



Vernal Pool Training for Conservation and Inland Wetland Commissions April 6, 2024

Presenters: Denise Savageau and Michael Aurelia
Hosted by the CT River Coastal Conservation District
and CT Audubon Roger Tory Peterson Estuary Center

Program Schedule

09:00 – 09:05	Welcome and Introductions
09:05 – 10:00	What are vernal pools and Why are they important?
10:00 – 10:30	Local land use commissions and vernal pool protection
10:30 – 11:00	Identifying vernal pools using GIS, aerial photography, and citizen scientists
11:00 – 11:15	Break
11:15 – 12:30	On-site Field Visit



What are vernal pools?

Vernal pools go by many names:

- seasonal wetlands
- isolated wetlands
- ephemeral wetlands
- vernal ponds
- woodland ponds

And in different parts of the country, they have different characteristics, flora, and fauna.



In the east, vernal pools are most often forested ecosystems such as this vernal pool in Greenwich, CT. But can be in floodplains or meadows and are quite varied in terms of shape and size.

This vernal pool is located in the Sacramento River Valley in Butte County, California. West coast vernal pools are often open grassland wetlands.



Vernal pools generally have three things in common:

- Unique hydrology – the “isolated” water regime is seasonal and often depends on rainfall
- No permanent fish populations
- Support breeding and development of specialized amphibian and other species in most years

These conditions combine to develop a wetland habitat that supports unique amphibian and invertebrate populations.

Although individual pools may be “isolated”, they are often found in complexes that work together.

Vernal pools are often overlooked as critical wetland habitat because of size and seasonal dry periods.



Photo credits: The Vernal Pool Association

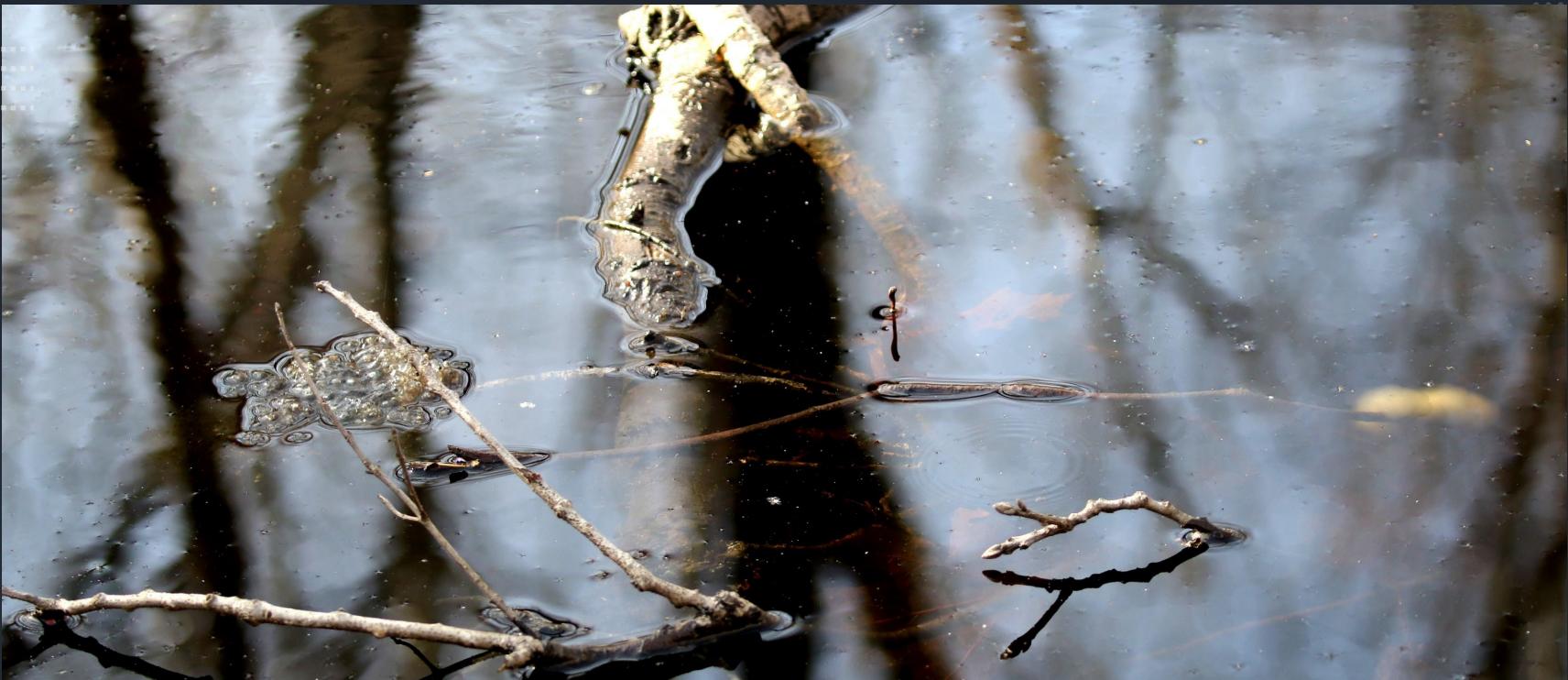
A “classic” vernal pool through the seasons showing hydrology regime.

Vernal pools often fill in fall through early spring but may be completely dry by mid-summer. To serve as breeding habitat, they need to have enough water to last until the amphibians metamorphose and are able to leave the pool.



Vernal pools vary tremendously throughout the landscape.

There is no one size fits all.



Vernal pools are used by a variety of vertebrate and invertebrate species.

In general:

- **Obligate or indicator*** species rely on vernal pools for survival
- **Facultative species** use vernal pools but are not dependent

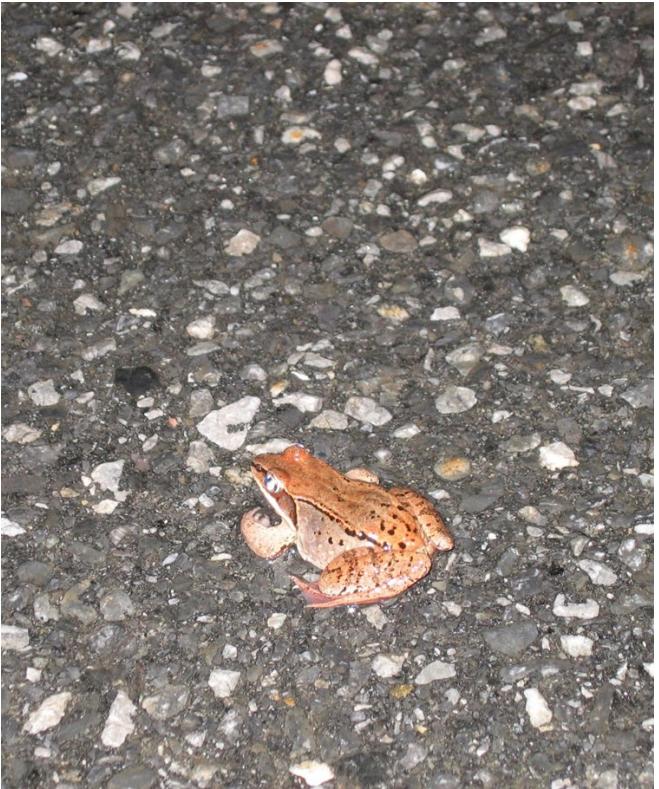
*For reference: Calhoun and Klemens refer to obligate species as indicator species



Wood frog

Rana Sylvatica

Vernal Pool obligate/Indicator species



Wood frogs and mole salamanders often have to traverse roads and other manmade barriers to get to a vernal pool.

Wood frogs in amplexus

Spotted salamander –
Ambystoma maculatum



*Blue-spotted
salamander –
Ambystoma laterale



*Jefferson salamander
– *Ambystoma jeffersonianum*

* These species interbreed and often referred to as a Blue-spotted/Jefferson complex



Connecticut has 4 species of mole salamanders (*Ambystoma* sp.) that are considered obligate/indicator species for vernal pools

Marbled salamander –
Ambystoma opacum





Spotted salamander



Marbled salamander

- lay eggs in fall

Fairy shrimp – obligate/indicator species





Invertebrate species

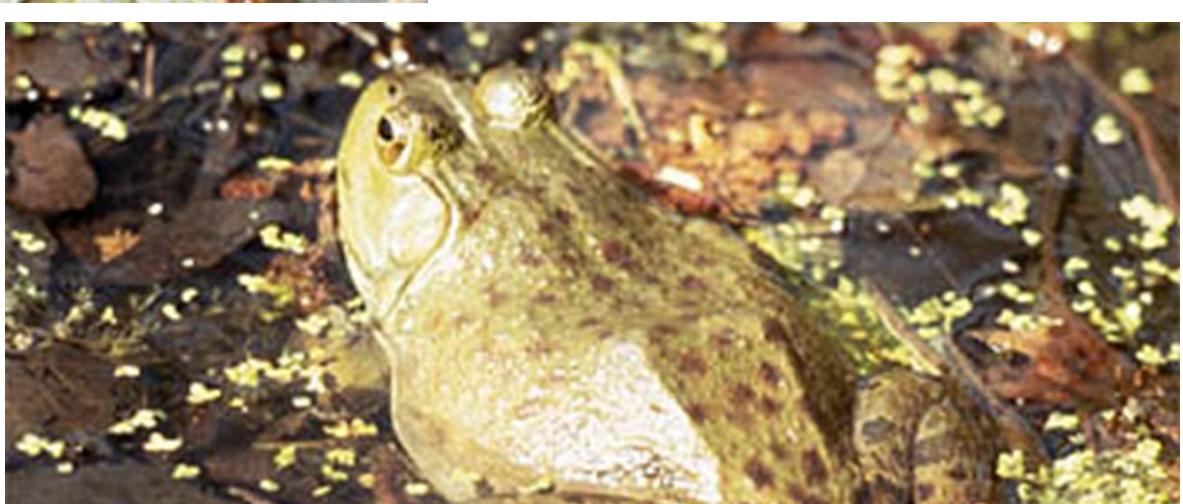
Although the amphibians and fairy shrimp get all the glory, invertebrates have a special role in vernal pools as shredders, algae eaters, prey, and predator.

Some are obligate/indicator species and some are facultative species.



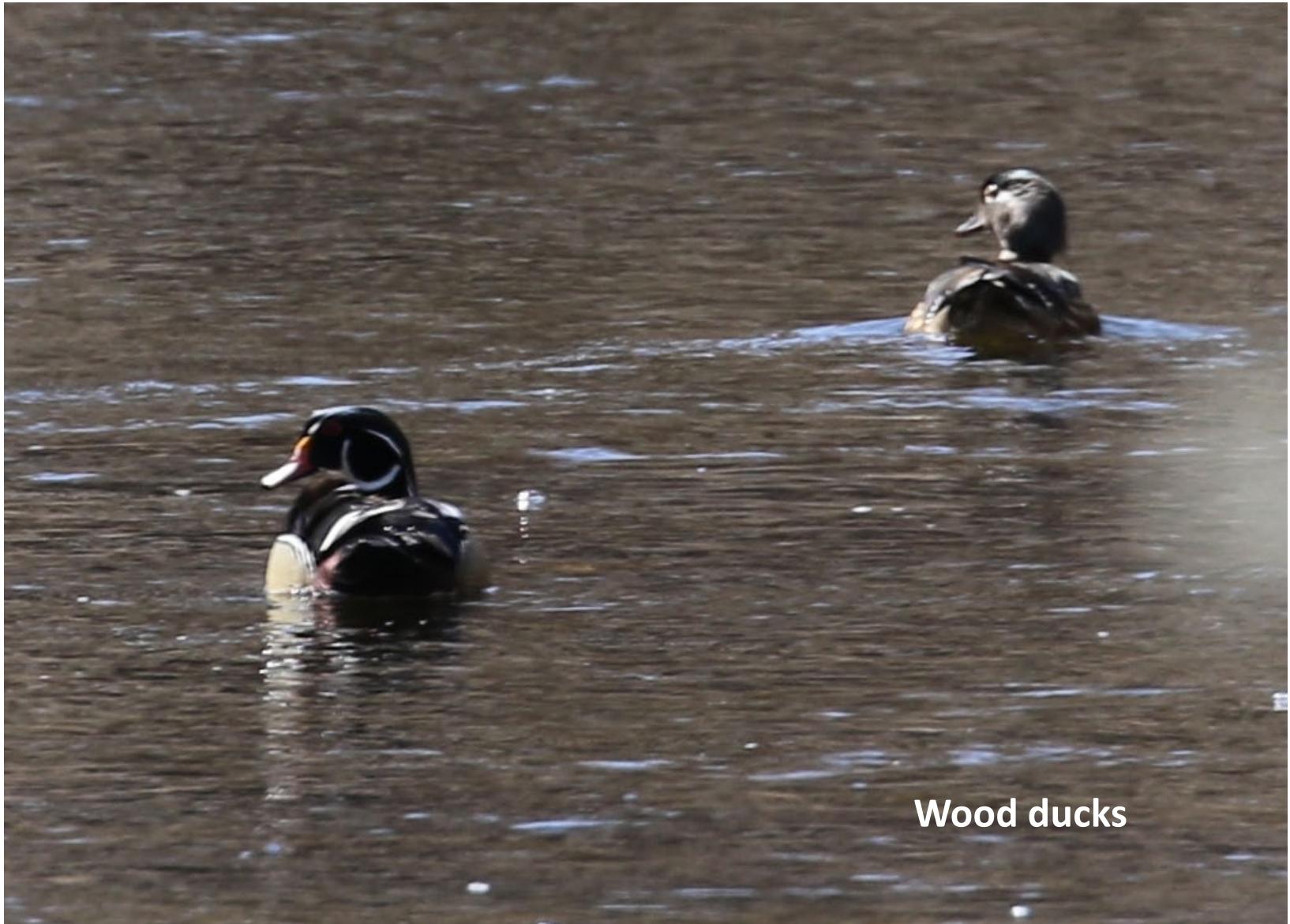
Facultative species

CT has 7 species of frogs and 2 species of toads. Only the wood frog is obligate for vernal pools. The other 8 species are facultative.



Of the 8 fresh water or terrestrial turtles in Connecticut, the spotted and wood turtle are the most likely to be seen in vernal pools





Wood ducks

Wicked Big Puddles

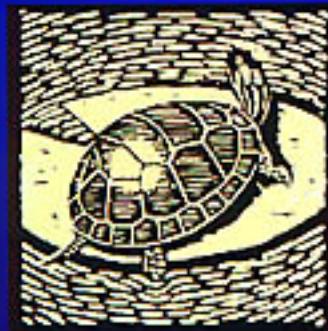
A slide series by the
Vernal Pool Association

Thanks to the Vernal Pool
Association for their great
resources!

You can reach them at:

www.vernalpool.org

Production and distribution of this program
is funded by a grant from:



The
Sweet Water
Trust

Roles for Conservation and Inland Wetland Commissions in protecting vernal pools



Inland Wetlands and Watercourses Commissions

“On or before July 1, 1988, each municipality shall establish an inland wetlands agency or authorize an existing board or commission to carry out the provisions of sections **22a-36 to 22a-45**”

Conservation Commissions - Sec. 7-131b

“**It shall keep an index of all open areas, publicly or privately owned, including open marshlands, swamps and other wetlands, for the purpose of obtaining information on the proper use of such areas**, and may from time to time recommend to the planning commission or, if none, to the chief executive officer or the legislative body plans and programs for the development and use of such areas. **It may make recommendations to zoning commissions, planning commissions, inland wetlands agencies and other municipal agencies on proposed land use changes.**”

Sec. 22a-36. Inland wetlands and watercourses. Legislative findings. The inland wetlands and watercourses of the state of Connecticut are an indispensable part of the natural environment. They are a fragile natural resource with which the citizens of the state must live in harmony. Inland wetlands and watercourses are an interrelated web of natural resources that are important to the supply of surface and underground water; to hydrologic balance; to the prevention of flooding and erosion; to the recharging and purification of ground water; and to the support of many forms of animal, aquatic and plant life. Many inland wetlands and watercourses have been destroyed or are in danger of destruction because of unregulated uses, such as the deposition, filling or removal of material, the diversion or diversion of water, the erection of structures and other uses, all of which have a significant impact on the wetlands and watercourses. Such unregulated uses have and will continue to imperil the natural environment thus adversely affecting the ecological, scenic, historic and other natural values and benefits of the state for its citizens now and forever more. The conservation and protection of the wetlands and watercourses from random, unnecessary, undesirable and unregulated uses, disturbance or destruction is in the public interest and is essential to the health, welfare and safety of the citizens of the state. **It is, therefore, the purpose of sections 22a-36 to 22a-45, inclusive, to protect the citizens of the state by making provisions for the protection, preservation, maintenance and use of the inland wetlands and watercourses by** minimizing their disturbance; preventing pollution; maintaining and improving water quality in accordance with the highest standards set by federal, state or local authority; preventing damage from erosion or siltation; **preventing loss of fish and other beneficial aquatic organisms, vegetation and the destruction of the natural habitats thereof**; preventing the danger of flood and pollution; protecting the quality of wetlands and watercourses; conserving, economic, aesthetic, recreational and other public and private values; and protecting the state's potable fresh water supplies from the dangers of overdraft, pollution, misuse and mismanagement by providing an orderly procedure to balance the need for the economic growth of the state and the use of its land while protecting its environment and ecology in order to forever guarantee to the people of the state, the safety of such natural resources for their benefit and enjoyment and for the benefit and enjoyment of generations yet unborn.

It is, therefore, the purpose of sections 22a-36 to 22a-45, inclusive, to protect the citizens of the state by making provisions for the protection, preservation, maintenance and use of the inland wetlands and watercourses by ...

...preventing loss of fish and other beneficial aquatic organisms, wildlife and vegetation and the destruction of the natural habitats thereof



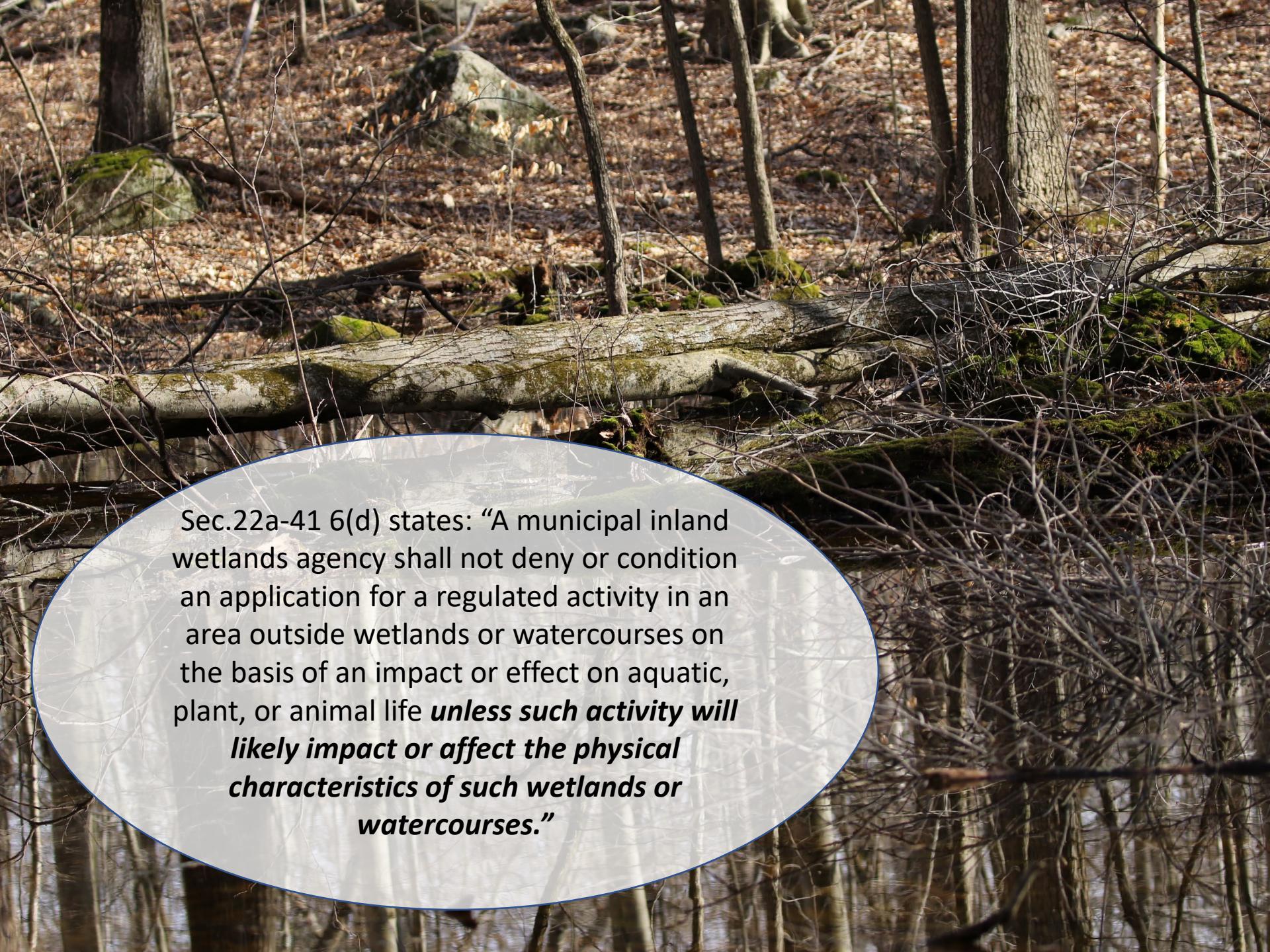
Because of their location in the landscape, vernal pools often fit into the soils-based definition in the CT IWWA

“Wetlands” means land, including submerged land, not regulated pursuant to sections 22a-28 to 22a-35, inclusive, which consists of any of the soil types designated as poorly drained, very poorly drained, alluvial, and floodplain by the National Cooperative Soils Survey, as may be amended from time to time, of the Natural Resources Conservation Service of the United States Department of Agriculture.”

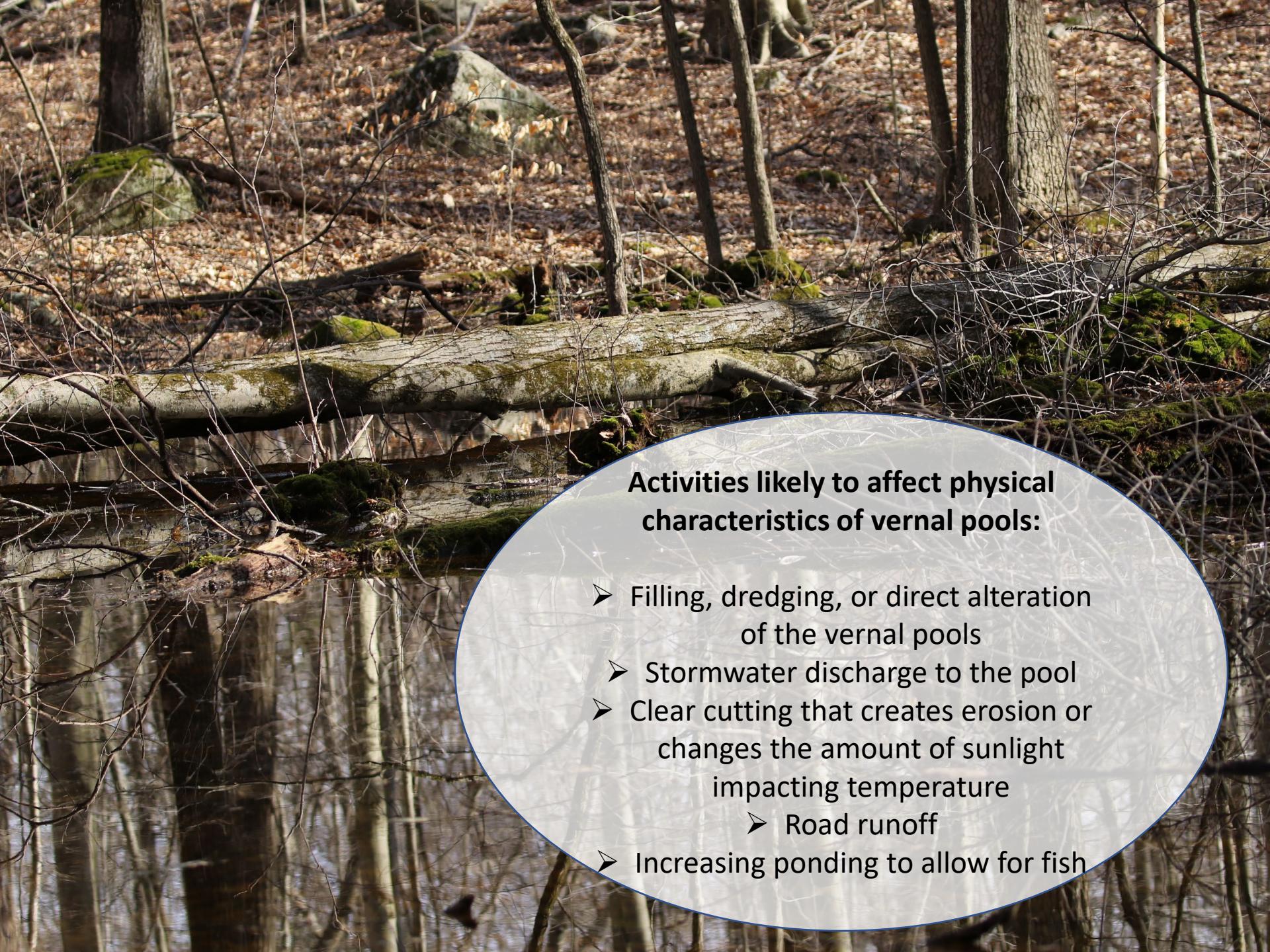


Vernal pools also fit into the Watercourses definition in statute.

“Watercourses” means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, **vernal or intermittent**, public or private, which are contained within, flow through or border upon this state or any portion thereof, not regulated pursuant to sections 22a-28 to 22a-35, inclusive. Intermittent watercourses shall be delineated by a defined permanent channel and bank and the occurrence of two or more of the following characteristics: (A) Evidence of scour or deposits of recent alluvium or detritus, (B) the presence of standing or flowing water for a duration longer than a particular storm incident, and (C) the presence of hydrophytic vegetation”



Sec.22a-41 6(d) states: “A municipal inland wetlands agency shall not deny or condition an application for a regulated activity in an area outside wetlands or watercourses on the basis of an impact or effect on aquatic, plant, or animal life ***unless such activity will likely impact or affect the physical characteristics of such wetlands or watercourses.***”



Activities likely to affect physical characteristics of vernal pools:

- Filling, dredging, or direct alteration of the vernal pools
- Stormwater discharge to the pool
- Clear cutting that creates erosion or changes the amount of sunlight impacting temperature
 - Road runoff
- Increasing ponding to allow for fish



Conservation Commissions can play an important role in vernal pool protection

- **Inventory and Assessment – using citizen scientists**
- **Providing input into the POCD and incorporating into open space planning efforts**
- **Commenting on development plans before IWWA and P&Z**
- **Outreach and education**



Identifying and Monitoring Vernal Pools



Connecticut Environmental Conditions Online

Maps and Geospatial Data for Everyone

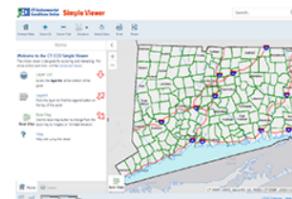
[Maps](#)[Data](#)[Info](#)[Featured](#)

Viewers

[Simple Map Viewer](#) | [Advanced Map Viewer](#) | [Aerial Imagery Viewer](#) | [CT 2016 Imagery Viewer](#) | [Elevation \(Lidar\) Viewer](#) | [3D Lidar Point Viewer](#) | [Blue Plan Viewer](#) | [CT MS4 Viewer](#) | [CT Parcel Viewer](#) | [Sea Level Rise Effects on Roads & Large Marshes Viewer](#) | [CT DEEP Fish Community Data - Inland Waters](#) | [CT Aquaculture Mapping Atlas](#) | [Connecticut Coastal Hazards Viewer](#)

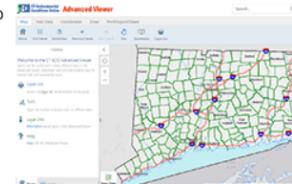
[Simple Map Viewer](#)

The [Simple Map Viewer](#) is for viewing one natural resource theme at a time such as farmland soils, wetland soils, protected open space, natural diversity data base areas, and water quality classifications. Select the map theme to display and optionally overlay it on aerial photography or elevation. The simple map viewer includes links to CT ECO [Data Guides](#) and [Resource Guides](#) that explain each map theme. Map themes in the simple map viewer closely correspond with the maps available in the [Map Catalog](#).

[GO TO VIEWER](#)[VIEWER HELP](#)

[The Advanced Map Viewer](#)

The [Advanced Map Viewer](#) is an interactive map viewer that provides more tools than the Simple Map Viewer as well as the possibility to combine many different data layers.

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[Aerial Imagery Viewer](#)

<https://cteco.uconn.edu/viewers/index.htm>



0.1 0 0.07 0.1 Miles

This map is intended for general planning, management, education, and research purposes only. Data shown on this map may not be complete or current. The data shown may have been compiled at different times and at different map scales which may not match the scale at which the data is shown on this map.



Legend

- Freshwater Forest and Shrub V
- Freshwater Emergent Wetland
- Other Freshwater Wetland
- Freshwater Ponds
- Lakes
- Riverine

Inland Wetland Soils

- Poorly Drained and Very Poorly Drained
- Alluvial and Floodplain Soils

Light Gray Canvas Base

Notes

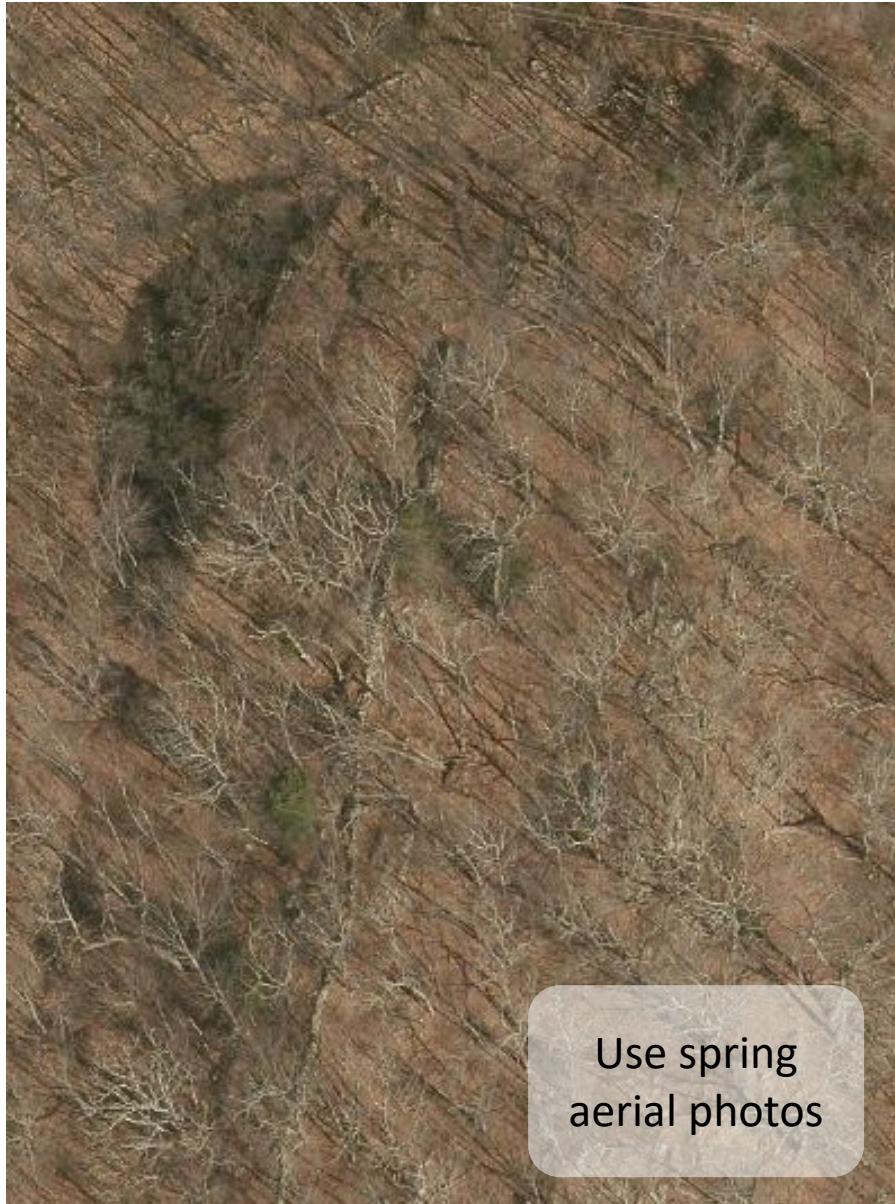
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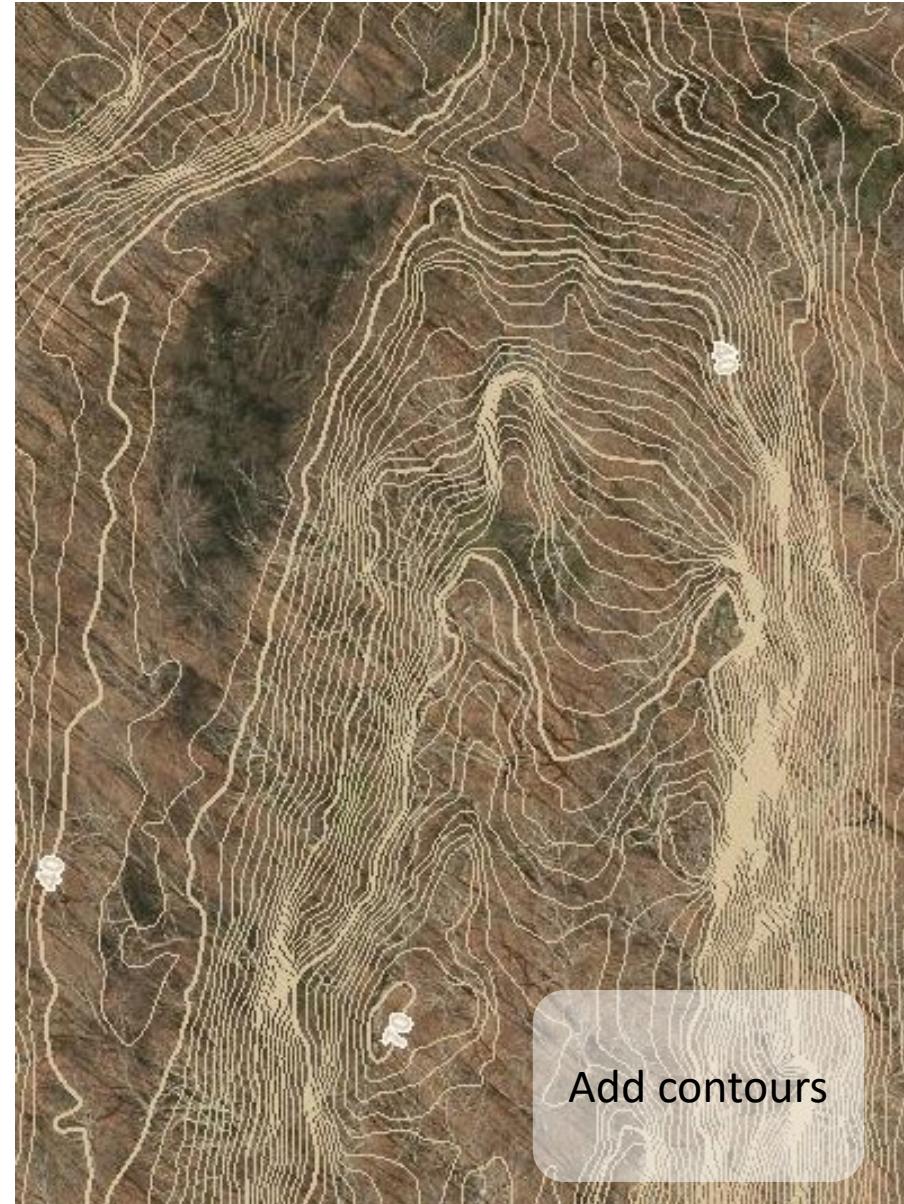
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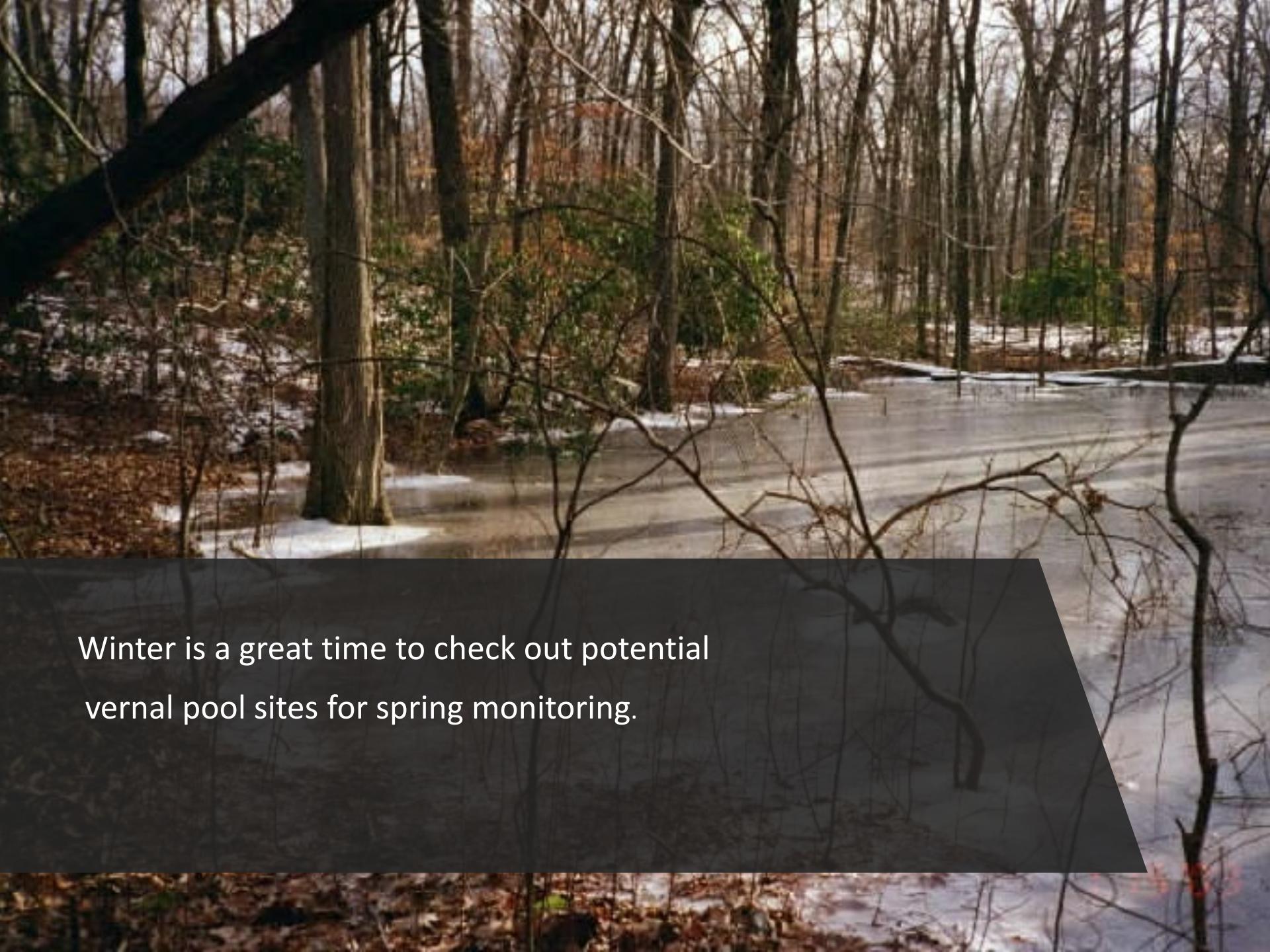
Use spring
aerial photos



Add contours



Field check confirmed

A photograph of a winter forest. The ground is covered in a thin layer of snow and fallen brown leaves. A frozen stream or pond stretches across the middle ground, reflecting the surrounding bare trees. The trees are mostly deciduous, with their branches reaching out over the water. The overall atmosphere is quiet and cold.

Winter is a great time to check out potential
vernal pool sites for spring monitoring.

Wood frogs and mole salamanders migrate to the pools in early spring, often the first warm rain in March.

It is amazing to see and hear the wood frogs and to see the salamanders congregate but this is a really fleeting event.

Usually by the first week in April you will see egg masses in the pools. By mid-April you will have tadpoles and by end of April you will also have salamander larvae.



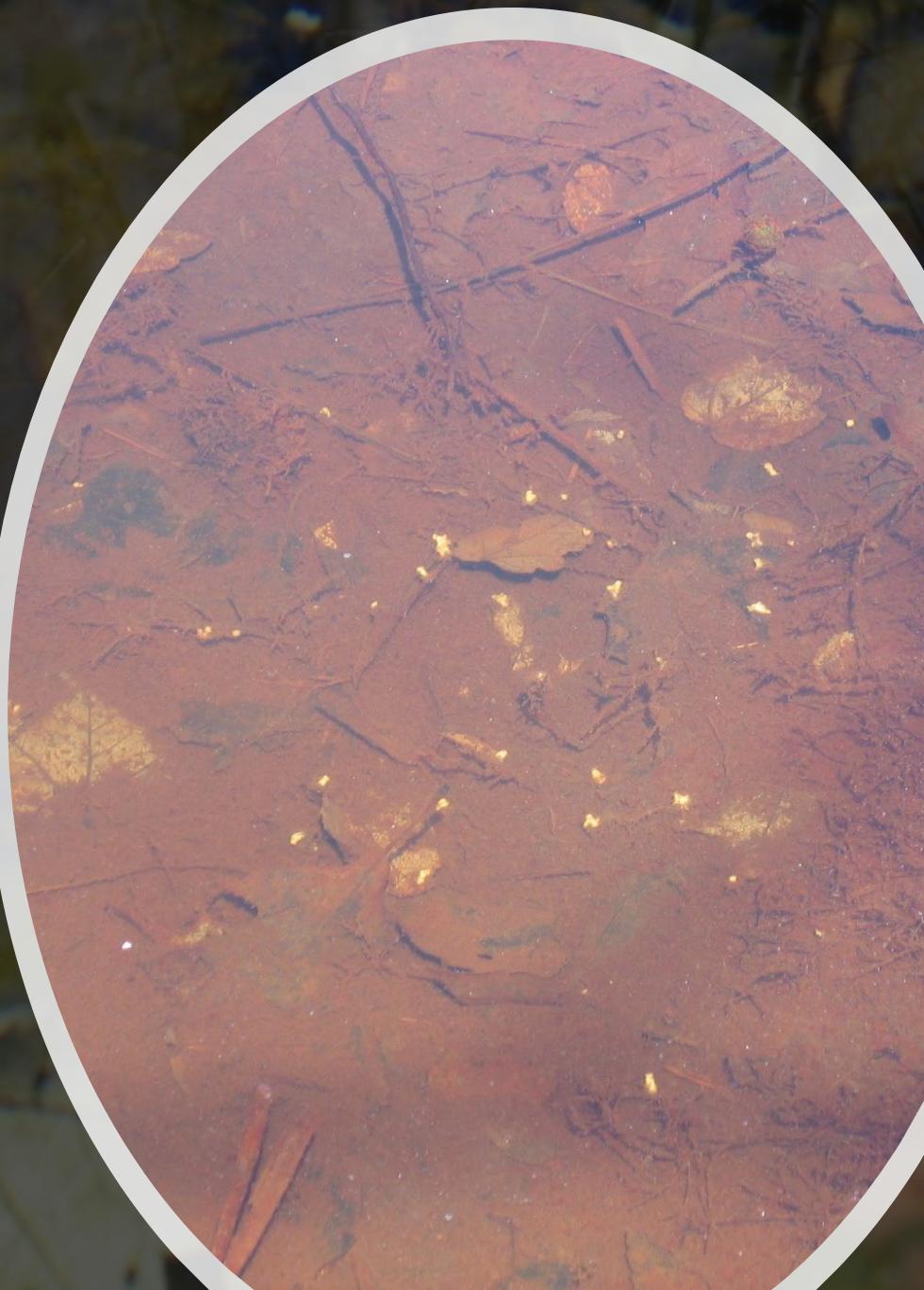


Equipment list

- Boots, dip net
- Binoculars
- Camera/cell phone
- White board/bowl
- Notebook/pen
- Maps

First places to check for egg masses – attached to woody branches or vegetation

Salamander
spermatophore





Larger marbled salamander larva with smaller
spotted larva



VISIT A VERNAL POOL

VERNAL POOL FAQS



WHEN TO VISIT A VERNAL POOL



HOW TO VISIT A VERNAL POOL "GENTLY"



SAFETY TIPS FOR YOUR VERNAL POOL VISIT



VERNAL POOL TOOLS



NOMINATE A VERNAL POOL FOR THE PROGRAM

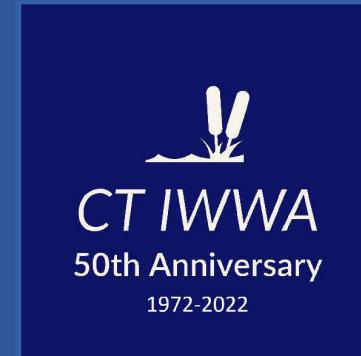


<https://ctwetlands.org/vernal-pool-monitoring.html>



*Congratulations Connecticut for
leading the way on Inland
Wetlands and Watercourses
Protection for 50 Years!*

The Connecticut Inland
Wetlands and Watercourses Act
(1972-2022)



Questions?

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