# JANUARY THAW 2008

## Summary


The January Thaw of 2008 occurred at nearly the identical time to the "pseudo"- January Thaw of 2007, but the conditions prior to each event were VERY different.

The Cold and Snowy start to the young 2007-08 Winter was a reversal of the 2006-07 Winter, when the first widespread winter storm across the North Country occurred on the Martin Luther King Jr. Holiday Observance (1/15/2007). Snowfall at the National Weather Service Office in South Burlington, Vermont was a meager 12.0 inches through January 5th, 2007, compared to 56.3 inches through January 5th, 2008.

The "pseudo"-January Thaw of 2007 occurred January 4-6th with maximum temperatures in the 50s and 60s across much of the North Country with 70s across southern New Hampshire, southern New England and New York. Actually, this was more of a continued, extended mild spell that started in December 2006 (which averaged 7.8 degrees above normal), rather than a defined "thaw", given there was no prolonged, preceding cold spell along with a lack of snow cover or river/lake ice to melt.

Meanwhile, the opposite occurred with The January Thaw of 2008 that occurred January 6-9th (which happened to occur on the same dates of the 10th Anniversary of the Devastating Ice Storm of 1998), with maximum temperatures in the 50s and 60s across the North Country. However, the preceding trend was opposite to the start of the winter of 2006-07, with the 4th snowiest December (2007) and the average December 2007 temperature near normal, but 7.8 degrees colder than in 2006.

Therefore, the apparent impact of the thaw was quite noticeable this year as snow cover across the region would diminish substantially or even disappear in spots during this warm spell.


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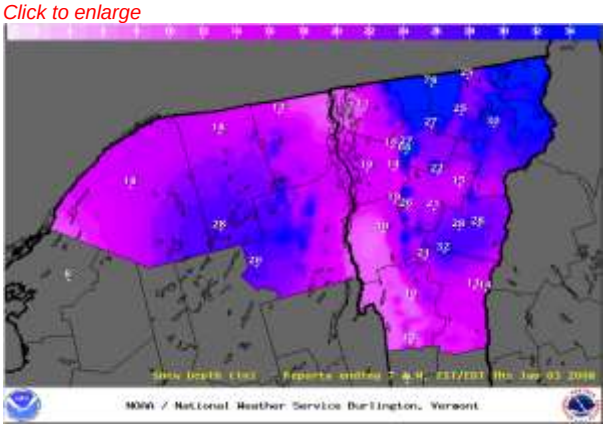


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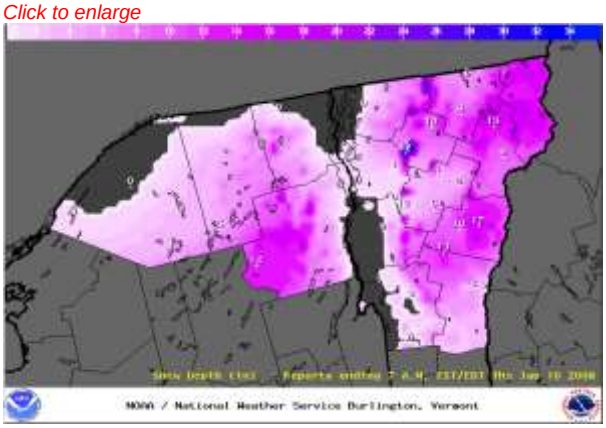

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In addition, river ice that was non-existent in January 2007 was prevalent prior to this thaw. Thus, snowmelt would cause increased water run-off into area streams and rivers, which caused some abnormally high water flows and some localized ice jams.

This resulted in water levels to exceed their banks with some very minor flooding, specifically along the AuSable River in New York and the Missisquoi River in northern Vermont.

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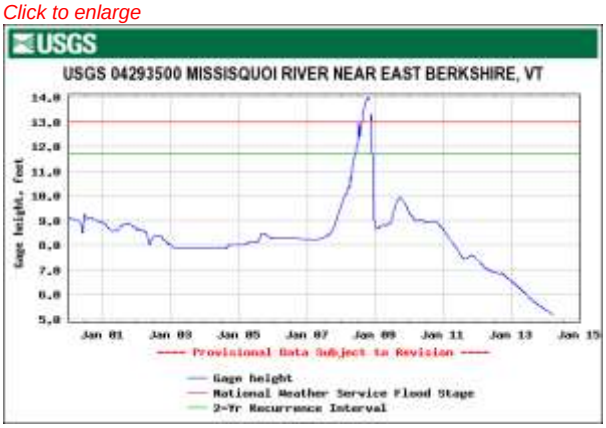


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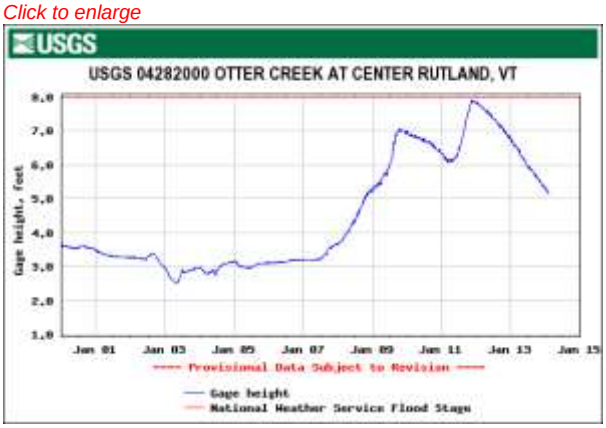


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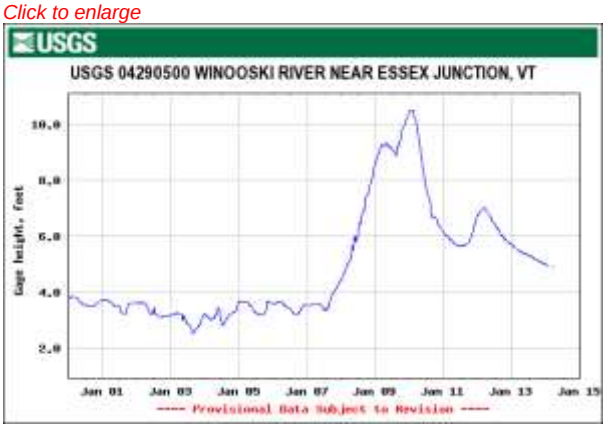


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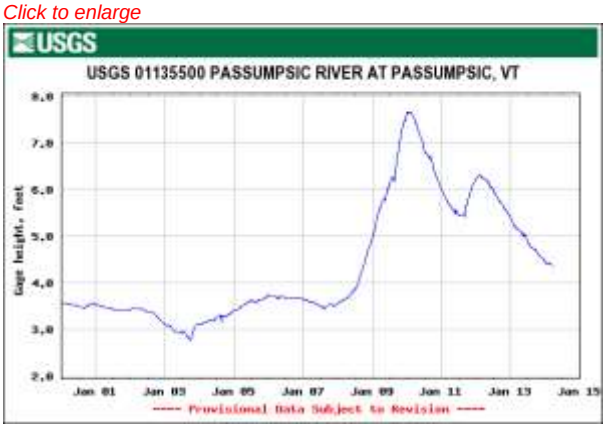

## Meteorological Background

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An arctic cold front moved across Vermont and northern New York on January 2nd, immediately following a New Year's Day snowfall that delivered 4 to 8 inches across the region. Arctic high pressure moved into the Mississippi and Tennessee River valleys with an elongated ridge axis across New York into Quebec by the morning of January 3rd with the ridge axis cresting across New England on the night of the 3rd. An arctic air mass, strong high pressure with clear skies, calm/light winds and fresh deep snow cover created ideal radiational cooling conditions for sub-zero temperatures during the early morning hours of the 3rd and 4th.

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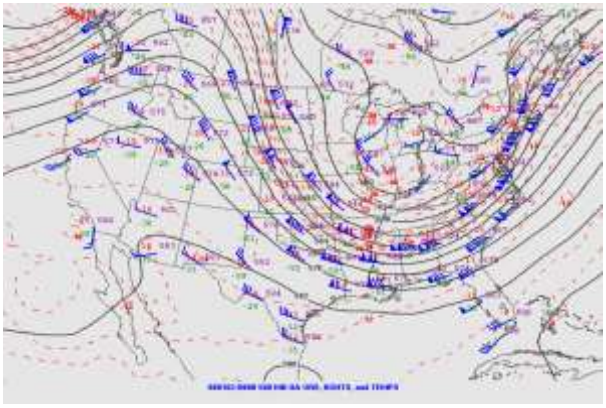

By the early morning hours of January 4th, the ridge axis had dampened and shifted southeast of the North Country allowing for a developing southwest "return" flow of milder air at the surface. Meanwhile at mid and upper layers of the atmosphere, the dominating ridge settled across the southeast United States, while a developing trough was entering the Pacific Northwest coast of the United States. This accounted for a very broad southwest flow to develop across the eastern United States including the North Country until the Pacific Northwest trough moves across the country and through the Northeast by January 9th.

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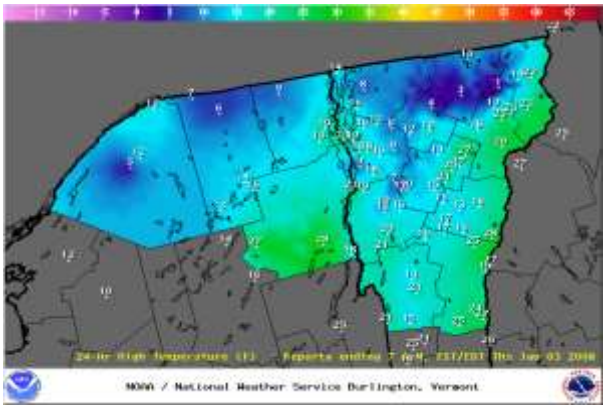


The influence of milder air moving into the region was apparent on the 4th and continued through the weekend into early next week.

Maximum temperatures rebounded from zero to 15 degrees above zero on the 3rd to mainly into the 20s on the 4th, 30s on the 5th, upper 30s to upper 40s on the 6th, mid 40s to mid 50s on the 7th, 50s to lower 60s on the 8th, and primarily in the 50s on the 9th as a surface cold front and mid atmospheric disturbance moved across the region.

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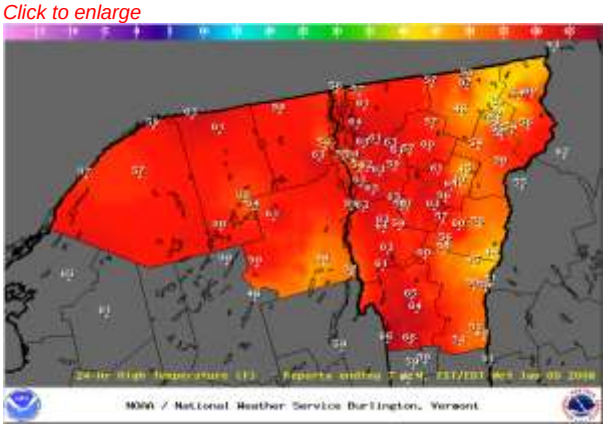


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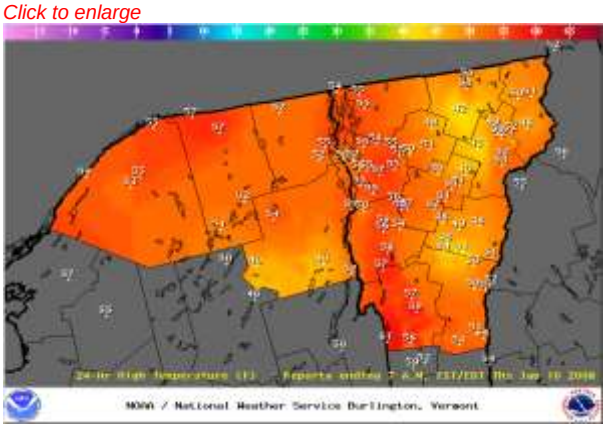


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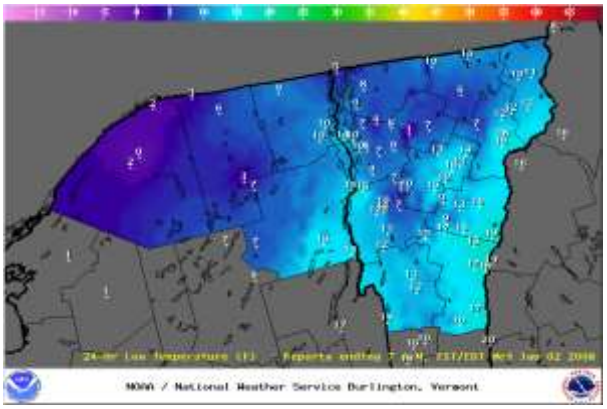


Meanwhile, minimum temperatures witnessed even greater changes with sub-zero temperatures throughout the North Country on the early morning of the 3rd and 4th, followed by teens and lower 20s across much of the region during the early morning of the 5th, primarily 20s on the 6th, 30s on the 7th, 30s and 40s on the 8th and 30s, 40s and lower 50s on the morning of January 9th.

On the 9th, an upper level trough and surface cold front moved across the region with scattered rain showers and cooler air that ended the main thaw.

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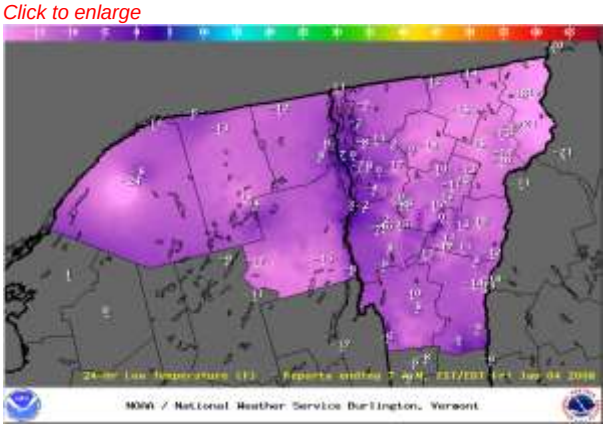


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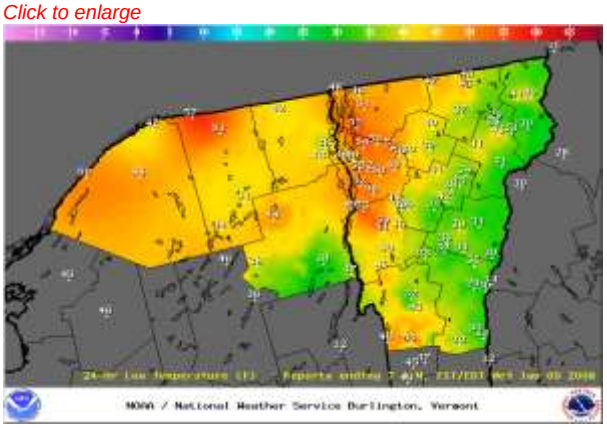


A typical pattern/feature emerged with respect to minimum and maximum temperatures across the North Country, that being the coolest temperatures were east of the Green Mountains, especially the Connecticut River Valley with the mildest readings experienced in the Champlain and St. Lawrence River valleys. The coldest readings in the east are associated with a phenomenon called an inversion. Colder air is denser than the arriving milder air, thus the mild air flows above the cold air and ground, thus forming an inversion. This inversion acts as a lid trapping the cold air beneath from escaping and the mild flow from reaching the surface.

Larger, broader valleys such as the St. Lawrence and Champlain valleys that are parallel to the flow are more receptive to the influx of milder air, thus scouring out the cold dense air. Meanwhile, deeper, narrower and shorter valleys like the numerous smaller river valleys within the Green Mountains and the Connecticut River Valley retain the coldest air at the surface, forcing the milder air aloft, thus producing an inversion.

This phenomena often occurs with the approach of a storm system from the southwest moving into the North Country with precipitation falling as snow then quickly changing to rain across much of New York

and the Champlain Valley of Vermont, while snow will change to rain aloft but the ground temperature remains below freezing thus the precipitation becomes freezing rain in the valleys of Vermont east of the Green Mountains. However, this inversion can occur on benign weather days preventing the mild air from reaching the deeper valleys thus witnessing tremendous temperature ranges within Vermont. For example, on the morning of the 9th, minimum temperatures were in the upper 40s to mid 50s across the Champlain Valley, while it was in the upper 20s to lower 30s in the Connecticut River Valley and further, it was milder in the lower 40s in higher elevation communities like Sutton, while it was near 30 in St. Johnsbury.

As mentioned above, tremendous snow melt occurred across much of the North Country including the higher elevations that were much milder above the inversion, yet the cooler regions of eastern Vermont witnessed the least snow melt.

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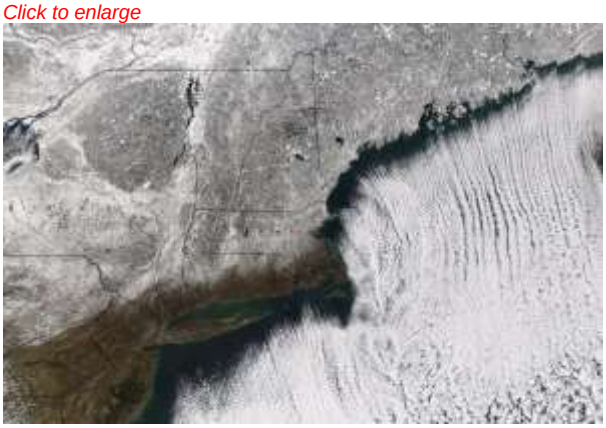

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