

Winter/Spring Drought in Vermont

STATEMENT ON THE 1998-1999 WINTER-SPRING DROUGHT IN VERMONT

June 11, 1999

Drought continues across Vermont ...

Drought conditions continue across Vermont in May 1999. Following one of the wettest summers on record in 1998, precipitation totals across the state of Vermont declined as the year drew to a close. In December 1998 according to the [Northeast Regional Climate Centre](#), the state received 1.06 inches (26.9 mm) of precipitation, only 32% of what is considered normal.

Dry conditions were really first observed in December 1998, although the statewide precipitation totals for January and March 1999 have helped to alleviate the drying. Very little precipitation was received from March 22 until May 19 when substantial amounts of rainfall (0.5-3 inches or 12.7 - 74.2 mm) from a conveyor belt storm system were received.

April was a particularly dry month across Vermont. Only 42% of the expected precipitation actually fell. As these dry conditions continued into May, a number of threats ranging from brush and wild fires to the drying of shallow residential wells began to be observed. Gardens and lawns began to show signs of moisture stress. Responding to the dry conditions, the abundance of yellow pollen being released from pine trees has been particularly marked this spring.

Implications of the current drought

The current dry conditions in Vermont have serious implications for various sectors of our economy. Although precipitation amounts have been for the most part adequate enough so that the soil has not completely dried out, two other factors make the low rainfall amounts potentially threatening. The first is the unseasonably warm temperatures that have characterized the last few months, while the second is the very low humidities that have accompanied these high temperatures. The combination of these two factors creates a high evaporative demand by the atmosphere, which in turn encourages evaporation from the soil and from plants. According to the stage of plant growth, this type of moisture stress may be detrimental to plants.

Other sectors of the economy that may be at risk include those that depend on surface water, groundwater or reservoir supplies, for example hydroelectric generating companies. Water levels are traditionally low during the cool season of the year. Recharge of the water table needs to continue in order to circumvent socioeconomic losses that may accompany hydrologic deficits.

The severity of the ongoing drought in Vermont has not reached the proportions that were observed during the drought of 1995 when both the [health of the forests](#) around the state as well as the [quality of our freshwater](#) were threatened.

What is drought?

The occurrence of [drought](#) is difficult to detect and many definitions exist to describe the various ways in which it can be categorized and examined. Two key issues should be remembered. A drought involves water availability that is below average (Beran and Rodier, 1985) and this shortfall must be in reference to a supply and demand (Dracup et al., 1980). Declines in precipitation are not

the only atmospheric parameter of interest, since the abnormal drying power of the atmosphere (atmospheric drought) is also important. When these precipitation shortages affect the soil moisture available for plants, especially those of economic importance, this is termed agricultural drought. The next level of impacts is related to the lagged response of streamflow, groundwater and reservoir storage, i.e. hydrologic drought. When all of these impacts begin to impinge on such variables as water, food supplies and hydroelectric power, socioeconomic drought exists.

There are a number of ways in which a drought can be characterized. One of the more common approaches is to use an index such as the Standardized Precipitation Index (SPI) or the Palmer Drought Severity Index (PDSI). The SPI determines drought (or wet conditions) as the normalized deviation of precipitation totals relative to the mean value. The SPI for April shows the presence of extreme drought across the entire New England area.

For further details on drought, drought monitoring and planning refer to the National Drought Mitigation Centre.

References

- Beran, M.A. and Rodier, J. A. (1985) Hydrological Aspects of Drought: a Contribution to the International Hydrological Programme, World Meteorological Organization, Studies and reports on hydrology 39, Paris.
- Dracup, J.A., Lee, K.S. and Paulson jr, E.G. (1980) "On the Definition of Droughts," Water Resources Research, 16(2):297-302.
- American Meteorological Society Policy Statement on Meteorological Drought.