

Historical Rainfall Analysis Tools

What they do: Two web-based tools for analysing rainfall records from Obscape tipping-bucket rain gauges. Together, they provide a complete workflow for understanding a site's rainfall characteristics — from long-term trends and statistical summaries through to identifying and examining individual significant storm events.

Who they're for: Municipal engineers, hydrologists, catchment managers, and anyone involved in stormwater planning, flood risk assessment, or climate adaptation who needs to understand the rainfall patterns at a monitored site.

Tool 1: Rain Data Viewer

A comprehensive rainfall analysis tool that loads historical rain gauge data, performs statistical and trend analysis, and produces a professional PDF report.

What it produces

- **Basic statistics** — total rainfall, daily averages, dry vs wet days, extreme values, longest dry and wet spells
- **Trend analysis** — Mann-Kendall test, Sen's Slope estimator, annual totals with regression trend lines, heavy-rain event frequency over time
- **Frequency analysis (IDF)** — Intensity-Duration-Frequency tables for return periods of 2 to 100 years, across durations from 5 minutes to 24 hours, with 90% confidence intervals. Suitable for use with standard engineering design methods such as the SANRAL Drainage Manual
- **Climate indices** — Standardized Precipitation Index (SPI) for drought/wet period monitoring, and Precipitation Concentration Index (PCI) for seasonality assessment
- **PDF report** — a complete, formatted A4 report with all analyses, charts, tables, methodology notes, references, and a glossary. Ready to attach to technical reports or share with stakeholders.

How to use it

1. Select or upload a rain gauge data file
 2. Adjust the storm parameters if needed (minimum depth and duration for event detection)
 3. Run the analysis — results are presented across sections: Rain Time Series, Basic Stats, Trend Analysis, Frequency Analysis, and Climate Indices
 4. Export a full PDF report, or save individual analysis reports
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Tool 2: Significant Rain Event Extractor

A focused tool for detecting, visualising, and exporting the most significant rainfall events in a gauge record. It identifies storms that exceed a user-defined intensity threshold and pairs each event with satellite imagery for spatial context.

What it produces

- **Event detection** — automatically scans the entire record and identifies rainfall events where intensity exceeds the configured threshold (e.g. 10 mm in 60 minutes)
- **Interactive event browsing** — select any detected event to see a detailed chart showing the rainfall profile, the peak intensity window, and cumulative rainfall
- **Satellite imagery** — view an infrared satellite image for each event date, with the station location marked, country borders, and coastlines overlaid
- **Exportable outputs** — summary CSV, per-event CSV and chart, satellite images, and a bundled PDF report

How to use it

1. Select or upload a rain gauge data file
2. Set the depth (mm) and duration (minutes) thresholds for what qualifies as a significant event
3. Run the analysis — detected events appear in a ranked list, most intense first
4. Browse individual events to view rainfall charts and satellite imagery
5. Export results: summary table, individual event data, charts, satellite images, and a bundled PDF report

How They Work Together

The **Rain Data Viewer** gives you the big picture — long-term trends, statistics, and engineering-grade IDF tables for design and planning. The **Significant Rain Event Extractor** lets you drill into individual storms — examining their intensity profiles, comparing events, and adding satellite context.

A typical workflow: 1. Start with the **Rain Data Viewer** to understand the site's overall rainfall characteristics and generate a PDF report 2. Then use the **Significant Rain Event Extractor** on the same data to identify and examine the most extreme storms, export event details, and retrieve satellite imagery

Input Data

Both tools accept CSV files exported from the Obscape Data Portal containing timestamped rainfall readings from a tipping-bucket rain gauge.

Access

Both tools are accessible through any web browser — no software installation required.

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These tools are provided for informational and planning purposes. Rainfall statistics and IDF estimates are based on the available gauge record and should be interpreted in the context of the record length and data quality. For critical infrastructure design, results should be reviewed by a qualified professional.