

Cooling Futures: CreaTech 2026 – 2 Page Proposal

Core Concept: The promise of a cool future demands research that moves beyond conventional disciplinary and technical boundaries. In a world of climate crisis and social injustice, being *cool* means staying calm and comfortable, physically and mentally. Addressing these dimensions requires approaches that are simultaneously social, environmental, spatial, cultural, technological and political; research that brings the past into dialogue with the present, linking ancient nature-based systems with cutting-edge technologies, and placing design at the centre as the discipline capable of synthesising these complex threads. Rather than treating cooling as a technical problem, the project asks what it means to be cool with and for specific relationships of Gadi Country and Gurin-gai Country, and how cooling might shape ongoing responsibilities to Country.

Cooling Futures aims to transform the Jones Street and Alumni Green precinct into a vibrant, climate-responsive habitat for the UTS community the public and more than human life, serving as both a place of climate refuge in a warming city and a living laboratory for climate-responsive practices and technologies. Positioned at a prominent civic entrance to the University, the project envisions Jones Street as an environmental and cultural gateway, signalling UTS' commitment to Country, climate leadership and social justice. It offers an integrated design process for urban place-making that connects the *local-ness* of the Jones Street environment, and its ancient vegetation and water systems lying far below the pavement, with contemporary technologies being developed at UTS in environmental science, data visualisation, building materials, design and fabrication. Through this synthesis, the project connects stories of place, enduring systems of knowledge, care and innovation across time.

The project's central innovations are its integration of the ecological with the technological, its connection of the historical with the contemporary. It frames designing with Country, through environmental practices and performance . In doing so it makes stories of Country become legible once more. Cooling is understood not merely as a climatic metric, but as a lived experience, one that is distributed unequally across bodies, species and communities, and that design has both the responsibility and the capacity to address. The innovations are apparent in the project's three-dimensional design strategy that combines revealed landscape infrastructure, advanced cooling technologies, and immersive storytelling to create a single layered, non-linear system in which each element activates and amplifies the others. In doing so, the living laboratory mobilises emergent and established UTS research to advance much needed climate responsive public space practice.

Stage 1: An Integrated Design Framework: Stage 1 develops the design strategy, spatial framework and visual conceptualisation for the Jones Street precinct as a cooling common. The three interrelated dimensions that are inseparable in both spatial logic and research intent are explored for ideation towards built interventions in Stage 1 and testing in Stage 2. These dimensions are described alongside speculative design propositions below.

The first dimension of this system is **Visible Landscape Infrastructure**. This explores the resurfacing of a network of vegetation, soil and water-based systems to support evapotranspiration, shading and thermal comfort across the precinct. The landscape systems are not decorative; they were once endemic and now re-connect with Country. They respond to the existing thermal conditions along Jones Street and are explored as a reference condition for considering subsequent cooling strategies. Working with **Bio DotDotDot**, the team will also develop proposals for green shade or canopy structures where trees cannot grow to emphasise how spatial character of the precinct can also moderate radiant heat, channelling airflow and anchoring a living ecology at ground level. The canopy structures are envisaged as physical armatures enabling the integration of the advanced systems described in the second dimension. One concept design will be prototyped through the **Advanced Robotics Fabrication Lab (AFRL)**.

The second dimension, **Advanced Climate-Responsive Cooling Technologies**, examines how cutting-edge material and environmental research could be deployed into the landscape system conceptualised in Dimensions 1 and 3, enhancing the proposition that by being cool we can more readily connect with Country. Strategies such as precision misting and evaporative cooling, conceptualised with **Transsolar**, are explored as potential responses to extreme heat days, working with the proposed canopy microclimate to extend the thermal comfort beyond shade alone. Simultaneously, bio-based material prototypes (passive cooling building skins made with mycelium-based composites developed under UTS' BioCOOL and Bio-Jaali 2.0 research programs) are investigated for integration as panelling within the canopy structures

and examined for their potential role as passive cooling skins that respond to humidity. Additionally, existing **Future Village/Urban Bioma** approaches to de-paving hard concrete surfaces and their IoT-based soil moisture sensing embedded within the vegetation troughs that generate real-time environmental data (heat, humidity, soil moisture, air quality, particulate matter) are expected to inform speculative approaches to environmental monitoring and public-facing communication, supporting later testing in Stage 2. This sensing and communication system is framed as a potential design outcome that could be explored as a living environmental dashboard, or responsive public artwork that makes the precinct's climatic performance visible, legible and shared.

The third dimension explores **Immersive Storytelling and Interpretation** as a way of conceptually bringing the system together as a cultural expression. The vegetation and water infrastructure of Dimension 1 draw their logic from the ancient hydrology of Blackwattle Creek catchment and the subsurface ecologies that predate the current urban fabric. Dimension 2's sensing data, when given spatial and temporal form, can be explored as a medium for narrating the site's climatic history and future trajectories. Working with industry partners at WEFT, the possible expressions include nighttime projections visualising historical water flows across the ground plane, thermochromic surface treatments that map Country beneath the pavement, QR-embedded smart furniture that enables visitors to access layered histories, and digital activations that invite pause, contemplation and climate-awareness. In this way, the immersive storytelling is not approached as an overlay, but as a framework through which environmental systems may be rendered meaningful – for instance the creek that once ran beneath Jones Street could flow again, not only as water, but also through light and data.

The result is a precinct conceived not as a transit zone, but as a common: a space of rest, refuge and shared climate experience, where old knowledge and new knowledge, past technologies and future innovations coexist within a single, integrated spatial framework.

Feasibility and Alignment with Jones Street: Stage 1 deliverables are paper-based and prototype-scale speculations, making them fully achievable within the program timeline. Exhibitable outputs include professionally rendered aerial plans and cross-sectional schema, simulations of historical water flows with proposed gathering and refuge zones, a 3D-printed site model with CNC-milled context base, and mycelium material prototypes for in situ testing. Additionally, a shading canopy prototype developed and robotically fabricated with AFRL input will serve as a centrepiece for the November 2026 public showcase. Outputs will be developed in consultation with UTS Property and appointed consultants to ensure site accuracy, delivery feasibility, and meaningful alignment with the Jones Street Landscape Projects at WEFT.

Interdisciplinary Contribution and Industry Collaboration: The Cooling Futures team combines award-winning, cross-disciplinary expertise across urban design, landscape, environmental science, climate justice, and First Nations practice including early career academics and recent graduates whose contributions bring fresh perspectives and emerging expertise. It spans the Schools of Architecture and Built Environment (including the Green Infrastructure Lab and AFRL), the School of Communications and the School of Design, alongside industry partners Bio DotDotDot, Transsolar and Future Village, design strategists from WEFT, and stakeholders from Committee of Sydney. Engagement with Country is foundational: the Gadigal landscape, particularly the hydrological heritage of Blackwattle Creek forms the conceptual origin of the entire design system. Country informs how the precinct can cool, breathe and sustain life across time.

Stage 2 Pathway: Cooling Futures Stage 1 outputs are developed both as a foundation for progression to Stage 2 and as tangible communication tools for wider engagement with the community, UTS stakeholders and collaborators, and additional industry partners. In this way, Stage 1 supports immediate pathways toward in situ testing while also informing future research partnerships and directions and seeding HDR research opportunities. It also serves as a model framework for other precincts and for connection to the broader Tech Central and Ultimo Creative ecosystem.

Stage 2, from 2027 onwards, transitions from concept to in situ intervention through a test-scale installation within the precinct. This phase is supported by longitudinal environmental monitoring (land surface temperature, air temperature, humidity, and particulate matter data) triangulated with qualitative behavioural mapping of site use under different heat conditions. Together, this evidence base will directly inform precinct-scale applications and position the team for external grant applications (including ARC Linkage, MRFF and NSW Government urban heat programs), journal publications, and unsolicited design proposals for future UTS campus development, and connections to broader urban and creative strategies. The living laboratory model established through Cooling Futures provides the infrastructure for a sustained, Country-centric research program at the intersection of climate science, design and social justice.

Cooling Futures: CreaTech 2026 – Project Timeline

(July – October 2026, leading to November showcase)

July 2026 | Project Establishment & Site Intelligence

- Project Team Workshop
- Establish research questions working methodology and design criteria
- Confirm team roles and industry partner inputs
- Collate site drawings and precinct data
- Begin base modelling and precedent testing
- Literature and First Nations research for Blackwattle Creek

Outputs

- Confirmed project brief and analytical base
- Initial site models (digital)

August -September 2026 | Design Framework and Concept Prototyping

- Develop integrated design framework (three dimensions) via Design Workshop, Walking on Country
- Remap Jones Street and its histories
- Advance canopy, landscape and cooling system concepts
- Begin environmental mapping logic diagrams and simulations
- Storytelling framework (eg. simulations of historical water flows with proposed gathering and refuge zones)
- Engage AFRL on prototype feasibility

Outputs

- An ecological atlas of Jones Street
- Draft design framework package
- Initial renders and diagrams of prototypes

September 2026 | Prototype Production, Visualisation and Communication

- Design Development Workshops
- Fabricate physical site model
- Produce mycelium material samples
- Fabricate 1:1 or 1:2 canopy prototype (AFRL)
- Finalise professional renders

Outputs

- Physical models and material prototypes
- Final render set
- Draft exhibition and Communication narrative

October 2026 | Synthesis, Documentation & Showcase Preparation

- Workshop and Synthesis of design, research and feasibility insights
- Photography and documentation
- Prepare exhibition panels, diagrams and captions
- Final coordination with CreaTech showcase team

Outputs

- Exhibition-ready material
- Final project documentation
- Public-facing narrative for November showcase

Early November 2026 | Public Showcase

- Installation and presentation
- Stakeholder engagement (UTS Property, industry, community)
- Outline of a journal article entitled **The creative green precinct**

Additionally, a detailed Stage 2 proposal for 2027 will be developed based on Stage 2 Call and Future Funding arrangements

Cooling Futures: CreaTech 2026 – Team Bios

Internal UTS Collaborators

Prof Leena Thomas (Professor, [Architecture](#), GI Lab, UARC) leads sustainable architecture research, pioneering climate-responsive design adaptive thermal comfort and cooling through living laboratories, post-occupancy evaluation, and partnerships with industry and government to deliver healthier, low-carbon buildings and precincts.

Prof Nimish Bitoria (Professor, [Architecture](#), GI Lab HDR Director, UARC) advances nature-based solutions and resilient urban futures through design-led, data-driven research grounded in social justice, participatory methods, and technology-enabled innovation informing urban policy and sustainable infrastructure.

Prof Martin Bryant (Professor, [Architecture](#), GI Lab Director) leads research on urban ecology and resilience, internationally recognised through projects and awards including Living Lab Northern Rivers, a Venice Architecture Biennale exhibition (2021), and authorship of the UN Habitat III policy paper on urban ecology and resilience (2017).

Dr Kumar Biswajit Debnath (Chancellor’s Research Fellow, [Architecture](#), GI Lab, Bio-X) pioneers bio-intelligent building systems and bio-building physics, using living materials, waste and bio-digital fabrication to develop self-regulating, carbon-negative building skins for climate-change resilience and circular, regenerative architecture.

Dr Endriana Audisho (Lecturer, [Architecture](#)) is an Early Career Researcher whose work interrogates space through histories of power, representation, and conflict, focussing on decolonial and justice-oriented practices. Her work appears in Routledge volumes and journals including *Places* and *IDEA*.

Matte Ager-McConnell (Lecturer, [Architecture](#)) is a proud Dabee Wiradjuri early career academic whose research and teaching focuses on Indigenous and decolonial design through storytelling and countering the architectural canon and architecture’s responsibility to care for Country.

Tyler Smith (Casual Academic, Research Assistant, [Architecture](#)) is the 2025 graduate recipient of the NSW Architects Registration Board Architects Medallion. An early-career practitioner, he begins with listening to the relationships of place, guided by de-colonial and relational thinking, designing so that form follows Country.

Prof Abby Mellick Lopes (Professor of Social Design, [Design](#), UARC) leads federally-funded research on community climate resilience, energy transitions and circular economies. Abby is a co-editor for *Design/Repair: place, practice and community* and is published in several leading journals.

Prof Gerard Reinmuth (Professor of Practice, [Architecture](#)) founded TERROIR in 1999, establishing a critical presence in Australian architecture that re-frames place in contemporary cultural and environmental contexts. His research interrogates the agency of the architect within current economic, political, and sustainability frameworks.

A/Prof David Pigram (Associate Professor, [Architecture](#)) leads computational design, and robotic fabrication research to decarbonise construction. Co-founder of architecture practice *supermanoeuvre*, he has built and exhibited globally and received over 30 international awards for architecture, design, innovation, and sustainability.

Dr Mukesh Ray (Lecturer, [Built Environment](#)) is an urban planner with expertise in urban heat analysis, land use and land cover change, urban analytics and environmental analysis using geospatial methods, including geographic information systems (GIS) and remote sensing methods.

A/Prof Pernille Christensen (Associate Professor, [Built Environment](#), GI Lab) examines social and environmental disruption in cities, developing adaptation and mitigation frameworks for policy and industry, with recent research on urban heat, flood-prone areas, inclusive community engagement and protective placemaking

Dr Flora Hung-Baesecke (Senior Lecturer, [Communication](#)) focuses on how communication creates social and environmental impact and value. Her interdisciplinary research spans sustainability, stakeholder engagement, organisational social purpose, CSR, digital and social media and societal and environmental change.

GI Lab - Green Infrastructure Lab

UARC - UTS Ageing Research Collaborative

Vis Inst – Visualization Institute

AFRL – Advanced Fabrication Research Laboratory

Bio-X – Advanced Bio-Architecture Cluster

External Collaborators

James de Vries. UTS Adjunct Professor of Design. Co-principal at Weft Strategy, a strategic design firm developing organisational strategy as both choices and storytelling. Former Creative Director of Harvard Business Publishing Group. He is Founder of de Luxe & Associates who designed editorial, news, and magazine projects across Australasia.

Sam Kernaghan (External Adviser) is Director of the Resilience Program at the Committee for Sydney, Sam brings 20 years' experience working with over 50 cities across Asia, Oceania, and the USA. He has led major climate and disaster resilience initiatives with 100 Resilient Cities, the Asian Development Bank, and state governments from New York to NSW.

Industry Partners:

Bio DotDotDot [[Bio Home](#)] Over the past four years, BioDotDotDot has developed a portfolio of nature-based and bio-inspired technologies, including Urban Canopee for climate-resilient green infrastructure, Aglae for luminescent plant-based design, Glowee for bioluminescent lighting, and LuminoKrom for fluorescent urban surfaces. This is complemented by The Fables of Gunter Pauli, supporting blue economy awareness. Together, these initiatives align strongly with research in sustainable urban systems, ecological design, and innovative infrastructure.

Future Village [[Future Village Home](#)] delivers sustainable, free-standing green infrastructure that brings nature into urban environments. Their nature-based systems mitigate urban heat, enhance biodiversity, and improve community well-being by supporting social interaction, physical activity, and mental health. With a flexible approach to testing new park designs, their work aligns strongly with research on urban resilience, liveability, and sustainable landscape innovation.

UrbanBioma [[Urban Bioma Home](#)] specialises in tailored greening strategies for buildings and precincts, with a strong focus on retrofitting existing urban environments. Through its Second Nature mission, the firm transforms grey infrastructure into vibrant, sustainable ecosystems. Their work supports immediate action on urban resilience while also consulting on future projects.

Transsolar [[Transsolar Home](#)] is an international climate engineering practice specialising in climate-responsive design and outdoor comfort across buildings and urban environments. Transsolar has contributed to climate-responsive projects including Atlassian's Sydney headquarters, located adjacent to the UTS campus. The team through **Dr Wolfgang Kessling** and **Professor Thomas Auer** (also Professor Technical University of Munich) brings specific expertise in holistic outdoor comfort including public-space cooling through microclimate design strategies such as shading, natural ventilation, fans and targeted misting (Dry Mist Systems) demonstrated in projects in Singapore, Qatar and other hot-climate contexts.

Selected List of Relevant Research and Design Projects completed by UTS Team Members

The UTS Team Members bring proven expertise from significant projects and scholarship, positioning them well to collaborate in new and innovative ways. Selected projects with hyperlinks are listed below.

[Northern Rivers Living Lab](#) - bringing locals and experts together to develop solutions and knowledge in response to climate disasters. - Martin Bryant, Leena Thomas

[Fairwater Living Laboratory](#) – Investigating Energy, Network Demand, Community, Resilience, Urban Heat Effects and Commerciality funded by ARENA, NSW Office of Environment and Heritage - Leena Thomas, Nimish Bilorla

[BioCOOL](#), [Bio-Jaali](#) and [RHpT](#) – developing bio-integrated, bio-based building skin and bio-climatic frameworks for climate responsive, low carbon (to carbon negative), circular and regenerative architecture – Kumar Biswajit Debnath and Nimish Bilorla

[Cooling the Commons](#) - co-designing practices and infrastructures for accessible cool living in an age of urban heating. - Abby Mellick Lopes

[Victoria Park Public Domain's](#) - water sensitive urban design project – Hassell, Martin Bryant

[Design for Koondrook Wharf](#) – multiple award-winning place based urban infrastructure for river front – Terroir, Gerard Reinmuth

[Bradfield Central Park](#) Unbuilt shortlisted scheme A First Nations-led reimagining of Australian public space tailored to a warming Western Sydney climate. - Supermanoeuvre: David Pigram, Bangawarra: Matte McConnell

[Periscope Canopy](#) a functional centrepiece and iconic gateway to a major urban renewal of the commercial core of Lane Cove in Sydney, Australia. - Supermanoeuvre: David Pigram

[NEST HiLo](#) a construction innovation demonstration project commissioned by the Swiss government materials research agency in Zurich. - Supermanoeuvre: David Pigram

[Forecourt for Institute of Marine and Antarctic Studies](#) - forecourt design consisting of two key interventions to invite a livelier form of engagement by the public. – Terroir, Gerard Reinmuth

[Home: Country as Creative Process UTS SoA Elective](#) – a relational, Country-centred methodology for collaborative design research and public engagement developed through the 2025 Venice Architecture Biennale by Matte Ager-McConnell and Dr Endriana Audisho

[North Head Viewing Platforms](#) – Ecological restoration, cultural practice, tourist walking trails and lookout, working holistically, defined by Country. Bangawarra: Matte McConnell