Wildfire Risk and Arizona Communities

Define The Problem
Best Available Science
Proposed Framework

The Necessity of Strategic Alignment on Mitigations that Matter (MTM)

- Unless “we” provide a clear and consistent mitigation alignment strategy, implemented and maintained at scale, we will face more frequent and severe life and property loss to wildfire, including cascading financial consequences from insurance, to reinsurance, possibly extending to the mortgage and municipal bond markets.

Task, Purpose, End State

Task: Develop recommendations that will mitigate wildfire risk to the built environment and reduce insurance uncertainties

Purpose: Reduce wildfire risk at the parcel level in a way that informs all levels of insurance underwriting

End State: Arizona residents are provided a framework that enables effective wildfire risk reduction and keeps private insurance markets balanced: Create a body of work and somehow influence the industry

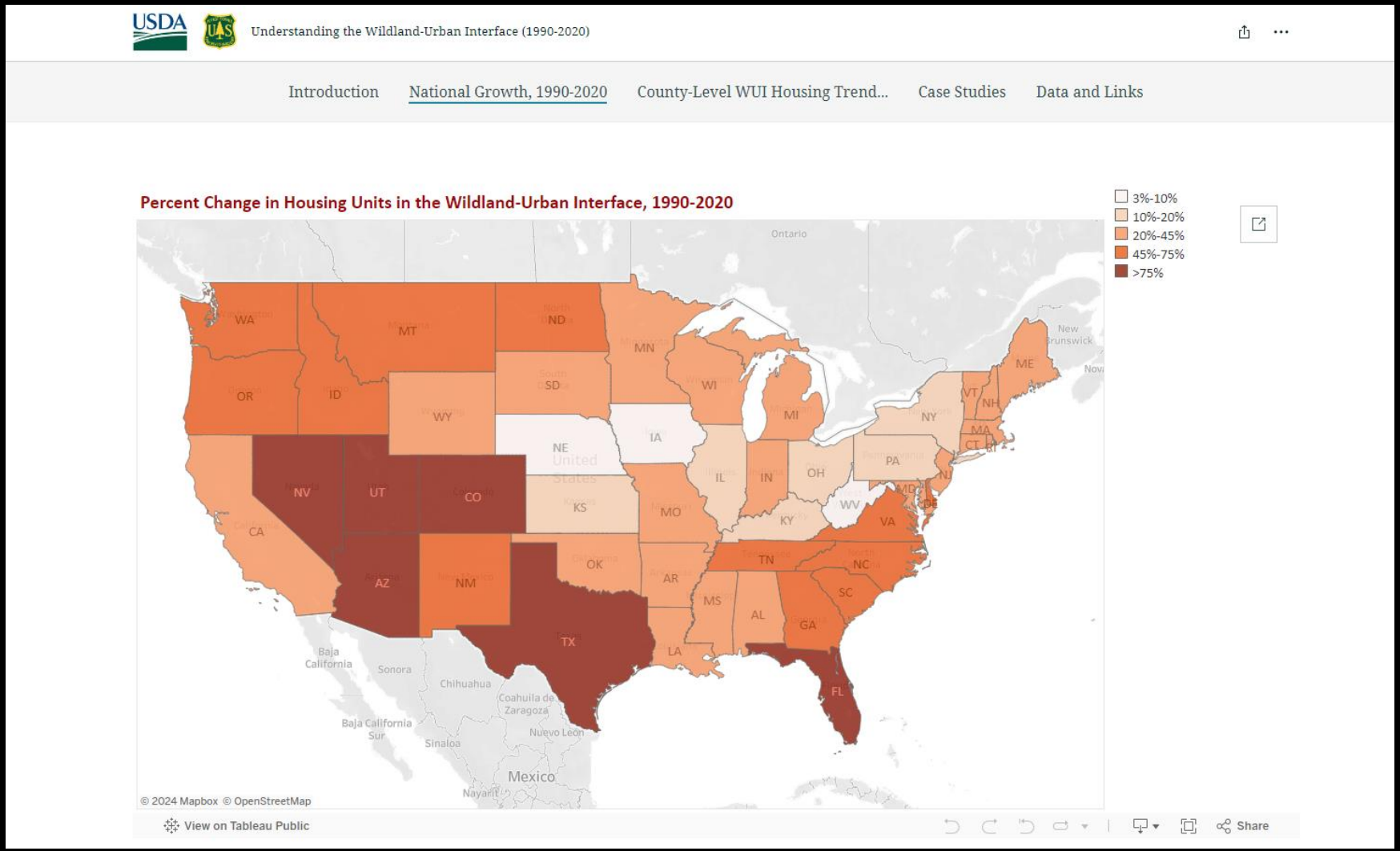
Fire return intervals are well known in the southwest

Natural environment fuel buildup due to Fire Suppression and Exclusion

Built environment codes need to be modernized and aligned with best available science

Photos taken at the same location

Change in housing units in the wildland-urban interface, 1990-2020



Where is the wildfire risk?

Where is the wildfire risk?

Best Available Science

Defensible Space, Home and Business Hardening

NFPA Firewise, IBHS, NIST

Natural & Built Environment Fire Pathways

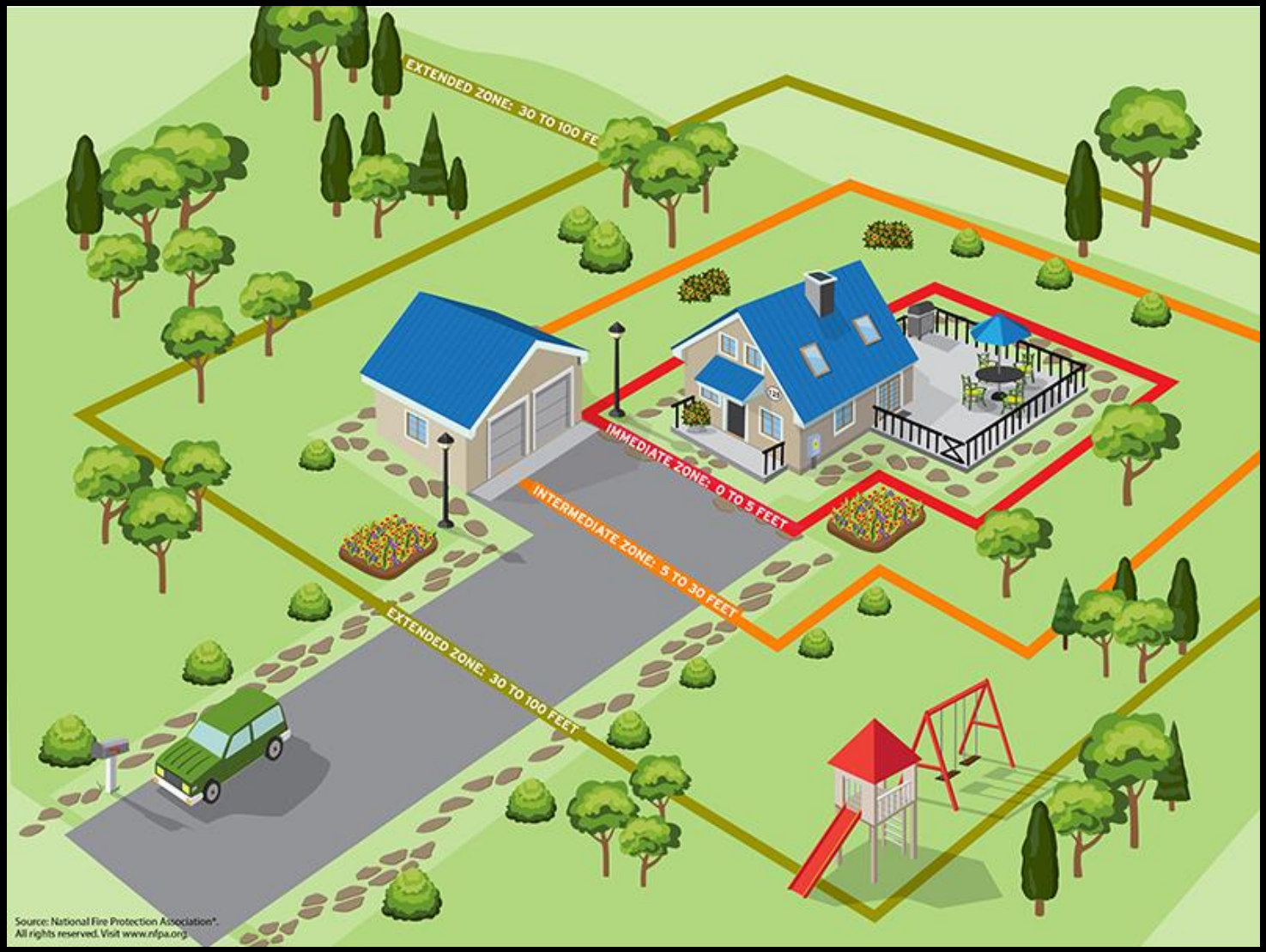
XyloPlan and Chief David Winnacker, Moraga-Orinda Fire District

Structure Fire Spread & Vulnerability Model

Hussam Mahmoud, Ph.D. at Colorado State University

Wildland Fire Mitigation and Management Commission Report

National Fire Protection Association
FIREWISE USA



How To Prepare Your Home for an Evaluation

The Wildfire Prepared Home designation program enables homeowners to take preventative measures for their home and yard to protect against wildfire. This checklist will guide you through required actions to help protect your home and receive a designation certificate.

Eligibility

- The applicant must be the owner of the 3-story or less, single-family detached home (no townhomes or condos).
- The home must be located in California.
- A 5-foot noncombustible buffer must surround the home. Photos submission are required for eligibility.

NOTE:

- Designation certificate requirements are stringent. Tree requirements may disqualify some homes, and some homeowners may have to work with neighbor(s) to meet the requirements.
- One of the most stringent required actions is creating a 5-foot noncombustible buffer around your home and decks. **ALL** vegetation, trees including overhanging branches, grass/turf, wood/rubber mulch, wood/vinyl fencing, and any stored items within 5 feet of your home must have been removed. Your home will not receive the designation certificate without meeting the requirements.

Examples of eligible homes with a 5-foot noncombustible buffer

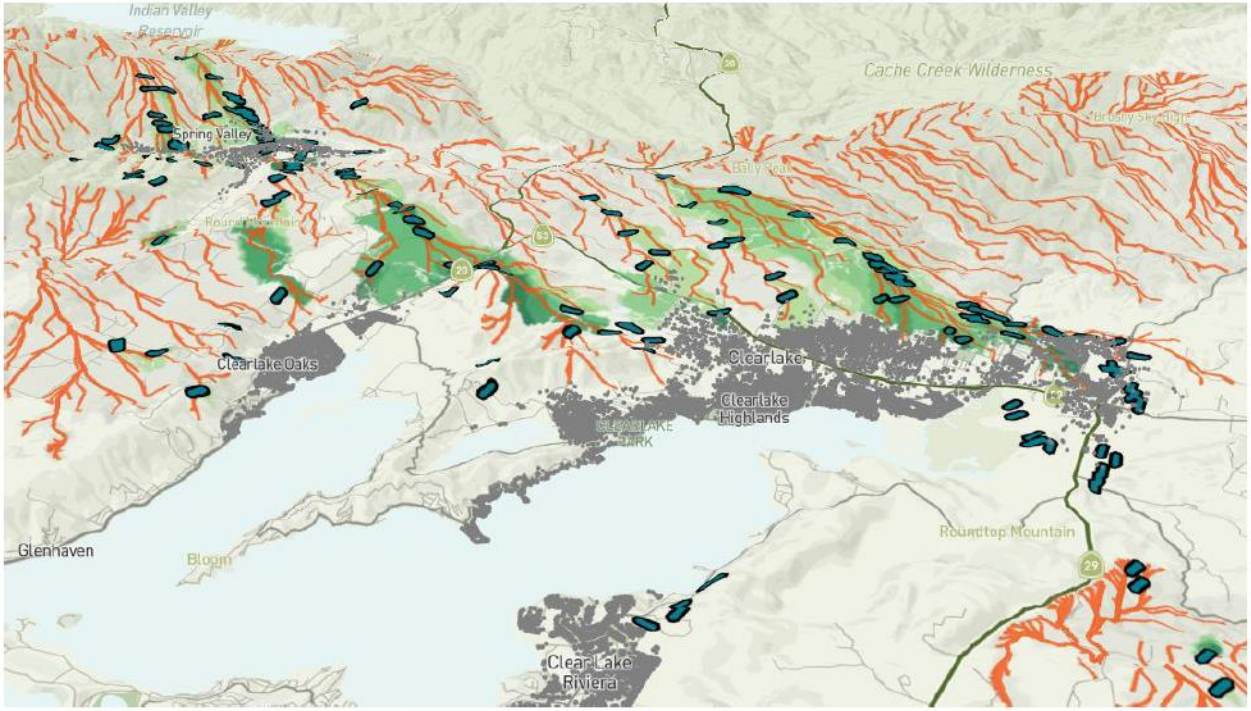
Designation Certificate Levels

We offer two solutions. To receive a designation certificate, your home must meet **all** requirements listed for the desired level.

1. **Wildfire Prepared Home Base** — This group of required actions includes creating a 5-foot home buffer, preparing the home's exterior, and maintaining the deck/covered porch and yard, **typically achieved through retrofits** to existing homes.
2. **Wildfire Prepared Home Plus** — This group of required actions builds upon *Wildfire Prepared Home Base* to add an extra layer of home protection, **commonly achieved with newer home construction** or after exterior home renovations.

IBHS Wildfire Prepared Home Designations

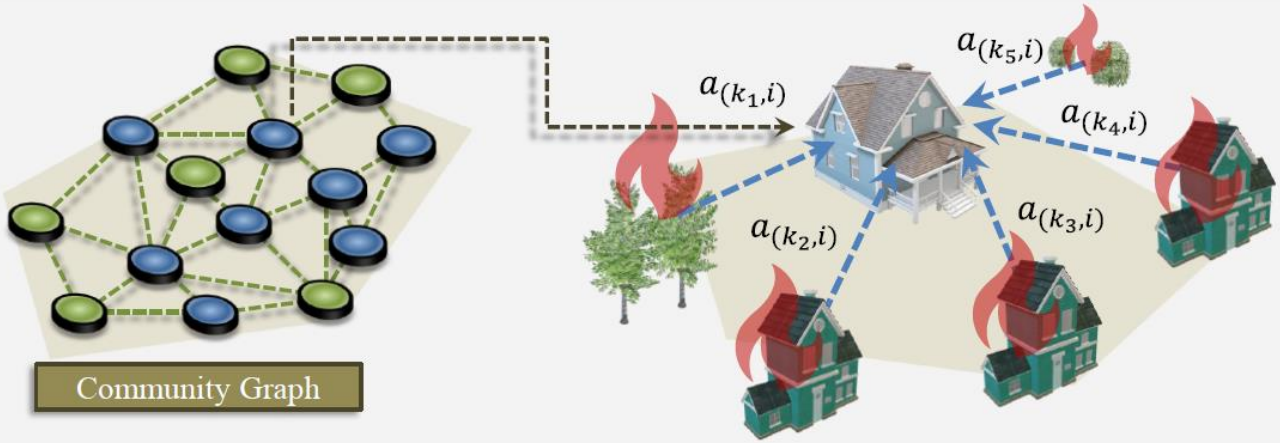
Vegetation to Vegetation: Speed Based Fire Pathways



Vulnerability – Relative Vulnerability

- The Vulnerability values calculated for individual structures are **relative** to each other.
- Structures with higher Relative Vulnerability are expected to have lower chances of Survival than structures with lower Vulnerability.

Relative Vulnerability calculated for building nodes from Community Graph



- Vulnerability of a building node evaluated as the cumulative impact of all its neighbors assuming they have been ignited

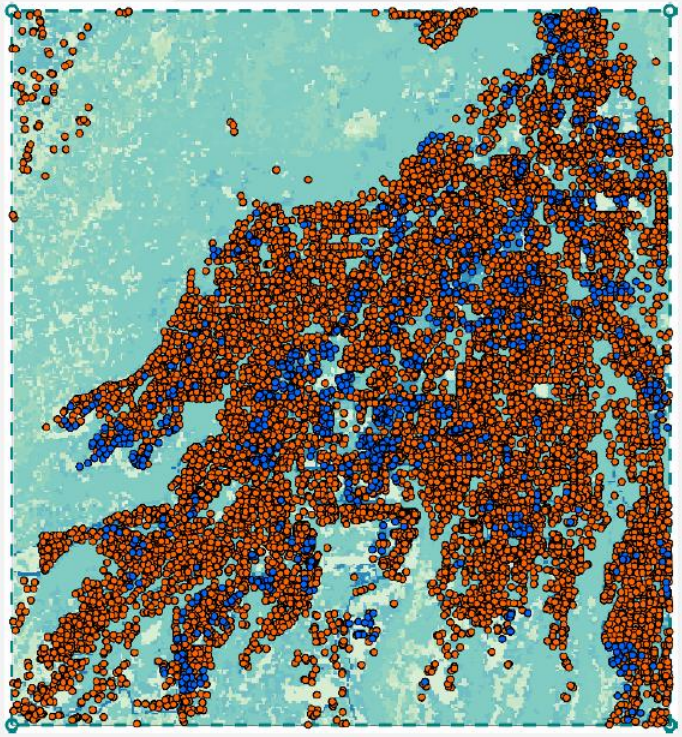
$$V^{(i)} = \frac{\sum_{k \in g(i)} a_{(k,i)}}{n^{g}_{(i)}}$$

Probability of Ignition of node *i* when node *k* is ignited

No. of closest neighbors to node *i*

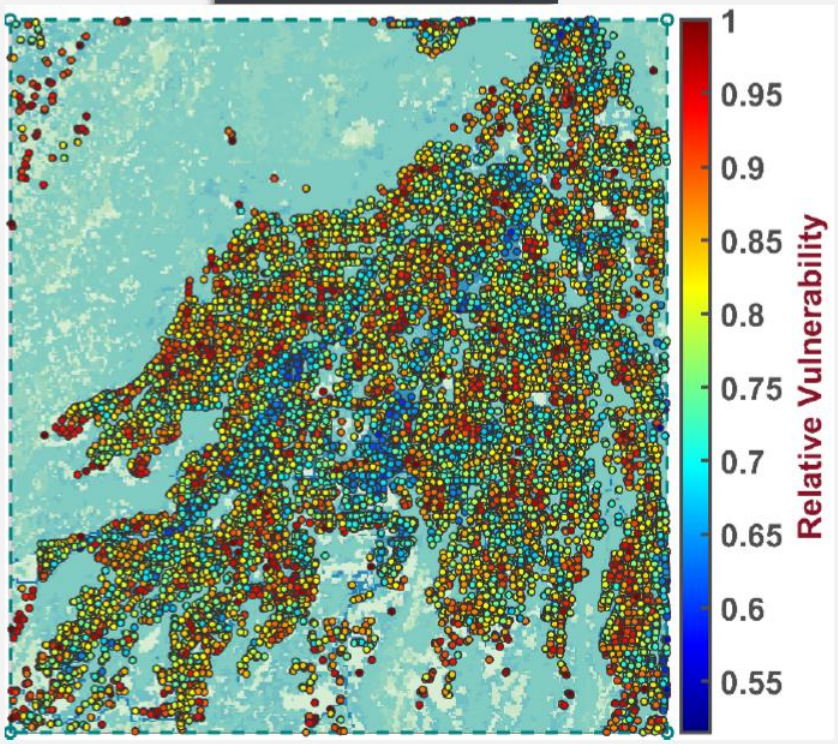
Damage Assessment – 2018 Camp Fire

Observed Damage



Survived Destroyed

Relative Vulnerability



Chulahwat and Mahmoud et al. (2022) ***Sci. Rep.***

ON FIRE: The Report of the Wildland Fire Mitigation and Management Commission

September 2023

Working Group Outcomes

1. Determine what are the priority wildfire risk mitigations that matter for structure protection

2. Determine the appropriate system to track and monitor the implementation of mitigations that matter

3. Establish a system of incentives for home/property owners that implement mitigations that matter

4. Summarize these recommendations in a report with an audience of fire insurance industry, State agencies, and AZ Legislature

Recommended Working Group Representatives

Arizona Fire Chiefs Association

Arizona Fire Districts Association

Western Fire Chiefs Association

Arizona Department of Insurance and Financial Institutions

Arizona Department of Forestry and Fire Management

Arizona State Fire Marshall

Representatives of the Insurance Industry

Next Steps

MOU with the Western Fire Chiefs Association and the Arizona Fire Chiefs Association

October meeting to align AZ efforts with WFCA

Present and discuss efforts at the Arizona Wildland Urban Interface Summit

(Dec 4-6 in Tucson)

Turning a billion-dollar challenge into safe communities

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