

The Drought: Likely to Get Worse in 2022

Here is a slightly updated version of an analysis of the drought outlook for the summer and fall of 2022 that was presented to the IPUD Board of Directors on February 23, 2022.

1. A number of water systems in our region are currently relaxing or scaling back the restrictions on water usage that they have had adopted in order to cope with the drought of the past two years. Typically, these are systems that rely on storage reservoirs, and they saw their nearly-empty reservoirs come close to filling up during October, November, and December when unseasonably heavy rains occurred in Northern California. As a result, most such systems now have enough water in their reservoirs to get through 2022 even if the drought continues through this year.
2. Our situation in Inverness is quite different because we are a surface-water system that does not have any reservoirs. This means we are totally dependent each day on the water that is flowing that day in the streams that drain our small (approx. 600-acre) watershed on the eastern slope of the Inverness Ridge.

If the drought continues through the spring, summer, and fall of 2022, we will surely see dramatic decreases in the amount of water flowing in our source streams. And we won't have any reservoir-stored water to draw on when we reach the point where streamflows become inadequate to satisfy customer demand.

3. We already experienced this scenario in 2021. Based on historic data, our customer demand in the late summer and early fall averages 84,760 gallons per day. Last year, as we entered this typically high-demand, low-availability period, our streams were measuring only 57,600 gallons per day – and their flows were falling day by day. We survived because we already had a Water Shortage Emergency in effect, including a ban on use of irrigation systems. Our customers responded to the emergency with flying colors. That normal-year demand of 84,760 gallons per day dropped by an astonishing 55% to a daily average of just 38,257 gallons.
4. The unexpected rains started on October 17, and measurable rainfall was recorded on 47 of the next 83 days; by the end of the first week in January, total rainfall in Inverness since July 1 had reached 25.62 inches – normal for the period is 15.9 inches. One result of this high rainfall at the end of 2021 was that our streams were flowing at the end of December at a rate of **1.4 million gallons per day**.
5. We discovered anecdotally a number of years ago that when streamflows measure at least 1,000,000 gallons per day at any time on or after the end of February, the streamflows at the end of the following October will still be adequate to easily satisfy customer demand (average normal-year streamflow for October 31 is 209,000 gallons per day). Put another way, we have never had a water shortage problem when our streams hit the 1,000,000-gpd mark on or after the end of February.
6. We wondered if hitting 1 million gpd on December 31 could also be relied on to get us through to the following October. When we ran this data, we discovered—counterintuitively—that in two-thirds of the years when streamflows approached or exceeded 1 million gpd on December 31, the following October's streamflows were BELOW normal. This tends to validate our long-held suspicion that **rain that falls during July-December is largely irrelevant to the streamflows by the following fall**. Moreover, in all but one case in which there was at least 1 million gpd on December 31 but the streamflow was below normal the following October 31, rainfall during January to June was significantly below average.
7. This leads us to conclude that **the adequacy of the streamflows in the late summer and early fall is highly dependent on the amount of rain that falls during the preceding January-June**. This conclusion seems to be validated by the data. Average rainfall between January 1 and June 30 is 23.17 inches. When we looked at every year with below normal rainfall during the period of January through June, there was a 91% chance that the streamflows the following October 31 would also be below normal, regardless of the amount of rain that fell before January 1.

8. Rainfall this past January (2022) totaled only 0.87 inches, virtually all of which fell during the first seven days of the month. So far in February, we've recorded only 0.09 inches (on Feb. 21). The available long-range forecasts indicate a low likelihood that there will be any noteworthy amount of rain during the coming weeks (well into March). **To reach normal rainfall for the entire period of January through June this year, we would have to receive an additional 22.20 inches.** That would be almost exactly 2.5 times the normal rainfall for that stretch, which is 8.87 inches.
9. It was reported in the press several days ago that a team of scientists has determined that the past two decades constitute the driest 22 years in the American West in at least 12 centuries. They labeled our current dry spell as a "megadrought," and they concluded that it is not only continuing, but is being intensified by climate change and human-caused global warming. The study's lead author, a climate scientist at UCLA, warned that "there is quite a bit of room for drought conditions to get worse," and he predicted that the drought will go on for the rest of this year and may continue for years to come.

CONCLUSION

On the basis of this discussion, the IPUD staff finds no encouragement to support scaling back the current Stage 1 and Stage 2 restrictions on water usage. Unfortunately, our own historical data and the scientific information that is available suggest strongly that **the region is very possibly heading into an even worse drought situation this coming summer and fall than we experienced last year**, notwithstanding the rain totals from this past October-December. There is always a chance of a "Spring Miracle," but staff does not feel it would be prudent to change course at this stage based on the slim possibility that such a "miracle" might occur.

Accordingly, at its meeting on February 23, the IPUD's Board of Directors concurred with its staff's recommendation to defer any action at this time on making changes to the current usage restrictions. The Board will revisit the issue at its next meeting, on March 23.