Meteorologic Analysis of the August 2023 Maui Wildfires

National Aeronautics and Space Administration

NASA/GMAO GEOS-FP Analysis
Near-surface wind (shaded, mph) and MSLP (contour, hPa)

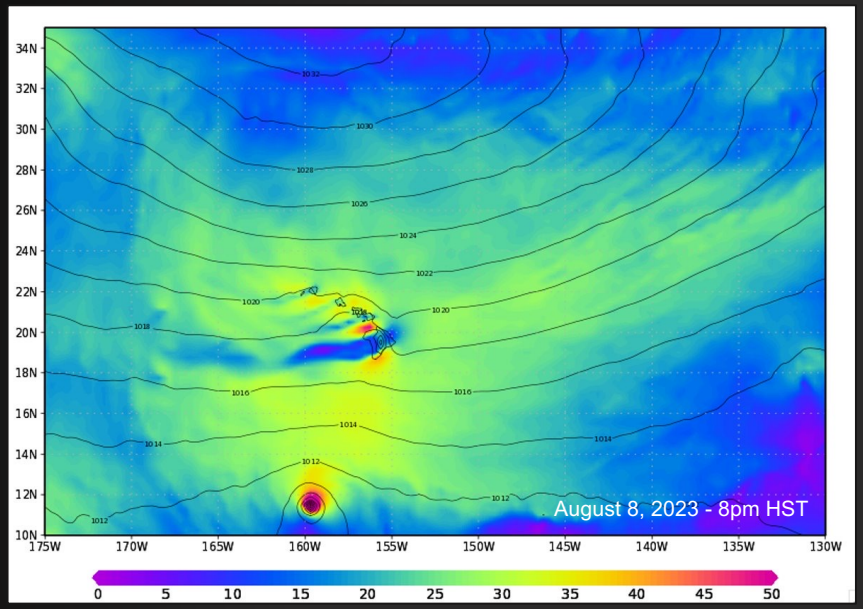

Figure 1a

NASA/GMAO MERRA-2
Near-surface wind (shaded, mph) and MSLP (contour, hPa)

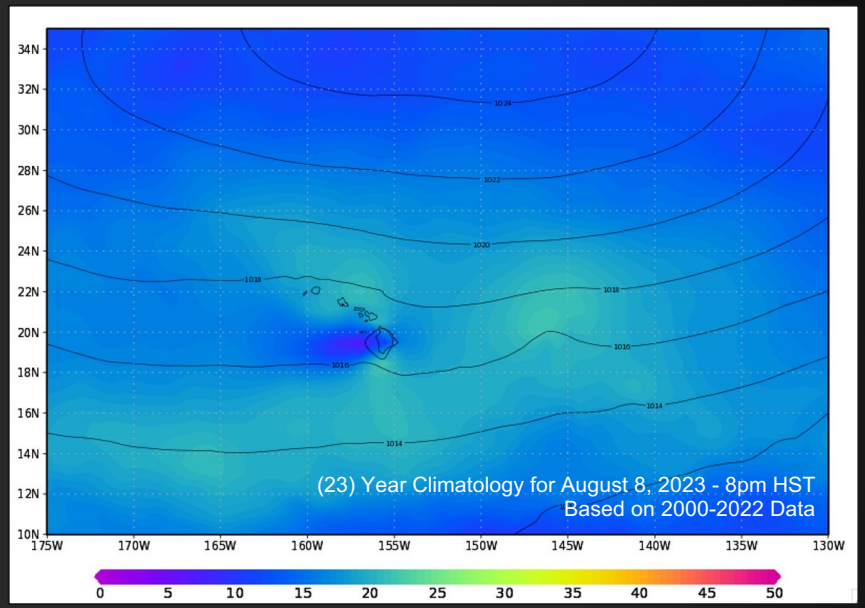

Figure 1b

The tragic August 2023 Maui wildfires occurred due to an anomalous and slightly altered high-pressure system. Moderate (D1) to severe (D2) drought conditions had dried vegetation, while an anomalously strong - 1034 hPa - high-pressure system was centered NNW of Hawaii, depicted in Figure 1a using GEOS-FP from NASA's GMAO. Differences in both the location and strength (~10 hPa) from the normal high-pressure this time of year, depicted in Figure 1b using NASA GMAO's MERRA-2 data, created strong easterly winds. The local topography of west Maui further strengthened winds, with the elevation and ridges of Pu'u Kukui Mountain adding a katabatic component and wind-funneling effect, respectively. Resulting downslope winds in excess of 65 mph spread a reignited fire east of the coastal town of Lahaina directly to the west. Notably, although Category 4 Hurricane Dora was located south of Hawaii, the distance of the storm (~600 miles) was too great for Dora to have any meaningful impact on the winds which spread the fires.