

1/20/2022

Groundwater Coordinating Committee Minutes

Attendees (all on Teams): Rosa Mastrocola, Patti Casey, Joanne Throwe, Michael Smith, Kira Jacobs, Craig Heindel, Diana Butler, Nathan Kie, John Schmeltzer, Thomas Akin, Julia Boyles, Kasey Kathan, Benjamin DeJong, Jon Armstrong, David Wilcox, Laura Ranker, Joe Buford, Anna Gallagher, Z. Reed Sims, Sille Larsen, Scott Stewart, Erin Stewart, Lydia Lee, Michael Nahmias, Jon Kim, Tom DeBell, Grahame Bradley, Jennifer Gould, Justin Tuthill, Bridget O'Brien, Meredith Albers

Speakers – Z. Reed Sims & John Schmeltzer

A) **Talk and Discussion** – Z. Reed Sims

Z. Reed Sims, NRCS, did a presentation on the nitrate leaching index he developed for the State of VT. It is intended to be a planning tool to help consider resource concerns regarding nitrate leaching. The inputs for the index are precipitation and a soil hydrologic group (water table depth, soil position on landscape and percolation tendency). The index gives a percolation rate per hour and categorizes risk as low, med, high and very high. The maps are done in GIS and are by county. A half and hour discussion followed. Ideas brought up:

- NRCS is developing a soil vulnerability index.
- Tile drainage, animal borings, karst topography and other things can circumvent this nitrate leaching index and still need to be taken into consideration when planning or using the tool.
- Critical source areas are highlighted by high leaching areas, and this can be used as an alert tool and can lead to outreach to specific farms.
- Extending this analysis deeper down to the bedrock.
- Extending this type of index to other chemicals. Phosphorous and chloride for example.

B) **PFAS Update** – John Schmeltzer

John Schmeltzer, DEC, did an Overview of the Bennington PFAS situation from the very start up until the reclassification of 20 sq miles to a Class IV groundwater area in November 2021. Class IV essentially means you cannot drill a new well in that area, but some properties can only have water if they drill. Therefore, this reclass includes criteria that allows new wells to be drilled. During the cleanup, installation of new water lines was completed in 6 years. There are still some homes on contaminated water, and the water is being treated and monitored. As well as some clean wells that are being monitored.

<https://dec.vermont.gov/bennington-groundwater-reclassification>

<https://anrweb.vt.gov/DEC/ERT/GWReclassification.aspx>



Example of PFAS treatment.

C) **Links from the chat:** NRCS staff provided many links with many related to Reed's presentation.

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/vt/newsroom/releases/?cid=NRCSEPRD1853429>

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp/>

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/vt/newsroom/releases/?cid=NRCSEPRD1864623>

<https://www.nfwf.org/programs/long-island-sound-futures-fund>

<https://geodata.vermont.gov/datasets/VCGL::vt-nitrate-leaching-index/about>

[FY22 EQIP CPAs, DIAs, And CEMAs | NRCS \(usda.gov\)](#)

[SVI-cc User Guide \(usda.gov\)](#)

[WIN-PST](#)

<https://www.uvm.edu/extension/agriculture/vermont-phosphorous-index>

<http://ipm.ucanr.edu/TOX/winpstdoc.html>

http://www.vectogether.org/wp-content/uploads/2018/06/Miles-Reclassification-Presentation-for-VEC_060618.pdf

[Certified Laboratory \(healthvermont.gov\)](#)

<https://survey123.arcgis.com/share/55b1d48e00af4eb3bf7bf01791d3744c?field:SurveyType=Missing>

D) **Others Notes of Interest**

NGWA Conference: Meeting the Challenges of Groundwater in Fractured Rock (#5017)

September 12-13, 2022

Burlington, Vermont

Next Meeting March 17th, 2021 – A teams invite will be sent out early March

If you have other topics of interest, please contact Scott or Erin.

Scott.stewart@vermont.gov/Erin.stewart@vermont.gov



Nitrate Leaching Index

A Measure of Risk for Nutrient Leaching into Groundwater

Reed Sims, NRCS ACES Program, Vermont

January 2021

Nitrate Leaching Index

How likely is it that water-soluble nutrients will reach the groundwater and eventually rivers, lakes, or ocean?

Model Uses Soil Characteristics and Precipitation information

- **Precipitation** is important: both **mean annual**, and **mean winter** precip – how often does the soil get saturated?
- **Soil Hydrologic Group** - characteristic that summarizes other influencing soil profile characteristics:
 - water table depth
 - soil position on the landscape
 - soil texture throughout the profile – affects percolation tendency

Nitrate Leaching Index

Index was developed at Cornell University by Extension Service in the 1950s. My adaptation to GIS:

1. Used their original document to figure out calculations
2. Obtained up-to-date precip information from PRISM in Oregon
3. Gathered soil properties from VT SSURGO data – Web Soil Survey
4. Used ArcGIS to develop the formulae and format the data

Nitrate Leaching Index

Why only use latest available Precipitation data?

You use a 30-year span to get averages.

Precip has been changing over the last century!

In 2011, NRCS engineers and planners were still using data from **1941-1970** to estimate water quantity for design criteria (manure pits, waterways, farm ponds and check dams)

Data I used from **1971-2000** showed that on average, precip in many places in VT had increased – by as much as **7** inches/year

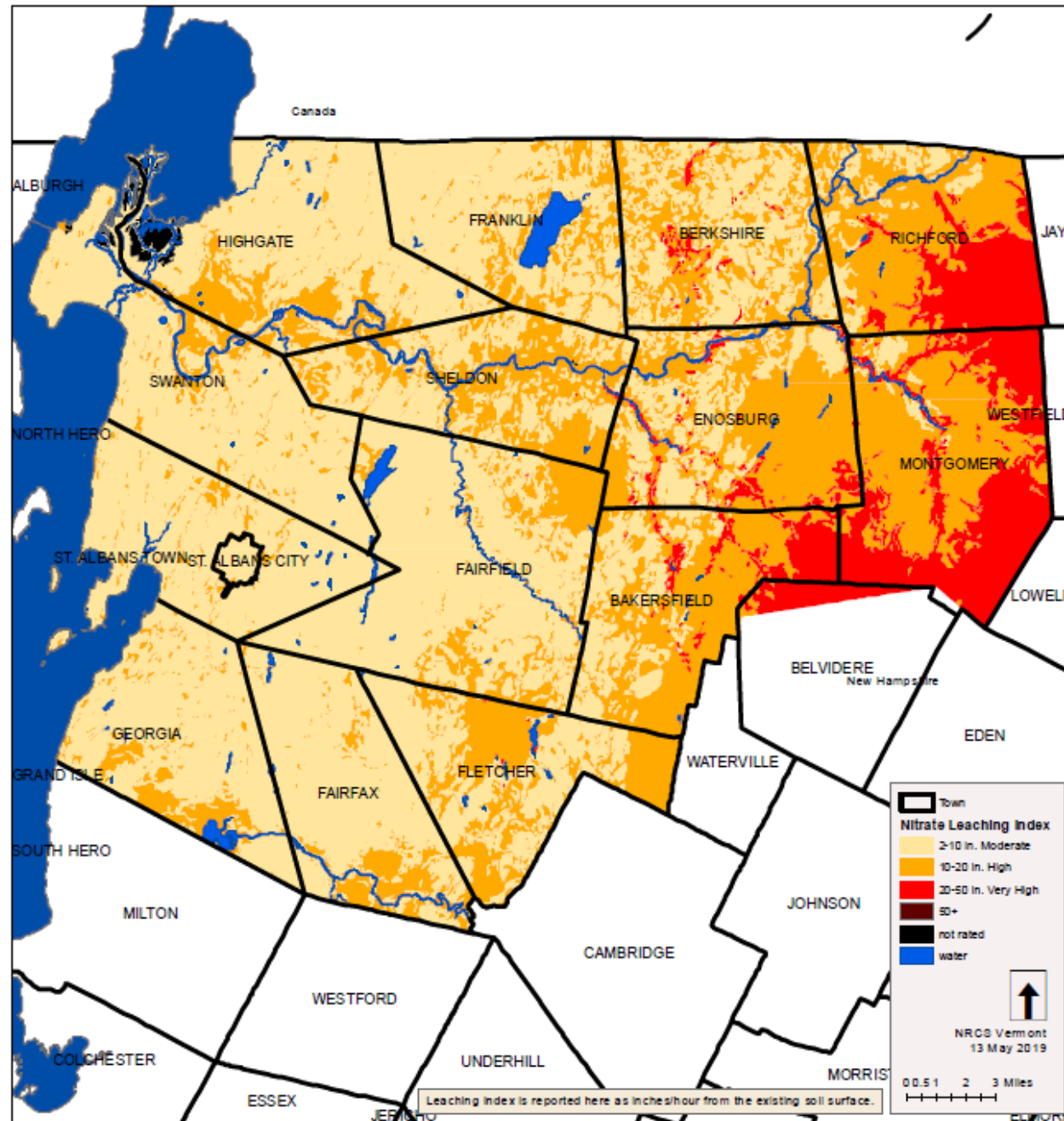
Nitrate Leaching Index

I re-ran the model in 2019 using latest Precip data, 1981-2010. Again, averages were a little higher than previous 30-yr time block.

What do these maps

look like?

Champlain
Valley



Town

Nitrate Leaching Index

2-10 in. Moderate

10-20 in. High

20-50 in. Very High

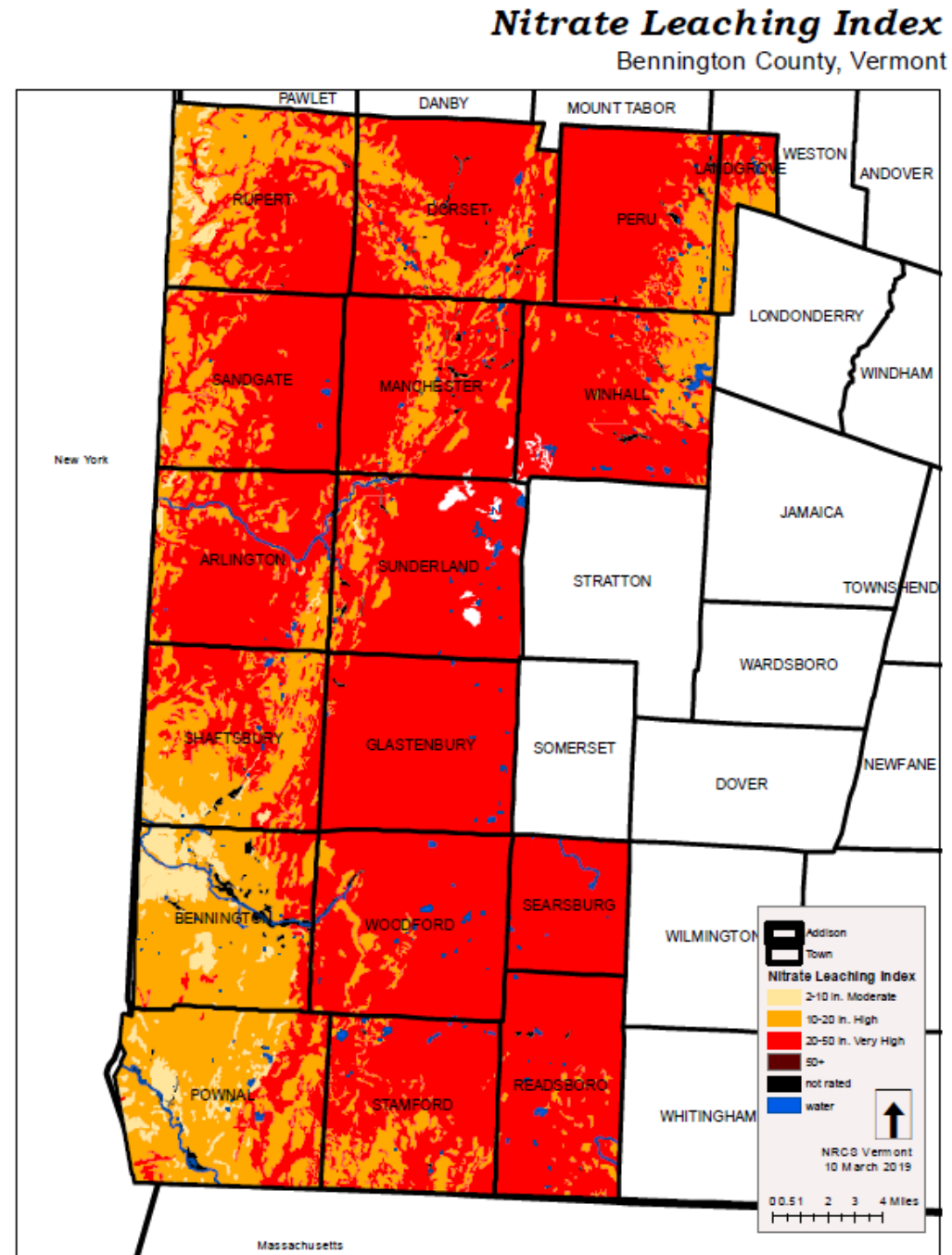
50+

not rated

water

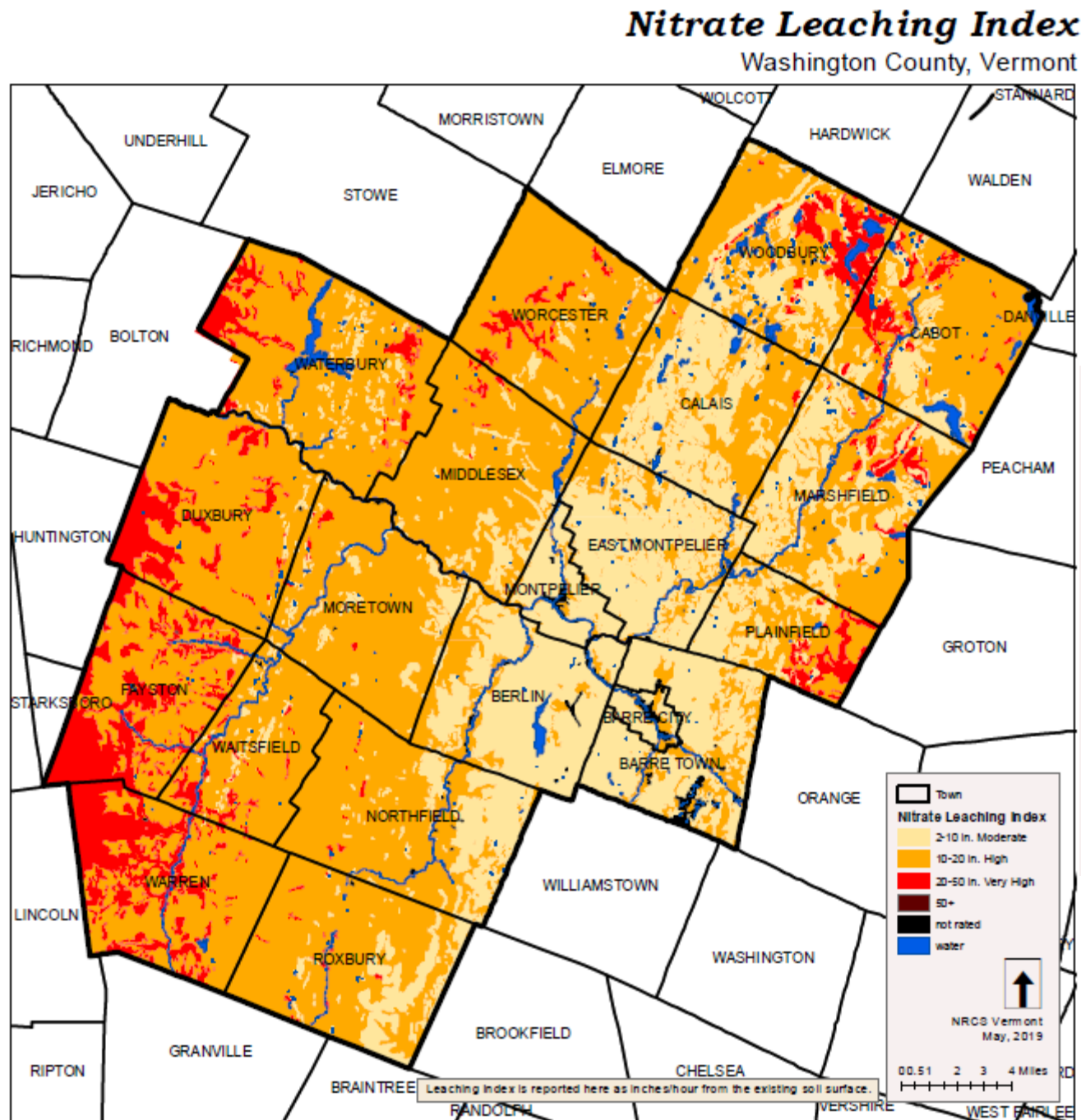
What do these maps
look like?

Hudson –
Hoosic R.



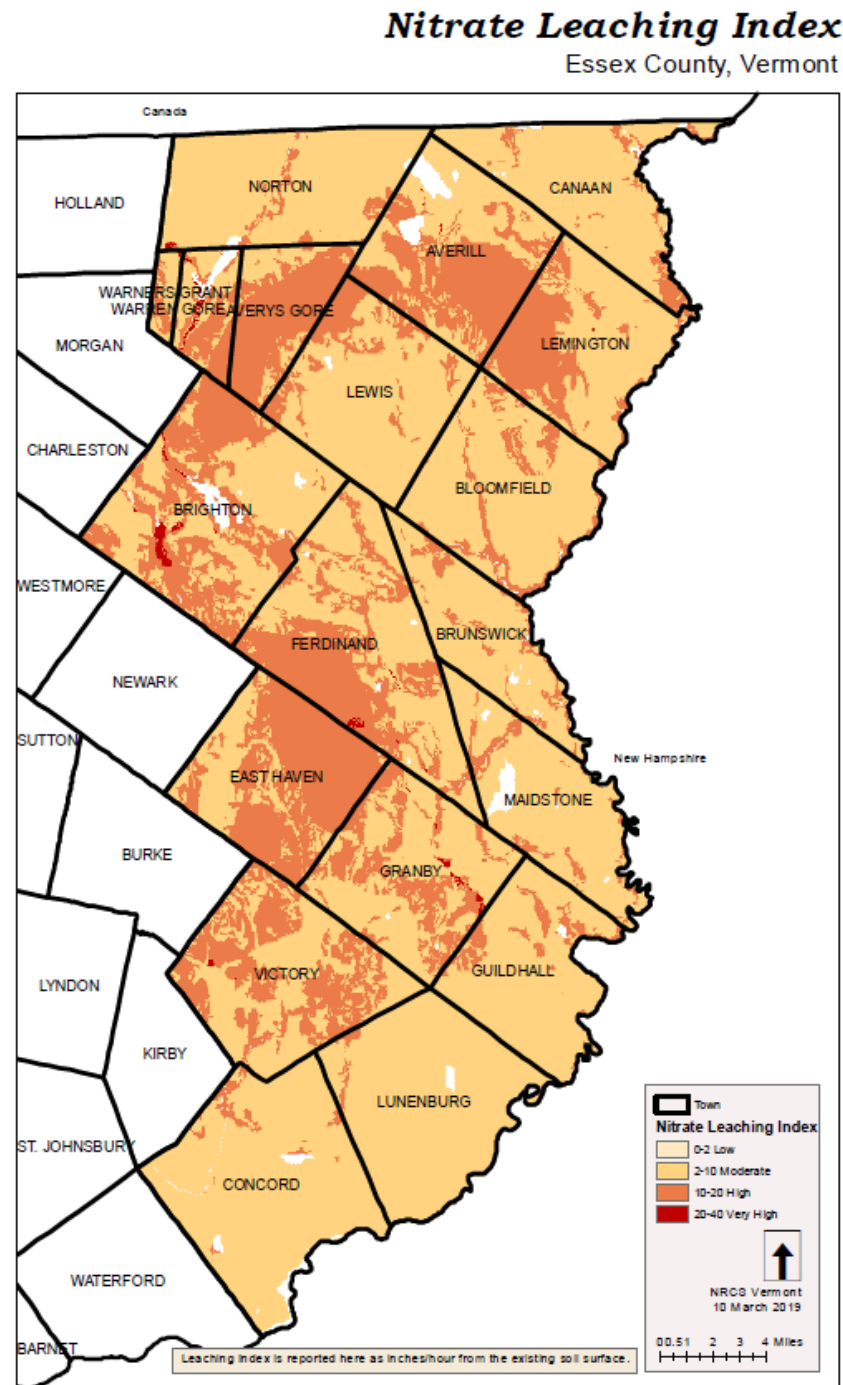
What do these maps look like?

Central
Vermont



What do these maps
look like?

Northeast Kingdom



Nitrate Leaching Index

Why is index so RED in Bennington County, and not in the NEK??



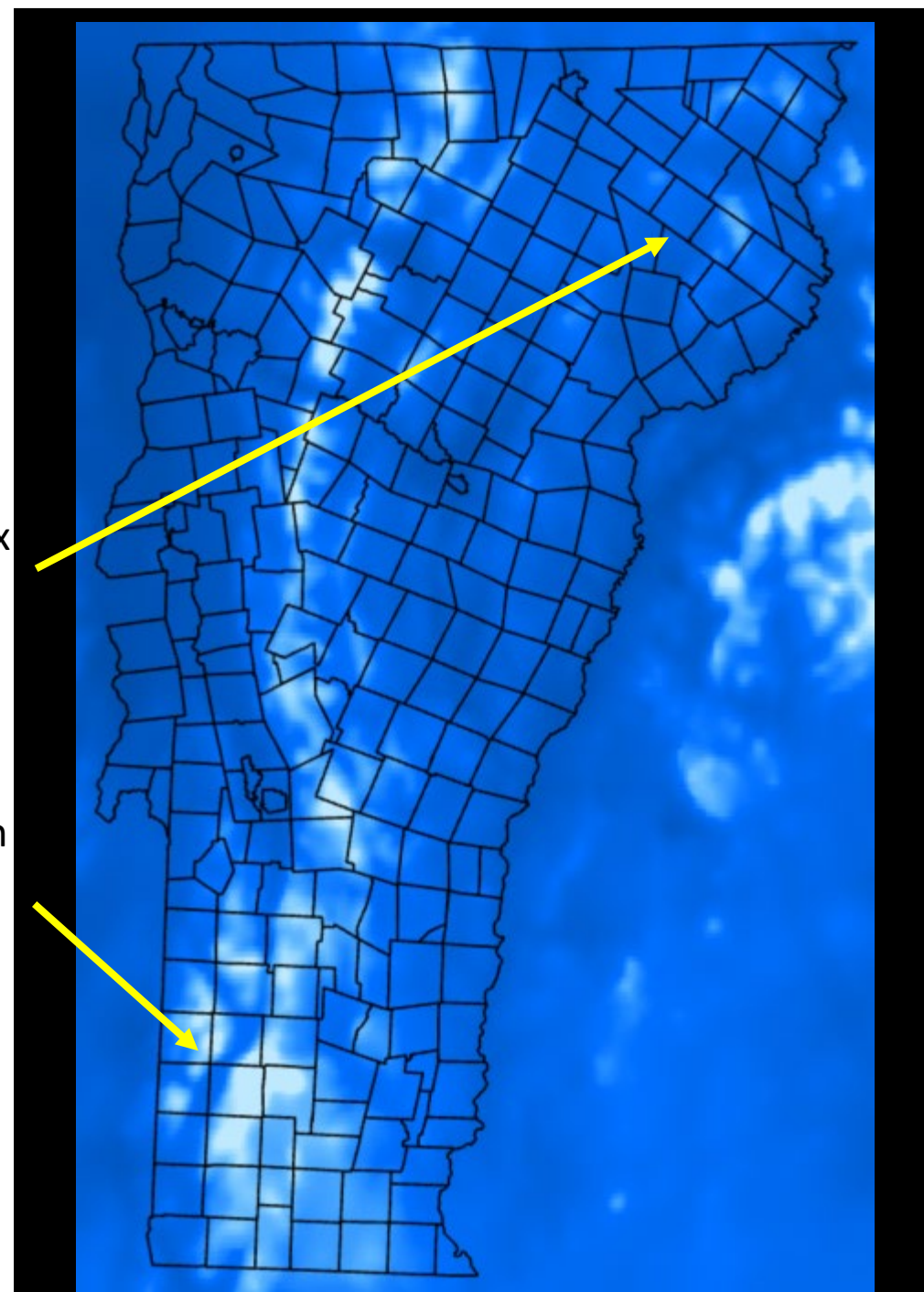
Look at mean annual precip in these places:

-Dk blue = lower
-White = higher

Conclusion: **Precip** drives this index most strongly

Essex Co.

Bennington Co.



NLI – Questions and Info

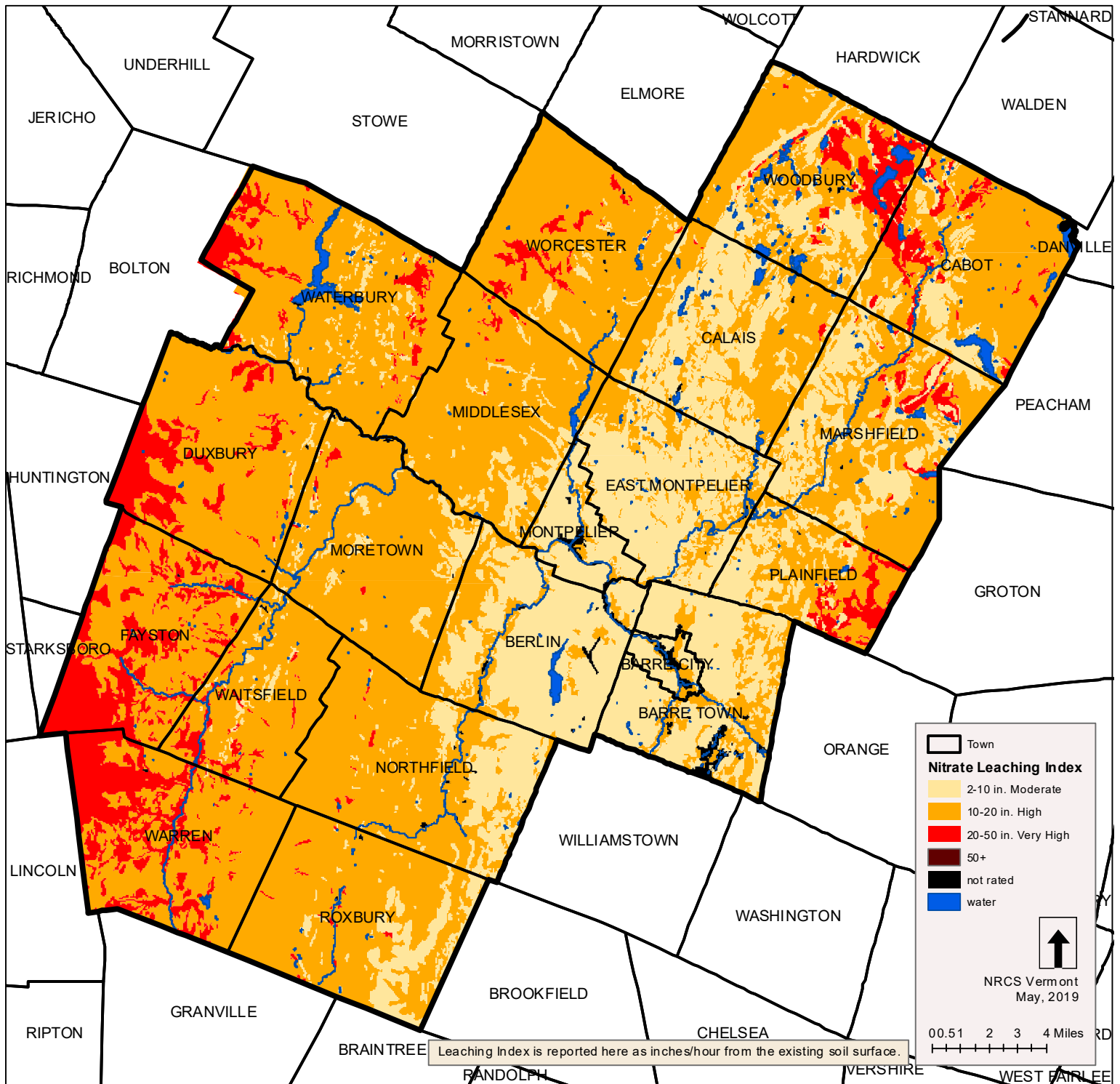
Contacts: Zachary.sims@usda.gov
Meredith.albers@usda.gov

*I could send you the maps, the Cornell fact sheet on NLI,
or my full ArcGIS Pro procedure.



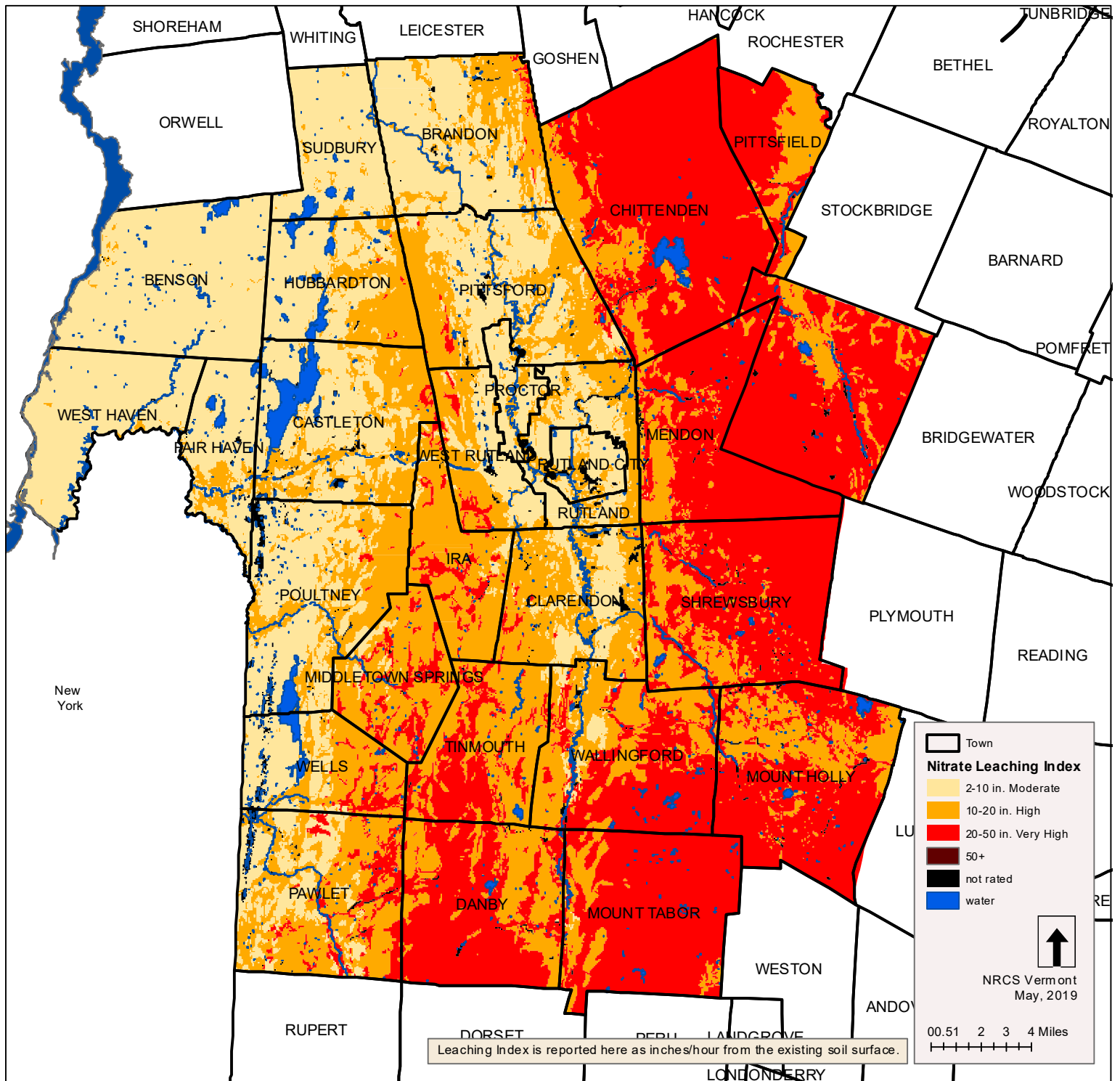
Nitrate Leaching Index

Washington County, Vermont



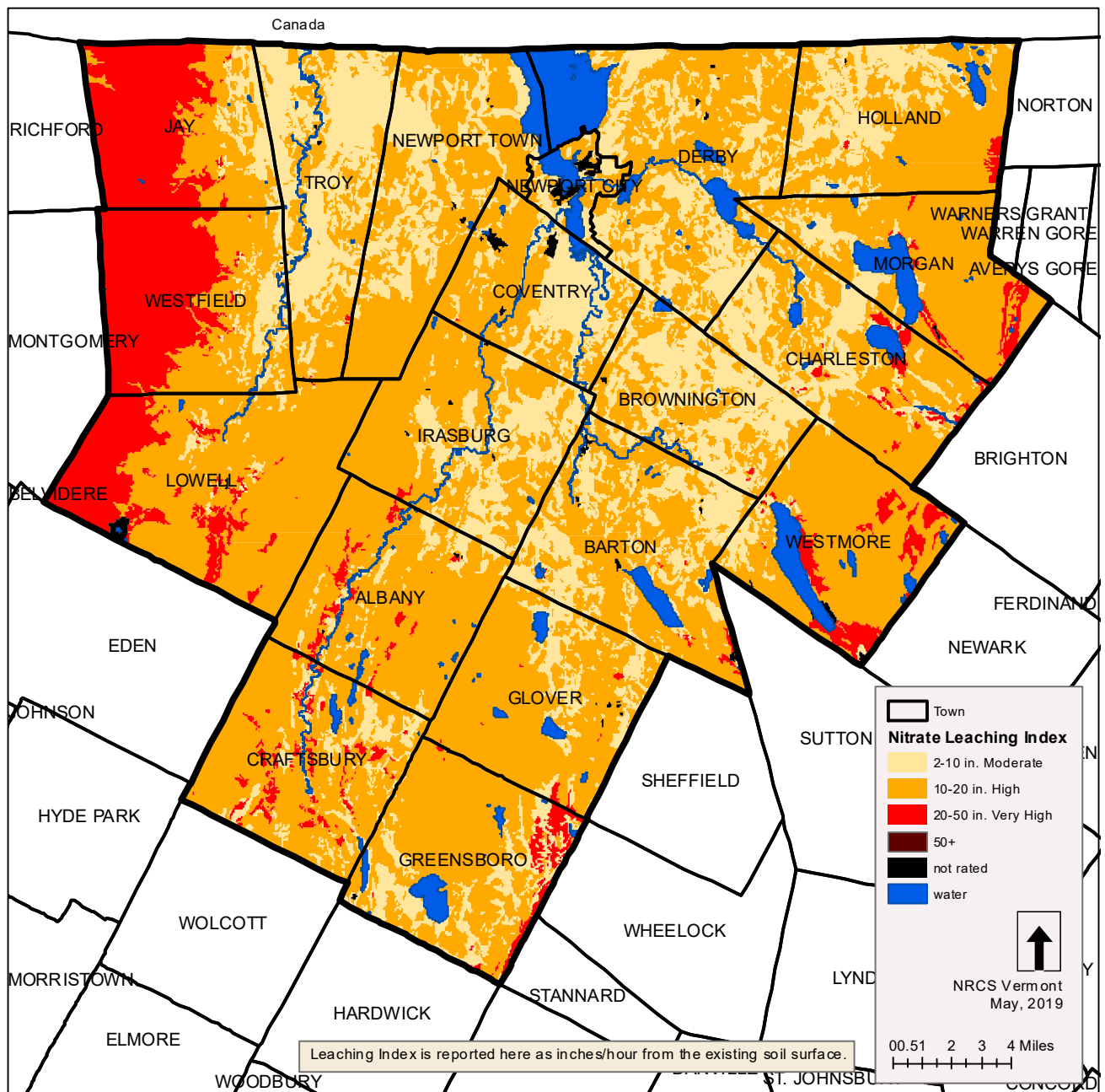
Nitrate Leaching Index

Rutland County, Vermont



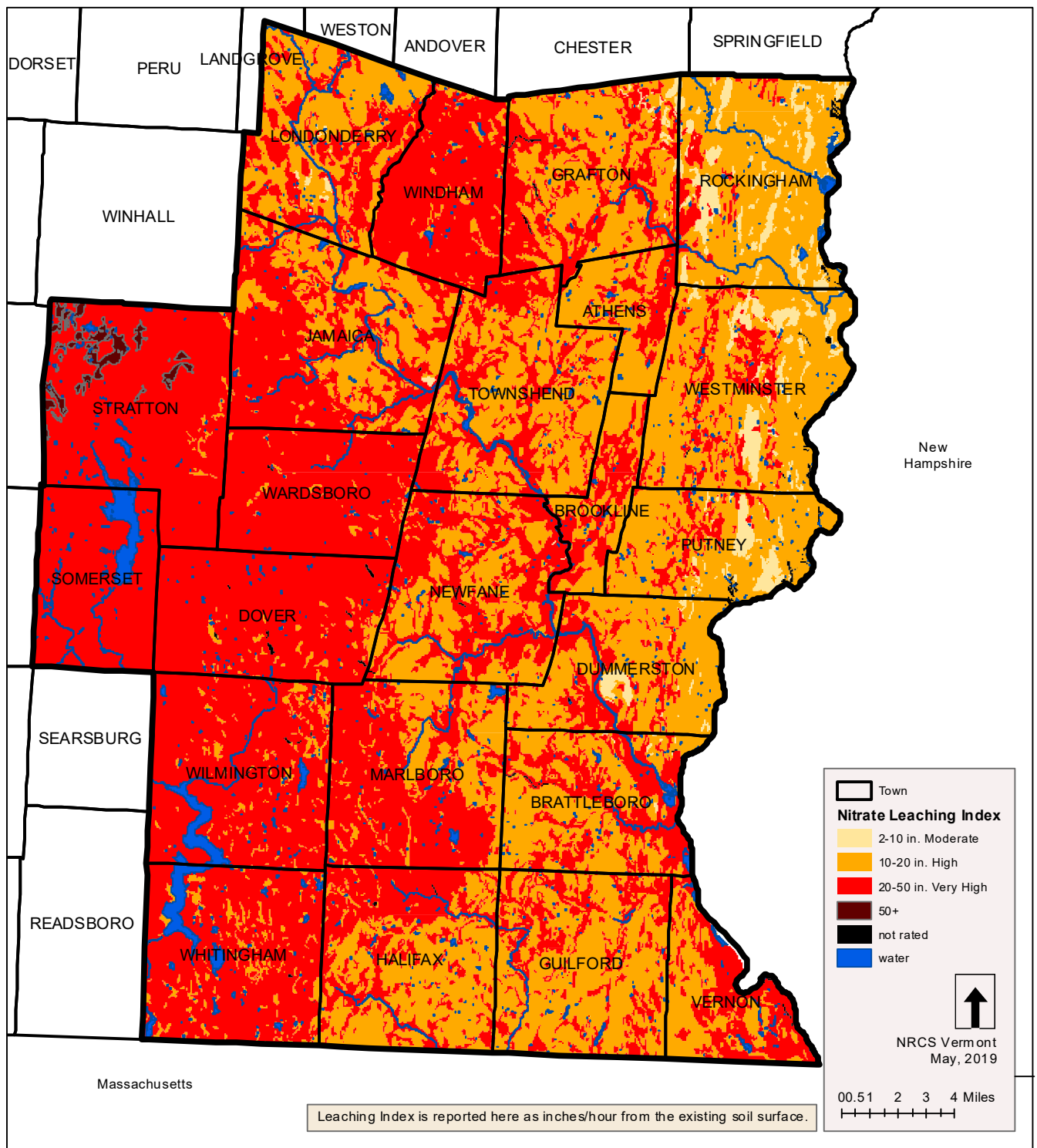
Nitrate Leaching Index

Orleans County, Vermont



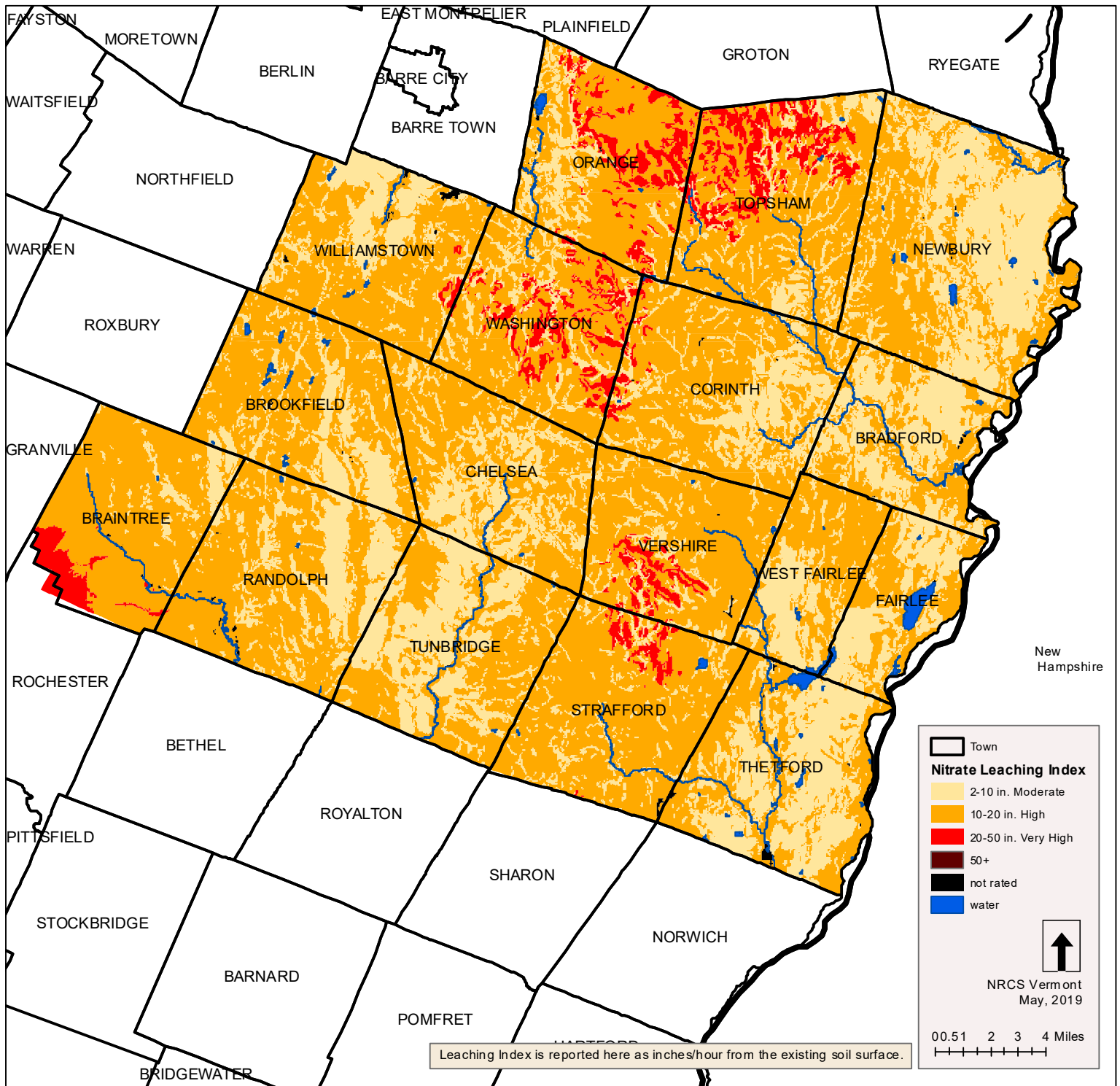
Nitrate Leaching Index

Windham County, Vermont



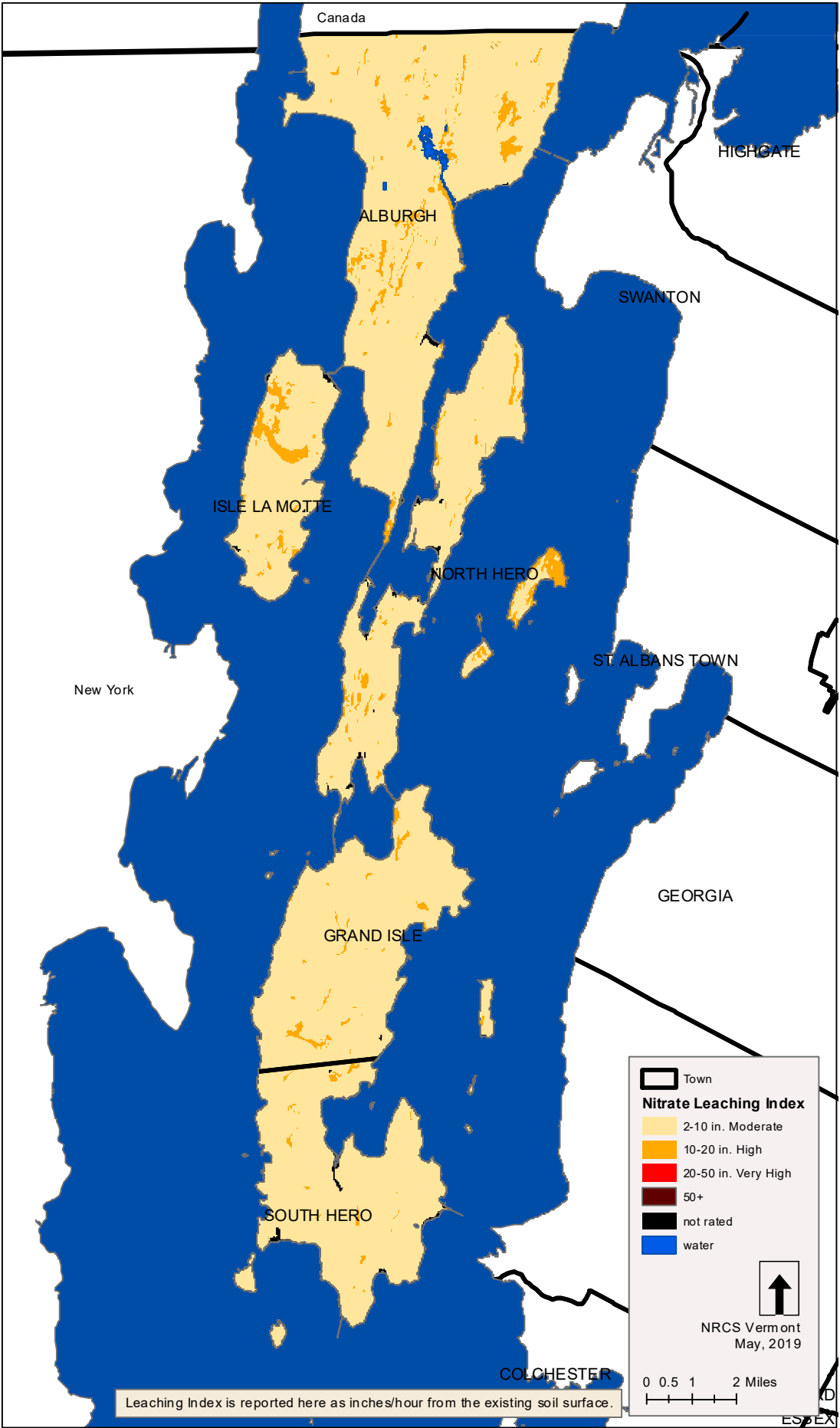
Nitrate Leaching Index

Orange County, Vermont



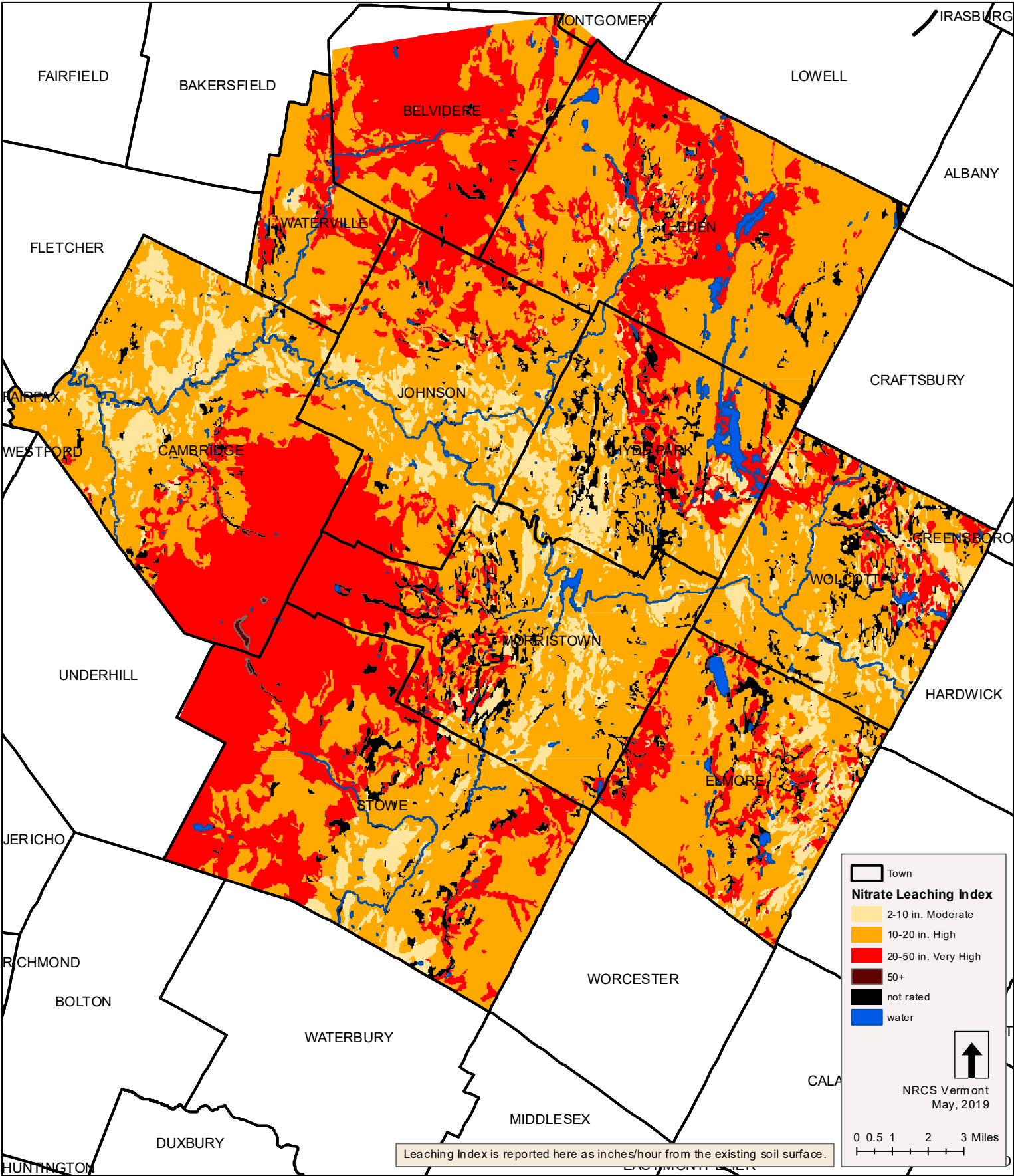
Nitrate Leaching Index

Grand Isle County, Vermont



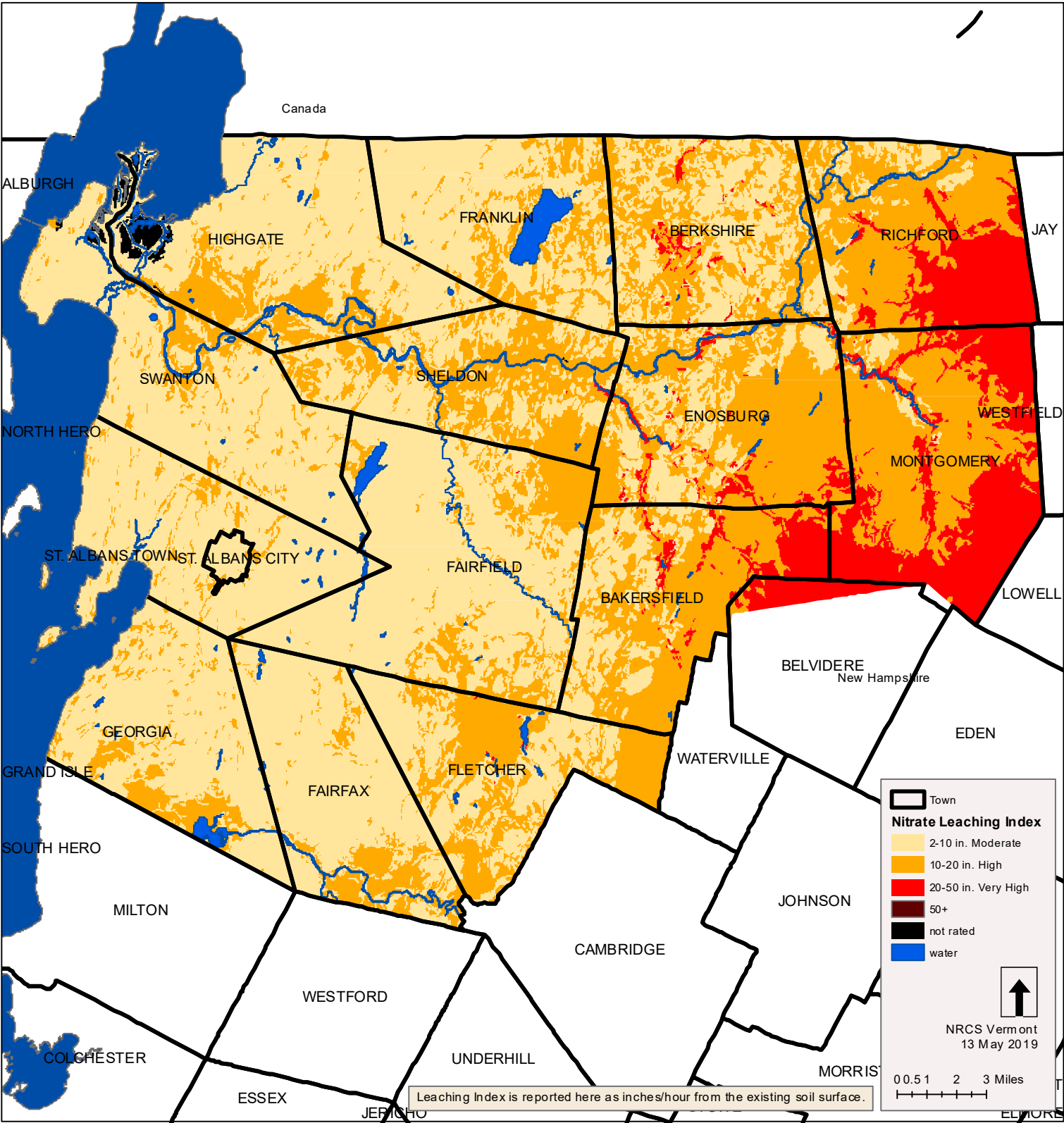
Nitrate Leaching Index

Lamoille County, Vermont



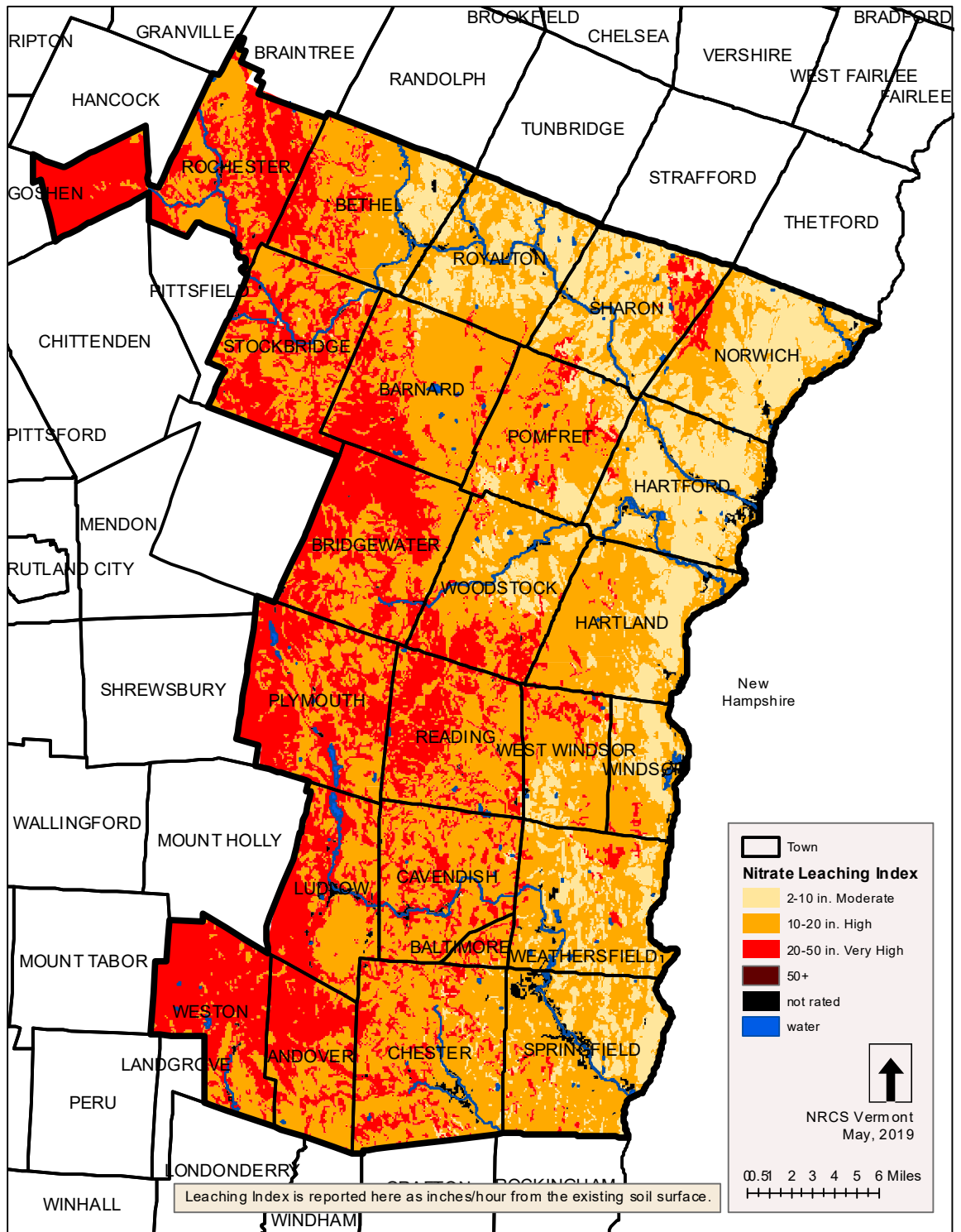
Nitrate Leaching Index

Franklin County, Vermont



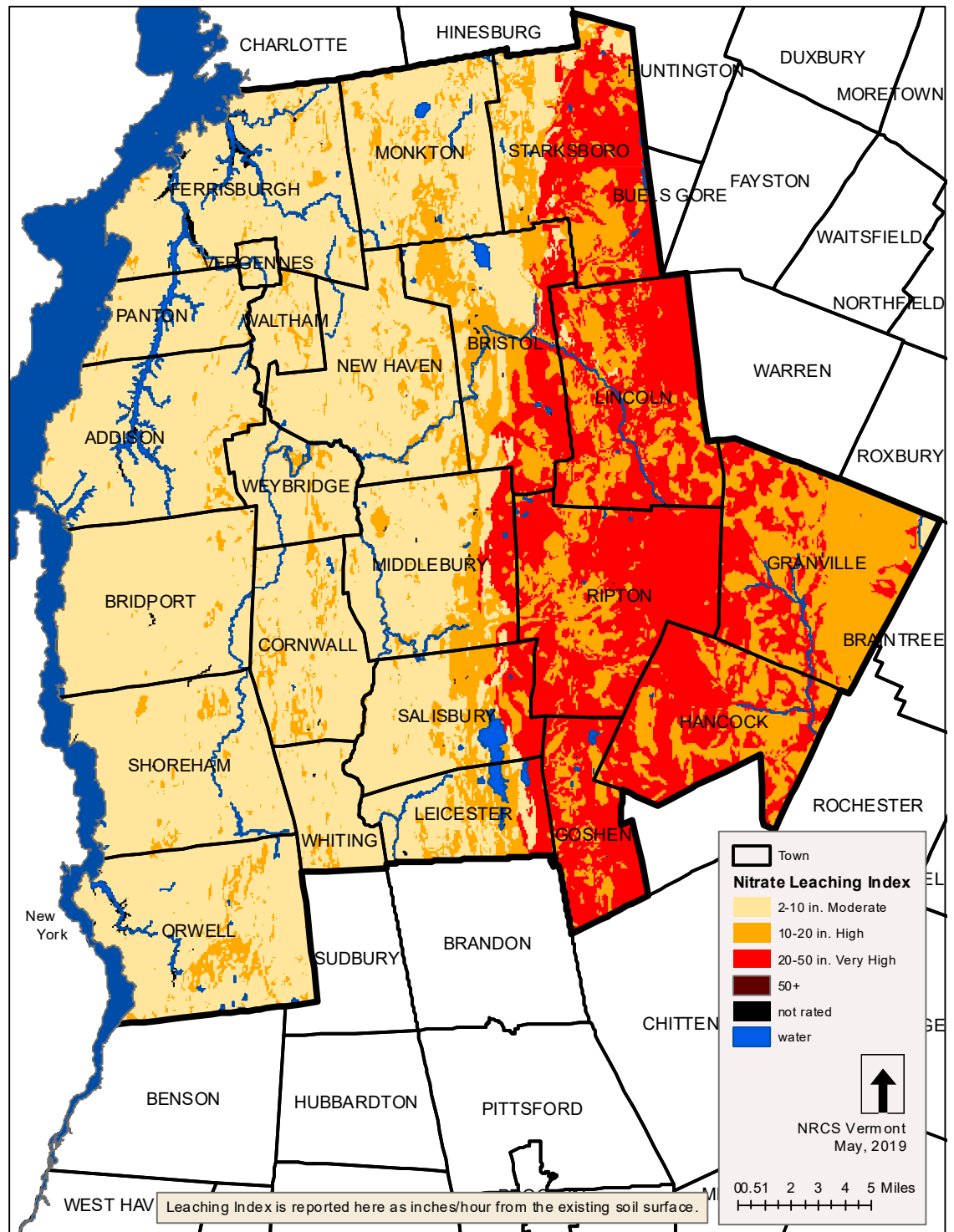
Nitrate Leaching Index

Windsor County, Vermont



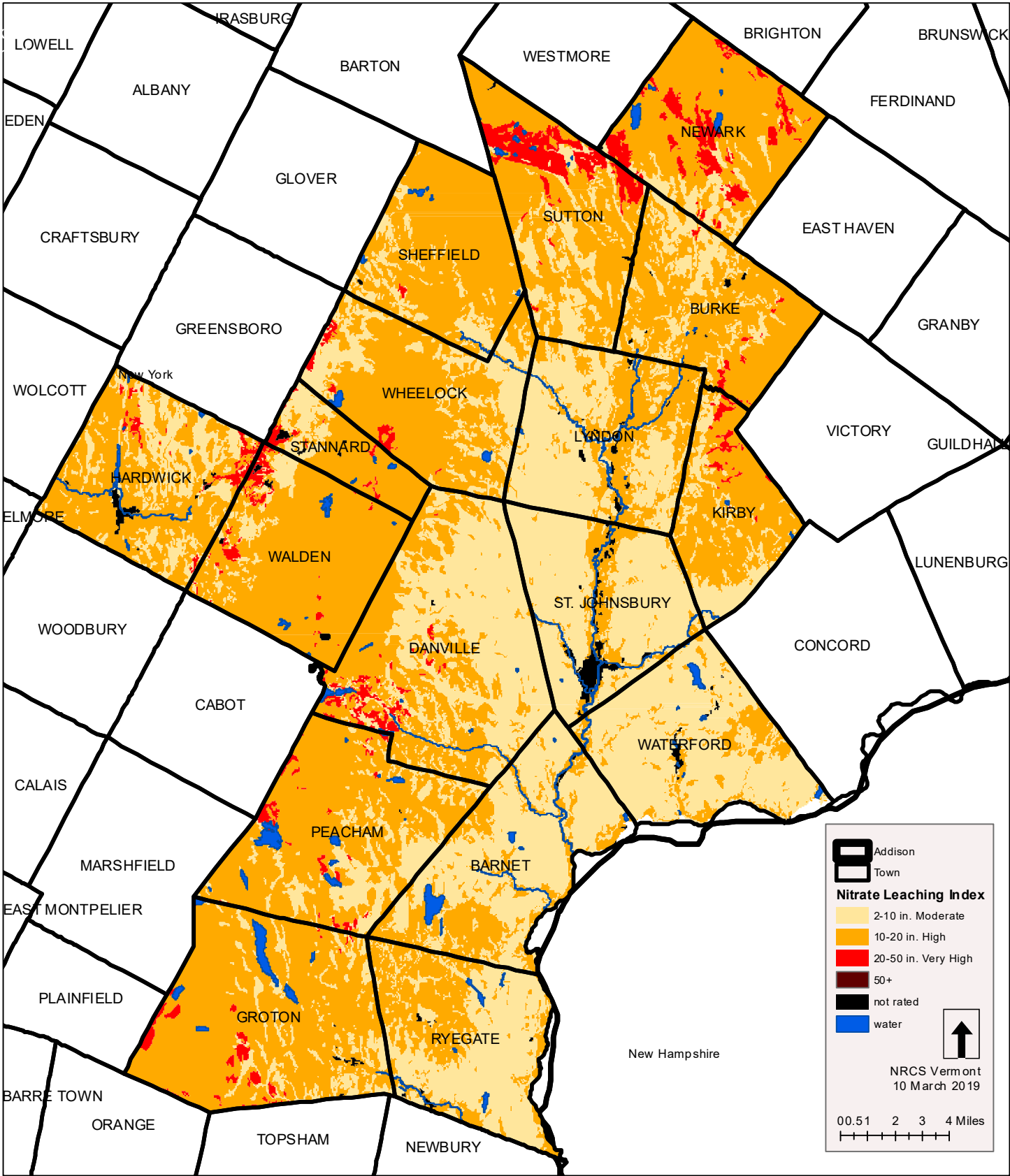
Nitrate Leaching Index

Addison County, Vermont



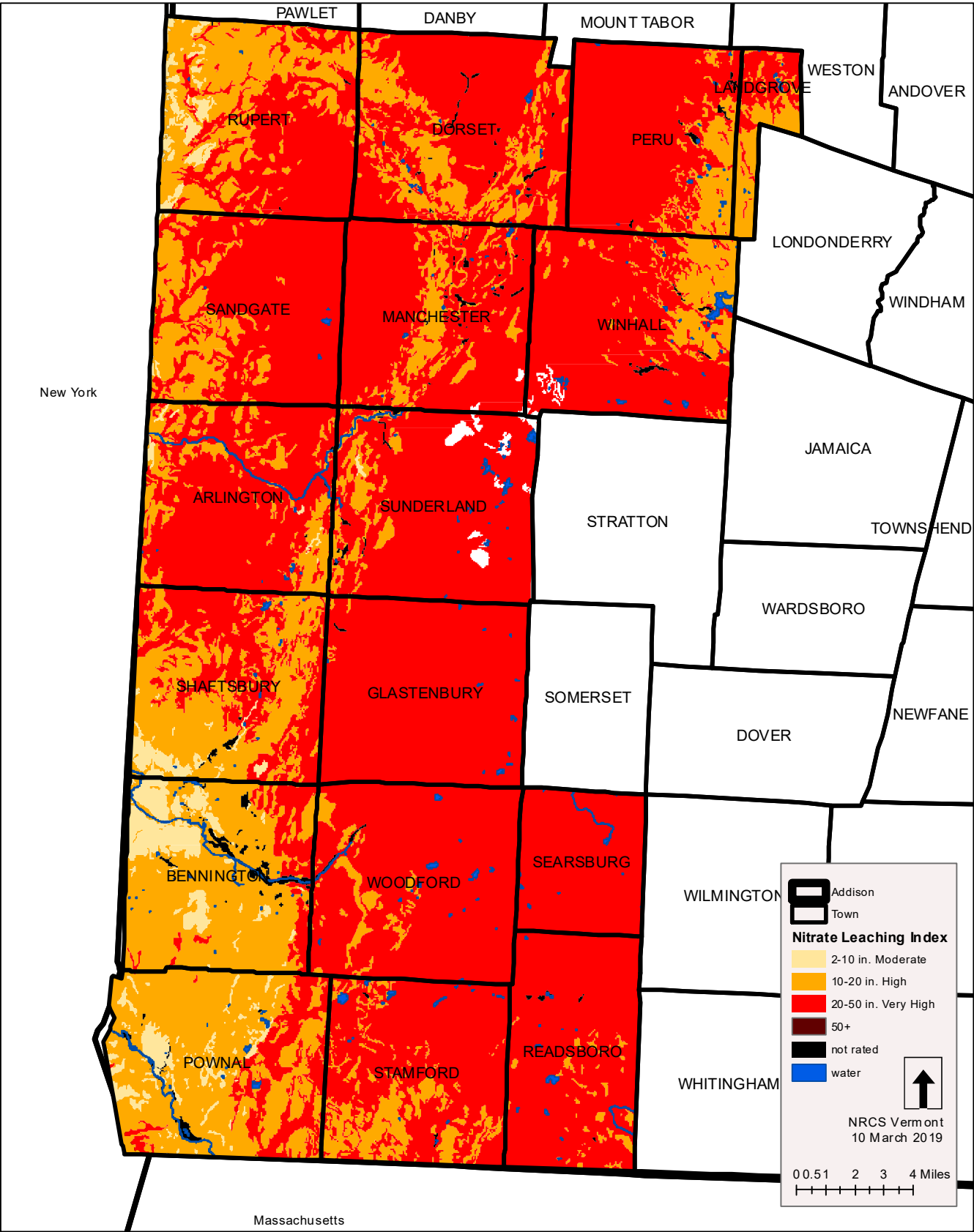
Nitrate Leaching Index

Caledonia County, Vermont



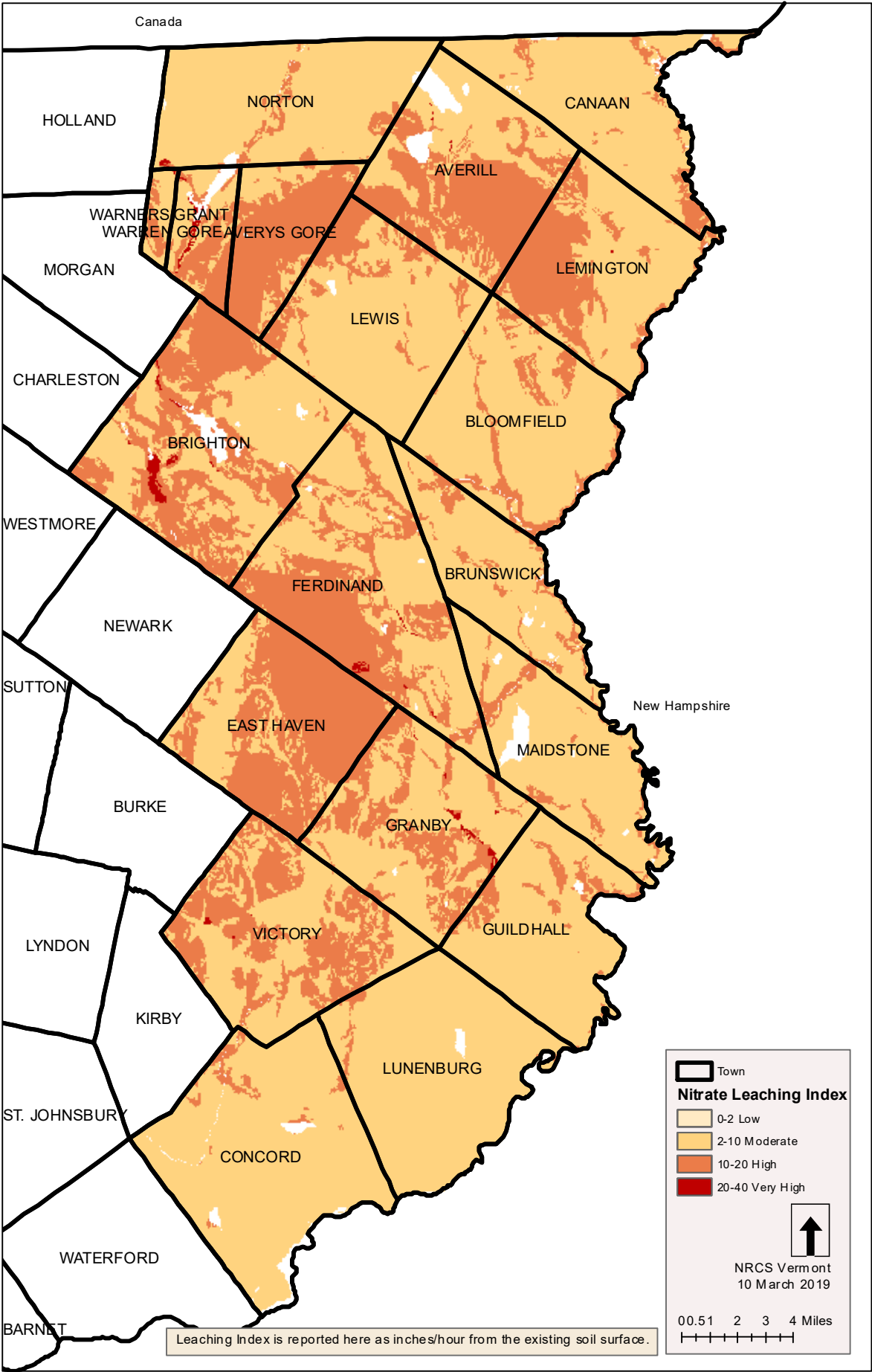
Nitrate Leaching Index

Bennington County, Vermont



Nitrate Leaching Index

Essex County, Vermont



Nitrate Leaching Index

Chittenden County, Vermont

