PI: Tzu-Hsin Karen Chen

Narrative & Budget File

What We Are Requesting

We are excited about the matching fund opportunity from CSDE and would like to request $20,000 to support the purchase of Twitter (X) data. Specifically, this will include 4 million geo-tagged tweets collected before and during heat waves on the West Coast.

Our team has experience working with the Twitter API and will implement strategies to minimize bot/advertisement data (e.g., filtering out users who post more than 1,000 tweets from different locations). This will maximize the value of the funding by ensuring the purchased data primarily consists of individual posts reflecting social media expressions across different environments and urban landscapes.

Based on our initial conversations, we understand that if this data is purchased through CSDE's funding, it will be accessible to other UW researchers who have access to CSDE's server.

Rationale of the PHI Proposal and CSDE Matching Fund

The PHI Tier 2 funding allows us to assemble an interdisciplinary team—including experts in environmental health, psychology, urban planning, architecture, and data science—to address a critical and ambitious question: How does urban planning and housing contribute to disparities in psychological responses during climate crises, and how do these effects vary across sociodemographic groups?

Traditional research methods, such as surveys, are infrequent, costly, and lack spatial granularity. In contrast, social media platforms provide a real-time window into emotional expression, offering valuable insights into geographic and temporal patterns of psychological responses during extreme climate events.

The PHI Tier 2 award of $50,000 supports 0.76 months of effort per team member, which is essential for launching this interdisciplinary pilot. However, CSDE's matching fund will be critical to the project, as it will enable us to acquire the core dataset necessary to analyze psychological responses at scale. Without this data, the research vision cannot materialize.

To further support interdisciplinary coordination, I (Karen Chen) am contributing an additional $3,305 to strengthen project management and ensure seamless collaboration across disciplines.

Integrating Mental Health into Urban Planning: A Pilot Study on Social Media-Expressed Helplessness During Climate Extremes

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	PHI	CSDE's matching	Chen's matching
Salaries			
Faculty	$31,715		$2,646
Staff			
Student/Postdoc/Research scientists	$6,480		
Benefits Based on Payroll Load Rate in Effect	$11,805		$659
Supplies and Materials		$20,000	
Total Direct Costs	$50,000	$20,000	$3,305

Budget Justification

Personnel in PHI's budget

Dr. Chen (0.063 FTE) will be responsible for overall project management, leading the environmental exposure component, supporting the built-environment component, driving an interdisciplinary publication with team, and developing future grants.

Dr. Gasperi (0.063 FTE) will be responsible for conceptualizing the connection between social media expressions and mental well-being, designing, validating, and refining the model of emotion detection.

Dr. Abbasabadi (0.063 FTE) will be responsible for leading the built environment component and support Twitter data collection component.

Dr. Huang (0.063 FTE) will be responsible for analyzing individual- and neighborhood-level vulnerability characteristics, as well as supporting analysis with epidemiological approaches.

Dr. Ashayeri (0.063 FTE) will be responsible for designing the emotion analysis along with the psychology input from Dr. Gasperi. He has also developed an online tool that can minimized bot data during Twitter data collection and thus maximize the data that are associated with residents and their well-being.

Senior Personnel
Dr. Seto (0 FTE) will serve as an advisory role in support of conceptualizing the sociodemographic disparity in emotion response to heat.

Matching Fund
Personnel
Dr. Chen (0.02 FTE) will match additional 0.02 FTE using her start-up fund for her role in managing and coordinating different components in this interdisciplinary project.

Supplies and Materials

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Twitter data ($20,000): Center for Studies in Demography and Ecology will support 4 million geo-tagged tweets within Washington, Oregon, and California, during and before heat waves.

Future Trajectories of this Work and Expected Funders

My long-term goal is to influence resilient urban planning policies by identifying protective factors for mental health that have yet to be integrated into building and land use regulations.

Several external grant opportunities hold promise:

- NSF: Human-Environment and Geographical Sciences Program; Regional Resilience Innovation Incubator.
- NIH: R01; NOT-DK-24-029 (Analysis of Existing Linked Data Sets to Understand the Relationship between Housing Program Participation and Risk for Chronic Diseases and Other Conditions).
- The Robert Wood Johnson Foundation: Call for Proposals—Reimagining Land Use & Zoning for Health Equity.
- Wellcome: Regular funding for Climate Impact Awards and Mental Health Awards.

While mental health is not currently included in environmental impact assessments for development and housing projects, its relevance to the built environment is growing, especially as climate change intensifies. This work, supported by CSDE and PHI Tier 2 funding, will lay the foundation for interdisciplinary collaboration with experts across the Schools/College of Medicine, Public Health, and Built Environments.

The combination of interdisciplinary research, social media data, emotion AI models, and proof-of-concept findings on the mental health-urban planning connection during climate extremes will significantly strengthen the likelihood of securing large-scale funding opportunities exceeding $200K.