



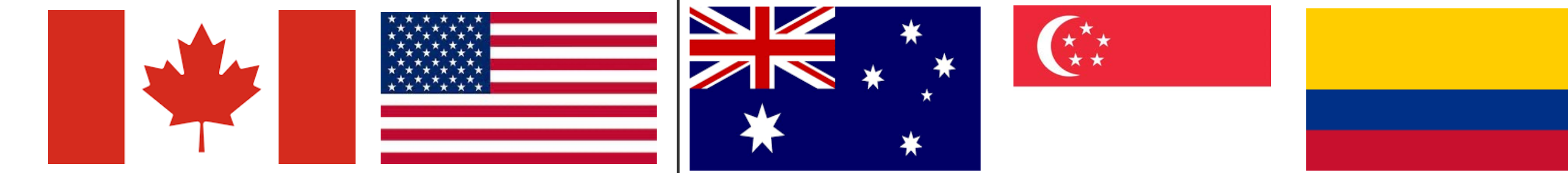
Global Centers Track 2: Heat Adaptation

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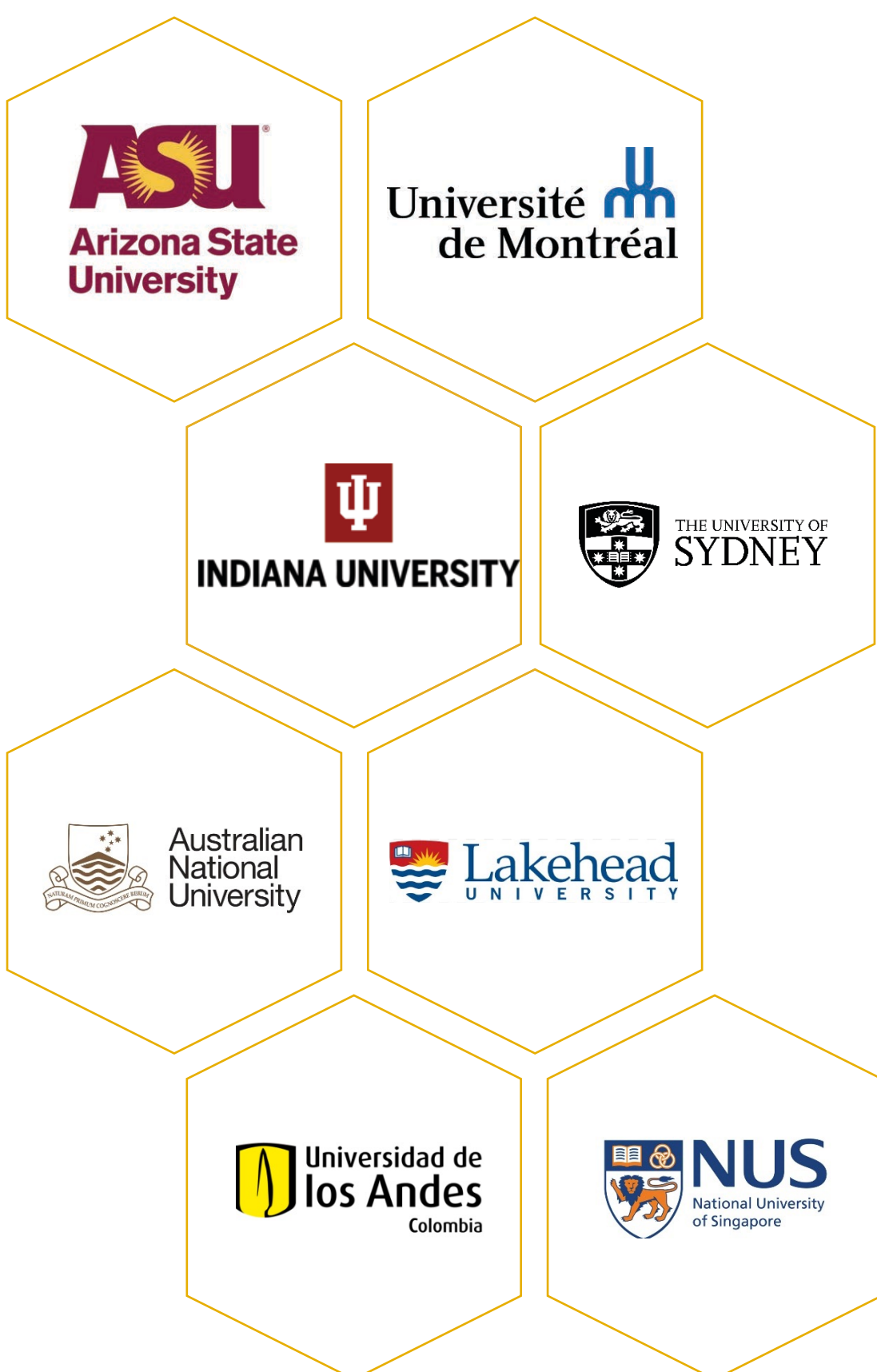
More project info:



Countries



Institutions



Strategic Growth

RO1: Network coordination, integration, and growth around use-inspired heat adaptation strategies.



Partners

- City of Phoenix Heat Office
- AZ Heat Resilience Working Group
- Montreal Public Health
- Maricopa County Public Health
- Intact Centre on Climate Adaptation, University of Waterloo
- Global Heat Health Information Network
- Office municipal d'habitation de Montréal
- Montreal coalition of neighborhood round tables
- Greater Sydney Heat Taskforce
- Resilient Sydney
- National Institute of Scientific Research, Quebec

Disciplines

Atmospheric Science
Human Biometeorology
Thermal Physiology
Behavioral Sciences
Epidemiology
Public Health
Social Sciences
Built Environment & Urban Climate
Computer Science & Engineering
Urban Planning

Embedded Learning



Team Workshop at Arizona State University - Aug 27-29, 2024

A consortium of global researchers, governments, healthcare providers, and community leaders* all with a common long-term vision.

Vision: To strengthen society's ability to manage and adapt to extreme heat across countries and cultures and train the next generation of global researchers and practitioners using thoughtful and innovative approaches.

Impactful Education

EO: Implement transdisciplinary Global School on Heat Adaptation in Montreal with students and stakeholders.

Inaugural...

Global School on Heat Adaptation

Hosted by:



RO2: Pilot test personal and household-level heat exposures, responses, and adaptation.

Innovative Research

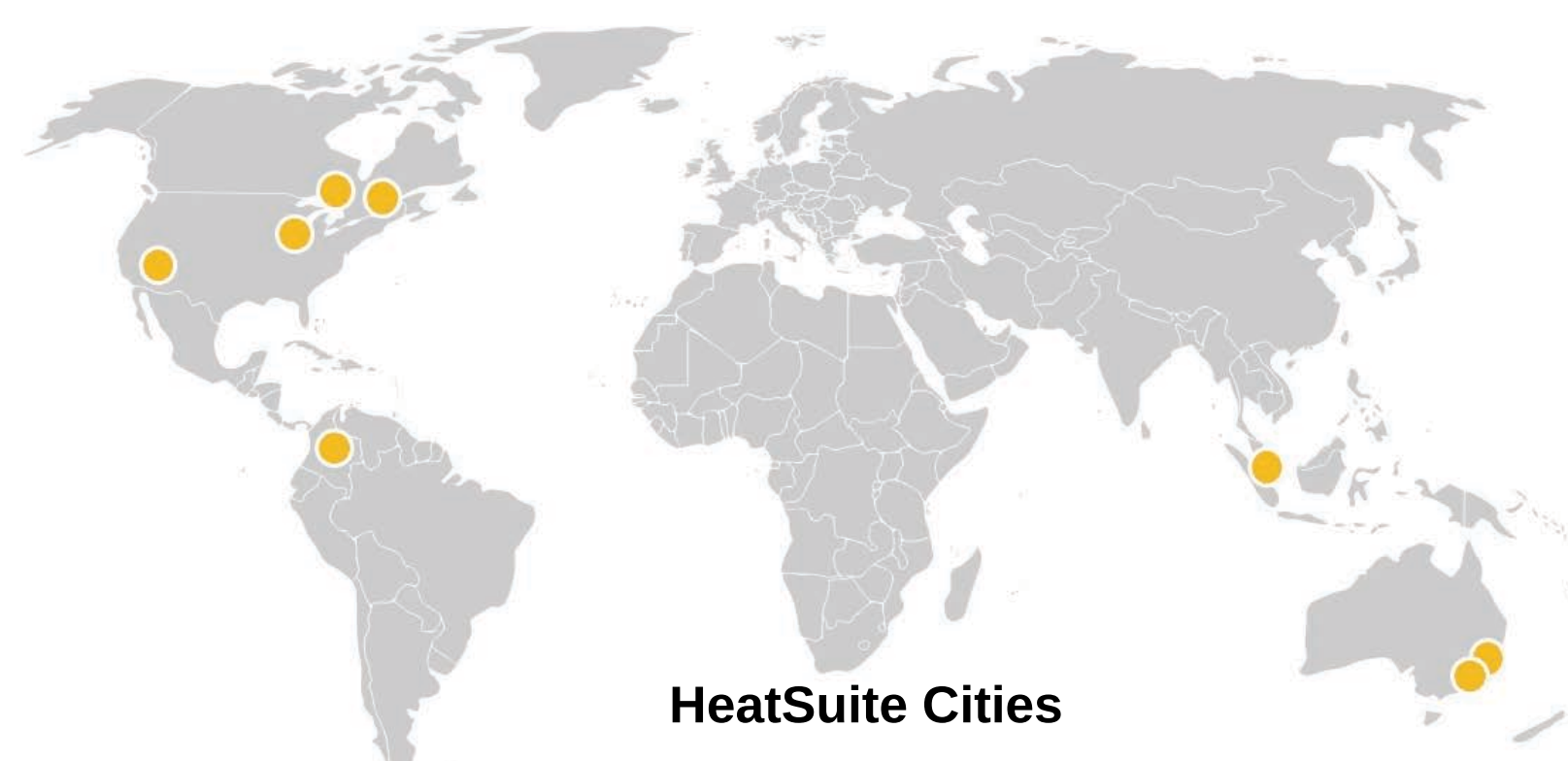


Research Gaps

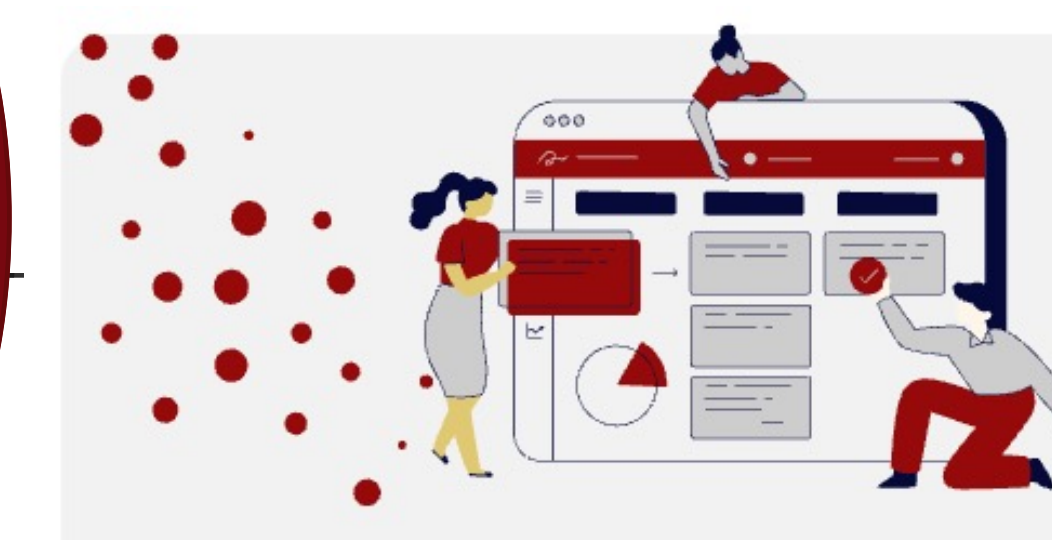
Ecologically valid data on overall "heat" exposure and physiological and behavioral responses are **virtually absent from the literature**, and minimally connected to health outcomes, especially in low- and middle-income countries. Available technologies are impractical, costly, and/or non-specific to a researcher's primary objectives. Large wearable companies also dictate data governance; thus, researchers are typically required to request data access.

Main Research Goal

Deploy a new modular remote data collection hardware and software platform—HeatSuite—in select global cities to address these gaps.



	Phoenix (n=39)	Colombia (n=10 Medellín, n=10 Cali)	Montreal (n=26)
Average participants characteristics	56.7±7.9 years 66% Female ~1.58 m, height ~78 kg, weight	65.0±7.4 years 100% Female ~1.65 m, height ~74 kg, weight	69.7±7.0 years 81% Female 1.60m, height 75.4 kg, weight
When	Jun–Oct, 2024 (5 waves of 21 days)	Feb–Apr, 2025 (2 waves of 16 days)	May–Jul, 2025 (1 wave)
At-home cooling devices?	100% AC presence; 92% fan presence	15% AC presence; 60% fan presence	68% AC presence; 87.5% fan
Heat experienced as:			
• Inconvenient	5	1	8
• Manageable	11	6	5
• Catastrophic	23	13	9



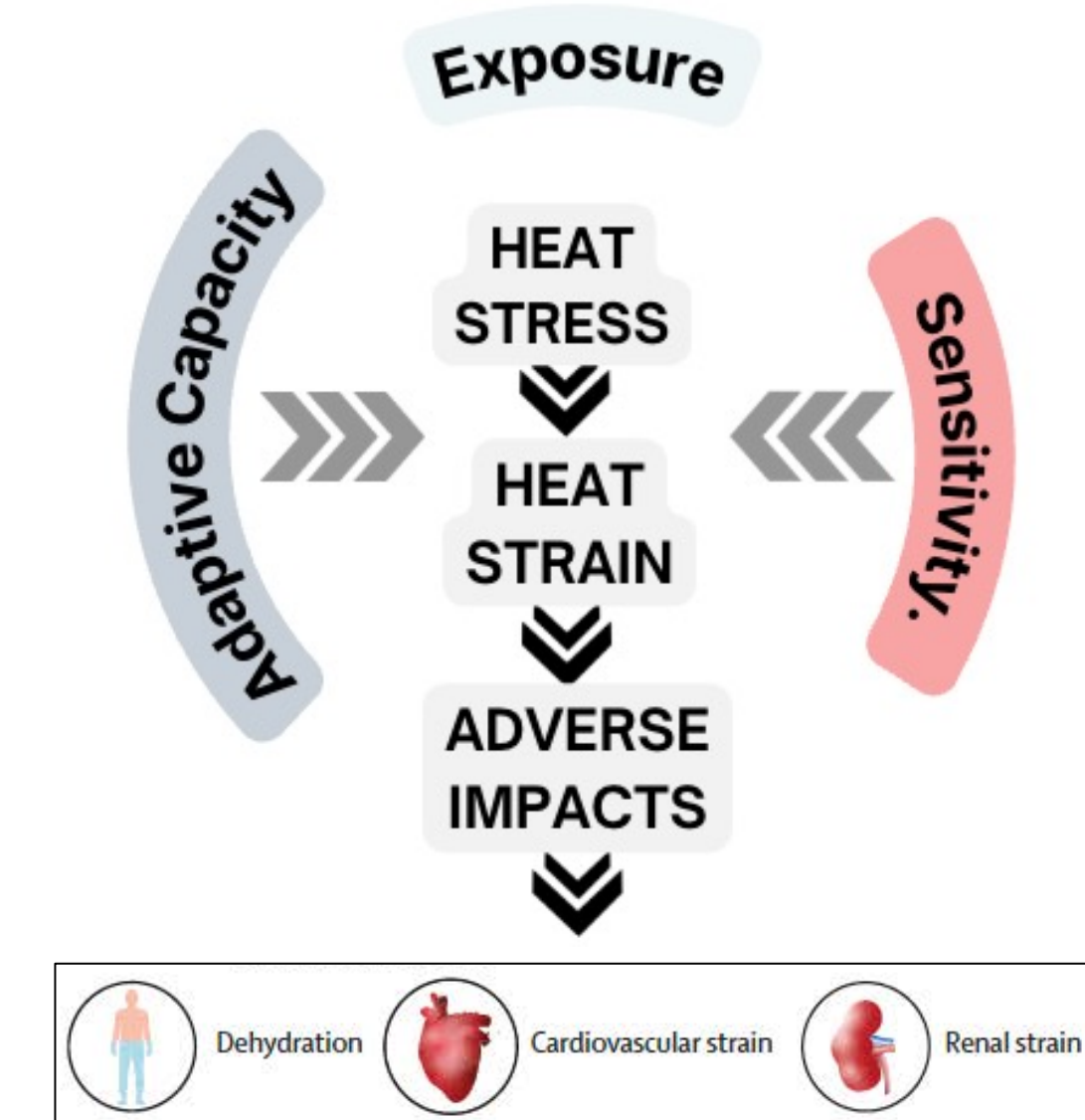
Guiding Research Questions

How do people & groups across **climates, cities, and cultures** behave in the heat, and what **adaptive coping strategies** (e.g., technologies, social connections) are used?

What is the **intensity & duration** of heat exposures in indoor and transient environments?

What factors (**intrinsic & extrinsic**) impede one's ability to **manage heat extremes**? How does **perceptions of heat**, including impacts & dangers, vary between people and locations?

What motivates **cool-seeking behavior**?



HeatSuite

Weather sensors

- Dry temperature
- Humidity
- Globe temperature
- Wind speed

Smartwatch

- Momentary assessments
 - Indoor/outdoor location
 - Heat perception
 - Sweating/Thirst
 - Heart rate
 - Steps/Acceleration
- Integration with **blood pressure** and **oral temperature** instrument

Regional weather

- Standard weather station

Qualitative instruments

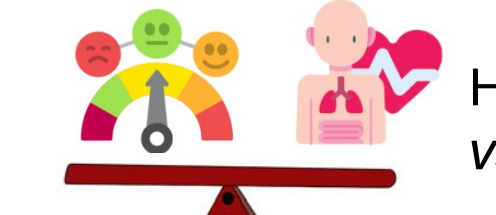
- Baseline/Exit survey (adaptive capacity to heat)
- Colombia semi-structured interview (Heat adaptation narrative)

Wearable weather sensor (Kestrel drop D2)

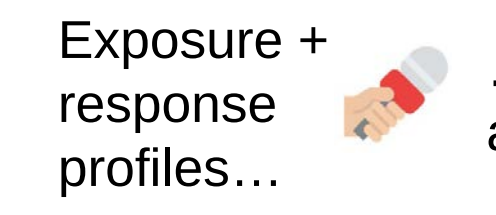
- Dry temperature
- Humidity



Exposures & Activity



Heat perception vs physiological stress



Exposure + response profiles...

...related to heat adaptation narratives

