Climate Change and Agriculture

Highlights from the New York State Climate Impacts Assessment

Agriculture is a vital industry in New York State. It provides food and other products to communities, creates jobs, and contributes more than $5.3 billion to the state’s economy annually. At a national level, New York State is a top producer of milk and dairy products; fruits, such as apples, grapes, and cherries; maple syrup; and more. Agriculture takes place in—and benefits—all regions of the state, including urban areas.

Climate Change Impacts on New York State’s Agriculture

Agricultural activities are heavily exposed to and dependent on weather and climate. As a result, agriculture in New York faces many challenges as the climate changes. A wide range of climate hazards can influence the sector, including:

- More extreme heat and cold events.
- Changes in the amount and duration of precipitation, including heavy rainfall and drought.
- More frequent and intense storms.
- Sea level rise and saltwater intrusion into farmland and water sources.

Because farmers rely on the weather, more uncertainty and more extreme weather events pose planning challenges for farmers and create a variety of risks to agricultural operations.

- **Extreme rainfall** can damage crops, flood fields, increase diseases and weeds, and cause delays in planting and harvesting. More frequent flooding has forced farmers to rethink which crops to plant and where to plant them.
- **Short-term drought** reduces crop yields and causes water shortages. Higher summer temperatures increase the risk of short-term droughts.
- **Warmer temperatures and longer growing seasons** could increase yields for some crops and offer opportunities to grow new crops.
- **Heat stress** affects livestock, crops, farmers, and farmworkers. High soil and air temperatures can harm plant growth and reduce crop yields. Heat stress can threaten the health of dairy cows and other livestock. Extreme heat can cause illness or death among workers exposed to high temperatures.
- **Increased weeds, diseases, and insects** damage crops. Warmer temperatures can increase the populations and ranges of some insects and other pests. Warmer temperatures might also allow new invasive species to take hold and increase the range of herbicide-resistant weed species, creating management challenges for farmers. Crops may become more susceptible to diseases as the climate becomes warmer and more humid.

Flooding caused by extreme rainfall has damaged this tomato crop on a farm in Upstate New York.
Changes to the seasonal cycles of plant and animal life. For example, unseasonably warm temperatures in early spring can cause fruit trees to bloom early. When cold temperatures return, the buds can freeze, and the fruit crop can be destroyed.

Climate Change Multiplies Threats to Agriculture and Farmers in the State

Farmers already face many challenges, such as tight profit margins and labor shortages. Climate change adds to these challenges by causing more weather extremes, which can disrupt operations as well as stress and damage crops and livestock, leading to economic losses. Adapting farm operations to address weather extremes, such as by increasing drainage systems or installing irrigation, are costly additional expenses that can affect farm income.

A farm’s location is an important factor in the risks it faces. Farms near the coast and near floodplains face the risk of increased flooding events. Urban farms often face heat-related risks, and adaptation options may be limited. A small farm in a rural community may have fewer resources to cope with climate hazards.

Many farming communities in New York State face high rural poverty rates. Climate change and related extreme weather events place additional strain on roads and other infrastructure in already economically strained farming communities. In addition, rising farmland costs make it harder for new farmers to enter and stay in agriculture.

Adaptation and Resilience Strategies

Many farmers recognize that climate impacts are occurring and are implementing adaptation strategies. Fruit growers are installing wind machines and fabric orchard covers to help reduce frost damage. Vegetable farmers are using protective structures, such as hoop houses and high tunnels, to cope with extreme weather and pests. A 2015 survey of maple producers in the Adirondacks found that they are already adapting to climate change by installing new technologies and diversifying their customer base. Indigenous communities, such as the Shinnecock Nation, have used shellfish restoration to adapt to climate change threats like sea level rise while also improving local water quality, boosting the local economy, and improving community resilience. Dairy farmers trying to reduce heat stress to cows are looking to upgrade facilities with better ventilation and cooling mechanisms, including fans and sprinklers.

Farmers are innovative and resilient, using adaptation practices where they can. Their diverse skill sets, ingenuity, and generational knowledge help them adapt, so their businesses can remain profitable and sustainable.

Learn More

Explore the New York State Climate Impacts Assessment at https://nysclimateimpacts.org/.