

Avalanche Simulation Data – Handover Notes

This document describes the avalanche simulation data prepared for the **pilot Brenner dataset**, focusing on the `/11_avaDirectory` directory, the scenario-specific exports in `/12_avaScenMaps`, and the lightweight preview outputs in `/13_avaScenPreview`.

`/11_avaDirectory/`

This folder contains the **full avalanche inventory** (~26k features = ~13k avalanches + ~13k release areas).

- **Result rasters**
 - ~6 raster products per avalanche run (e.g. `zDelta`, `travelLengthMax`, `travelAngleMax`, ...).
 - Stored in `com4_*` subfolders.
 - **avaDirectoryType.***
 - Base directory files: geometry + attributes, but **no raster paths**.
 - Formats: `.csv`, `.geojson`, `.parquet`.
 - Use as the starting point for enrichment.
 - **avaDirectoryResults.***
 - Enriched directory files: geometry + attributes + **relative raster paths**.
 - Formats: `.csv`, `.geojson`, `.parquet`.
 - These are the **main input** for scenario filtering and WebGIS.
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`/12_avaScenMaps/`

This folder contains **scenario-specific exports**, generated after applying filters (area IDs, sector, flow type, elevation bands, etc.):

- **avaScen_parquet**
 - Filtered scenario, geometry + attributes + raster paths.
 - Fast and compact for backend processing.
 - **avaScen_geojson**
 - Same as above, but WebGIS-ready.
 - Includes geometry, attributes, and relative raster paths (`path_*`).
 - **avaScenMaster.***
 - Optional combined export of **all filtered scenarios** in one file.
 - Written if `makeMaster=True` during filtering.
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`/13_avaScenPreview/`

This folder contains **preview-ready data in WGS84** (EPSG:4326) for fast use in **WebGIS and Leaflet**. The files here are derived from the UTM-based outputs in `/12_avaScenMaps` and `/00_input`.

Transformations Applied

- **CRS Conversion**
All data converted from UTM (EPSG:25832) → WGS84 (EPSG:4326).
- **Raster reprojection**
Hillshade (`10HS_pilotBrenner_MC_mask.tif`) reprojected with nearest-neighbor resampling.

- **Vector reprojection**

Avalanche results (`avaScenMaster.parquet`) and microregion boundaries (`avaScenMaster_avaReportMicroRegionsPilotBrenner.geojson`) reprojected to WGS84.

- **Path field shortening**

Raster path fields (`path_*`) shortened to last 10 characters for readability.

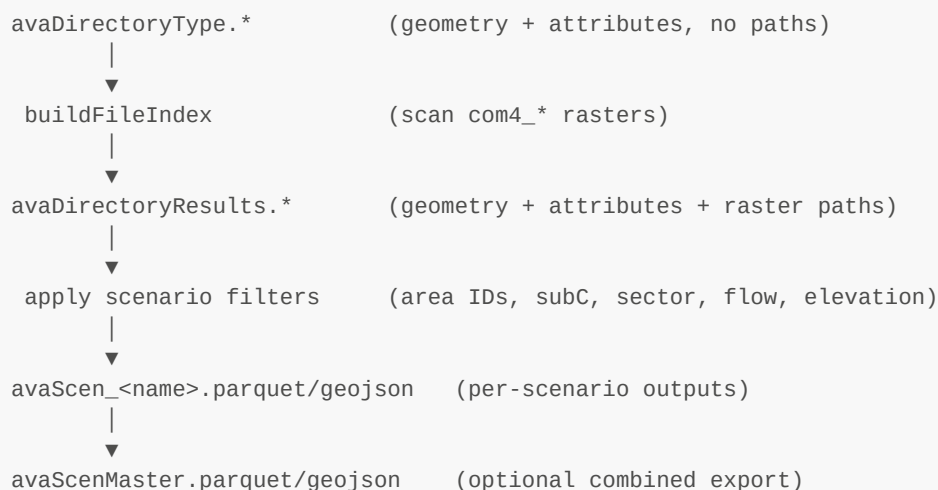
Purpose

- **This folder** → lightweight preview, fast to load in WebGIS.
- **For complete data** → refer to `/12_avaScenMaps/avaScenMaster.*` (keeps full raster paths + attributes, UTM-based).

Contents

- `avaScenMaster_wgs84.geojson` → avalanche polygons + attributes (paths shortened)
- `10HS_pilotBrenner_wgs84.tif` → hillshade raster in WGS84
- `avaRepMicroRegionsPilotBrenner_wgs84.geojson` → microregion boundaries in WGS84
- `avaScenPreviewHTML.html` / `avaScenPreviewHTML.zip` → exported interactive preview map

Preprocessing Pipeline



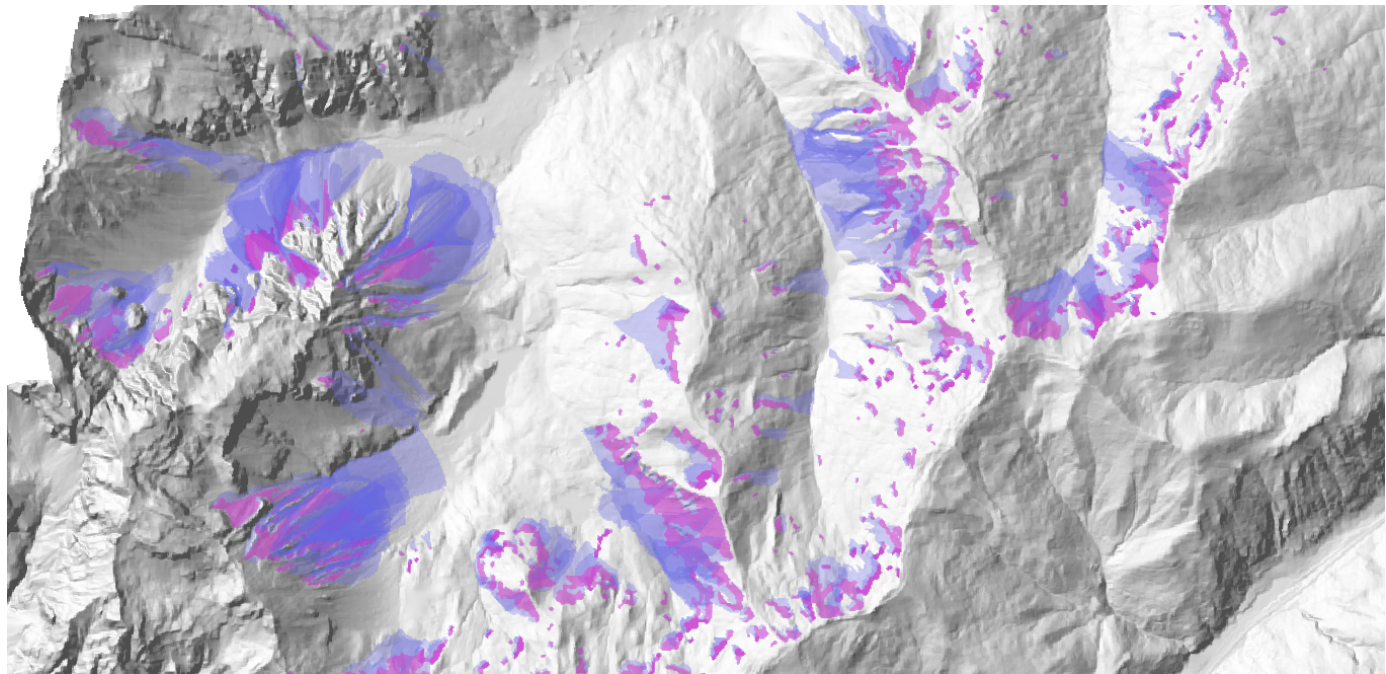
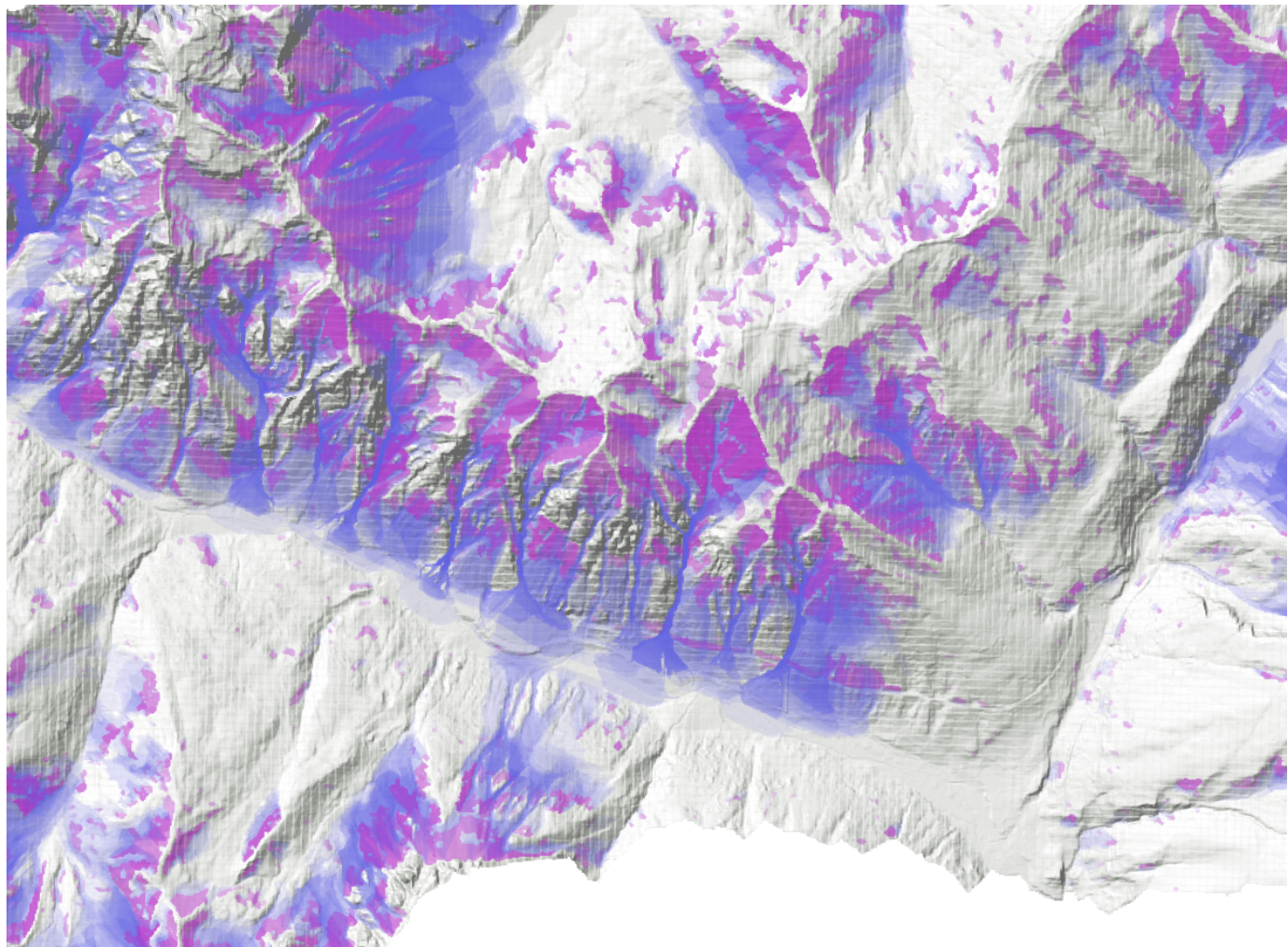
Suggested WebGIS Workflow

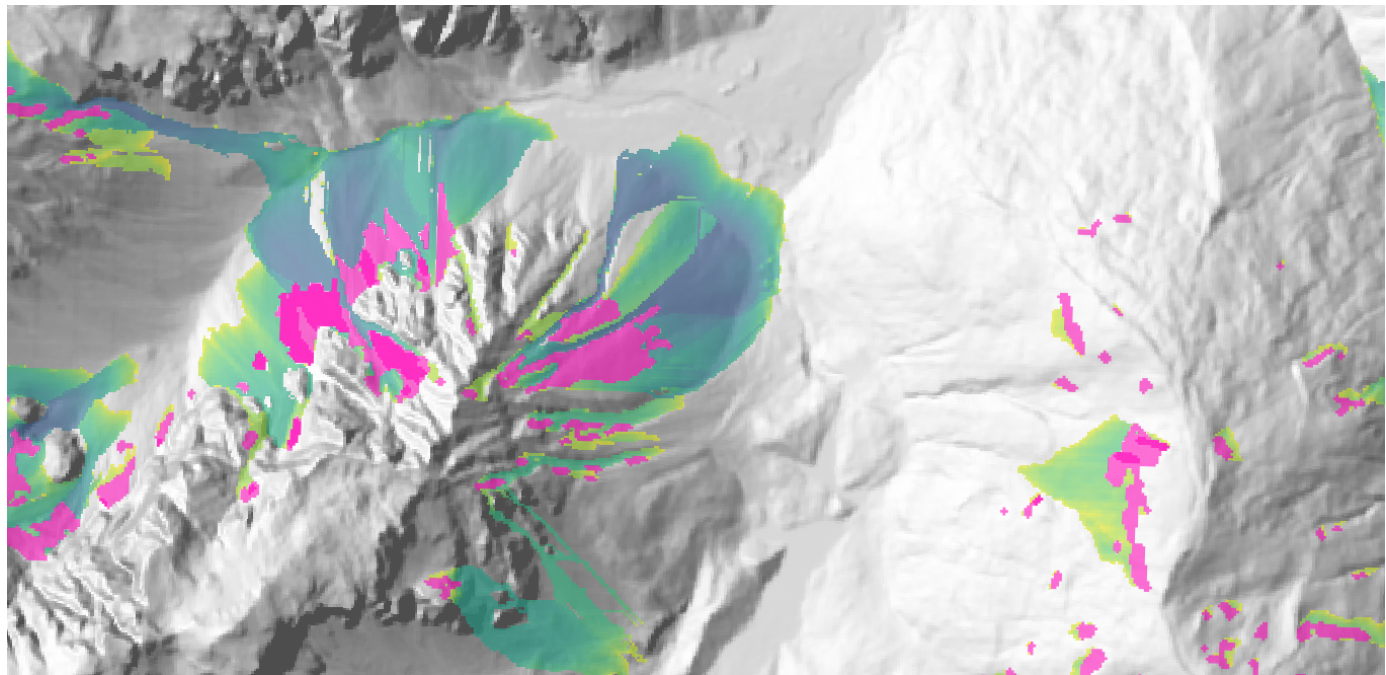
1. Filtering pipeline

- Apply scenario filters first on **avaDirectory.csv** (fast).
- Once filtered avalanches are selected, merge back with **avaDirectory.parquet** to attach geometry.
- Add raster paths from the raster index (`indexAvaFiles.pkl`).
- Export a **final GeoJSON** with geometry + relative raster paths
→ already prepared in `/12_avaScenMaps/`.

2. Display concept

- **Zoomed out** → show only **polygons**
 - avalanche outlines [blue], release areas [pink], see 1&2 screenshot below.
- **Zoomed in** (after a threshold) → load the linked **TIFF rasters on demand** from the `path_*` fields in the scenario GeoJSON.
 - avalanche raster [intensity], release areas [pink], see 3 screenshot below.
- This keeps the map lightweight while enabling rich raster detail when needed.





Applied Filters for Testing

Scenario 1 – Brenner South

```
areaLwdIds = ['IT-32-BZ-04-01', 'IT-32-BZ-05-01']
subCs      = [500]
sectors     = ["S", "E"]
flows      = ["Dry"]
elevMin     = 0
elevMax     = 2000
```

Output:

- AREA 1 | Scenario 1 → 12_avaScenMaps/avaScen_BrennerSued.parquet / .geojson
- (per-area exports also available if makeMaster=False)

Scenario 2 – Brenner North

```
areaLwdIds = ['AT-07-22', 'AT-07-23-02']
subCs      = [500]
sectors     = ["N", "W"]
flows      = ["Dry"]
elevMin     = 1800
elevMax     = 2400
```

Output:

- AREA 2 | Scenario 2 → 12_avaScenMaps/avaScen_BrennerNord.parquet / .geojson
- (per-area exports also available if makeMaster=False)

Summary Table Scenario Area IDs SubC Sectors Flows Elevation Range Output Files Brenner South IT-32-BZ-04-01, IT-32-BZ-05-01 500 S, E Dry 0 – 2000 m avaScen_BrennerSued.parquet / .geojson Brenner North AT-07-22, AT-07-23-02 500 N, W Dry 1800 – 2400 m avaScen_BrennerNord.parquet / .geojson

Summary Table (when makeMaster = False)

Scenario	Area IDs	SubC	Sectors	Flows	Elevation Range	Output Files
Brenner South	IT-32-BZ-04-01, IT-32-BZ-05-01	500	S, E	Dry	0 – 2000 m	avaScen_BrennerSued.parquet / .geojson
Brenner North	AT-07-22, AT-07-23-02	500	N, W	Dry	1800 – 2400 m	avaScen_BrennerNord.parquet / .geojson