Geoneon
MAPPING CLIMATE RISKS

2025 GREATER HOBART BUSHFIRE EXPOSURE REPORT

An Analysis of Bushfire Exposure across the Greater Hobart, offering insights to support local governments and communities in enhancing long-term preparedness

September 2025

Project partners

City of Clarence

City of HOBART

Derwent Valley COUNCIL

Kingborough

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FOREWORD

Putting actionable science in people's hands

Greater Hobart's strength lies in how our councils and communities plan together. This year's Greater Hobart Bushfire Exposure Index is another step in that direction: an annually refreshed, public, building level map designed to help prioritise mitigation, inform planning, and support community awareness ahead of the fire season. The 2025 update assesses exposure for around 112,000 buildings and has been delivered in partnership with City of Hobart, Clarence City Council, Kingborough Council and Derwent Valley Council—now included for the first time—so the region can make decisions with a shared evidence base. It is a planning tool, not a real time warning system, and it complements the guidance of the Tasmania Fire Service.

Behind the map is Geoneon's Wildfire Data Stack, which brings together satellite derived vegetation structure, terrain and long term climate with quality controlled building footprints to estimate potential severity in the landscape and the exposure of each building to nearby fuels. We publish results on a simple 1–10 scale so they are easy to read while remaining scientifically grounded and

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CEO | Geoneon

comparable through time. This year we have enhanced the vegetation analytics and expanded coverage—continuing the approach we have documented and presented publicly to build trust and transparency in how the Index works.

Thank you to our council partners for funding and collaboration on this third consecutive annual release, and to the many people across Greater Hobart who use the Index to start practical conversations—about vegetation management, defensible space, and household bushfire plans. I encourage residents to check their property on the map, talk with neighbours, and prepare early. Together, we can focus effort where it matters most and keep improving our resilience year on year.

METHODOLOGY

Understand the index v2025

The Greater Hobart Bushfire Exposure Index is built from two complementary layers:

— **Wildfire Severity Index (WSI) —** a landscape layer that ranks where severe fire is most likely if a fire occurs, based on fuels, terrain and long term dryness. WSI is calculated as a continuous surface and then published as easy to read classes 1–10.

— **Wildfire Exposure Index (WEI) —** a building level measure of exposure to nearby fuels, computed from the WSI around each building and also shown on a 1–10 scale.

This asset centred approach is designed for preparedness and mitigation planning rather than real time fire spread prediction.

We integrate five inputs to produce WSI and WEI: satellite imagery, vegetation structure, topography, climate dryness, and buildings. Each is versioned and refreshable, so the Index can be updated on a regular cadence while remaining comparable year to year.

— **Imagery (Sentinel 2 Level 2A, 10 m)**: provides the spectral detail to map vegetation reliably across the region.

— **Vegetation structure (10 m)**: combines spectral indices (NDVI/EVI) with a learned tree probability layer to capture the continuity and density of fuels, aggregated over ~1 ha to reflect how fuels behave, then normalised to [0,1].

— **Topography**: derived from a DEM to capture slope and short range terrain variation; slope modulates potential rate of spread.

— **Climate dryness**: a slowly varying long term precipitation proxy, resampled to analysis scale; emphasises fuel related effects over vegetated pixels.

— **Buildings**: quality controlled footprints anchor the analysis to each structure for WEI.

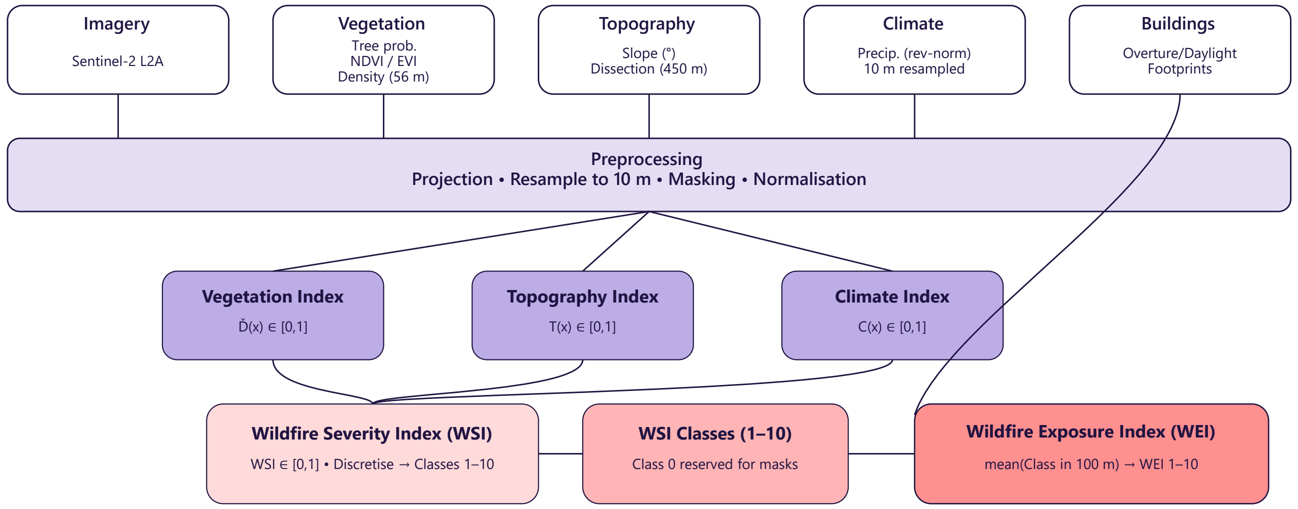

Figure 1. Geoneon Wildfire Data Stack — Diagram of the inputs → processing → outputs workflow used to generate WSI and building level WEI for Greater Hobart.

How we build the WSI and WEI

1. **Vegetation structure (fuels)**: We fuse NDVI and EVI with a deep learning tree probability surface to map woody vegetation and its local continuity at 10 m. Fuels are then class weighted and aggregated over a ~1 ha neighbourhood to reflect how continuous fuels drive fire behaviour. The result is a vegetation density layer in [0,1].
2. **Topographic modifier**: From the DEM we compute slope (affecting potential rate of spread) and a local relief measure (short range terrain variation). These are normalised and combined into a single topography factor in [0,1].
3. **Climate dryness**: We derive a dryness proxy from long term precipitation (wetter areas score lower; drier ar-

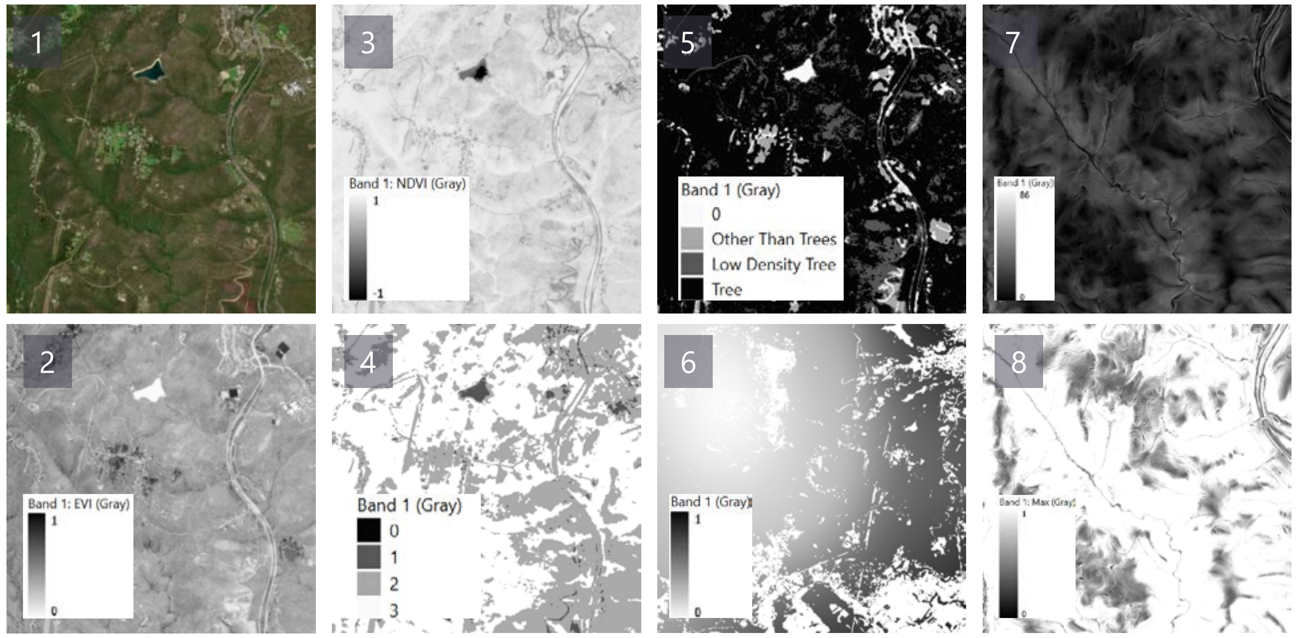

Figure 2. Satellite derived vegetation structure (1-5) underpins the fuels signal that drives WSI. Long term dryness (6) and terrain (7-8) provide modifiers to the vegetation driven severity signal.

eas higher), resampled to 10 m. This provides a stable, interpretable background condition for preparedness products.

4. **Integration and classes**: Vegetation, topography and dryness are combined (unit sum weights) into a continuous WSI and then discretised to classes 1–10 for consistent mapping and communication; class 0 is reserved for masked/no data areas.

For each building, we compute the mean of WSI classes (1–10) within 100 m of the building's centroid to obtain a raw exposure score, then bin it to classes 1–10. This produces an interpretable, per asset index aligned with wildland–urban interface literature that relates structural exposure to the proximity and continuity of nearby fuels.

Data sources for version GH-2025.00

The datasets presented in Table 1 were used for the version GH-2025.00 production run of the Greater Hobart Wildfire Data Stack (used to generate WSI/WEI for this report).

Table 1. Input datasets used for the version 2025.01 production run of the Greater Hobart Wildfire Data Stack (WSI/WEI).

Data type	Source / Version	Capture / Release date	Download date
Derwent Valley imagery	Sentinel-2 Level-2A (surface reflectance)	29/03/2024	17/07/2025
Hobart imagery	Sentinel-2 Level-2A (surface reflectance)	04/12/2024	17/07/2025
Buildings	Overture / Daylight building footprints	2025-06-25.0	27/07/2025
Topography	COPDEM (Copernicus DEM)	14/08/2021	12/09/2024
Weather / Climate	ANUCLIM v6.1 & CSIRO gridded climate data	12/08/2018	05/09/2024

Appropriate use & limitations

— **Not a spread or ignition model**. WSI/WEI do not simulate where a fire will start or how it will move on a given day; they show where severe fire is most likely if nearby fuels burn.

— **Input dependencies**. Exposure inherits limitations from building footprints and from the design choice of a 100 m exposure radius (a transparent, conservative default).

— **Scope changes**. Comparisons with prior years should consider area/scope changes and input refreshes.

RESULTS

Building exposure across Greater Hobart

Greater Hobart contains 111,810 buildings across 115 suburbs. Of these, 11,701 buildings (10.5%) fall in the higher exposure bands (7–10) of the Bushfire Exposure Index. Exposure clusters along the wildland–urban interface and peri-urban corridors—places where continuous bushland meets settlement.

The region-wide share reflects two dynamics in the sections below:

1. Different council profiles, where some LGAs have a higher rate of exposed buildings while others contribute large counts because they have more buildings overall.
2. Suburb-scale concentration, where a relatively small set of suburbs account for a large portion of the total exposed buildings.

Table 2. This table summarises the total number and percentage of buildings in the Greater Hobart area that fall into each exposure category (7-10), ranging from "Moderately High" to "Extremely High."

Bushfire Exposure Index	Number of Buildings	Percentage of Buildings
Extremely High (10)	150	0.13%
Very High (9)	2,757	2.47%
Relatively High (8)	4,385	3.92%
Moderately High (7)	4,409	3.94%
Total	**11,701**	**10.5%**

LGA breakdown

At the council scale, Kingborough contributes the largest number of higher-exposure buildings—about four in ten of the regional total—reflecting both its peri-urban footprint and interface length. Hobart contributes roughly a quarter, while Clarence contributes a substantial number at a lower rate (because it has the largest overall building stock). Derwent Valley shows a high rate (similar to Kingborough) despite a smaller total building count—typical of rural/peri-urban areas with extensive nearby fuels.

Table 3: Breakdown of buildings exposed to bushfires (bands 7-10) by Local Government Area (LGA).

LGA	Number of Buildings (7-10)	Percentage of Buildings (7-10)
Kingborough Council	4,736	16.15%
City of Hobart	2,837	9.50%
Clarence City Council	2,188	5.46%
Derwent Valley Council	1,940	15.42%
Total	**11,701**	**10.5%**

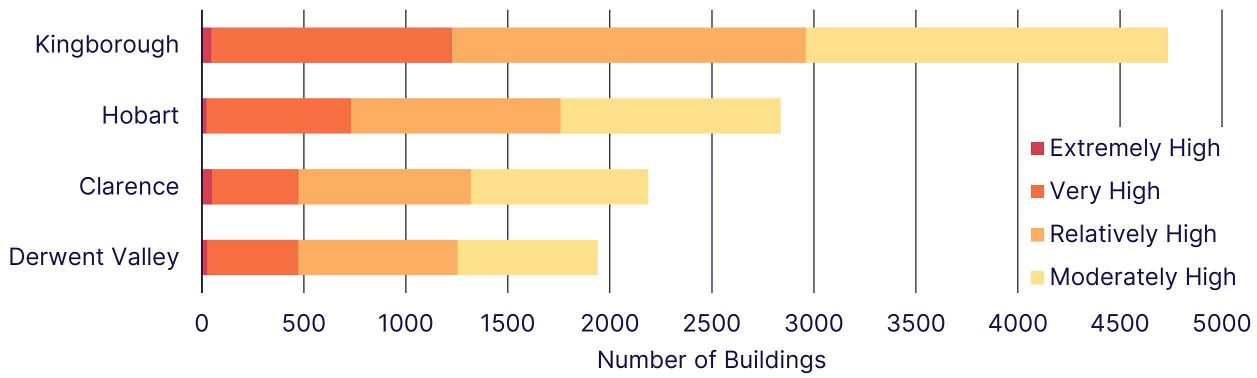

Figure 3: Number of buildings by Bushfire Exposure Index bands (7-10) for each LGA.

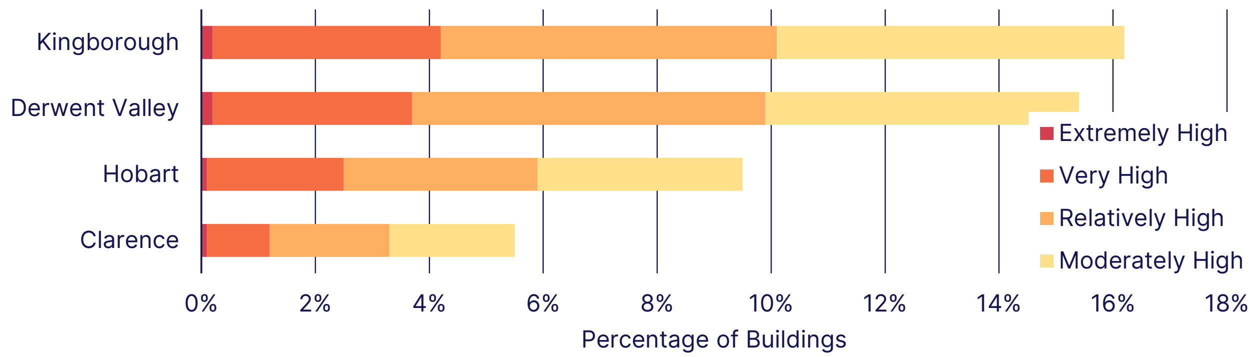

Figure 4: Percentage of buildings by Bushfire Exposure Index bands (7-10) for each LGA.

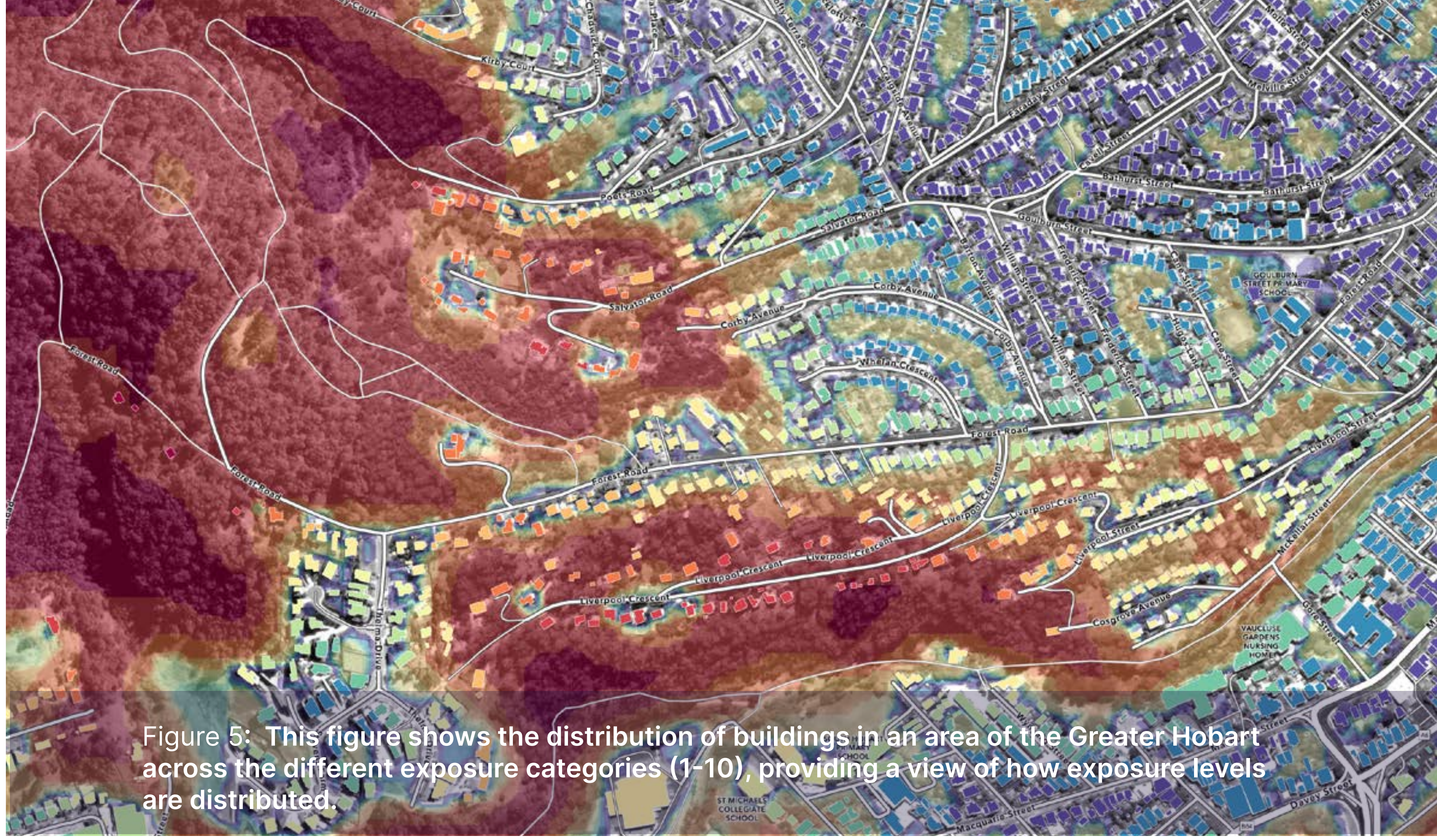

Figure 5: This figure shows the distribution of buildings in an area of the Greater Hobart across the different exposure categories (1-10), providing a view of how exposure levels are distributed.

Suburb-level breakdown

Higher-exposure buildings are not evenly distributed; they concentrate in a relatively small set of interface suburbs. The top ten suburbs by count account for ~44% of all higher-exposure buildings across Greater Hobart. These are spread across all four LGAs and trace well-known interface edges (e.g., Sandford, South Hobart, Mount Nelson, Margate/Kingston) and Derwent Valley corridors (Molesworth, Lachlan, Southwest).

Table 4: Top 10 suburbs by number of buildings in Bushfire Exposure Index bands 7–10.

Suburb	LGA	Number of Buildings
Sandford	Clarence City Council	794
South Hobart	City of Hobart	788
Mount Nelson	City of Hobart	610
Margate	Kingborough Council	563
Kingston	Kingborough Council	539
Fern Tree	City of Hobart	451
Molesworth	Derwent Valley Council	408
Southwest	Derwent Valley Council	365
Lachlan	Derwent Valley Council	346
Kettering	Kingborough Council	283

Looking at percentage (share within each suburb) highlights small settlements that are almost entirely exposed because they sit within or immediately alongside continuous fuels. To avoid small-number artefacts, we report suburbs with ≥ 50 buildings. Several stand out for both high percentage and a meaningful base of buildings—most notably Fern Tree (very high percentage and substantial count), along with Bonnet Hill, Oyster Cove and Tolmans Hill.

Table 5: Top 10 suburbs by percentage of buildings in Bushfire Exposure Index bands 7–10 (≥ 50 buildings)

Suburb	LGA	% of buildings (7–10)	Total buildings
Styx	Derwent Valley Council	96.4%	55
Fern Tree	City of Hobart	93.2%	484
Bonnet Hill	Kingborough Council	86.8%	317
Mount Field	Derwent Valley Council	77.2%	66
Ridgeway	City of Hobart	75.8%	199
Longley	Kingborough Council	71.5%	281
Mount Rumney	Clarence City Council	71.3%	321
Oyster Cove	Kingborough Council	66.0%	404
Tolmans Hill	City of Hobart	58.4%	262
Dulcot	Clarence City Council	52.0%	204

Interpreting Differences from 2024

This year's figures are not directly comparable to the 2024 headline numbers because the study scope and inputs changed, and the asset counting method was refined. The main drivers are listed below in order of importance.

1. **Geographic scope changed (biggest driver):** The 2025 update includes Derwent Valley and does not include Brighton, Glenorchy or Sorell from last year's analysis extent. Derwent Valley has a higher share of buildings in bands 7–10 (15.42%) than the 2024 low rate LGAs (e.g., Brighton 1.1%, Sorell 1.9%, Glenorchy 2.5%). Switching the mix of councils therefore lifts the regional percentage even before any model or data changes are considered.
2. **Unit of analysis: per building (2025) vs largest building per parcel (2024):** In 2024 we counted the largest/main building per parcel to avoid overweighting sheds or minor structures; in 2025 we count every building individually. This increases both the denominator and numerator. In peri urban areas where lots often contain multiple structures within 100 m of bushland, the net effect tends to raise the proportion in bands 7–10 because additional outbuildings and secondary dwellings are also near continuous fuels.

3. **Buildings dataset is more complete in 2025:** The current run uses a later release of quality controlled open footprints, closing many previously missing buildings. Added footprints are disproportionately located around the wildland–urban interface, so completeness improvements can raise the counted share in higher exposure bands.
4. **Improved fuels mapping (model refinements):** The 2025 cycle includes enhancements to the AI derived vegetation layer, which can reclassify some pixels to higher potential severity where continuous fuels were previously under detected—especially along canopy edges and bushland margins. This improves face validity against burn severity patterns but can shift some buildings upward in WEI.
5. **Input refresh and normal year to year change:** Updates to imagery epochs, building releases, and QA, plus local vegetation change (e.g., clearing, regrowth) introduce expected small deltas in severity and exposure. These are routine for an annually refreshed index and are part of keeping the product current.

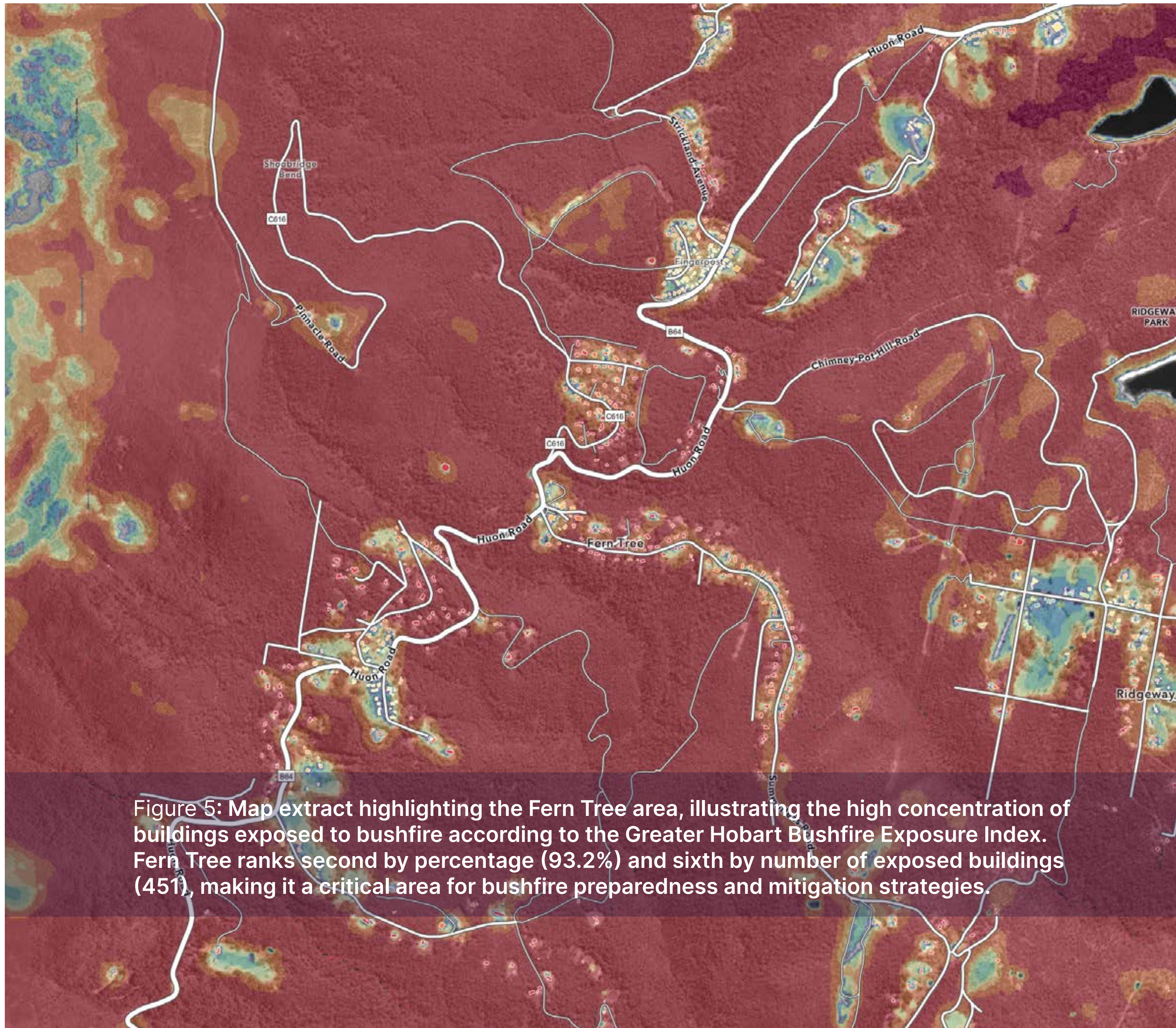

Figure 5: Map extract highlighting the Fern Tree area, illustrating the high concentration of buildings exposed to bushfire according to the Greater Hobart Bushfire Exposure Index. Fern Tree ranks second by percentage (93.2%) and sixth by number of exposed buildings (451), making it a critical area for bushfire preparedness and mitigation strategies.

CONCLUSION

Building resilience with consistent, asset level evidence

The 2025 Greater Hobart Bushfire Exposure Index provides a clear, building level picture of where exposure concentrates across the region and makes that information accessible to councils and residents through the public map. This year's update assesses ~112,000 buildings, adds Derwent Valley to the mapped area, and refreshes inputs and QA—continuing an annual cycle intended for preparedness, mitigation planning and community awareness.

Across 111,810 buildings in 115 suburbs, 11,701 (10.5%) fall in the higher exposure classes (7–10). Exposure continues to cluster along the wildland–urban interface and peri urban corridors. At LGA scale, Kingborough has the largest number of higher exposure buildings (16.15% of its stock), with Derwent Valley also elevated by share (15.42%); Hobart and Clarence show substantial but lower overall proportions. Suburb patterns reflect this geography, with large counts in Sandford, South Hobart and Mount Nelson, and high percentages in Styx, Fern Tree and Bonnet Hill. These results give councils a ranked, location specific basis to focus investment and engagement.

How to use the Index.

- **Target mitigation and maintenance**: Prioritise programs where large counts and high percentages coincide (e.g., treatment planning, defensible space initiatives, seasonal communications).
- **Inform planning workflows**: Use suburb/LGA tables to support strategic assessments, capital works scheduling, and community engagement materials.
- **Support public awareness**: Encourage residents to locate their property on the map and update household bushfire plans before the season. The map is designed for communication and education as well as technical use.

Appropriate use and limitations

The Index is a planning and preparedness product. It does not predict where a fire will start or how it will spread on a given day, and it should be used alongside professional judgement and statutory guidance. For live warnings and advice, refer to the Tasmania Fire Service. Methodologically, the Index derives landscape potential severity from vegetation structure, terrain and long term dryness, then summarises exposure for each building within 100 m—an approach documented and peer presented in our technical paper.

About differences from 2024

Comparisons with last year should note that study scope changed (Derwent Valley included; Brighton, Glenorchy and Sorell not in scope), the asset counting method now treats every building (not just the largest per parcel), the building footprints are more complete, and the vegetation model was refined—all of which legitimately shift both the denominator and the distribution across exposure classes. These are expected evolutions in an annually refreshed evidence base; see the “Interpreting Differences from 2024” note in Results.

Where we are headed

We will continue to publish stable, discretised layers (1–10) on an annual basis so councils can track change and evaluate the effect of mitigation over time. Future technical work will focus on conditioning the baseline on seasonal drivers while preserving comparability, and on enhancing building level context where appropriate—all within the same transparent, reproducible framework described in the Methodology.

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About Geoneon

Geoneon is a Tasmanian climate tech company that uses Earth observation, artificial intelligence and data fusion to turn complex geospatial data into decision ready climate risk insights. We work with public and private organisations—including utilities, insurers, cities, government agencies and international organisations—and deliver projects from suburb scale to national deployments.

About this document