1. Overview  
   • This dataset contains (a) station-based disaggregation coefficients relative to daily rainfall, rasterized via IDW; and (b) ratios between sub-daily durations (e.g., 5 min/30 min, 30 min/1 h, 1 h/24 h), also rasterized via IDW.  
   • Values are dimensionless. Higher values indicate a larger fraction of the reference duration.
2. Source Data  
   • Stations: shapefile “All\_Stations\_Treated\_SIRGAS.shp” with columns P5m\_Pday, P10m\_Pday, …, P24h\_Pday and station metadata including dt\_min (native sampling in minutes).  
   • Boundary/mask: “Brasil\_estados.shp” (dissolved to a national polygon).  
   • Notes: 5-min and 10-min coefficients at stations are model-derived from a polynomial fit; the other durations come from observed or aggregated sub-daily/hours. All station columns are expressed as P(duration)/P(day).
3. Folder Structure & File Naming  
   • Current folder (daily-based coefficients):  
   – Files: IDW\_P{dur}\_Pday\_res{res}\_k{k}\_p{p}.tif  
   – Example: IDW\_P30m\_Pday\_res0.100\_k10\_p2.0.tif  
   • Subfolder relative\_to\_subdaily (ratios vs sub-daily references):  
   – Files: IDW\_{key}\_res{res}\_k{k}\_p{p}.tif  
   – Example: IDW\_R\_5m\_30m\_res0.100\_k10\_p2.0.tif  
   • Figures (for quicklook): IDW\_Disagg\_{cols}x{rows}.png and .svg (multi-panel maps of the ratio rasters).
4. Raster Specification (all .tif files)  
   • CRS: EPSG:4326 (WGS-84, geographic).  
   • Pixel size: 0.1 degree (~11 km at the Equator).  
   • Extent: national Brazil polygon; land-only (outside masked to NoData).  
   • Interpolator: Inverse Distance Weighting (IDW), k-nearest neighbors.  
   • Parameters: k\_neighbors = 10 (or as in file name); power p = 2.0.  
   • Data type: 32-bit float; NoData = −9999; LZW compressed; tiled (256×256).  
   • Grid transform: north-up, top-left origin.
5. Variables and Meanings

A) Daily-based coefficients (saved in the current folder)  
Each raster below stores the station coefficient P(d)/P(day) interpolated to the grid.  
• IDW\_P5m\_Pday\_\*.tif → P(5 min) / P(1 day) [5 min modeled by polynomial fit]  
• IDW\_P10m\_Pday\_\*.tif → P(10 min) / P(1 day) [10 min modeled by polynomial fit]  
• IDW\_P15m\_Pday\_\*.tif → P(15 min) / P(1 day)  
• IDW\_P20m\_Pday\_\*.tif → P(20 min) / P(1 day)  
• IDW\_P25m\_Pday\_\*.tif → P(25 min) / P(1 day)  
• IDW\_P30m\_Pday\_\*.tif → P(30 min) / P(1 day)  
• IDW\_P1h\_Pday\_\*.tif → P(1 h) / P(1 day)  
• IDW\_P6h\_Pday\_\*.tif → P(6 h) / P(1 day)  
• IDW\_P8h\_Pday\_\*.tif → P(8 h) / P(1 day)  
• IDW\_P10h\_Pday\_\*.tif → P(10 h) / P(1 day)  
• IDW\_P12h\_Pday\_\*.tif → P(12 h) / P(1 day)  
• IDW\_P24h\_Pday\_\*.tif → P(24 h) / P(1 day)

B) Ratios relative to sub-daily references (saved in relative\_to\_subdaily)  
Each raster stores a ratio of two durations computed at stations and then IDW-interpolated.  
• IDW\_R\_5m\_30m\_\*.tif → P(5 min) / P(30 min) [5 min modeled]  
• IDW\_R\_10m\_30m\_\*.tif → P(10 min) / P(30 min) [10 min modeled]  
• IDW\_R\_15m\_30m\_\*.tif → P(15 min) / P(30 min)  
• IDW\_R\_20m\_30m\_\*.tif → P(20 min) / P(30 min)  
• IDW\_R\_25m\_30m\_\*.tif → P(25 min) / P(30 min)  
• IDW\_R\_30m\_1h\_\*.tif → P(30 min) / P(1 h)  
• IDW\_R\_1h\_24h\_\*.tif → P(1 h) / P(24 h)  
• IDW\_R\_6h\_24h\_\*.tif → P(6 h) / P(24 h)  
• IDW\_R\_8h\_24h\_\*.tif → P(8 h) / P(24 h)  
• IDW\_R\_10h\_24h\_\*.tif → P(10 h) / P(24 h)  
• IDW\_R\_12h\_24h\_\*.tif → P(12 h) / P(24 h)  
• IDW\_R\_24h\_1dia\_\*.tif → P(24 h) / P(1 day) (for reference; equals P24h\_Pday)

1. Station Filtering & Modeling Assumptions  
   • NaN handling: stations with missing numerator or denominator are excluded for that variable.  
   • Native sampling (dt\_min): for a ratio P(d1)/P(d2), stations must satisfy dt\_min ≤ min(d1, d2).  
   • Bypass for modeled short scales: ratios involving 5 min or 10 min as numerator (R\_5m\_30m, R\_10m\_30m) bypass the dt\_min rule because those durations are derived from a polynomial fit.  
   • Masking: only grid cells within the Brazil polygon are retained; outside is NoData.
2. Recommended Value Ranges (for QA/QC and visualization)  
   • Daily-based coefficients P(d)/P(day): typically 0.2–1.2 (depending on d).  
   • Sub-daily ratios:  
   – 5 min/30 min ≈ 0.3–0.6 (typical ~0.34)  
   – 10 min/30 min ≈ 0.5–0.7 (typical ~0.54)  
   – 30 min/1 h ≈ 0.6–0.8 (typical ~0.74)  
   – 1 h/24 h ≈ 0.3–0.5 (typical ~0.42)  
   – 6–12 h/24 h ≈ 0.7–0.9 (typical ~0.72–0.85)  
   – 24 h/1 day often slightly > 1 (typical ~1.14)  
   • The figure used a visualization range of 0.30–1.20 with a discrete colormap; rasters store full precision.

Method Summary (how rasters were created)

1. Read station shapefile and Brazil states; dissolve states to a national polygon.
2. Build a 0.1° grid covering Brazil; compute cell centers; create a land mask.
3. For each variable (coefficient or ratio), select valid stations using the rules in Section 6.
4. Interpolate station values to the grid using IDW (k-nearest neighbors, p = 2.0).
5. Apply the Brazil mask; write GeoTIFF with EPSG:4326, float32, LZW compression.
6. For ratios, save to relative\_to\_subdaily; for daily-based coefficients, save to the current folder.
7. Generate a multi-panel PNG/SVG quicklook of the ratio rasters (shared legend).
8. Known Limitations  
   • IDW is a distance-weighted average and does not model anisotropy, orographic effects, or physical controls; patterns are most reliable where station density is higher.  
   • Edge effects may occur near borders or in regions with sparse stations.  
   • Ratios can be sensitive where the denominator is small; visual inspection and local expertise are advised.
9. Contact & Reproducibility  
   • Script: Python (rasterio, geopandas, scipy), parameterized by res\_deg, k\_neighbors, and power p.  
   • Key parameters are encoded in file names for traceability (resolution, k, p).  
   • For questions or to regenerate with different parameters, use the same script and adjust res\_deg / k\_neighbors / p.