



5.4.2 DROUGHT

This section provides a profile and vulnerability assessment of the drought hazard for Monroe County.

5.4.2.1 Hazard Profile

This section provides information regarding the description, extent, location, previous occurrences and losses, climate change projections, and the probability of future occurrences of the drought hazard.

Hazard Description

Drought is a period characterized by long durations of below-normal precipitation. Drought is a temporary irregularity and differs from aridity since the latter is restricted to low-rainfall regions and is a permanent feature of climate. Drought conditions occur in virtually all climatic zones, yet its characteristics vary significantly from one region to another, since it is relative to the normal precipitation in that region. Drought can affect agriculture, water supply, aquatic ecology, wildlife, and plant life.

There are four different ways that drought can be defined or grouped:

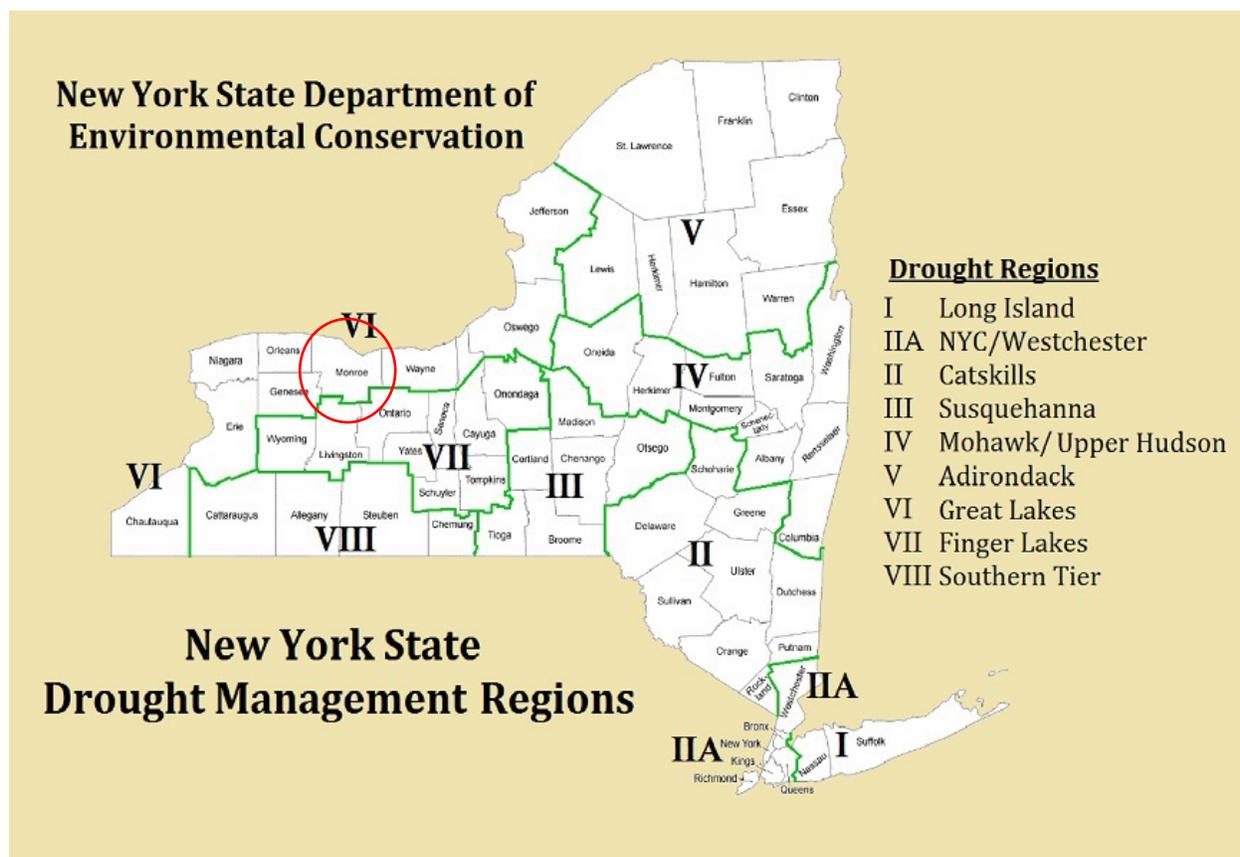
- **Meteorological** drought is a measure of the departure of precipitation from normal. It is defined solely by the relative degree of dryness. Due to climatic differences, what might be considered a drought in one location of the country may not be a drought in another location.
- **Agricultural** drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels, and other parameters. It occurs when there is not enough water available for a particular crop to grow at a particular time. Agricultural drought is defined in terms of soil moisture deficiencies relative to water demands of plant life, primarily crops.
- **Hydrological** drought is associated with the effects of periods of precipitation shortfalls (including snowfall) on surface or subsurface water supply. It occurs when these water supplies are below normal. It is related to the effects of precipitation shortfalls on stream flows and reservoir, lake, and groundwater levels.
- **Socioeconomic** drought is associated with the supply and demand of an economic good with elements of meteorological, hydrological, and agricultural drought. This differs from the aforementioned types of drought because its occurrence depends on the time and space processes of supply and demand to identify or classify droughts. The supply of many economic goods depends on the weather (for example water, forage, food grains, fish, and hydroelectric power). Socioeconomic drought occurs when the demand for an economic good exceeds the supply as a result of a weather-related shortfall in the water supply (NDMC 2013).

Location

New York State is divided into nine drought management regions based roughly on drainage basins and county lines. NYSDEC monitors precipitation, lake and reservoir levels, stream flow, and groundwater levels every month within each region, and more frequently during periods of drought. NYSDEC uses these data to assess the condition within each region, which can range from “normal” to “drought disaster” (NYSDEC 2022). Monroe County is identified as NYSDEC Drought Management Region 6, the Great Lakes Drought Region (Figure 5.4.2-1).



Figure 5.4.2-1. NYSDEC Drought Management Regions of New York State



Source: NYSDEC 2022

Note: The red circle indicates the approximate location of Monroe County.

When a drought occurs, the agricultural industry is most at risk in terms of economic impact and damage. According to the 2017 Census of Agriculture, Monroe County is home to 527 farms, covering 106,778 acres. Only 1 percent of that land is irrigated (USDA 2017). Some farms have access to Monroe County Water Authority for tank loads during emergencies. Many dairy operations on the west side of Monroe County are on well water, while many horse operations in the County are on public water service. In cases of emergency, tank loads can be dumped into wells or on-site water tanks can be delivered. A minority of crop farmers in Monroe County have irrigation and access to an emergency water source.

Extent

The severity of a drought depends on the degree of moisture deficiency, the duration, and the size and location of the affected area. The longer the duration of the drought and the larger the area impacted, the more severe the potential impacts (NOAA 2022). The NYSDEC and the New York State Drought Management Task Force identify droughts in the following four stages:

- **Normal** is considered the standard moisture soil levels found throughout New York State
- **Drought Watch** is the first stage of drought. This stage is declared by the NYSDEC and is intended to give advance notice of a developing drought. At this stage, the general public is urged to conserve water. Public water purveyors and industries are urged to update and begin to implement individual drought contingency plans.



- **Drought Warning** is the second stage of drought. This stage is also declared by the NYSDEC and is a notice of impending and imminent severe drought conditions. A warning declaration includes stepping up public awareness and increasing voluntary conservation. Public water supply purveyors and industries are urged to continue to implement local drought contingency plans. Federal, state, and local water resources agencies are notified to prepare for emergency response measures.
- **Drought Emergency** is the third stage of drought. This stage is declared by the NYS DHSES, based upon the recommendation of the Task Force. It is a notice of existing severe and persistent drought conditions. An emergency declaration is a notice for local water resources agencies to mandate conservation and implement other emergency response measures. A continuing and worsening drought emergency may result in the New York State governor declaring a drought disaster. It is a notice of the most severe and persistent drought conditions. At this stage, a significant proportion of communities in the impacted area likely are unable to respond adequately (NYSDEC n.d.).

New York State applies two methodologies to identify the different drought stages. The most commonly used indicator is the Palmer Drought Severity Index (PDSI), which is primarily based on soil conditions. Soil with decreased moisture content is the first indicator of an overall moisture deficit. The second methodology applied in New York State, created by the NYSDEC, is known as the State Drought Index (SDI) (NYSDEC n.d.).

Table 5.4.2-1 lists the Palmer Drought Severity Index (PDSI) classifications. According to the National Integrated Drought Information System (NIDIS), the PDSI was developed in 1965, and indicates prolonged and abnormal moisture deficiency or excess. It uses temperature and precipitation data to calculate water supply and demand, incorporates soil moisture, and is considered most effective for assessing moisture conditions in unirrigated cropland. The PDSI primarily indicates long-term drought and has been used extensively as a signal to initiate drought relief (NIDIS 2015).

Table 5.4.2-1. PDSI Classifications

Palmer Classifications	
4.0 or more	Extremely wet
3.0 to 3.99	Very wet
2.0 to 2.99	Moderately wet
1.0 to 1.99	Slightly wet
0.5 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.5 to -0.99	Incipient dry spell
-1.0 to -1.99	Mild drought
-2.0 to -2.99	Moderate drought
-3.0 to -3.99	Severe drought
-4.0 or less	Extreme drought

Source: NDMC 2013

The SDI evaluates drought conditions more comprehensively by determining whether numerous indicators reach dire thresholds. It compares the following four parameters to historical or “normal” values to evaluate drought conditions: stream flows, precipitation, lake and reservoir storage levels, and groundwater levels. The State’s Drought Management Task Force uses those factors along with water use, duration of the dry period, and season to assess drought within different areas of the State. The data acquired are compared to critical threshold values to indicate a normal or changeable drought condition. The indicators are weighted regionally to reflect the different circumstances within each drought management region (NYS DHSES 2014; NYSDEC 2022). Table 5.4.2-2 lists the SDI index range within the Normal stage and the three drought stages.

**Table 5.4.2-2. State Drought Index Range of Values**

Drought Stage	Drought Index Range
Normal	100 to 150
Watch	75 to 100
Warning	50 to 70
Emergency	0 to 50

Source: NYS DHSES 2014

Previous Occurrences and Losses

Many sources provide historical information regarding previous occurrences and losses associated with drought events throughout New York State and Monroe County. Information about loss and impact resulting from each of many events can vary depending on the source. Notably, monetary amounts cited in this section on drought derive solely from information obtained during the research for this HMP.

FEMA Major Disaster and Emergency Declarations

Between 1954 and 2022, FEMA declared that New York State underwent one drought-related disaster (DR) or emergency (EM) classified as a water shortage. Generally, drought-related disasters affect a wide region of the State and thus may have impacted many counties. However, Monroe County was not included in the disaster declaration.

USDA Declarations

The Secretary of Agriculture from the U.S. Department of Agriculture (USDA) is authorized to designate counties as disaster areas to make emergency loans to producers suffering losses in those counties and in counties that are contiguous to a designated county. Between 2015 and 2022, Monroe County was included in the following USDA-designated agricultural disasters that included or may have included losses due to drought:

- S4023 - 2016 Drought
- S4031 - 2016 Drought
- S4037 - 2016 Drought

The USDA crop loss data provide another indicator of the severity of previous events. Additionally, crop losses can have a significant impact on the economy by reducing produce sales and purchases. Such impacts may have long-term consequences, particularly if crop yields are low the following years as well. USDA records indicate that Monroe County has experienced crop losses from severe storm events in the years when USDA disasters were declared. Table 5.4.2-3 provides details regarding crop losses in Monroe County according to USDA records.

Table 5.4.2-3. USDA Crop Losses from Drought in Monroe County

Year	Crop Type	Cause of Loss	Losses
2016	Wheat	Drought	\$2,697.00
2016	Corn	Drought	\$1,183,280.10
2016	Sweet Corn	Drought	\$134,788.80
2016	Fresh Market Sweet Corn	Drought	\$49,309.00
2016	Processing Beans	Drought	\$84,969.50
2016	Dry Beans	Drought	\$73,666.00
2016	Apples	Drought	\$30,050.22



Year	Crop Type	Cause of Loss	Losses
2016	Green Peas	Drought	\$89,502.00
2016	Cabbage	Drought	\$80,389.00
2016	Soybeans	Drought	\$367,032.80

Source: USDA 2022

Previous Events

Table 5.4.2-4 identifies the known drought events that impacted Monroe County between 2015 and 2022. For events prior to 2015, refer to Appendix H (Supplementary Data). For detailed information on damages and impacts to each municipality, refer to Section 9 (Jurisdictional Annexes).

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Table 5.4.2-4. Drought Events in Monroe County between 2015 and 2022.

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts
January – July 2015	Drought	N/A	No	According to the U.S. Drought Monitor, D0 conditions in Monroe County lasted from January through July 2015.
December 2015 – February 2016	Drought	N/A	No	According to the U.S. Drought Monitor, D0 conditions lasted from December 2015 to February 2016.
May 2016 – March 2017	Drought	N/A	No	According to the U.S. Drought Monitor, conditions varied between D0 – D3 drought in Monroe County from summer 2016 to the spring of 2017. NOAA – NCEI described a weather pattern supporting dry conditions were prevalent across New York resulting in below-normal precipitation. In addition, below-normal snowpack from a mild winter left conditions drier than normal going into spring. These were the primary factors that led to the drought conditions. The USGS groundwater level network showed that numerous wells are in the driest 10th percentile.
June – September 2018	Drought	N/A	No	According to the U.S. Drought Monitor, conditions varied from D0-D1 drought conditions in Monroe County from June to September 2018.
September – October 2019	Drought	N/A	No	Monroe County briefly experienced D0 drought conditions from September to October 2019 according to the U.S. Drought Monitor.
July 2022	Drought Watch	N/A	No	Monroe County is one of 21 counties placed under drought watch by the New York State Department of Environmental Conservation.

Sources: NOAA-NCEI 2022; USDA 2022; U.S. Drought Monitor 2022; (Rochester First 2022); The Democrat and Chronicle Various Articles; NWS Buffalo 2007; The Times Union 2007.

FEMA Federal Emergency Management Agency

N/A Not applicable

NRCC Northeast Regional Climate Center

NWS National Weather Service

USDA U.S. Department of Agriculture



Climate Change Impacts

According to the 2019 New York State HMP update, rising summer temperatures, along with little change in summer rainfall, are projected to increase frequency of short-term droughts. This scenario will lead to impacts on the natural and managed ecosystems across New York State. Water management and hydrology are also affected (NYS DHSES 2019).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Monroe County is part of Region 1, Western New York, Great Lakes Plain. In Region 1, it is estimated that temperatures will increase by 3.0 °F to 5.5 °F by the 2050s and 4.5 °F to 8.5 °F by the 2080s (baseline of 48.0 °F, mid-range projection). Precipitation totals will increase between 0 and 10 percent by the 2050s and 0 to 15 percent by the 2080s (baseline of 37.0 inches, mid-range projection). Table 5.4.2-5 displays the projected seasonal precipitation change for the Region 1 (NYSERDA 2011).

Table 5.4.2-5. Projected Seasonal Precipitation Change in Region 1, 2050s (% change)

Winter	Spring	Summer	Fall
5 to +15	0 to +15	-10 to +10	-5 to +10

Source: NYSERDA 2011

With the increase in temperatures, heat waves will become more frequent and intense as shown in Table 5.4.2-6 below. Heat waves, defined as three or more consecutive days with maximum temperatures at or above 90 °F. Summer droughts are projected to increase under these conditions, affecting water supply, agriculture, ecosystems, and energy projects (NYSERDA 2014).

Table 5.4.2-6. Extreme Event Projections for Region 1

Middle Range (25th to 75th Percentile)	2020s	2050s	2080's
Days over 90 °F (8 days)	14 to 17	22 to 34	27 to 57
# of Heat Waves (0.7 heat waves)	2 to 2	3 to 4	3 to 8
Duration of Heat Waves (4 days)	4 to 4	4 to 5	5 to 6
Days below 32 °F (133 days)	103 to 111	84 to 96	68 to 88
Days over 1" Rainfall (5 days)	5 to 5	5 to 5	5 to 6
Days over 2" Rainfall (0.6 days)	0.6 to 0.7	0.6 to 0.8	0.6 to 0.9

Source: NYSERDA 2014

By the end of the 21st century, the number of droughts is likely to increase, as the effect of higher temperatures on evaporation is likely to outweigh the increase in precipitation. Droughts in the northeast U.S. have been associated with local and remote modes of multi-year ocean-atmosphere variability that are unpredictable and may change with climate change. Changes in distribution of precipitation throughout the year and in timing of snowmelt could increase frequency of droughts (NYSERDA 2011).

Probability of Future Occurrences

Based upon risk factors for and past occurrences, it is likely that droughts will occur across New York State and Monroe County in the future. In addition, as temperatures increase (see climate change impacts), the probability



for future droughts will likely increase as well. Therefore, it is likely that droughts will occur in the State and County of varied severity in the future.

It is estimated that Monroe County will continue to experience direct and indirect impacts of drought and its impacts on occasion, with the secondary effects causing potential disruption or damage to agricultural activities and creating shortages in water supply within communities.

In Section 5.3, the identified hazards of concern for Monroe County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Steering Committee, the probability of occurrence for drought in the County is considered 'occasional' (between 10 and 100 percent annual probability of a hazard event occurring, as presented in Table 5.3-2).

5.4.2.2 Vulnerability Assessment

Drought is a significant concern to Monroe County, mainly due to its impact on public health, natural resources, and agriculture. Estimated losses are difficult to quantify; however, drought events can impact Monroe County's population and economy. Assets at particular risk would include areas used for agricultural purposes (farms and cropland). In the past, drought in other counties and regions affected Monroe County, including the 2007 persistent shortage of rainfall along the Mohawk Valley and in Western New York. This dry period reduced the amount of water available to maintain sufficient navigational depth in some sections of the NYS Canal System, which was forced to close commercial traffic one week early that October, impacting local food supply and trade markets. That closure also impacted water-based recreational markets, affecting the local economy. Year-round recreation and tourism in Monroe County from snow skiing to boating and other activities rely on water.

In addition, water supply resources could be impacted by extended periods of below average rain. The County's public water supply is lake fed, but rural populations are served by private wells and are significantly affected by periods of diminished groundwater resources. Particularly susceptible to the drought hazard and cascading impacts are populations vulnerable because of age, health conditions, limited ability to mobilize to shelter, and limited accessibility to cooling and medical resources.

Potential drought impacts are agricultural, hydrologic, and socioeconomic. The sequence of these impacts highlights the differences among them. When a drought begins, the agricultural sector is typically the first to be affected due to its heavy dependence on stored soil water. During dry periods, soil water can deplete quickly. If precipitation deficiencies continue, people who depend on other sources of water will begin to feel impacts of the shortage. Those who rely on surface water (for example, reservoirs and lakes) and subsurface water (for example, groundwater) are usually the last to be affected. A short-term drought that persists for 3 to 6 months may have little impact on these sectors, depending on characteristics of the hydrologic system and intensity of water use (NYS DHSES 2014).

Because agriculture and related sectors, including forestry, fisheries, and water activities, rely on surface and subsurface water supplies, they are vulnerable to numerous economic impacts. Droughts often result in loss of crop yields and livestock production, increased issues with insect infestations, increased forest diseases, and reduced growth. Forest and grass fires also increase substantially during extended drought periods, posing higher levels of risk to human and wildlife populations, as well as to property (NYS DHSES 2014)

Loss of income is another factor in assessment of impacts of drought. Examples of income loss include reduced income for farmers, and for retailers and others who provide goods and services to farmers. The recreation and tourism industries may also undergo a loss of income because of increased costs of food, energy, and other products as supplies decrease. Some local shortages of certain goods trigger the need to import goods from



outside the affected region. Reduced water supply affects use of rivers and other water bodies. Hydropower production may also be impacted by drought (NYS DHSES 2014)

Environmental losses from drought include damages to plant and animal species, wildfire habitat, and air and water quality; forest and grass fires; degradation of landscape quality; loss of biodiversity; and soil erosion. Some impacts may be short-term, and others may linger for longer periods of time. If changes in climate intensify, environmental impacts and losses may become more significant. Wildfire habitat may be degraded through loss of wetlands, lakes, and vegetation. Increased soil erosion can lead to a more permanent loss of biological productivity of landscapes. However, quantifying environmental losses is difficult (NYS DHSES 2014).

Social impacts primarily involve public safety, health, conflicts among water users, reduced quality of life, and inequities in distribution of impacts and disaster relief. Many economic and environmental effects induce social impacts as well (NYS DHSES 2014).

To understand risk, a community must evaluate what assets are exposed or vulnerable within the identified hazard area. Regarding the drought hazard, all of Monroe County has been identified as the hazard area. Therefore, all assets within the County (population, structures, critical facilities, and lifelines), as described in the County Profile (Section 4), are vulnerable to a drought. The following factors are addressed in subsequent text that evaluates and estimates potential impacts of the drought hazard on the County:

- Impact on: (1) life, health, and safety of residents; (2) general building stock; (3) critical facilities; (4) economy; and (5) environment
- Cascading Impacts on Other Hazards
- Future changes that may impact vulnerability
- Change of vulnerability since the 2017 HMP

Impact on Life, Health, and Safety

The entire population of Monroe County is vulnerable to drought events. According to the 2020 U.S. Census, the county had a population of 753,109. Drought conditions can affect people’s health and safety, including health problems related to low water flows and poor water quality, and health problems related to dust. Droughts also can lead to loss of human life (NDMC 2013). Other possible impacts on health from drought include increased recreational risks; effects on air quality; diminished living conditions related to energy, air quality, and sanitation and hygiene; compromised food and nutrition; and increased incidence of illness and disease. Health implications of drought are numerous. Some drought-related health effects are short-term while others can be long-term (CDC 2012).

As previously stated, drought conditions can cause shortages of water for human consumption. Droughts can also lead to reduced local firefighting capabilities. The drought hazard is a concern for Monroe County because rural populations within the County rely upon private water supply from local groundwater resources.

Impact on General Building Stock

A drought event is not expected to directly affect any structures. However, droughts contribute to conditions conducive to wildfires and reduce fire-fighting capabilities. Risk to life and property is greatest within those areas where forested areas adjoin urbanized areas (high-density residential, commercial, and industrial) or wildland urban interface (WUI). Therefore, all assets within and adjacent to the WUI zone—including population, structures, critical facilities, lifelines, and businesses—are considered vulnerable to wildfire. Refer to Section 5.4.11 for more information on wildfire risk.



Impact on Critical Facilities

Water supply facilities may be affected by short supplies of water. As mentioned, drought events generally do not impact buildings; however, droughts can impact agriculture-related facilities and critical facilities associated with potable water supplies. Also, those critical facilities in and adjacent to the WUI zone are considered vulnerable to wildfire. Refer to Section 5.4.11 for more information on wildfire risk.

Impact on Economy

Drought causes many economic impacts on agriculture and related sectors (forestry, fisheries, and waterborne activities). In addition to losses in yields in crop and livestock production, drought is associated with increased insect infestations, plant diseases, and wind erosion. Drought can lead to other losses because so many sectors are affected—losses that include reduced income for farmers and reduced business for retailers and others who provide goods and services to farmers. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue. Prices for food, energy, and other products may also increase as supplies decrease (NYS DHSES 2014). As noted in the 2019 New York State HMP, economic impacts that could occur from drought include the following:

- Decreased land prices
- Loss to industries directly dependent on agricultural production (e.g., machinery and fertilizer manufacturers, food processors, dairies, etc.)
- Unemployment from drought-related declines in production
- Strain on financial institutions (foreclosures, more credit risk, capital shortfalls)
- Revenue losses to Federal, State, and Local governments (from reduced tax base)
- Reduction of economic development
- Fewer agricultural producers (due to bankruptcies, new occupations)
- Rural population loss.

When a drought occurs, the agricultural industry is most at risk for economic impact and damage. During droughts, crops do not mature, which results in smaller crop yield, undernourishment of wildlife and livestock, decreases in land values, and ultimately financial loss to the farmer (FEMA 1997).

Based on the 2017 Census of Agriculture, 527 farms were present in Monroe County, encompassing 106,778 acres of total farmland. The average farm size was 203 acres. Monroe County farms had a total market value of products sold of \$76.64 million, averaging \$145,433 per farm (USDA 2017). Table 5.4.2-7 lists the acreage of agricultural land exposed to the drought hazard.

Table 5.4.2-7. Agricultural Land in Monroe County in 2017

Number of Farms	Land in Farms (acres)	Total Cropland (acres)	Total Pastureland (acres)	Acres Irrigated
527	106,778	85,422	4,271	639

Source: USDA 2017

In 2017, the top three agricultural products sold in Monroe County were grains, oilseeds, dry beans, and dry peas at \$26 million; vegetables, melons, potatoes, and sweet potatoes at \$19.7 million; and nursery, greenhouse, floriculture, and sod at \$11.9 million. Monroe County was the eighth-highest-ranked County in the State for its sales of cut Christmas trees and short rotation woody crops, and sixth highest ranked for its total acreage of crop items for all harvested vegetables (USDA 2017).





If the average production (dollar value) per crop type could be identified on a per acre basis, loss estimates could be developed based on assumed percent damage that could result from a drought. If a drought impacted 40 percent of the agricultural products sold from Monroe County farms, based on 2017 market values, this would be a loss of \$30.6 million. This figure does not include how the tourism industry and local jobs are impacted.

Impact on the Environment

Drought can impact the environment because it can trigger wildfires, increase insect infestations, and exacerbate the spread of disease (NOAA 2000). Droughts will also impact water resources that are relied upon by aquatic and terrestrial species. Ecologically sensitive areas, such as wetlands, can be particularly vulnerable to drought periods because they are dependent on steady water levels and soil moisture availability to sustain growth. As a result, these types of habitats can be negatively impacted after long periods of dryness.

Cascading Impacts On Other Hazards

Drought may trigger wildfires in the County. As discussed in earlier sections, drought can lead to increasing temperatures and evaporation of moisture, which are ideal dry conditions for wildfire events to occur. Dry, hot, and windy weather combined with dry vegetation is more susceptible to sparking wildfires when met with a spark created by humans or natural events, such as lightning (National Integrated Drought Information System 2020). Refer to Section 5.4.11 for more information on wildfire risk.

Drought may also increase the spread of certain insect infestations. For more information on invasive species, refer to Section 5.4.7.

Future Changes That May Impact Vulnerability

Understanding future changes that impact vulnerability in the county can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. The county considered the following factors to examine potential conditions that may affect hazard vulnerability:

- Potential or projected development
- Projected changes in the population
- Other identified conditions as relevant and appropriate, including the impacts of climate change

Projected Development

Section 4 identifies areas targeted for future growth and development across the County. Any areas of growth located in the County could be susceptible to drought. Specific areas of recent and new development are indicated in tabular form and/or on the hazard maps included in Volume II, Section 9 (Jurisdictional Annexes) of this plan.

Projected Changes in the Population

According to the 2020 Census, the population of the County has increased by approximately 1.2 percent since 2010. The County’s population is anticipated to slightly increase over the next decade (0.7 percent increase by 2030). Changes in the density of the population can impact the number of persons exposed to drought and the draw upon water resources.

Climate Change

As discussed above, most studies project that the State of New York and Monroe County will see an increase in average annual temperatures. Additionally, the State is projected to experience more frequent droughts.



Droughts can cause deficits in surface and groundwater used for drinking water. The New York State Water Resources Institute at Cornell University conducted a vulnerability assessment of drinking water supplies and climate change. To assess water supplies in New York State, it was assumed that long-term average supply will remain the same, but the duration and/or frequency of dry periods may increase. Both types of water supplies, surface water and groundwater, were divided into three categories: sensitive to short droughts (two to three months), sensitive to moderate and longer droughts (greater than six months), and relatively sensitive to any droughts. Major reservoir systems are presumed to have moderate sensitivity to drought because there is a likelihood of decreases in summer and fall water availability (NYSERDA 2011). The greatest likelihood of future water shortages is likely to occur on small water systems.

Change of Vulnerability Since 2017 HMP

Monroe County continues to be vulnerable to the drought hazard. Updated population and building stock statistics were used in the current risk assessment. Further, exposure for both the population and critical facilities was analyzed. These updated datasets provide a more accurate exposure analysis to the drought hazard.