DISCOVER-AQ Outlook for Tuesday, July 19, 2011

Poor flying conditions (clouds) are forecasted for Tuesday. Wednesday through the weekend is forecasted to be hazy, very hot, and very humid with intermittent clouds, so the cloud forecast should be monitored closely. This heatwave builds as the massive upper-level ridge plaguing the Plains moves east and the Bermuda High pumps very moist air into the Mid-Atlantic. Air quality is expected to be poor most of the work week.
Recommendations for July 19th-22nd

July 19th, Tuesday: No Fly - Clouds
July 20th, Wednesday: Can Fly – Watch Cloud Forecast
July 21st, Thursday: Can Fly – Watch Cloud Forecast
July 22nd, Friday: Can Fly

God-awful heatwave beginning on Wednesday and ramping up on Thursday into weekend. Extended period of high heat and high humidity.

Heat Indices for DC area 105-110°F Thursday
Current Conditions at BWI, 11 am

Baltimore-Washington International Airport
Lat: 39.19  Lon: -76.67  Elev: 148
Last Update on Jul 18, 11:54 am EDT

- Humidity: 45%
- Wind Speed: Calm
- Barometer: 30.03" (1016.8 mb)
- Dewpoint: 67°F (19°C)
- Heat Index: 94°F (34°C)
- Visibility: 10.00 mi.

Meteogram for KBWI from 1100Z 17 JUL 11 to 1100Z 18

Mostly Cloudy

91°F (33°C)
SYNOPSIS... HIGH PRESSURE WILL REMAIN OFF THE MID ATLANTIC COAST TODAY. A COLD FRONT WILL DROP SOUTH INTO THE AREA LATE TONIGHT AND TUESDAY. HIGH PRESSURE IS THEN EXPECTED FOR THE REST OF THE WEEK INTO THE WEEKEND.
Monday

Weak Frontal Passage

Clouds, POP

Tuesday

Juicy

Wednesday
Hazy, Very Hot, Very Humid

Wednesday → Juicy

Thursday → Juicier
Hazy, Very Hot, Very Humid

Friday → Still Juicy

Saturday → Juicy

Clouds?
- Clouds and precip Tuesday morning and early afternoon

- Low clouds late morning on Wednesday, no precip

- Very deep BL Height on Wednesday
Today: High pressure remains nearly stationary over the next 24 hours. Flow around it will continue to increase moisture across our area.

Activity from an MCS currently over Michigan and the passage of the cold front will contribute to thunderstorms this evening.
Tomorrow: Ongoing thunderstorm activity as cold front passes through our region. Probably of precipitation and cloud cover decrease throughout the day.
Wednesday: Front dissipates south of our area. Bermuda High begins to pump hottest air yet this year into the Mid-Atlantic.
Thursday: Bermuda High continues to pump hot moist air into our region.
Tuesday 8 am: GFS forecasts high level cloud cover (50-80%). NAM showing high level (18K+ ft). GEOS-5 predicts precip. GEM model shows thin cloud cover.
Tuesday 2 pm: GFS forecasts high level cloud cover (10-60%). NAM showing low level (< 6K – 12K ft). GEOS-5 predicts precip. GEM model showing increased cloud cover.
Tuesday 8 pm: GFS forecasts high level cloud cover (0-30%). NAM showing low and high level (< 6K and 18K+ ft).
Wednesday 8 am: NAM showing cloud cover between 6K and 12K ft
Wednesday 2 pm: All models clear

GEOS - 5

66-hr forecast valid Wed 18z 2011–07–20
Wednesday 8 pm: NAM forecasting clouds from <6K – 12K ft and above 18K ft.
Thursday 8 am: GFS shows high cloud cover (10-30%). NAM forecasting clouds above 18K ft.
Thursday 8 pm: All models clear. NAM showing high level clouds to our west.
Friday 8 am: All models clear. GFS shows high level clouds over northern MD and southern PA.
Friday 8 pm: GFS shows high level clouds over our region (10-30%).
GFS extended forecast: Precip forecast for Saturday and Sunday
MDE Surface Sites

Padonia  Beltsville  Edgewood  Aldino  Essex  Fairhill

Ozone (ppbv) 1 hr

PM2.5 (ug/m³) 1 hr
### Today's AQI Forecast

**Monday, July 18, 2011**

#### Air Quality Forecast

<table>
<thead>
<tr>
<th>Today's High</th>
<th>Tomorrow's High</th>
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<tbody>
<tr>
<td><strong>Air Quality Index (AQI)</strong></td>
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</tr>
<tr>
<td><img src="111" alt="111" /></td>
<td><img src="100" alt="100" /></td>
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<tr>
<td><strong>Unhealthy for Sensitive Groups</strong></td>
<td><strong>Moderate</strong></td>
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**Health Message:** Active children and adults, and people with lung disease, such as asthma, should reduce prolonged or heavy exertion outdoors.

#### AQI - Pollutant Details

<table>
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<tr>
<th>Pollutants</th>
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<th>Tomorrow's AQI</th>
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<tr>
<td>Ozone</td>
<td><img src="111" alt="111" /></td>
<td><img src="100" alt="100" /></td>
</tr>
<tr>
<td>Particles (PM2.5)</td>
<td><img src="52" alt="52" /></td>
<td><img src="55" alt="55" /></td>
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</table>

**Health Message:** Unusually sensitive people should consider reducing prolonged or heavy exertion outdoors.

#### Source:
Maryland Department of the Environment
Monday: Max 1 hr ozone (ppbv)

Tuesday: Max 1 hr ozone (ppbv)

Bay breeze should get going Wednesday – Friday, which is conducive for poor air quality.
NAQFC-MOS valid for Tuesday

Edgewood

- ID: 240251001
- VALID: 2011-07-19
- Mean: 73.05
- Mode: 73.5
- 95% CI: 56.2 - 89.64

Beltsville

- ID: 240330030
- VALID: 2011-07-19
- Mean: 75.18
- Mode: 71.75
- 95% CI: 61.48 - 90.22
Forecast Discussion: A rapid change in air-mass is anticipated on Monday as the high pressure system off the Mid-Atlantic coast extends inland and creating a pronounced trough line along the I-95 corridor. This feature will enhance southwesterly flow and will transport a very warm and moist air-mass into the region for tomorrow. This coupled with most clear skies during the afternoon will be very conducive for high ozone production with Unhealthy for Sensitive Groups (USG) conditions along the Baltimore-Washington corridor and Moderate elsewhere. Particle pollution is also anticipated to quickly rise into the Moderate range on Monday. An approaching cold front is forecasted to arrive and bring possible showers and thunderstorms starting late afternoon/evening and may persist through Tuesday morning. At this time, cloud covers may be sufficient to inhibit ozone levels from reaching very high levels although the forecast is still uncertain. At this time, Moderate ozone is anticipated in most areas on Tuesday. Particle pollution will continue to be Moderate in all areas. On Wednesday, the frontal boundary is expected to move to the south and the Bermuda High will try to take control of the weather again. This could lead to another polluted day; however, the forecast is still very uncertain at this time. - MDE
Smoke from Ontario fires may brush area on Tuesday & Wednesday. Keep an eye out!
PM finally on the rise beginning tomorrow.
Essex
MAIN ISSUES TO ADDRESS TODAY ARE CLOUDS...AND ANY CONVECTIVE SYSTEMS TO THE NORTH THAT MIGHT AFFECT THE CWA DURING THE OVERNIGHT PERIOD. HIGH PRESSURE WILL DOMINATE THE WEATHER TODAY...THEN A WEAK BOUNDARY...POSSIBLY THE REMNANTS FROM EARLIER CONVECTIVE MESO SYSTEMS...WILL SLOWLY DROP SOUTH TONIGHT AND BRING HIGHER CHANCES FOR PRECIP FOR THE AREA...WITH THE HIGHEST CHANCES ALONG THE NORTHERN TIER OF COUNTIES AND DECREASING SOUTHWARD. 12Z MORNING SOUNDING AT IAD MODIFIED FOR AFTERNOON CONDITIONS SHOWED A CAPE OF APPRX 900 J/KG.

REGARDING CLOUDS TODAY...LATEST SATL TRENDS SHOW HIGH CIRRUS CLOUDS THINNING AS THE THEY PROGRESS SOUTHEST INTO THE CWA. MORNING SOUNDINGS WERE PRETTY DRY...BUT MOIST ENOUGH TO GIVE MOST OF THE CWA SOME AFTERNOON CUMULUS CLOUDS. BLENDED THE 13Z IR CLOUDS WITH PREVIOUS CLOUD FORECAST TO UPDATE GRIDS.

REGARDING CONVECTION TODAY...THINK TODAY WILL BE DRY THROUGHOUT THE CWA...SAVE THE FAR WESTERN MOUNTAINS...WHERE MODELS SUGGEST THE HIGHEST POTENTIAL TO REACH CONVECTIVE TEMPERATURES AND FIRE CONVECTION.
FOR TONIGHT...FORECAST CONTINGENT ON HOW CONVECTION FIRES TO THENORTH WHERE THE BETTER DYNAMICS ARE. CONFIDENCE IS LOW IN WHATEXACTLY WILL ENTER FROM THE NORTH AS CONVECTIVE-ALLOWING MODELGUIDANCE IS ALL OVER THE PLACE WITH WHERE CONVECTION IS. BUT THEMODEL GUIDANCE IS CERTAIN THAT A BAND OF HIGHER PRECIP WATER WILLADVECT INTO THE REGION FROM THE NORTH TONIGHT...WITH PW VALUES INCREASING TO NEARLY 1.75 INCHES. THIS MOISTURE INCREASE WILL HELP DESTABILE THE ATMOSPHERE TONIGHT. BEST SHEAR DYNAMICS STAY TO THENORTH ASSOCIATED WITH THE UPPER LEVEL JET STREAK. SPC HAS THENORTHERN THIRD OF THE CWA FOR TONIGHT...ASSOCIATED WITH SOUTHWARDMOVING BOWING LINE SEGMENTS THAT MIGHT CROSS THE MASON DIXON LINE. NOTE...BRET IS FORECAST TO MOVE AWAY FROM THE EASTERN SEABOARD AND WILL NOT BE FACTOR IN MID ATLANTIC WEATHER. CONSULT LATEST NHC FORECASTS ON BRET.
SHORT TERM / TUESDAY THROUGH 6 AM TUESDAY/...TUESDAY...ONGOING SCATTERED THUNDERSTORM ACTIVITY IS EXPECTED AS THE WEAK COLD SAGS SOUTH THROUGH THE CENTRAL MID ATLANTIC. LEFT POPS AS HIGH CHANCE /40S AND 50S/ GIVEN THE MESOSCALE NATURE OF REMNANT ACTIVITY FROM MONDAY NIGHT AND DIURNAL REDEVELOPMENT. SHOULD THEREMNANT PRECIP BE A SHIELD IN THE MORNING...THE POPS WOULD OBVIOUSLY HAVE TO BE RAISED. REDUCED TEMPERATURES FROM BALTIMORE AND SOUTHERN GIVEN EXPECTED CLOUD COVER...MAX TEMPS GENERALLY LOW 90S. TUESDAY NIGHT...TROUGH STRUGGLES TO CLEAR THE SRN CWA UNTIL MIDNIGHT TIMEFRAME. THEREFORE...CHANCES POPS WERE EXTENDED THROUGH THE EVENING...BEFORE TAPERING OFF THROUGH MIDNIGHT. LOWERED MIN TEMPS WITH EXPECTED CLEARING...MIN TEMPS UPR 60S INLAND TO LOW 70S I-95 AND EAST /HIGH IN URBAN AREAS AND RIGHT ALONG THE WARM WATER/. SHOULD NLY/ELY FLOW BE STRONGER IN BUILDING HIGH PRESSURE...LOWER TEMPS CAN BE EXPECTED. WEDNESDAY...TROUGH DISSIPATES SOUTH OF THE LWX CWA. PULLED MOST POPS EAST OF THE BLUE RIDGE GIVEN LACK OF NOTABLE FORCING MECHANISM BESIDES TERRAIN CIRCULATION...WHICH IS WHY LOW CHANCE POPS FORTHUNDERSTORMS WERE MAINTAINED WEST OF THE BLUE RIDGE. 20C 850MB TEMPS BUILD IN FROM WEST THROUGH THE DAY PER 00Z GFS/ECMWF...THEREFORE WENT MAX TEMPS IN THE MID 90S WEST OF THE BLUE RIDGE /AND INVOF KCHO/...LOW 90S EAST.
LONG TERM /WEDNESDAY NIGHT THROUGH SUNDAY/... ZONAL UPR FLOW TO OUR NORTH /OVER THE GREAT LAKES AND NEW ENGLAND/ SETS UP AS A BERMUDA HIGH PUMPS THE HOTTEST AIR YET THIS YEAR INTO THE MID ATLANTIC. 850MB TEMPS ARE A GOOD MEASURE OF TEMPERATURES IN BERMUDA HIGH REGIMES. AROUND 22C TEMPS ON THURSDAY SUGGEST UPR 90S TO AROUND 100F EAST OF THE BLUE RIDGE. THEN UP TO 24C TEMPS ON FRIDAY SUGGEST LOW 100S EAST OF THE BLUE RIDGE...AROUND 100F IN THE VALLEYS WEST. THE 00Z GFS FEATURES A SFC TROUGH DIPPING INTO THE REGION /SIMILAR TO THE ONE APPROACHING TONIGHT/ AND THE 12Z ECMWF SOMEWHAT AGREED. HOWEVER...NOW THE 00Z ECMWF KEEPS ANY TROUGH WELL NORTH...WITH 22/23C 850MB TEMPS OVER THE CENTRAL MID ATLANTIC...SUGGESTING A REPEAT OF FRIDAY. MAX TEMPS WERE DROPPED A DEGREE OR TWO...WILL HAVE TO MONITOR FOR ANY BREAKS TO THE HEAT...AND NOT BE OVERLY OPTIMISTIC...THIS IS GENUINELY HOT AIR COMING. WITH DEWPOINTS SOMEWHERE AROUND 70F...EXCESSIVE HEAT WATCHES MAY BE NEEDED BY MIDWEEK.