



SW-IFL: Southwest

Urban Integrated Field Laboratory



What is SW-IFL?

SW-IFL is a partnership involving three public universities in Arizona, two national laboratories, and industry studying the rapidly urbanizing megaregion stretching across Arizona from the Mexican border to the Navajo (Diné) Nation. The growing population is stressed by the complex interactions of extreme heat, atmospheric pollutants, and limited water.

Principal Investigator

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Lead Institution

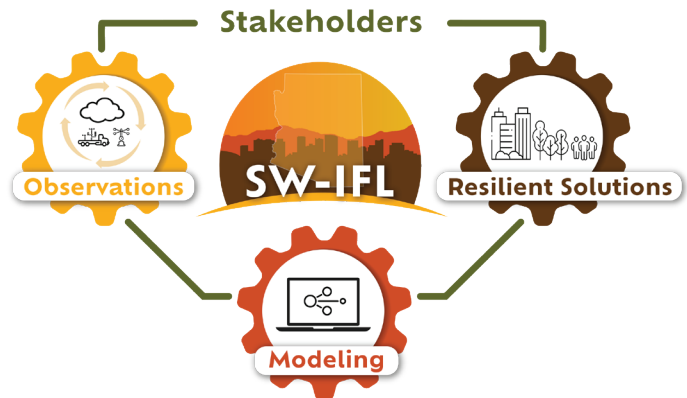
Arizona State University

Partner Institutions

- Brookhaven National Laboratory
- IBM Research
- Northern Arizona University
- Oak Ridge National Laboratory
- The University of Arizona

What Are Urban Integrated Field Laboratories?

The U.S. Department of Energy Biological and Environmental Research program supports four urban integrated field laboratories (UIFLs) that aim to inform equitable climate and energy solutions to strengthen community-scale resilience across urban landscapes. UIFLs represent diverse demographic characteristics, differing climate-induced pressures on people and infrastructures, and unique settings.



Research Approach

SW-IFL integrates high-resolution observations, modeling, and stakeholder-driven resilient solutions to provide new knowledge that addresses extreme heat and related urban environmental challenges. SW-IFL delivers next-generation predictive tools that are regionally specific but also translatable to other sunbelt regions.

Vision

SW-IFL seeks to engage stakeholders and provide scientists and decision makers with high-quality, relevant knowledge capable of spurring and guiding responses to environmental concerns.

Top photo: Tempe, Ariz., as viewed from Papago Park. [Adobe Stock]



U.S. DEPARTMENT OF
ENERGY

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Science

Biological and Environmental Research Program



**Southwest
Integrated
Field Laboratory**



Researchers at Brookhaven's Center for Multiscale Applied Sensing integrated a suite of weather instruments on a truck to create a mobile observatory capable of measuring climate data while driving through local neighborhoods. [Courtesy Brookhaven National Laboratory]

RESEARCH SPOTLIGHT

During intensive observational periods throughout the summer months, SW-IFL uses mobile observatories to measure large-scale boundary-layer processes. SW-IFL also uses focused neighborhood-scale heavily instrumented testbed experiments to elucidate drivers of microclimate variations and evaluate the efficacy of proposed solutions.

SW-IFL BY THE NUMBERS

- 105 RESEARCHERS IN 3 RESEARCH THRUSTS
- MORE THAN 7 MILLION ARIZONA RESIDENTS
- 3 UNIVERSITIES
- 2 NATIONAL LABORATORIES

RESEARCH QUESTIONS

SW-IFL seeks to address research questions and stakeholder concerns, including:

- What are the impacts of extreme heat, air chemistry, and urban hydrology on disadvantaged or underrepresented communities?
- How do climate and surface or human drivers interact, and how do their impacts manifest spatiotemporally across urban environments?
- How do policy levers, technologies, materials, and landscaping strategies impact the patterns of urban climate and associated societal outcomes, including equity considerations?



Representatives from the DOE Office of Science visit the Maryvale flux tower with SW-IFL researchers in February 2024.

SW-IFL NEWS

sw-ifl.asu.edu/news



SW-IFL WEBSITE

sw-ifl.asu.edu



UIFL WEBSITE

ess.science.energy.gov/urban-ifls

