

User Guide for Automated Wetland Determination Data Form

This guide is for the wetland determination data form spreadsheet using Microsoft Excel. The spreadsheet will automatically populate hydrology, vegetation, and soil indicators using raw data input by the user. The information contained in the spreadsheet is from the Regional Supplement to the Corps of Engineers Wetland Delineation Manual (Version 2.0). (http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/reg_supp.aspx) The spreadsheet includes plant information from the U.S. Army Corps of Engineers 2016 National Wetland Plant List (NWPL), version 3.3. (<http://wetland-plants.usace.army.mil>)¹ Any upland plant information for plants not listed in the National Wetland Plant List is from the USDA PLANTS Database. (<http://plants.usda.gov/index.html>) The spreadsheet uses soil indicators from the NRCS Field Indicators of Hydric Soils version 7.0 (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053171.pdf) including the 2015 Errata. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx) The data form is a revised Version 2.0 form that includes hydric soil indicator changes from these Errata.

General Instructions:

Please use a fresh copy of the Excel file for every use and use the **Save As** command to save the spreadsheet. This Excel file is a macro-enabled worksheet. Enable macros by either selecting **Options** -> **Enable this Content** if a Security Warning bar pops up when the file is opened, or you can enable the macros by selecting **Microsoft Office button** -> **Excel Options** -> **Trust Center** -> **Trust Center Settings** -> **Macro Settings** -> **Enable all macros**. Also, when correcting data on most cells in the form, try to check and uncheck the blanks by double-clicking them or use the **Undo** command. There are many hidden formulas in the spreadsheet and overwriting them with your own data will erase these formulas. By using a fresh copy of the file and either double-clicking to uncheck or using the **Undo** command, you will preserve these formulas for future use. Areas outside the blanks for the data form are locked and cannot be selected. Comments are located throughout the spreadsheet, which give information about the indicators or other cells. Comments can be shown by holding the cursor over the cell. This spreadsheet contains a macro which automatically re-sizes the comment blocks for easy reading on any size monitor when the file first opens.

Disclaimer:

The Detroit District Regulatory Office uses the spreadsheet to produce “data-entered” copies of the wetland determination data form in Appendix C in the Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Northcentral and Northeast Region, Version 2.0, January 2012 (NCNE Supplement) and the Corps of Engineers Wetlands Delineation Manual: Midwest Region, Version 2.0, August 2010 (Midwest Supplement). The Detroit District Regulatory Office’s spreadsheet, and the resulting data sheet, includes the Natural Resource Conservation Service’s Field Indicators of Hydric Soils version 7.0 2015 Errata (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_051293.docx), which is not part of the current NCNE or Midwest Supplement data form. We are obliged to inform other users that the spreadsheet was developed for use within the Detroit District of the U.S. Army Corps of Engineers and is not intended nor approved as an *official* data entry tool/document of the U.S. Army Corps of Engineers. The spreadsheet is provided “*as is*”, with no guarantees, assurances or warranties of any kind, either express or implied, as to its accuracy, appropriateness, completeness, fitness or legal effect for any particular purpose and should be understood that usage is *not* endorsed by the U.S. Army Corps of Engineers and is fully “*at your own risk*”.

¹ Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. *The National Wetland Plant List: 2016 wetland ratings*. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X **Please see the website at:** <http://www.phytoneuron.net>

Symbols and Backgrounds:

Symbol	Description
X	This indicator is present at your sampling site based on the information you have provided.
?	This indicator <i>may be</i> present at your sampling site based on the information you have provided. Please read the comment contained in the spreadsheet cell for that indicator before verifying that indicator with an “X”.
?C	This hydric soil indicator <i>may be</i> present at your sampling site. Based on the information you have provided, this indicator meets all of the requirements except thickness. However, two of the commonly combined hydric soil indicators may be used in combination if they meet the most restrictive requirements of one of the two combined indicators. The commonly combined indicators are Sandy Redox (S5), Dark Surface (S7), Loamy Mucky Mineral (F1), Depleted Matrix (F3), Redox Dark Surface (F6), and Depleted Dark Surface (S7), but all of these indicators may not be available in the sampling site’s Subregion (LRR/MLRA). Please read the comment contained in the spreadsheet cell for that indicator before verifying that indicator with an “X”.
	A yellow background indicates that you must read the comment for that cell, as it contains important information.
	A red background indicates that the soil information is not in the proper place or is in the wrong format. See the Soil section below for more information.

Table 1: Key to symbols and background colors found in the spreadsheet.

Site Information:

Input the appropriate information at the top of page 1. The information entered into the Sampling Point cell will be copied through the subsequent pages. In the State/Territory/Commonwealth cell, please select from the drop-down list. The vegetation hydrophytic indicator status will be generated using this information. If present on the form, in the Subregion (LRR/MLRA) cell, please select your Land Resource Region and Major Land Resource Area from the drop-down list. A map of the LRR/MLRAs is available from the NRCS for the conterminous United States (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052441.pdf), and for Alaska, Hawai‘i, the Caribbean, and the Pacific Basin. (http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_050899.pdf) Selecting your proper subregion will ensure that the only the hydric soil indicators appropriate for your area will be used. This information is also used to ensure the proper vegetation indicator status is used in a state with multiple NWPL subregions. Please also be sure to check with an “X” if the sampling site’s vegetation, soil, or hydrology has been disturbed or naturally problematic, as it will allow the spreadsheet to select certain vegetation and soil indicators if wetland hydrology, hydrophytic vegetation, and hydric soil are not present.

Hydrology:

Comments containing the descriptions for the hydrology indicators are from the Regional Supplement. Table 2 below shows the hydrology indicators that will be automatically generated if present on the form. All other hydrology indicators must be reviewed and checked with an “X”.

Note: The indicators contained in Table 2 below may not automatically generate in all cases. Please review all hydrology indicators.

Hydrology Indicator	Description (for most Regions)	Spreadsheet Action
Surface Water (A1)	This indicator consists of the direct, visual observation of surface water (flooding or ponding) during a site visit.	“X” generated from Field Observations in the Hydrology section.
High Water Table (A2)	This indicator consists of the direct, visual observation of the water table 12 inches (30 cm) or less below the surface in a soil pit, auger hole, or shallow monitoring well. This indicator includes water tables derived from perched water, throughflow, and discharging groundwater (e.g., in seeps) that may be moving laterally near the soil surface.	“X” generated from Field Observations in the Hydrology section.
Saturation (A3)	Visual observation of saturated soil conditions 12 inches (30 cm) or less from the soil surface as indicated by water glistening on the surfaces and broken interior faces of soil samples removed from the pit or auger hole. This indicator must be associated with an existing water table located immediately below the saturated zone; however, this requirement is waived under episaturated conditions if there is a restrictive soil layer or bedrock within 12 inches (30 cm) of the surface.	“X” generated from Field Observations in the Hydrology section and Restrictive Layer in the Soil section.
Sparsely Vegetated Concave Surface (B8)	On concave land surfaces (e.g., depressions and swales), the ground surface is either unvegetated or sparsely vegetated (less than 5 percent ground cover) due to long-duration ponding during the growing season.	“?” generated from % Bare Ground in Herb Stratum (if present on form), or other vegetation information in the Vegetation section.
Biotic Crust (B12)	This indicator includes ponding-remnant biotic crusts, benthic microflora, and the dried remains of free-floating algae left on or near the soil surface after dewatering.	“?” generated from % Cover of Biotic Crust in the Vegetation section.
Hydrogen Sulfide Odor (C1)	A hydrogen sulfide (rotten egg) odor within 12 inches (30 cm) of the soil surface.	“X” generated if Hydric Soil Indicator Hydrogen Sulfide (A4) has been checked with an “X”.
Dry-Season Water Table (C2)	Visual observation of the water table between 12 and 24 inches (30 and 60 cm) below the surface during the normal dry season or during a drier-than-normal year.	“?” generated from Field Observations in the Hydrology section.
Presence of Reduced Iron (C4)	Presence of a layer containing reduced (ferrous) iron in the upper 12 inches (30 cm) of the soil profile, as indicated by a ferrous iron test or by the presence of a soil that changes color upon exposure to the air.	“X” generated from Profile Description in the Soil section.
Thin Muck Surface (C7)	This indicator consists of a layer of muck 1 inch (2.5 cm) or less thick on the soil surface.	“X” generated from Profile Description in the Soil section.
Shallow Aquitard (D3)	In most regions: This indicator occurs in and around the margins of depressions and in flat landscapes, and consists of the presence of an aquitard within the soil profile that is potentially capable of perching water within 12 in. (30 cm) of the surface. In Alaska; Northcentral and Northeast; and Western Mountains, Valleys, and Coast Regions: This indicator consists of the presence of an aquitard within 24 in. (60 cm) of the soil surface that is potentially capable of perching water within 12 in. (30 cm) of the surface.	“?” generated from Restrictive Layer in the Soil section. In the Alaska Region, Northcentral and Northeast Region and Western Mountains, Valleys, and Coast Region an “X” generated if Surface Water (A1) or High Water Table (A2) are also present. This indicator does not automatically generate in the Arid West Region.
FAC-Neutral Test (D5)	The plant community passes the FAC-neutral test.	“X” generated from information in the Vegetation section.

Table 2: Automatically generated hydrology indicators.

Vegetation:

Enter in the species name and the absolute % cover in any order of abundance (make sure to enter in the state information on page 1). The spreadsheet can search any plant name in the Regional Supplement area in multiple ways. The scientific name can be entered or a correctly spelled current genus name can be typed and then the species selected from a drop-down list. The spreadsheet will also find the scientific name if only the common name is known if a “space” is typed and then the common name is spelled correctly. Then you will select the scientific name which is the name directly above the common name from the list. Also, any synonyms for the species could also be entered and the correct indicator will be generated. For example, if the plant *Schoenoplectus tabernaemontani* is present, the full scientific name could be entered, “Schoenoplectus” could be entered and then the species name chosen from the drop-down list, “Scirpus validus” could be entered which is a synonym for the plant, or you could type “[space]Soft-Stem Club-Rush” and then select *Schoenoplectus tabernaemontani* from the drop-down list directly above the common name. The spreadsheet will determine if it is a dominant species and it will calculate the Dominance Test worksheet, the Prevalence Index Test worksheet, and the FAC-Neutral Test (D5) in the Hydrology section. The Prevalence Index will be calculated, but will only check with an “X” in the Hydrophytic Vegetation Indicators list if wetland hydrology and hydric soil are present. If not, the spreadsheet will search if the sampling site’s soil or hydrology has been disturbed or is naturally problematic, which is entered on page 1.

Soil:

Enter the soil profile information according to Figure 1 (make sure to enter the Subregion (LRR\MLRA) information on page 1 if present on the form).

Sampling Point: _____

SOIL								
Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-4	10YR 3/1	90	5Y 3/2	5	C	M	Loamy/Clayey	Faint redox concentrations
			5Y 4/4	5	C	PL		Prominent redox concentrations
4-8	N 4/	90	10YR 4/4	5	C	M	Sandy	Prominent redox concentrations
			10YR 5/1	5	D	M		

Figure 1: Example of the proper method of inputting soil data.

The information in the depth column must be entered in order and the starting depth of the second layer must equal the ending depth of the first layer. Only numbers may be entered in the depth column (no extra characters, i.e. + signs). Any additional information needed can be placed in the Remarks section. The colors for matrix and redox features must be entered in the format hue[space]value/chroma or hue[space]value/(blank) for neutral-hued (N) soils. If the soil color is between chroma, please round to the nearest color chip and add any additional information in the Remarks cell. Rounding should not be used to make chroma meet the requirements of an indicator. Select textures from the drop-down list and only select the texture on the same line as the matrix color and depth information. See Table 2 below for descriptions on the available textures. If additional texture information is required, place the information in the Remarks cell. Any errors in the above information will either generate an error statement or will format the cell with a red background.

Texture	Description
Loamy/Clayey	Loamy very fine sand and finer.
Sandy	Loamy fine sand and coarser.
Mucky Loam/Clay	“Mucky” is a USDA texture modifier for mineral soils. Mucky modified mineral soil material that has 0 percent clay has between 5 and 12 percent organic carbon. Mucky modified mineral soil material that has 60 percent clay has between 12 and 18 percent organic carbon. Soils with an intermediate amount of clay have intermediate amounts of organic carbon. Where the organic component is peat (fibric material) or mucky peat (hemic material), mucky mineral soil material does not occur. An example is mucky sandy loam, which has at least 7 percent organic carbon but not more than about 14 percent.
Mucky Sand	“Mucky” is a USDA texture modifier for mineral soils. Mucky modified mineral soil material that has 0 percent clay has between 5 and 12 percent organic carbon. Where the organic component is peat (fibric material) or mucky peat (hemic material), mucky mineral soil material does not occur. An example is mucky fine sand, which has at least 5 percent organic carbon but not more than about 12 percent.
Muck	Sapric organic soil material in which virtually all of the organic material is so decomposed that identification of plant forms is not possible. Muck has less than one-sixth (17%) fibers visible with a hand lens after rubbing.
Mucky Peat	Hemic organic material, which is characterized by decomposition that is intermediate between that of fibric material and that of sapric material. Mucky peat has between one-sixth (17%) and two-fifths (40%) fibers visible with a hand lens after rubbing.
Peat	Fibric organic soil material. The plant forms can be identified in virtually all of the organic material. Peat has two-fifths (40%) or more fibers visible with a hand lens after rubbing.

Table 3: Available textures and their descriptions from the Field Indicators of Hydric Soils in the United States version 7.0.

Place any additional texture information you wish to include in the Remarks section. Finally, the contrast for redox concentrations against the matrix color will automatically be calculated according to the NRCS soil color contrast information (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053569) and shown in the Remarks cell on the same line as the redox concentration.

Note: If you wish to place any other information in that Remarks cell, be aware that typing in that cell will erase the hidden formula. If you would like to include the contrast information, you will have to retype it.

All soil indicators will be calculated using the soil profile information that has been entered. An “X”, “?”, or “?C” will be generated in the hydric soil indicator cells that meet the criteria for your appropriate Subregion (LRR/MLRA). Comments containing the descriptions for the soil indicators are from the NRCS Field Indicators of Hydric Soils version 7.0 and the 2015 Errata. Following the procedure for the Regional Supplement, indicators for problematic hydric soils will generate a “?” if that wetland hydrology and hydrophytic vegetation are present. If not, the spreadsheet will search if the sampling site’s vegetation or hydrology has been disturbed or is naturally problematic, which is entered on page 1. Table 3 below shows the hydric soil indicators that were not able to be fully verified by the spreadsheet due to other information required during the field inspection.

Note: Combinations of soil indicators that meet the requirements of the individual indicators except thickness are not verified except for the six commonly combined indicators detailed in the Symbols and Backgrounds section above.

Hydric Soil Indicator	Description	Limitation
Organic Bodies (A6)	Presence of 2 percent or more organic bodies of muck or a mucky modified mineral texture starting within 15 cm (6 inches) of the soil surface.	The spreadsheet cannot verify the presence of organic bodies. Only the requirements for the starting depth and the presence of non-automated remarks made by the user for that soil layer are verified.
Polyvalue Below Surface (S8)	A layer with value of 3 or less and chroma of 1 or less starting within 6 inches (15 cm) of the soil surface. At least 70 percent of the visible soil particles must be masked with organic material, viewed through a 10x or 15x hand lens. Observed without a hand lens, the particles appear to be close to 100 percent masked. Directly below this layer, 5 percent or more of the soil volume has value of 3 or less and chroma of 1 or less, and the remainder of the soil volume has value of 4 or more and chroma of 1 or less to a depth of 12 inches (30 cm) or to the spodic horizon, whichever is less.	The spreadsheet cannot verify a spodic horizon. Only the requirements for the upper layer and the underlain layer are verified.
Thin Dark Surface (S9)	A layer 2 inches (5 cm) or more thick, within the upper 6 inches (15 cm) of the soil, with value of 3 or less and chroma of 1 or less. At least 70 percent of the visible soil particles must be masked with organic material, viewed through a 10x or 15x hand lens. Observed without a hand lens, the particles appear to be close to 100 percent masked. This layer is underlain by a layer or layers with value of 4 or less and chroma of 1 or less to a depth of 12 inches (30 cm) or to the spodic horizon, whichever is less.	The spreadsheet cannot verify a spodic horizon. Only the requirements for the upper layer and the value and chroma for an underlain layer are verified.
Reduced Vertic (F18)	<p>In Vertisols and Vertic intergrades, a positive reaction to alpha-alpha-dipyridyl that:</p> <ul style="list-style-type: none"> a. Is the dominant (60 percent or more) condition of a layer at least 4 inches thick within the upper 12 inches (or at least 2 inches thick within the upper 6 inches) of the mineral or muck soil surface, b. Occurs for at least 7 continuous days and 28 cumulative days, and c. Occurs during a normal or drier season and month (within 16 to 84 percent of probable precipitation). 	The spreadsheet cannot verify the reaction to alpha-alpha-dipyridyl. Only the thickness requirements for the loamy/clayey or muck texture are verified.
Mesic Spodic (TA6)	<p>A layer 2 inches (5 cm) or more thick, starting within 6 inches (15 cm) of the mineral soil surface, that has value of 3 or less and chroma of 2 or less and is underlain by either:</p> <ul style="list-style-type: none"> a. A layer(s) 3 inches (8 cm) or more thick occurring within 12 inches (30 cm) of the mineral soil surface, having value and chroma of 3 or less, and showing evidence of spodic development; or b. A layer(s) 2 inches (5 cm) or more thick occurring within 12 inches (30 cm) of the mineral soil surface, having value of 4 or more and chroma of 2 or less, and directly underlain by a layer(s) 3 inches (8 cm) or more thick having value and chroma of 3 or less and showing evidence of spodic development. 	The spreadsheet cannot verify spodic development. However, all other requirements are verified.

Table 4: Limitations for verifying hydric soil indicators.

Suggestions:

Send all comments, suggestions, or bug reports to wrtc@usace.army.mil.