Weather forecast around Veracruz

**Sunday:** Mostly cloudy to partly cloudy, with low chance of scattered light rain during the morning and later in the evening. Winds E-NE 20-30 km/h. Maximum temperatures of 26-28°C.

**Monday:** Partly cloudy, low chance of rain, Winds E-NE 25-35 km/h. Max temperatures 27-29°C.

**Long Range** (Monday+): Partly cloudy, low chance of rain, Winds E-NE 25-35 km/h. Increasing maximum temperatures.

Weather forecast around Mexico City

**Sunday:** Mostly cloudy with chance of afternoon convection and rains/showers. Maximum temperatures between 23-25°C. Winds WNW~10-20 km/h.

**Monday-Tuesday:** Mostly cloudy with lower chance of afternoon showers. Maximum temperatures 24-26°C. Winds W-SW ~10-20 km/h.
So What Happened with the Plume Forecast?  
(in case you missed the drama this morning)

Yesterday’s 700 mb Forecast  
for 12 UTC today

Today’s 700 mb Forecast  
for 12 UTC today

Shift in predicted high pressure system caused a shift in the ambient flow  
and thus the transport of the Mexico City pollutant plume
Southerly near-surface winds transport nighttime emissions to the north instead of through the SE gap as in yesterday’s plume forecast.

The plume forecast really did chance locally!
Yesterday WRF forecast at 12 UTC

T0

700 mb

Down-valley flow around sunrise underestimated

Today WRF forecast at 12 UTC

T0

Much better agreement with radar wind profiler data
Forecast position of high pressure system causes predicted northerly flow to shift to more southerly flow, changing influence of new emissions in comparison to our previous forecast. Older emissions will continue to be SE of domain.
Current and Forecasted Regional Meteorological Conditions
WRF Precipitation Forecast for Today 16 UTC 26 March

Over-estimating intensity of showers along the coast
Integrated cloud water
Blue Yellow Purple Gray (high->low)

Precipitation
WRF 27 March Monday, 21 UTC (3 LT)

700 mb winds

500 mb winds

Integrated cloud water
Blue Yellow Purple Gray (high->low)

Precipitation
WRF 28 March, 21 UTC (3 pm LT)

700 mb winds

500 mb winds

Integrated cloud water
Blue Yellow Purple Gray (high->low)
WRF 29 March, 21 UTC (3 pm LT)

700 mb winds

500 mb winds

MC region thunderstorms?

Integrated cloud water
Blue, Yellow, Purple, Gray (high->low)
WRF forecast for Mexico City region PBL heights

Sun 26 March 2006
3 pm, 21h fcst
~ 900 m 10 am (local time)
~ 2300 m 12 noon
~ 3100 m 3 pm

Mon 27 March 2006
3 pm, 45h fcst
~ 1300 m 10 am (local time)
~ 2200 m 12 noon
~ 3000 m 3 pm
Local-Regional Plume Forecast Side-by-Side Model Comparisons
Sunday March 26, 21 UTC (15 LT)

STEM - 1 km AGL

MM5-Flexpart drifting SE in late afternoon

T2

T1

WRF - C1 Tracer 0-4 km
Monday March 27, 21 UTC (15 LT)

STEM - 1 km AGL

MM5-Flexpart

WRF - C1 Tracer 0-4 km

NE transport aloft late in afternoon

More stagnant

Some northward transport

Sunday emissions
Tuesday March 28, 21 UTC (15 LT)

STEM - 1 km AGL

MM5-Flexpart

E-NE transport aloft late in afternoon

More stagnant
Wednesday March 29, 21 UTC (15 LT)

E-NE transport aloft late in afternoon
Movie
Regional-Scale Plume Forecast Side-by-Side Model Comparisons
Sunday March 26, 18 UTC (12 pm LT)

STEM 3 km CO

WRF - C5 Tracer 0-4 km

MOZART and GMAO not available
Monday March 27, 18 UTC (12 pm LT)

STEM 3 km CO

WRF - C5 Tracer 0-4 km

FLEXPART column tracer (21Z)
Tuesday March 28, 18 UTC (12 pm LT)

STEM 3 km MC CO

WRF - C5 Tracer 0-4 km

FLEXPART column tracer (21Z)
Wednesday March 29, 18 UTC (12 pm LT)

STEM 3 km MC CO

WRF - C5 Tracer 0-4 km

FLEXPART column tracer (21Z)
Sample Cross Sections of Tracer and Chemistry
21 h WRF forecast C5 tracer, 3 pm Sun CST 26 Mar
0-4 km MSL average

- Sunday emissions
- Shallow plume to the NE of MC
- Fri & Sat emissions
- Fri & Sat plume
- 18Kft
- 12Kft

NW SE
45 h WRF forecast C5 tracer, 3 pm Monday CST 27 Mar 0-4 km MSL average

- Shallow plume NE from Sun emissions
- High-level plume to E/SE from late Sun/Mon emissions
- Plume to SE from late Sun/Mon emissions
- Plume from Fri & Sat emissions

Sunday emissions
Late Sun & Mon emissions
Fri & Sat emissions

12Kft
18Kft
69 h WRF forecast C5 tracer, 3 pm Tues CST 28 Mar 4-6 km MSL average

93 h WRF forecast C5 tracer, 3 pm Wed CST 29 Mar 4-6 km MSL average
60 deg     WRF-Chem Today SUN 03/26 15:00 LST
Sunday.
Upper level flow continues to E, while early LL flow to N, then to E.

Monday
Westerly flow early morning, with shift to southerly flow in the later part of the day. Afternoon convergence to N. Earlier, pollution to E.

Tuesday
Early morning flow to N, shifting to NE during day. Older pollution to W.
**Wed March 29 18 Z Carbon Monoxide**

New emissions will have NE with some outflow to SW, and offshore older aged emissions.
Lagrangian sites will be hit stronger then predicted.
Summary

Veracruz Operations Center

- **Sunday (March 26):** Reduced chance of clouds and showers over central Mexico - but isolated pockets still possible over the mountains. Models have transport NE out of the valley and then the plume will drift to the E late in the afternoon.

- **Monday-Wednesday:** Partly cloudy - small chance for afternoon convection. Similar to Sunday, with somewhat more stagnant conditions over the city before early afternoon and ventilation of the pollutants to the E-NE late in the afternoon.

- **Older emissions:** Older material at low levels will be caught in the high pressure circulation and transported clockwise, with highest concentrations SE of Mexico City. Strong upper-level winds at 500 mb will still transport material aloft quickly to the east.

- **Note - lesson learned from this morning:** Local forecasts can change from day to day because of the weak 700-mb flow.