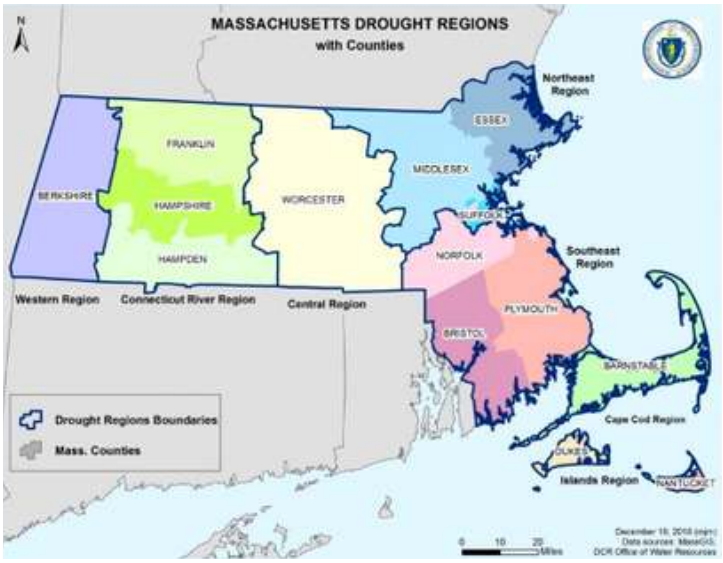
Massachusetts' Drought Assessment Process

DROUGHT DOES HAPPEN IN MASSACHUSETTS...

Since 1895, when weather-related record-keeping began, Massachusetts has experienced over 50 droughts, varying in intensity and duration. The most recent drought of 2024 is unusual because of its severity, its rapid development, and its occurrence outside of the normal drought season. Usually, drought conditions happen in Massachusetts between May and October. But in 2024, drought conditions began in September and continued through December. **Many places in the state saw their lowest rainfall totals ever for October.** Unfortunately, climate change means we will experience droughts more frequently and that drought may become less predictable.

DROUGHT REGIONS



WHAT DETERMINES DROUGHT?

Various agencies measure six indices across the state to determine the severity of drought in Massachusetts (see infographic on next page). Measurements for each are collected across the state over the course of a month (see table). These data are then compared to historic measurements. If the collected data are unusually low compared to past data, the decrease is quantified and assigned a drought severity level. If enough drought indices in a specific region correspond to a certain severity level, that level of drought is assigned to that region.

WHO DETERMINES DROUGHT AND HOW?

The administrative body that determines drought in Massachusetts, **the Drought Management Task Force, (DMTF)** ensures that drought conditions are recorded for public notification and water conservation.

The Task Force, an advisory body chaired by the Massachusetts Executive Office of Energy and Environmental Affairs and the Massachusetts Emergency Management Agency, meets monthly during the main drought season, and more frequently when there are significant drought conditions.

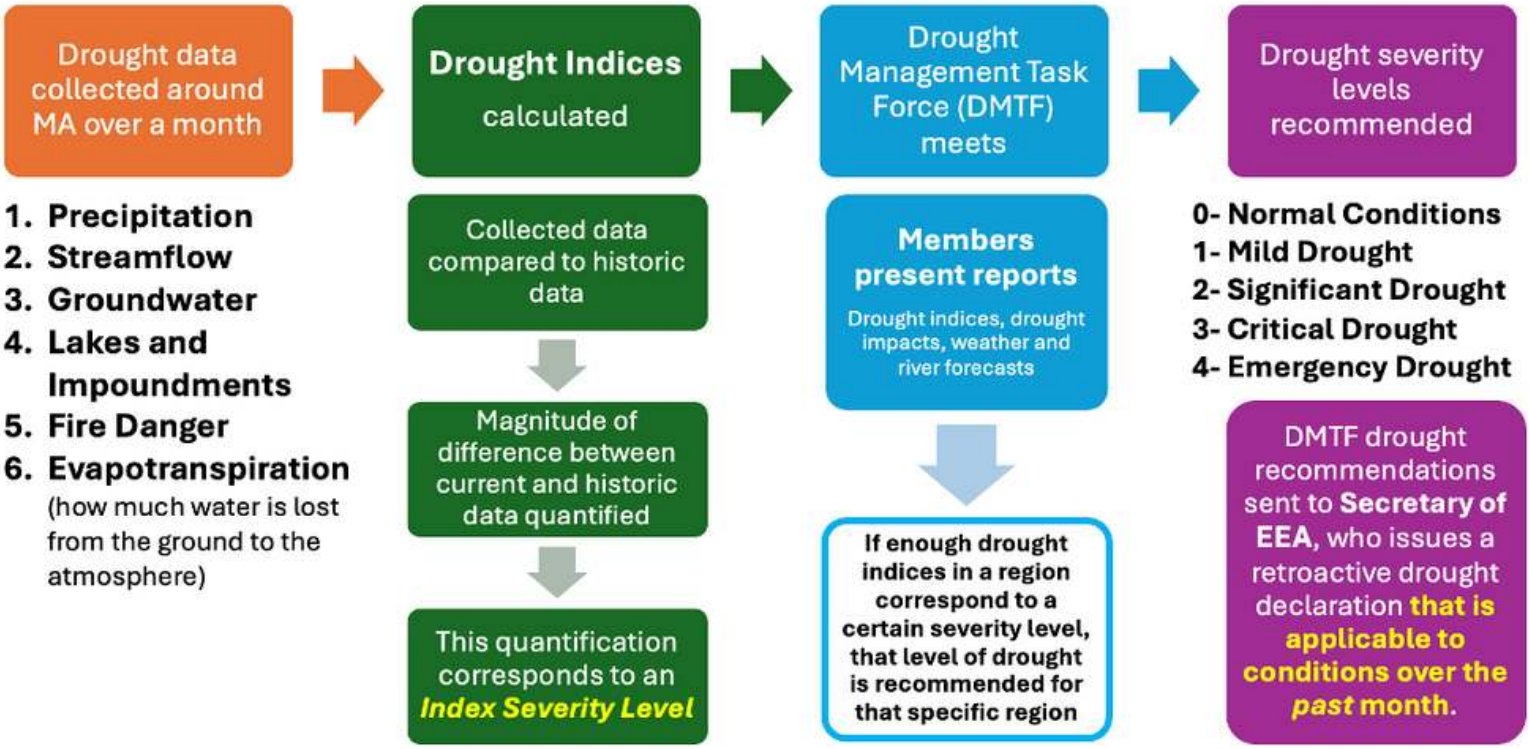
The DMTF's membership includes 16 state and federal officials, and four public members who report on drought conditions across the state at each meeting. In addition to the agencies that contribute data to the drought indices, reports from other task force members are taken into consideration for drought determinations. Such information may include weather forecasts from the National Weather Service, or drought impact reports from public organizations.

Based on data presented at their meetings, the Task Force determines if drought is occurring, where it is occurring, and the level of severity. There are five drought severity levels (see infographic on next page). As drought level severity increases, so do the EOEEA's suggested restrictions on nonessential outdoor water use and water conservation (see next page).

DATA USED TO DETERMINE DROUGHT INDICES

Drought Index	Data Source	Reporting Agency
Standarized Precipitation	precipitation monitoring stations	Department of Conservation and Recreation National Weather Service Community Collaborative Rain, Hail, and Snow Network
Evapotranspiration	Evaporative Demand Drought Index	National Oceanic and Atmospheric Administration
Streamflow	stream gages	United States Geological Service
Lakes and Impoundments	water elevation data	United States Geological Service Public/Private Water Suppliers Massachusetts Department of Environmental Protection
Groundwater	groundwater wells	United States Geological Service
Fire Danger	Keetch-Byram Drought Index	Massachusetts Bureau of Forest Fire Control and Forestry

HOW DROUGHT IS DETERMINED



Infographic by Lydia Olson

WATER RESTRICTIONS AND CONSERVATION ACTIONS BY DROUGHT SEVERITY LEVEL

State Drought Condition (by Region)	Nonessential Outdoor Water-Use Restrictions (NOWUR)	Water Conservation Actions
Level 1 (Mild Drought)	1 day per week watering, between 5 pm - 9 am (to minimize evaporative losses)	employ Level 1 NOWUR at state agencies, recommend Level 1 NOWUR to municipalities and other water users
Level 2 (Significant Drought)	Limit outdoor watering to hand-held hoses or watering cans, used only between 5 pm - 9 am	employ Level 2 NOWUR at state agencies, recommend Level 2 NOWUR to municipalities and other water users
Level 3 (Critical Drought)	Ban on all nonessential outdoor water use	employ Level 3 NOWUR at state agencies, recommend Level 3 NOWUR to municipalities and other water users, advise reduction of overall water use
Level 4 (Emergency Drought)	Ban on all nonessential outdoor water use	employ Level 4 NOWUR at state agencies, agencies and institutions reduce water use by 15% or more, implement mandatory Level 4 NOWUR for all water users, reduce essential water use to extent feasible

THE DMTF AND CLIMATE RESILIENCE

Massachusetts has experienced some level of drought in one or more regions eight out of the last ten years. As droughts become more frequent, the DMTF's work will become more important in the state's efforts to become climate resilient. The public, municipalities, water suppliers, and others cannot effectively prepare for, or mitigate, drought conditions without timely and science-based determinations resulting from the essential work of the DMTF.

This informational brief was prepared by Lydia Olson, Technical Specialist and Monica Driggers, Deputy Director for the Massachusetts Rivers Alliance. Any questions or comments can be directed to info@massriversalliance.org.

Graphic Design by Amanda Siow

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