

Addressing Mould Challenges in Southeast Queensland's Universities

Simplifying Mould Minimisation at UQ

UniMutual Conference
2026



Key Themes

- Revealing the scale of UQ's mould problems
- The true complexity of moulds root causes, and why chasing them all wastes resources and delays resolution
- Cutting through the complexity: the core drivers of mould growth
- Putting the simplified theory into practice

Introduction

Financial Impact of Remediation

2024 - ~\$1.2 million

3-year average - ~\$700k

Lead contractor cost only

Work Request Volume

2024 - 1124

3-year work request average – 822

Average internal labour of 616.5 hours each year manage

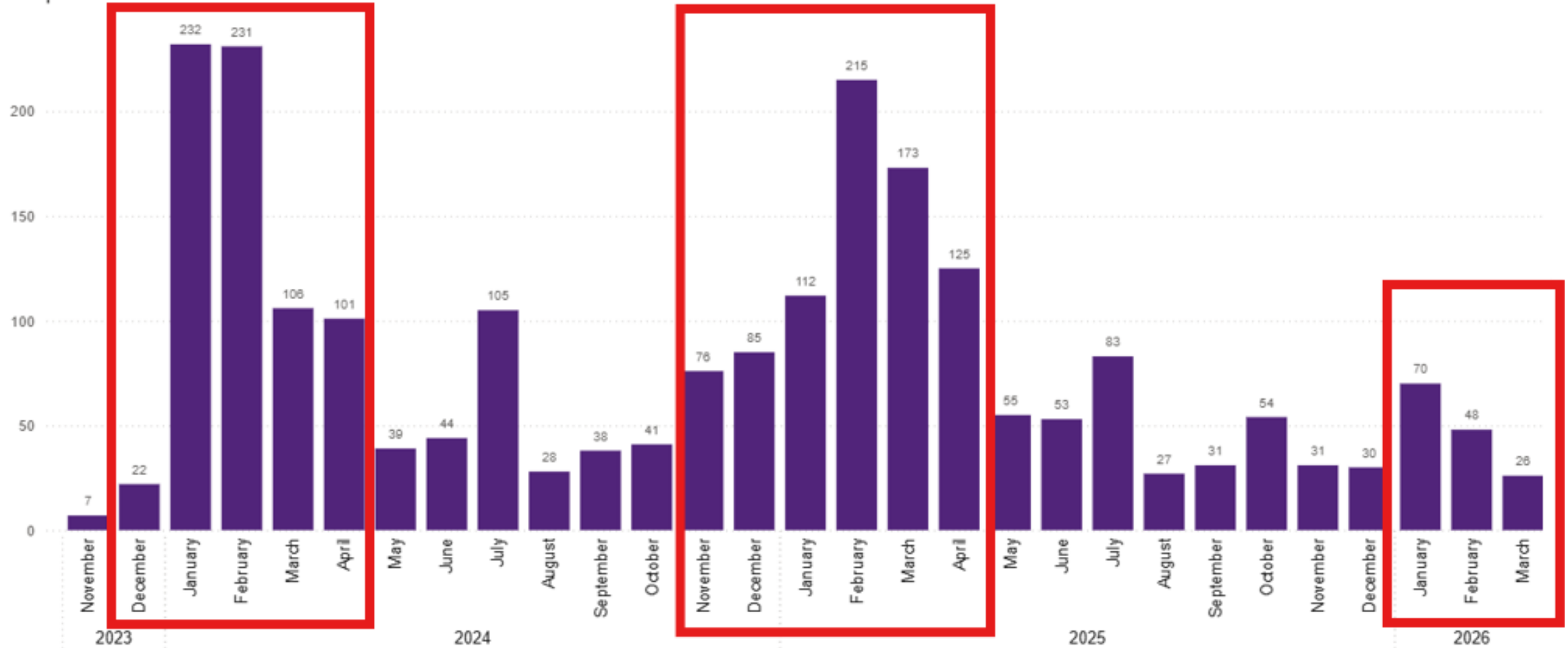
The mouldy stench in UQ's heritage buildings.

Posted On : 19 February 2024 Published By : ERROL PHUAH



Work Request Volume & Cost Trends

Requests over Time

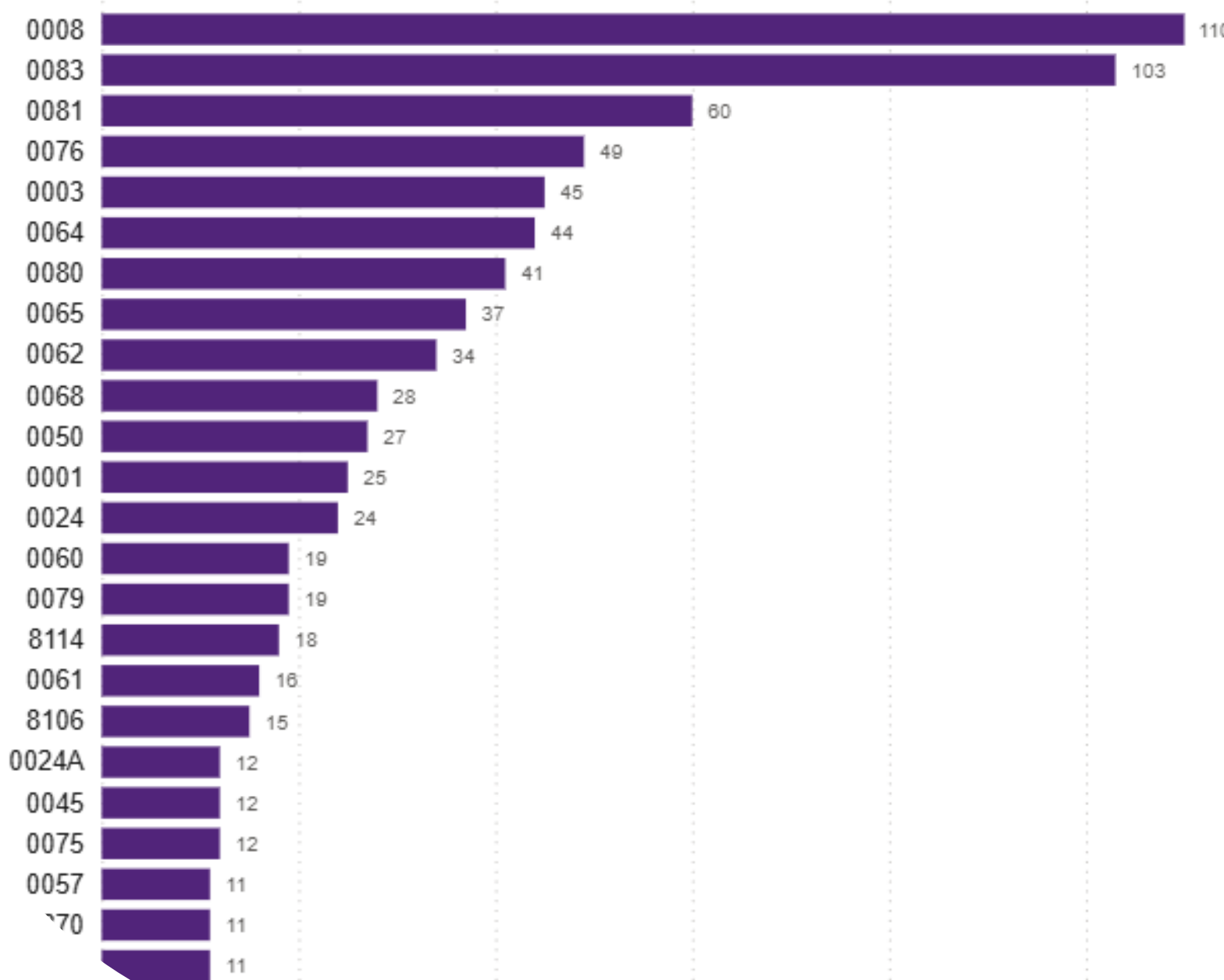


\$800,000

~\$100,000

~\$40,000

Requests over Time



2024 – Top buildings of concern

Work Request Volume Per Building

Building View

Narrowing down high frequency spaces

Heat maps used to visualise key impacted spaces to aid in both identification of local causes, and prevention via efficient HVAC grouping



Examples – Identified Root Cause Issues

Engineering design

- Lack of Ventilation.
- Outside air treatment – Dehumidification –
- Pressure control and adjacent spaces.
- Sensible temperature control vs. latent
- Filtration.
- Plants near OA intake.

Operational and user practices

- Service and maintenance (Failed devices)
- Low set point temperature below design.
- Operational hours.
- Units shut down if space is not used (Covid 19).
- Set back temperatures (Sensible vs. Latent Load).
- Users' habits (Airconditioned spaces open to ambient- Storage)

Building related

- Building fabrics and furniture (High moisture absorption index - Old buildings)
- Building Leakage and Infiltration- No vapour seal
- Weatherproofing and rain resistance.
- Pipe Leakages (HVAC & Non HVAC).
- Condensation (failed insulation)
- Roof cavity ventilation

Examples – Identified Root Cause Issues

No.	Discipline	Consultant	Level	Location/Element	Item	Description	Consultant Recommendation
504	Architecture	BVN	Level 5	Roof	Waterproofing Membrane	Membrane 100% failing - open gaps at parapet. Open cavity exposed to elements	Consult with façade / roofing contractor and Hydraulics engineer
505	Architecture	BVN	Level 5	Roof	Waterproofing Membrane	Parapet membrane damaged and cracking.	Consult with façade / roofing contractor and Hydraulics engineer
506	Architecture	BVN	Level 5	Roof	Waterproofing Membrane	Parapet membrane damaged and remedial work showing signs of cracking	Consult with façade / roofing contractor and Hydraulics engineer
507	Architecture	BVN	Level 5	Roof	Blocked Downpipe	Leaf blockage around downpipe	Consult with Hydraulics engineer / Building Operations consult with Arborist
508	Architecture	BVN	Level 5	Roof	Waterproofing Membrane	Parapet membrane damaged and remedial work showing signs of cracking. Review overflow outlet height and location	Consult with façade / roofing contractor and Hydraulics engineer
509	Architecture	BVN	Level 5	Roof	Blocked Downpipe	Leaf blockage around downpipe	Consult with Hydraulics engineer / Building Operations consult with Arborist
510	Architecture	BVN	Level 5	Roof	Drainage obstructions	Conduit fixed directly to roof deck obstructing water and catching leaf's	Consult with Hydraulics engineer
511	Architecture	BVN	Level 5	Roof	Blocked Downpipe	Leaf blockage around downpipe	Consult with Hydraulics engineer / Building Operations consult with Arborist
512	Architecture	BVN	Level 5	Roof	Parapet movement joint	Parapet movement joint membrane cracked, silicone gaps in flashing.	Consult with façade / roofing contractor and Hydraulics engineer
513	Architecture	BVN	Level 5	Roof	Parapet movement joint	Parapet movement joint membrane cracked, silicone gaps in flashing.	Consult with façade / roofing contractor and Hydraulics engineer
514	Architecture	BVN	Level 5	Roof	Waterproofing Membrane	Antenna post fixed directly into membrane. No silicone sealing around fixings	Consult with a façade and Hydraulics engineer
515	Architecture	BVN	Level 5	Roof	Waterproofing Membrane	Parapet membrane damaged and cracking.	Consult with façade / roofing contractor and Hydraulics engineer
516	Architecture	BVN	Level 5	Roof	Parapet corner	Membrane showing signs of deterioration, cracking and no fillet	Consult with a façade and Hydraulics engineer
517	Architecture	BVN	Level 5	Roof	Drainage obstructions	Exterior step obstructing water from running to drain	Consult with Hydraulics engineer
518	Architecture	BVN	Level 5	Roof	Parapet flashing	Membrane showing signs of deterioration. Over flashing not sealed. Guardrail fixings submerged in water without seal	Consult with a façade and Hydraulics engineer
519	Architecture	BVN	Level 5	Roof	Blocked Downpipe	Leaf blockage around downpipe	Consult with Hydraulics engineer / Building Operations
520	Architecture	BVN	Level 5	Roof	Drainage obstructions	Mechanical framing obstruction blocking waterflow	Consult with Hydraulics / Mechanical engineer
521	Architecture	BVN	Level 5	Roof	Drainage obstructions	Mechanical framing obstruction blocking waterflow	Consult with Hydraulics / Mechanical engineer

Operational Interventions - Mould Causes

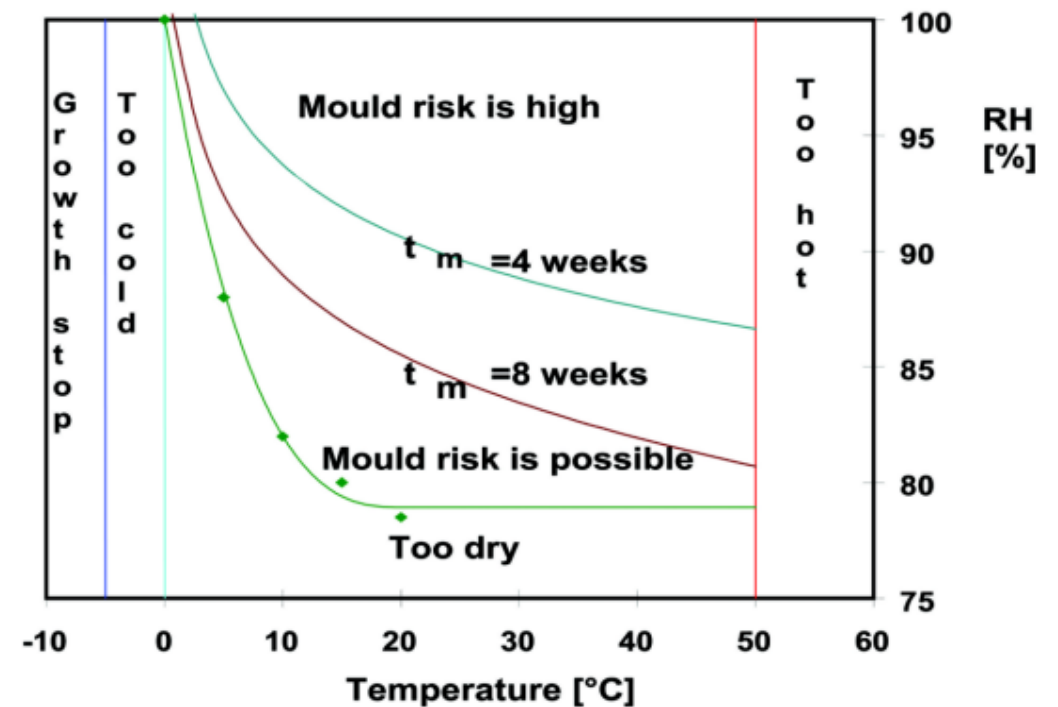
Mould growth is determined by four key factors: Water Activity (Humidity/dampness), Surface quality/contamination, temperature, and time in conditions.

Time in conditions

Temperature (0-50C)

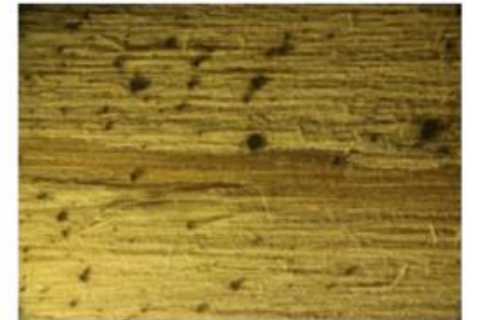
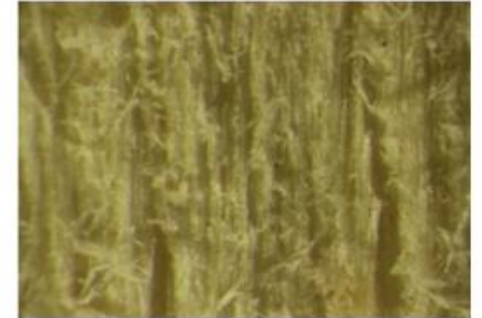
Surface Quality

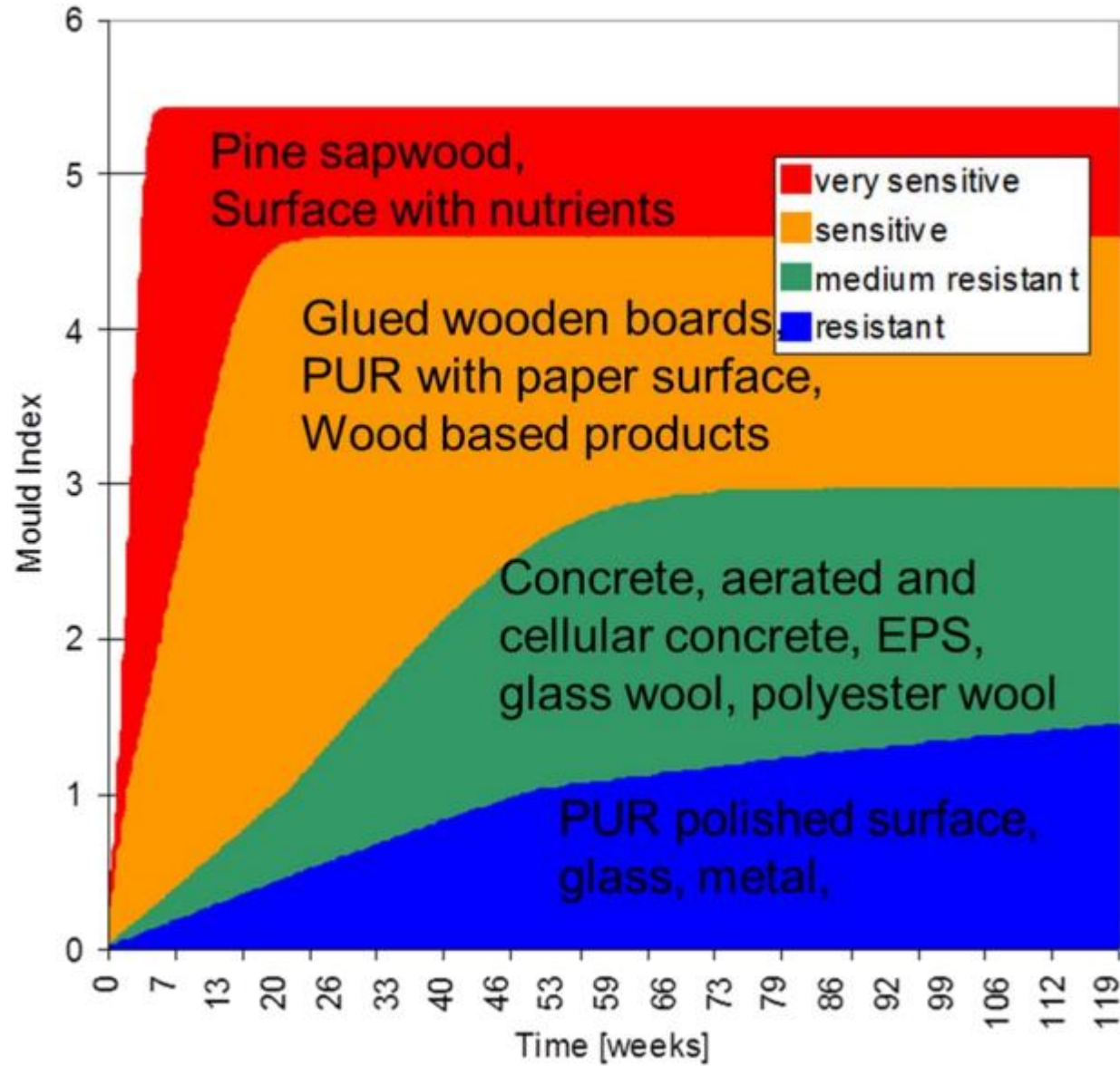
Water activity (Leaks/Humidity)



Mould Index definition

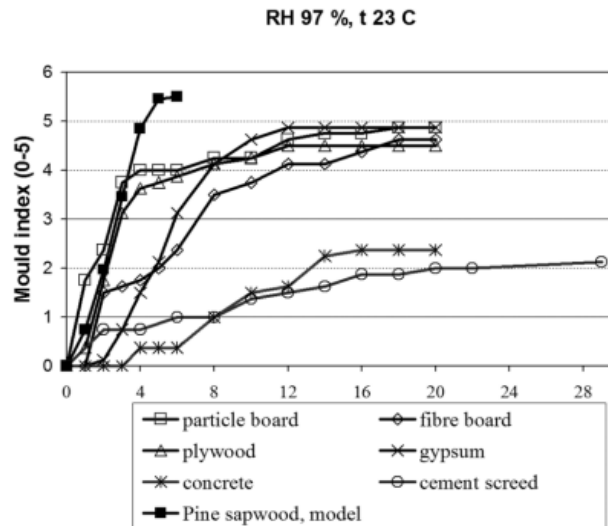
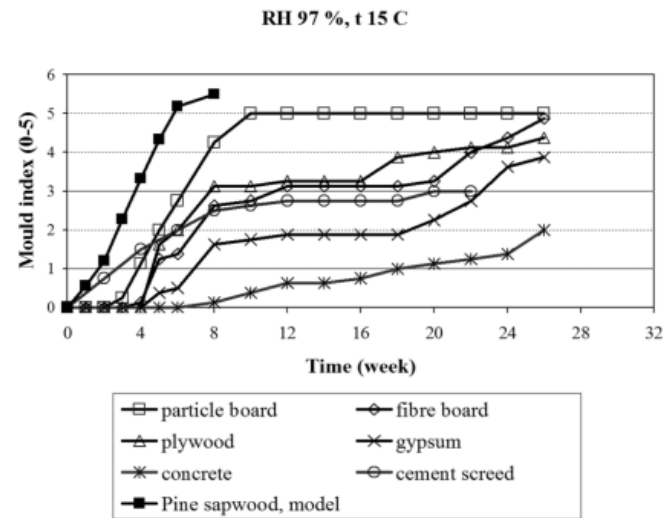
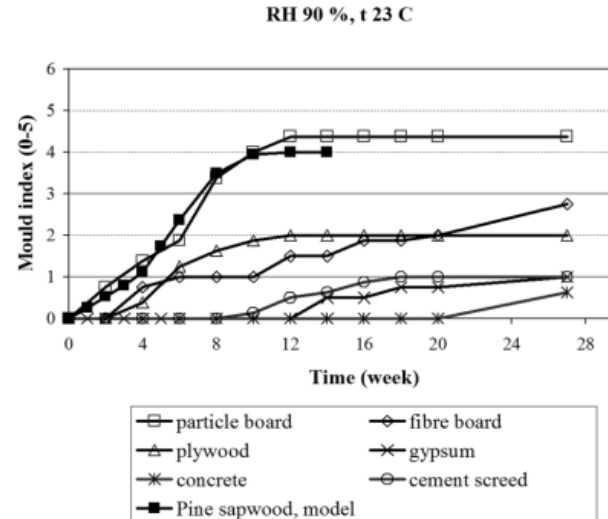
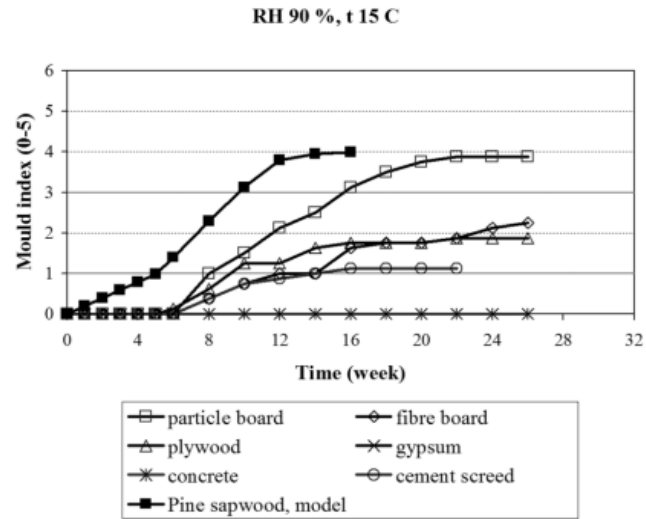
Index	Description of the growth rate
0	No growth
1	Small amounts of mould on surface (microscope), initial stages of local growth
2	Several local mould growth colonies on surface (microscope)
3	Visual findings of mould on surface, < 10 % coverage, or, < 50 % coverage of mould (microscope)
4	Visual findings of mould on surface, 10 - 50 % coverage, or, >50 % coverage of mould (microscope)
5	Plenty of growth on surface, > 50 % coverage (visual)
6	Heavy and tight growth, coverage about 100 %



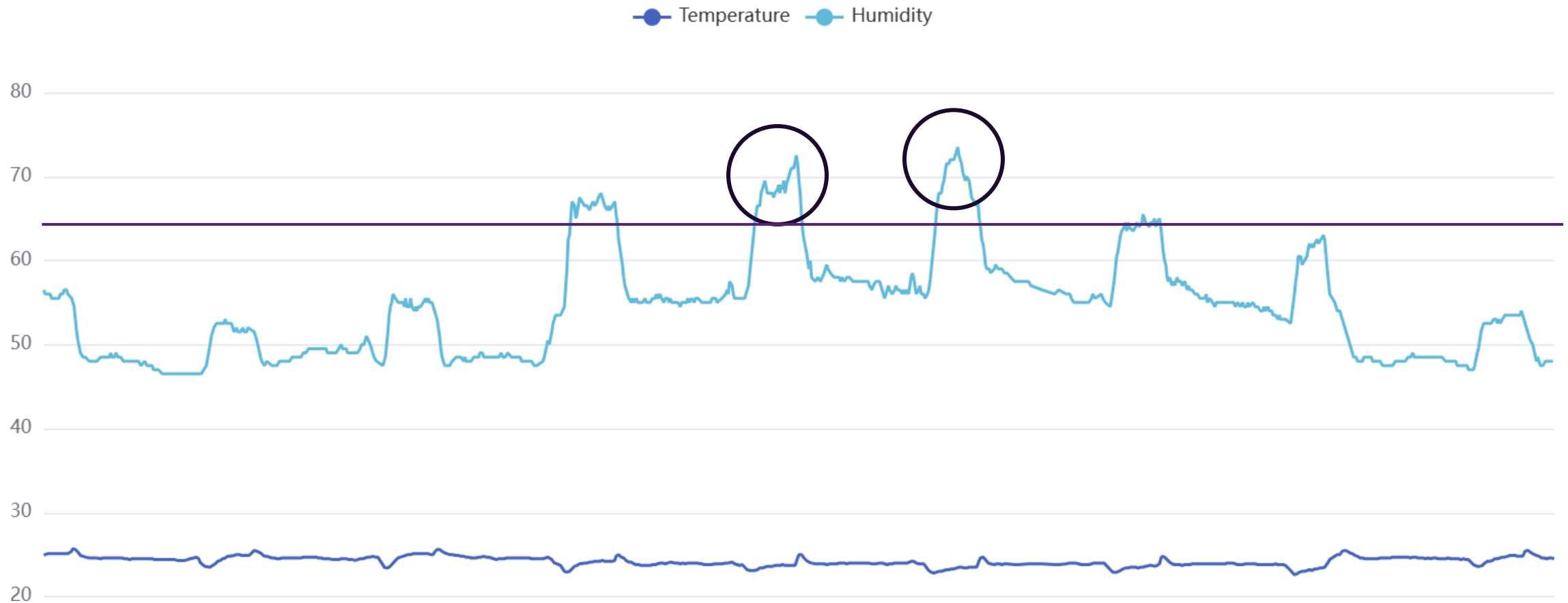


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Impact of temperature and humidity

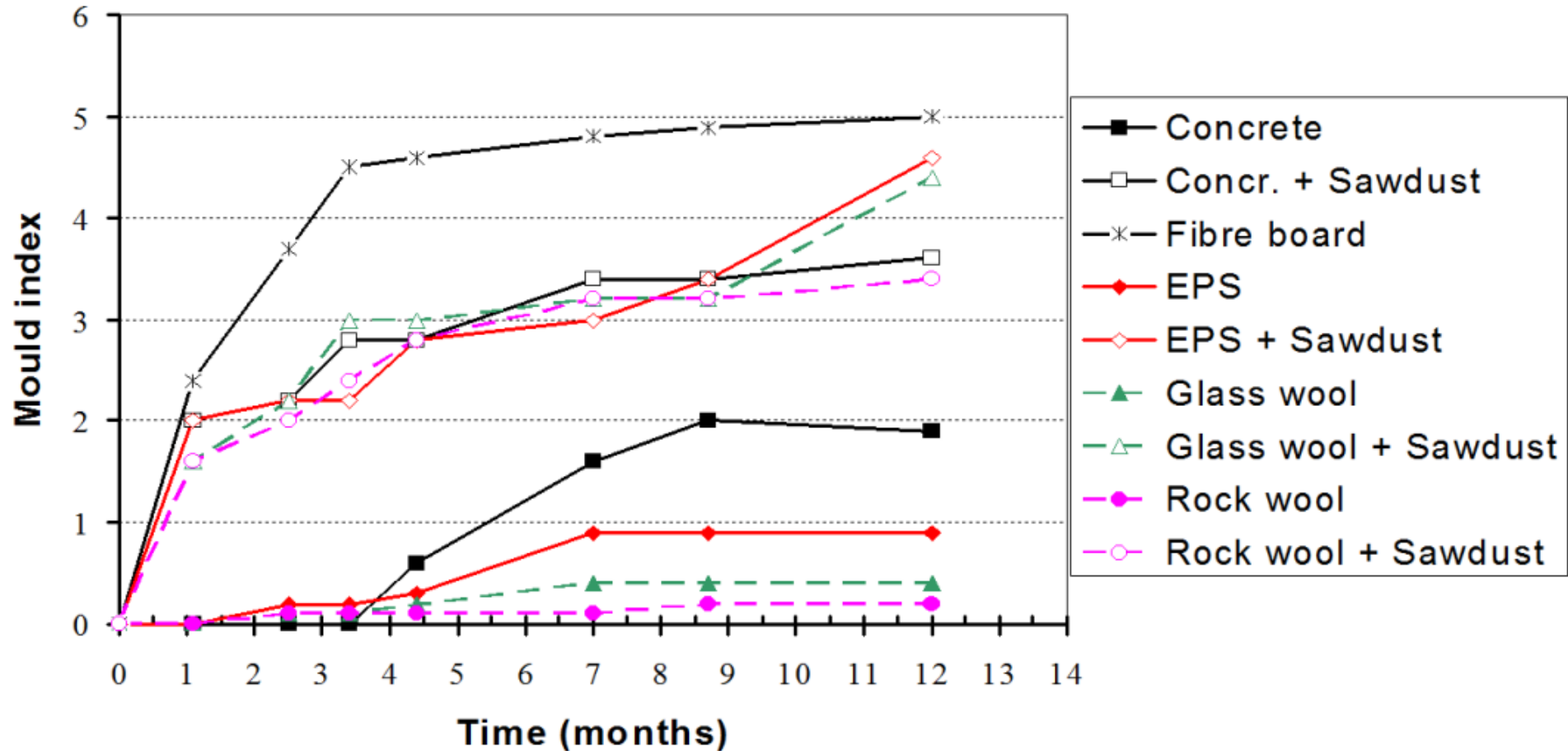


Operation Interventions - Dehumidification



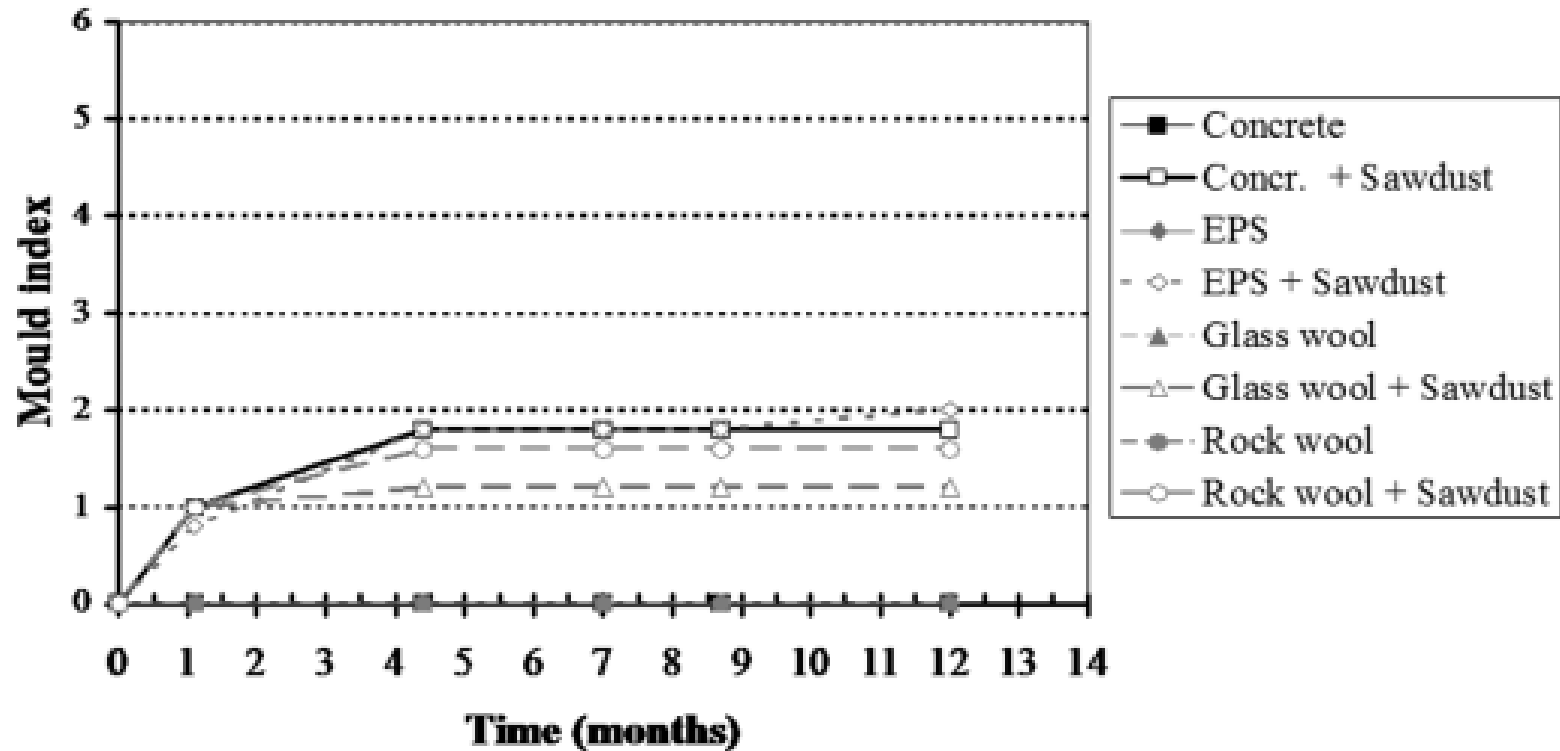
Impact of surface quality on building material

+20 C / 98 % RH conditions

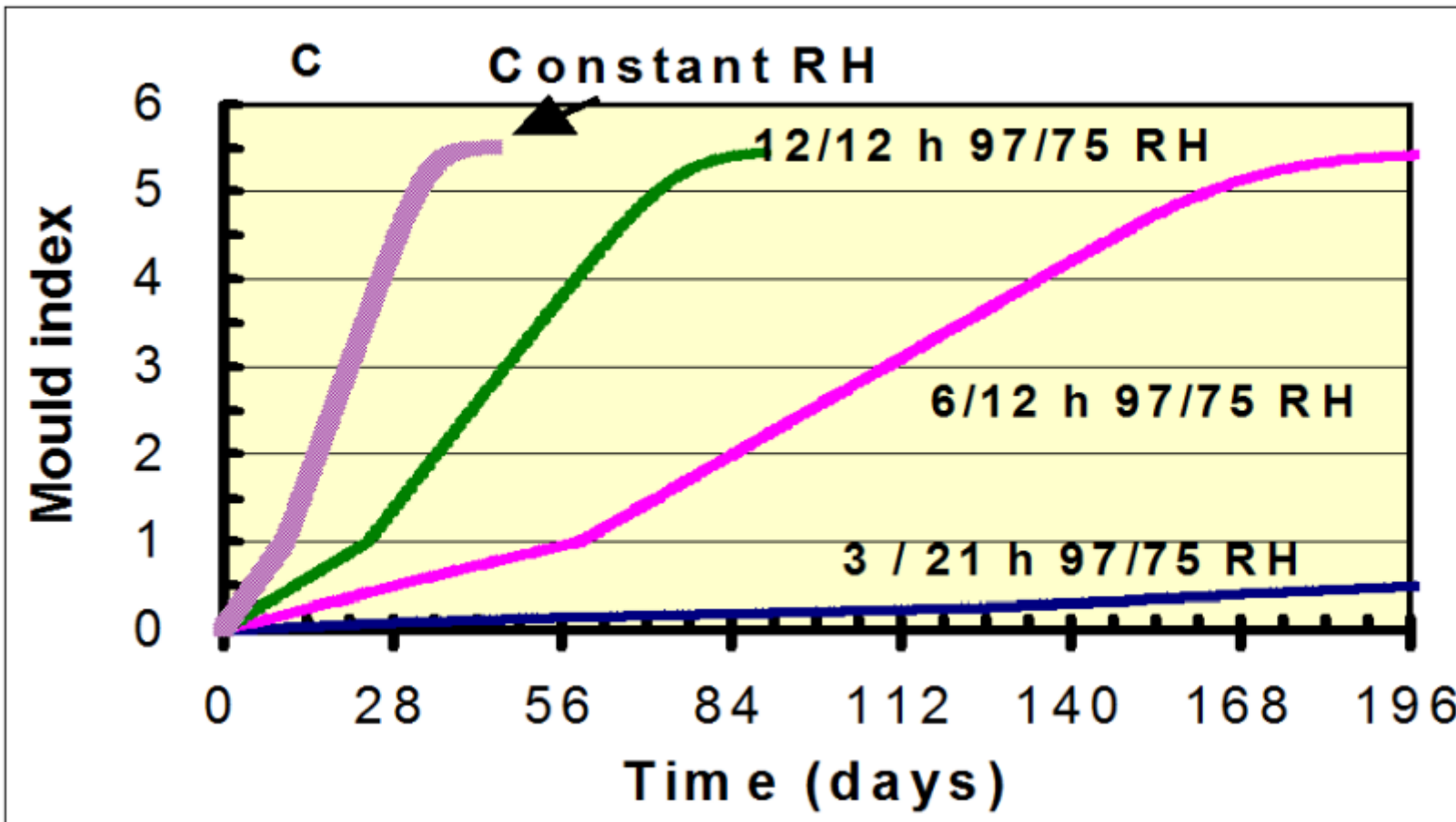


Impact of surface quality on building material

Open surface of materials, continual RH 88 - 90 %, T=20



Impact of time in conditions



Operational Interventions

Humidity Interventions

Wireless humidity sensors deployed in 100 locations

Implement tiered humidity controls

1. Designed Dehumidification
2. Ad hoc Dehumidification
3. Portable Dehumidification

Surface Quality Interventions

- Preventatively clean known at-risk surfaces such as doors, glass, seating in high-risk locations
- Partnership with lead contractor to increase monitoring and immediate cleans
- Centralised Mould remediation resulting in significant reduction in time-to-completion and cost



UNIVERSITY *of*
TASMANIA

Managing Mould after the 2018 flood event

**Unimutual Conference
Campus Services**

March 2026

utas.edu.au



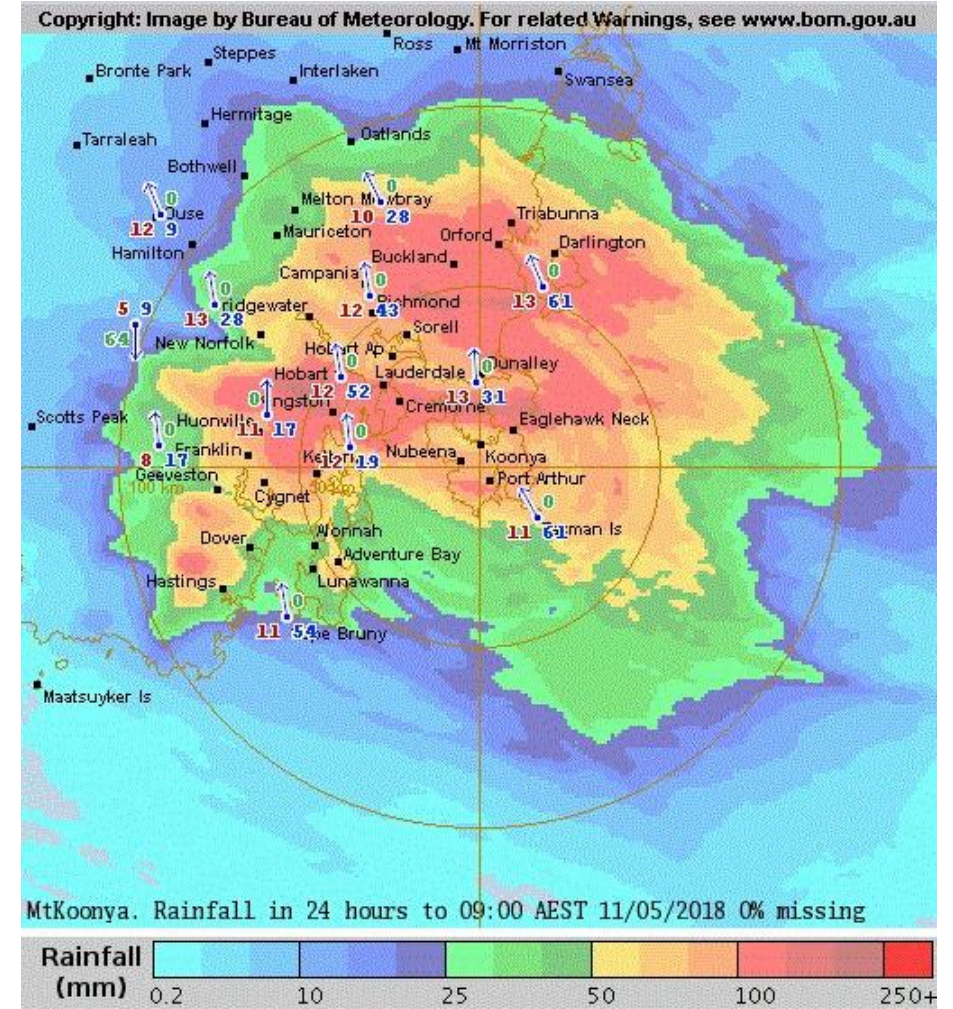
Extreme weather event: 10/11 May 2018

Hobart and surrounds

- 129mm rainfall and ~1,000 lightning strikes
- 256mm on Mt Wellington in 24 hours (southerly pattern)
- Only 5th time since 1893 that Hobart recorded more than 100mm rainfall in one day
- Extensive damage and power outages across Hobart and southern suburbs
- Residents advised to avoid unnecessary travel in the Hobart CBD and surrounds

University impact

- Several Sandy Bay University buildings inundated with floodwater
- Engineering and Law buildings most affected – loss of research equipment, Law library books, staff belongings, elec/mech infrastructure
- Sandy Bay campus without power for ~48 hours, from 10.45pm, 10/5
- Campus closed Friday 11 May 2018, reopened 14 May 18



Sandy Bay Campus

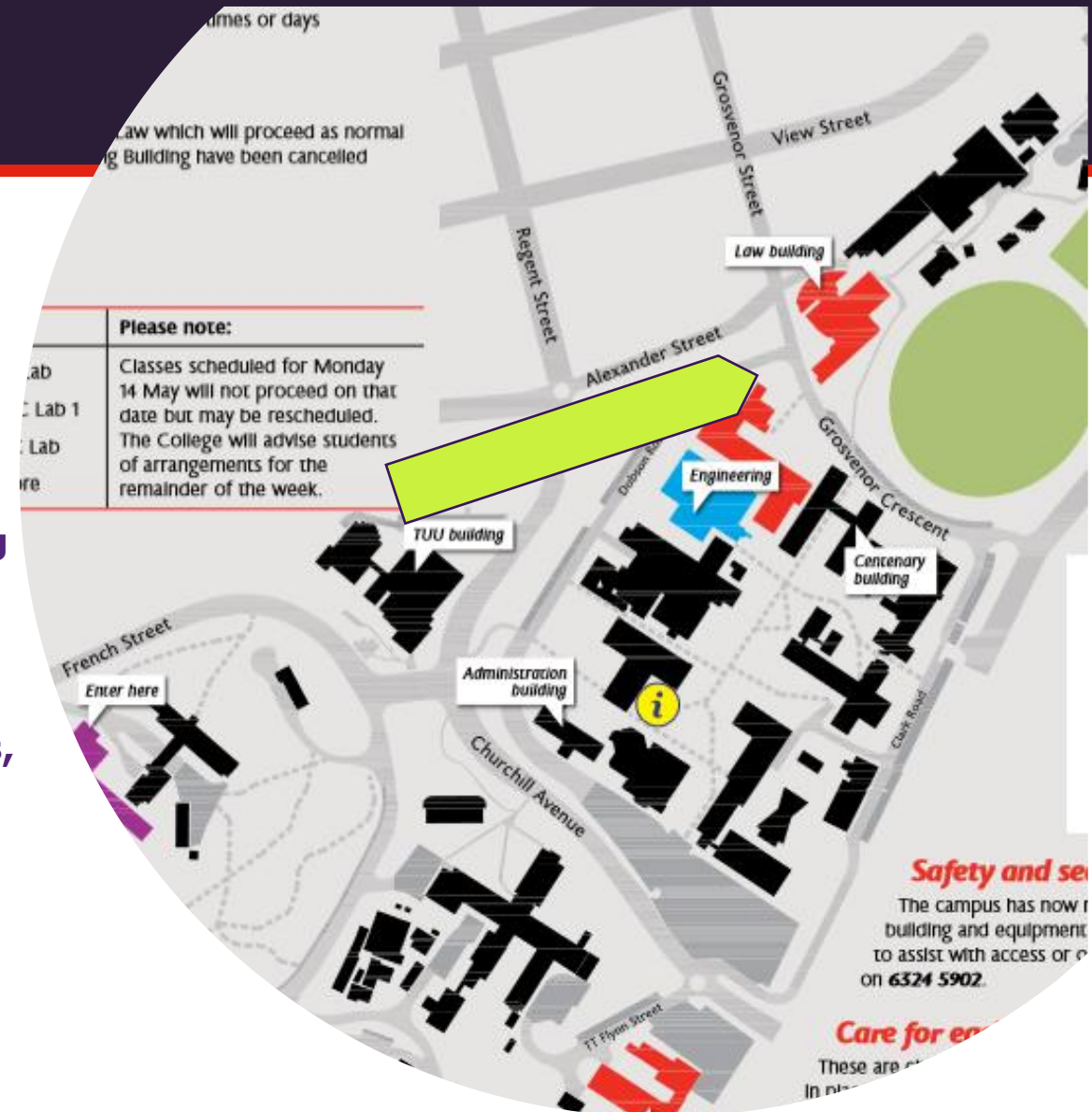
Call from Security officer at around 10.10pm, 10 May 18

Main water flow occurred from Proctors Gully behind the TUU building

Significant rainwater flow off hard surfaces (roads, car parks, etc)

Headed down hill towards Engineering and Law Buildings

2 m high wall of water across Regent Street/Churchill Ave opposite TUU Building at around 10.20pm on 10 May 18



University impact: Engineering Building



University impact: Law Building



University crisis response

Issues for consideration in first days of event occurrence

- **Safety, safety, safety**
- **Assessing the extent of damage at 10.30pm +, with limited resources**
- **Hobart CBD also hit hard – in excess of \$100M**
- **Loss of power – freezers, research, access control, CCTV**
- **Restoration of power – isolation considerations**
- **TasNetworks (provider) inundated – getting updates on power restoration difficult**
- **Access to hire equipment - generators**
- **Campus Closure – signage, human resources, building access**
- **Hygienists - dirty water (faecal matter, mud, etc), IAQ, mould, etc**
 - Turnaround time for results (min 1 week)
- **Recovery – immediate (within 2 weeks), short (1-2 months) and long term (6-12 months+)**

University crisis response Rapid Campus Reopening & Continuity of Operations

LAW

The UTAS Law Library suffered severe losses, with thousands of books destroyed or swept out of the building.

Roughly 400 rare and irreplaceable books were sent interstate for specialist salvage, using freeze-drying techniques to stabilise waterlogged pages and prevent mould.

Conservation specialists advised UTAS on prioritising items and using freezing to buy time while recovery plans were developed.

Staff described emotional scenes of rare Tasmanian legal history collections lying damaged on lawns, highlighting the cultural impact of the event.

This preservation effort became one of the most significant heritage-recovery projects UTAS had undertaken.



University crisis response Rapid Campus Reopening & Continuity of Operations

Engineering Building

The floods destroyed UTAS's \$5 million "kunanyi" high-performance computing (HPC) cluster, housed in the Engineering precinct.

The data centre was inundated, and the cluster was taken offline with uncertainty about whether any components could be salvaged.

UTAS worked to re-establish computational capability by temporarily relying on its smaller HPC systems ("Katabatic" and "Vortex") while planning long-term replacement capacity.

Importantly, no production data was lost, allowing research continuity even while hardware was written off.

This rapid pivot ensured UTAS researchers could continue essential work despite heavy infrastructure losses.



University crisis response Rapid Campus Reopening & Continuity of Operations

UTAS's recovery focused on:

Reopening fast, by mobilising staff and relocating teaching activities.

Protecting heritage collections, including major freeze-drying operations.

Restoring research capability, following loss of a flagship HPC system.

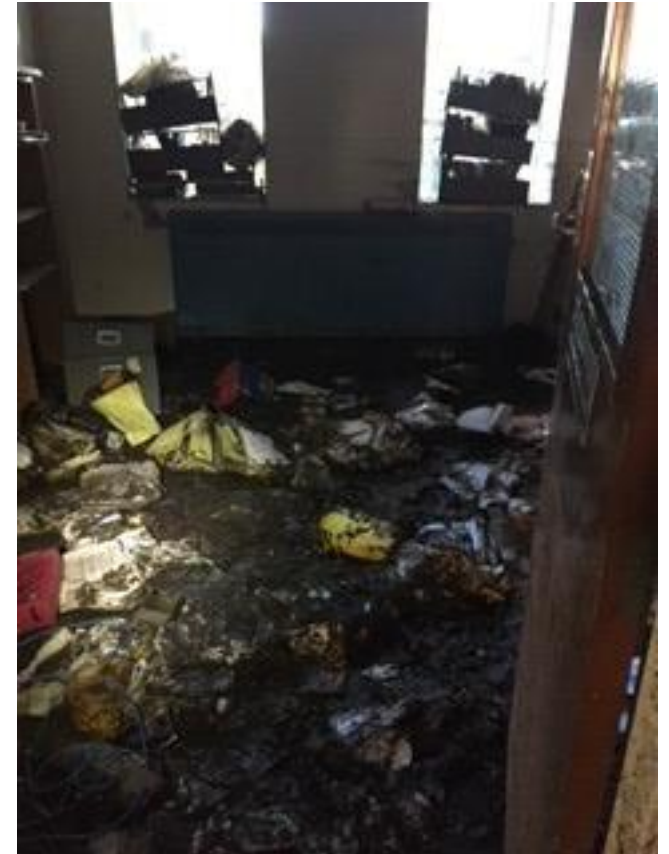
Stabilising and repairing campus buildings, especially in Sandy Bay.

Documenting and learning from the event, integrating lessons into resilience frameworks.



Insurance Timeline

- Emailed Unimutual at 7.27am on Friday the 11th
- Unimutual called at 9.01am on Friday the 11th
- Unimutual were extremely keen to have expert contractors assist with assessing the damage and the clean up
- Steamatic attended on Monday the 14th, UTAS contracted them with guarantee from Unimutual (this helped procurement process and allowed approval for sole source appointment)
- Visits from Unimutual, underwriters, claims assessor, electrical claims assessor, our insurance broker, claims preparer and structural engineer. Quantity surveyor may be next
- Was obvious claim was going to be large. An initial payment of \$2m was forwarded within 2 weeks
- Claims preparer has been appointed which is covered under policy



Lessons learned the importance of cutting wall linings at least 300mm above water line

- Removes saturated materials – Plasterboard and insulation hold moisture; cutting 300 mm above the waterline removes sections most likely to stay wet.
- Prevents mould growth – Mould can establish within 24–48 hours in damp cavities. Removing the lower section stops hidden mould from forming behind the wall lining.
- Allows internal wall cavities to dry out properly – Cutting back the wall opens the cavity so air movement can reach the stud frame, noggins, and insulation, speeding up drying.
- Prevents long-term structural damage – Trapped moisture can cause timber framing to rot or corrode steel components over time. Opening the wall avoids future structural issues.
- Improves air circulation for dehumidifiers and fans – Creating a 300 mm opening allows equipment to effectively extract moisture from inside wall spaces.
- Ensures accurate assessment of hidden damage – Removing the lower section lets assessors check for swelling, distortion, or water damage to framing and services.
- Reduces risk of future odours and air-quality issues – Damp plasterboard and insulation can hold musty smells; removal prevents residual contamination.
- Aligns with industry best practice – Insurance, restoration, and building standards commonly recommend removing wall linings up to 300 mm above the highest water mark for flood-affected buildings.



Lessons learned actions to reduce mould growth after flooding.

Immediate Actions (First 24–48 hours)

- Remove all wet materials early – carpets, underlay, insulation, skirtings, and cabinetry bases should come out to stop moisture being trapped.
- Cut wall linings
- Extract standing water quickly – delays increase mould risk dramatically.
- Increase ventilation – open windows/doors where safe and practical.

Drying & Air Management

- Use commercial-grade dehumidifiers – reduces airborne moisture and helps internal framing dry.
- Use air movers/fans to promote airflow – crucial for drying cavities and flooring systems.
- Maintain controlled airflow – avoid blowing air onto visible mould, as this spreads spores.
- Monitor humidity – keep Relative Humidity (RH) below 60%; mould thrives above this.

Cleaning & Decontamination

- Clean all surfaces with a suitable antimicrobial solution – prevents mould from taking hold on porous or semi-porous surfaces.
- HEPA vacuum all areas – captures fine spores that standard vacuums recirculate.
- Remove any visible mould immediately – do not paint over it; that traps moisture behind coatings.
- Clean HVAC systems/vents – these can harbour and spread mould spores after flooding.

Lessons learned actions to reduce mould growth after flooding.

Structural & Material Considerations

- Check timber moisture content regularly – should be below ~15% before wall linings are reinstated.
- Remove and replace saturated insulation – batt insulation rarely dries effectively inside cavities.
- Inspect plasterboard, MDF, and particleboard – these materials retain moisture and deteriorate quickly.
- Check subfloors and under-building areas – moisture can accumulate in voids and cause mould to return.

Environmental Controls

- Maintain a consistent drying environment – do not turn equipment off too soon; drying can take days to weeks.
- Seal off unaffected areas – reduces cross-contamination.
- Use air scrubbers with HEPA filtration when mould is already present.
- Document drying progress – moisture readings, photos, and daily logs.
- Consider independent IAQ (indoor air quality) testing for high-risk or sensitive environments.

Lessons learned Equipment testing

- After floods in 2018,undertook a flood remediation course in Northern Queensland where the experience of flooding is more common.
- This looked at causation of issues and remediation thereafter and provided a thorough understanding of how to move forward after damage occurs.
- Relevant for more than just flooding as provide a way forward where moisture related issues.
- UTAS Experience - Had a gymnasium floor that lifted and was looking at large expense
- Was due to be moisture under the slab caused from a very damp winter.
- By applying drying mats to the area succeeded reducing the moisture content in the timber and, thus replacement parquetry floor was saved.
- This saved over 60k and cost associated with lost revenue, due to down time to the gymnasium. Six years later and still in good order.
- Did install a small blower to the area that can also be used quickly if a reoccurrence happens



Lessons learned

Deloitte engaged to undertake a PIR to assist with learnings

- **Summary – UTAS handled the crisis extremely well. Recommendations include:**

- Review CMRP - more nimble / agile

- Use of electronic system for managing crises – CQCommand now TEAMS Site

- Constantly review BCPs

- Clear separation between crisis and recovery processes

- Early involvement of WH&S

- **Resources when things go bang in the night?**

- **Severe weather event forecast preparations in readiness and to prevent damage...known hot spots to attend to. Gutters cleaned (additional program), stormwater drains, creek checks, flood gate closed monitor web pages/forecast**

- **Location of critical infrastructure – eResearch data centre/security control room?**

- **Vacated (surplus) building allowed relocation of activities (teaching and admin) – fortunate?**

- **Annual training of the team resulted in a good outcome – reinforce need to nominate team and train them**

