

Appendix 3. Drought in Massachusetts in 2022

Drought conditions first became widespread in Massachusetts in May, when flows at 11 of 17 streamgages experienced below normal conditions, 3 streamgages experienced well below normal conditions, and only 3 streamgages had normal conditions (fig. 3A). Flows remained below normal in June when only 4 of 17 streamgages experienced normal conditions. In July and most noticeably August, streamflow conditions for most the State were below or well below normal. In August, four streamgages recorded 30-year mean monthly record flows, and only two streamgages recorded normal or above normal conditions. Mean monthly record low flows were recorded at three streamgages in southeastern Massachusetts during May; however, the most severely affected streamgages were in western Massachusetts (fig. 5A) where four streamgages recorded 30-year mean monthly record low flows in August (fig. 3A). Two streamgages, Old Swamp River near South Weymouth, Mass. (01105600) in eastern Massachusetts and Mill River at Northampton, Mass. (01171500) in western Massachusetts (fig. 5A), recorded 7-day average record low flows for their entire period of record on August 21 and 22, respectively. Additionally, the Parker River at Byfield, Mass. (01101000) streamgage in northeastern Massachusetts recorded a 7-day average zero-flow from August 22 to September 4 (zero flow ties the period of record low for the gage). At the end of August to the beginning of September, streamflows began increasing in a fluctuating pattern (long-term increasing trend with shorter periods of

increasing and decreasing flows), for example, at the Quaboag River at West Brimfield, Mass. (01176000) U.S. Geological Survey (USGS) streamgage (fig. 3.1).

Massachusetts has an extensive groundwater monitoring network, with a total of 62 wells evaluated. Statewide, in April, 54 of the 60 monitoring wells with measurements had groundwater levels within the normal or above normal range. From May to August, the number of wells with below normal monthly water levels steadily increased each month, with 46 of the 62 wells recording water levels below normal by August, including the MA–HLW 23 Haverhill, MA (424841071004101) USGS monitoring well (fig. 3.2). For 6 of the 62 wells, the monthly water level was a 25-year low in August (figs. 3B and 5B). Drought severity differed across the State during the summer months. In July, a total of 37 wells recorded water level measurements below normal, with 22 of these wells in eastern Massachusetts (Massachusetts-Rhode Island coastal watershed). In August, water levels in western Massachusetts (Lower Connecticut River watershed) declined substantially as an additional 6 wells recorded water levels below normal, whereas only one additional well in eastern Massachusetts indicated below normal conditions. Water levels in many wells recovered to at least normal conditions in September (39 of 62 wells). Many of the wells with groundwater levels that remained below normal in September were in northeastern Massachusetts and Cape Cod.

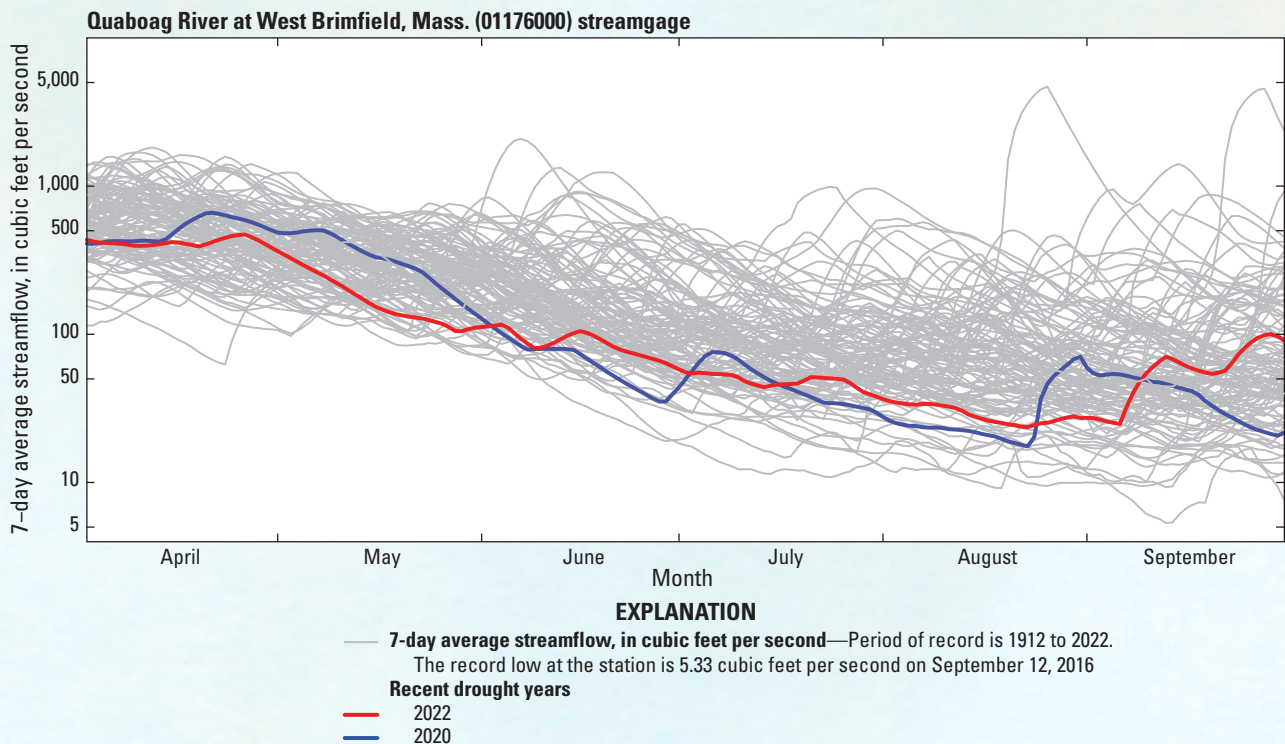


Figure 3.1. Graph showing the moving average 7-day flows at the Quaboag River at West Brimfield, Mass. (01176000) U.S. Geological Survey streamgage for April through September for the streamgage period of record.

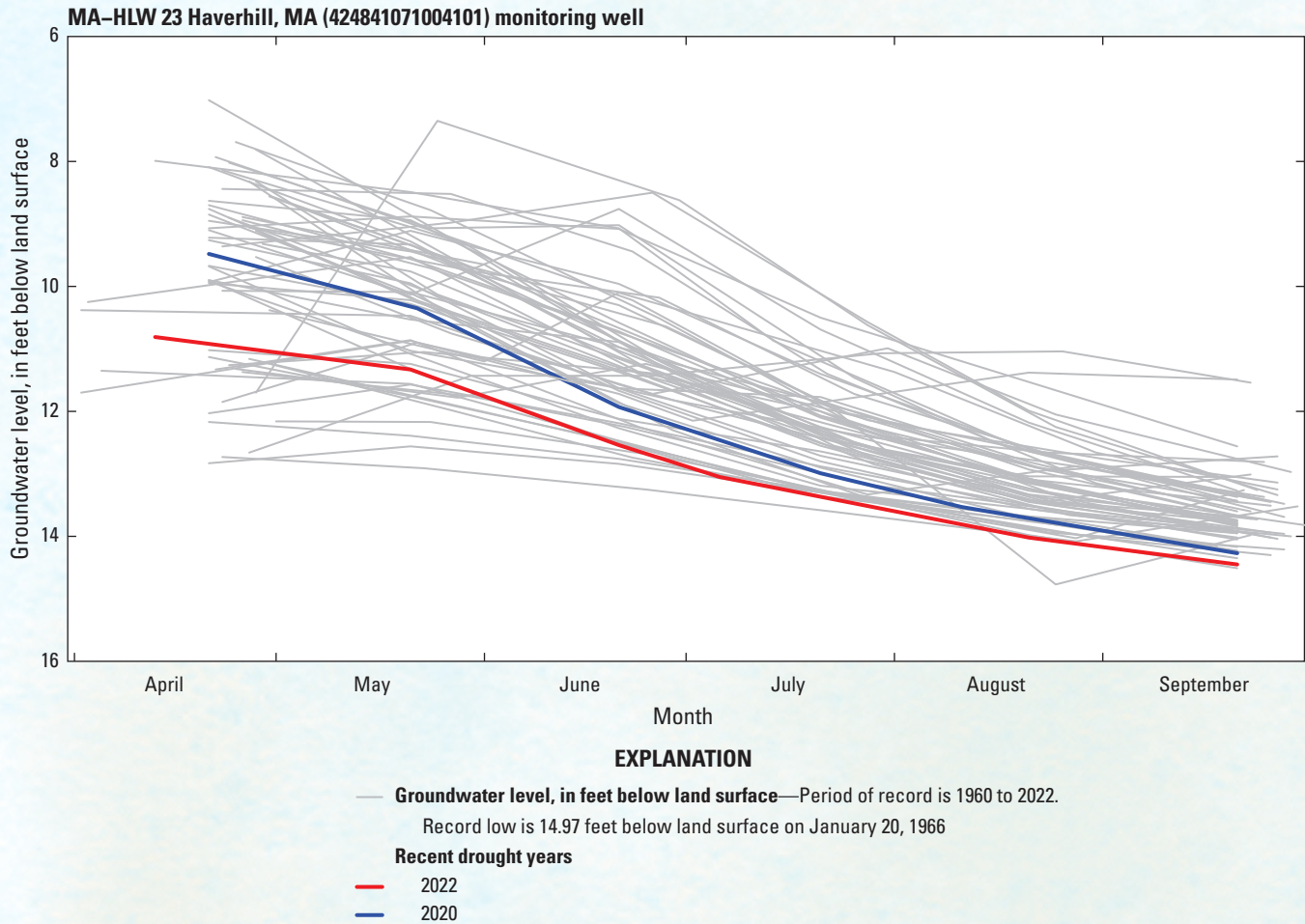


Figure 3.2. Graph showing monthly groundwater levels at the MA–HLW 23 Haverhill, MA (424841071004101) U.S. Geological Survey monitoring well for April through September for the well’s period of record.