



DISSERTATION DEFENSE

April 16, 2026



11:00 AM

HAMP 2201

Reframing Climate Risk: From Physical Processes to Social Dimensions

Climate risk is commonly understood as the product of hazard, exposure, and vulnerability, yet each of these components is shaped by choices about measurement, indicators, and aggregation. This dissertation argues that what is measured, and by whom, determines what is recognized as climate risk and what remains invisible.

Drawing on multiple empirical approaches, this research shows how structural inequalities influence whose scientific knowledge enters the global record, how conventional temperature metrics can obscure widespread warming, and how alternative measures incorporating humidity reveal different patterns of heat risk. It further demonstrates that these dynamics are not confined to a single region but emerge across diverse hydroclimatic settings through interactions between soil moisture and atmospheric processes.

Through a case study of community-led air quality monitoring in Superior, Wisconsin, this dissertation shows how residents can produce knowledge that makes otherwise unrecognized environmental exposures visible and actionable within governance systems.

In all, this work shows that climate risk is constructed across multiple scales, from physical measurement to institutional practice, shaping not only how risk is understood, but whose knowledge counts.

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