

Alex Mitchell and Tyler Leicht

11 April - Bandar Abbas, Iran and Karachi, Pakistan

Big Picture

Like many of the forecasts written before, high-latitude blocking is an important impact on the overall forecast. An anticyclonically curved subtropical jet across the Sahara will help to build a short wavelength ridge across the western Arabian peninsula, as well as further downstream development of a trough in the Persian Gulf and the Arabian Sea by day 3. This deepening trough will set up the risk for major flooding across Iran, Pakistan, and Afghanistan through days 5 and 6. This risk is due to already wet conditions from previous rains, plus positive anomalies in sea surface temperature in the Arabian Sea, the strength of the subtropical jet, and precipitable water values. By days 5 and 6, the subtropical jet stream moves north of the Tibetan Plateau, eliminating the fetch off of the Arabian Sea supplying most of the moisture for the heavy rains. However, the transition from a high-latitude block to an omega block over continental Europe results in the eastern trough centered over Turkey, Egypt, and the eastern Mediterranean broadly. This upstream blocking transition, as usual, comes about from significant wave breaking over. Unlike the previous trough over the Arabian Sea, this trough will not be able to tap into as much of a moisture source. The greatest risk for flooding will come later in the forecast period as this upper-level trough remains quasi-stationary over the eastern Mediterranean basin, with the greatest chance in upslope regions far eastern Turkey, northern Iraq, and northwestern Iran.

Day 7-10

With the developing omega block over Europe looking stable going through the extended forecast period, much of the precipitation and interesting weather will be happening across the western portion of the Middle East. Favorable onshore flow will start on days 9 and 10 much more than on days 7 and 8. This will act to bring heavier upslope precipitation into interior regions of Turkey, northern Iraq, and northwest Iran. Because of the higher elevation in this region, much of this precipitation will fall as snow, greatly reducing the flooding risk associated with this precipitation. In a reversal from earlier in the forecast period, temperatures will be cooler than average for the western 2/3rds of the oferecast domain and warmer than average over eastern Iran, Afghanistan, and Pakistan.

Day 4-6

An anomalous -4 sigma shortwave centered over southeast Iran will become vertically stacked with a previously developed surface cyclone throughout day 4. Dense, low theta-e air will channel into the Persian Gulf by the effects of a surface anticyclone centered over the eastern Mediterranean from day 1. This air mass will act to force low-

level lifting as it moves into the Arabian sea and along the coast of Iran, acting as a gust front ahead of the air mass as it is advected into a relatively much warmer region. Tropospheric instability associated with cooling aloft and weak to moderate vertical wind shear from 0-6 km may aid in the development of multicells along the leading front of low theta-e air and obtain enough organization to persist within weakly sheared environments along the coast. Upon the passing of the surface cyclone by day 6, anomalously cool temperatures are expected throughout both eastern Iran and western Pakistan. Orographically enhanced precipitation will localize much of the heavy precipitation along the Central Mahran Range and terrain along eastern Iran as the surface cyclone moves through the region.

Day 0-3

The irrotational wind associated with low-level diabatic heating over both central Africa and the Persian Gulf promotes negative PV advection throughout days 0-1, aiding to induce an anticyclonic curvature to the North Africa jet. A surface cyclone begins developing over the Persian Gulf by the end of the period ahead of the shortwave trough moving over Saudi Arabia as a consequence to equatorward, tropospheric cold air advection. The mid-levels depict an enhanced area of integrated water vapor due to a large pressure gradient force extending over the northern Arabian Sea associated with the forming surface cyclone and a downstream, climatological high pressure centered over the Arabian Sea. Highly anomalous precipitable water at +3 sigma, sufficient synoptic forcing for lift in the lower troposphere and ascent throughout the layer ahead of the shortwave will favor the heaviest precipitation in southeast Iran.

Probabilistic Forecasts for the period

Bandar Abbas, Iran

Day 0-3

High Temperature	10th: 76°F	50th: 79°F	90th: 82°F
Low Temperature	10th: 68°F	50th: 70°F	90th: 72°F
Precipitation	10th: 1.30"	50th: 1.80"	90th: 2.30"

Day 4-6

High Temperature	10th: 75°F	50th: 77°F	90th: 79°F
Low Temperature	10th: 66°F	50th: 68°F	90th: 70°F
Precipitation	10th: 0.00"	50th: 0.15"	90th: 0.30"

Day 7-10

High Temperature	10th: 78°F	50th: 82°F	90th: 86°F
Low Temperature	10th: 69°F	50th: 72°F	90th: 75°F
Precipitation	10th: 0.00"	50th: 0.00"	90th: 0.00"

Karachi, Pakistan

Day 0-3

High Temperature	10th: 93°F	50th: 95°F	90th: 98°F
Low Temperature	10th: 79°F	50th: 81°F	90th: 83°F
Precipitation	10th: 0.00"	50th: 0.00"	90th: 0.05"

Day 4-6

High Temperature	10th: 85°F	50th: 86°F	90th: 88°F
Low Temperature	10th: 76°F	50th: 77°F	90th: 79°F
Precipitation	10th: 0.20"	50th: 0.30"	90th: 0.50"

Day 7-10

High Temperature	10th: 91°F	50th: 92°F	90th: 93°F
Low Temperature	10th: 78°F	50th: 79°F	90th: 80°F
Precipitation	10th: 0.00"	50th: 0.00"	90th: 0.05"