

Vermont Rare Plant Trends—as viewed through Historical & Extirpated vascular taxa



Beach Pea (*Lathyrus japonicus ssp. maritimus*)

Over 150 years of Monitoring data

-(1829-)1870-1930: Lots of activity & documentation. But access to botany careers mostly limited to white men

-1980's: The Nature Conservancy sends out professional botanists to map and redocument historical sites

-1990's: Native Plant Trust forms a network of professionals and Natural Heritage programs (NEPCoP) to monitor and conserve rare plants. VT Natural Heritage Inventory at VT Fish & Wildlife manages database, monitoring and inventories

-1999-2022: Native Plant Trust expands the monitoring program to non-professional volunteers. This volunteer network quickly becomes one of the largest and most detailed sources of Natural Heritage monitoring data, and builds a much larger engaged plant conservation community.

-2018-Present: Use of Vermont Atlas of Life/iNaturalist explodes, with exponentially more documentations of rare plant species by new users through the pandemic.



Vermont Natural
Heritage Inventory

**Community Science is now a big
piece of our database!**

The plant was last documented in Vermont in 1902.

Small Whorled Pogonia (*Isotria medeoloides*)



CNN.COM

A rare orchid thought to be extinct in Vermont was rediscovered after 120 years

👍❤️😮 15K 519 comments 1.2K shares

Troy Selden
Looks like a ballerina dancing.
Like Reply 23w 81

Barbara Williamson
Aileen Walden I had no clue there were any orchids native to North America...much less Vermont! I thought they only grew in jungles.
Like Reply 23w 15

Tatiana Joelle
It looks like she's dancing
Like Reply 23w

Rare orchid found in Vermont after being spotted on nature app



A Hike in the Woods to See the State's Newly Discovered Endangered Orchid

By ANNE WALLACE ALLEN @ANNEWALLALLEN
Published June 29, 2022 at 10:00 a.m.



Tom Doubleday (standing) with John Gange on the orchid excursion | ANNE WALLACE ALLEN

VTDIGGER

ENERGY & ENVIRONMENT

Federally threatened orchid rediscovered in Vermont, thanks to a smartphone app

By Ella Ruehsen
Jun 8 2022

The mood was festive as a quartet of botanists made its way toward Vermont's newly discovered rare orchid, the small whorled pogonia.

Plant thought extinct in Vermont since 1908 rediscovered on Mt. Mansfield

Share



Updated: 1:01 PM EST Nov 16, 2022

Infinite Scroll Enabled

Purple Crowberry (*Empetrum atropurpureum*)



E ENERGY & ENVIRONMENT

Alpine plant believed extinct since 1908 in Vermont rediscovered on Mount Mansfield

By Juliet Schulman-Hall
Nov 16 2022

SX - Presumed extinct/extirpated:

Not located despite intensive searches and little likelihood of rediscovery in a state [Now 6 taxa]



John Gange



SH - Possibly extinct/extirpated:
Missing [>25 years]; only historical occurrences but potential for rediscovery in a state [Now 86 taxa]

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ABSTRACT

Field searches in 2021 resulted in rediscovery of the pea-fruited hawthorn, *Crataegus pisifera* Sarg. (*C. succulenta* var. *pisifera* (Sarg.) Kruschke), a Vermont endemic known with confidence only from the type collections made in 1901. Collections made throughout the 2021 growing season from the type locality and from new populations nearby confirm its continued presence on the Vermont landscape.



Photo: Art Gilman



Boreal Aster
(*Symphyotrichum boreale*)

Unreported from within Vermont since 1926.
Refound by Plant Conservation Volunteers 2021

Rusty Flatsedge
(*Cyperus odoratus*)



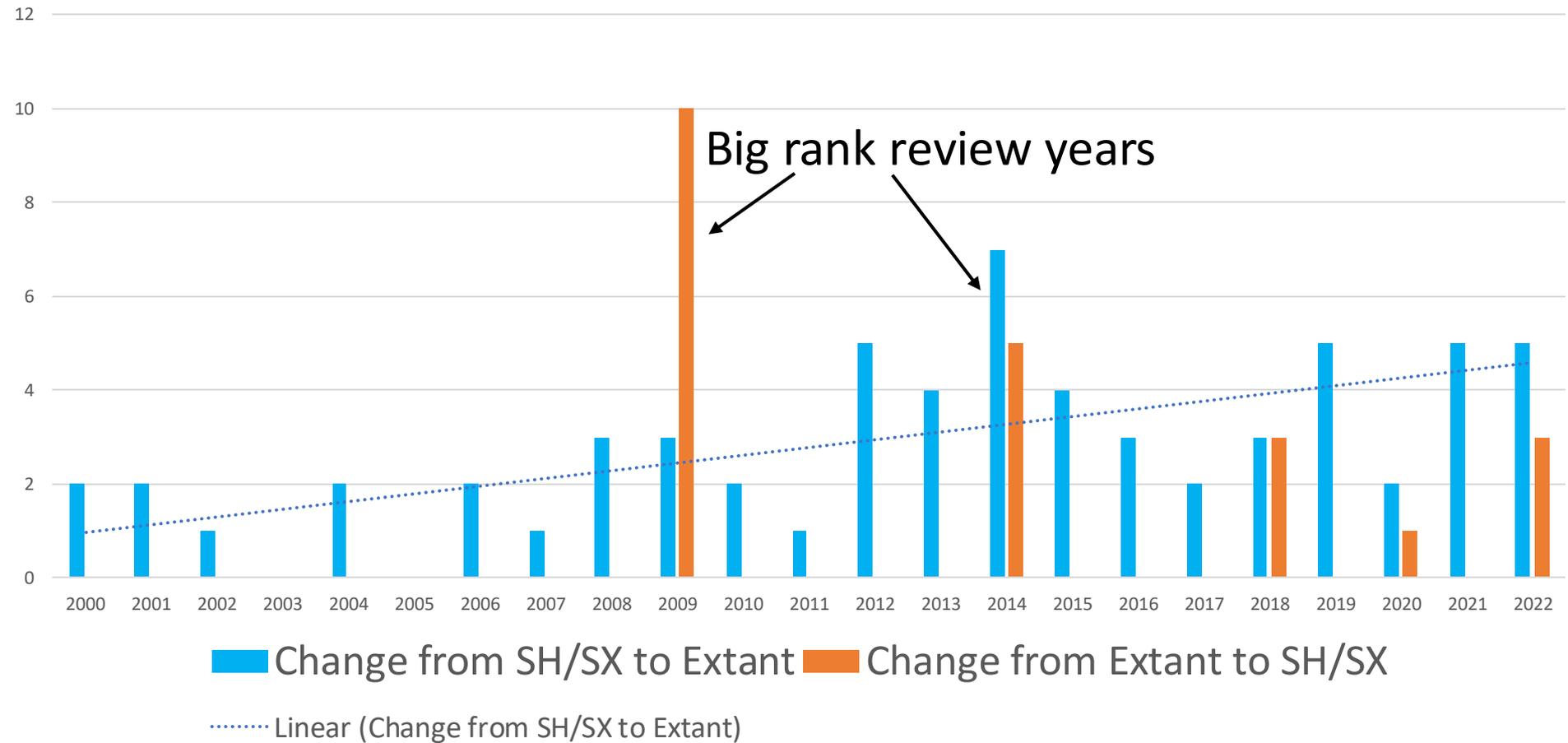
Engelman's Flatsedge
(*Cyperus engelmannii*)



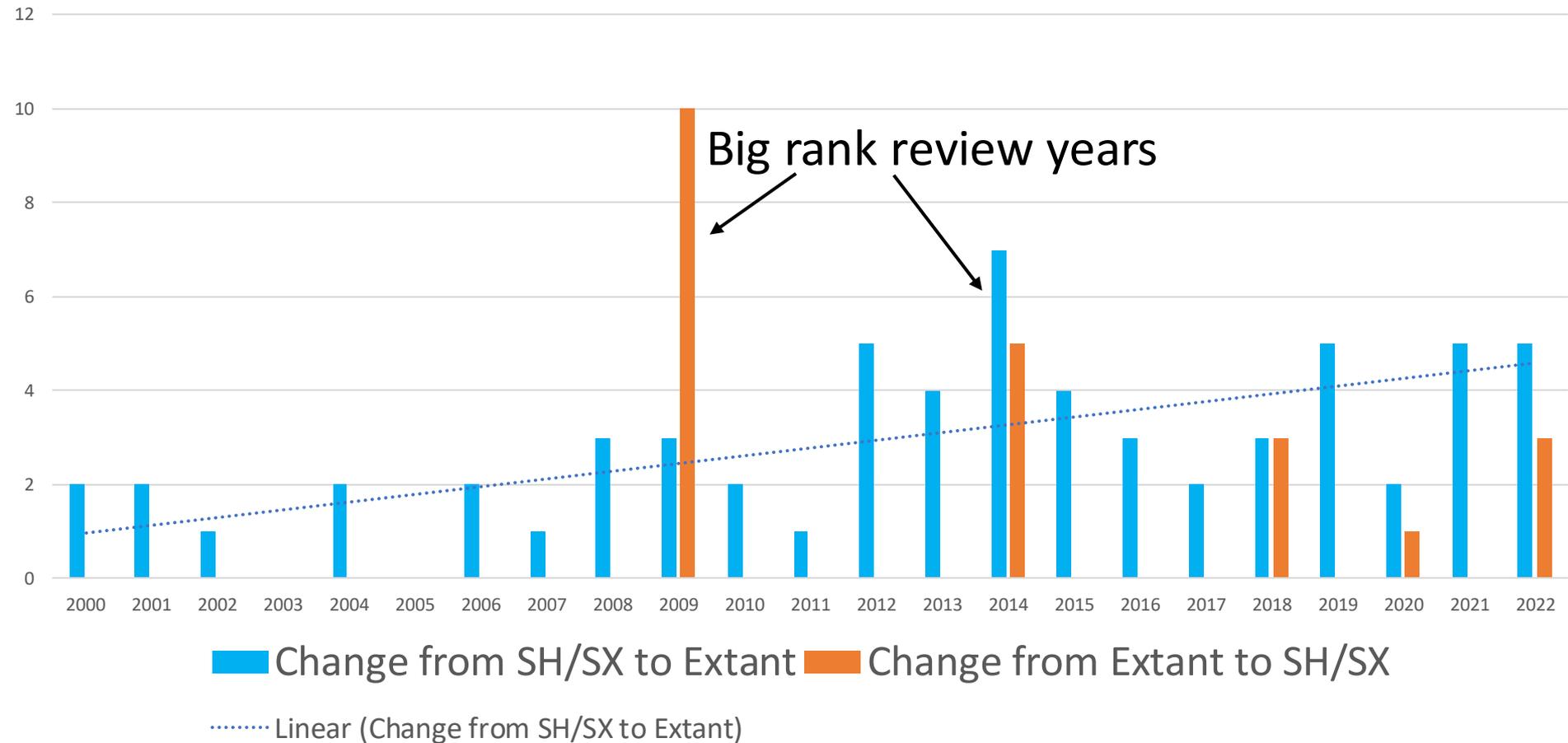
Red-Root Flatsedge
(*Cyperus erythrorhizos*)



Changes to and from SH (state historical) and SX (state extirpated) Tracking Status of Vermont's Rare Vascular Plant Species from 2000-2022



Changes to and from SH (state historical) and SX (state extirpated) Tracking Status of Vermont's Rare Vascular Plant Species from 2000-2022



So are all these plants increasing or recovering?

Fairy Slipper Orchid
(*Calypso bulbosa* var. *americana*) SH

22 populations once
known across Vermont:

Pre-1980's: Abundant

1980's: Dozens to
hundreds

1990's: Single plant to 10

2000's: Gone

By Garrett Crow (Peacham population)



Two centuries of change in the native flora of Franklin County, Massachusetts, U.S.A.

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ABSTRACT

We examined changes in the native vascular flora of Franklin County, Massachusetts, a largely rural county with a long history of botanical investigation. The historical flora was documented using herbarium specimens and literature records, and the current flora was assessed in 10 years of field work starting in 2010. The county contains 26 towns, and apparent changes were based on

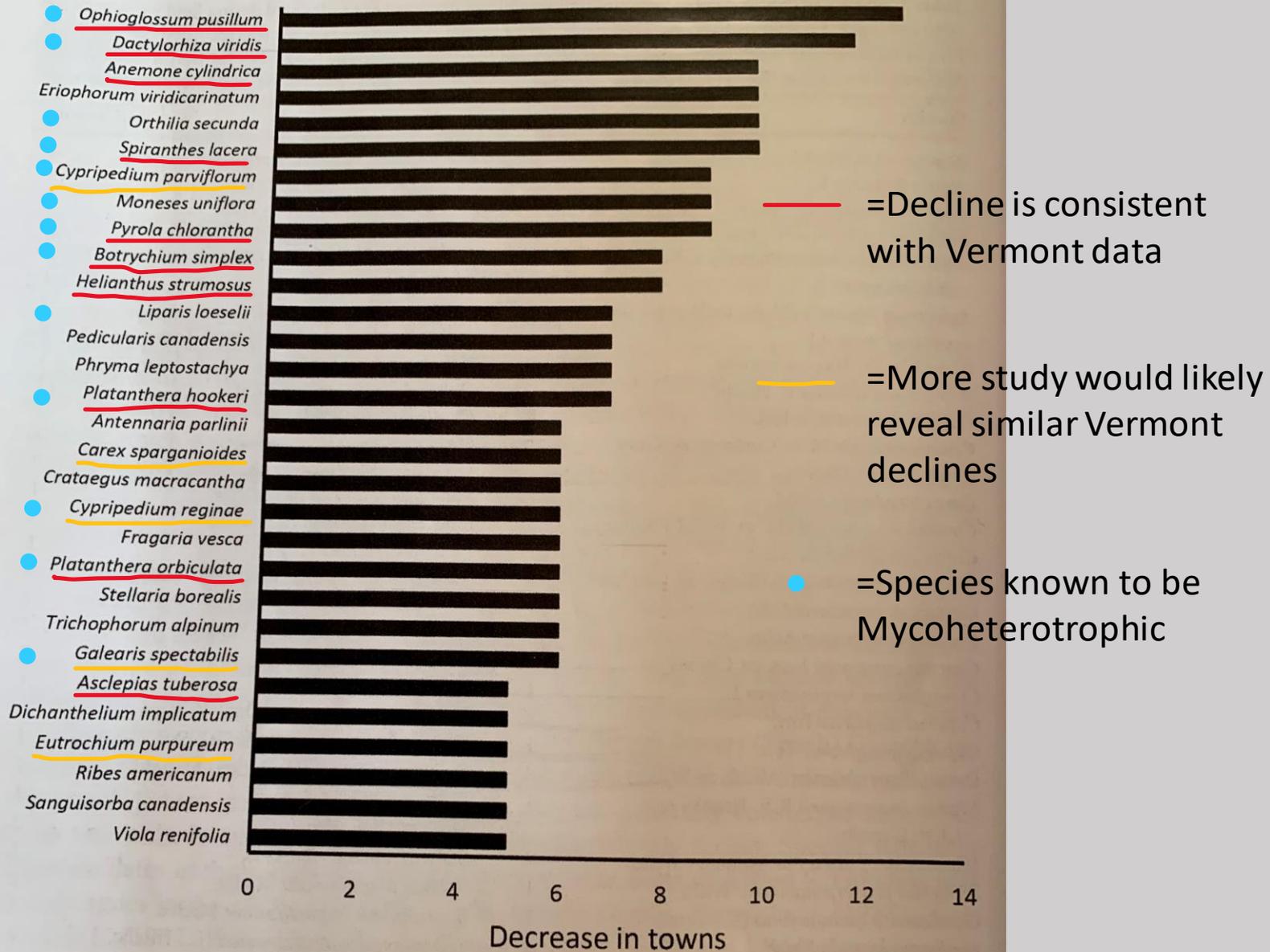


Figure 1. Native species showing the largest declines between the historical (pre-2010) and recent (2010–2019) periods in the numbers of Franklin County towns in which they were recorded.

Northern Adder's-Tongue fern (*Ophioglossum pusillum*)



Colchester, VT: 1973 and Now

Green=Rare plants locations mapped since 1980's

Development is still the largest threat to Vermont's rare plants



Where habitat loss is the primary threat, conservation efforts have effectively prevented most short-term extirpations, but are under-resourced to prevent long-term declines

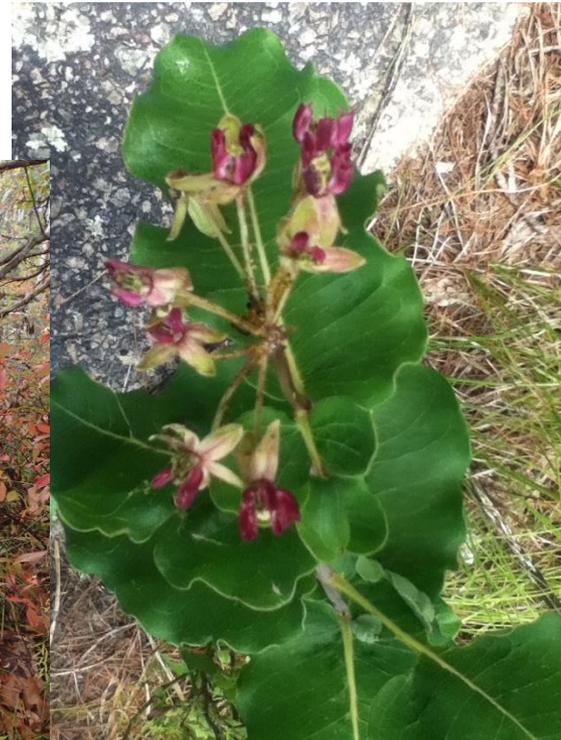


Low Bindweed (*Calystegia spithamea*)
Threatened in Vermont
Sandplains in Colchester, Essex, and the Champlain Valley



Susquehanna Sand Cherry
(*Prunus susquehanae*)

Blunt-Leaved Milkweed
(*Asclepias amplexicaulis*)

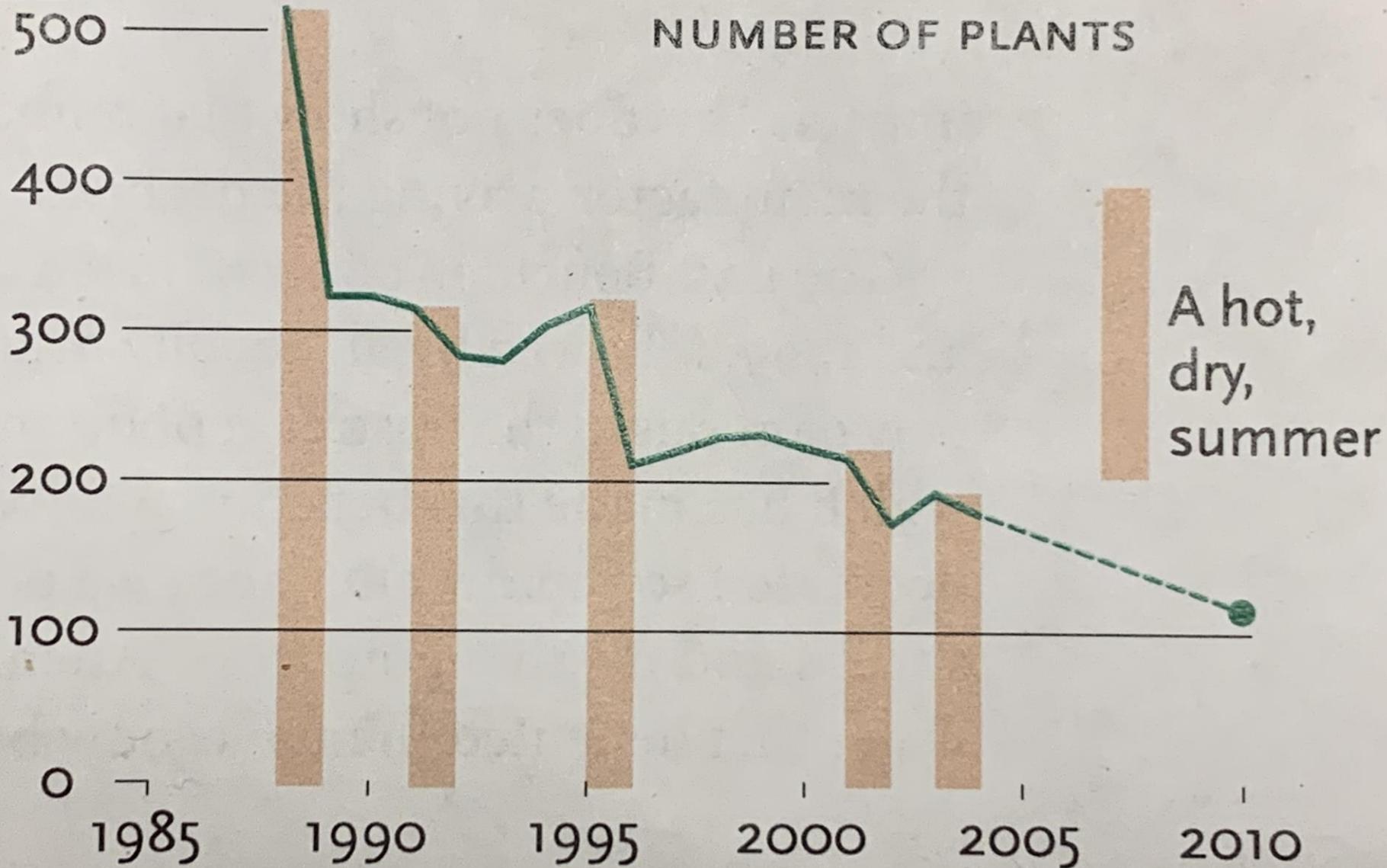


Climate Change: more than temperature

A photograph of an Early Thimbleweed (Anemone multifida) growing on a rocky stream bank. The plant has several bright pink flowers on tall, thin green stems. The base of the plant is covered in bright green, finely divided leaves. The surrounding environment is a rocky stream bed with dark, wet rocks and patches of moss. The water is clear and flows over the rocks.

Early Thimbleweed
(*Anemone multifida*)

Early Thimbleweed (*Anemone multifida*)

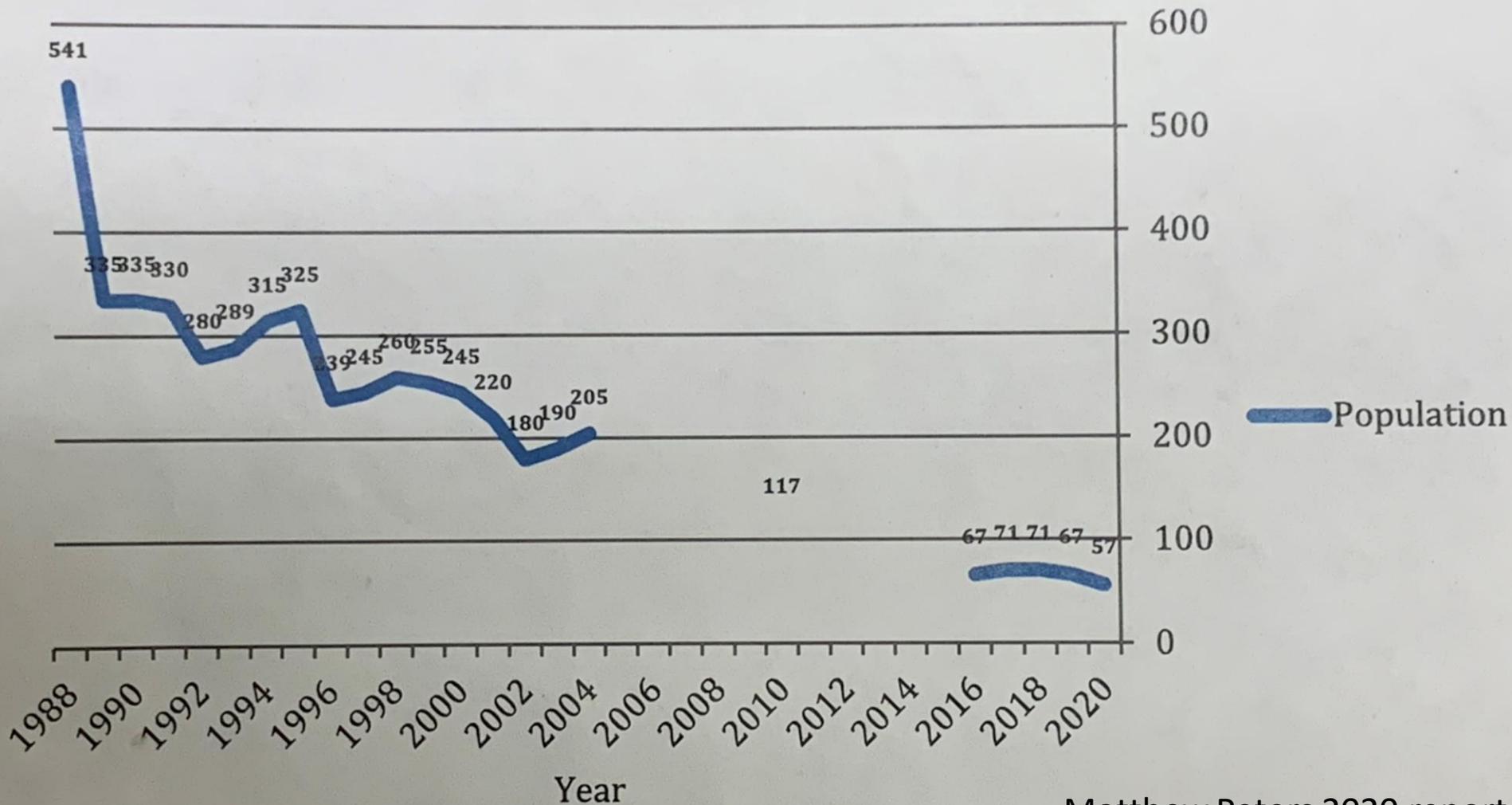




Early Thimbleweed (*Anemone multifida*)

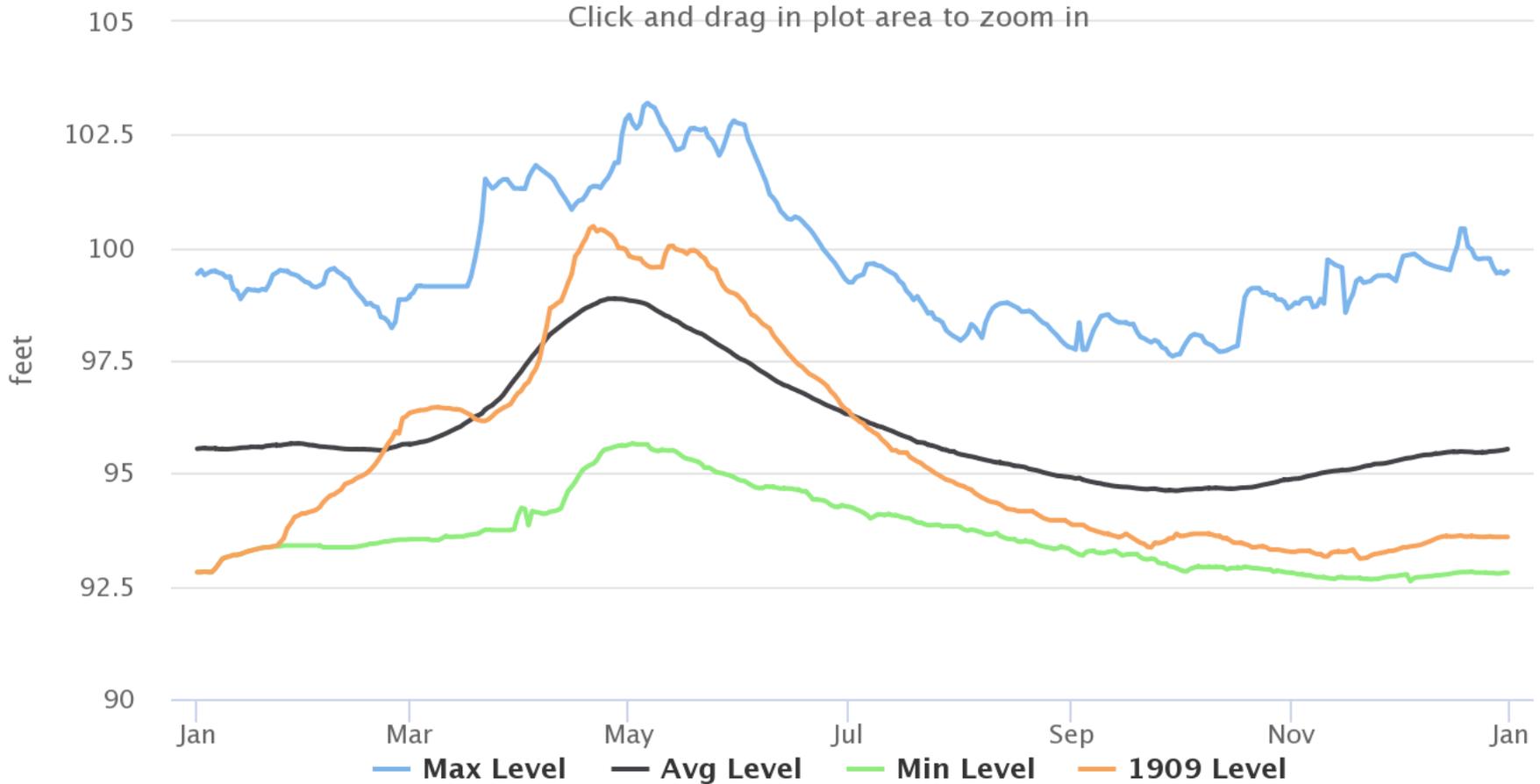
A Stairstep Decline

Cut-leaved Anemone Population Changes Over Time: 1988-present



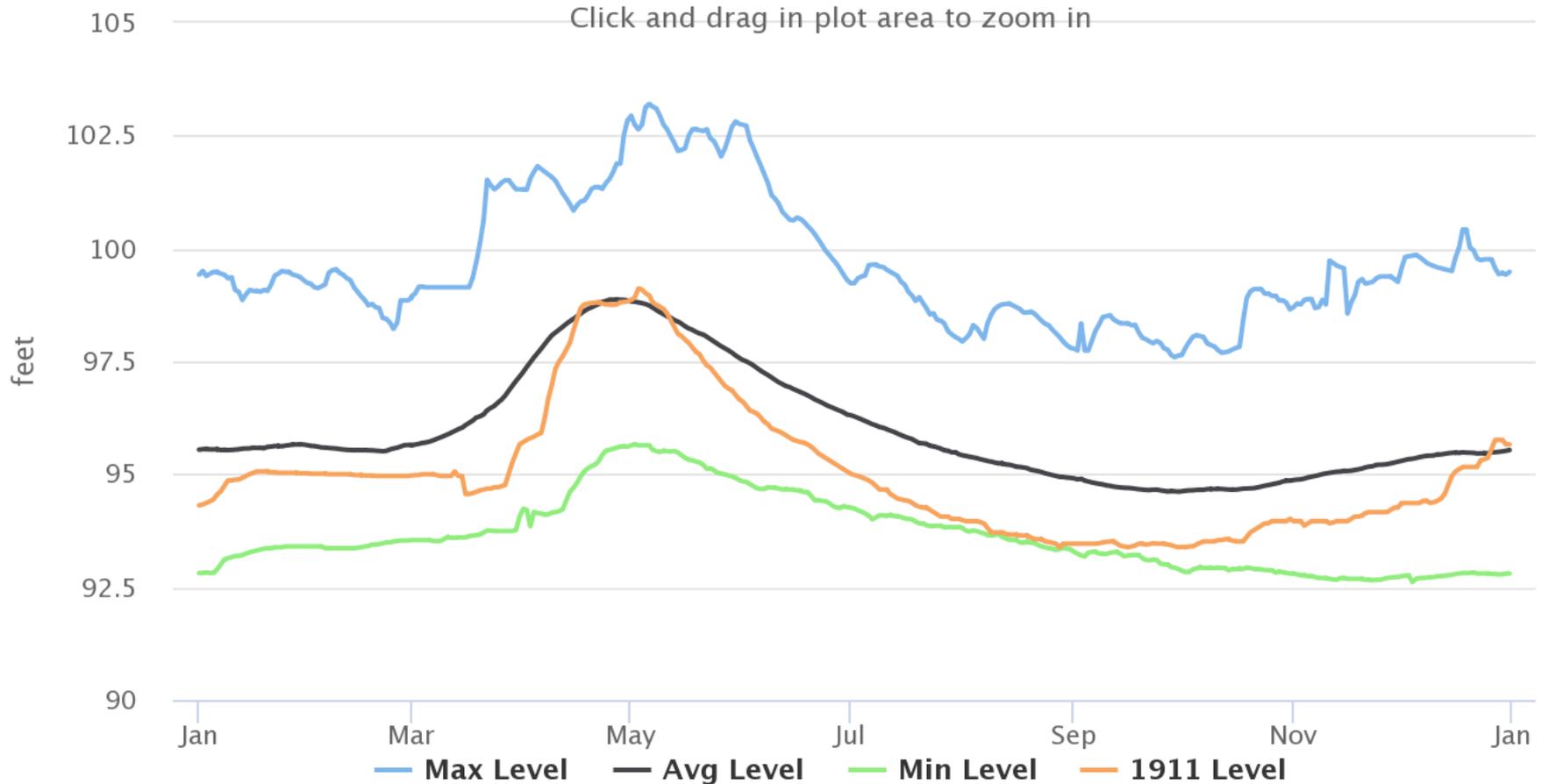
USGS: lake level gauges

Lake Champlain Extremes and 1909 Level



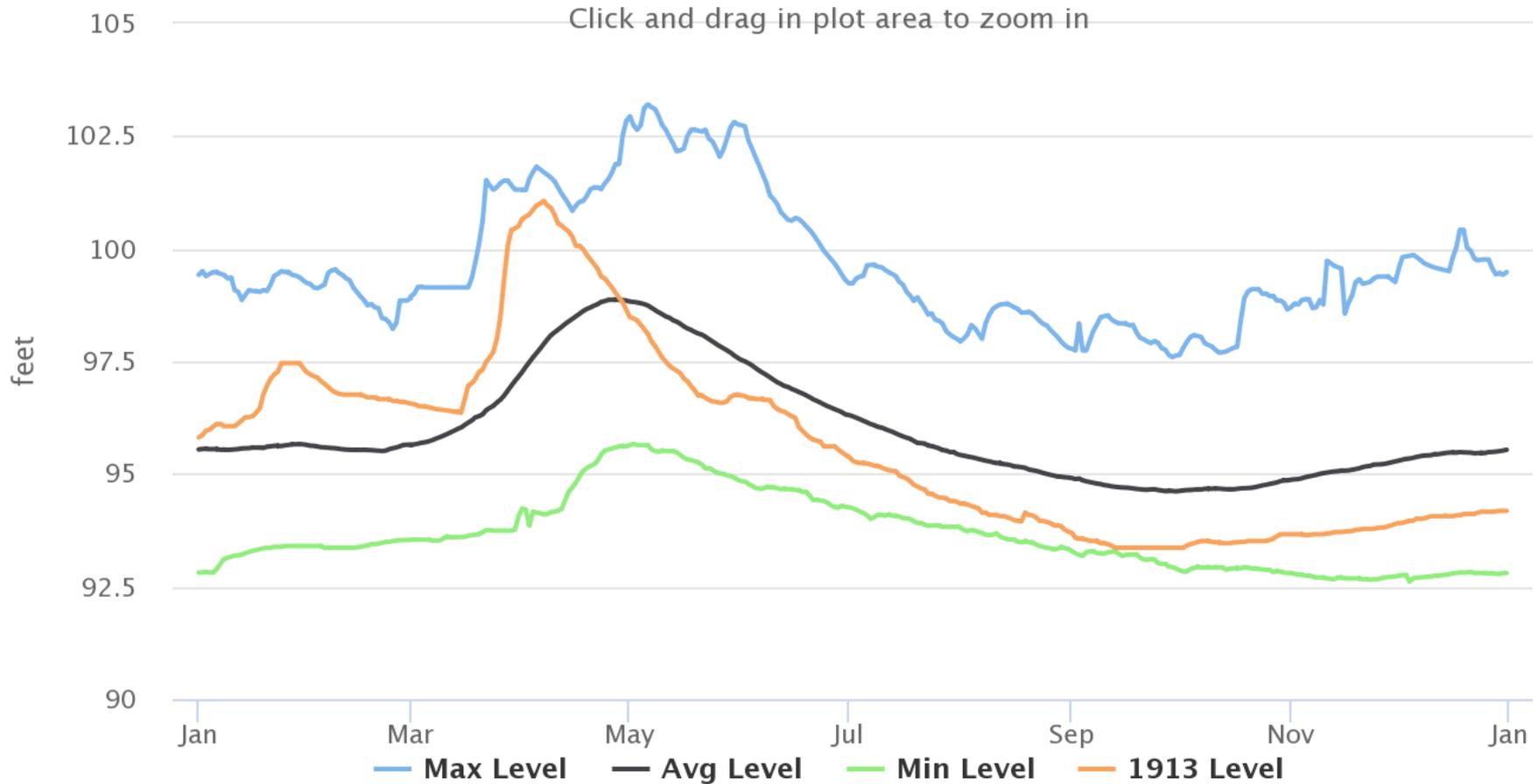
USGS: lake level gauges

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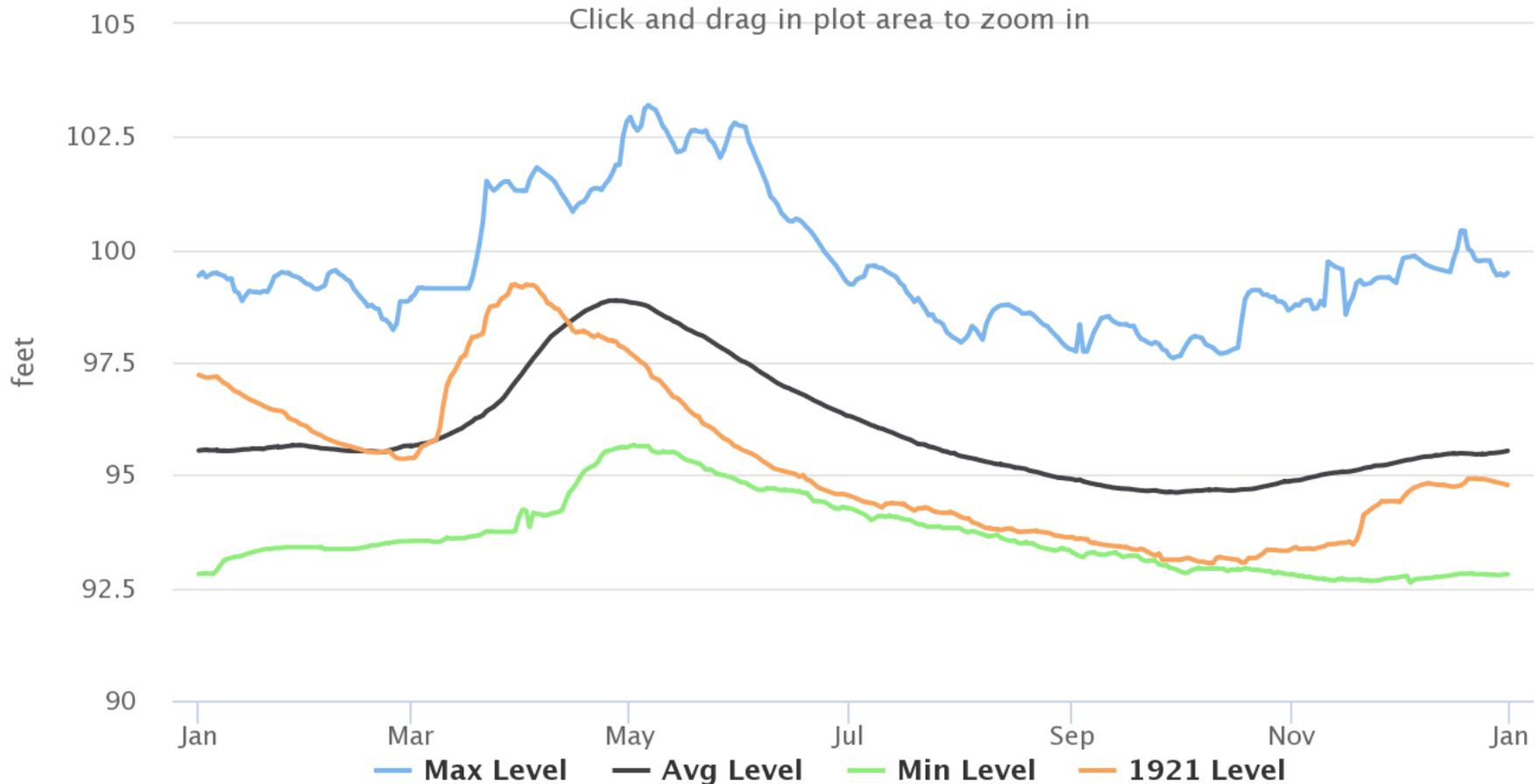
USGS: lake level gauges

Lake Champlain Extremes and 1913 Level



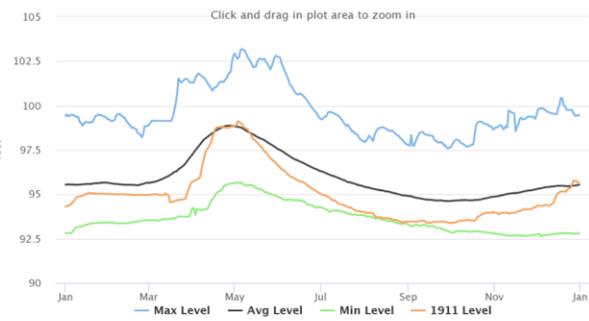
USGS: lake level gauges

Lake Champlain Extremes and 1921 Level



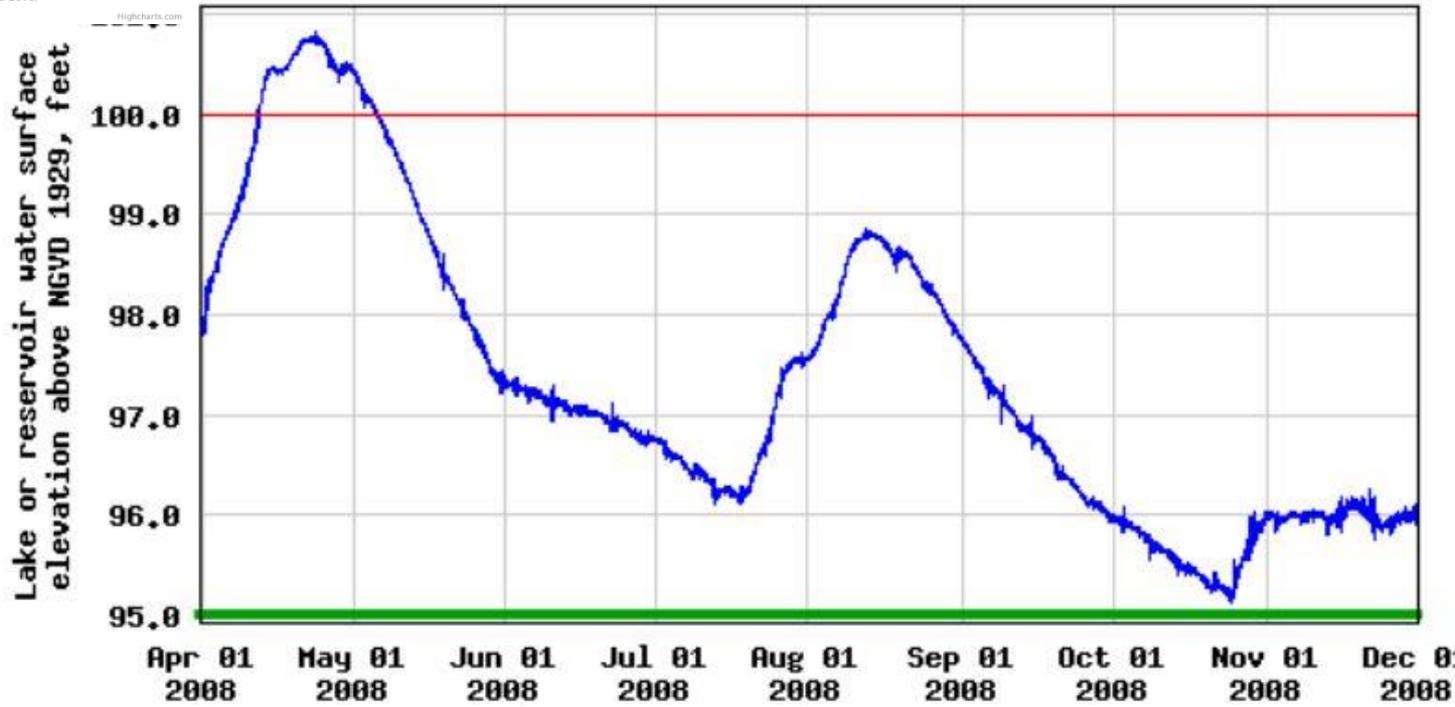
USGS: lake level gauges 2008

Lake Champlain Extremes and 1911 Level



Reservoir water surface elevation above NGVD 1929, feet
 Current instantaneous value: 94.20 10-10-2018 16:00 EDT

USGS 04294500 LAKE CHAMPLAIN AT BURLINGTON, VT

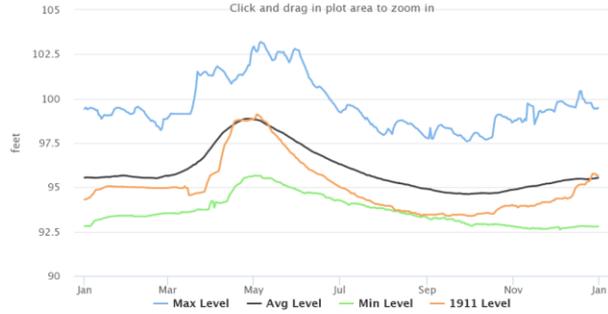


- Lake or reservoir water surface elevation above ngvd 1929
- Period of approved data
- National Weather Service Flood Stage

USGS: lake level gauges 2009

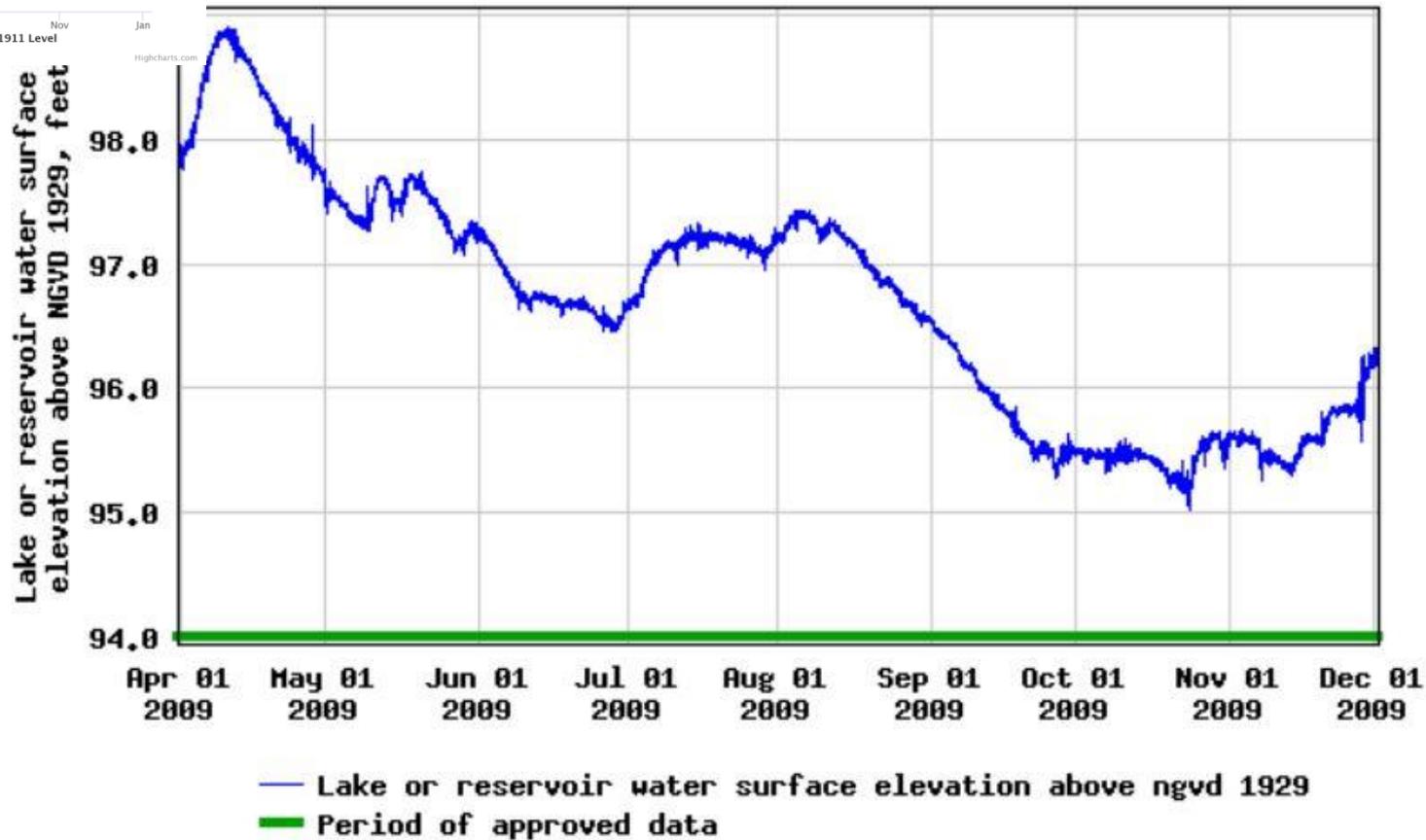
Lake Champlain Extremes and 1911 Level

Click and drag in plot area to zoom in



voir water surface elevation above NGVD 1929, feet
it instantaneous value: 94.20 10-10-2018 16:00 EDT

USGS 04294500 LAKE CHAMPLAIN AT BURLINGTON, VT



USGS: lake level gauges 2013

Lake Champlain Extremes and 1911 Level

Click and drag in plot area to zoom in



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 ent instantaneous value: 94.20 10-10-2018 16:00 EDT

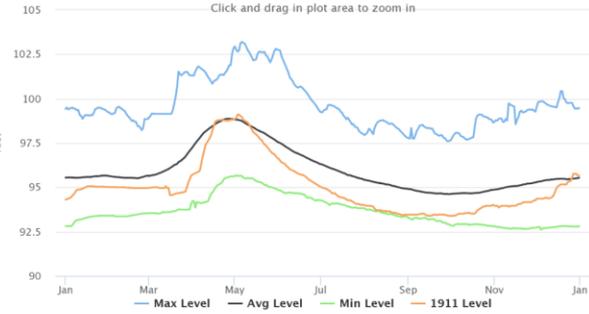
USGS 04294500 LAKE CHAMPLAIN AT BURLINGTON, VT



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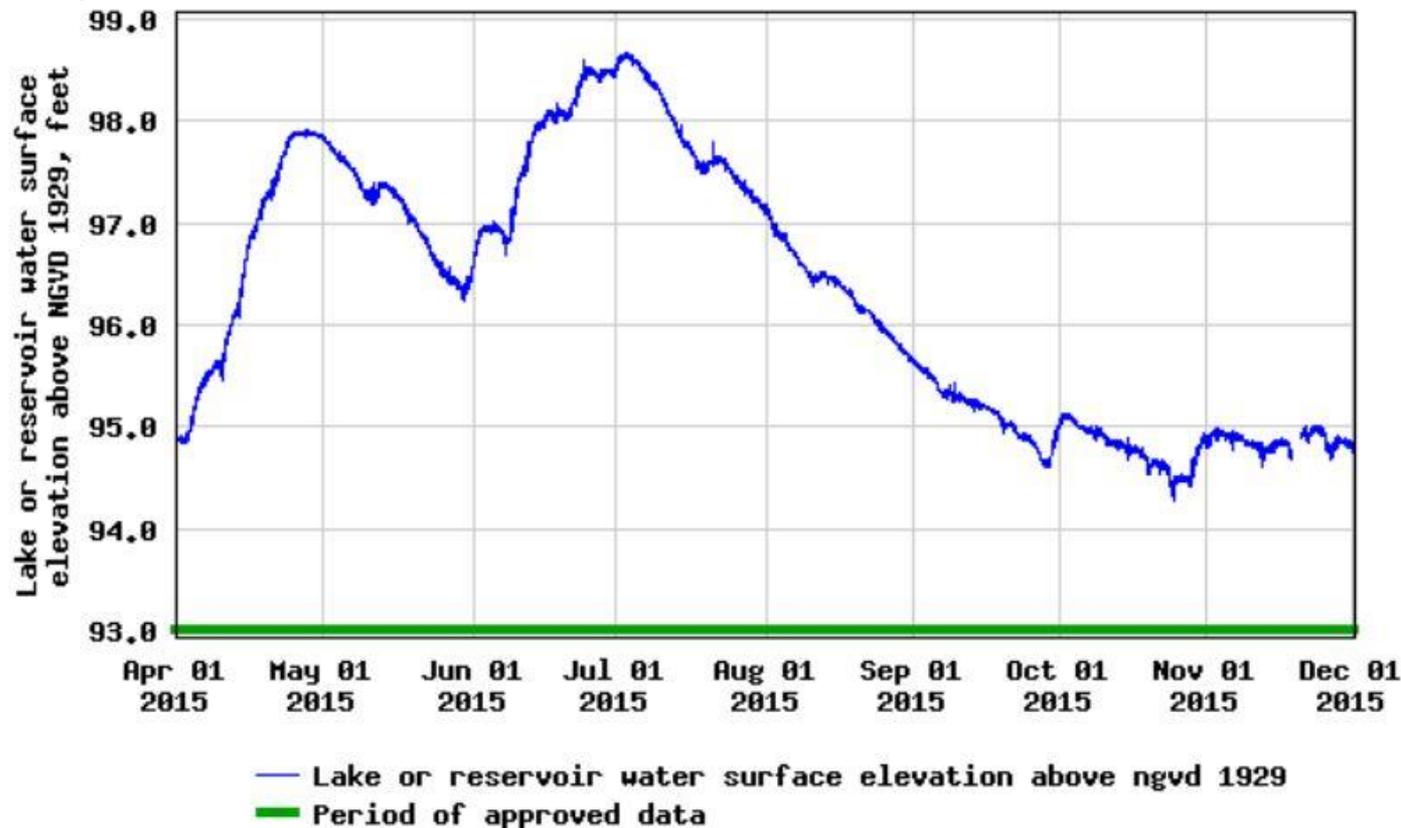
USGS: lake level gauges 2015

Lake Champlain Extremes and 1911 Level



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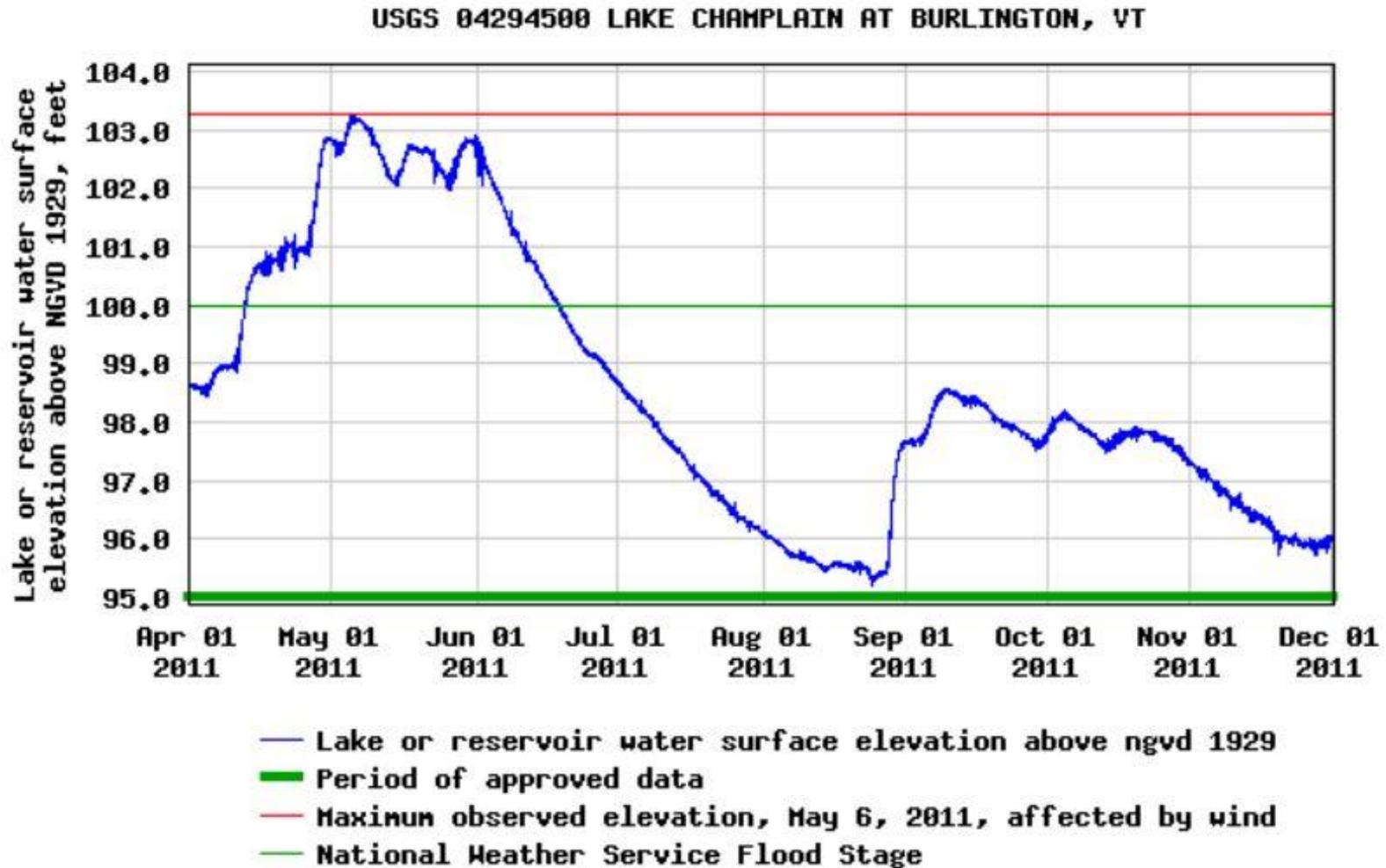
USGS 04294500 LAKE CHAMPLAIN AT BURLINGTON, VT



2011 record flooding in Lake Champlain

Lake or reservoir water surface elevation above NGVD 1929, feet

Most recent instantaneous value: 94.20 10-10-2018 16:00 EDT





Champlain Dunegrass
(*Ammophila/Calamagrostis*
breviligulata ssp. champlainensis)

Beach Pea

(Lathyrus japonicus var. maritimus)



Beach Pea

(*Lathyrus japonicus* var. *maritimus*)





Impacted by
changes in the
flood regime
(dams and
climate
change)

Jesup's Milkvetch
(*Astragalus robbinsii* var.
jesupii)

Endangered

3 locations in the world

Plants may be resilient and adaptive but there are tipping points:
Plant *do* go extinct

Robbins's Milkvetch
(*Astragalus robbinsii* var. *robbinsii*)

Last documented in 1893

Image from the Consortium of Northeast Herbaria portal:

<https://portal.neherbaria.org/portal/>



Emotional toll

A photograph of a lush green meadow filled with numerous pink flowers, likely lady's slippers, in the foreground. The meadow is bordered by a dense forest of tall evergreen trees in the background. The scene is captured in a natural, slightly overcast light.

Resist

Accept

Adapt



Emotional toll:

Resist

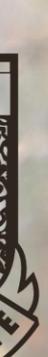
-Self-care

Accept

-Grieving process

Adapt

-Creativity/Diversity

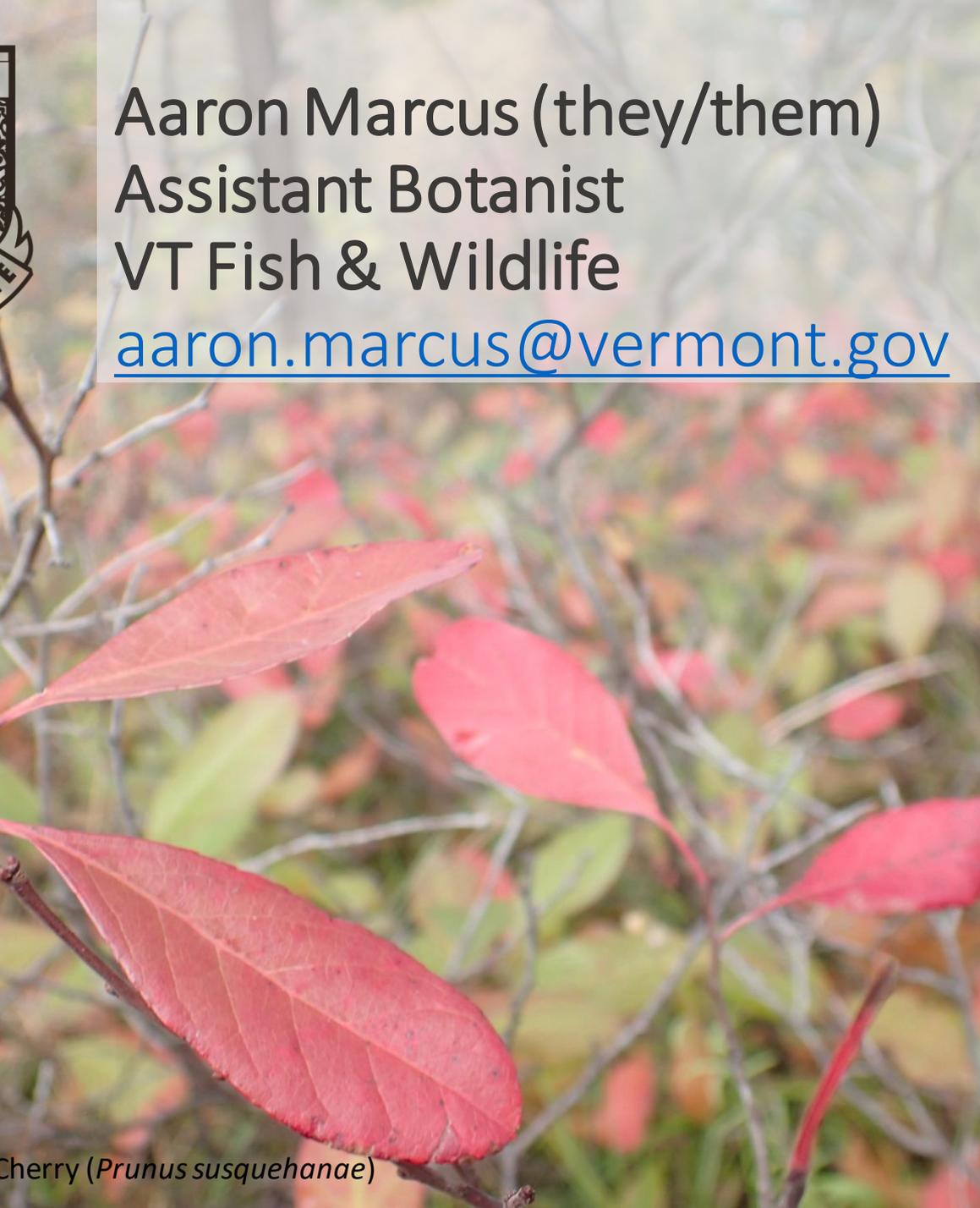


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Cherry (*Prunus susquehanae*)

