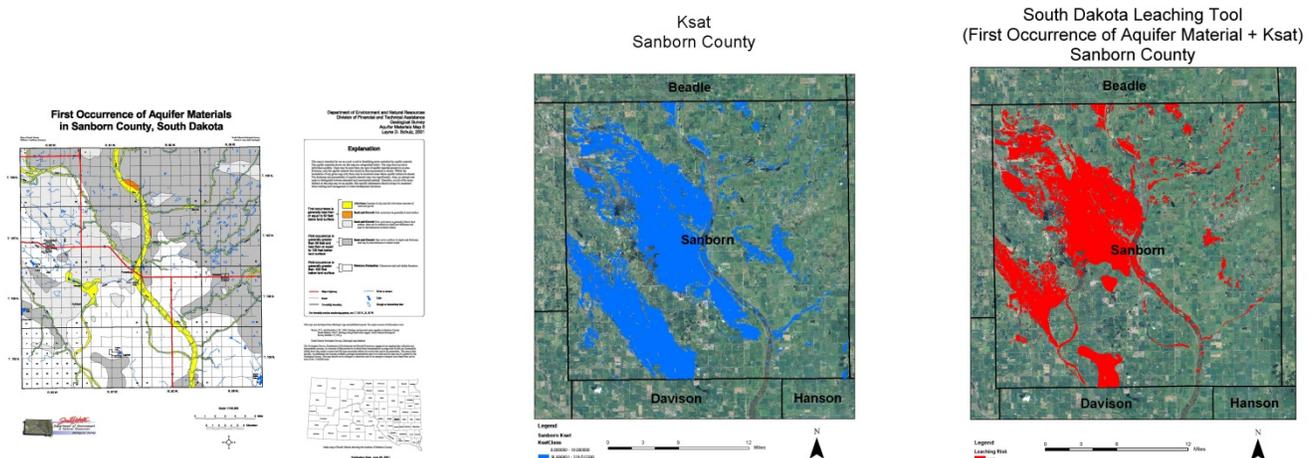
Explanation

Ksat Method

For counties that **do not** have SD DENR, "First Occurrence of Aquifer Materials" maps, the current procedure will remain in place. The NRCS will make groundwater leaching assessments based on a soils saturated hydraulic conductivity. Ksat is the ease with which pores of a saturated soil transmit water and is expressed in terms of micrometers per second. Soil map units that have a Ksat value of 10 micrometers/sec or greater and with <6 percent slope will be considered to have a "high leaching risk."

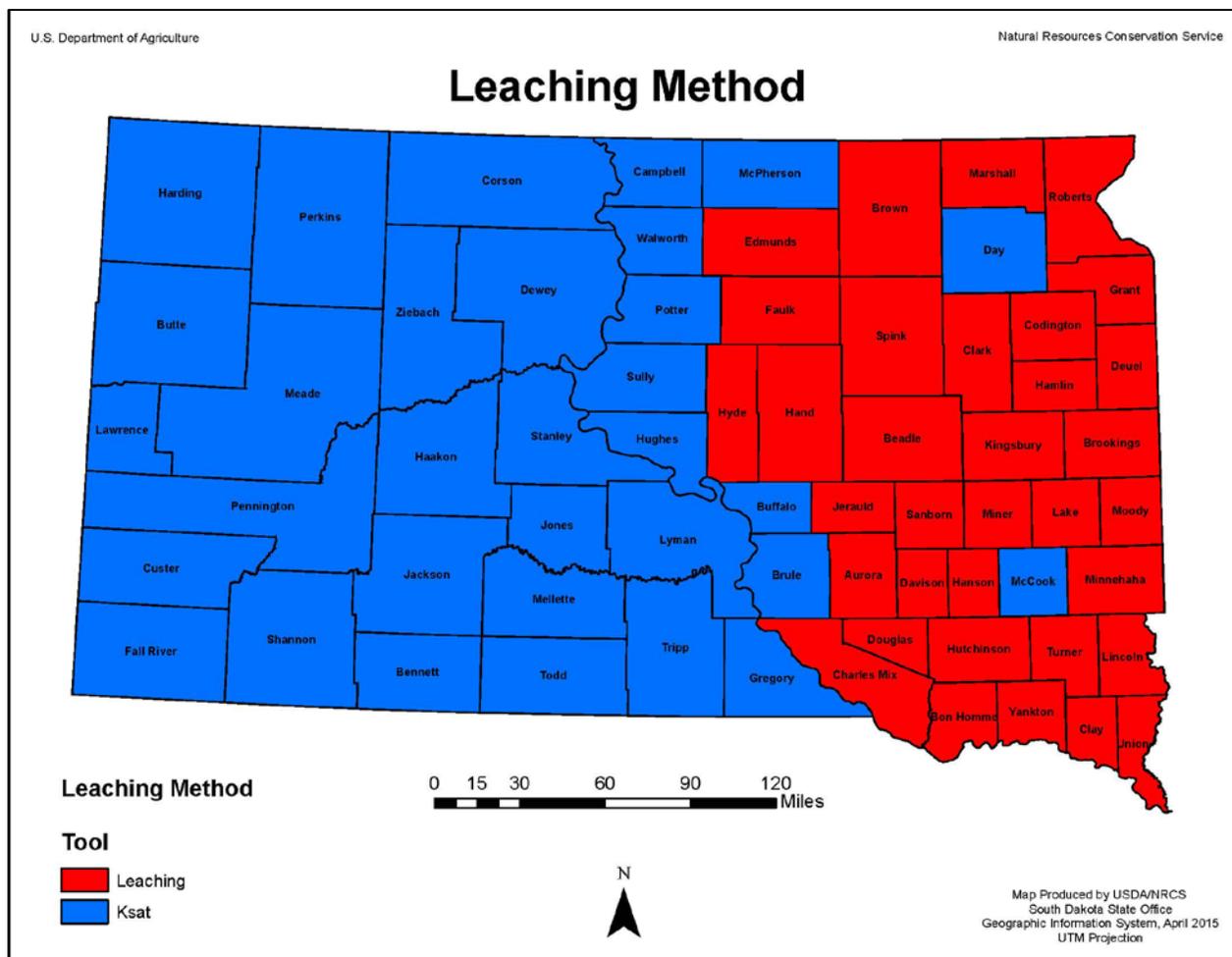
SD Leaching Tool

The new leaching tool was developed by combining the existing Ksat method with SD DENR "First Occurrence of Aquifer Materials" maps. Where there is Aquifer Material within the first 100 feet of the land surface and Ksat value of 10 micrometers/sec. or greater and with <6 percent slope will be considered to have a "high leaching risk." This procedure was completed for all counties that SD DENR, USGS has completed "First Occurrence of Aquifer Materials" maps.



Planning Criteria

The first step is to determine the appropriated method for the county. If you are using a Geographic Information System template, the current leaching determination method should be preloaded in the template. Otherwise, check the map below to select the available method (Ksat or SD Leaching Tool). If available, the SD Leaching Tool should be used before the Ksat method.



Ksat Method

The two methods which may be used to determine Ksat values are: 1) the leaching layer in Arc Map template for field office (FO) use, or manually add the GIS data from F:\geodata\soils\Leaching\leaching_FIPS.shp; 2) A downloadable Adobe Acrobat map is located in the SD Field Office Tech Guide (FOTG): Section II \Statewide Soil and Site Information\CNMP\County Name

SD Leaching Tool

This data can be accessed in two different ways: 1) "Leaching Tool" layer in the ArcMap Template for FOs or manually add the GIS data from F:\geodata\soils\Leaching_Tool\Leaching_Tool_FIPS code.shp; 2) A downloadable Adobe Acrobat map is located in the SD Field Office Tech Guide (FOTG): Section II \Statewide Soil and Site Information\CNMP\County Name

Leaching Determination:

For Ksat or the SD Leaching Tool method, view the layer on the field that a determination is being made for or look at hard copy map and see if the field has a “High Risk” or “Low Risk,” for fields that are “High,” a planner has two options:

1. If >1/3 of the field is considered high, then the entire field will be designated as “High Leaching Potential.”
2. Give the producer the option of splitting the high leaching area out and managing as a separate field.

Once the determination has been made, indicate the “High Risk” fields with the proper symbol, “L” on the Water Quality Risk Assessment Map or Plan Map.

Refer to applicable conservation practice standards such as Nutrient Management (590) and/or Integrated Pest Management (595) for guidance on how to provide conservation planning on these land units.

For DENR Permitted AFO/CAFO Facilities: the NRCS personnel will be responsible to submit the field locations for nutrient management plans to SD DENR for all leaching determinations. The field locations submitted will be identified on an aerial photograph and submitted to SD DENR. Submit fields for review to Kent Woodmansey, DENR, PMS 2020, Joe Foss Building, 523 East Capital, Pierre, SD 57501-3182.

References

USDA-Natural Resource Conservation Service, “Saturated Hydraulic Conductivity: Water Movement Concepts and Class History”

[HTTP://WWW.NRCS.USDA.GOV/WPS/PORTAL/NRCS/DETAIL/SOILS/REF/?CID=NRCS142P2_053573](http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=NRCS142P2_053573)

USDA-Natural Resource Conservation Service, National Soil Survey Handbook, 618.49, “Saturated Hydraulic Conductivity” http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_054242

South Dakota Department of Natural Resources – Geologic Survey. Aquifer Materials Maps <http://www.sdgs.usd.edu/publications/downloads.html>