

## DROUGHT

### HAZARD PROFILE

#### Description

According to the NYS Plan, drought is “a prolonged period with no rain, particularly during the planning and growing season in agricultural areas. Limited winter precipitation accompanied by moderately long periods during the spring and summer months can also lead to drought conditions” (NYS, 2004). Drought can be aggravated by other factors such as high temperatures, high winds, and low relative humidity. These conditions are caused by anomalous weather patterns when shifts in the jet stream block storm systems from reaching an area. As a result, large high-pressure cells may dominate a region for a prolonged period, thus reducing precipitation.

This natural hazard differs from others in several ways. First, there is no universally accepted definition of drought. Second, drought onset and recovery are usually slow. Third, droughts also can cover a much larger area and last much longer than most other natural hazards. Fourth, they are part of the natural variability. Due to these differences many communities have neglected to include this hazard in their disaster management plans (ICLR, 2005).

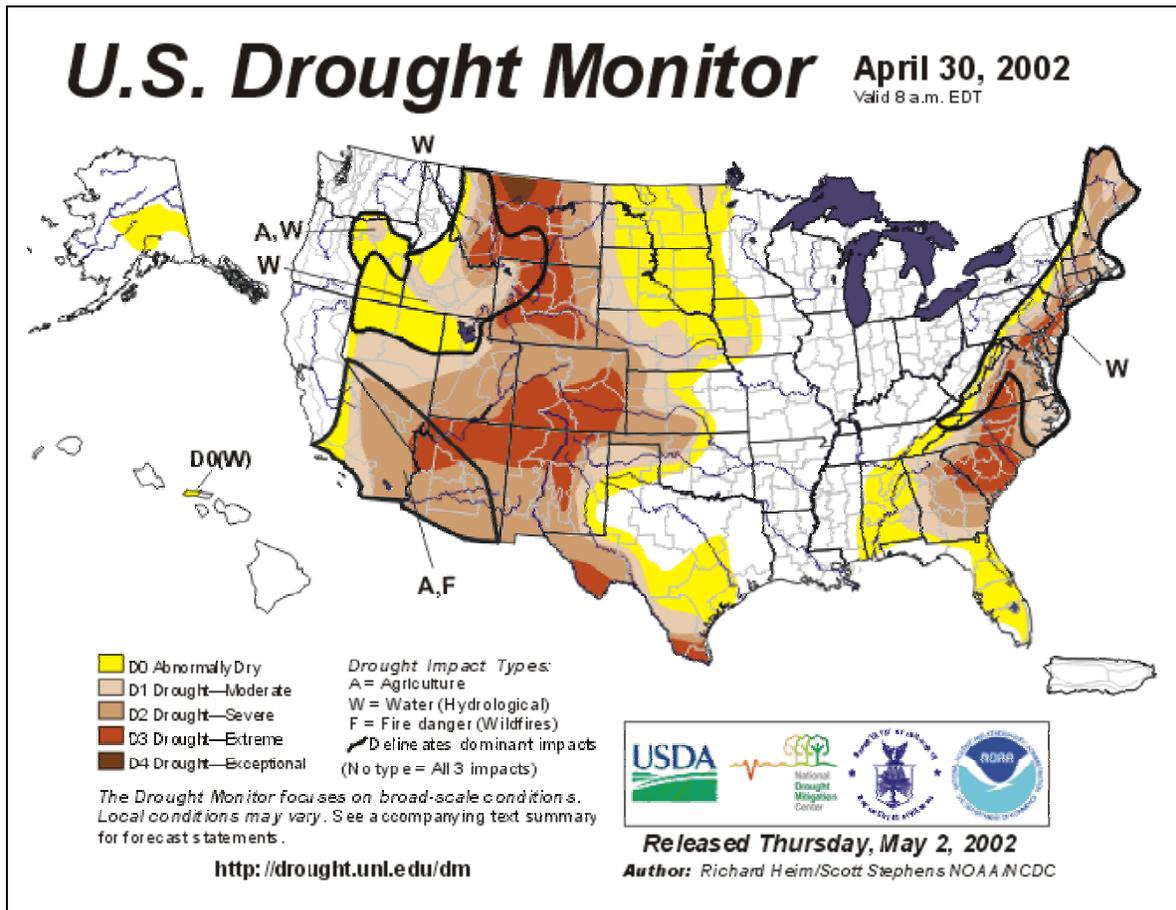
#### Location and Extent

All of WC, and therefore the Village, are susceptible to drought. However, areas at particular risk include areas where communities rely on private wells for potable water supply, and certain areas with elderly, impoverished, or otherwise vulnerable populations.

The severity of drought can depend on the duration, intensity, geographic extent, and the regional water supply demands made by human activities and vegetation. The intensity of the impact from drought could be minor to total damage in a localized area or regional damage affecting human health and the economy.

The National Drought Mitigation Center produces a daily drought monitor map that identifies drought areas and ranks droughts by intensity. Their drought classification scheme ranges from D0 to D4 with D4 being the most intense. D0, drought watch areas, are either areas drying out and possibly heading for drought or are areas recovering from drought but not yet back to normal and suffering long-term impacts such as low reservoir levels. The primary physical effects of the drought (agricultural, water supply, wildfire) are also described. Figure 5-36 illustrates an example of a U.S. Drought Monitor map. The U.S. Geological Survey (USGS) also provides information on NYS drought conditions and links to other web sites with drought information at: <http://ny.water.usgs.gov/projects/duration/>.

Figure 5-54. Drought Conditions Across the United States (April 2002)



Source: NDMC, University of Nebraska, 2005. <http://drought.unl.edu/dm/archive/2002/drmon0430.htm>

## Previous Occurrences and Losses

The NOAA's NCDC Storm Event database records drought events since 1950. According to NDCD no significant droughts were reported for WC from 1950 to 2005. Table 5-26 provides data on summarizes historic drought events and losses within WC from other sources. Based on past occurrences, the NYSDEC has been designated as the lead agency to implement monitoring, preparedness, and planning for future droughts. The NYSDEC posts current drought conditions on its website at: <http://www.dec.state.ny.us/website/dow/current.html>. In addition, it provides information on droughts, information on reservoir and stream levels, and has in place a drought management approach based on designated state drought management regions.

Table 5-38. Drought Events for Westchester (1950 to July 2006)

Events	Year	Recorded Damages (Property)	Comments
0	1950-1994	\$0M	No events documented.
1	November 2001-January 2002	NP	A drought event occurred between November 2001 and January 2002 throughout WC and surrounding New York counties. The combined storage in the NY City water supply reservoir system was 41% of capacity (normal for that time is 71%). Property or crop damage information is not provided for this event.
1	April 2002 – October 2002	NP	A drought event occurred between April and October 2002 throughout WC. Groundwater and water storage facilities were below normal. The NY City reservoir system reached a low of 64.5%, which was 34% below normal. Property or crop damage was not provided.
1	2005	NP	A drought/heat declaration was issued for WC for drought conditions from June 1 through October 15, 2005 (Declaration #10293). Estimated property damages or losses are not provided for this event. This drought event received two Secretarial Designations (S2203 and S2260). Secretarial designation S2203 was issued because of the combined effect of excessive precipitation, drought, excessive heat and high humidity. The reasoning for Secretarial designation S2260 is not provided.
1	2006	NP	A drought event occurred in 2006 and an area including WC was issued a Secretarial Designation S2204 (January). Secretarial designation S2204 was issued because of combined drought, high temperature, excessive rain, high wind, flooding and flash flooding conditions.
4	1950-2006	NP	<b>The historic record shows an increased frequency in drought events in recent years with damages unknown/to be determined.</b>

Source: U.S. Small Business Administration; NYSEMO Comprehensive Emergency Management Plan – New York State Multi-Hazard Mitigation Plan; DisasterHelp.gov. Notes: NP=not provided.

### Probability of Future Events

Earlier in this section, the identified hazards of concern for the Village were ranked. The NYS HMP includes a similar ranking process for hazards that affect the State. The probability of occurrence, or likelihood of the event, is one parameter used in this ranking process. Based on historical records and input from the Planning Committee, the probability of occurrence for drought events in the Village is considered occasional (likely to less often than once every 5 years, but more often than once every 30 years) (see Table 5-3). The overall ranking assigned to this hazard is low (see Table 5-7).

## VULNERABILITY ASSESSMENT

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the drought hazard, the entire Village has been identified as the hazard area. Assets at particular risk would include any open land that could become vulnerable to the wildfire hazard due to extended periods of low rain and high heat. In addition, water supply resources could be impacted by extended periods of low rain. Finally, vulnerable populations could be particularly susceptible to the drought hazard due to age, health conditions, and limited ability to mobilize to shelter, cooling and medical resources. The following text evaluates and estimates the potential impact of the drought hazard on the Village including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact, including: (1) impact on life, safety and health of Village residents, (2) general building stock, (3) critical facilities and infrastructure, and (4) economy
- Impact on new buildings, critical facilities and infrastructure
- Further data collections that will assist understanding of this hazard over time
- Overall vulnerability conclusion

### **Overview of Vulnerability**

The Village does not include agriculture or pastureland that is vulnerable to the drought hazard. Therefore, potential drought impacts are limited to hydrologic and socioeconomic. Hydrological drought impacts are associated with the effects of insufficient precipitation (rain and snow) on surface and subsurface water supplies (for example, reservoir and groundwater levels). Socioeconomic drought impacts are associated with the human health and business impacts that can occur when the demand for an economic good exceeds supply as a result of weather-related shortages in water supply or for example, tourism is impacted by conditions such as high heat that make an area less desirable for recreation (NYS, 2004).

### **Data and Methodology**

Data was collected from NOAA NCDC, the Village, the Small Business Administration (SBA) and Planning Committee sources. At the time of this draft HMP, insufficient data are available to model the long-term potential impacts of a drought on the Village. Over time additional data will be collected to allow better analysis for this hazard. Available information and a preliminary assessment is provided below.

### **Impact on Life, Health and Safety**

Droughts conditions can cause a shortage of water for human consumption and reduce local fire-fighting capability. The NYS Plan also lists mental and physical stress as social impacts of a drought (NYS, 2004). Persons that live in homes without air conditioning or sufficient cooling may require shelter in cases of extreme high temperatures; the infirm, young, and elderly and are particularly susceptible to temperature extremes. Further, business impacts can accrue (for example, decreased tourism). For the purposes of this HMP, the entire population in the Village is vulnerable to drought events.

### **Impact on General Building Stock**

No structures are anticipated to be affected by a drought event.

### **Impact on Critical Facilities and Infrastructure**

It is expected that critical facilities will continue to be operational during a drought event. Further, no infrastructure is anticipated to be damaged by a drought event.

### **Impact on the Economy**

A prolonged drought can have a serious economic impact on a community. Increased demand for water may result in shortages and a higher cost for these resources (FEMA, 2005; NYS, 2004). Industries that rely on water for business may be impacted the hardest (for example, landscaping businesses). Even

though most businesses will still be operational, they may be impacted aesthetically. These aesthetic impacts are most significant to the recreation and tourism industry. In addition, droughts in another area could impact the food supply/price of food for residents in the Village.

### **Impact on New Buildings, Critical Facilities and Infrastructure**

As identified in Section 4, “Village Profile – Future Development”, at this time the Village anticipates residential and limited business development within the Scarborough Road Corridor, which will require improvements to stormwater management systems and other infrastructure in the area. The exposure and vulnerability of this area to the drought hazard is considered similar other developed parts of the Village. Specifically, structures, critical facilities and infrastructure are not considered particularly vulnerable to drought.

### **Additional Data and Next Steps**

Recent historic data available indicate that droughts can impact WC. For the revised plan, any additional information regarding localized concerns and past impacts will be collected and analyzed. Mitigation efforts could include building on existing NYS, WC, and local efforts. The lead State Agency for drought preparedness is the NYSDEC.