

Baton Rouge Car Paint and Ceramic Coating Weather Dataset, 2006–2025

Open data on how Baton Rouge, Louisiana weather stresses automotive paint (UV, heat, humidity, rain) and how often the weather allows a ceramic coating to be applied and cure. Includes a 12-city U.S. comparison and the 1950–2025 record of 90°F days.

- **Version:** 1.0 (October 2026)
- **License:** data CC BY 4.0; code in `code/` MIT
- **Creators:** Matthew Mire (Immaculate Detailing of BR, <https://www.immaculatecarwash.com/>) and Andres Rusic (Marketing & AI, <https://marketingandai.com/>)
- **Report:** <https://www.immaculatecarwash.com/guides/ceramic-coating-weather-study-baton-rouge>

Key findings

Measure (Baton Rouge Metro Airport)	Value	Period
Days at or above 90°F per year	111.3	2016–2025
Days at or above 95°F per year	34.4	2016–2025
Trend in 90°F days	+2.9 days per decade (Sen's slope; Mann-Kendall $p = 0.014$)	1950–2025
Days with peak UV index ≥ 8 per year	117.3	2016–2025
Hours at $\geq 80\%$ relative humidity per year	5,212 (59% of hours)	2016–2025
Hot-sun rain days per year	21.1	2016–2025
Ceramic coating cure-window days per year	165.0 (station), 123.8 (model)	2016–2024
Cure-window days, July / October	2.0 / 20.6	2016–2024
Paint stress rank among 12 U.S. metros	3rd (after Tampa, Miami)	2016–2025

Files

File	Rows	What it holds
<code>baton-rouge-daily-paint-weather-2006-2025.csv</code>	7,305	One row per day, Baton Rouge
<code>city-benchmark-12-metros-2016-2025.csv</code>	12	10-year annual means per metro, paint stress score and rank
<code>baton-rouge-monthly-profile.csv</code>	12	Monthly means for Baton Rouge
<code>baton-rouge-annual-2006-2025.csv</code>	20	Yearly counts for Baton Rouge
<code>baton-rouge-90f-days-1950-2025.csv</code>	76	Yearly 90°F and 95°F day counts, station only
<code>cure-window-sensitivity.csv</code>	8	Cure-window days per year under alternative thresholds

File	Rows	What it holds
east-baton-rouge-air-quality-2006-2025.csv	20	EPA AirData annual AQI summary, East Baton Rouge Parish (context only)
stats.json	n/a	Every headline number, thresholds, trend tests and validation results
charts/	n/a	PNG and SVG charts, cover image
code/	n/a	fetch.py (downloads raw inputs), analyze.py, build_outputs.py, cities.py

Data dictionary: daily file

Column	Unit	Source	Definition
date	YYYY-MM-DD		Local standard time (UTC−6)
station_tmax_f, station_tmin_f	°F	NOAA GHCN-Daily USW00013970	Daily max and min air temperature
station_precip_in	inches	NOAA GHCN-Daily	Daily precipitation
uv_index_peak_model	UV index	NASA POWER hourly ALLSKY_SFC_UV_INDEX	Highest hourly all-sky UV index that day
uv_index_hours_model	UV index × hours	NASA POWER	Sum of hourly UV index. × 0.09 = erythema dose in kJ/m ²
air_temp_max_c_model	°C	NASA POWER T2M (MERRA-2)	Max hourly 2 m temperature
rel_humidity_mean_pct_model	%	NASA POWER RH2M	Mean hourly relative humidity
hours_rh_80plus_model	hours	NASA POWER	Hours with RH ≥ 80%
precip_mm_model	mm	NASA POWER PRECTOTCORR	Daily total of modeled hourly precipitation
hot_sun_rain_day	boolean	station + model	station_precip_in ≥ 0.01 AND station_tmax_f ≥ 90 AND uv_index_peak_model ≥ 8
cure_window_model	boolean	NASA POWER hourly	Cure-window test on modeled hourly data (see below)
cure_window_station	boolean	NOAA ISD-Lite 722320- 13970	Cure-window test on airport hourly observations (2016–2024 only)

Definitions

- **Very high UV day:** peak hourly UV index ≥ 8 (the WHO/EPA "very high" category starts at 8; "extreme" at 11).
- **Hot-sun rain day:** measurable rain (≥ 0.01 in) on a day that also reaches 90°F and a peak UV index of 8 or more.
- **Cure window:** a day with at least one start hour between 08:00 and 14:00 local where (a) the next 3 hours are all 10–30°C (50–86°F) with RH ≤ 80%, and (b) total precipitation over the 24 hours from the start is ≤ 0.2 mm. Temperature range from Feynlab's published application range; 24-hour dry period

from Adam's Polishes and Feynlab instructions; the RH limit is an assumption (no manufacturer we checked publishes one). See `cure-window-sensitivity.csv`.

- **Paint stress score:** mean of z-scores (across the 12 metros) of yearly erythematous UV dose, days $\geq 90^\circ\text{F}$, hours $\geq 80\%$ RH and hot-sun rain days. A relative weather-exposure index, not a damage measure. Baton Rouge ranks 3rd with all four components and 3rd or 4th when any one is dropped.

Validation

- Modeled daily max temperature vs station: $r = 0.97$ (bias -1.4°F) in Baton Rouge and $r = 0.96\text{--}0.99$ in 10 of the other 11 cities. Los Angeles is the exception ($r = 0.81$, $+4.1^\circ\text{F}$), because its coastal grid cell mixes ocean and inland air. Heat days and rain in the comparison always come from the station record, so this affects only LA's modeled humidity and UV columns. Per-city figures are in `stats.json` under `validation`.
- Modeled vs station monthly precipitation: $r = 0.89$; modeled total = 95% of station total in Baton Rouge.
- Cure-window days by month, model vs station: $r = 0.98$. The model count is lower (123.8 vs 165.0 days a year) because modeled hourly rain includes light drizzle; use the station column for Baton Rouge totals and the model column for city comparisons.

Limitations

Airport weather is not paint-surface temperature or a particular car's exposure. NASA POWER values are gridded estimates (about 0.5°), not point measurements. The cure-window test models an outdoor application; work done in a garage relaxes the temperature and humidity conditions but not the need to keep the car dry afterwards. The 12-city comparison uses each city's main airport.

Sources

- NOAA National Centers for Environmental Information. Global Historical Climatology Network – Daily (GHCN-Daily), and Integrated Surface Database (ISD-Lite).
- NASA Langley Research Center (LaRC) POWER Project, funded through the NASA Earth Science/Applied Science Program. Hourly API, accessed October 2026.
- U.S. EPA AirData, annual AQI by county.

Citation

Mire, M., & Rusic, A. (2026). *Baton Rouge Car Paint and Ceramic Coating Weather Dataset, 2006–2025* (Version 1.0) [Data set]. Immaculate Detailing of BR. <https://www.immaculatecarwash.com/guides/ceramic-coating-weather-study-baton-rouge>

Charts

