

Sample: Disaster response, Kathmandu: report

Project: Sample: Disaster response, Kathmandu

Goal: Describe the project Sample: Disaster response, Kathmandu: run the analyses that tell the most about its data, draw every result, and write a cited report.

Run: 2199067b-8747-4c82-b083-7c3d5abda8f (running, 11 agent run(s))

Generated: 2026-10-18T05:36:27Z, version 1

Model cost: USD 0.0000 over 0 model call(s)

Data used

Data	Kind	Rows	Time span	Summary	Source
Wards	vector, Polygon	20		20 polygon (area) features; 'population' 26,870 to 97,681 (mean 5.61e+04); 'households' 6,248 to 22,716 (mean 1.305e+04); named by 'name' (e.g. Ward 1 Oakwood, Ward 2 Ashby Green, Ward 3 Cedar Vale); total area 56.01 km ² ; extent 85.2789,27.6679 to 85.3610,27.7321. Areas (Wards) with population to compare and map.	[96]
Damage assessments	vector, Point	2,000	2026-09-02 to 2026-09-22	2,000 point features; dated by 'assessed_at' from 2026-09-02 to 2026-09-22; 'occupancy' has 4 values (top: residential 792, commercial 425, school 397); 'construction' has 3 values (top: RC frame 680, brick in mud 671, brick in cement 649); 'damage_grade' 1 to 5 (mean 2.374); 'storeys' 1 to 5 (mean 2.846); 'people_displaced' 0 to 14 (mean 3.328); extent 85.2803,27.6689 to 85.3599,27.7310. Dated point events by occupancy: where and when Damage assessments happen.	[2]
Shelters	vector, Point	25		25 point features; 'type' has 3 values (top: open space 10, school 9, tent camp 6); 'capacity' 150 to 1,200 (mean 716); named by 'name' (e.g. Elmstead open space shelter, Hawthorn Rise open space shelter, Kingsmead open space shelter); extent 85.2832,27.6721 to 85.3569,27.7277. Point locations of Shelters by type.	[97]
Road status	vector, LineString	160	2026-09-03 to 2026-09-20	160 line features; dated by 'updated_on' from 2026-09-03 to 2026-09-20; 'status' has 3 values (top: open 122, restricted 21, blocked 17); 'cause' has 1 values (top: debris 38); named by 'name' (e.g. Tol Path, Bagh Path, Pul Path); total length 26.39 km; extent 85.2805,27.6687 to 85.3596,27.7311. Lines (Road status) such as routes or networks.	[3]
Water points	vector, Point	60		60 point features; 'type' has 3 values (top: well 27, tap stand 17, tanker point 16); 'working' has 2 values (top: True 48, False 12); 'litres_per_day' 3,306 to 43,201 (mean 1.409e+04); extent 85.2811,27.6709 to 85.3594,27.7290. Point locations of Water points by type.	[98]
Health posts	vector, Point	20		20 point features; 'functional' has 2 values (top: True 14, False 6); 'beds' 5 to 25 (mean 14.7); named by 'name' (e.g. Health post Ashby Green, Health post Cedar Vale, Health post Elmstead); extent 85.2869,27.6701 to 85.3532,27.7259. Point locations of Health posts by functional.	[99]

Data	Kind	Rows	Time span	Summary	Source
Relief distributions	vector, Point	320	2026-09-04 to 2026-09-22	320 point features; dated by 'date' from 2026-09-04 to 2026-09-22; 'item' has 4 values (top: blanket 87, tarpaulin 85, hygiene kit 77); 'agency' has 3 values (top: relief society 109, municipality 108, NGO partner 103); 'households_served' 21 to 400 (mean 209.4); extent 85.2828,27.6718 to 85.3572,27.7279. Dated point events by item: where and when Relief distributions happen.	[4]
Ward needs by day	table	420	2026-09-02 to 2026-09-22	Table of 420 rows and 5 columns without geometry; dated by 'date' from 2026-09-02 to 2026-09-22; 'ward_code' has 20 values (top: W01 21, W02 21, W03 21); 'households_need_shelter' 62 to 1,174 (mean 276.6); 'water_l_per_person' 11 to 32 (mean 21.77); 'food_kits_needed' 51 to 503 (mean 155.4). A table of Ward needs by day without locations.	[5]
Shelter register	table	25		Table of 25 rows and 5 columns without geometry; 'managed_by' has 3 values (top: NGO 11, municipality 8, army 6); 'capacity' 150 to 1,200 (mean 716); 'occupants' 98 to 1,663 (mean 808.5); 'toilets' 4 to 30 (mean 18.84). A table of Shelter register without locations.	[100]
Situation report No. 4	document			1-page pdf document 'Situation report No. 4'; language en; mentions 4 place(s): Ward 20 Upton Vale (1), 27.68758, 85.33803 (1), Ward (1), Elmstead open space shelter (1). A document about Ward 20 Upton Vale, 27.68758, 85.33803, Ward.	[101]
Sample: Disaster response, Kathmandu	record				[102]
Hot spot analysis: Relief distributions	layer, Point	320			[103]
Hot spot analysis: Water points	layer, Polygon	20			[104]
Hot spot analysis: Damage assessments	layer, Point	2,000			[105]
Emerging hot spots: Relief distributions	layer, Polygon	54			[106]
Emerging hot spots: Damage assessments	layer, Polygon	87			[107]
Repeat and near repeat classification: Relief distributions	layer, Point	320			[108]
Summarize within: Wards	layer, Polygon	20			[109]
Summarize within: Wards	layer, Polygon	20			[110]
Summarize within: Wards	layer, Polygon	20			[111]
Find point clusters: Shelters	layer, Point	25			[112]
Find point clusters: cluster hulls	layer, Polygon	1			[113]
Find point clusters: Relief distributions	layer, Point	320			[114]
Find point clusters: cluster hulls	layer, Polygon	21			[115]

Data	Kind	Rows	Time span	Summary	Source
Find point clusters: Health posts	layer, Point	20			[116]
Find point clusters: cluster hulls	layer, Polygon	2			[117]
Calculate density: Shelters	layer, Polygon	90			[118]
Calculate density: Relief distributions	layer, Polygon	222			[119]
Calculate density: Health posts	layer, Polygon	228			[120]
Situation report No. 4	document				[121]
Find outliers: Wards	layer, Polygon	20			[122]

Timeline

Timeline: events per day by dataset

Per day: 21 days from 2026-09-02 to 2026-09-22; trend -3.48 per day; first half 1,586, second half 1,177 (-25.8%)

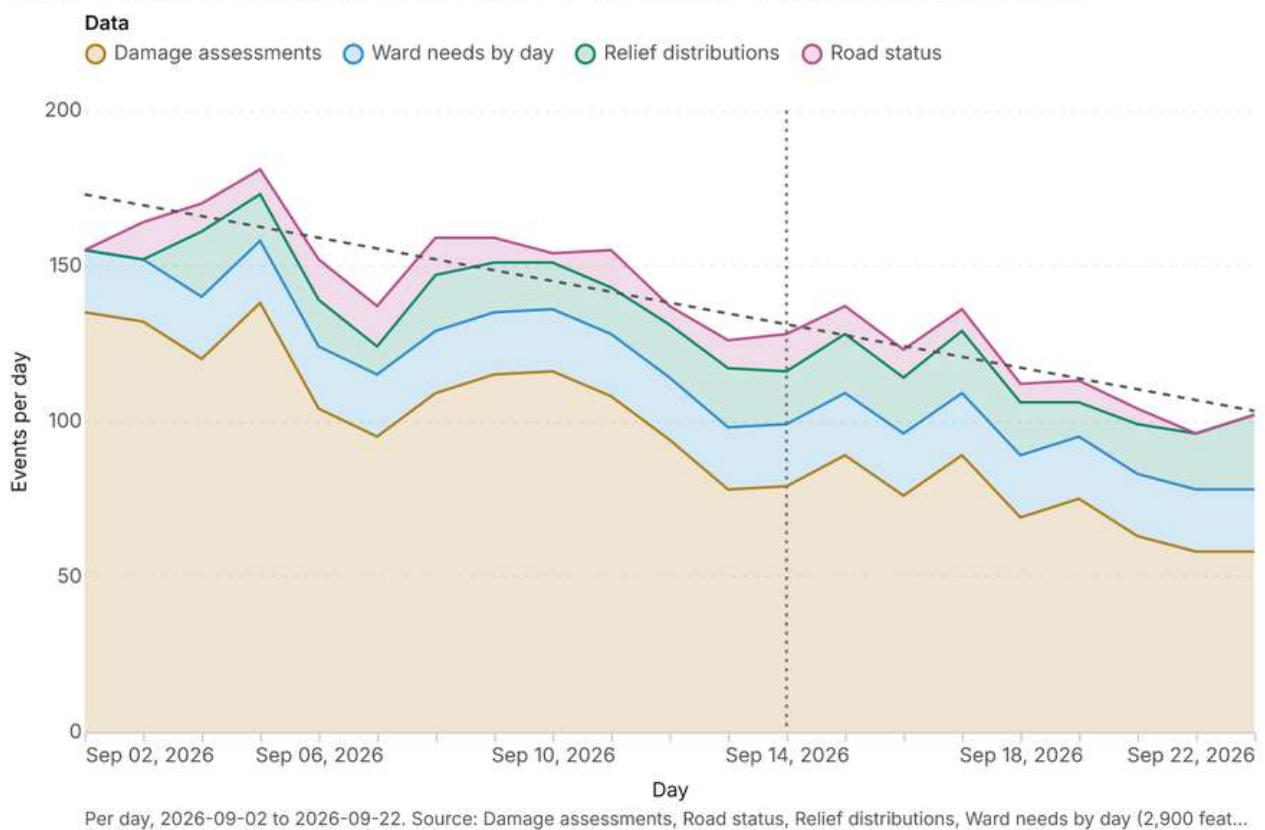


Figure 1. Timeline: events per day by dataset [1]. Per day, 2026-09-02 to 2026-09-22. Source: Damage assessments, Road status, Relief distributions, Ward needs by day (2,900 features). Dotted lines mark dates named in the project's documents. The data is in the appendix.

The timeline counts 2,900 dated events in Damage assessments, Road status, Relief distributions and 1 more per day, from 2026-09-02 to 2026-09-22 [1][2][3][4][5]. By dataset: Damage assessments 2,000; Ward needs by day 420; Relief distributions 320; Road status 160 [1]. The trend is -3.48 events per day; the second half of the days has 1,177 against 1,586 in the first (-25.8%) [1]. The project's documents name 1 date inside this span, drawn as dotted lines; the most named is 2026-09-14 (Situation report No [6]. 4, page 1, 1 mention) [6].

Busiest days

- 2026-09-05: 181 events [1]
- 2026-09-04: 170 events [1]

- 2026-09-03: 164 events [1]

Quietest days

- 2026-09-21: 96 events [1]

- 2026-09-22: 102 events [1]

- 2026-09-20: 104 events [1]

Hot spots

What this analysis is. Hot spot analysis: Getis-Ord Gi* hot and cold spots with z-scores, p-values and confidence bins [7]. In ArcGIS it is Find Hot Spots or Hot Spot Analysis (Getis-Ord Gi*); in QGIS, qgis:hotspot (plugin) [7].

Why it was run on this data. 320 points: Getis-Ord Gi* tests whether the concentrations in Relief distributions are statistically significant [8].

What it found. Hot spot analysis was performed using the Relief distributions layer [10]. The resulting analysis generated 320 features [9] and took 5 milliseconds to complete [9]. The total billing cost for this operation was 0.0564 [9].

Result	Value
result, count	320
result, elapsed ms	5
result, excluded null	0
result, distance band m	1,000
billing, cost	0.0564
billing, list price	0.0564
billing, upstream cost	0

Findings

Evidenced: Hot spots on Relief distributions: Hot spot analysis: 1 layer saved: Hot spot analysis: Relief distributions (320 features) [9][10].

Evidenced: It reported result, count 320; result, elapsed ms 5; result, excluded null 0; result, distance band m 1,000; billing, cost 0.0564; billing, list price 0.0564 [9].

Tool gp_hot_spots; parameters {"field": "households_served", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Relief distributions (83cbe688)", "aggregation": "hexagon", "cell_size_m": 1000.0, "distance_band_m": 1000.0}}

Hot spots

What this analysis is. Hot spot analysis: Getis-Ord Gi* hot and cold spots with z-scores, p-values and confidence bins [7]. In ArcGIS it is Find Hot Spots or Hot Spot Analysis (Getis-Ord Gi*); in QGIS, qgis:hotspot (plugin) [7].

Why it was run on this data. 60 points: Getis-Ord Gi* tests whether the concentrations in Water points are statistically significant [11].

What it found. The hot spot analysis used "Water points" as its input [13]. The process saved one layer titled "Hot spot analysis: Water points (20 features)" [12]. Results for the analysis indicated 20 bins and 20 counts, based on a cell size of 2,000 m [12]. The final billing cost associated with this analysis was 0.0512 [12].

Result	Value
result, bins	20
result, count	20
result, elapsed ms	3
result, cell size m	2,000

Result	Value
result, incidents used	60
result, distance band m	2,000
billing, cost	0.0512
billing, list price	0.0512
billing, upstream cost	0

Findings

Evidenced: Hot spots on Water points: Hot spot analysis: 1 layer saved: Hot spot analysis: Water points (20 features) [12][13].

Evidenced: It reported result, bins 20; result, count 20; result, elapsed ms 3; result, cell size m 2,000; result, incidents used 60; result, distance band m 2,000 [12].

Tool gp_hot_spots; parameters {"project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Water points (2a061d8c)"}, "aggregation": "hexagon", "cell_size_m": 2000.0, "distance_band_m": 2000.0}

Hot spots

What this analysis is. Hot spot analysis: Getis-Ord Gi* hot and cold spots with z-scores, p-values and confidence bins [7]. In ArcGIS it is Find Hot Spots or Hot Spot Analysis (Getis-Ord Gi*); in QGIS, qgis:hotspot (plugin) [7].

Why it was run on this data. 2000 points: Getis-Ord Gi* tests whether the concentrations in Damage assessments are statistically significant [14].

What it found. The hot spot analysis successfully generated one saved layer titled "Hot spot analysis: Damage assessments" [15].

Result	Value
result, count	2,000
result, elapsed ms	35
result, excluded null	0
result, distance band m	500
billing, cost	0.09
billing, list price	0.09
billing, upstream cost	0

Findings

Evidenced: Hot spots on Damage assessments: Hot spot analysis: 1 layer saved: Hot spot analysis: Damage assessments (2000 features) [15][16].

Evidenced: It reported result, count 2,000; result, elapsed ms 35; result, excluded null 0; result, distance band m 500; billing, cost 0.09; billing, list price 0.09 [15].

Tool gp_hot_spots; parameters {"field": "people_displaced", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Damage assessments (26bd99f3)"}, "aggregation": "hexagon", "cell_size_m": 500.0, "distance_band_m": 500.0}

Space time hot spots

What this analysis is. Emerging hot spots: Where hot spots are new, consecutive, intensifying, persistent, diminishing, sporadic, oscillating or historical over time [17]. In ArcGIS it is Emerging Hot Spot Analysis or Create Space Time Cube [17].

Why it was run on this data. Relief distributions carry dates in 'date': emerging hot spot analysis finds new, intensifying and fading hot spots per day [18].

What it found. Space time hot spots on Relief distributions: Emerging hot spots: 1 layer saved: Emerging hot spots: Relief distributions (54 features) [10][19]. It reported result, count 54; result, elapsed ms 10; result, resolution 8; result, features used 320; result, time neighbors 0; billing, cost 0.116 [19].

Result	Value
result, count	54
result, elapsed ms	10
result, resolution	8
result, features used	320
result, time neighbors	0
billing, cost	0.116
billing, list price	0.116
billing, upstream cost	0

Findings

Evidenced: Space time hot spots on Relief distributions: Emerging hot spots: 1 layer saved: Emerging hot spots: Relief distributions (54 features) [10][19].

Evidenced: It reported result, count 54; result, elapsed ms 10; result, resolution 8; result, features used 320; result, time neighbors 0; billing, cost 0.116 [19].

Tool gp_space_time_hot_spots; parameters {"agg": "sum", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Relief distributions (83cbe688)"}, "interval": "day", "bin_shape": "h3", "resolution": 8, "time_field": "date", "value_field": "households_served"}

Space time hot spots

What this analysis is. Emerging hot spots: Where hot spots are new, consecutive, intensifying, persistent, diminishing, sporadic, oscillating or historical over time [17]. In ArcGIS it is Emerging Hot Spot Analysis or Create Space Time Cube [17].

Why it was run on this data. Damage assessments carry dates in 'assessed_at': emerging hot spot analysis finds new, intensifying and fading hot spots per day [20].

What it found. Space time hot spots on Damage assessments: Emerging hot spots: 1 layer saved: Emerging hot spots: Damage assessments (87 features) [16][21]. It reported result, count 87; result, elapsed ms 18; result, resolution 8; result, features used 2,000; result, time neighbors 0; billing, cost 0.2 [21].

Result	Value
result, count	87
result, elapsed ms	18
result, resolution	8
result, features used	2,000
result, time neighbors	0
billing, cost	0.2
billing, list price	0.2
billing, upstream cost	0

Findings

Evidenced: Space time hot spots on Damage assessments: Emerging hot spots: 1 layer saved: Emerging hot spots: Damage assessments (87 features) [16][21].

Evidenced: It reported result, count 87; result, elapsed ms 18; result, resolution 8; result, features used 2,000; result, time neighbors 0; billing, cost 0.2 [21].

Tool gp_space_time_hot_spots; parameters {"agg": "sum", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Damage assessments (26bd99f3)"}, "interval": "day", "bin_shape": "h3", "resolution": 8, "time_field": "assessed_at", "value_field": "households_served"}

"people_displaced"]}

Near repeat

What this analysis is. Repeat and near repeat classification: Classify incidents as originators, repeats (same place) or near repeats within a distance and time window, with a Knox test table [22]. In ArcGIS it is Repeat and Near Repeat Classification or Near Repeat Calculator [22].

Why it was run on this data. Near repeat analysis tests whether Relief distributions close in space also follow each other within 3 days [23].

What it found. Near repeat on Relief distributions: Repeat and near repeat classification: 1 layer saved: Repeat and near repeat classification: Relief distributions (320 features) [10][24]. It reported result, days 3; result, count 320; result, chains 41; result, distance m 500; result, elapsed ms 13; result, pairs linked 742 [24].

Result	Value
result, days	3
result, count	320
result, chains	41
result, distance m	500
result, elapsed ms	13
result, pairs linked	742
billing, cost	0.0596
billing, list price	0.0596
billing, upstream cost	0

Findings

Evidenced: Near repeat on Relief distributions: Repeat and near repeat classification: 1 layer saved: Repeat and near repeat classification: Relief distributions (320 features) [10][24].

Evidenced: It reported result, days 3; result, count 320; result, chains 41; result, distance m 500; result, elapsed ms 13; result, pairs linked 742 [24].

Tool gp_near_repeat; parameters {"days": 3, "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Relief distributions (83cbe688)"}, "distance_m": 500.0, "time_field": "date"}

Summarize within

What this analysis is. Summarize within: Count and aggregate the features inside each polygon (or bin), proportionally for lines and polygons [25]. In ArcGIS it is Summarize Within or Aggregate Points; in QGIS, native:countpointsinpolygon or native:sumlinelengths [25].

Why it was run on this data. Count Shelters inside each feature of Wards by type; the counts map as a choropleth (natural breaks, sequential colors) [26].

What it found. Summarize within on Shelters, Wards: Summarize within: 1 layer saved: Summarize within: Wards (20 features) [27][28][29]. It reported result, count 20; result, elapsed ms 0; billing, cost 0.01092; billing, list price 0.01092; billing, upstream cost 0 [27].

Result	Value
result, count	20
result, elapsed ms	0
billing, cost	0.01092
billing, list price	0.01092
billing, upstream cost	0

Findings

Evidenced: Summarize within on Shelters, Wards: Summarize within: 1 layer saved: Summarize within: Wards (20 features) [27][28][29].

Evidenced: It reported result, count 20; result, elapsed ms 0; billing, cost 0.01092; billing, list price 0.01092; billing, upstream cost 0 [27].

Tool gp_summarize_within; parameters {"stats": [{"stat": "sum", "field": "capacity"}], "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Shelters (ee1b31b2)", "group_by": "type", "polygons": {"layer": "Wards (b338e26e)"}}

Summarize within

What this analysis is. Summarize within: Count and aggregate the features inside each polygon (or bin), proportionally for lines and polygons [25]. In ArcGIS it is Summarize Within or Aggregate Points; in QGIS, native:countpointsinpolygon or native:sumlinelengths [25].

Why it was run on this data. Count Shelters inside each feature of Wards by type; the counts map as a choropleth (natural breaks, sequential colors) [26].

What it found. Summarize within on Relief distributions, Wards: Summarize within: 1 layer saved: Summarize within: Wards (20 features) [10][29][30]. It reported result, count 20; result, elapsed ms 1; billing, cost 0.01682; billing, list price 0.01682; billing, upstream cost 0 [30].

Result	Value
result, count	20
result, elapsed ms	1
billing, cost	0.01682
billing, list price	0.01682
billing, upstream cost	0

Findings

Evidenced: Summarize within on Relief distributions, Wards: Summarize within: 1 layer saved: Summarize within: Wards (20 features) [10][29][30].

Evidenced: It reported result, count 20; result, elapsed ms 1; billing, cost 0.01682; billing, list price 0.01682; billing, upstream cost 0 [30].

Tool gp_summarize_within; parameters {"stats": [{"stat": "sum", "field": "households_served"}], "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Relief distributions (83cbe688)", "group_by": "item", "polygons": {"layer": "Wards (b338e26e)"}}

Summarize within

What this analysis is. Summarize within: Count and aggregate the features inside each polygon (or bin), proportionally for lines and polygons [25]. In ArcGIS it is Summarize Within or Aggregate Points; in QGIS, native:countpointsinpolygon or native:sumlinelengths [25].

Why it was run on this data. Count Shelters inside each feature of Wards by type; the counts map as a choropleth (natural breaks, sequential colors) [26].

What it found. Summarize within on Health posts, Wards: Summarize within: 1 layer saved: Summarize within: Wards (20 features) [29][31][32]. It reported result, count 20; result, elapsed ms 0; billing, cost 0.01082; billing, list price 0.01082; billing, upstream cost 0 [31].

Result	Value
result, count	20
result, elapsed ms	0
billing, cost	0.01082

Result	Value
billing, list price	0.01082
billing, upstream cost	0

Findings

Evidenced: Summarize within on Health posts, Wards: Summarize within: 1 layer saved: Summarize within: Wards (20 features) [29][31][32].

Evidenced: It reported result, count 20; result, elapsed ms 0; billing, cost 0.01082; billing, list price 0.01082; billing, upstream cost 0 [31].

Tool gp_summarize_within; parameters {"stats": [{"stat": "sum", "field": "beds"}], "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Health posts (7aed59a8)", "group_by": "functional", "polygons": {"layer": "Wards (b338e26e)"}}

Find point clusters

What this analysis is. Find point clusters: Density-based clusters (DBSCAN, HDBSCAN or OPTICS, optionally space-time) with hulls and noise [33]. In ArcGIS it is Find Point Clusters or Density-based Clustering; in QGIS, native:dbscanclustering or native:stdbcanclustering [33].

Why it was run on this data. DBSCAN finds dense groups of Shelters and separates noise [34].

What it found. The `gp\_find\_point\_clusters` tool was used on the Shelters data [28] to identify point clusters. The process resulted in a count of 25 clusters and 2 noise points [35]. The output contained 2 layers, specifically listing "Shelters (25 features)" and "cluster hulls (1 feature)" [35]. The computation was efficient, completing in an elapsed time of 4 ms [35].

Result	Value
result, count	25
result, noise	2
result, distance m	2,000
result, elapsed ms	4
result, min points	3
billing, cost	0.0505
billing, list price	0.0505
billing, upstream cost	0

Findings

Evidenced: Find point clusters on Shelters: Find point clusters: 2 layers saved: Find point clusters: Shelters (25 features); Find point clusters: cluster hulls (1 feature) [28][35].

Evidenced: It reported result, count 25; result, noise 2; result, distance m 2,000; result, elapsed ms 4; result, min points 3; billing, cost 0.0505 [35].

Tool gp_find_point_clusters; parameters {"method": "dbscan", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Shelters (ee1b31b2)", "distance_m": 2000.0, "min_points": 3}}

Find point clusters

What this analysis is. Find point clusters: Density-based clusters (DBSCAN, HDBSCAN or OPTICS, optionally space-time) with hulls and noise [33]. In ArcGIS it is Find Point Clusters or Density-based Clustering; in QGIS, native:dbscanclustering or native:stdbcanclustering [33].

Why it was run on this data. DBSCAN finds dense groups of Relief distributions and separates noise [36].

What it found. Find point clusters on Relief distributions: Find point clusters: 2 layers saved: Find point clusters: Relief distributions (320 features); Find point clusters: cluster hulls (21 features) [10][37]. It reported result, count 320; result,

noise 12; result, distance m 500; result, elapsed ms 10; result, min points 8; billing, cost 0.0564 [37].

Result	Value
result, count	320
result, noise	12
result, distance m	500
result, elapsed ms	10
result, min points	8
billing, cost	0.0564
billing, list price	0.0564
billing, upstream cost	0

Findings

Evidenced: Find point clusters on Relief distributions: Find point clusters: 2 layers saved: Find point clusters: Relief distributions (320 features); Find point clusters: cluster hulls (21 features) [10][37].

Evidenced: It reported result, count 320; result, noise 12; result, distance m 500; result, elapsed ms 10; result, min points 8; billing, cost 0.0564 [37].

Tool gp_find_point_clusters; parameters {"method": "dbscan", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Relief distributions (83cbe688)"}, "distance_m": 500.0, "min_points": 8}

Find point clusters

What this analysis is. Find point clusters: Density-based clusters (DBSCAN, HDBSCAN or OPTICS, optionally space-time) with hulls and noise [33]. In ArcGIS it is Find Point Clusters or Density-based Clustering; in QGIS, native:dbscanclustering or native:stdbcanclustering [33].

Why it was run on this data. DBSCAN finds dense groups of Health posts and separates noise [38].

What it found. Find point clusters on Health posts: Find point clusters: 2 layers saved: Find point clusters: Health posts (20 features); Find point clusters: cluster hulls (2 features) [32][39]. It reported result, count 20; result, noise 1; result, distance m 2,000; result, elapsed ms 1; result, min points 3; billing, cost 0.0504 [39].

Result	Value
result, count	20
result, noise	1
result, distance m	2,000
result, elapsed ms	1
result, min points	3
billing, cost	0.0504
billing, list price	0.0504
billing, upstream cost	0

Findings

Evidenced: Find point clusters on Health posts: Find point clusters: 2 layers saved: Find point clusters: Health posts (20 features); Find point clusters: cluster hulls (2 features) [32][39].

Evidenced: It reported result, count 20; result, noise 1; result, distance m 2,000; result, elapsed ms 1; result, min points 3; billing, cost 0.0504 [39].

Tool gp_find_point_clusters; parameters {"method": "dbscan", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Health posts (7aed59a8)"}, "distance_m": 2000.0, "min_points": 3}

Calculate density

What this analysis is. Calculate density: Kernel density per square kilometer on a grid [40]. In ArcGIS it is Calculate Density or Kernel Density; in QGIS, native:heatmapkerneldensityestimation [40].

Why it was run on this data. 25 points in Shelters: a density surface shows where they concentrate [41].

What it found. Calculate density on Shelters: Calculate density: 1 layer saved: Calculate density: Shelters (90 features) [28][42]. It reported result, count 90; result, elapsed ms 4; result, bandwidth m 2,000; result, cell size m 1,000; result, excluded null 0; result, max density per km2 0.8364 [42].

Result	Value
result, count	90
result, elapsed ms	4
result, bandwidth m	2,000
result, cell size m	1,000
result, excluded null	0
result, max density per km2	0.8364
billing, cost	0.0505
billing, list price	0.0505
billing, upstream cost	0

Findings

Evidenced: Calculate density on Shelters: Calculate density: 1 layer saved: Calculate density: Shelters (90 features) [28][42].

Evidenced: It reported result, count 90; result, elapsed ms 4; result, bandwidth m 2,000; result, cell size m 1,000; result, excluded null 0; result, max density per km2 0.8364 [42].

Tool gp_calculate_density; parameters {"kernel": "quartic", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Shelters (ee1b31b2)"}, "bandwidth_m": 2000.0, "cell_size_m": 1000.0}

Calculate density

What this analysis is. Calculate density: Kernel density per square kilometer on a grid [40]. In ArcGIS it is Calculate Density or Kernel Density; in QGIS, native:heatmapkerneldensityestimation [40].

Why it was run on this data. 320 points in Relief distributions: a density surface shows where they concentrate [43].

What it found. Calculate density on Relief distributions: Calculate density: 1 layer saved: Calculate density: Relief distributions (222 features) [10][44]. It reported result, count 222; result, elapsed ms 7; result, bandwidth m 1,000; result, cell size m 500; result, excluded null 0; result, max density per km2 5,070 [44].

Result	Value
result, count	222
result, elapsed ms	7
result, bandwidth m	1,000
result, cell size m	500
result, excluded null	0
result, max density per km2	5,070
billing, cost	0.0564
billing, list price	0.0564
billing, upstream cost	0

Findings

Evidenced: Calculate density on Relief distributions: Calculate density: 1 layer saved: Calculate density: Relief distributions (222 features) [10][44].

Evidenced: It reported result, count 222; result, elapsed ms 7; result, bandwidth m 1,000; result, cell size m 500; result, excluded null 0; result, max density per km2 5,070 [44].

Tool gp_calculate_density; parameters {"kernel": "quartic", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Relief distributions (83cbe688)"}, "bandwidth_m": 1000.0, "cell_size_m": 500.0, "weight_field": "households_served"}

Calculate density

What this analysis is. Calculate density: Kernel density per square kilometer on a grid [40]. In ArcGIS it is Calculate Density or Kernel Density; in QGIS, native:heatmapkerneldensityestimation [40].

Why it was run on this data. 20 points in Health posts: a density surface shows where they concentrate [45].

What it found. The density was calculated using the `gp\_calculate\_density` tool [46], processing the Health posts layer [32] across 228 features [46].

Result	Value
result, count	228
result, elapsed ms	6
result, bandwidth m	5,000
result, cell size m	1,000
result, excluded null	0
result, max density per km2	6.578
billing, cost	0.0504
billing, list price	0.0504
billing, upstream cost	0

Findings

Evidenced: Calculate density on Health posts: Calculate density: 1 layer saved: Calculate density: Health posts (228 features) [32][46].

Evidenced: It reported result, count 228; result, elapsed ms 6; result, bandwidth m 5,000; result, cell size m 1,000; result, excluded null 0; result, max density per km2 6.578 [46].

Tool gp_calculate_density; parameters {"kernel": "quartic", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Health posts (7aed59a8)"}, "bandwidth_m": 5000.0, "cell_size_m": 1000.0, "weight_field": "beds"}

Outliers

What this analysis is. Find outliers: Anselin local Moran's I: HH, LL clusters and HL, LH outliers [47]. In ArcGIS it is Find Outliers or Cluster and Outlier Analysis (Anselin Local Moran's I) [47].

Why it was run on this data. Local Moran's I maps clusters and outliers of 'population' [48].

What it found. Outliers on Wards: Find outliers: 1 layer saved: Find outliers: Wards (20 features) [29][49]. It reported result, count 20; result, elapsed ms 4; result, permutations 199; result, excluded null 0; result, distance band m 1,735; billing, cost 0.0506 [49].

Result	Value
result, count	20
result, elapsed ms	4
result, permutations	199
result, excluded null	0
result, distance band m	1,735
billing, cost	0.0506
billing, list price	0.0506

Result	Value
billing, upstream cost	0

Findings

Evidenced: Outliers on Wards: Find outliers: 1 layer saved: Find outliers: Wards (20 features) [29][49].

Evidenced: It reported result, count 20; result, elapsed ms 4; result, permutations 199; result, excluded null 0; result, distance band m 1,735; billing, cost 0.0506 [49].

Tool gp_outliers; parameters {"field": "population", "project": "affd1e20-248c-4f96-b09d-48d3027477be", "features": {"layer": "Wards (b338e26e)"}, "aggregation": "hexagon"}

Maps and charts

The run also made 20 map image(s) [50][51][52][53][54][55][56][57][58][59][60][61][62][63][64][65][66][67][68][69] and 26 chart(s) [70][71][72][73][74][75][76][77][78][79][80][81][82][83][84][85][86][87][88][89][90][91][92][93][94][95].

Hot spot analysis: Relief distributions

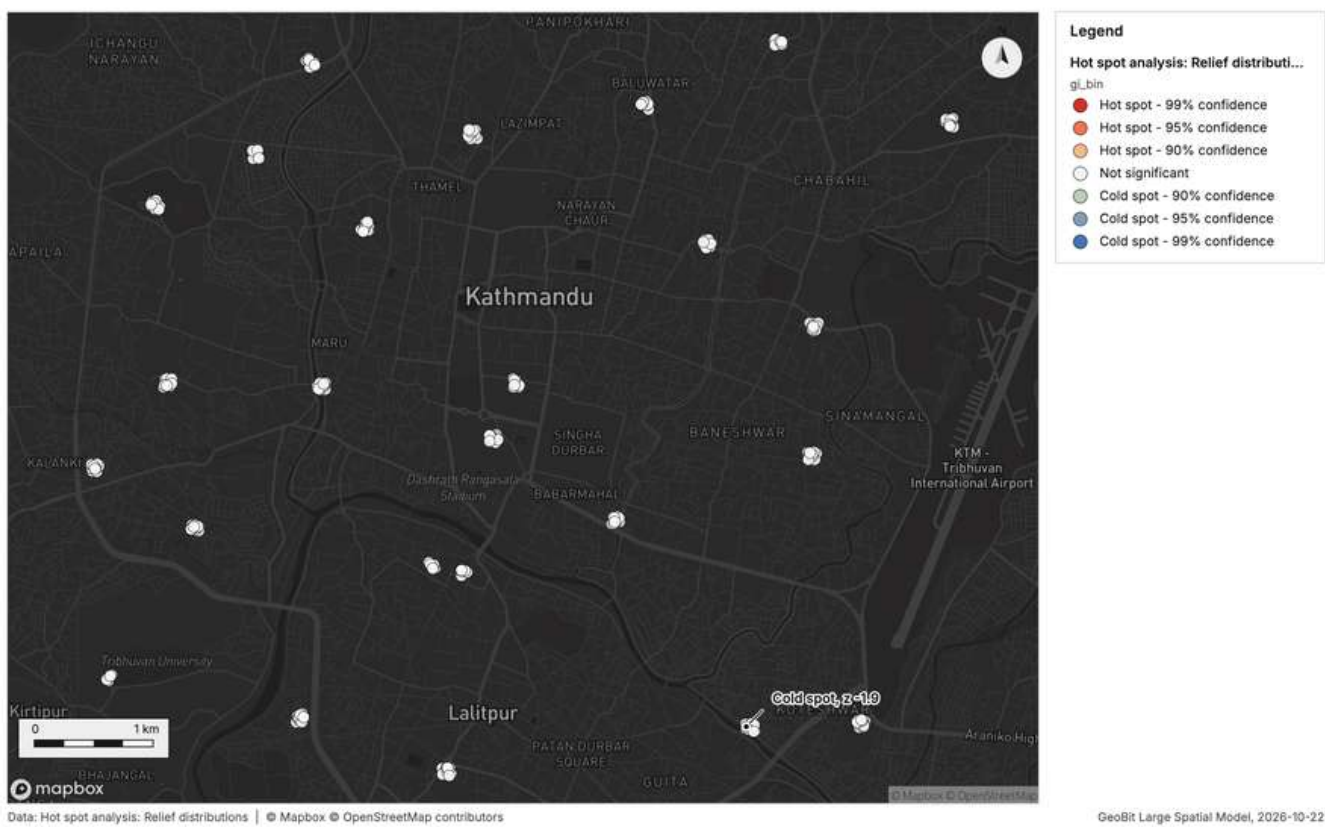


Figure 2. Hot spot analysis: Relief distributions [50]

Hot spot analysis: Water points



Figure 3. Hot spot analysis: Water points [51]

Hot spot analysis: Damage assessments

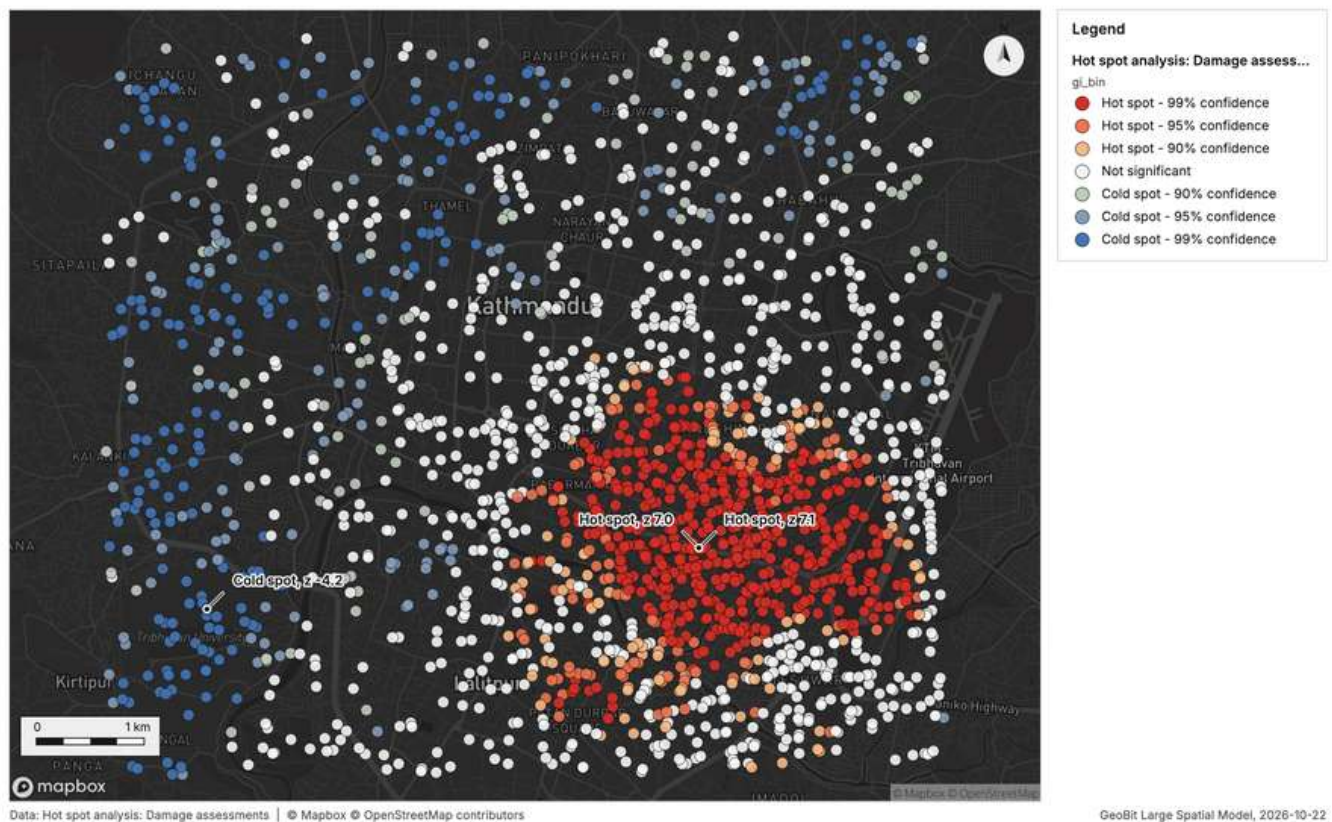


Figure 4. Hot spot analysis: Damage assessments [52]

Emerging hot spots: Relief distributions



Figure 5. Emerging hot spots: Relief distributions [53]

Emerging hot spots: Damage assessments



Figure 6. Emerging hot spots: Damage assessments [54]

Repeat and near repeat classification: Relief distributions

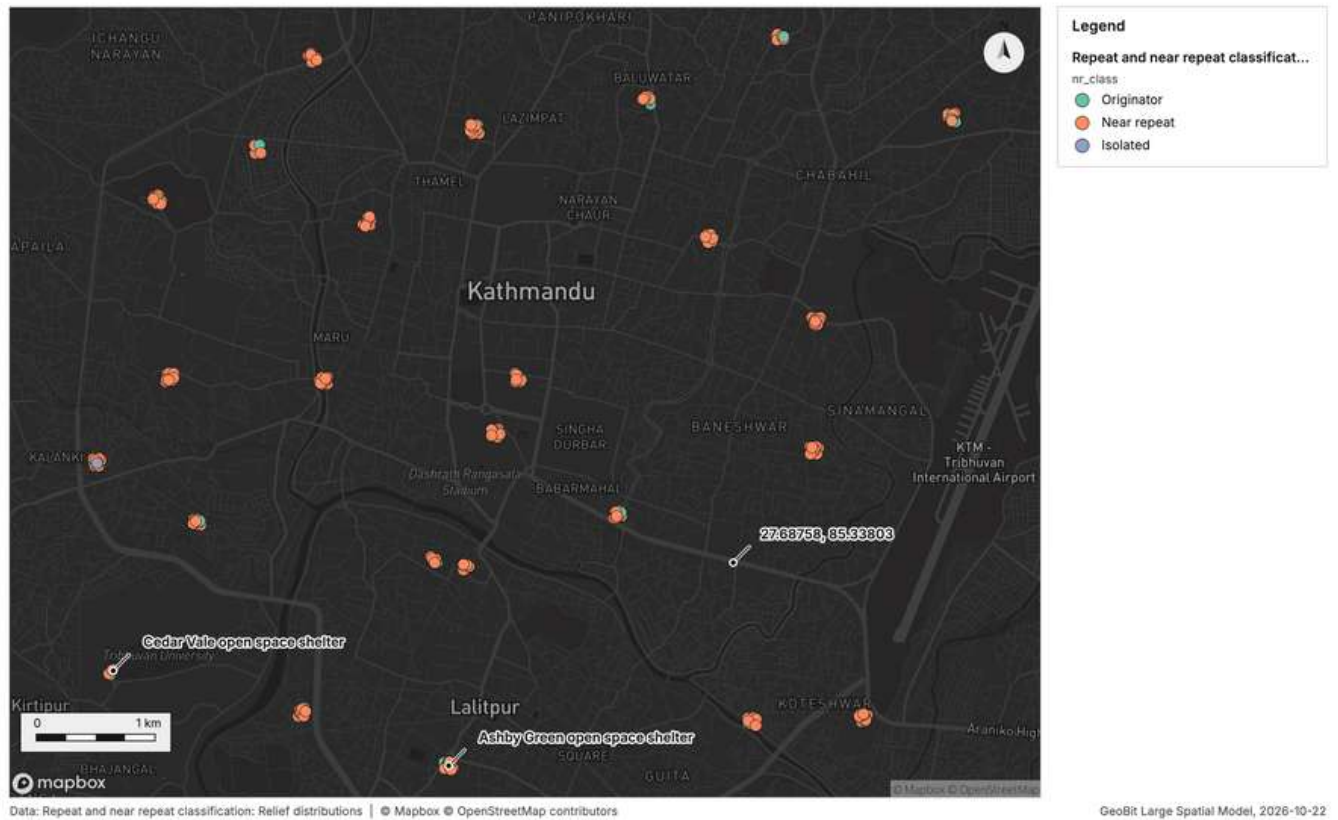


Figure 7. Repeat and near repeat classification: Relief distributions [55]

Summarize within: Wards



Figure 8. Summarize within: Wards [56]

Summarize within: Wards



Figure 9. Summarize within: Wards [57]

Summarize within: Wards

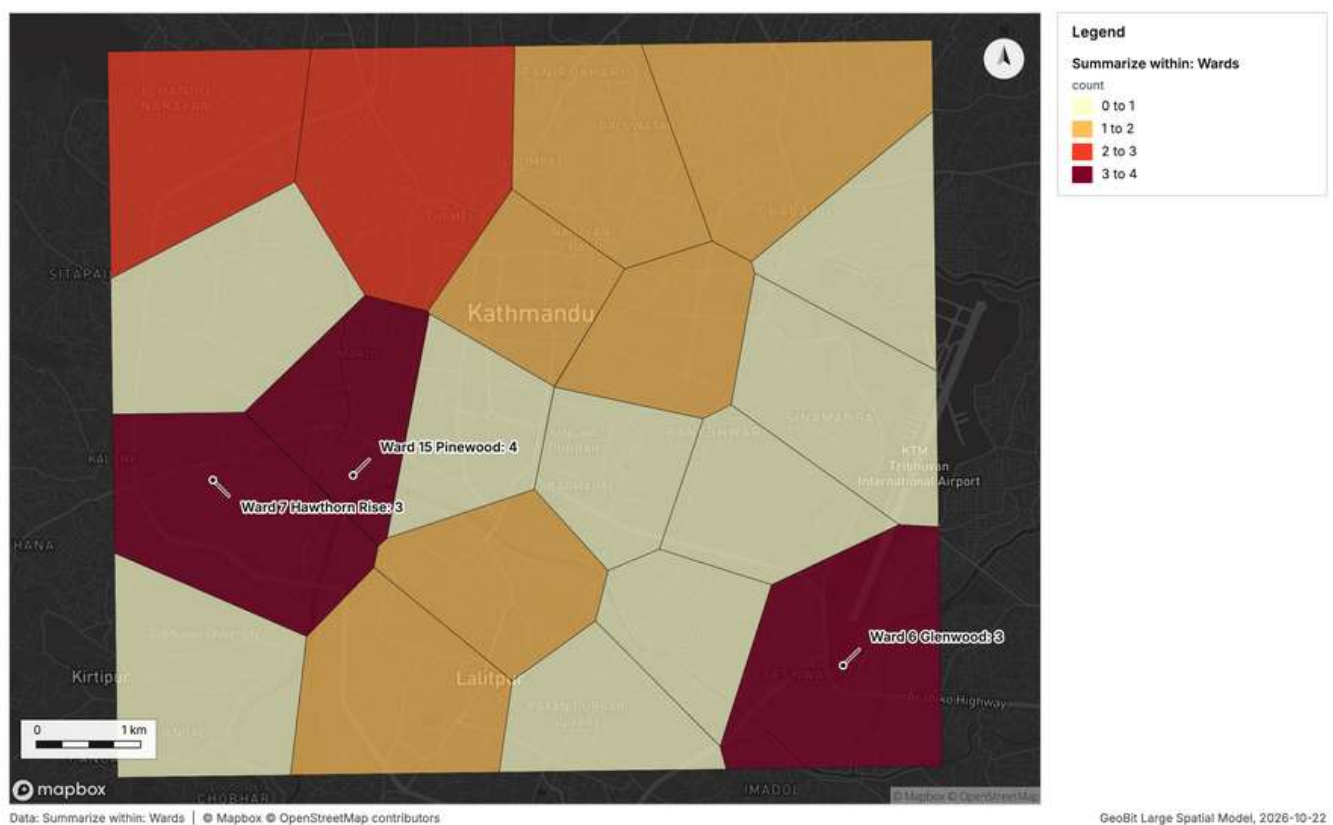


Figure 10. Summarize within: Wards [58]

Find point clusters: Shelters

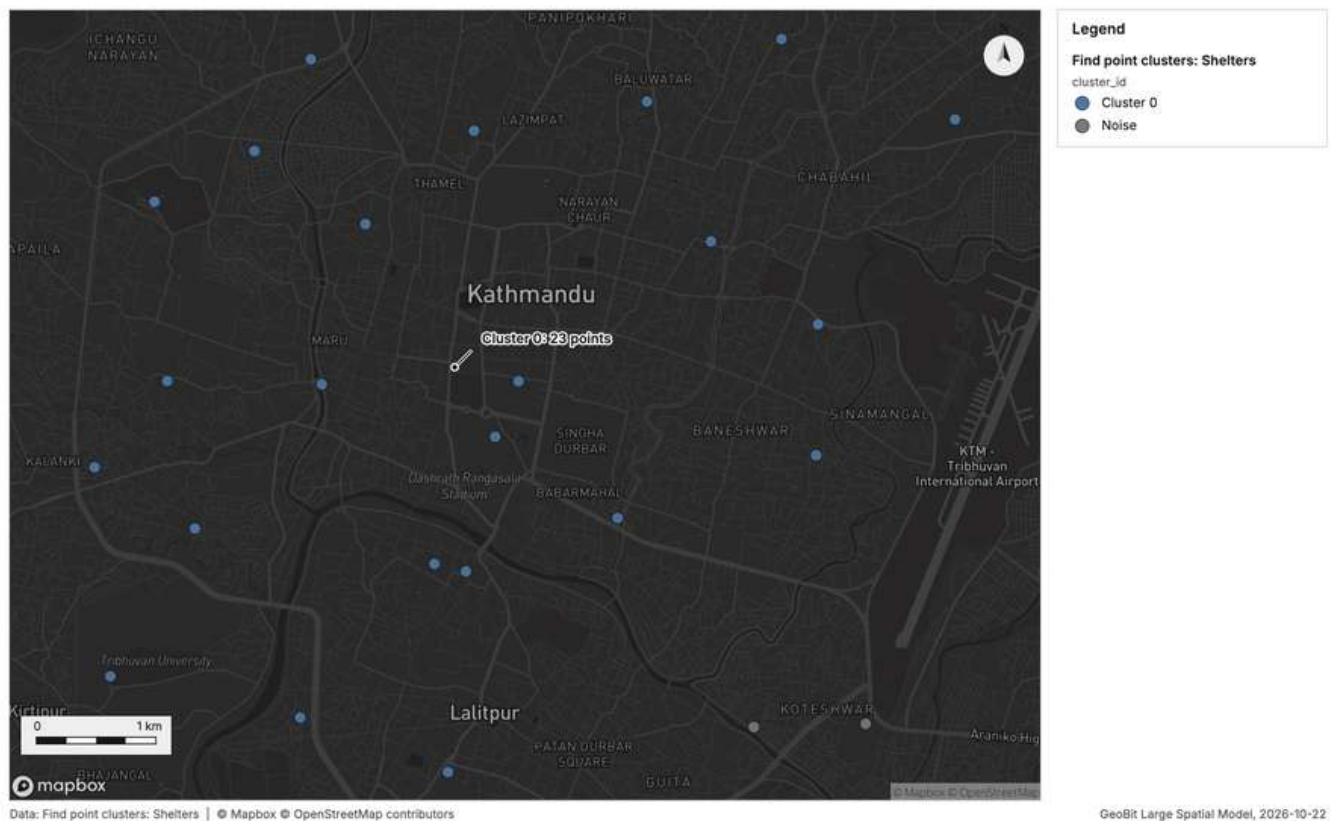


Figure 11. Find point clusters: Shelters [59]

Find point clusters: cluster hulls



Figure 12. Find point clusters: cluster hulls [60]

Find point clusters: Relief distributions

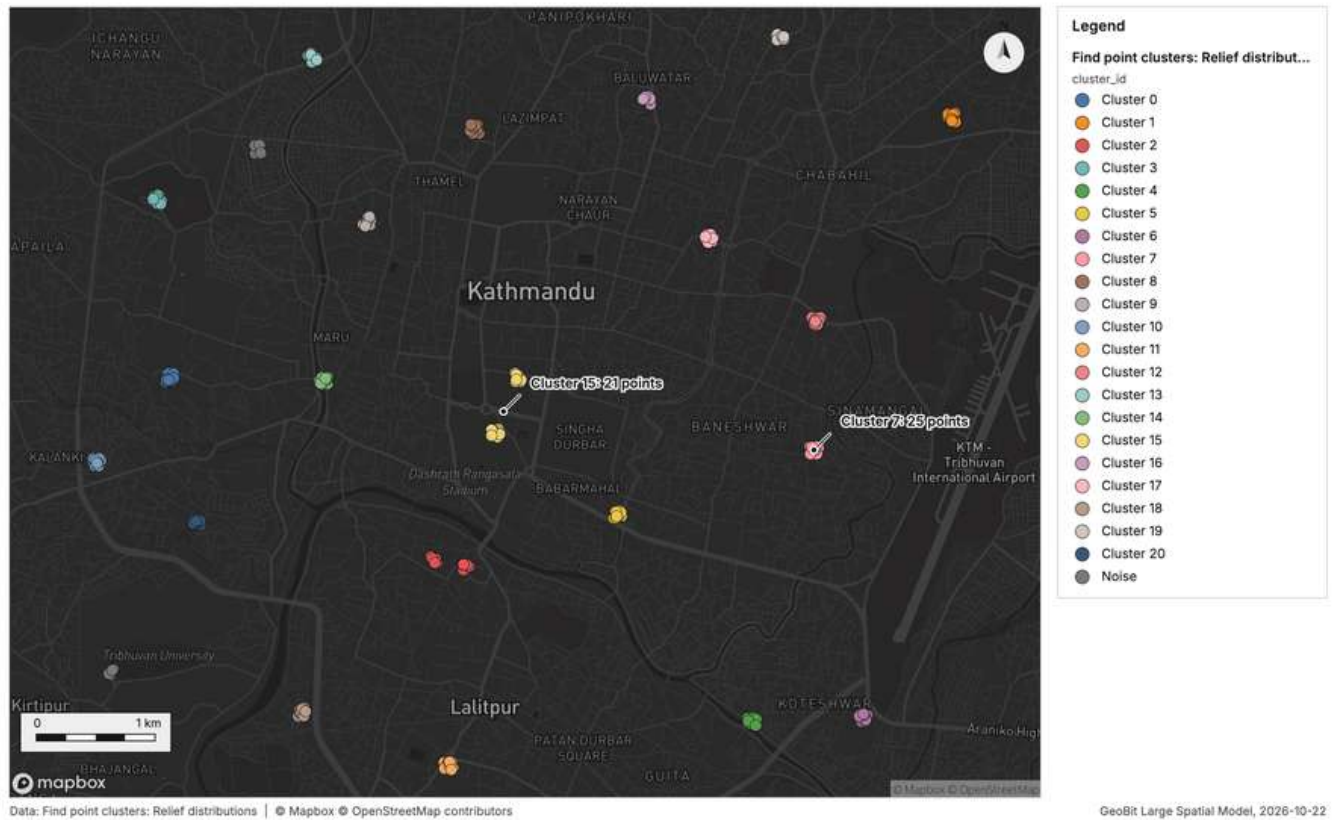


Figure 13. Find point clusters: Relief distributions [61]

Find point clusters: cluster hulls

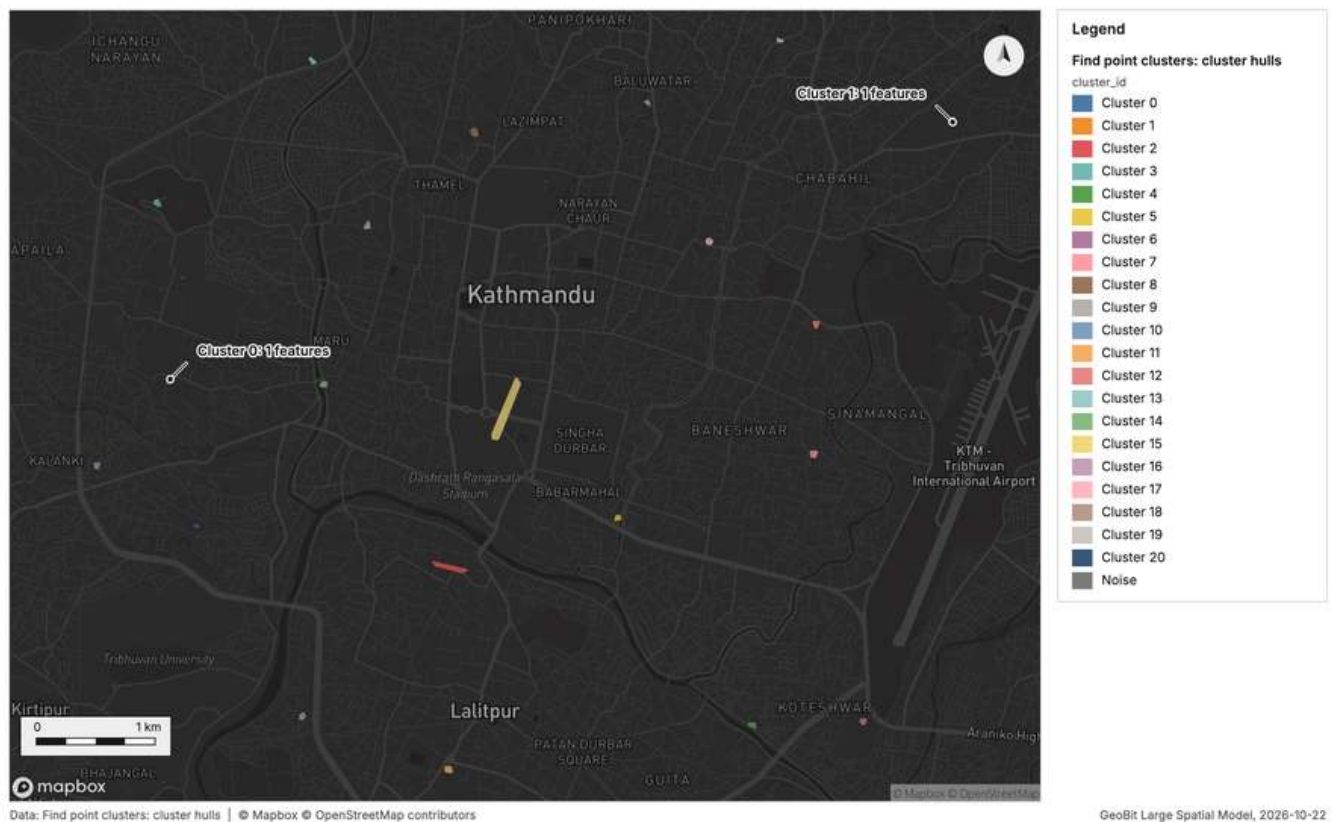


Figure 14. Find point clusters: cluster hulls [62]

Find point clusters: Health posts

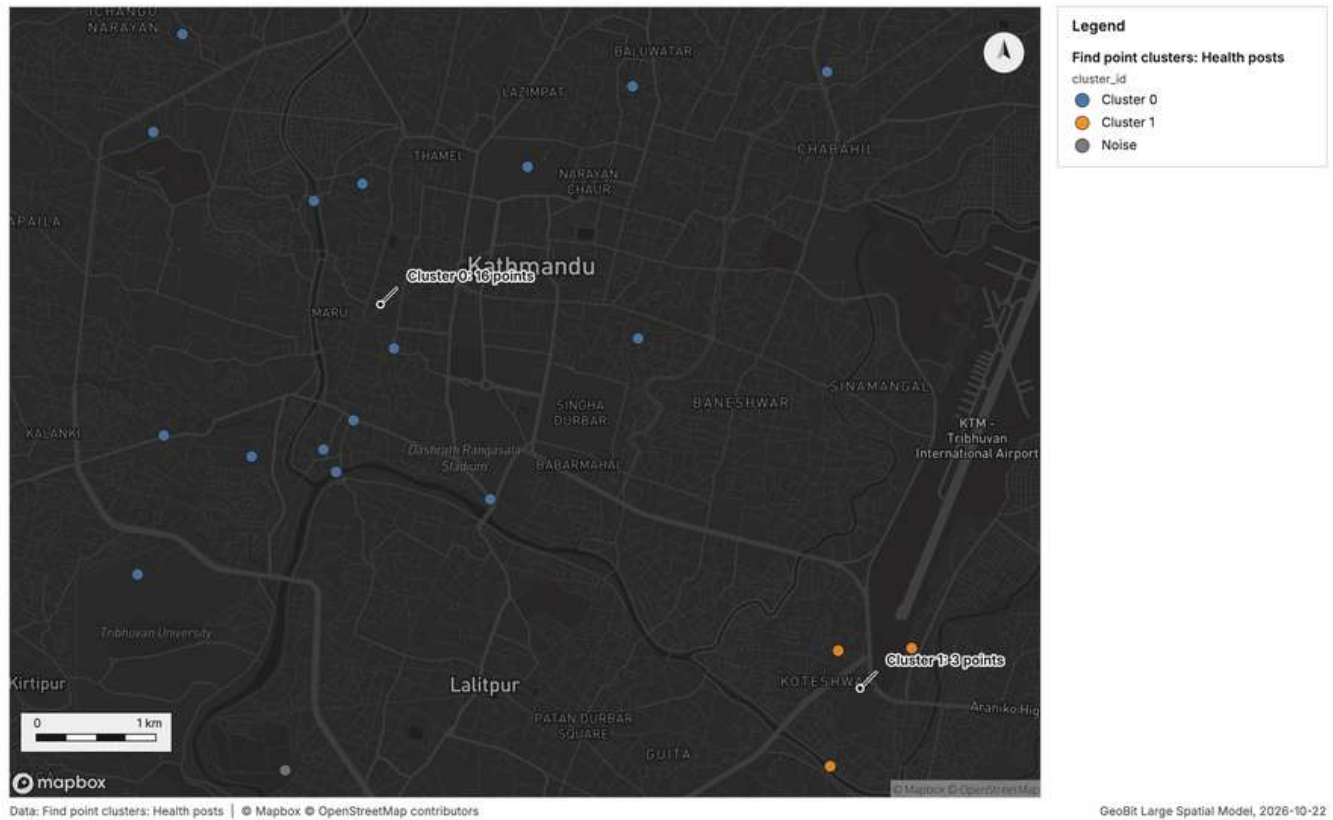


Figure 15. Find point clusters: Health posts [63]

Find point clusters: cluster hulls

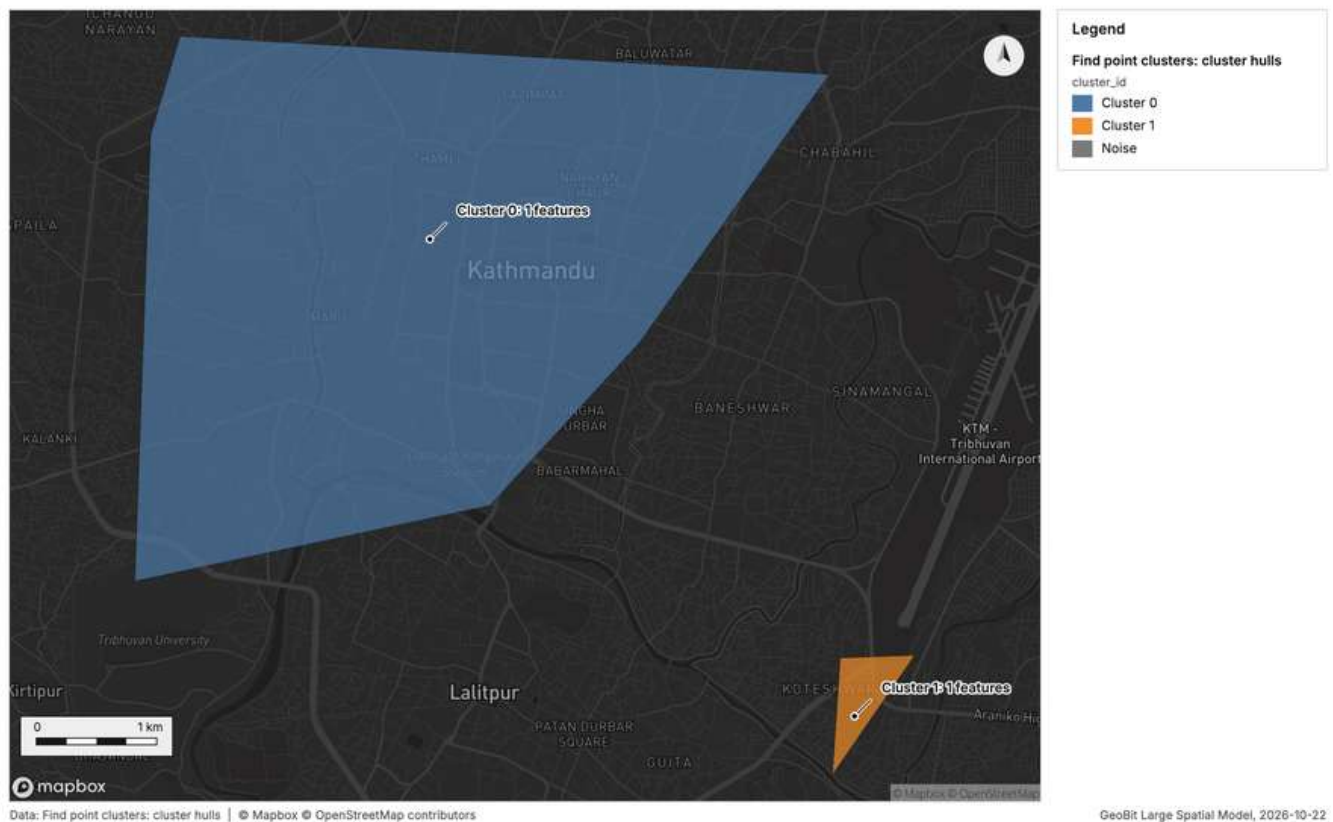


Figure 16. Find point clusters: cluster hulls [64]

Calculate density: Shelters

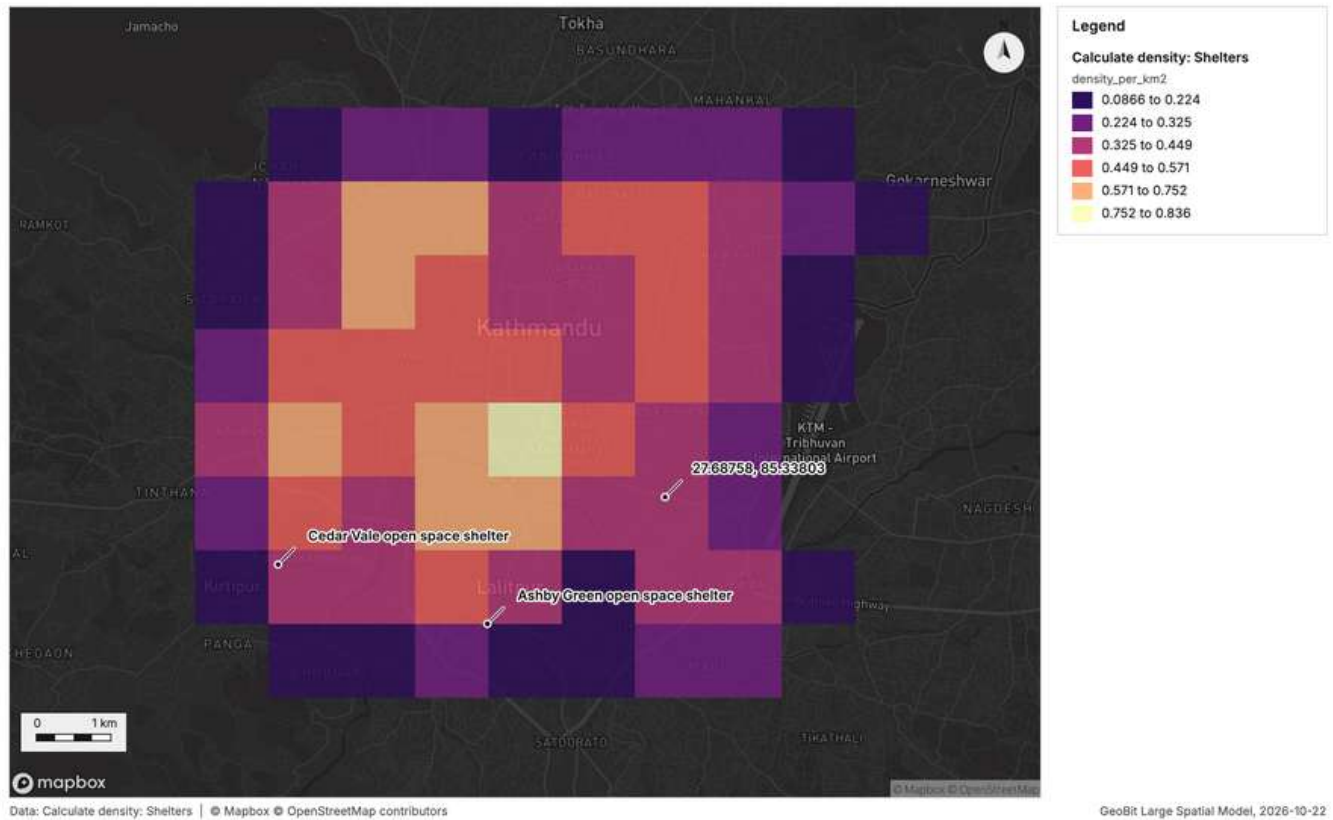


Figure 17. Calculate density: Shelters [65]

Calculate density: Relief distributions



Figure 18. Calculate density: Relief distributions [66]

Calculate density: Health posts

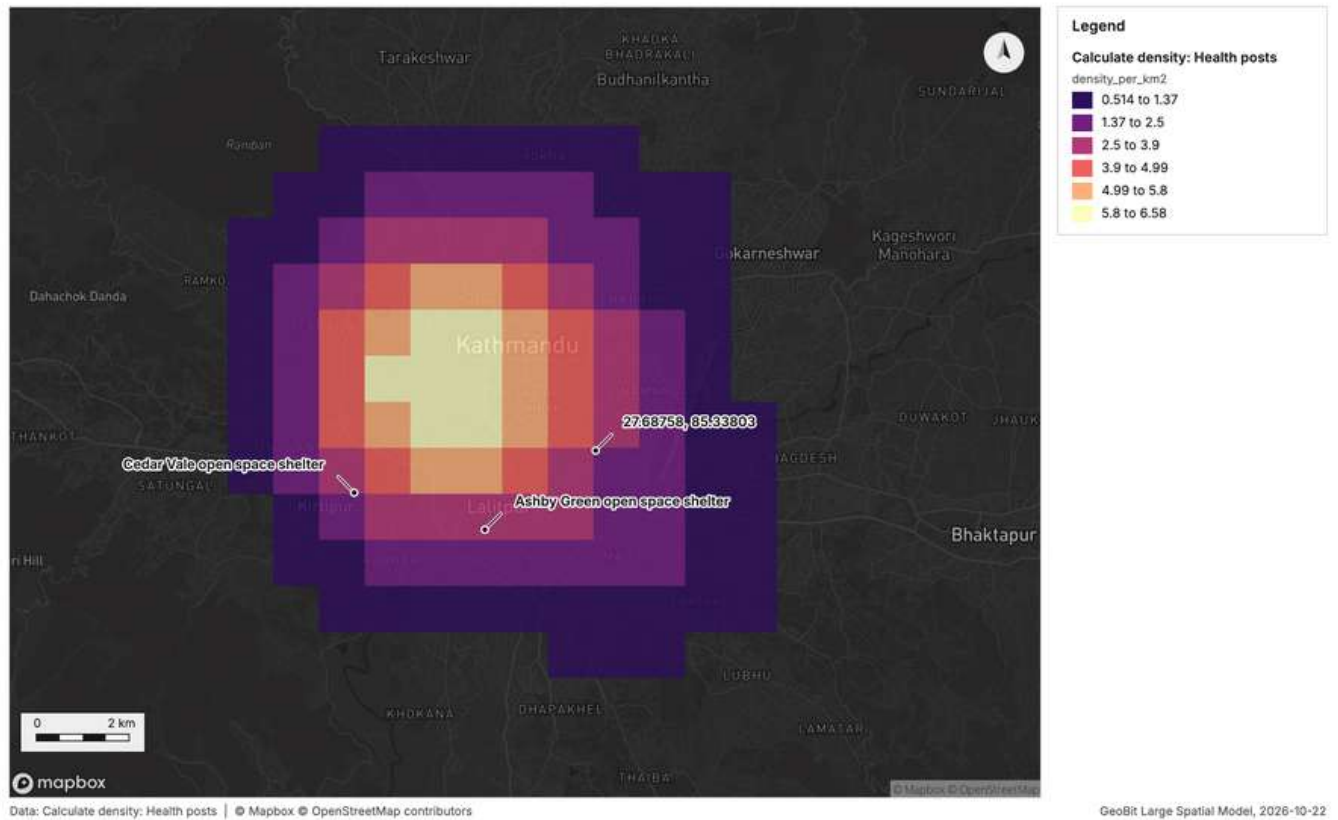


Figure 19. Calculate density: Health posts [67]

Wards by population

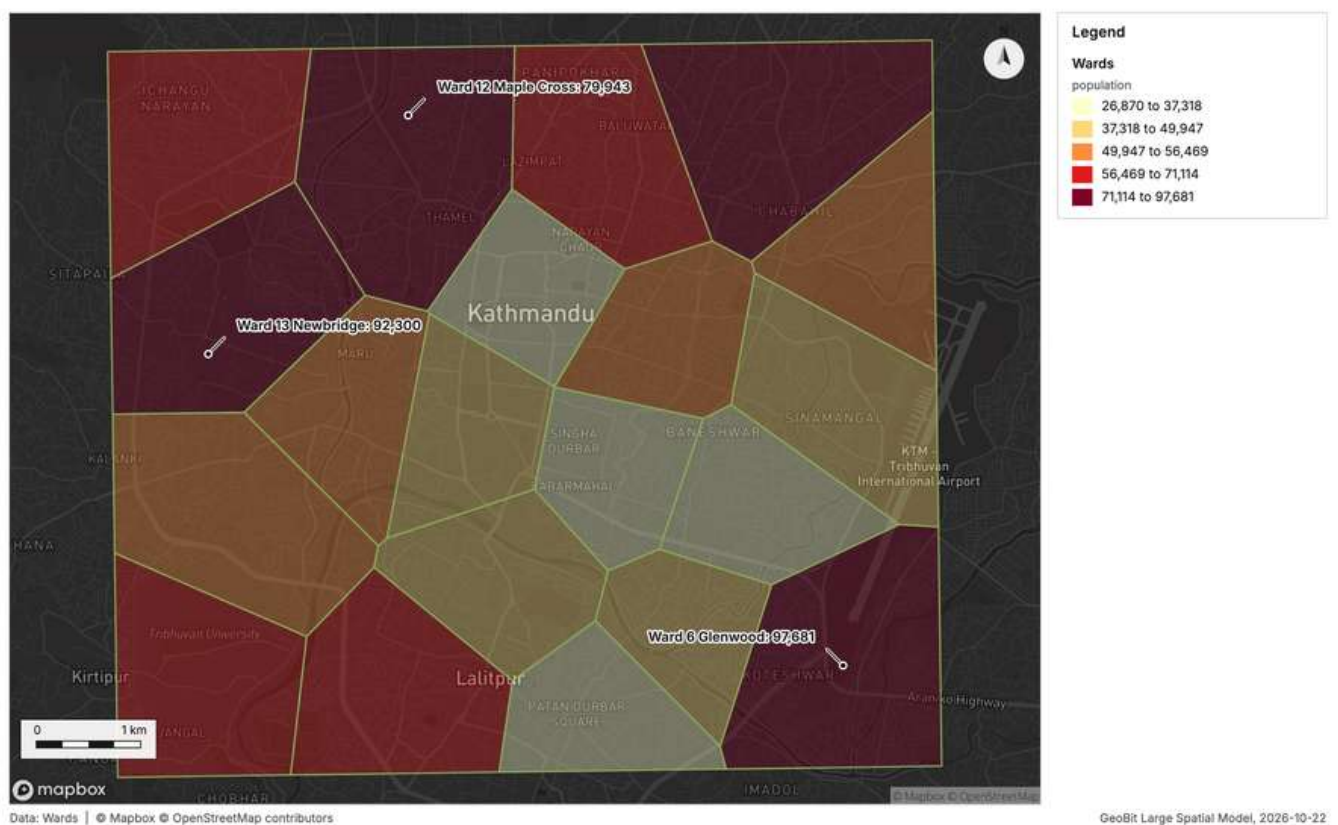


Figure 20. Wards by population [68]

Find outliers: Wards

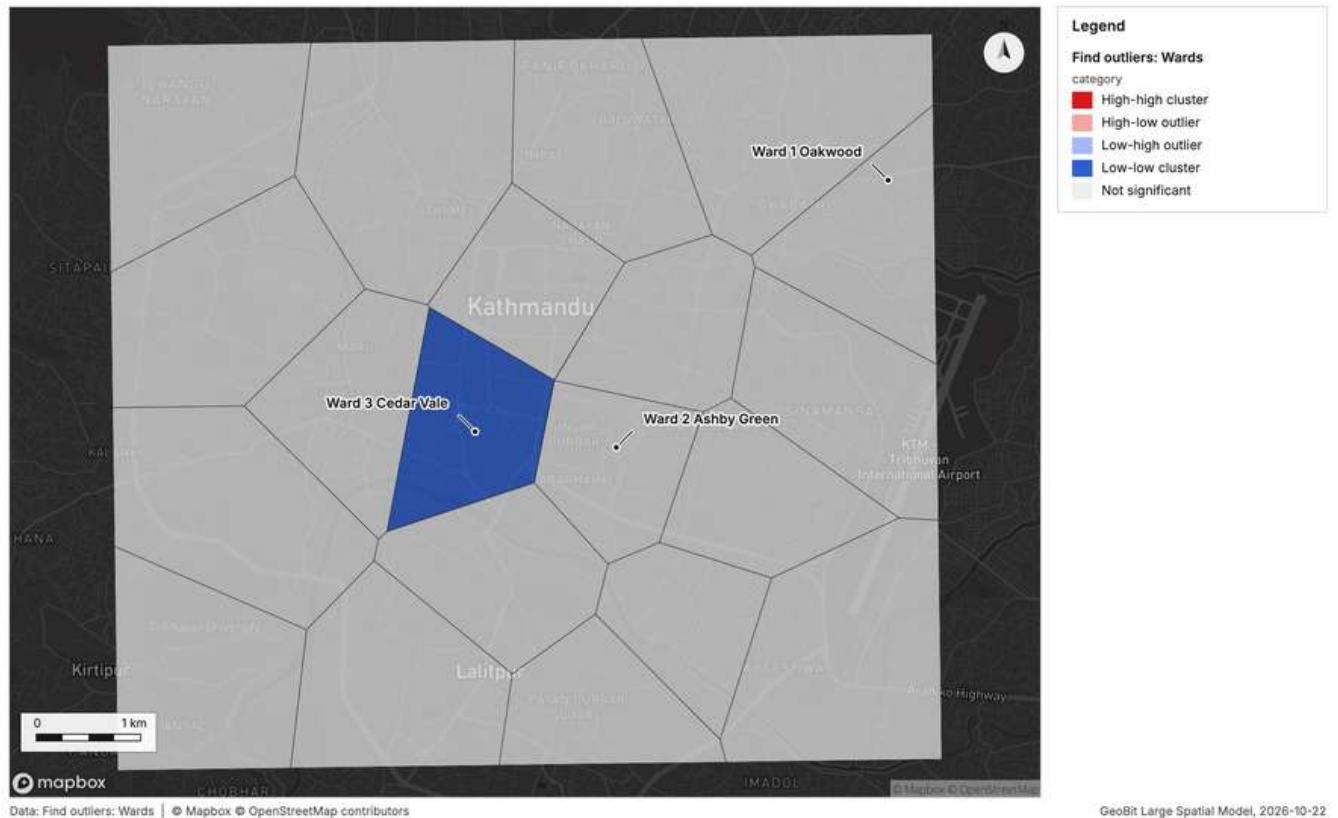


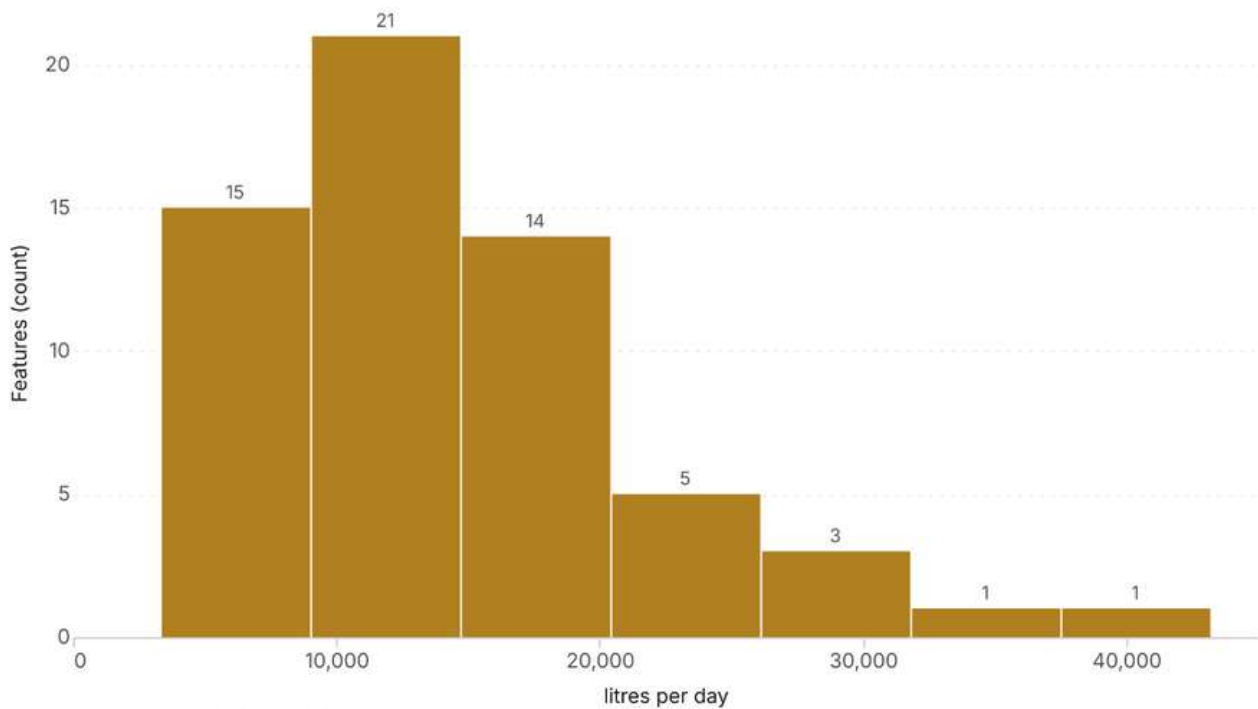
Figure 21. Find outliers: Wards [69]

What the map shows. The map illustrates the results of an emerging hot spot analysis for relief distributions, categorizing areas based on detected patterns. The legend indicates that "Sporadic hot spot" areas are colored orange, while regions with "No pattern detected" are [53]

Inferred: read from the image by gemma4:e4b, not evidence.

Distribution of litres_per_day

60 values in 7 bins



Source: Water points (60 features).

Figure 22. Water points over time (litres_per_day) [70]. Source: Water points (60 features). The data is in the appendix.

Sum of households_served per day by date and item

Per day: 19 days from 2026-09-04 to 2026-09-22; trend +55.3 per day; first half 2.854e+04, second half 3.489e+04 (+22.3%)

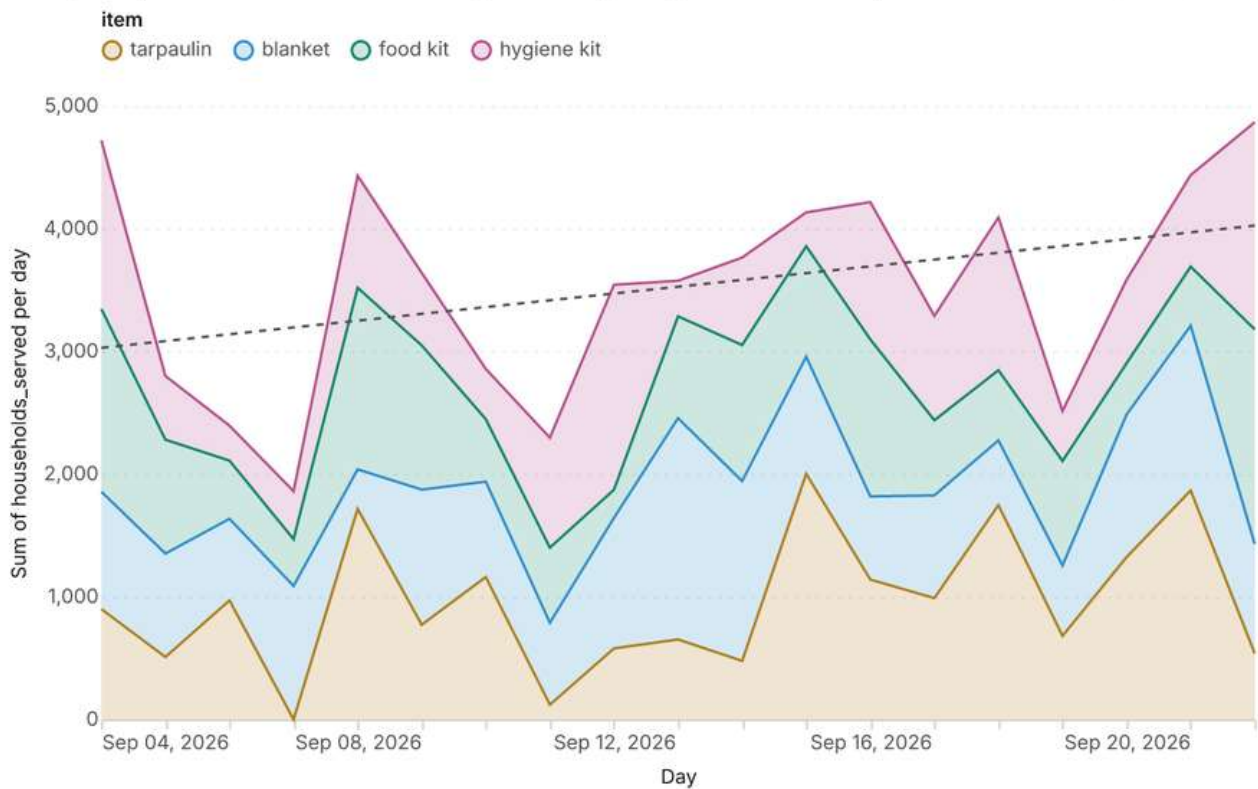


Figure 23. Relief distributions over time (date) [71]. Per day, 2026-09-04 to 2026-09-22. Source: Relief distributions (320 features). The data is in the appendix.

Sum of households_need_shelter per day by date and ward_code

Per day: 21 days from 2026-09-02 to 2026-09-22; trend -173 per day; first half 6.485e+04, second half 4.581e+04 (-29.4%)

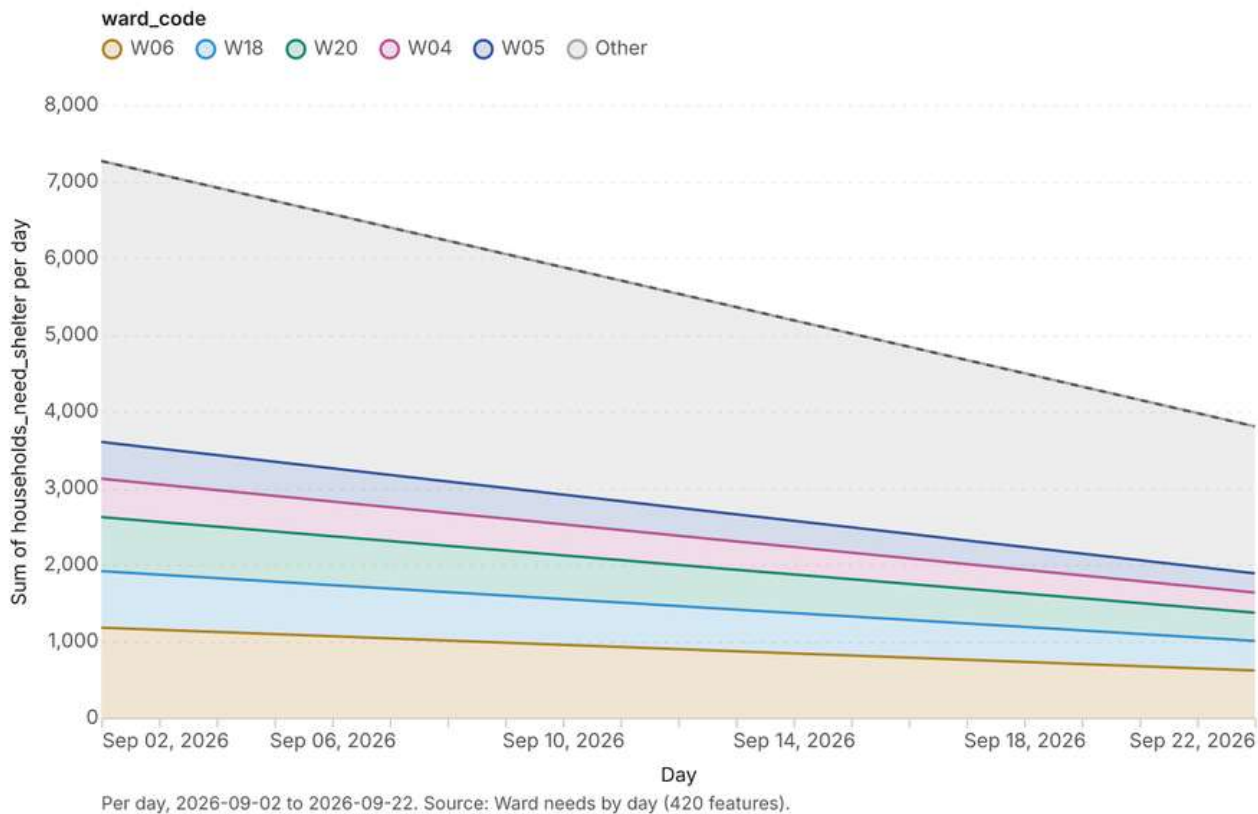
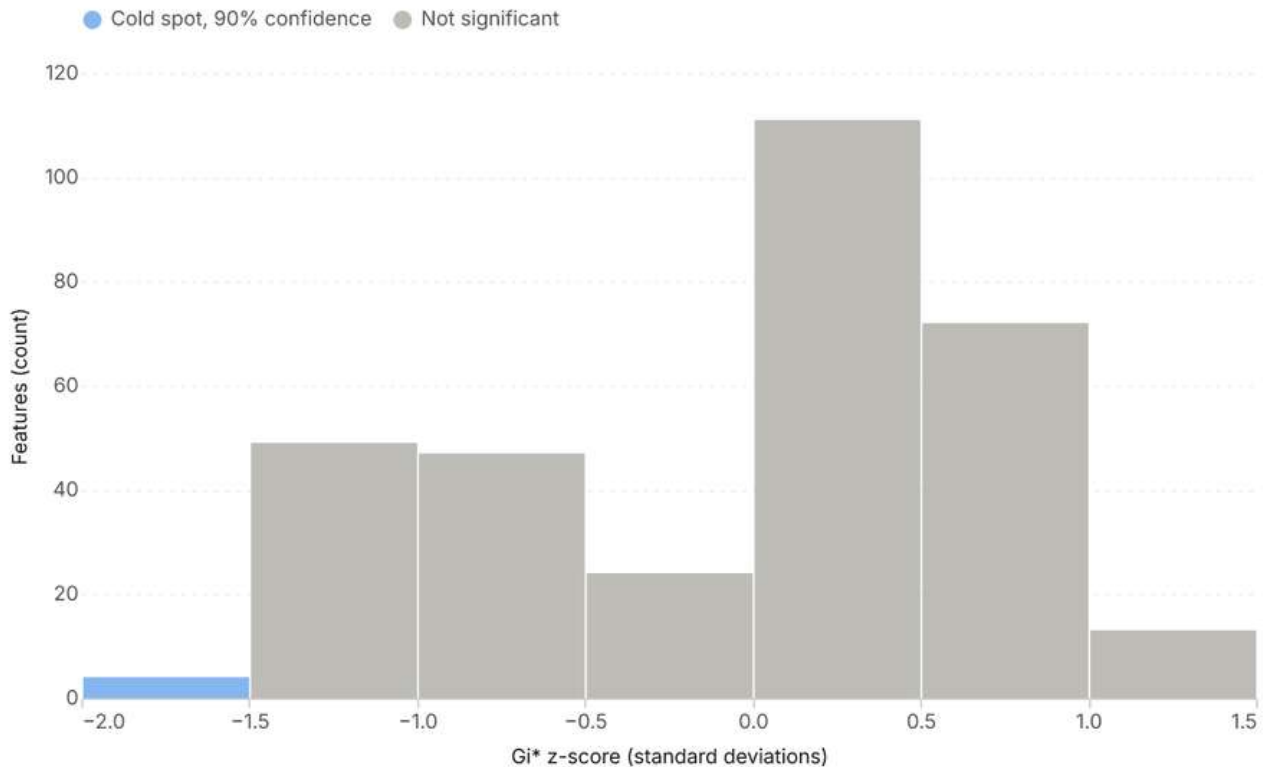


Figure 24. Ward needs by day over time (date) [72]. Per day, 2026-09-02 to 2026-09-22. Source: Ward needs by day (420 features). The data is in the appendix.

Gi* z-score distribution

320 features: 0 hot and 4 cold at 90% confidence or more

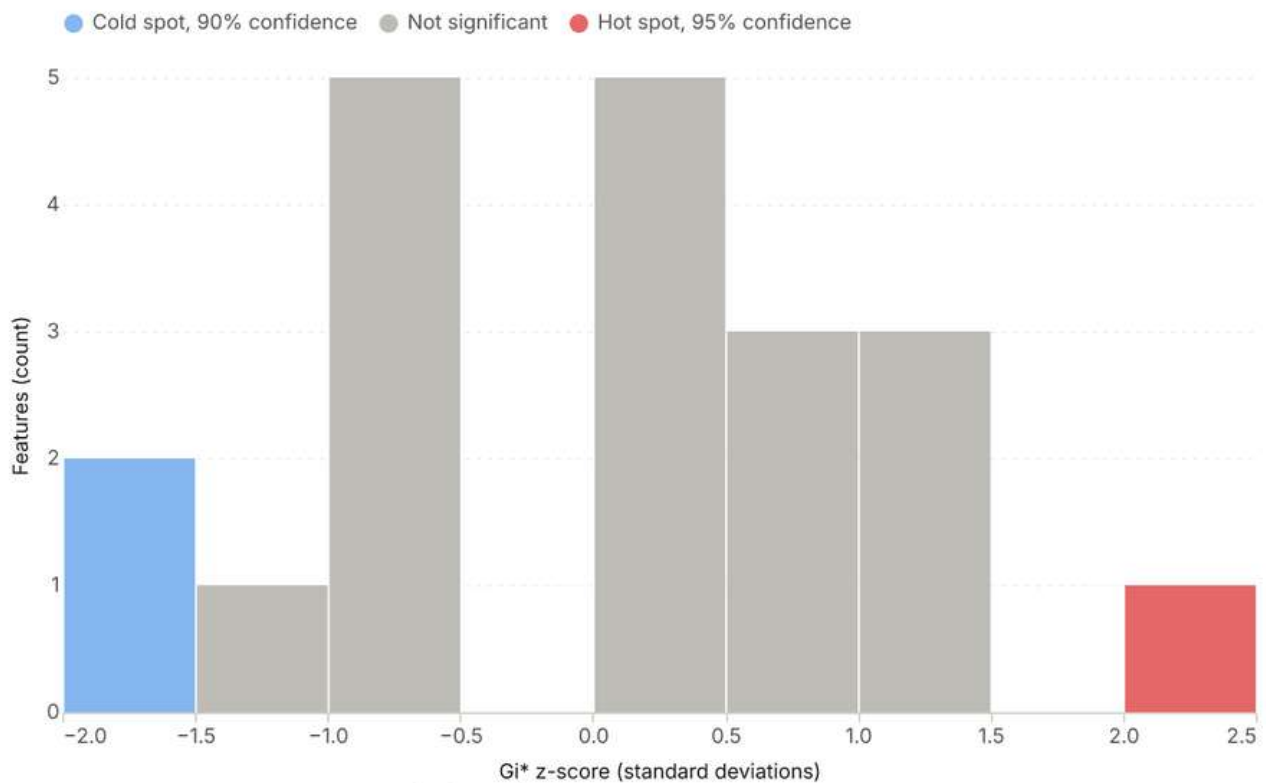


Period: 2026-09-04 to 2026-09-22 (date). Source: Hot spot analysis: Relief distributions (320 features).

Figure 25. Hot spot analysis: Relief distributions [73]. Period: 2026-09-04 to 2026-09-22 (date). Source: Hot spot analysis: Relief distributions (320 features). The data is in the appendix.

Gi* z-score distribution

20 features: 1 hot and 2 cold at 90% confidence or more



Source: Hot spot analysis: Water points (20 features).

Figure 26. Hot spot analysis: Water points [74]. Source: Hot spot analysis: Water points (20 features). The data is in the appendix.

Gi* z-score distribution

2,000 features: 790 hot and 452 cold at 90% confidence or more

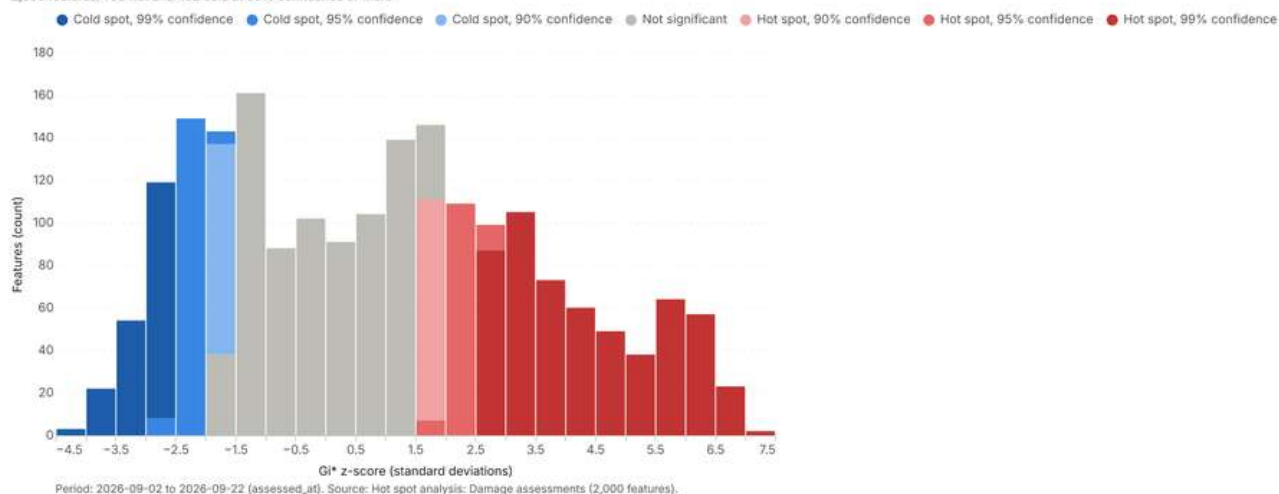


Figure 27. Hot spot analysis: Damage assessments [75]. Period: 2026-09-02 to 2026-09-22 (assessed_at). Source: Hot spot analysis: Damage assessments (2,000 features). The data is in the appendix.

Distribution of last_z

54 values in 7 bins

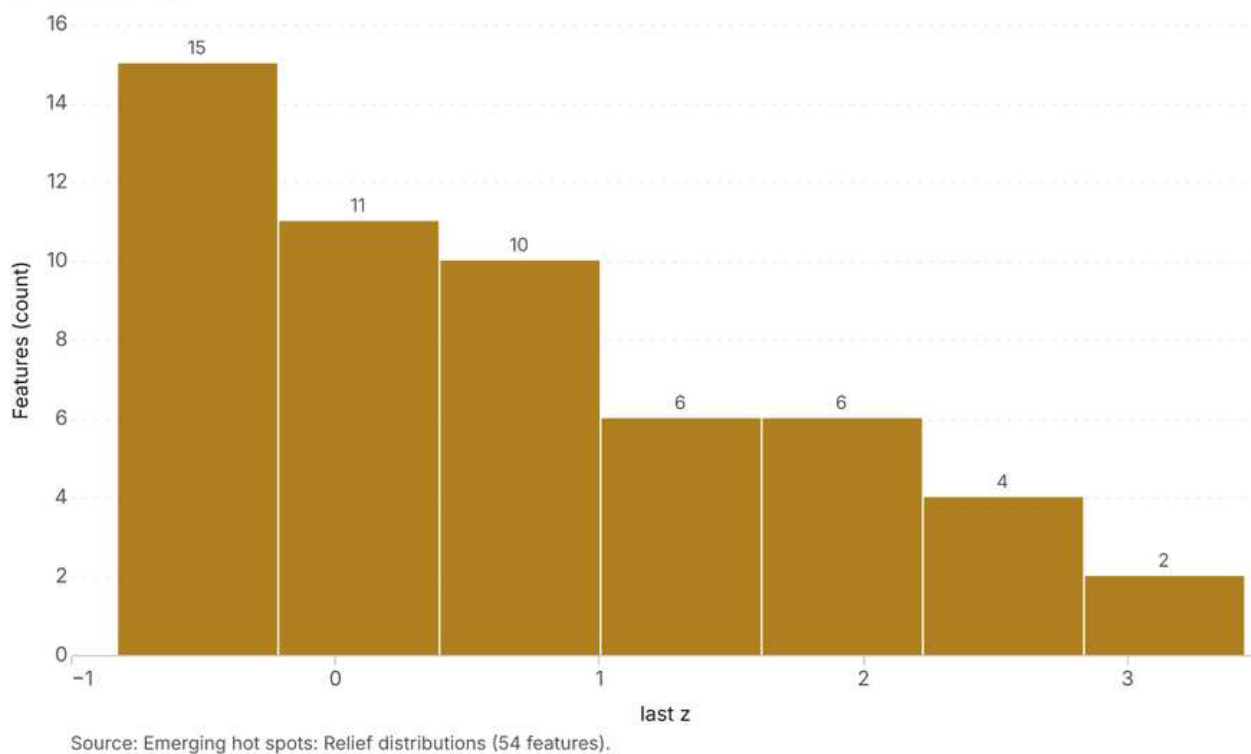
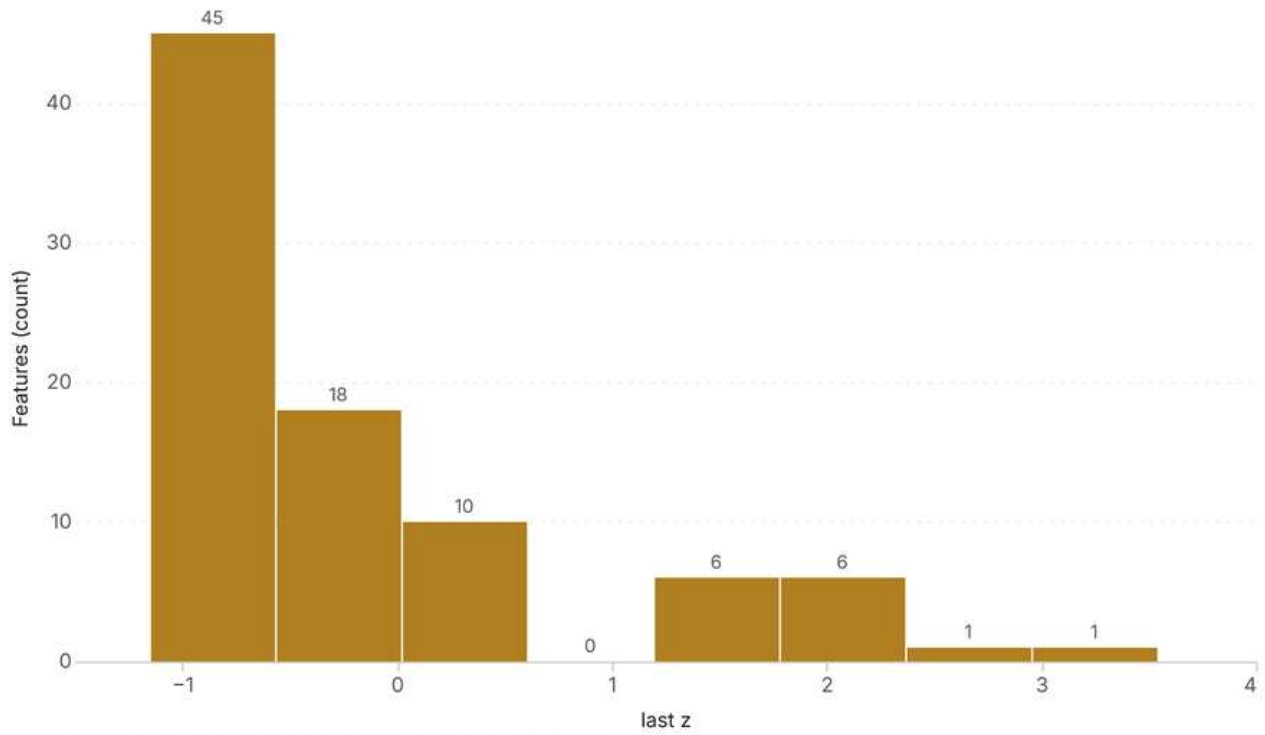


Figure 28. Emerging hot spots: Relief distributions [76]. Source: Emerging hot spots: Relief distributions (54 features). The data is in the appendix.

Distribution of last_z

87 values in 8 bins



Source: Emerging hot spots: Damage assessments (87 features).

Figure 29. Emerging hot spots: Damage assessments [77]. Source: Emerging hot spots: Damage assessments (87 features). The data is in the appendix.

Count per day by date and item

Per day: 19 days from 2026-09-04 to 2026-09-22; trend +0.172 per day; first half 141, second half 160 (+13.5%)

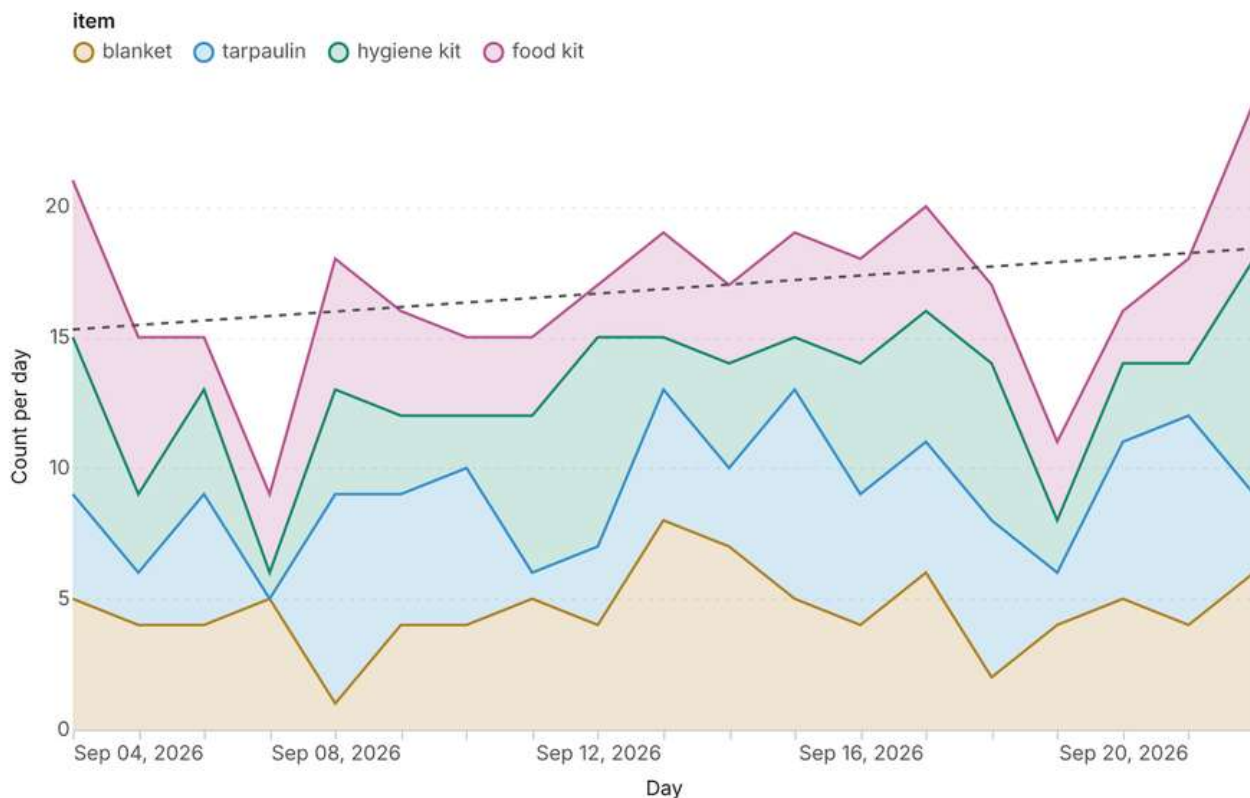


Figure 30. Repeat and near repeat classification: Relief distributions [78]. Per day, 2026-09-04 to 2026-09-22. Source: Repeat and near repeat classification: Relief distributions (320 features). The data is in the appendix.

Distribution of count

20 values in 6 bins

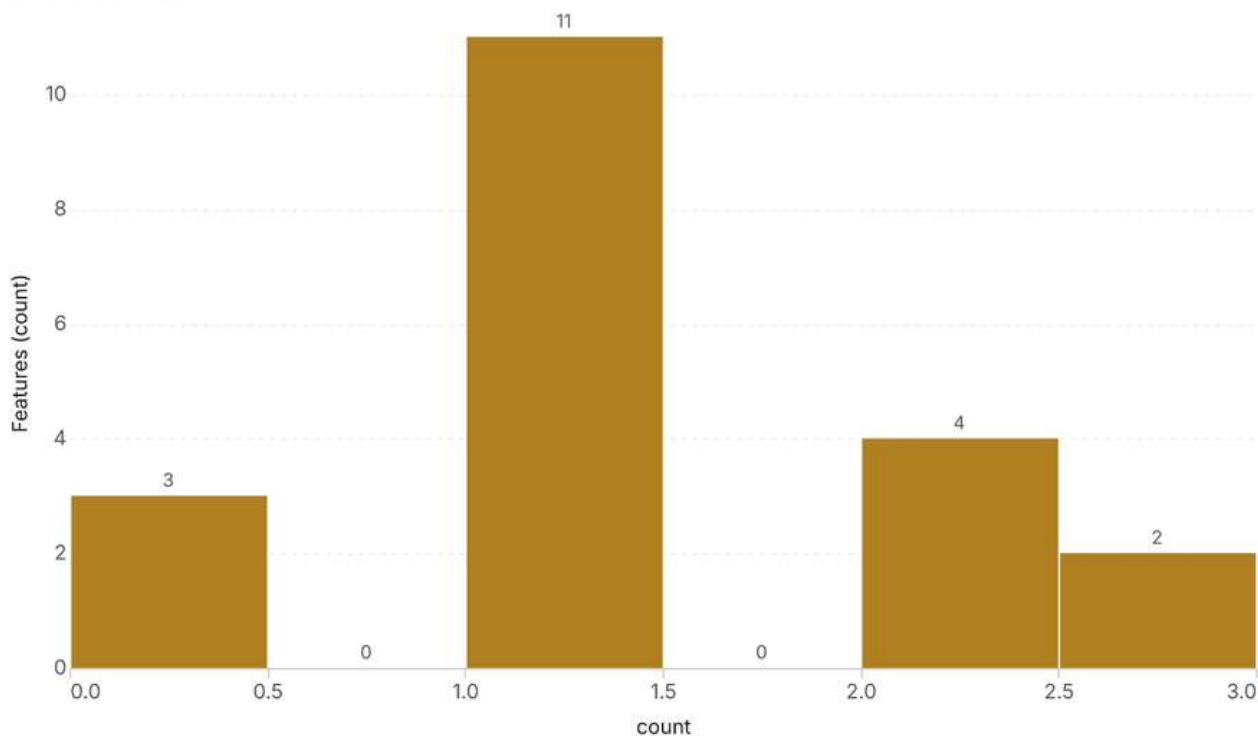


Figure 31. Summarize within: Wards [79]. Source: Summarize within: Wards (20 features). The data is in the appendix.

Distribution of count

20 values in 6 bins

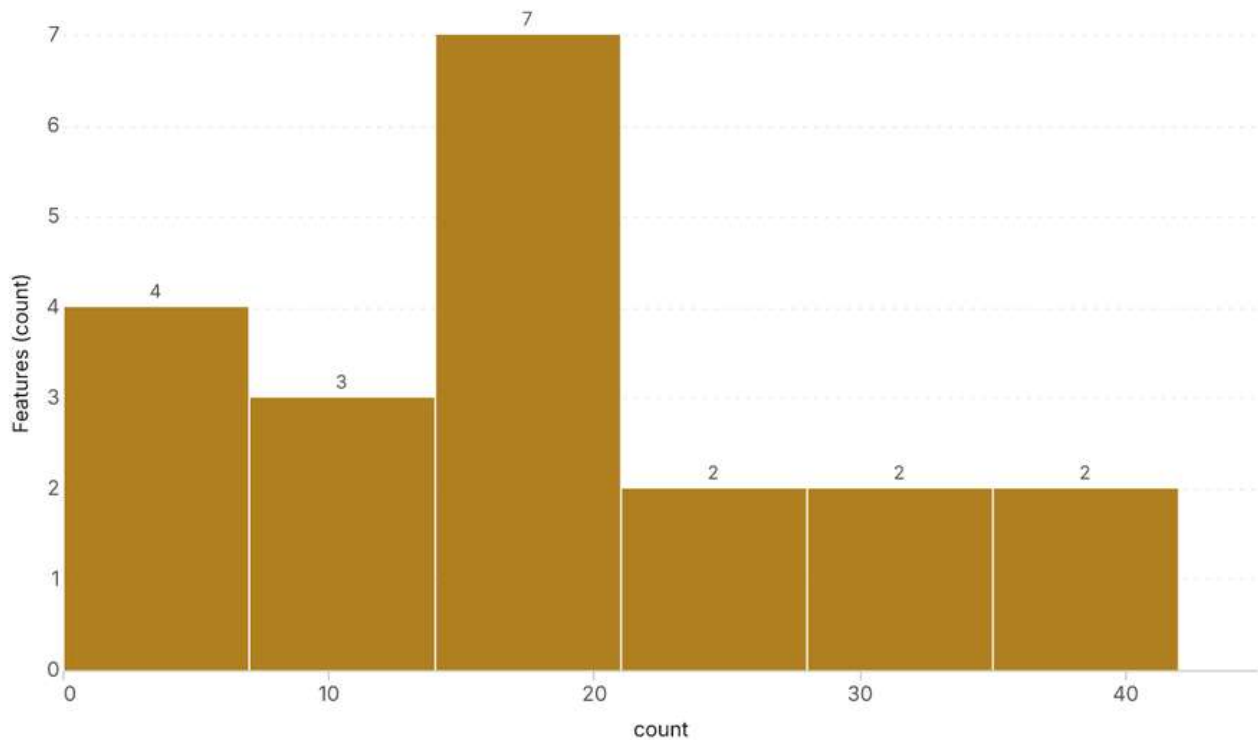


Figure 32. Summarize within: Wards [80]. Source: Summarize within: Wards (20 features). The data is in the appendix.

Distribution of count

20 values in 6 bins

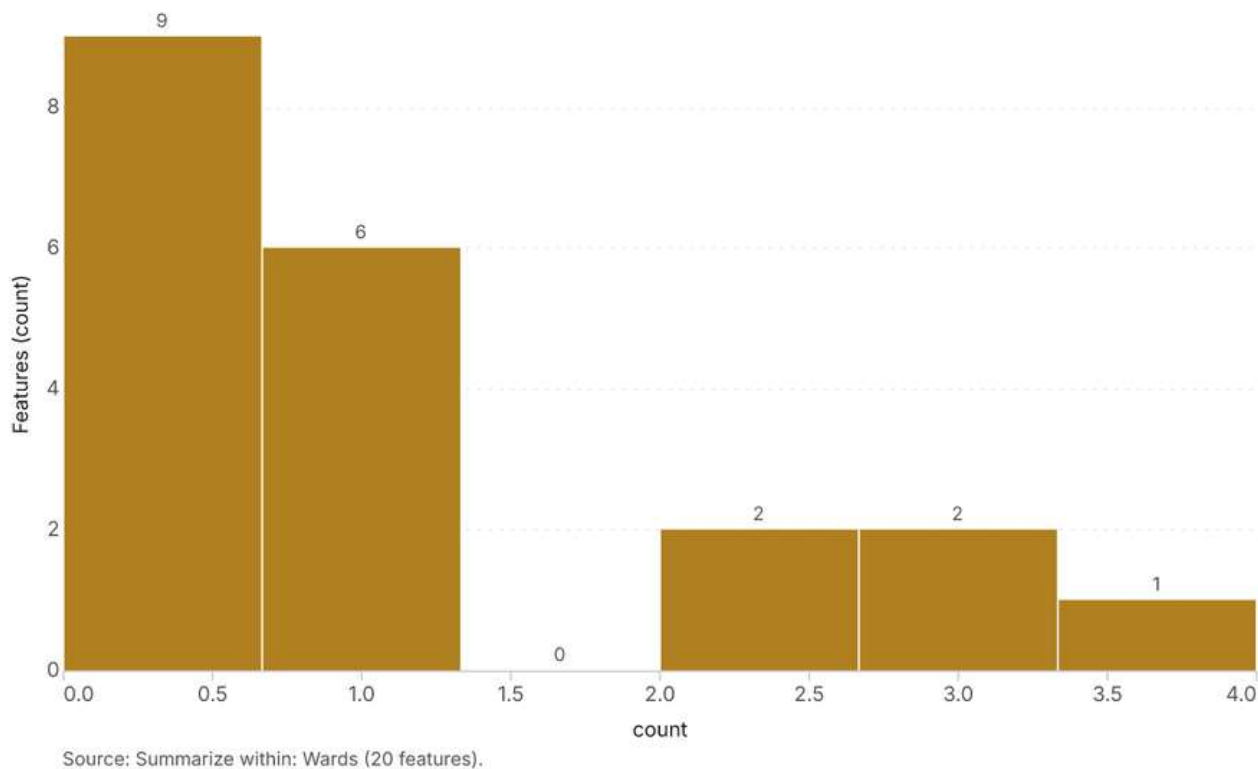


Figure 33. Summarize within: Wards [81]. Source: Summarize within: Wards (20 features). The data is in the appendix.

Cluster sizes

1 clusters over 25 features

cluster	features	share
0	23	92.0%
Noise	2	8.0%

Source: Find point clusters: Shelters (25 features).

Figure 34. Find point clusters: Shelters [82]. Source: Find point clusters: Shelters (25 features). The data is in the appendix.

Cluster sizes

1 clusters over 1 features

cluster	features	share
0	1	100.0%

Source: Find point clusters: cluster hulls (1 features).

Figure 35. Find point clusters: cluster hulls [83]. Source: Find point clusters: cluster hulls (1 features). The data is in the appendix.

Cluster sizes

21 clusters over 320 features

cluster	features	share
7	25	7.8%
15	21	6.6%
0	17	5.3%
10	17	5.3%
2	17	5.3%
9	16	5.0%
11	15	4.7%
12	15	4.7%
3	15	4.7%
14	14	4.4%
17	14	4.4%
4	14	4.4%
5	14	4.4%
6	14	4.4%
8	14	4.4%
18	13	4.1%
13	12	3.8%
20	12	3.8%
Noise	12	3.8%
19	11	3.4%
1	10	3.1%
16	8	2.5%

Period: 2026-09-04 to 2026-09-22 (date). Source: Find point clusters: Relief distributions (3...

Figure 36. Find point clusters: Relief distributions [84]. Period: 2026-09-04 to 2026-09-22 (date). Source: Find point clusters: Relief distributions (320 features). The data is in the appendix.

Cluster sizes

21 clusters over 21 features

cluster	features	share
0	1	4.8%
1	1	4.8%
10	1	4.8%
11	1	4.8%
12	1	4.8%
13	1	4.8%
14	1	4.8%
15	1	4.8%
16	1	4.8%
17	1	4.8%
18	1	4.8%
19	1	4.8%
2	1	4.8%
20	1	4.8%
3	1	4.8%
4	1	4.8%
5	1	4.8%
6	1	4.8%
7	1	4.8%
8	1	4.8%
9	1	4.8%

Source: Find point clusters: cluster hulls (21 features).

Figure 37. Find point clusters: cluster hulls [85]. Source: Find point clusters: cluster hulls (21 features). The data is in the appendix.

Cluster sizes

2 clusters over 20 features

cluster	features	share
0	16	80.0%
1	3	15.0%
Noise	1	5.0%

Source: Find point clusters: Health posts (20 features).

Figure 38. Find point clusters: Health posts [86]. Source: Find point clusters: Health posts (20 features). The data is in the appendix.

Cluster sizes

2 clusters over 2 features

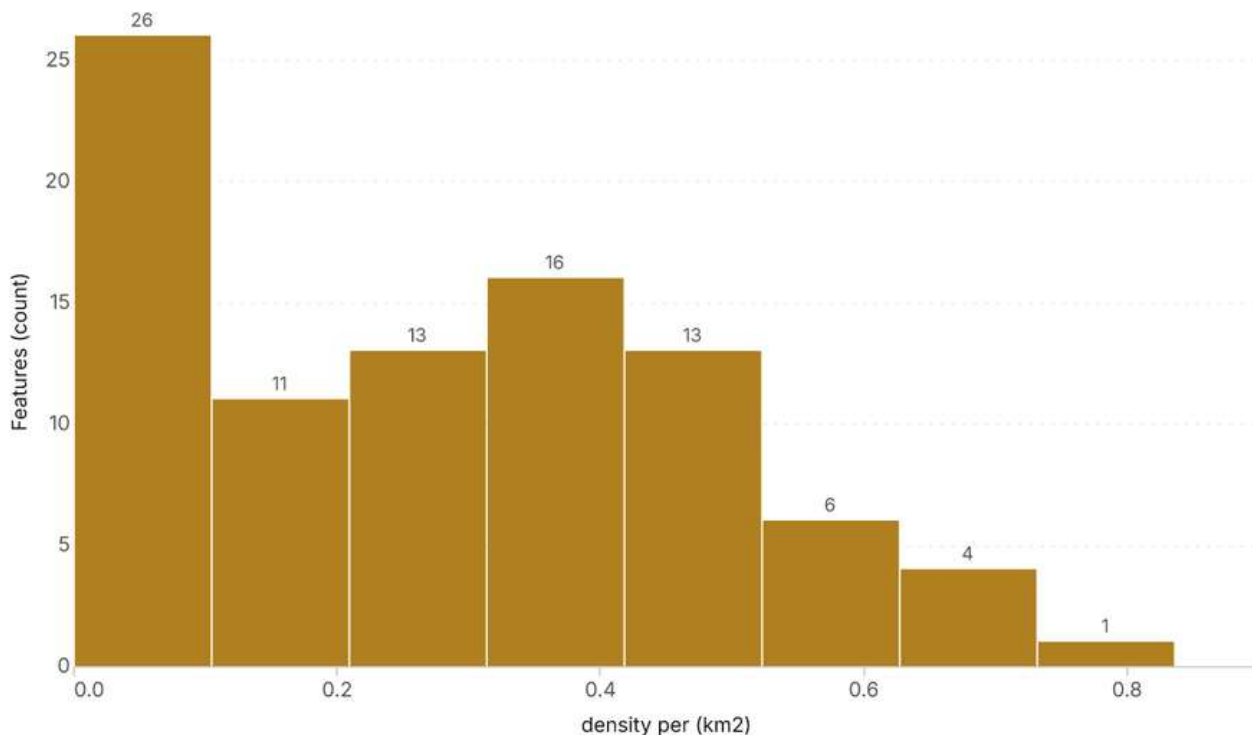
cluster	features	share
0	1	50.0%
1	1	50.0%

Source: Find point clusters: cluster hulls (2 features).

Figure 39. Find point clusters: cluster hulls [87]. Source: Find point clusters: cluster hulls (2 features). The data is in the appendix.

Distribution of density_per_km2

90 values in 8 bins

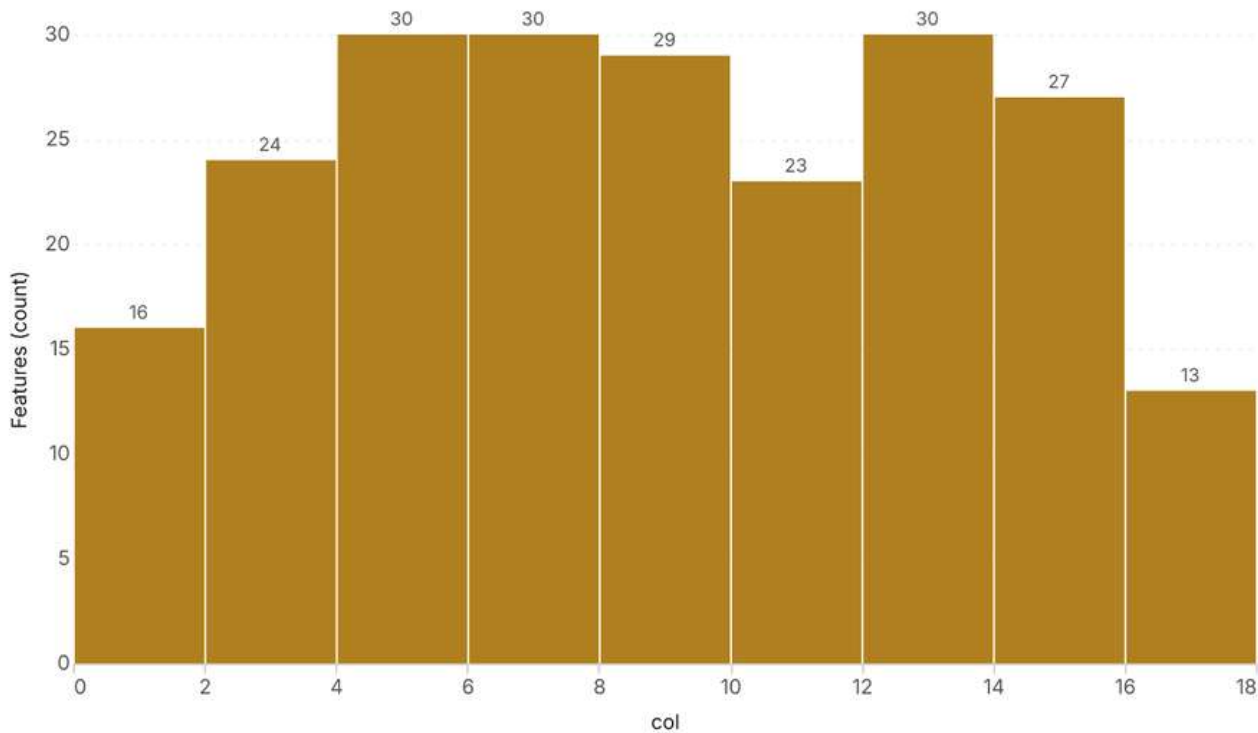


Source: Calculate density: Shelters (90 features).

Figure 40. Calculate density: Shelters [88]. Source: Calculate density: Shelters (90 features). The data is in the appendix.

Distribution of col

222 values in 9 bins



Source: Calculate density: Relief distributions (222 features).

Figure 41. Calculate density: Relief distributions [89]. Source: Calculate density: Relief distributions (222 features). The data is in the appendix.

Distribution of col

228 values in 9 bins

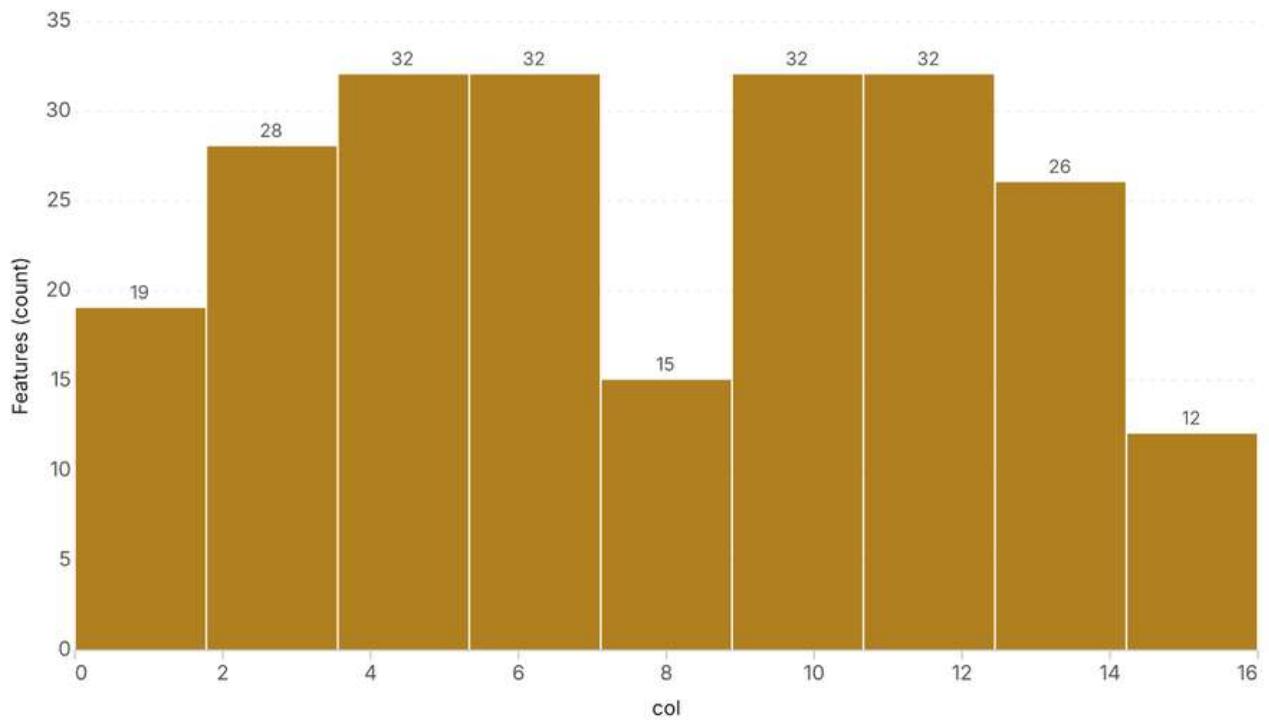


Figure 42. Calculate density: Health posts [90]. Source: Calculate density: Health posts (228 features). The data is in the appendix.

Moran scatter

20 features; slope -0.057 (the Moran's I of these standardized values)

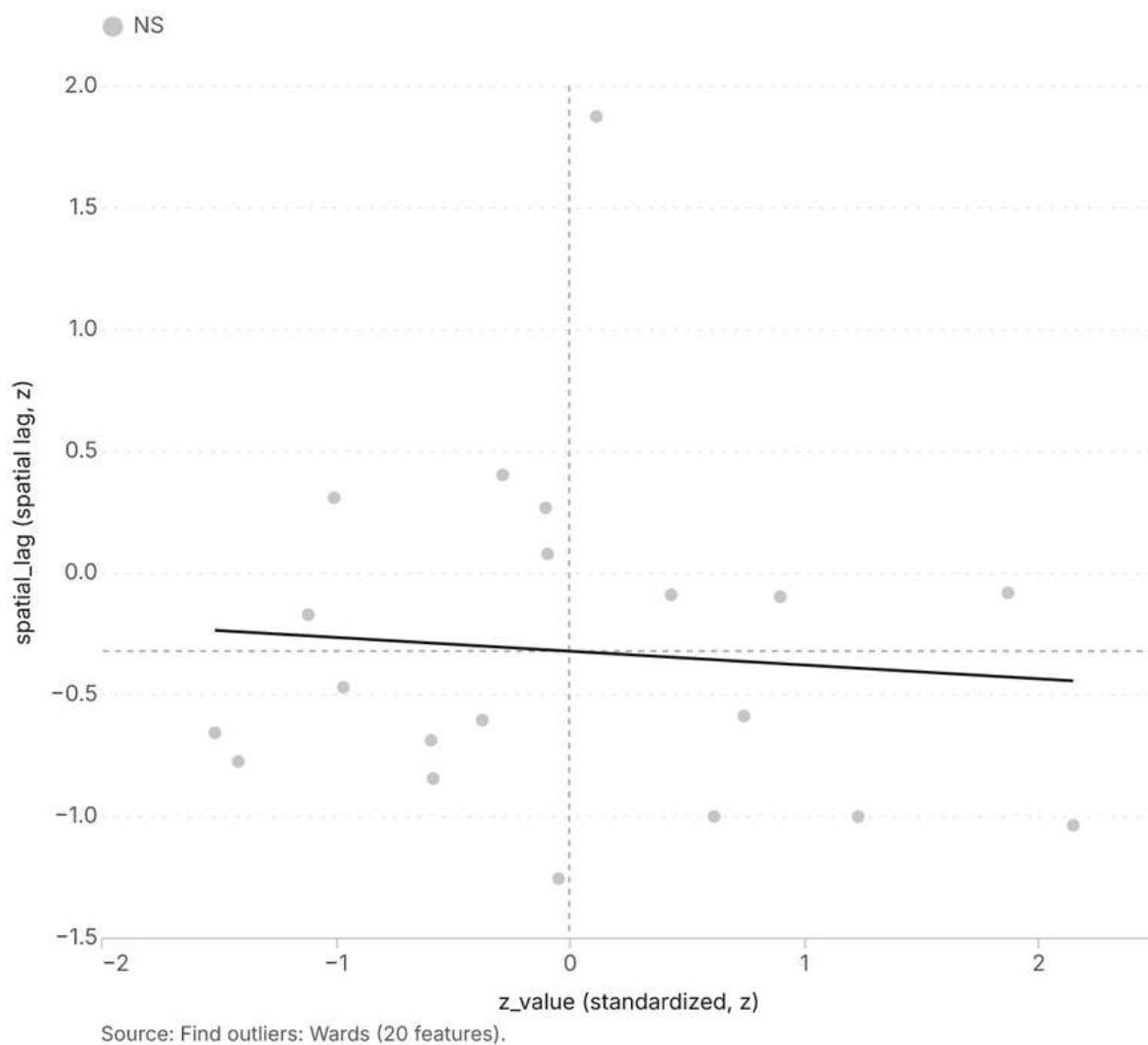


Figure 43. Find outliers: Wards [91]. Source: Find outliers: Wards (20 features). The data is in the appendix.

Count per day by date and item

Per day: 19 days from 2026-09-04 to 2026-09-22; trend +0.172 per day; first half 141, second half 160 (+13.5%)

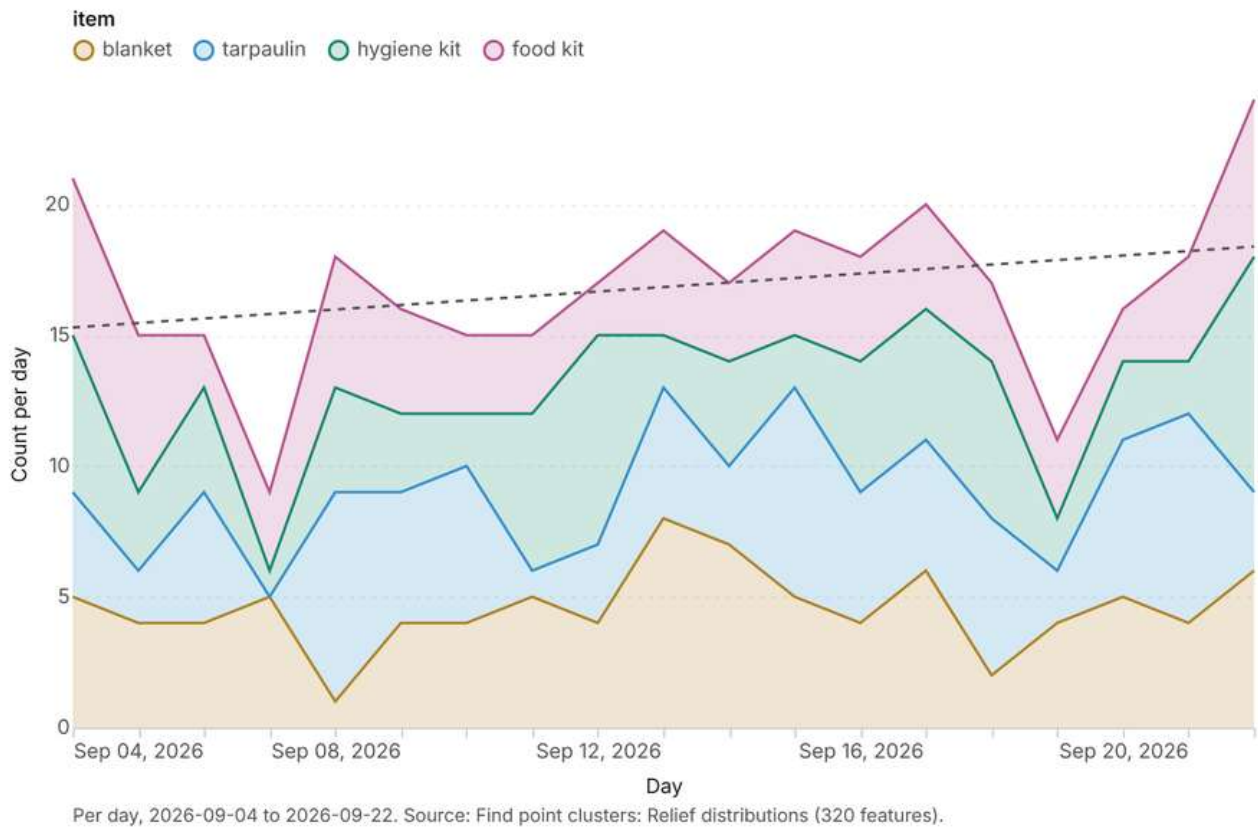


Figure 44. Find point clusters: Relief distributions over time [92]. Per day, 2026-09-04 to 2026-09-22. Source: Find point clusters: Relief distributions (320 features). The data is in the appendix.

Count per day by date and item

Per day: 19 days from 2026-09-04 to 2026-09-22; trend +0.172 per day; first half 141, second half 160 (+13.5%)

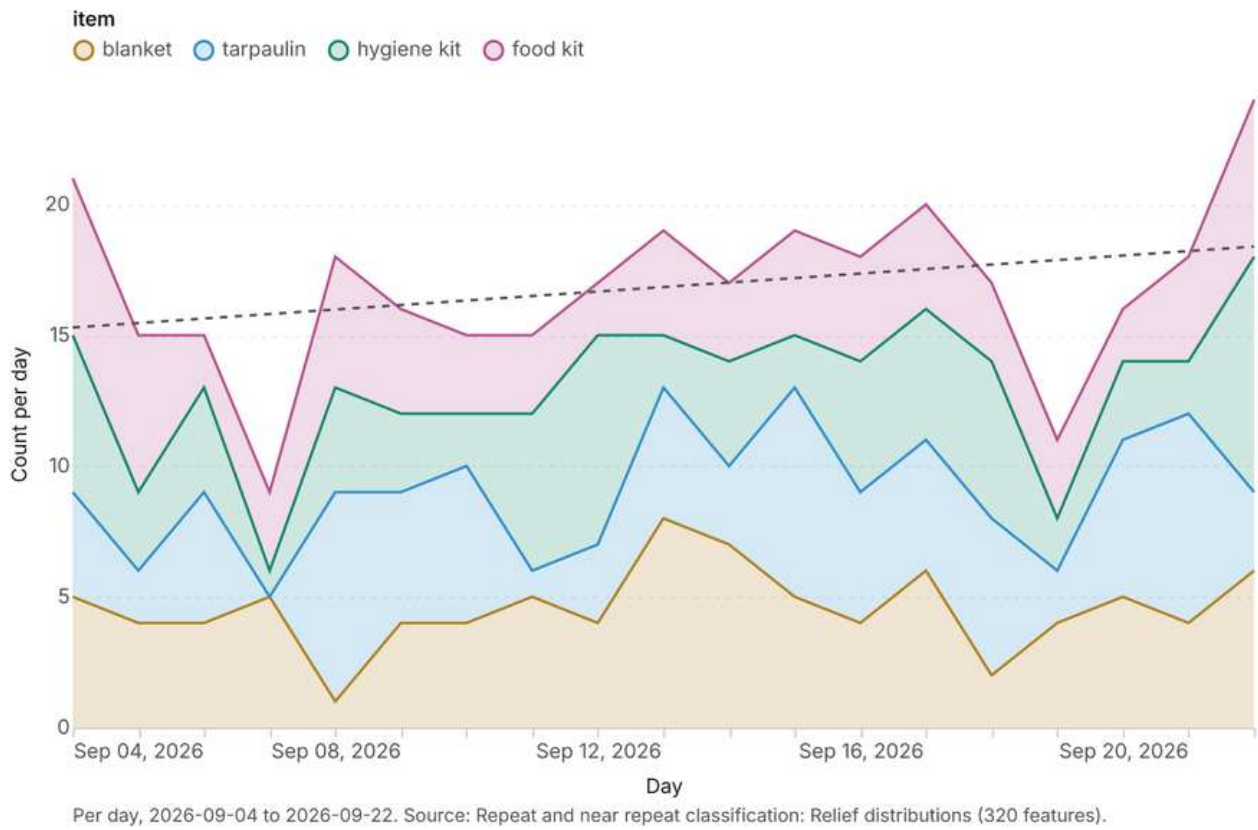


Figure 45. Repeat and near repeat classification: Relief distributions over time [93]. Per day, 2026-09-04 to 2026-09-22. Source: Repeat and near repeat classification: Relief distributions (320 features). The data is in the appendix.

Count per day by assessed_at and gi_bin

Per day: 21 days from 2026-09-02 to 2026-09-22; trend -3.75 per day; first half 1,172, second half 734 (-37.4%)

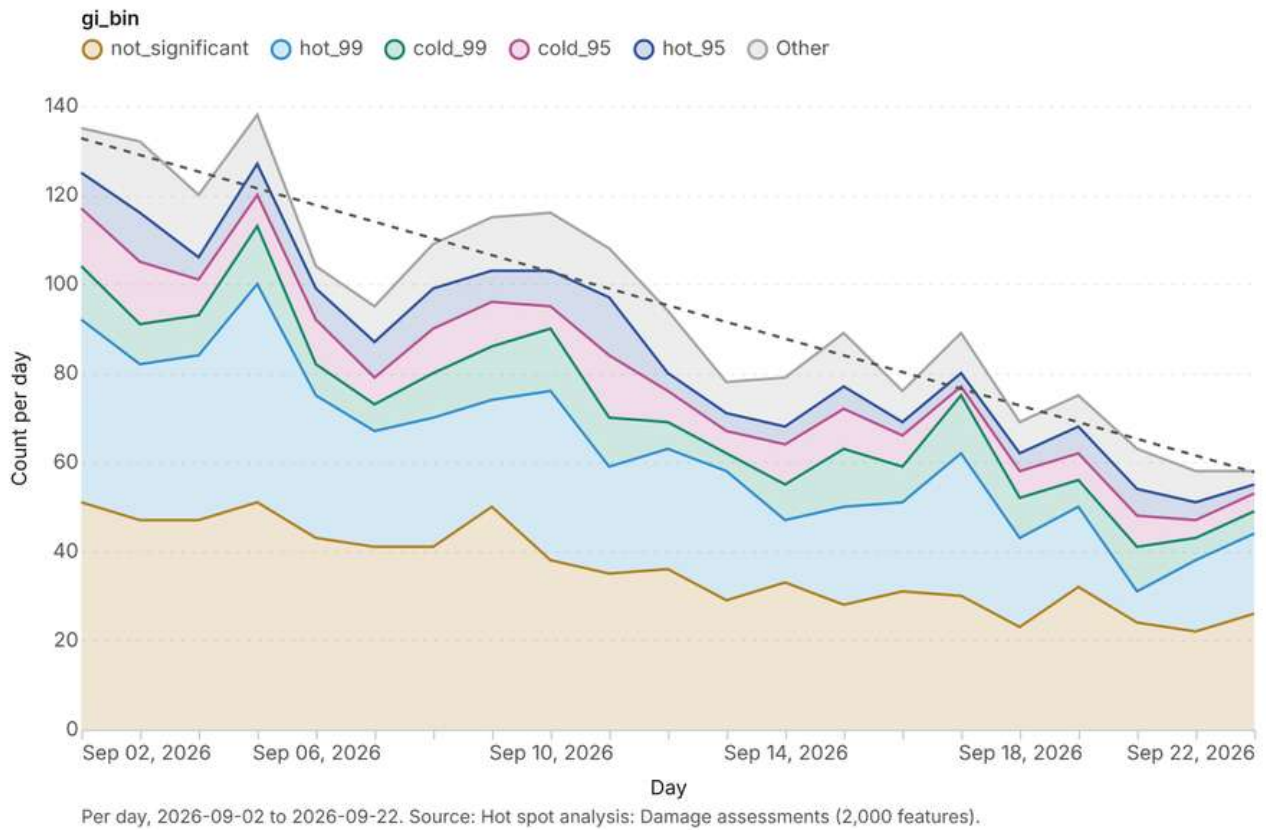


Figure 46. Hot spot analysis: Damage assessments over time [94]. Per day, 2026-09-02 to 2026-09-22. Source: Hot spot analysis: Damage assessments (2,000 features). The data is in the appendix.

Count per day by date and item

Per day: 19 days from 2026-09-04 to 2026-09-22; trend +0.172 per day; first half 141, second half 160 (+13.5%)

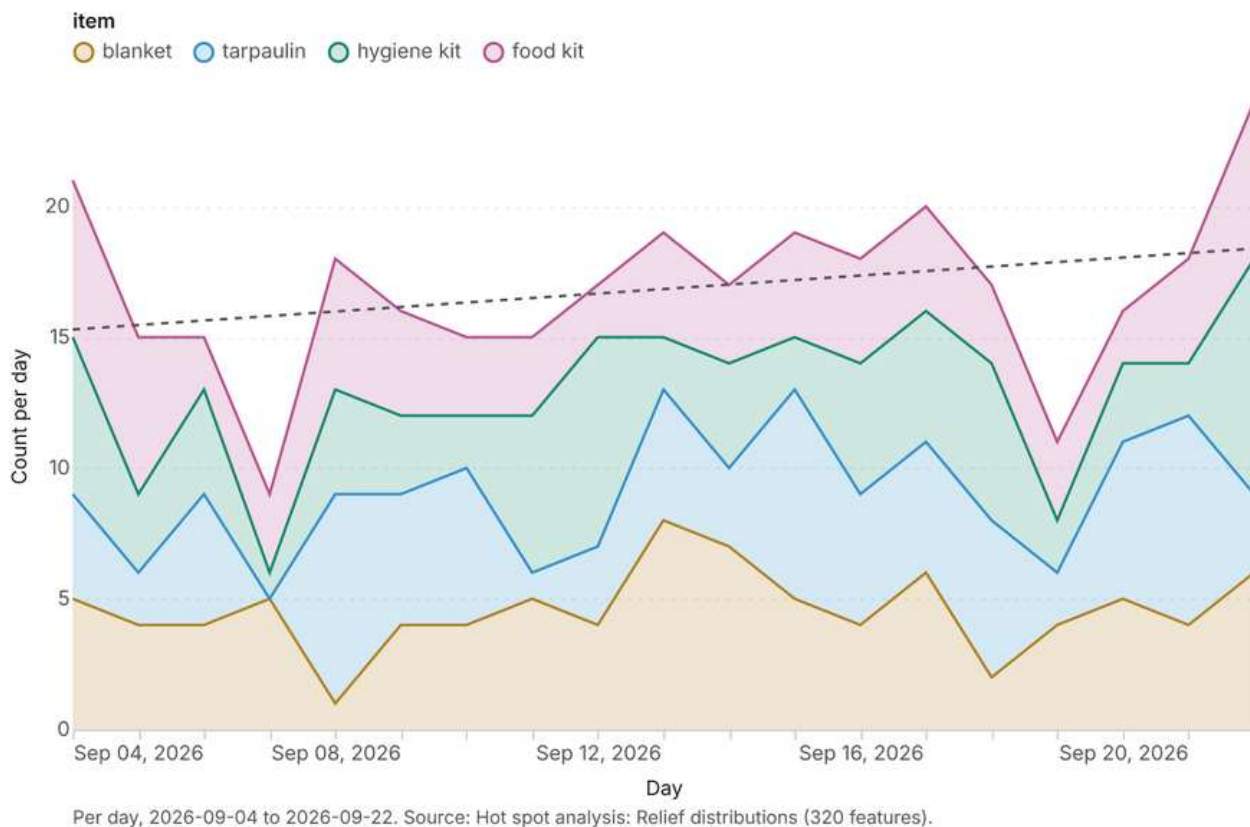


Figure 47. Hot spot analysis: Relief distributions over time [95]. Per day, 2026-09-04 to 2026-09-22. Source: Hot spot analysis: Relief distributions (320 features). The data is in the appendix.

Changes since the last run

This is the first report of this project.

Sources

- [1] Rendering: Chart: Timeline: events per day by dataset. 84 rows (id 9bebc2a3-106c-4b25-9db2-00e0031eb8f3)
- [2] Dataset: Damage assessments. vector, 2000 rows (id f5a03720-aeb0-4ef8-aac1-6cee065b688a)
- [3] Dataset: Road status. vector, 160 rows (id f3c7c4b5-fd2f-4d56-9b57-5acf7a4d0374)
- [4] Dataset: Relief distributions. vector, 320 rows (id 27e9cd9e-cac7-4864-8dbe-27172247ad35)
- [5] Dataset: Ward needs by day. table, 420 rows (id b8f0859d-75f2-425c-a636-bd120d62d172)
- [6] Document page: Situation report No. 4, page 1. 2026-09-14 (id c492201b-e67e-4ae4-b97c-58a6ff283bc1:1)
- [7] Catalog: Hot spot analysis (operation catalog, gp_hot_spots). Getis-Ord Gi* hot and cold spots with z-scores, p-values and confidence bins. ArcGIS: Find Hot Spots, Hot Spot Analysis (Getis-Ord Gi*). QGIS: qgis:hotspot (plugin). (id gp_hot_spots)
- [8] Plan: Hot spots of Relief distributions (the Start plan's candidate c_2bd4e1c1361d). 320 points: Getis-Ord Gi* tests whether the concentrations in Relief distributions are statistically significant. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_2bd4e1c1361d)
- [9] Tool result: gp_hot_spots, step 0. Hot spot analysis: 1 layer saved: Hot spot analysis: Relief distributions (320 features). (id 312e7d93-9021-497b-95d6-33778143cdfc:0)
- [10] Layer: Relief distributions. 320 features (id 83cbe688-753d-41e3-963d-5ac6a237060b)
- [11] Plan: Hot spots of Water points (the Start plan's candidate c_0814d71ea2c0). 60 points: Getis-Ord Gi* tests whether the concentrations in Water points are statistically significant. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_0814d71ea2c0)
- [12] Tool result: gp_hot_spots, step 1. Hot spot analysis: 1 layer saved: Hot spot analysis: Water points (20 features). (id 312e7d93-9021-497b-95d6-33778143cdfc:1)
- [13] Layer: Water points. 60 features (id 2a061d8c-77a7-4d5f-9dfd-426a08595f03)

[14] Plan: Hot spots of Damage assessments (the Start plan's candidate c_5240b7fee4b7). 2000 points: Getis-Ord Gi* tests whether the concentrations in Damage assessments are statistically significant. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_5240b7fee4b7)

[15] Tool result: gp_hot_spots, step 2. Hot spot analysis: 1 layer saved: Hot spot analysis: Damage assessments (2000 features). (id 312e7d93-9021-497b-95d6-33778143cdfe:2)

[16] Layer: Damage assessments. 2,000 features (id 26bd99f3-3f2e-40d8-9e45-68835e95f651)

[17] Catalog: Emerging hot spots (operation catalog, gp_space_time_hot_spots). Where hot spots are new, consecutive, intensifying, persistent, diminishing, sporadic, oscillating or historical over time. ArcGIS: Emerging Hot Spot Analysis, Create Space Time Cube. (id gp_space_time_hot_spots)

[18] Plan: Space time hot spots of Relief distributions (the Start plan's candidate c_a90b274940ea). Relief distributions carry dates in 'date': emerging hot spot analysis finds new, intensifying and fading hot spots per day. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_a90b274940ea)

[19] Tool result: gp_space_time_hot_spots, step 0. Emerging hot spots: 1 layer saved: Emerging hot spots: Relief distributions (54 features). (id 6a511518-66af-49c2-9961-06cf7330178d:0)

[20] Plan: Space time hot spots of Damage assessments (the Start plan's candidate c_e9b3cd3966d9). Damage assessments carry dates in 'assessed_at': emerging hot spot analysis finds new, intensifying and fading hot spots per day. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_e9b3cd3966d9)

[21] Tool result: gp_space_time_hot_spots, step 1. Emerging hot spots: 1 layer saved: Emerging hot spots: Damage assessments (87 features). (id 6a511518-66af-49c2-9961-06cf7330178d:1)

[22] Catalog: Repeat and near repeat classification (operation catalog, gp_near_repeat). Classify incidents as originators, repeats (same place) or near repeats within a distance and time window, with a Knox test table. ArcGIS: Repeat and Near Repeat Classification, Near Repeat Calculator. (id gp_near_repeat)

[23] Plan: Near repeat of Relief distributions (the Start plan's candidate c_d2196a8324bf). Near repeat analysis tests whether Relief distributions close in space also follow each other within 3 days. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_d2196a8324bf)

[24] Tool result: gp_near_repeat, step 2. Repeat and near repeat classification: 1 layer saved: Repeat and near repeat classification: Relief distributions (320 features). (id 6a511518-66af-49c2-9961-06cf7330178d:2)

[25] Catalog: Summarize within (operation catalog, gp_summarize_within). Count and aggregate the features inside each polygon (or bin), proportionally for lines and polygons. ArcGIS: Summarize Within, Aggregate Points. QGIS: native:countpointsinpolygon, native:sumlinelengths. (id gp_summarize_within)

[26] Plan: Shelters per feature of Wards (the Start plan's candidate c_51fb9e92bbf5). Count Shelters inside each feature of Wards by type; the counts map as a choropleth (natural breaks, sequential colors). (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_51fb9e92bbf5)

[27] Tool result: gp_summarize_within, step 0. Summarize within: 1 layer saved: Summarize within: Wards (20 features). (id 0979c79d-77b1-475d-a7be-e19a6678cb6f:0)

[28] Layer: Shelters. 25 features (id ee1b31b2-feece-4bec-a323-47ac9bdb3e6e)

[29] Layer: Wards. 20 features (id b338e26e-89d1-4de4-af0b-e9e1f797c2dd)

[30] Tool result: gp_summarize_within, step 1. Summarize within: 1 layer saved: Summarize within: Wards (20 features). (id 0979c79d-77b1-475d-a7be-e19a6678cb6f:1)

[31] Tool result: gp_summarize_within, step 2. Summarize within: 1 layer saved: Summarize within: Wards (20 features). (id 0979c79d-77b1-475d-a7be-e19a6678cb6f:2)

[32] Layer: Health posts. 20 features (id 7aed59a8-fdc9-4dca-9da9-530aea39fdf7)

[33] Catalog: Find point clusters (operation catalog, gp_find_point_clusters). Density-based clusters (DBSCAN, HDBSCAN or OPTICS, optionally space-time) with hulls and noise. ArcGIS: Find Point Clusters, Density-based Clustering. QGIS: native:stdbscanclustering, native:stdbscanclustering. (id gp_find_point_clusters)

[34] Plan: Cluster points of Shelters (the Start plan's candidate c_f692379d6a4c). DBSCAN finds dense groups of Shelters and separates noise. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_f692379d6a4c)

[35] Tool result: gp_find_point_clusters, step 0. Find point clusters: 2 layers saved: Find point clusters: Shelters (25 features); Find point clusters: cluster hulls (1 feature). (id e8b434c3-b356-440a-9abe-58d49d66cc97:0)

[36] Plan: Cluster points of Relief distributions (the Start plan's candidate c_349573557ecd). DBSCAN finds dense groups of Relief distributions and separates noise. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_349573557ecd)

[37] Tool result: gp_find_point_clusters, step 1. Find point clusters: 2 layers saved: Find point clusters: Relief distributions (320 features); Find point clusters: cluster hulls (21 features). (id e8b434c3-b356-440a-9abe-58d49d66cc97:1)

[38] Plan: Cluster points of Health posts (the Start plan's candidate c_ff423f0ff11e). DBSCAN finds dense groups of Health posts and separates noise. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_ff423f0ff11e)

[39] Tool result: gp_find_point_clusters, step 2. Find point clusters: 2 layers saved: Find point clusters: Health posts (20 features); Find point clusters: cluster hulls (2 features). (id e8b434c3-b356-440a-9abe-58d49d66cc97:2)

[40] Catalog: Calculate density (operation catalog, gp_calculate_density). Kernel density per square kilometer on a grid. ArcGIS: Calculate Density, Kernel Density. QGIS: native:heatmapkerneldensityestimation. (id gp_calculate_density)

[41] Plan: Kernel density of Shelters (the Start plan's candidate c_af35bc95bb98). 25 points in Shelters: a density surface shows where they concentrate. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_af35bc95bb98)

[42] Tool result: gp_calculate_density, step 0. Calculate density: 1 layer saved: Calculate density: Shelters (90 features). (id dd271da2-1bea-419c-8888-9b686b947d5a:0)

[43] Plan: Kernel density of Relief distributions (the Start plan's candidate c_346097776d28). 320 points in Relief distributions: a density surface shows where they concentrate. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_346097776d28)

[44] Tool result: gp_calculate_density, step 1. Calculate density: 1 layer saved: Calculate density: Relief distributions (222 features). (id dd271da2-1bea-419c-8888-9b686b947d5a:1)

[45] Plan: Kernel density of Health posts (the Start plan's candidate c_18ec87c25f18). 20 points in Health posts: a density surface shows where they concentrate. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_18ec87c25f18)

[46] Tool result: gp_calculate_density, step 2. Calculate density: 1 layer saved: Calculate density: Health posts (228 features). (id dd271da2-1bea-419c-8888-9b686b947d5a:2)

[47] Catalog: Find outliers (operation catalog, gp_outliers). Anselin local Moran's I: HH, LL clusters and HL, LH outliers. ArcGIS: Find Outliers, Cluster and Outlier Analysis (Anselin Local Moran's I). (id gp_outliers)

[48] Plan: Local morans i of Wards (the Start plan's candidate c_de4b9b365cb7). Local Moran's I maps clusters and outliers of 'population'. (id 5a15d461-f147-4d9e-923e-64f1e88fcd39:c_de4b9b365cb7)

[49] Tool result: gp_outliers, step 0. Find outliers: 1 layer saved: Find outliers: Wards (20 features). (id 82ada6bc-afff-4238-9ffd-a1a3201c03ab:0)

[50] Rendering: Map: Hot spot analysis: Relief distributions (id 9390dd7d-eb52-4fef-b240-a9e39c60419a)

[51] Rendering: Map: Hot spot analysis: Water points (id c442f0af-9418-4ebb-bfcc-511695a7dfa4)

[52] Rendering: Map: Hot spot analysis: Damage assessments (id bf47cbcc-a7c2-4872-8e54-35d0ac4ff377)

[53] Rendering: Map: Emerging hot spots: Relief distributions (id 25f4f54c-4c45-48cf-a569-65f18477854c)

[54] Rendering: Map: Emerging hot spots: Damage assessments (id 6a4358fa-15b6-48b5-8954-acdaa394ce25)

[55] Rendering: Map: Repeat and near repeat classification: Relief distributions (id 9939dbb6-e3f8-4379-ac14-09eaa503d896)

[56] Rendering: Map: Summarize within: Wards (id 7e37ed6c-8912-44a3-bf3e-ee68208d7033)

[57] Rendering: Map: Summarize within: Wards (id be38a33a-5f20-4c0b-8912-57fa7895a19e)

[58] Rendering: Map: Summarize within: Wards (id b5d154ed-f63d-4d53-9377-fa605622ef5a)

[59] Rendering: Map: Find point clusters: Shelters (id c9d2bd3b-593e-4289-8016-4c68db15e487)

[60] Rendering: Map: Find point clusters: cluster hulls (id 6a3bb4df-0c93-47d3-ac5d-799d9cc55d97)

[61] Rendering: Map: Find point clusters: Relief distributions (id 7e541131-6f4c-4bb1-b407-1446d58780c9)

[62] Rendering: Map: Find point clusters: cluster hulls (id 38f01879-759a-4a13-835c-d8b021e78321)

[63] Rendering: Map: Find point clusters: Health posts (id 3e2a4e84-8386-4533-beff-b52a92b8455a)

[64] Rendering: Map: Find point clusters: cluster hulls (id 2e4605ac-3908-4fc6-9ef3-f84a99eee64a)

[65] Rendering: Map: Calculate density: Shelters (id 4c369f35-f8c0-44c2-af51-a805408d3d2c)

[66] Rendering: Map: Calculate density: Relief distributions (id 1fe838e1-34dc-4443-9b06-a8e4dfca95b1)

[67] Rendering: Map: Calculate density: Health posts (id 757ffe50-e313-4da5-9be2-6dc7c3f38b2c)

[68] Rendering: Map: Wards by population (id 74dd8da4-312d-43c5-85e7-bb2fb6224f53)

[69] Rendering: Map: Find outliers: Wards (id 7bf81023-a30e-4346-ab12-ff2513b7947f)

[70] Rendering: Chart: Water points over time (litres_per_day). 7 rows (id be19f3c9-7c18-4737-8ac1-c4b65ed62211)

[71] Rendering: Chart: Relief distributions over time (date). 76 rows (id 2be61f8a-8348-49a8-8c78-1ea19f2626a3)

[72] Rendering: Chart: Ward needs by day over time (date). 126 rows (id 3683d15b-0f5f-4034-99d3-c60bbd06867c)

[73] Rendering: Chart: Hot spot analysis: Relief distributions. 7 rows (id 8a54330c-390f-456b-b3e3-6ba7256e4df3)

[74] Rendering: Chart: Hot spot analysis: Water points. 7 rows (id beea2a8b-78df-4622-919a-df7a4d7bf1a9)

[75] Rendering: Chart: Hot spot analysis: Damage assessments. 30 rows (id b6ec9de8-9bcf-49e9-ba5e-2e62a12c8ca5)

[76] Rendering: Chart: Emerging hot spots: Relief distributions. 7 rows (id bde631a0-88da-4ec0-881b-6dc66cb32acc)

[77] Rendering: Chart: Emerging hot spots: Damage assessments. 8 rows (id 5060f9d4-d1f0-4a03-b624-4e1aa484e60d)

[78] Rendering: Chart: Repeat and near repeat classification: Relief distributions. 76 rows (id ad7da8c7-ed67-45e8-86ad-6f21ca29cbfd)

[79] Rendering: Chart: Summarize within: Wards. 6 rows (id eb5740e9-38f8-42ba-9d54-b9bec7d81080)

[80] Rendering: Chart: Summarize within: Wards. 6 rows (id 87ce8246-fadd-470c-b5a7-eb0629fc5ea3)

[81] Rendering: Chart: Summarize within: Wards. 6 rows (id 190869f4-a9ae-4fed-a451-67bc4560549c)

[82] Rendering: Chart: Find point clusters: Shelters. 2 rows (id 7be17c77-d4b9-4caf-8e86-10eb6d9d53e2)

[83] Rendering: Chart: Find point clusters: cluster hulls. 1 rows (id 382198e8-9ac9-4b75-9e8e-ef34700f25cd)

[84] Rendering: Chart: Find point clusters: Relief distributions. 22 rows (id bae50ece-0f0f-4399-87fd-3618eed224a5)

[85] Rendering: Chart: Find point clusters: cluster hulls. 21 rows (id 7bff01e1-9aeb-448c-8822-197f969c18f3)

[86] Rendering: Chart: Find point clusters: Health posts. 3 rows (id c1d4618b-97c3-444b-b7e7-445c2a95bc45)

[87] Rendering: Chart: Find point clusters: cluster hulls. 2 rows (id 004552ff-ca8c-4bd5-9838-b11d434b85b3)

[88] Rendering: Chart: Calculate density: Shelters. 8 rows (id 4716859b-53cb-4d5a-8441-47de226233ed)

[89] Rendering: Chart: Calculate density: Relief distributions. 9 rows (id a66c3a3a-0d79-4a90-8ba8-25684b82f78c)

[90] Rendering: Chart: Calculate density: Health posts. 9 rows (id 6d33660c-fb55-4ce5-9407-14cede82f1f7)

[91] Rendering: Chart: Find outliers: Wards. 20 rows (id 2c943aea-f0e1-4d2e-9a74-b1f3a68cccaf)

[92] Rendering: Chart: Find point clusters: Relief distributions over time. 76 rows (id ae09526f-b719-40fa-9352-7253703419e6)

[93] Rendering: Chart: Repeat and near repeat classification: Relief distributions over time. 76 rows (id d25012cc-f981-414f-b270-f5188a23b23a)

[94] Rendering: Chart: Hot spot analysis: Damage assessments over time. 126 rows (id dddbf0f7-9186-4260-86f0-90b42b3a2b7c)

[95] Rendering: Chart: Hot spot analysis: Relief distributions over time. 76 rows (id 75a753b2-7ec0-435d-93af-df87c5a2fdf9)

[96] Dataset: Wards. vector, 20 rows (id cd24d135-3a85-486d-b85d-aad5c710434a)

[97] Dataset: Shelters. vector, 25 rows (id 1a4488fc-1d07-4261-9f0e-01b2b1f2dca2)

[98] Dataset: Water points. vector, 60 rows (id c5cb6996-b665-4741-91b9-eb2b235d60b3)

[99] Dataset: Health posts. vector, 20 rows (id 8e654bff-294d-4ad6-be89-593de050aebf)

[100] Dataset: Shelter register. table, 25 rows (id 71a97a94-2ec4-4a02-b6d8-66a6192053f9)

[101] Dataset: Situation report No. 4. document, ? rows (id 919b6864-e3dc-42c9-b9dc-71340dbf1f59)

[102] Record: Sample: Disaster response, Kathmandu (id affd1e20-248c-4f96-b09d-48d3027477be)

[103] Layer: Hot spot analysis: Relief distributions. 320 features (id 9e5f578c-630b-43eb-8ebe-8545f6fca7c2)

[104] Layer: Hot spot analysis: Water points. 20 features (id bb294769-aa54-4b53-b8ab-a11a9895ae52)

[105] Layer: Hot spot analysis: Damage assessments. 2,000 features (id 363b8c44-c958-4210-beb4-e032340f3591)

[106] Layer: Emerging hot spots: Relief distributions. 54 features (id 6f8363b7-e1a7-432e-b17e-f0e1a5b04c12)

[107] Layer: Emerging hot spots: Damage assessments. 87 features (id 26abf030-7544-4caa-a068-87e5fbf6fc76)

[108] Layer: Repeat and near repeat classification: Relief distributions. 320 features (id 176d38bd-d5dd-4e59-bcf4-f4f67c442f05)

[109] Layer: Summarize within: Wards. 20 features (id 59ed06c8-19f7-4cdc-bf0a-93f1af3df0bb)

[110] Layer: Summarize within: Wards. 20 features (id 60eb7f4c-9283-4a68-b158-7fe6014e035b)

[111] Layer: Summarize within: Wards. 20 features (id d2a68fd2-e432-4366-8c8c-79cfc7fbd916)

[112] Layer: Find point clusters: Shelters. 25 features (id db7ac08f-e31a-41c7-b06d-b7bc5b1ddae1)

[113] Layer: Find point clusters: cluster hulls. 1 features (id 1a61db01-7dbf-4a4b-a14e-619c2d2130e2)

[114] Layer: Find point clusters: Relief distributions. 320 features (id 80a3b728-2f6b-44e4-962f-eac228b32051)

[115] Layer: Find point clusters: cluster hulls. 21 features (id ab1e3ae7-0d91-4e6a-8a58-5afda7d572e8)

[116] Layer: Find point clusters: Health posts. 20 features (id f387abca-2c2c-4945-9f86-d310b94a5d2e)

[117] Layer: Find point clusters: cluster hulls. 2 features (id 0ee12d31-db24-4ae2-ba77-bea3bd72c010)

[118] Layer: Calculate density: Shelters. 90 features (id 70bc6150-3af3-4110-ba8a-60400c37bf40)

[119] Layer: Calculate density: Relief distributions. 222 features (id 3d315b62-8343-4e06-9cb9-c92f6b2c53e0)

[120] Layer: Calculate density: Health posts. 228 features (id dc129652-f329-497f-8a85-b1a55c7c00b4)

[121] Document: Situation report No. 4 (id c492201b-e67e-4ae4-b97c-58a6ff283bc1)

Appendix: the data behind the charts

Figure 1. Timeline: events per day by dataset [1]

period	series	value
2026-09-02	Damage assessments	135
2026-09-02	Ward needs by day	20
2026-09-02	Relief distributions	0
2026-09-02	Road status	0
2026-09-03	Damage assessments	132
2026-09-03	Ward needs by day	20
2026-09-03	Relief distributions	0
2026-09-03	Road status	12
2026-09-04	Damage assessments	120
2026-09-04	Ward needs by day	20
2026-09-04	Relief distributions	21
2026-09-04	Road status	9
2026-09-05	Damage assessments	138
2026-09-05	Ward needs by day	20
2026-09-05	Relief distributions	15
2026-09-05	Road status	8
2026-09-06	Damage assessments	104
2026-09-06	Ward needs by day	20
2026-09-06	Relief distributions	15
2026-09-06	Road status	13
2026-09-07	Damage assessments	95
2026-09-07	Ward needs by day	20
2026-09-07	Relief distributions	9
2026-09-07	Road status	13
2026-09-08	Damage assessments	109
2026-09-08	Ward needs by day	20
2026-09-08	Relief distributions	18
2026-09-08	Road status	12
2026-09-09	Damage assessments	115
2026-09-09	Ward needs by day	20
2026-09-09	Relief distributions	16
2026-09-09	Road status	8
2026-09-10	Damage assessments	116
2026-09-10	Ward needs by day	20
2026-09-10	Relief distributions	15
2026-09-10	Road status	3
2026-09-11	Damage assessments	108
2026-09-11	Ward needs by day	20
2026-09-11	Relief distributions	15
2026-09-11	Road status	12

period	series	value
2026-09-12	Damage assessments	94
2026-09-12	Ward needs by day	20
2026-09-12	Relief distributions	17
2026-09-12	Road status	6
2026-09-13	Damage assessments	78
2026-09-13	Ward needs by day	20
2026-09-13	Relief distributions	19
2026-09-13	Road status	9
2026-09-14	Damage assessments	79
2026-09-14	Ward needs by day	20
2026-09-14	Relief distributions	17
2026-09-14	Road status	12
2026-09-15	Damage assessments	89
2026-09-15	Ward needs by day	20
2026-09-15	Relief distributions	19
2026-09-15	Road status	9
2026-09-16	Damage assessments	76
2026-09-16	Ward needs by day	20
2026-09-16	Relief distributions	18
2026-09-16	Road status	9
2026-09-17	Damage assessments	89
2026-09-17	Ward needs by day	20
2026-09-17	Relief distributions	20
2026-09-17	Road status	7
2026-09-18	Damage assessments	69
2026-09-18	Ward needs by day	20
2026-09-18	Relief distributions	17
2026-09-18	Road status	6
2026-09-19	Damage assessments	75
2026-09-19	Ward needs by day	20
2026-09-19	Relief distributions	11
2026-09-19	Road status	7
2026-09-20	Damage assessments	63
2026-09-20	Ward needs by day	20
2026-09-20	Relief distributions	16
2026-09-20	Road status	5
2026-09-21	Damage assessments	58
2026-09-21	Ward needs by day	20
2026-09-21	Relief distributions	18
2026-09-21	Road status	0
2026-09-22	Damage assessments	58
2026-09-22	Ward needs by day	20
2026-09-22	Relief distributions	24

period	series	value
2026-09-22	Road status	0

Figure 22. Water points over time (litres_per_day) [70]

bin_start	bin_end	count
3,306	9,005	15
9,005	1.47e+04	21
1.47e+04	2.04e+04	14
2.04e+04	2.61e+04	5
2.61e+04	3.18e+04	3
3.18e+04	3.75e+04	1
3.75e+04	4.32e+04	1

Figure 23. Relief distributions over time (date) [71]

period	series	value
2026-09-04	tarpaulin	900
2026-09-04	blanket	956
2026-09-04	food kit	1,490
2026-09-04	hygiene kit	1,373
2026-09-05	tarpaulin	509
2026-09-05	blanket	843
2026-09-05	food kit	928
2026-09-05	hygiene kit	519
2026-09-06	tarpaulin	970
2026-09-06	blanket	665
2026-09-06	food kit	474
2026-09-06	hygiene kit	285
2026-09-07	tarpaulin	0
2026-09-07	blanket	1,088
2026-09-07	food kit	381
2026-09-07	hygiene kit	391
2026-09-08	tarpaulin	1,716
2026-09-08	blanket	322
2026-09-08	food kit	1,480
2026-09-08	hygiene kit	913
2026-09-09	tarpaulin	772
2026-09-09	blanket	1,101
2026-09-09	food kit	1,175
2026-09-09	hygiene kit	591
2026-09-10	tarpaulin	1,161
2026-09-10	blanket	777
2026-09-10	food kit	509
2026-09-10	hygiene kit	409
2026-09-11	tarpaulin	120
2026-09-11	blanket	668

period	series	value
2026-09-11	food kit	612
2026-09-11	hygiene kit	896
2026-09-12	tarpaulin	579
2026-09-12	blanket	1,064
2026-09-12	food kit	229
2026-09-12	hygiene kit	1,670
2026-09-13	tarpaulin	652
2026-09-13	blanket	1,803
2026-09-13	food kit	830
2026-09-13	hygiene kit	290
2026-09-14	tarpaulin	477
2026-09-14	blanket	1,465
2026-09-14	food kit	1,109
2026-09-14	hygiene kit	713
2026-09-15	tarpaulin	2,002
2026-09-15	blanket	954
2026-09-15	food kit	900
2026-09-15	hygiene kit	276
2026-09-16	tarpaulin	1,140
2026-09-16	blanket	678
2026-09-16	food kit	1,279
2026-09-16	hygiene kit	1,119
2026-09-17	tarpaulin	989
2026-09-17	blanket	837
2026-09-17	food kit	612
2026-09-17	hygiene kit	851
2026-09-18	tarpaulin	1,746
2026-09-18	blanket	528
2026-09-18	food kit	572
2026-09-18	hygiene kit	1,245
2026-09-19	tarpaulin	681
2026-09-19	blanket	574
2026-09-19	food kit	851
2026-09-19	hygiene kit	408
2026-09-20	tarpaulin	1,323
2026-09-20	blanket	1,162
2026-09-20	food kit	418
2026-09-20	hygiene kit	680
2026-09-21	tarpaulin	1,866
2026-09-21	blanket	1,343
2026-09-21	food kit	481
2026-09-21	hygiene kit	746
2026-09-22	tarpaulin	538

period	series	value
2026-09-22	blanket	891
2026-09-22	food kit	1,749
2026-09-22	hygiene kit	1,689

Figure 24. Ward needs by day over time (date) [72]

period	series	value
2026-09-02	W06	1,174
2026-09-02	W18	738
2026-09-02	W20	705
2026-09-02	W04	501
2026-09-02	W05	480
2026-09-02	Other	3,667
2026-09-03	W06	1,146
2026-09-03	W18	720
2026-09-03	W20	688
2026-09-03	W04	489
2026-09-03	W05	468
2026-09-03	Other	3,581
2026-09-04	W06	1,118
2026-09-04	W18	703
2026-09-04	W20	672
2026-09-04	W04	477
2026-09-04	W05	457
2026-09-04	Other	3,492
2026-09-05	W06	1,090
2026-09-05	W18	685
2026-09-05	W20	655
2026-09-05	W04	465
2026-09-05	W05	445
2026-09-05	Other	3,405
2026-09-06	W06	1,062
2026-09-06	W18	667
2026-09-06	W20	638
2026-09-06	W04	453
2026-09-06	W05	434
2026-09-06	Other	3,318
2026-09-07	W06	1,034
2026-09-07	W18	650
2026-09-07	W20	621
2026-09-07	W04	441
2026-09-07	W05	422
2026-09-07	Other	3,230
2026-09-08	W06	1,006
2026-09-08	W18	632

period	series	value
2026-09-08	W20	604
2026-09-08	W04	429
2026-09-08	W05	411
2026-09-08	Other	3,143
2026-09-09	W06	978
2026-09-09	W18	615
2026-09-09	W20	588
2026-09-09	W04	417
2026-09-09	W05	400
2026-09-09	Other	3,055
2026-09-10	W06	950
2026-09-10	W18	597
2026-09-10	W20	571
2026-09-10	W04	405
2026-09-10	W05	388
2026-09-10	Other	2,968
2026-09-11	W06	922
2026-09-11	W18	580
2026-09-11	W20	554
2026-09-11	W04	393
2026-09-11	W05	377
2026-09-11	Other	2,880
2026-09-12	W06	894
2026-09-12	W18	562
2026-09-12	W20	537
2026-09-12	W04	381
2026-09-12	W05	365
2026-09-12	Other	2,792
2026-09-13	W06	866
2026-09-13	W18	544
2026-09-13	W20	520
2026-09-13	W04	370
2026-09-13	W05	354
2026-09-13	Other	2,705
2026-09-14	W06	838
2026-09-14	W18	527
2026-09-14	W20	504
2026-09-14	W04	358
2026-09-14	W05	342
2026-09-14	Other	2,616
2026-09-15	W06	811
2026-09-15	W18	509
2026-09-15	W20	487

period	series	value
2026-09-15	W04	346
2026-09-15	W05	331
2026-09-15	Other	2,530
2026-09-16	W06	783
2026-09-16	W18	492
2026-09-16	W20	470
2026-09-16	W04	334
2026-09-16	W05	320
2026-09-16	Other	2,442
2026-09-17	W06	755
2026-09-17	W18	474
2026-09-17	W20	453
2026-09-17	W04	322
2026-09-17	W05	308
2026-09-17	Other	2,355
2026-09-18	W06	727
2026-09-18	W18	457
2026-09-18	W20	436
2026-09-18	W04	310
2026-09-18	W05	297
2026-09-18	Other	2,270
2026-09-19	W06	699
2026-09-19	W18	439
2026-09-19	W20	420
2026-09-19	W04	298
2026-09-19	W05	285
2026-09-19	Other	2,180
2026-09-20	W06	671
2026-09-20	W18	421
2026-09-20	W20	403
2026-09-20	W04	286
2026-09-20	W05	274
2026-09-20	Other	2,093
2026-09-21	W06	643
2026-09-21	W18	404
2026-09-21	W20	386
2026-09-21	W04	274
2026-09-21	W05	262
2026-09-21	Other	2,006
2026-09-22	W06	615
2026-09-22	W18	386
2026-09-22	W20	369
2026-09-22	W04	262

period	series	value
2026-09-22	W05	251
2026-09-22	Other	1,918

Figure 25. Hot spot analysis: Relief distributions [73]

bin_start	bin_end	band	band_label	count
-2	-1.5	cold_90	Cold spot, 90% confidence	4
-1.5	-1	not_significant	Not significant	49
-1	-0.5	not_significant	Not significant	47
-0.5	0	not_significant	Not significant	24
0	0.5	not_significant	Not significant	111
0.5	1	not_significant	Not significant	72
1	1.5	not_significant	Not significant	13

Figure 26. Hot spot analysis: Water points [74]

bin_start	bin_end	band	band_label	count
-2	-1.5	cold_90	Cold spot, 90% confidence	2
-1.5	-1	not_significant	Not significant	1
-1	-0.5	not_significant	Not significant	5
0	0.5	not_significant	Not significant	5
0.5	1	not_significant	Not significant	3
1	1.5	not_significant	Not significant	3
2	2.5	hot_95	Hot spot, 95% confidence	1

Figure 27. Hot spot analysis: Damage assessments [75]

bin_start	bin_end	band	band_label	count
-4.5	-4	cold_99	Cold spot, 99% confidence	3
-4	-3.5	cold_99	Cold spot, 99% confidence	22
-3.5	-3	cold_99	Cold spot, 99% confidence	54
-3	-2.5	cold_95	Cold spot, 95% confidence	8
-3	-2.5	cold_99	Cold spot, 99% confidence	111
-2.5	-2	cold_95	Cold spot, 95% confidence	149
-2	-1.5	cold_90	Cold spot, 90% confidence	99
-2	-1.5	cold_95	Cold spot, 95% confidence	6
-2	-1.5	not_significant	Not significant	38
-1.5	-1	not_significant	Not significant	161
-1	-0.5	not_significant	Not significant	88
-0.5	0	not_significant	Not significant	102
0	0.5	not_significant	Not significant	91

bin_start	bin_end	band	band_label	count
0.5	1	not_significant	Not significant	104
1	1.5	not_significant	Not significant	139
1.5	2	hot_90	Hot spot, 90% confidence	104
1.5	2	hot_95	Hot spot, 95% confidence	7
1.5	2	not_significant	Not significant	35
2	2.5	hot_95	Hot spot, 95% confidence	109
2.5	3	hot_95	Hot spot, 95% confidence	12
2.5	3	hot_99	Hot spot, 99% confidence	87
3	3.5	hot_99	Hot spot, 99% confidence	105
3.5	4	hot_99	Hot spot, 99% confidence	73
4	4.5	hot_99	Hot spot, 99% confidence	60
4.5	5	hot_99	Hot spot, 99% confidence	49
5	5.5	hot_99	Hot spot, 99% confidence	38
5.5	6	hot_99	Hot spot, 99% confidence	64
6	6.5	hot_99	Hot spot, 99% confidence	57
6.5	7	hot_99	Hot spot, 99% confidence	23
7	7.5	hot_99	Hot spot, 99% confidence	2

Figure 28. Emerging hot spots: Relief distributions [76]

bin_start	bin_end	count
-0.827	-0.2167	15
-0.2167	0.3936	11
0.3936	1.004	10
1.004	1.614	6
1.614	2.224	6
2.224	2.835	4
2.835	3.445	2

Figure 29. Emerging hot spots: Damage assessments [77]

bin_start	bin_end	count
-1.153	-0.5664	45
-0.5664	0.02025	18
0.02025	0.6069	10
0.6069	1.194	0
1.194	1.78	6
1.78	2.367	6

bin_start	bin_end	count
2.367	2.953	1
2.953	3.54	1

Figure 30. Repeat and near repeat classification: Relief distributions [78]

period	series	value
2026-09-04	blanket	5
2026-09-04	tarpaulin	4
2026-09-04	hygiene kit	6
2026-09-04	food kit	6
2026-09-05	blanket	4
2026-09-05	tarpaulin	2
2026-09-05	hygiene kit	3
2026-09-05	food kit	6
2026-09-06	blanket	4
2026-09-06	tarpaulin	5
2026-09-06	hygiene kit	4
2026-09-06	food kit	2
2026-09-07	blanket	5
2026-09-07	tarpaulin	0
2026-09-07	hygiene kit	1
2026-09-07	food kit	3
2026-09-08	blanket	1
2026-09-08	tarpaulin	8
2026-09-08	hygiene kit	4
2026-09-08	food kit	5
2026-09-09	blanket	4
2026-09-09	tarpaulin	5
2026-09-09	hygiene kit	3
2026-09-09	food kit	4
2026-09-10	blanket	4
2026-09-10	tarpaulin	6
2026-09-10	hygiene kit	2
2026-09-10	food kit	3
2026-09-11	blanket	5
2026-09-11	tarpaulin	1
2026-09-11	hygiene kit	6
2026-09-11	food kit	3
2026-09-12	blanket	4
2026-09-12	tarpaulin	3
2026-09-12	hygiene kit	8
2026-09-12	food kit	2
2026-09-13	blanket	8
2026-09-13	tarpaulin	5
2026-09-13	hygiene kit	2

period	series	value
2026-09-13	food kit	4
2026-09-14	blanket	7
2026-09-14	tarpaulin	3
2026-09-14	hygiene kit	4
2026-09-14	food kit	3
2026-09-15	blanket	5
2026-09-15	tarpaulin	8
2026-09-15	hygiene kit	2
2026-09-15	food kit	4
2026-09-16	blanket	4
2026-09-16	tarpaulin	5
2026-09-16	hygiene kit	5
2026-09-16	food kit	4
2026-09-17	blanket	6
2026-09-17	tarpaulin	5
2026-09-17	hygiene kit	5
2026-09-17	food kit	4
2026-09-18	blanket	2
2026-09-18	tarpaulin	6
2026-09-18	hygiene kit	6
2026-09-18	food kit	3
2026-09-19	blanket	4
2026-09-19	tarpaulin	2
2026-09-19	hygiene kit	2
2026-09-19	food kit	3
2026-09-20	blanket	5
2026-09-20	tarpaulin	6
2026-09-20	hygiene kit	3
2026-09-20	food kit	2
2026-09-21	blanket	4
2026-09-21	tarpaulin	8
2026-09-21	hygiene kit	2
2026-09-21	food kit	4
2026-09-22	blanket	6
2026-09-22	tarpaulin	3
2026-09-22	hygiene kit	9
2026-09-22	food kit	6

Figure 31. Summarize within: Wards [79]

bin_start	bin_end	count
0	0.5	3
0.5	1	0
1	1.5	11
1.5	2	0

bin_start	bin_end	count
2	2.5	4
2.5	3	2

Figure 32. Summarize within: Wards [80]

bin_start	bin_end	count
0	7	4
7	14	3
14	21	7
21	28	2
28	35	2
35	42	2

Figure 33. Summarize within: Wards [81]

bin_start	bin_end	count
0	0.6667	9
0.6667	1.333	6
1.333	2	0
2	2.667	2
2.667	3.333	2
3.333	4	1

Figure 34. Find point clusters: Shelters [82]

cluster	features	fraction	share
0	23	0.92	92.0%
Noise	2	0.08	8.0%

Figure 35. Find point clusters: cluster hulls [83]

cluster	features	fraction	share
0	1	1	100.0%

Figure 36. Find point clusters: Relief distributions [84]

cluster	features	fraction	share
7	25	0.07812	7.8%
15	21	0.06563	6.6%
0	17	0.05312	5.3%
10	17	0.05312	5.3%
2	17	0.05312	5.3%
9	16	0.05	5.0%
11	15	0.04688	4.7%
12	15	0.04688	4.7%
3	15	0.04688	4.7%
14	14	0.04375	4.4%
17	14	0.04375	4.4%
4	14	0.04375	4.4%
5	14	0.04375	4.4%
6	14	0.04375	4.4%

cluster	features	fraction	share
8	14	0.04375	4.4%
18	13	0.04063	4.1%
13	12	0.0375	3.8%
20	12	0.0375	3.8%
Noise	12	0.0375	3.8%
19	11	0.03438	3.4%
1	10	0.03125	3.1%
16	8	0.025	2.5%

Figure 37. Find point clusters: cluster hulls [85]

cluster	features	fraction	share
0	1	0.04762	4.8%
1	1	0.04762	4.8%
10	1	0.04762	4.8%
11	1	0.04762	4.8%
12	1	0.04762	4.8%
13	1	0.04762	4.8%
14	1	0.04762	4.8%
15	1	0.04762	4.8%
16	1	0.04762	4.8%
17	1	0.04762	4.8%
18	1	0.04762	4.8%
19	1	0.04762	4.8%
2	1	0.04762	4.8%
20	1	0.04762	4.8%
3	1	0.04762	4.8%
4	1	0.04762	4.8%
5	1	0.04762	4.8%
6	1	0.04762	4.8%
7	1	0.04762	4.8%
8	1	0.04762	4.8%
9	1	0.04762	4.8%

Figure 38. Find point clusters: Health posts [86]

cluster	features	fraction	share
0	16	0.8	80.0%
1	3	0.15	15.0%
Noise	1	0.05	5.0%

Figure 39. Find point clusters: cluster hulls [87]

cluster	features	fraction	share
0	1	0.5	50.0%
1	1	0.5	50.0%

Figure 40. Calculate density: Shelters [88]

bin_start	bin_end	count
4.952e-05	0.1046	26
0.1046	0.2091	11
0.2091	0.3137	13
0.3137	0.4182	16
0.4182	0.5227	13
0.5227	0.6273	6
0.6273	0.7318	4
0.7318	0.8364	1

Figure 41. Calculate density: Relief distributions [89]

bin_start	bin_end	count
0	2	16
2	4	24
4	6	30
6	8	30
8	10	29
10	12	23
12	14	30
14	16	27
16	18	13

Figure 42. Calculate density: Health posts [90]

bin_start	bin_end	count
0	1.778	19
1.778	3.556	28
3.556	5.333	32
5.333	7.111	32
7.111	8.889	15
8.889	10.67	32
10.67	12.44	32
12.44	14.22	26
14.22	16	12

Figure 43. Find outliers: Wards [91]

value	lag	type
-0.1006	0.265	NS
-1.513	-0.6592	NS
-0.5809	-0.8478	NS
-0.3709	-0.6076	NS
-0.0457	-1.258	NS
2.151	-1.039	NS
-0.0925	0.0756	NS
-1.004	0.3063	NS
0.1157	1.873	NS
0.9009	-0.1006	NS

value	lag	type
-0.5907	-0.6902	NS
1.234	-1.004	NS
1.873	-0.0841	NS
0.7456	-0.5907	NS
-0.2838	0.3999	NS
-1.413	-0.7775	NS
0.4349	-0.0925	NS
-0.9643	-0.4722	NS
0.6182	-1.004	NS
-1.115	-0.1741	NS

Figure 44. Find point clusters: Relief distributions over time [92]

period	series	value
2026-09-04	blanket	5
2026-09-04	tarpaulin	4
2026-09-04	hygiene kit	6
2026-09-04	food kit	6
2026-09-05	blanket	4
2026-09-05	tarpaulin	2
2026-09-05	hygiene kit	3
2026-09-05	food kit	6
2026-09-06	blanket	4
2026-09-06	tarpaulin	5
2026-09-06	hygiene kit	4
2026-09-06	food kit	2
2026-09-07	blanket	5
2026-09-07	tarpaulin	0
2026-09-07	hygiene kit	1
2026-09-07	food kit	3
2026-09-08	blanket	1
2026-09-08	tarpaulin	8
2026-09-08	hygiene kit	4
2026-09-08	food kit	5
2026-09-09	blanket	4
2026-09-09	tarpaulin	5
2026-09-09	hygiene kit	3
2026-09-09	food kit	4
2026-09-10	blanket	4
2026-09-10	tarpaulin	6
2026-09-10	hygiene kit	2
2026-09-10	food kit	3
2026-09-11	blanket	5
2026-09-11	tarpaulin	1
2026-09-11	hygiene kit	6

period	series	value
2026-09-11	food kit	3
2026-09-12	blanket	4
2026-09-12	tarpaulin	3
2026-09-12	hygiene kit	8
2026-09-12	food kit	2
2026-09-13	blanket	8
2026-09-13	tarpaulin	5
2026-09-13	hygiene kit	2
2026-09-13	food kit	4
2026-09-14	blanket	7
2026-09-14	tarpaulin	3
2026-09-14	hygiene kit	4
2026-09-14	food kit	3
2026-09-15	blanket	5
2026-09-15	tarpaulin	8
2026-09-15	hygiene kit	2
2026-09-15	food kit	4
2026-09-16	blanket	4
2026-09-16	tarpaulin	5
2026-09-16	hygiene kit	5
2026-09-16	food kit	4
2026-09-17	blanket	6
2026-09-17	tarpaulin	5
2026-09-17	hygiene kit	5
2026-09-17	food kit	4
2026-09-18	blanket	2
2026-09-18	tarpaulin	6
2026-09-18	hygiene kit	6
2026-09-18	food kit	3
2026-09-19	blanket	4
2026-09-19	tarpaulin	2
2026-09-19	hygiene kit	2
2026-09-19	food kit	3
2026-09-20	blanket	5
2026-09-20	tarpaulin	6
2026-09-20	hygiene kit	3
2026-09-20	food kit	2
2026-09-21	blanket	4
2026-09-21	tarpaulin	8
2026-09-21	hygiene kit	2
2026-09-21	food kit	4
2026-09-22	blanket	6
2026-09-22	tarpaulin	3

period	series	value
2026-09-22	hygiene kit	9
2026-09-22	food kit	6

Figure 45. Repeat and near repeat classification: Relief distributions over time [93]

period	series	value
2026-09-04	blanket	5
2026-09-04	tarpaulin	4
2026-09-04	hygiene kit	6
2026-09-04	food kit	6
2026-09-05	blanket	4
2026-09-05	tarpaulin	2
2026-09-05	hygiene kit	3
2026-09-05	food kit	6
2026-09-06	blanket	4
2026-09-06	tarpaulin	5
2026-09-06	hygiene kit	4
2026-09-06	food kit	2
2026-09-07	blanket	5
2026-09-07	tarpaulin	0
2026-09-07	hygiene kit	1
2026-09-07	food kit	3
2026-09-08	blanket	1
2026-09-08	tarpaulin	8
2026-09-08	hygiene kit	4
2026-09-08	food kit	5
2026-09-09	blanket	4
2026-09-09	tarpaulin	5
2026-09-09	hygiene kit	3
2026-09-09	food kit	4
2026-09-10	blanket	4
2026-09-10	tarpaulin	6
2026-09-10	hygiene kit	2
2026-09-10	food kit	3
2026-09-11	blanket	5
2026-09-11	tarpaulin	1
2026-09-11	hygiene kit	6
2026-09-11	food kit	3
2026-09-12	blanket	4
2026-09-12	tarpaulin	3
2026-09-12	hygiene kit	8
2026-09-12	food kit	2
2026-09-13	blanket	8
2026-09-13	tarpaulin	5
2026-09-13	hygiene kit	2

period	series	value
2026-09-13	food kit	4
2026-09-14	blanket	7
2026-09-14	tarpaulin	3
2026-09-14	hygiene kit	4
2026-09-14	food kit	3
2026-09-15	blanket	5
2026-09-15	tarpaulin	8
2026-09-15	hygiene kit	2
2026-09-15	food kit	4
2026-09-16	blanket	4
2026-09-16	tarpaulin	5
2026-09-16	hygiene kit	5
2026-09-16	food kit	4
2026-09-17	blanket	6
2026-09-17	tarpaulin	5
2026-09-17	hygiene kit	5
2026-09-17	food kit	4
2026-09-18	blanket	2
2026-09-18	tarpaulin	6
2026-09-18	hygiene kit	6
2026-09-18	food kit	3
2026-09-19	blanket	4
2026-09-19	tarpaulin	2
2026-09-19	hygiene kit	2
2026-09-19	food kit	3
2026-09-20	blanket	5
2026-09-20	tarpaulin	6
2026-09-20	hygiene kit	3
2026-09-20	food kit	2
2026-09-21	blanket	4
2026-09-21	tarpaulin	8
2026-09-21	hygiene kit	2
2026-09-21	food kit	4
2026-09-22	blanket	6
2026-09-22	tarpaulin	3
2026-09-22	hygiene kit	9
2026-09-22	food kit	6

Figure 46. Hot spot analysis: Damage assessments over time [94]

period	series	value
2026-09-02	not_significant	51
2026-09-02	hot_99	41
2026-09-02	cold_99	12
2026-09-02	cold_95	13

period	series	value
2026-09-02	hot_95	8
2026-09-02	Other	10
2026-09-03	not_significant	47
2026-09-03	hot_99	35
2026-09-03	cold_99	9
2026-09-03	cold_95	14
2026-09-03	hot_95	11
2026-09-03	Other	16
2026-09-04	not_significant	47
2026-09-04	hot_99	37
2026-09-04	cold_99	9
2026-09-04	cold_95	8
2026-09-04	hot_95	5
2026-09-04	Other	14
2026-09-05	not_significant	51
2026-09-05	hot_99	49
2026-09-05	cold_99	13
2026-09-05	cold_95	7
2026-09-05	hot_95	7
2026-09-05	Other	11
2026-09-06	not_significant	43
2026-09-06	hot_99	32
2026-09-06	cold_99	7
2026-09-06	cold_95	10
2026-09-06	hot_95	7
2026-09-06	Other	5
2026-09-07	not_significant	41
2026-09-07	hot_99	26
2026-09-07	cold_99	6
2026-09-07	cold_95	6
2026-09-07	hot_95	8
2026-09-07	Other	8
2026-09-08	not_significant	41
2026-09-08	hot_99	29
2026-09-08	cold_99	10
2026-09-08	cold_95	10
2026-09-08	hot_95	9
2026-09-08	Other	10
2026-09-09	not_significant	50
2026-09-09	hot_99	24
2026-09-09	cold_99	12
2026-09-09	cold_95	10
2026-09-09	hot_95	7

period	series	value
2026-09-09	Other	12
2026-09-10	not_significant	38
2026-09-10	hot_99	38
2026-09-10	cold_99	14
2026-09-10	cold_95	5
2026-09-10	hot_95	8
2026-09-10	Other	13
2026-09-11	not_significant	35
2026-09-11	hot_99	24
2026-09-11	cold_99	11
2026-09-11	cold_95	14
2026-09-11	hot_95	13
2026-09-11	Other	11
2026-09-12	not_significant	36
2026-09-12	hot_99	27
2026-09-12	cold_99	6
2026-09-12	cold_95	7
2026-09-12	hot_95	4
2026-09-12	Other	14
2026-09-13	not_significant	29
2026-09-13	hot_99	29
2026-09-13	cold_99	4
2026-09-13	cold_95	5
2026-09-13	hot_95	4
2026-09-13	Other	7
2026-09-14	not_significant	33
2026-09-14	hot_99	14
2026-09-14	cold_99	8
2026-09-14	cold_95	9
2026-09-14	hot_95	4
2026-09-14	Other	11
2026-09-15	not_significant	28
2026-09-15	hot_99	22
2026-09-15	cold_99	13
2026-09-15	cold_95	9
2026-09-15	hot_95	5
2026-09-15	Other	12
2026-09-16	not_significant	31
2026-09-16	hot_99	20
2026-09-16	cold_99	8
2026-09-16	cold_95	7
2026-09-16	hot_95	3
2026-09-16	Other	7

period	series	value
2026-09-17	not_significant	30
2026-09-17	hot_99	32
2026-09-17	cold_99	13
2026-09-17	cold_95	2
2026-09-17	hot_95	3
2026-09-17	Other	9
2026-09-18	not_significant	23
2026-09-18	hot_99	20
2026-09-18	cold_99	9
2026-09-18	cold_95	6
2026-09-18	hot_95	4
2026-09-18	Other	7
2026-09-19	not_significant	32
2026-09-19	hot_99	18
2026-09-19	cold_99	6
2026-09-19	cold_95	6
2026-09-19	hot_95	6
2026-09-19	Other	7
2026-09-20	not_significant	24
2026-09-20	hot_99	7
2026-09-20	cold_99	10
2026-09-20	cold_95	7
2026-09-20	hot_95	6
2026-09-20	Other	9
2026-09-21	not_significant	22
2026-09-21	hot_99	16
2026-09-21	cold_99	5
2026-09-21	cold_95	4
2026-09-21	hot_95	4
2026-09-21	Other	7
2026-09-22	not_significant	26
2026-09-22	hot_99	18
2026-09-22	cold_99	5
2026-09-22	cold_95	4
2026-09-22	hot_95	2
2026-09-22	Other	3

Figure 47. Hot spot analysis: Relief distributions over time [95]

period	series	value
2026-09-04	blanket	5
2026-09-04	tarpaulin	4
2026-09-04	hygiene kit	6
2026-09-04	food kit	6
2026-09-05	blanket	4

period	series	value
2026-09-05	tarpaulin	2
2026-09-05	hygiene kit	3
2026-09-05	food kit	6
2026-09-06	blanket	4
2026-09-06	tarpaulin	5
2026-09-06	hygiene kit	4
2026-09-06	food kit	2
2026-09-07	blanket	5
2026-09-07	tarpaulin	0
2026-09-07	hygiene kit	1
2026-09-07	food kit	3
2026-09-08	blanket	1
2026-09-08	tarpaulin	8
2026-09-08	hygiene kit	4
2026-09-08	food kit	5
2026-09-09	blanket	4
2026-09-09	tarpaulin	5
2026-09-09	hygiene kit	3
2026-09-09	food kit	4
2026-09-10	blanket	4
2026-09-10	tarpaulin	6
2026-09-10	hygiene kit	2
2026-09-10	food kit	3
2026-09-11	blanket	5
2026-09-11	tarpaulin	1
2026-09-11	hygiene kit	6
2026-09-11	food kit	3
2026-09-12	blanket	4
2026-09-12	tarpaulin	3
2026-09-12	hygiene kit	8
2026-09-12	food kit	2
2026-09-13	blanket	8
2026-09-13	tarpaulin	5
2026-09-13	hygiene kit	2
2026-09-13	food kit	4
2026-09-14	blanket	7
2026-09-14	tarpaulin	3
2026-09-14	hygiene kit	4
2026-09-14	food kit	3
2026-09-15	blanket	5
2026-09-15	tarpaulin	8
2026-09-15	hygiene kit	2
2026-09-15	food kit	4

period	series	value
2026-09-16	blanket	4
2026-09-16	tarpaulin	5
2026-09-16	hygiene kit	5
2026-09-16	food kit	4
2026-09-17	blanket	6
2026-09-17	tarpaulin	5
2026-09-17	hygiene kit	5
2026-09-17	food kit	4
2026-09-18	blanket	2
2026-09-18	tarpaulin	6
2026-09-18	hygiene kit	6
2026-09-18	food kit	3
2026-09-19	blanket	4
2026-09-19	tarpaulin	2
2026-09-19	hygiene kit	2
2026-09-19	food kit	3
2026-09-20	blanket	5
2026-09-20	tarpaulin	6
2026-09-20	hygiene kit	3
2026-09-20	food kit	2
2026-09-21	blanket	4
2026-09-21	tarpaulin	8
2026-09-21	hygiene kit	2
2026-09-21	food kit	4
2026-09-22	blanket	6
2026-09-22	tarpaulin	3
2026-09-22	hygiene kit	9
2026-09-22	food kit	6