Contents

Session 7 Report: Spatial Data I

Course: Applied Quantitative Methods for the Social Sciences II (AQM2) **Date produced:** 2026-02-22
Topic: Spatial data I — Working with spatial data

Summary Table

Artifact	Status	File
Slide body	PASS	`slides/07_spatial1/spatial1`
Presentation PDF	PASS	`slides/07_spatial1/spatial1` (330 KB)
Notes PDF	PASS	`slides/07_spatial1/spatial1` (234 KB)
Assignment	PASS	`assignments/assign7_spatial` → `assign7_spatial1.pdf` (105 KB)
Solution Part 1 Rmd	PASS (knits)	`assignments/solutions/assig` → `assign7_part1.pdf` (282 KB)
Solution Part 2 Rmd	PASS (knits, synthetic data)	`assignments/solutions/assig` → `assign7_part2.pdf` (327 KB)
Bare R script (combined)	CREATED	`assignments/code/assign7.R`

Slides

Section Overview

Section	Frames	Content
Why Spatial Data?	3	Motivation diagram, research examples, discussion prompt
Types of Spatial Data	4	Vector/raster diagram, geometry types, attributes table, raster grid
Coordinate Reference Systems	4	Definition, geographic CRS (globe), projected CRS, EPSG table
The sf Package	9	sf intro, console output demo, reading, inspecting, dplyr ops, CRS ops, geometric ops, spatial joins, worked example
Visualization with ggplot2	5	geom_sf, choropleth, layering, complete example, tips
Wrap-up	3	Key takeaways, next session, questions

Total content frames: ~28 (plus ~5 auto-generated Roadmap frames)

Compilation

- **Presentation (`spatial1.pdf`):** Compiles without errors; only warnings are 2.12pt footer hboxes (below 10pt threshold — minor)
- **Notes (`spatial1_notes.pdf`):** Compiles without errors

Pedagogy Review Results

Reviewed by pedagogy-reviewer agent. Issues found and fixed:

Issue	Severity	Fixed?
No Socratic questions in deck	HIGH	YES — discussion prompt added after Section 1 ("Think about your own research topic…")
8-slide Section 4 run without visual anchor	HIGH	YES — sf console output frame inserted before "Reading spatial data"
`st_drop_geometry()` not surfaced on slide	MEDIUM	YES — added to "Attribute operations" frame
`st_within` passed without `()` — needs note	LOW	YES — sub-bullet added in "Spatial joins" frame
`\pgfmathsetmacro` in raster color argument	BUG	YES — replaced with hardcoded percentages

Images Needed

One image frame is commented out pending asset creation:

- **`slides/img/acled_africa_map.png`**: Map of Africa showing ACLED armed conflict event locations as points or density, with visible clustering in Sahel, Horn of Africa, and DRC. Create with R using `ggplot2 + geom_sf` + ACLED data, or download a screenshot from acleddata.com. Once the image is placed, uncomment the frame block at line ~91 in `spatial1_body.tex`.

Assignment

Structure

Part	Type	Dataset	Sections
Part 1 (in-class)	`spData::world` built-in	Inspect sf, dplyr ops, ggplot2 choropleth	
Part 2 (take-home)	`conflict_events.csv` (external)	CSV → sf, spatial join, choropleth	

Assignment Checker Results

Check	Result
Variable names in `world` dataset	ALL CORRECT (7/7)
sf functions (`st_read`, `st_join`, etc.)	ALL VALID (7/7)
R packages	ALL ON CRAN (sf, spData, dplyr, ggplot2, tidyr)
Compilation	CLEAN (zero overfull hboxes)

Issues Fixed After Checker

Issue	Severity	Fixed
`summarise()` incorrectly described as dropping geometry	CRITICAL	YES — corrected to "unions geometries by group"
No CRS check before `st_join()`	MAJOR	YES — `st_crs() == st_crs()` check added
`print(head(events_by_country, 10))` includes geometry	WARNING	YES — wrapped in `st_drop_geometry()`
Log-scale legend missing `name =`	MINOR	YES — `name = "Log(events+1)"` added

Requires Instructor Attention

1. **CRITICAL — Dataset missing**: `conflict_events.csv` does not exist at `github.com/franvillamil/AQ` Part 2 (roughly half the assignment) will not work until this file is uploaded. Once uploaded, use the direct raw URL (e.g. `raw.githubusercontent.com/franvillamil/AQM2/master/datasets/spatia` so students can use `read.csv(url)` directly.

2. **Deadline**: Currently `[DEADLINE - TBD]` — set before distributing.

Solutions

Files

- `assign7_part1.Rmd` / `.R` — Part 1 (world dataset, no download needed)
- `assign7_part2.Rmd` / `.R` — Part 2 (**uses synthetic conflict data** pending real CSV)
- `code/assign7.R` — combined bare script

Knit Status

File	Status	Pages
`assign7_part1.pdf`	PASS (knits cleanly, 25 chunks)	282 KB
`assign7_part2.pdf`	PASS (knits cleanly, 25 chunks, synthetic data)	327 KB

Note on Part 2 solutions

Part 2 solutions use synthetic conflict event data (500 random points in Africa bounding box). The synthetic data block is clearly marked. When the real `conflict_events.csv` is uploaded, replace the data generation block with `events = read.csv("conflict_events.csv")` — all downstream code will work unchanged.

Quality Scores

Artifact	Score	Assessment
Slides	92/100	PASS — 1 image still needed, all other issues fixed
Assignment	85/100	PASS (pending dataset upload and deadline)
Solutions	90/100	PASS (Part 2 uses synthetic data, clearly flagged)

Action Items for Instructor

1. **Upload `conflict_events.csv`** to the course GitHub repository at `datasets/spatial/`; update the URL in `assign7_spatial1.tex` to use the raw download link
2. **Set the assignment deadline** (replace `[DEADLINE - TBD]` in the assignment)
3. **Source/create the ACLED Africa map** for the image frame in the slides (see Images Needed above); then uncomment the frame in `spatial1_body.tex`
4. When distributing the assignment, compile one final time to confirm the URL resolves