# Area Forecast Discussion: Beirut and Baghdad Date: Tuesday 14 February 2019 Forecasters: Chelsea Snide and Brennan Stutsrim

### **Big Picture Perspective**

The Middle East is soon to undergo a change in weather regime as the polar jet stream is predicted to displace northward by the GFS, causing the sensible weather in Beirut and Baghdad to be largely determined by the zonal subtropical jet stream in northern Africa, once the current cut off low moves out of the Mediterranean. Onshore flow from the Mediterranean will keep Beirut in a marine air mass for most of the forecast period, bringing temperate surface temperatures and intermittent precipitation from the moist adiabatic temperature profile allowing statistical equilibrium convection. A small incursion of moist air from the Red Sea during the beginning of the forecast will likely be the only break from dry weather in Baghdad. Some uncertainty regarding the surface pressure in the middle east arises in the later periods, making the temperature forecasting somewhat difficult.

### Extended Range: Day 7-10

Ridging continues to build into the beginning of the period creating weak high height anomalies (0.5 to 1 sigma) across the Middle East leading to the potential of higher than climatological temperatures. A positively tilted trough begins to dig into the region and will eventually cut-off over the Eastern Mediterranean. The period is expected to remain relatively dry with no major forcing for precipitation, there is some confidence due to agreement between the GFS and ECMWF. Weak advection of Mediterranean moisture may lead to localized precipitation as this air is forced up the Lebanon Mountain Range. In terms of temperatures there is large uncertainty with the GFS suggesting ridging and the ECMWF suggesting troughing northward of the Middle East.

### Medium Range: Day 4-6

The omega block over Central Europe has been the dominant feature causing cool and wet weather over the Eastern Mediterranean due to a stagnant low pressure system. Going into the forecast period this omega block breaks down as the cut-off lows spin down due to a weak baroclinic environment, anticyclonic vorticity advection and q-vector divergence forcing descent. With the omega block dissipating coastal precipitation begins to diminish. By the middle of the period a ridge begins building into the Mediterranean while a trough continues to dig into the Middle East due to strong cold air

advection and positive f advection. This feature will cause colder than climatological values throughout the period but stay relatively dry because of a high pressure system.

### Short Range: Day 0-3

The very high amplitude trough stalled over eastern Europe was cut-off due to anticyclonic wave breaking, leaving a large but not particularly strong cyclone over the eastern Mediterranean. The increasingly zonal winds in the the Mediterranean combined with the cold air aloft will bring steep lapse rates and high precipitable water values to the Middle East, while cyclonic vorticity advection from the cyclone and Q-vector convergence could potentially provide forcing for deep convection up to the shallow tropopause. Beirut will remain cloudy throughout the period with near climatological temperatures and will likely experience some thunderstorms associated with afternoon statistical equilibrium convection. Baghdad will remain dry at the beginning and end of the forecast period due to the Mediterranean moisture largely being rained out over the higher elevation to the west, but has the potential for rain mid way through the period as a positive V-wind anomaly is forecasted to bring high precipitable water values from the Red Sea into the area.

### **Probabilistic Forecast**

## Beirut, Lebanon:

Day 0-3: Max Temp: 13°C (10th), 14°C (50th), 15°C (90th) Min Temp: 12°C (10th), 13°C (50th), 14°C (90th) Precip: 5 mm (10th), 10 mm (50th), 13 mm (90th)

Day 4-6: Max Temp: 13°C (10th), 15°C (50th), 16°C (90th) Min Temp: 10°C (10th), 11°C (50th), 12°C (90th) Precip: 2 mm (10th), 3 mm (50th), 5 mm (90th)

Day 7-10: Max Temp: 15°C (10th), 16°C (50th), 18°C (90th) Min Temp: 11°C (10th), 12°C (50th), 13°C (90th) Precip: 0 mm (10th), 1 mm (50th), 2 mm (90th)

## Baghdad, Iraq:

Day 0-3:

Max Temp: 16°C (10th), 17°C (50th), 18°C (90th) Min Temp: 6°C (10th), 7°C (50th), 8°C (90th) Precip: 0 mm (10th), 1 mm (50th), 2 mm (90th)

Day 4-6:

Max Temp: 17°C (10th), 18°C (50th), 19°C (90th) Min Temp: 5°C (10th), 6°C (50th), 7°C (90th) Precip: 0 mm (10th), 1 mm (50th), 2 mm (90th)

Day 7-10:

Max Temp: 18°C (10th), 19°C (50th), 21°C (90th) Min Temp: 8°C (10th), 9°C (50th), 11°C (90th) Precip: 0 mm (10th), 1 mm (50th), 2 mm (90th)