Sonoma Technology meteorologists provide same-day, next-day, and two-day Air Quality Index (AQI) forecasts for ozone and particulate matter (PM$_{2.5}$) in eight Louisiana cities. The graphs and charts shown below and on pages 2 through 8 summarize next-day AQI forecasts and observed AQI levels for 2021. Select high AQI days are discussed on pages 10 and 11.

Counts of observations and forecasts in each category are on pages 12 and 13, and forecast accuracy statistics are shown on page 14.

During the year, there were 3 days with Unhealthy for Sensitive Groups (USG) AQI levels and 2 days with Unhealthy AQI levels. These high ozone days were likely the result of enhanced ozone precursors from smoke.
Baton Rouge Ozone

Baton Rouge PM$_{2.5}$

Air Quality Index

- Sonoma Technology’s next-day forecast

No bars are shown for monitors or dates for which data were not available.
Lake Charles Ozone

Highest Ozone AQI Days For Lake Charles
- 156 Ozone, July 28 Carlyss
- 90 Ozone, August 6 Vinton
- 87 Ozone, October 8 Carlyss
- 80 Ozone, May 7, September 26 Vinton

Lake Charles PM$_{2.5}$

Highest PM$_{2.5}$ AQI Days For Lake Charles
- 94 PM$_{2.5}$, September 5 Westlake
- 86 PM$_{2.5}$, July 11 Westlake
- 76 PM$_{2.5}$, February 25 Westlake
- 74 PM$_{2.5}$, February 23 Westlake

No bars are shown for monitors or dates for which data were not available.

<table>
<thead>
<tr>
<th>0</th>
<th>50</th>
<th>100</th>
<th>150</th>
<th>200</th>
<th>300</th>
<th>500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>Moderate</td>
<td>Unhealthy For Sensitive Groups</td>
<td>Unhealthy</td>
<td>Very Unhealthy</td>
<td>Hazardous</td>
<td></td>
</tr>
</tbody>
</table>

Louisiana Department of Environmental Quality
602 N Fifth Street
Baton Rouge LA 70802
(866) 896-LDEQ
www.deq.louisiana.gov
Highest Ozone AQI Days For Monroe

<table>
<thead>
<tr>
<th>Month</th>
<th>Ozone</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>87</td>
<td>June 15</td>
</tr>
<tr>
<td>June</td>
<td>74</td>
<td>June 17</td>
</tr>
<tr>
<td>June</td>
<td>64</td>
<td>June 16, July 30</td>
</tr>
<tr>
<td>May</td>
<td>58</td>
<td>May 8</td>
</tr>
</tbody>
</table>

Observational PM$_{2.5}$ data are not measured for Monroe and Alexandria, and observational ozone data are not measured for Alexandria.

**Monroe Ozone**

**Monroe PM$_{2.5}$**

**Alexandria Ozone**

**Alexandria PM$_{2.5}$**

Air Quality Index

- Good
- Moderate
- Unhealthy For Sensitive Groups
- Unhealthy
- Very Unhealthy
- Hazardous

Louisiana Department of Environmental Quality
602 N Fifth Street
Baton Rouge LA 708082
(866) 896-LDEQ
www.deq.louisiana.gov
New Orleans Ozone

Highest Ozone AQI Days For New Orleans

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>AQI</th>
</tr>
</thead>
<tbody>
<tr>
<td>June 14</td>
<td>Garyville</td>
<td>108</td>
</tr>
<tr>
<td>August 6, 7</td>
<td>Kenner</td>
<td>105</td>
</tr>
<tr>
<td>July 27</td>
<td>Kenner</td>
<td>100</td>
</tr>
<tr>
<td>July 30</td>
<td>Garyville</td>
<td>80</td>
</tr>
</tbody>
</table>

New Orleans PM$_{2.5}$

Highest PM$_{2.5}$ AQI Days For New Orleans

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>AQI</th>
</tr>
</thead>
<tbody>
<tr>
<td>September 6</td>
<td>Chalmette Vista</td>
<td>77</td>
</tr>
<tr>
<td>September 8</td>
<td>Chalmette Vista</td>
<td>73</td>
</tr>
<tr>
<td>August 6</td>
<td>Chalmette Vista</td>
<td>70</td>
</tr>
<tr>
<td>March 8, August 5</td>
<td>Chalmette Vista, Kenner</td>
<td>67</td>
</tr>
</tbody>
</table>

No bars are shown for monitors or dates for which data were not available.
Shreveport Ozone

- Highest Ozone AQI Days For Shreveport:
  - 93 Ozone: June 17 Dixie
  - 77 Ozone: August 6, 24 Dixie & Shreveport Airport
  - 71 Ozone: June 15, September 25 Dixie & Shreveport Airport
  - 67 Ozone: September 26, October 8 Dixie

Shreveport PM2.5

- Highest PM2.5 AQI Days For Shreveport:
  - 87 PM2.5: August 4 Shreveport Airport
  - 86 PM2.5: July 30 Shreveport Airport
  - 81 PM2.5: September 27 Shreveport Airport
  - 79 PM2.5: July 25 Shreveport Airport

No bars are shown for monitors or dates for which data were not available.
Thibodaux Ozone

Air Quality Index

Highest Ozone AQI Days For Thibodaux

- **84** Ozone, May 7
- **71** Ozone, September 26
- **67** Ozone, May 8, August 6
- **64** Ozone, June 17

Thibodaux PM$_{2.5}$

Air Quality Index

Highest PM$_{2.5}$ AQI Days For Thibodaux

- **73** PM$_{2.5}$, June 16
- **69** PM$_{2.5}$, August 6, 7
- **67** PM$_{2.5}$, August 5
- **65** PM$_{2.5}$, July 26, October 31

No bars are shown for monitors or dates for which data were not available.
## Meteorological Summary, 2021

<table>
<thead>
<tr>
<th>2021</th>
<th>Alexandria</th>
<th>Baton Rouge</th>
<th>Lafayette</th>
<th>Lake Charles</th>
<th>Monroe</th>
<th>New Orleans</th>
<th>Shreveport</th>
<th>Thibodaux</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average temperature (°F)</td>
<td>68.1</td>
<td>68.6</td>
<td>69.7</td>
<td>70.0</td>
<td>66.8</td>
<td>71.7</td>
<td>67.9</td>
<td>69.6</td>
</tr>
<tr>
<td>Average Max temperature (°F)</td>
<td>78.3</td>
<td>78.5</td>
<td>78.8</td>
<td>79.0</td>
<td>77.4</td>
<td>79.4</td>
<td>78.6</td>
<td>78.7</td>
</tr>
<tr>
<td>Average Min temperature (°F)</td>
<td>57.9</td>
<td>58.7</td>
<td>60.7</td>
<td>60.9</td>
<td>56.3</td>
<td>63.9</td>
<td>57.2</td>
<td>60.6</td>
</tr>
<tr>
<td>Number of days above 90°F</td>
<td>86</td>
<td>51</td>
<td>60</td>
<td>57</td>
<td>76</td>
<td>58</td>
<td>96</td>
<td>54</td>
</tr>
<tr>
<td>Number of days above 95°F</td>
<td>25</td>
<td>0</td>
<td>7</td>
<td>6</td>
<td>19</td>
<td>16</td>
<td>30</td>
<td>4</td>
</tr>
<tr>
<td>Number of days below 32°F</td>
<td>19</td>
<td>11</td>
<td>8</td>
<td>7</td>
<td>20</td>
<td>2</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>Total Precipitation (inches)</td>
<td>54.56</td>
<td>79.87</td>
<td>79.44</td>
<td>72.26</td>
<td>45.77</td>
<td>86.08</td>
<td>46.13</td>
<td>86.37</td>
</tr>
</tbody>
</table>

Meteorological data courtesy of the National Weather Service.
High Ozone Days

August 7, Baton Rouge: 159 AQI

The highest observed AQI level of the year in Louisiana occurred on August 7 in Baton Rouge. On this day, a stationary front caused pollutants to converge over the Baton Rouge area. In addition, smoke from wildfires in the western U.S. and Canada contributed to ozone precursors across southeastern Louisiana, where PM$_{2.5}$ concentrations climbed above 30 ug/m$^3$ during the day. Furthermore, mostly sunny skies and highs in the low-90s enhanced ozone formation. These conditions, along with pollutant carryover from the previous day, resulted in an observed AQI reading of 159 at the Capitol and Dutchtown monitoring sites, which is in the Unhealthy category.

July 28, Lake Charles: 156 AQI

The second highest observed AQI of the year occurred on July 28 in Lake Charles, when a strong ridge of high pressure aloft limited atmospheric mixing and brought hot temperatures to the central and southern U.S. Similar to the August 7 event discussed above, wildfire smoke from the western U.S. and Canada contributed to ozone precursors as the upper-level high circulated a large plume of smoke into Louisiana. Dispersion was also limited on this day due to light and variable winds at the surface, while partly sunny skies and high temperatures in the low-90s aided ozone development. These conditions led to an Unhealthy AQI level of 156 at the Carlyss monitoring site.

August 7: Daily maximum 8-hour ozone concentrations in ppb (dots), satellite fire detections (red triangles), and NOAA smoke plume analysis (gray). Smoke and other ozone precursors converged over Baton Rouge along a stalled front, allowing AQI levels to climb into the Unhealthy category (red dots) (Courtesy: AirNow-Tech).

July 28: 500-mb analysis valid at 7:00 a.m. CDT. At this time, an upper-level high pressure system was the dominant weather feature across the central and southern U.S. Hot temperatures, limited mixing, and wildfire smoke rotating around the high pressure system led to Unhealthy AQI levels in Lake Charles (Courtesy: NOAA).
High PM$_{2.5}$ Days

September 5, Lake Charles: 94 AQI

The year’s highest levels of PM$_{2.5}$ in Louisiana occurred in Lake Charles on September 5, when an expansive area of high pressure aloft limited atmospheric mixing over the Bayou State. Meanwhile, light westerly winds at the surface were hindering dispersion and transporting a mixture of smoke and Saharan dust into the region. The smoke and dust created hazy conditions, reducing visibility down to 5 miles at times during the day. Despite isolated thunderstorms in Lake Charles during the evening, the 24-hour average concentration of PM$_{2.5}$ reached 32.4 $\mu$g/m$^3$, which is in the high-Moderate category.

August 4, Shreveport: 87 AQI

The next highest PM$_{2.5}$ levels of 2021 occurred in Shreveport on August 4. On this day, light northeasterly winds limited dispersion and transported widespread wildfire smoke from Canada into Louisiana behind a cold front. Sinking air behind the front pushed aloft smoke to the surface, leading to increased particle levels across the Bayou State; AQI levels reached 87 in Shreveport, which is in the high-Moderate category. A surface high pressure system allowed the smoke to persist over Louisiana for several days before southerly winds finally improved dispersion on August 8.
2021 Ozone

Count of Ozone Observations in Each AQI Category

Count of Ozone Forecasts in Each AQI Category

Observational ozone data are not measured for Alexandria.
2021 PM$_{2.5}$

**Count of PM$_{2.5}$ Observations in Each AQI Category**

- Alexandria: 89 (100%)
- Baton Rouge: 274 (100%)
- Lafayette: 18 (50%)
- Lake Charles: 292 (50%)
- Monroe: 20 (100%)
- New Orleans: 102 (50%)
- Shreveport: 75 (100%)
- Thibodaux: 58 (100%)

**Count of PM$_{2.5}$ Forecasts in Each AQI Category**

- Alexandria: 53 (100%)
- Baton Rouge: 119 (100%)
- Lafayette: 99 (50%)
- Lake Charles: 122 (50%)
- Monroe: 49 (100%)
- New Orleans: 111 (100%)
- Shreveport: 96 (50%)
- Thibodaux: 85 (50%)

*Observational PM$_{2.5}$ data are not measured for Monroe or Alexandria.*
2021 Next-Day Forecast Statistics at the Good-to-Moderate Threshold

2021 next-day forecasting performance statistics are presented in the charts below. The statistics are calculated by comparing forecasted and observed AQI levels for the Good-to-Moderate threshold. Percent Correct indicates the percentage of forecasts that correctly predicted whether observations would be above or below a certain threshold. Because few USG days were predicted or observed in the Louisiana forecast cities in 2021, Moderate-to-USG forecast statistics are not shown.

### Percent Correct—Ozone

<table>
<thead>
<tr>
<th>City</th>
<th>Percent Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexandria*</td>
<td>90</td>
</tr>
<tr>
<td>Baton Rouge</td>
<td>94</td>
</tr>
<tr>
<td>Lafayette</td>
<td>92</td>
</tr>
<tr>
<td>Lake Charles</td>
<td>97</td>
</tr>
<tr>
<td>Monroe</td>
<td>90</td>
</tr>
<tr>
<td>New Orleans</td>
<td>90</td>
</tr>
<tr>
<td>Shreveport</td>
<td>90</td>
</tr>
<tr>
<td>Thibodaux</td>
<td>96</td>
</tr>
</tbody>
</table>

### Percent Correct—PM\(_{2.5}\)

<table>
<thead>
<tr>
<th>City</th>
<th>Percent Correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alexandria*</td>
<td>77</td>
</tr>
<tr>
<td>Baton Rouge</td>
<td>82</td>
</tr>
<tr>
<td>Lafayette</td>
<td>74</td>
</tr>
<tr>
<td>Lake Charles</td>
<td>76</td>
</tr>
<tr>
<td>Monroe</td>
<td>80</td>
</tr>
<tr>
<td>New Orleans</td>
<td>80</td>
</tr>
<tr>
<td>Shreveport</td>
<td>77</td>
</tr>
<tr>
<td>Thibodaux</td>
<td></td>
</tr>
</tbody>
</table>

*Observational PM\(_{2.5}\) data are not measured for Monroe, and ozone and PM\(_{2.5}\) data are not measured for Alexandria.

Although Sonoma Technology, Inc., prepares air quality forecasts using the highest professional standards, forecasting is an inexact science. Therefore, Sonoma Technology, Inc., cannot assume any liability or responsibility for any consequences that might arise due to the accuracy or inaccuracy of forecasts delivered under this contract, or for any decisions or actions taken based on the forecasts provided.