# Vermont Fuel Price Report

August 2014

## EIA-Short-Term Energy Outlook – Highlights

- The market's perception of reduced risk to Iraqi oil exports and news regarding increasing Libyan oil exports contributed to a drop in the Brent crude oil spot price to an average of $107 per barrel (bbl) in July, $5/bbl lower than the June average. EIA projects Brent crude oil prices to average $107/bbl over the second half of 2014 and $105/bbl in 2015. West Texas Intermediate (WTI) crude oil prices fell from an average of $106/bbl in June to $104/bbl in July, despite record levels of U.S. demand for crude oil. The WTI discount to Brent, which averaged $11/bbl in 2013, is expected to average $8/bbl and $9/bbl in 2014 and 2015, respectively, both $1/bbl lower than projected in last month's STEO.

- Regular gasoline retail prices fell to an average of $3.61 per gallon (gal) in July, 8 cents/gal below the June average. Regular gasoline retail prices are projected to continue to decline to an average of $3.30/gal in December. EIA expects regular gasoline retail prices to average $3.50/gal in 2014 and $3.46/gal in 2015, compared with $3.51/gal in 2013.

- U.S. total crude oil production averaged an estimated 8.5 million barrels per day (bbl/d) in July, the highest monthly level of production since April 1987. U.S. total crude oil production, which averaged 7.5 million bbl/d in 2013, is expected to average 8.5 million bbl/d in 2014 and 9.3 million bbl/d in 2015. The 2015 forecast represents the highest annual average level of oil production since 1972. Natural gas plant liquids production increases from an average of 2.6 million bbl/d in 2013 to 3.1 million bbl/d in 2015. The growth in domestic production has contributed to a significant decline in petroleum imports. The share of total U.S. petroleum and other liquids consumption met by net imports fell from 60% in 2005 to an average of 33% in 2013. EIA expects the net import share to decline to 22% in 2015, which would be the lowest level since 1970.

- Natural gas spot prices fell from $4.47/million British thermal units (MMBtu) at the beginning of July to $3.78/MMBtu at the end of the month as natural gas stock builds continued to outpace historical norms. Natural gas working inventories on August 1 totaled 2.39 trillion cubic feet (Tcf), 0.54 Tcf (18%) below the level at the same time a year ago and 0.61 Tcf (20%) below the previous five-year average (2009-13). Projected natural gas working inventories reach 3.46 Tcf at the end of October, 0.35 Tcf below the level at the same time last year. EIA expects that the Henry Hub natural gas spot price, which averaged $3.73 per MMBtu in 2013, will average $4.46/MMBtu in 2014 and $4.00/MMBtu in 2015, $0.31/MMBtu and $0.51/MMBtu lower than in last month's STEO, respectively.

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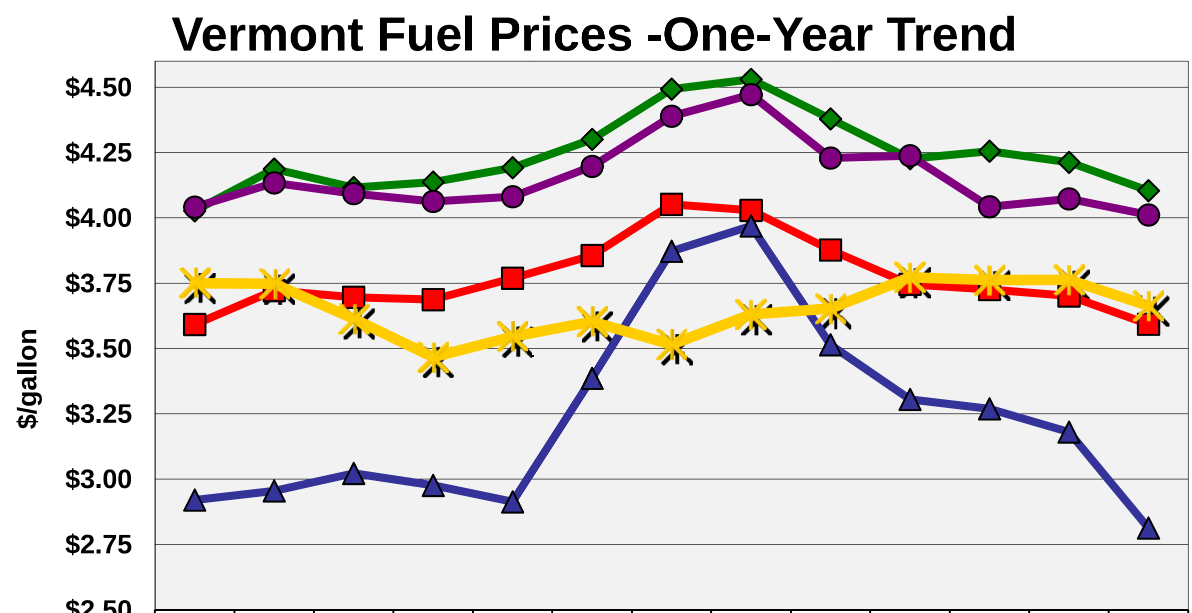
**Editor's Note:** Data presented in the *Vermont Fuel Price Report* as in the past, is collected on the first Monday of the month.




| | Aug'13 | Sept '13 | Oct '13 | Nov '13 | Dec '13 | Jan '14 | Feb'14 | Mar'14 | Apr'14 | May'14 | June '14 | July '14 | Aug '14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fuel Oil #2 | $3.59 | $3.72 | $3.70 | $3.69 | $3.77 | $3.86 | $4.05 | $4.03 | $3.877 | $3.746 | $3.726 | $3.701 | $3.593 |
| Kerosene | $4.03 | $4.19 | $4.12 | $4.14 | $4.19 | $4.30 | $4.49 | $4.53 | $4.379 | $4.226 | $4.255 | $4.213 | $4.104 |
| Propane | $2.92 | $2.96 | $3.02 | $2.98 | $2.91 | $3.39 | $3.87 | $3.97 | $3.514 | $3.305 | $3.269 | $3.180 | $2.813 |
| Gasoline | $3.75 | $3.75 | $3.61 | $3.47 | $3.55 | $3.60 | $3.52 | $3.63 | $3.653 | $3.773 | $3.762 | $3.763 | $3.664 |
| Diesel | $4.04 | $4.13 | $4.09 | $4.06 | $4.08 | $4.20 | $4.39 | $4.47 | $4.229 | $4.238 | $4.043 | $4.073 | $4.011 |

**Vermont Average Retail Petroleum Prices (per gallon)**

| | Aug '14 | July '14 | %change | Aug'13 | %change |
|---|---|---|---|---|---|
| No. 2 Fuel Oil | $3.593 | $3.701 | -2.92% | $3.592 | 0.03% |
| Kerosene | $4.104 | $4.213 | -2.58% | $4.027 | 1.91% |
| Propane | $2.813 | $3.180 | -11.56% | $2.920 | -3.67% |
| Reg. Unleaded Gasoline | $3.664 | $3.763 | -2.63% | $3.750 | -2.30% |
| Diesel | $4.011 | $4.073 | -1.51% | $4.041 | -0.74% |

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| Comparing the Cost of Heating Fuels | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Type of Energy** | **BTU/unit** | **Typ Effic** | **$/unit** | **$/MMBtu** | | **High Efficiency** | **$/MMBtu HF** |
| **Fuel Oil, gallon** | 138,200 | 80% | $3.50 | $31.68 | | 95% | $26.68 |
| **Kerosene, gallon** | 136,600 | 80% | $4.04 | $36.99 | | | |
| **Propane, gallon** | 91,600 | 80% | $2.76 | $37.65 | | 93% | $32.39 |
| **Natural Gas, therm** | 100,000 | 80% | $1.52 | $18.96 | * | 95% | $15.97 |
| **Electricity, kWh (resistive heat)** | 3,412 | 100% | $0.15 | $43.46 | | | |
| **Electricity, kWh (cold climate heat pump)** | 3,412 | | $0.15 | | | 240% | $18.32 |
| **Wood, cord (green)** | 22,000,000 | 60% | $193.33 | $14.65 | * | | |
| **Pellets, ton** | 16,400,000 | 80% | $247.00 | $18.83 | | | |

* The natural gas price is based on the rate effective 8/7/14. *Wood green updated 9/25/13.

The *Comparing the Cost of Heating Fuels* table now includes two additional columns “High Efficiency” and $/MMBTU HF. The new furnaces which are manufactured to meet higher efficiency standards can result in savings on energy for the customer. If you are in need of or thinking of replacing your current system contact your dealer for information on high efficiency systems.

Since the Fuel Price Report’s *Comparing the Cost of Heating Fuels* section began including information on heat pumps, the Department has received a number of comments and suggestions concerning the value of the Coefficient of Performance (COP) for air source heat pumps (ASHP). A COP over 1 means that occupants of a home receive more heat than is contained in the electricity delivered to run the ASHP.

$$Heat\ Pump\ Efficiency = \frac{Quantity\ of heating\ or\ cooling\ delivered}{Electricity\ required\ by\ the\ heat\ pump}$$

Historically, the use of heat pumps has been concentrated in areas with temperate climates which rarely see temperatures much below freezing. This is because the performance of these systems tended to decline significantly at temperatures below freezing. These systems’ COPs remain high as temperature varies through cool, but not cold, weather. As ambient temperatures begin declining from the optimal operation range the operational efficiency begins to decline as well. At some point,

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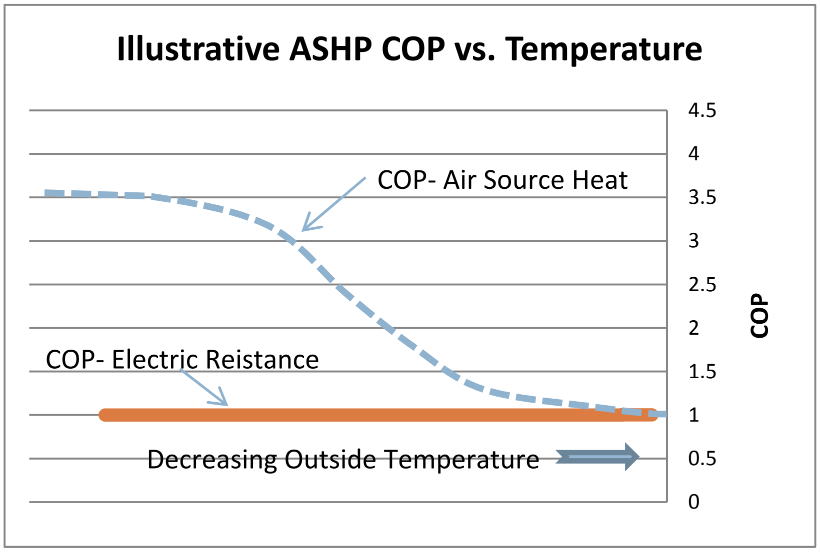
depending on the refrigerant and configuration of the heat pump, the COP = 1 which is the same as for electric resistance heating. At that level the heat pump alone cannot supply enough heat to maintain a comfortable interior temperature and requires that a supplemental source of heat be available.

In recent years manufacturers have developed air source "cold climate" heat pumps which have improved performance over a larger temperature range, due in part to the introduction of new refrigerants and more advanced compressors. These ASHPs have the potential to displace other heating sources down to zero F or below, resulting in displacement of a significant fraction of Vermont winter heating. Here in Vermont several programs are currently in the process of collecting actual operational data from ASHPs; their goal is to determine real world annual COP under Vermont's annual temperature range of over 120 degrees. The average yearly heating COP is expected to lie some at some value between 1 and 3 with 2.4 being a reasoned guesstimate based on average winter temperatures and product specifications. As information becomes available we will update the table accordingly.

The figure below is for illustrative purposes only and does not represent actual operational data.

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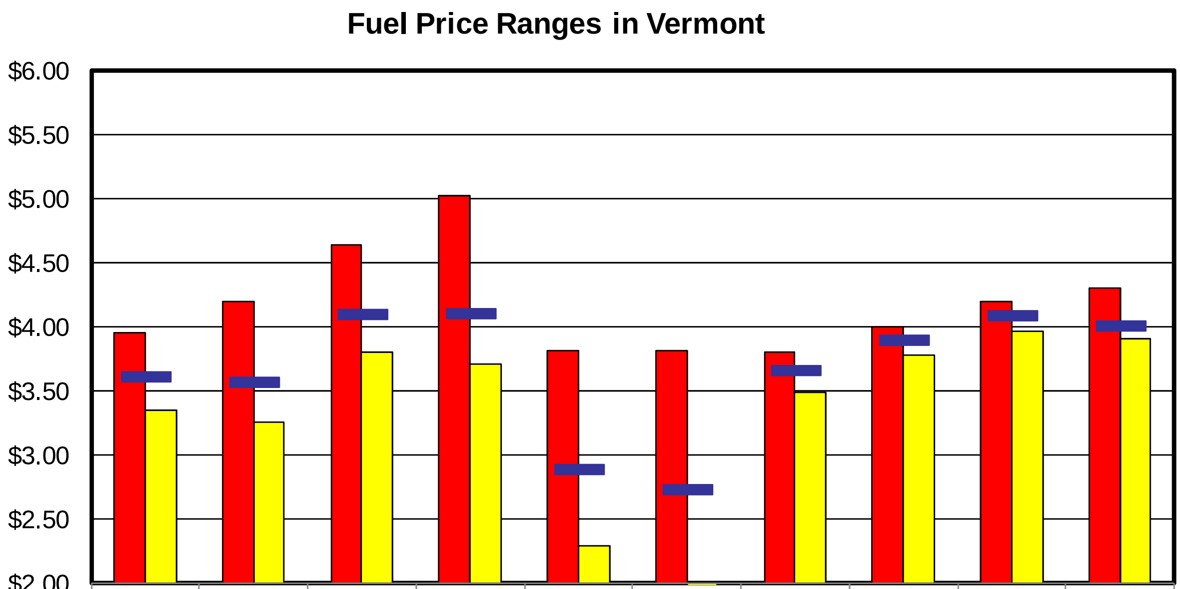


| | Oil-Credit | Oil-Cash | Kero-Credit | Kero-Cash | Pro-Credit | Pro-Cash | Regular Gasoline | Mid Grade Gasoline | Super Gasoline | Diesel |
|---|---|---|---|---|---|---|---|---|---|---|
| Maximum | $3.95 | $4.20 | $4.64 | $5.02 | $3.81 | $3.81 | $3.80 | $4.00 | $4.20 | $4.30 |
| Minimum | $3.35 | $3.25 | $3.80 | $3.70 | $2.29 | $0.00 | $3.49 | $3.78 | $3.96 | $3.90 |
| Average | $3.61 | $3.57 | $4.10 | $4.11 | $2.89 | $2.73 | $3.66 | $3.90 | $4.09 | $4.01 |

***Fuel Price Ranges in Vermont***

| | *Oil-Credit* | *Oil-Cash* | *Kero-Credit* | *Kero-Cash* | *Pro-Credit* | *Pro-Cash* | *Regular Gasoline* | *Mid Grade Gasoline* | *Super Gasoline* | *Diesel* |
|---|---|---|---|---|---|---|---|---|---|---|
| ***Stan.Dev $*** | $0.15 | $0.20 | $0.20 | $0.31 | $0.40 | $0.73 | $0.26 | $0.94 | $0.24 | $0.42 |
| ***Stan.Dev%*** | 4.17% | 5.60% | 4.99% | 7.65% | 13.83% | 26.71% | 2.05% | 5.88% | 1.93% | 2.22% |

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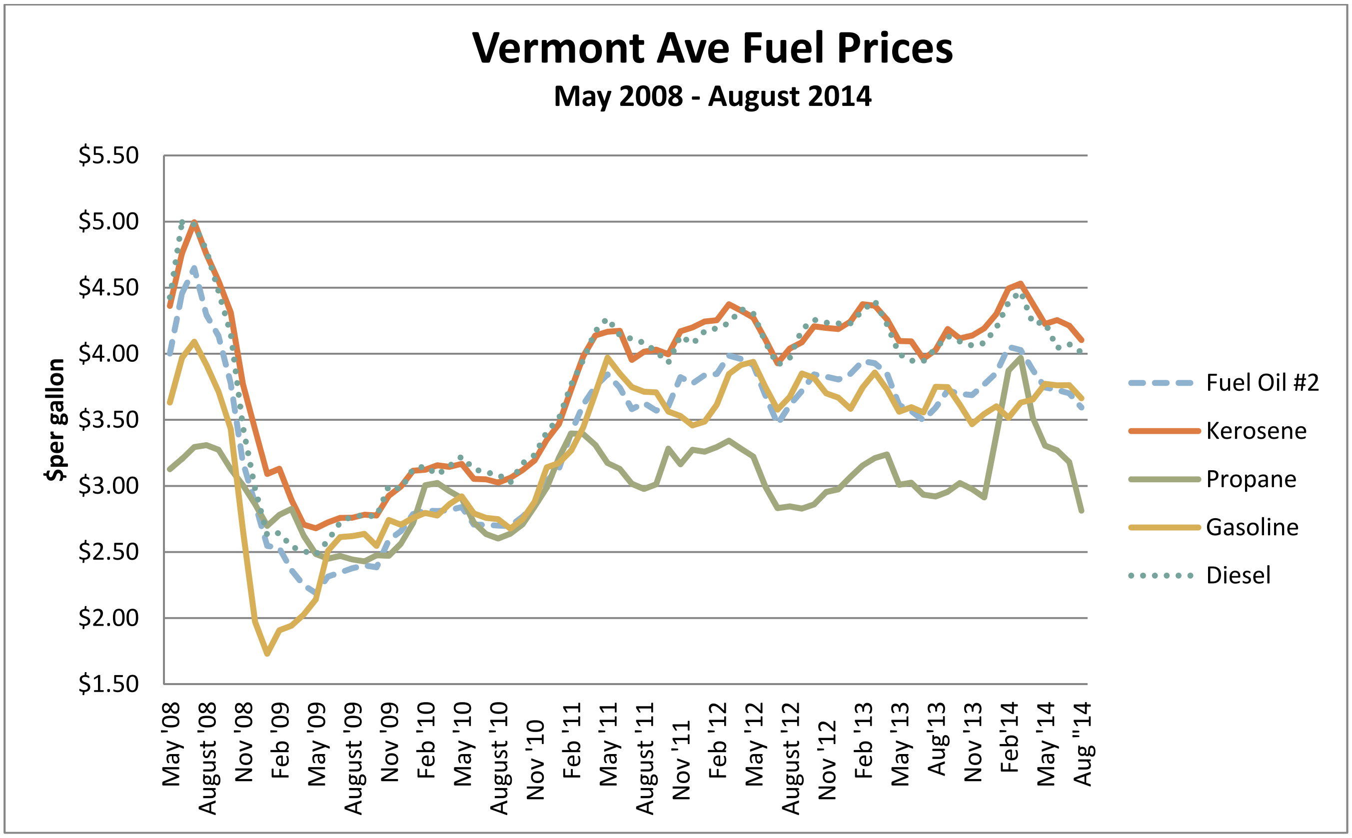


## PRICE PROTECTION PROGRAMS

This past winter's combination of colder weather and supply constraints resulted in pretty significant spikes in prices. Here are some suggestions for mitigating some impact caused by the spikes. Around this time of the year many fuel dealers offer their customers "price protection" programs. Such as "Pre-Buy" programs, in which participating customers can purchase a specified volume of fuel at a discounted price by paying for the heating season's fuel in advance. In "Fixed Price" programs, a pre-determined price per unit is set for all of the fuel delivered during the heating season. In "Cap" programs, the fuel price will not exceed a pre-determined value and may go down based on market conditions at time of delivery. Cap and Fixed Price programs may be part of "Budget" programs, in which the customer agrees to make equal monthly payments, often for 10 to 12 months. Price protection programs can be beneficial, as they provide a degree of certainty, and customers are better able to budget their finances and thus are not caught short during the heating season. However, price protection programs don't guarantee savings, so consumers need to consider their options carefully.

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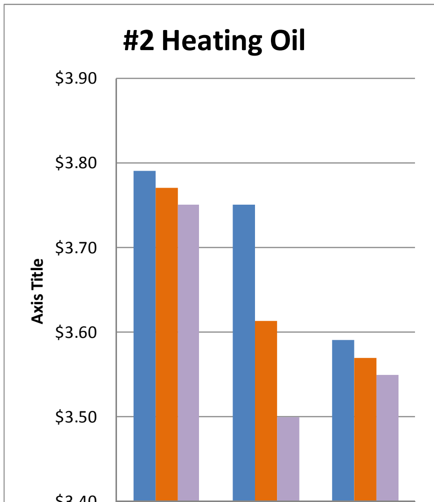
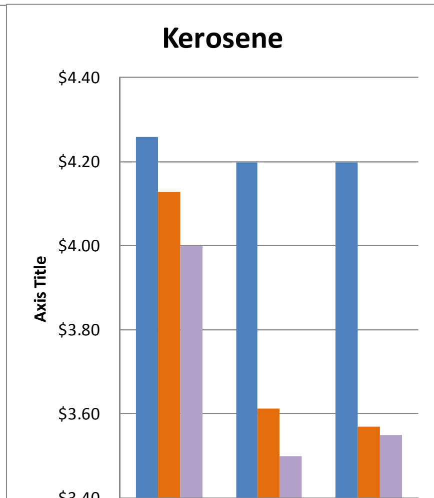
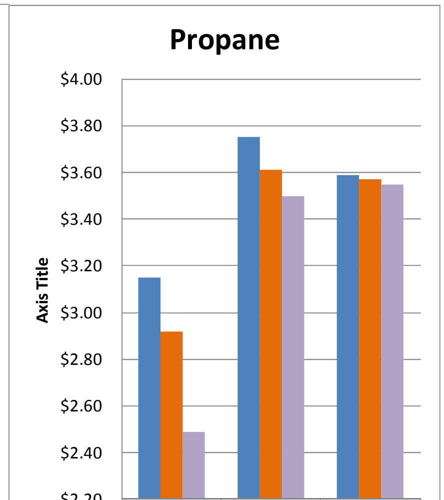
Below is a sampling of dealer's offerings for price protection programs.. Contact your Dealer for up to date terms and conditions of their "price protection" programs.




| | Budget | Prebuy w/cash | Prebuy w/cc |
|---|---|---|---|
| High | $3.79 | $3.75 | $3.59 |
| Ave | $3.77 | $3.61 | $3.57 |
| Low | $3.75 | $3.50 | $3.55 |




| | Budget | Prebuy w/cash | Prebuy w/cc |
|---|---|---|---|
| High | $4.26 | $4.20 | $4.20 |
| Ave | $4.13 | $3.61 | $3.57 |
| Low | $4.00 | $3.50 | $3.55 |




| | Budget | Prebuy w/cash | Prebuy w/cc |
|---|---|---|---|
| High | $3.15 | $3.75 | $3.59 |
| Ave | $2.92 | $3.61 | $3.57 |
| Low | $2.49 | $3.50 | $3.55 |

## Vermont Historical Weather and Degree Day Data

CDD's are used during summer months to compare the current day's average temperature against the 65ºF standard to determine the energy demands of cooling your home through air conditioning or fans. For example, if the current day's high is 85ºF and the low is 65ºF, the day's average temperature will be 75ºF. Since 75ºF-65ºF is 10ºF, this day would have 10 cooling degree days. Adding the degree days together for the whole month provides a way to compare previous months or years.

HDD's are used the same way during winter months to determine the energy demands of heating your home. The 65ºF standard still is used; however, the day's average temperature is subtracted instead of added to the standard. For example, if the current day's high is 30ºF and the low is 10ºF, the day's average temperature will be 20ºF. Since 65ºF-20ºF is 45ºF, this day would have 45 heating degree days.

Just like cooling degree days, heating degree days may be added together for the entire month to compare to previous months or years.[1]

[1] http://www.consumersenergy.com/content.aspx?id=4582

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The primary online source for historical weather and degree day data is the available from the NOAA - National Climatic Data Center (NCDC) web site at: http://www7.ncdc.noaa.gov/CDO/CDODivisionalSelect.jsp#

NCDC maintains the world's largest climate data archive and provides climatological services. Records in the archive range from paleoclimatic data to centuries-old journals to data less than an hour old.

Another source is the Weather Data Depot web site. The data collection is not as extensive as the NOAA collection only covering the years from 1993 forward. But the site is more user friendly. http://www.weatherdatadepot.com/?pi_ad_id=8426228665&gclid=CIaZvMf8krQCFQqk4AodFRYArQ

A negative percentage means the Comparison Year was milder than the Base Year. A positive percentage means the Comparison Year was more severe than the Base Year. When the monthly degree days in either the base year or the comparison year are less than 30, a percentage comparison is not calculated. However, the Annual Total comparison percentages include all heating and cooling degree days.

**Monthly Degree Day Comparison (Station: VTNO)**

| | Base Year (2013) | | | Comparison Year (2014) | | | Comparison Percentages | | |
|---|---|---|---|---|---|---|---|---|---|
| Month | HDD | CDD | TDD | HDD | CDD | TDD | HDD | CDD | TDD |
| January | 1307 | 0 | 1307 | 1398 | 0 | 1398 | 7% | | |
| February | 1102 | 0 | 1102 | 1253 | 0 | 1253 | 13% | | 13% |
| March | 976 | 0 | 976 | 1294 | 0 | 1294 | 32% | | 32% |
| April | 574 | 2 | 576 | 580 | 0 | 580 | 1% | | 0% |
| May | 178 | 31 | 209 | 197 | 23 | 120 | 10% | | 5% |
| June | 61 | 130 | 191 | 28 | 109 | 137 | | -0.16% | -0.28% |
| July | 2 | 303 | 305 | 1 | 212 | 214 | | -30% | -30% |
| August | 13 | 145 | 158 | | | | | | |
| September | 167 | 59 | 226 | | | | | | |
| October | 400 | 0 | 400 | | | | | | |
| November | 867 | 0 | 867 | | | | | | |
| December | 1200 | 0 | 1200 | | | | | | |
| Annual Total | 6847 | 670 | 7517 | 4751 | 334 | 5095 | 13% | -26% | 9% |

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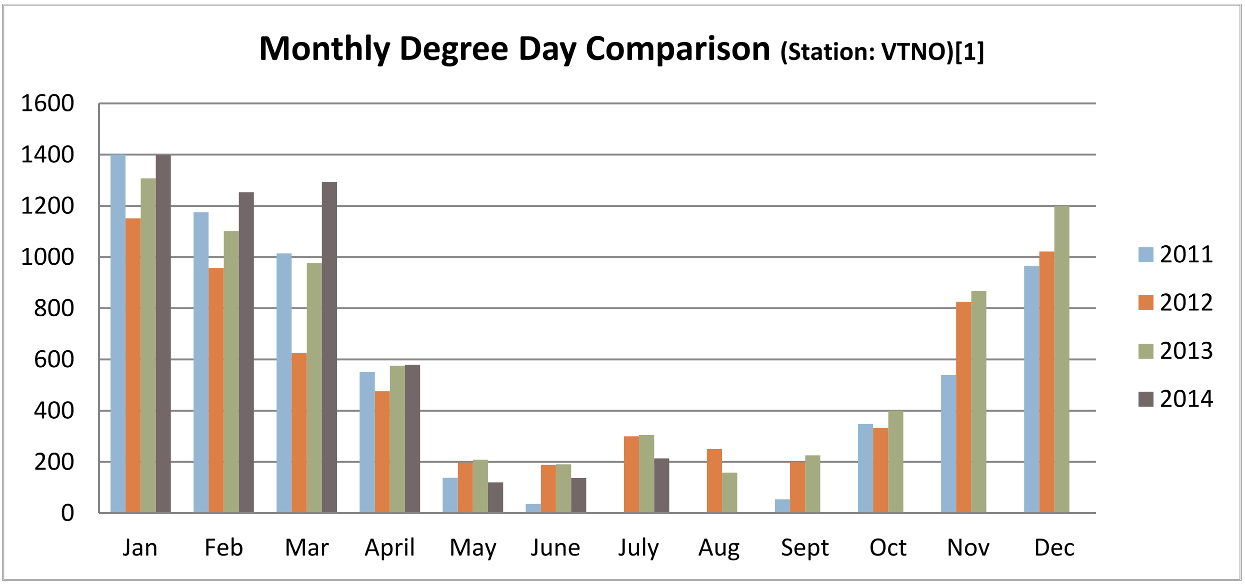




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