

HYDRIC SOILS OF NEBRASKA

INTRODUCTION

The concept of hydric soils includes soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. Soils that are sufficiently wet because of artificial measures are included in the concept of hydric soils. Also, soils in which the hydrology has been artificially modified are hydric if the soil, in an unaltered state, was hydric. Some series, designated as hydric, have phases that are not hydric depending on water table, flooding, and ponding characteristics.

The lists of hydric soils were created by using criteria that were developed by the [National Technical Committee for Hydric Soils](#). The criteria are selected soil properties that are documented in Soil Taxonomy (Soil Survey Staff, 1999) and were designed primarily to generate a list of hydric soils from the National Soil Information System (NASIS) database. The official county hydric soils list may be found in the eFOTG, Soil Data Mart, or Web Soil Survey web sites.

Hydric soil lists have a number of agricultural and nonagricultural applications. These include assistance in land-use planning, conservation planning, and assessment of potential wildlife habitat. A combination of the hydric soil, hydrophytic vegetation, and hydrology criteria defines wetlands as described in the National Food Security Act Manual as amended (NFSAM) and the Corps of Engineers Wetlands Delineation Manual (Wetland Research Program Technical Report Y-87-1 by Environmental Laboratory, January 1987) which is currently being regionalized. Therefore, an area that meets the hydric soil criteria must also meet the hydrophytic vegetation and wetland hydrology criteria in order for it to be classified as a wetland for NFSAM purposes.

DEFINITION OF HYDRIC SOIL

The definition of a hydric soil is a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part.

CRITERIA FOR HYDRIC SOILS

The following National Soil Information System (NASIS) criteria reflect those soils that may meet the definition of hydric soils. Criteria 1, 3, and 4 serve as both database criteria and as field indicators for identification of hydric soils. Criterion 2 serves only to retrieve soils from the database. In addition, the wording of criteria 1 and 2 were changed in 2000 to incorporate recent changes in Soil Taxonomy (Soil Survey Staff, 1999). Note that these changes did not cause any soils to be added or deleted from the list. The criteria numbering system from the below list corresponds with the *Hydric criteria* column from a NASIS database printout.

1. All Histels except Folistels, and Histosols except Folist.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
 - A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
 - B. are poorly drained or very poorly drained and have either:
 - 1.) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
 - 2.) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
 - 3.) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

NFSAM APPLICATIONS FOR WETLAND DETERMINATIONS

HYDROLOGY CRITERIA FOR WETLANDS (NFSAM 514.22 & 23)

Farmed Wetland (FW) Hydrology Criteria: Secondary Indicators

NOTE: In order to protect remaining unique wetland functions and values, more restrictive criteria have been adopted for potholes, playas, and pocosins to give credit for saturated conditions.

Playa, Pothole, or Pocosin Landforms

NFSAM Hydrology Definition for FW:

If the area is a playa, pothole, or a pocosin, is inundated for at least 7 consecutive days or saturated for at least 14 consecutive days during the growing season.

NASIS Correlation for FW:

Playa, pothole, or a pocosin Landform meets the wetland hydrology criteria when listed under the hydric criteria of 2A, 2B1, 2B2 and 2B3. These soils are saturated for at least 14 consecutive days. OR hydric criteria of 3, which means they are inundated for at least 7 consecutive days.

All Other Landforms (other than playa, pothole, or pocosin)

NFSAM Hydrology Definition for FW:

If the area is NOT a pothole, playa, or pocosin, has 50% chance of being seasonally ponded or flooded for at least 15 consecutive days during the growing season, or 10% of the growing season, whichever is less, under normal conditions.

NASIS Correlation for FW:

All other soil Landforms that are not playa, pothole, or a pocosin MAY meet the wetland hydrology criteria when listed under the hydric criteria of 3 or 4. These soils are frequently ponded or flooded for long or very long duration (7 to 30 days).

NOTE: Local soils survey data can NOT be used as a secondary indicator for hydrology UNLESS additional undeniable information exists to support that hydrology (required ponding or flooding) exists.

Farmed Wetland Pasture (FWP) Hydrology Criteria: Secondary Indicators

NFSAM Hydrology Definition for FWP:

If the area is a playa, pothole, or a pocosin, is inundated for at least 7 consecutive days or saturated for at least 14 consecutive days during the growing season.

NASIS Correlation for FWP:

Playa, pothole, or a pocosin Landform meets the wetland hydrology criteria when listed under the hydric criteria of 2A, 2B1, 2B2 and 2B3. These soils are saturated for at least 14 consecutive days. OR hydric criteria of 3, which means they are inundated for at least 7 consecutive days.

Woody Vegetation for determining if hydrology would result in PC label

The use of the woody vegetation indicators to generate a PC label applies to areas with ALL of the following:

- NOT a playa, pothole, or pocosin landform.
- Woody vegetation under natural conditions as determined by one of the geographic areas listed below.
- A confirmed manipulation such as cropping that was used to produce an agricultural commodity prior to December 23, 1985.
- Only the saturation criteria is met and listed under the hydric criteria codes of 2A, 2B1, 2B2, and 2B3.

NOTE: Even if woody vegetation is removed there may be areas such as oxbows and/or natural channels that may meet the FW hydrology definition due to ponding or flooding. In such cases, a PC label would NOT apply to the oxbow or channel.

Natural conditions in Nebraska are defined as those existing in the 1800's before settlers from the east established towns, farming, and ranching. Soils of Nebraska considered to support woody vegetation when under natural conditions are found in the following geographic areas:

See attached maps corresponding to each area.

- Pine Ridge
- Wildcat Hills
- Niobrara River Valley
- bottom lands in the Missouri River Valley,
- bottom lands in the tributary stream valleys in all counties east of, and including State Highway 15.

GLOSSARY

anaerobic: a situation in which molecular oxygen is virtually absent from the environment.

artificial hydric soil: a soil that meets the definition of a hydric soil as a result of an artificially induced hydrologic regime and did not meet the definition before the artificial measures were applied.

biologic zero: the soil temperature, at a depth of 50 cm (19.7"), below which the growth and function of locally adapted plants are negligible.

drained: a condition in which ground or surface water has been removed by artificial means.

flooded: a condition in which the soil surface is temporarily covered with flowing water from any source, such as streams overflowing their banks, runoff from adjacent or surrounding slopes, inflow from the high tides, or any combination of sources.

frequently flooded, ponded, saturated: a frequency class in which flooding, ponding, or saturation is likely to occur often under usual weather conditions (more than 50 percent chance in any year, or more than 50 times in 100 years).

growing season: the part of the year when soils temperatures at 19.7 inches below the soil surface are higher than biological zero (5 degrees C). Growing season may be estimated by approximation the number of frost free days unless quantitative data is available from in-ground instrumentation. The growing season can be approximated as the period of time between the average date of the last killing frost to the average date of the first killing frost. This represents a temperature threshold of 28 degrees F or lower at a frequency of 5 years in 10. For Nebraska wetland determination applications see Field

Office Technical Guide, Section I, Maps, Nebraska Maps, “Growing Seasons for Wetland Hydrology”

hydrophytic vegetation: plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content.

long duration: a duration class in which inundation for a single event ranges from 7 days to 1 month.

permeability: the ease with which water passes through a bulk mass of soil or a layer of soil. In the NASIS database, permeability is expressed as the number of inches per hour that water moves downward through the saturated soil.

phase, soil: a subdivision of a soil series based on features that affect its use and management (e.g., slope, surface texture, stoniness, and thickness).

ponded: a condition in which water stands in a closed depression. The water is removed only by percolation, evaporation, or transpiration.

poorly drained: water is removed from the soil so slowly that the soil is saturated periodically during the growing season or remains wet for long periods.

saturated: a condition in which all voids (pores) between soil particles are filled with water.

soil series: a group of soils having horizons similar in differentiating characteristics and arrangements in the soil profile, except for texture of the surface layer.

somewhat poorly drained: water is removed slowly enough that the soil is wet for significant periods during the growing season.

very long duration: a duration class in which inundation for a single event is greater than 1 month.

very poorly drained: water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season.

water table: the upper surface of ground water where the water is at atmospheric pressure. In the NASIS database, entries are made for the zone of saturation at the highest average depth during the wettest season. It is at least six inches thick and persists in the soil for more than a few weeks. In other databases, saturation, as defined in Soil Taxonomy (Soil Survey Staff. 1999), is used to identify conditions that refer to water table in Criteria 2.