



Illustration by Libby Walker Davidson

WETLANDS FACT SHEET

Department of Environmental Conservation
Water Quality Division, Wetland Office
103 South Main St., Waterbury, VT 05671-0408
(802) 241-3770

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Topic: What is a Wetland?

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BACKGROUND

Wetlands are defined as those areas of the state that are inundated by surface or ground water with a frequency sufficient to support plants and animals that depend on saturated or seasonally saturated soil conditions for growth and reproduction. These areas are commonly known as ponds, bogs, fens, marshes, wet meadows, shrub swamps, and wooded swamps. In the Vermont landscape, wetlands often occur in association with lakes, ponds, rivers, and streams, but they may also be isolated from any obvious connection to surface water.

The saturated or seasonally saturated conditions in wetlands create an environment that favors the growth of specifically adapted wetland plants (hydrophytic vegetation) and promotes the development of wetland soils (hydric soils). These three factors (hydrology, vegetation, and soils) are used in the delineation of wetland boundaries and are described in more detail below.

TYPES OF WETLANDS IN VERMONT

The most common wetland types in Vermont are described as follows:

- Wooded Swamp - A wetland dominated by trees greater than 20 feet tall. Typical species include red maple, northern white cedar, and American elm.
- Shrub Swamp - A wetland dominated by woody shrubs less than 20 feet tall. Typical species include speckled alder, willows, and buttonbush.
- Wet Meadow - A wetland dominated by grasses, sedges, and other forbs with saturated soil near the surface but without standing water for most of the year.
- Marsh - A frequently or continually flooded wetland characterized by emergent herbaceous vegetation.
- Pond - A small, relatively shallow body of open water less than 20 acres in size.
- Bog - A wetland underlain by a thick layer of peat and which receives water mostly by precipitation. Vermont bogs are usually dominated by sphagnum mosses and low shrubs such as leatherleaf.

HOW ARE WETLANDS RECOGNIZED IN THE FIELD?

Some wetland types can be easily recognized, especially those with standing water, while others may be less obvious. Areas that are flooded in the spring and early summer may dry up by August. Other wetlands may never have standing water but may have saturated soil conditions for a portion of the growing season. Therefore, the presence or absence of water cannot, by itself, be used to make a determination. In the field we look for indicators of three wetland parameters: hydrology, soils and vegetation. Normally, evidence of all three parameters must be found for an area to qualify as a wetland.

HYDROLOGY

Wetland hydrology refers to the timing and extent of flooding or soil saturation and is considered to be the "driving force" in wetland formation. Rainfall, soil permeability, position in the landscape, surrounding land use, and type of vegetation all influence the hydrology of a wetland. Although hydrology is the most important of the three wetland parameters, it can sometimes be the most difficult factor to determine in the field because water levels in wetlands are often highly variable in the course of an average year. As an example, floodplain forest wetlands may be flooded for a few days or several weeks during the spring and then, as the river level falls, water may rapidly drain out of the wetland. Such areas may then be dry for the rest of the growing season. Other wetlands with less permeable soils may have a brief period of surface flooding in the spring, followed by a slow retreat of the water table through the summer and early fall. Still other areas may not have surface water at all; they may have saturated soil for several weeks or months during the growing season. These areas would also be considered wetlands if they have the wetland soils and vegetation described below.

Direct evidence of wetland hydrology includes actual observation of soil saturation or surface water, long-term observation of water levels in monitoring wells, records of past floods, and detection of flooding on aerial photographs. Indirect evidence includes water marks and silt deposits on trees, shallow rooting of trees or shrubs, buttressing, silt-stained leaves on the ground surface, and flood debris.

SOILS

Wetland soil characteristics form when soil is continuously saturated for at least one week during the growing season. Under such saturated conditions, soil micro-organisms can rapidly use up the oxygen in the soil, resulting in reduced conditions. A general description of the important types of wetland soils is given below.

If the soil is continually saturated throughout the growing season, the lack of oxygen may severely slow the rate of decay of plant matter and result in the accumulation of a thick layer of peat or muck. Such soils are known as organic soils. All organic soils in Vermont are considered to be hydric, or wetland, soils. Muck is an organic soil in which most of the plant material is heavily decomposed and there are few recognizable plant fragments. Peat is an organic soil in which most of the plant material is still identifiable. Mucks are usually black, while peats may range in color from brown or reddish brown to black. Many organic soils emit an odor of rotten eggs, resulting from the partial decomposition of plants under waterlogged conditions.

Soils composed predominantly of mineral matter, such as sand, silt, clay, or loam, are known as mineral soils. If the saturation is of a shorter duration and/or if there is more flow of water through the wetland, there may be little or no accumulation of organic matter. Prolonged saturation leads to the development of gleyed or mottled soils. Gleyed soil horizons are gray to greenish or bluish gray in color. Soils that are

gleyed up to within 18 inches of the surface are hydric soils. Mottled soil horizons form in locations where the water table fluctuates over the course of the year. Soils which contain brown or yellow mottles within a grayish matrix are hydric soils when the mottling occurs within 18 inches of the surface.

The USDA Natural Resource Conservation Service (NRCS) has prepared soil surveys for most of the counties in the state and is in the process of mapping the remaining counties. The surveys include soil maps and detailed soil descriptions and can serve as very useful guides in identifying the larger areas of wetland soil. Contact your County NRCS office for more information.

VEGETATION

Wetland plants are those plant species which have adapted to growing in the low-oxygen conditions associated with prolonged soil saturation or inundation. Plant species vary in their tolerance of wetland conditions. Those species which grow only in wetlands are classified as obligate wetland plants, and those which grow only in non-wetland conditions are classified as obligate upland plants. Species which grow with roughly equal frequency in wetlands and non-wetlands are classified as facultative wetland plants. See the National List of Plant Species That Occur in Wetlands: 1988, Vermont for more information. Table 1 is a listing of some of the common plants encountered in Vermont's wetlands.

TABLE 1. Typical Vermont Wetland Plants

<p>PONDS spatterdock white pond lily pond weeds pickerel weed water smartweed water-milfoils coontail bladderworts duckweeds watershield</p>	<p>BOGS sphagnum mosses leatherleaf American larch black spruce highbush blueberry Labrador tea bog laurel sheep laurel small cranberry bog rosemary cottongrass pitcher plant sundews</p>	<p>WOODED SWAMPS red maple silver maple black willow northern white cedar green ash black ash American elm American larch black spruce</p>
<p>MARSHES cattails bulrushes sedges burreeds rushes arrowheads common reed pickerel weed wild rice</p>	<p>WET MEADOWS reed canary grass wool grass manna grass sedges meadowsweet sensitive fern Joe-pye-weed boneset blue vervain</p>	<p>SHRUB SWAMPS speckled alder shrub willows red maple saplings American elm saplings red-osier dogwood silky dogwood highbush blueberry common winterberry northern arrowwood buttonbush</p>

VERMONT WETLAND MAPS

National Wetland Inventory (NWI) maps indicate the general locations of most of the wetlands that are 2-3 acres in size or larger. Some smaller wetlands are also shown. The wetlands are classified according to a system developed by the U.S. Fish and Wildlife Service. A combination of letter and number codes indicates the wetland type, the dominant vegetation type, and the water regime. The Vermont Water Resources Board has adopted a particular set of these maps as the Vermont Significant Wetland Inventory (VSWI) maps. Official VSWI maps have a special legend block identifying them as such. These maps can be used at town or regional planning offices, and copies are available from the Water Quality Division at the address below.

The NWI maps indicate that there are approximately 244,000 acres of wetlands in the state. This represents about 4.1 percent of the land area. Field observations by the Wetlands Office staff indicate that this is an underestimation and that the actual figure is probably closer to five to six percent. According to the NWI maps, about 54 percent of the Vermont wetland acreage consists of wooded swamps while shrub swamps occupy about 29 percent, marshes and wet meadows occupy about 11 percent, and ponds make up about 4 percent. Bogs dominated by low shrubs, such as leatherleaf, make up only about 1 percent of the total wetland acreage in Vermont.

WETLAND FUNCTIONS AND VALUES

Some of the functions and values that wetlands provide include: flood control, water quality protection, wildlife habitat, recreation and economic benefits, and erosion control. See the *Wetland Functions and Values* Fact Sheet for more information.

WETLAND REGULATIONS

Any work in a wetland, whether it is mapped or not, may be regulated at the federal, state, or local level. Appropriate offices should be notified prior to any dredging, draining, filling, or grading of wetlands. See the Fact Sheets entitled *Federal Wetland Regulations* and *Wetland Rules Summary* and the *Vermont Wetland Rules* for more information.

FOR MORE INFORMATION CONTACT:

Vermont Wetlands Office
Dept. of Environmental Conservation
103 South Main Street
Building 10 North
Waterbury, VT 05671-0408
(802) 241-3770 Fax (802) 241-3287
www.vtwaterquality.org/wetlands

Army Corps of Engineers
Vermont Field Office
8 Carmichael Street Suite 205
Essex, VT 05452
(802) 872-2893 Fax (802) 879-7638