Kate Dargan Marquis
Senior Wildfire Advisor
Gordon and Betty Moore Foundation

Future Climate

Wildfire
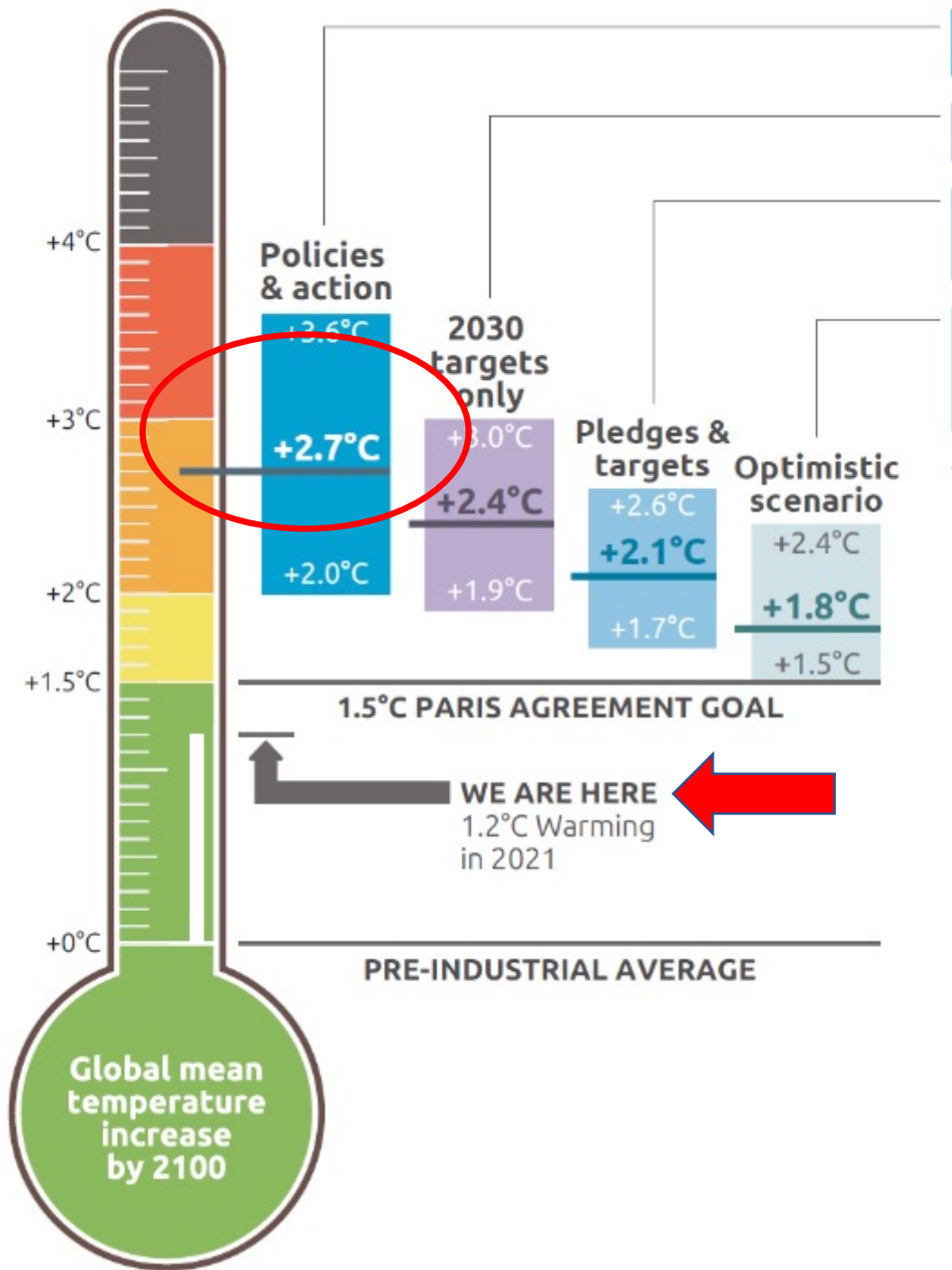
Climate

Time

Trends

Tilt

Triage

Wildfire

Climate

Wildfire

Time

By 2075 – wildfire frequency and severity will be 30-50% greater than today in terms of burned area, heat intensity, and fire frequency.

Policies & action
+3.6°C
+2.7°C
+2.0°C

2030 targets only
+3.0°C
+2.4°C
+1.9°C

Pledges & targets
+2.6°C
+2.1°C
+1.7°C

Optimistic scenario
+2.4°C
+1.8°C
+1.5°C

1.5°C PARIS AGREEMENT GOAL

WE ARE HERE
1.2°C Warming in 2021

PRE-INDUSTRIAL AVERAGE

Global mean temperature increase by 2100

GLOBAL WARMING
GLOBAL WARNING

Climate

Wildfire

Trends

Climate/GHG – Worsening fires, increasing emissions
Energy – Big infrastructure build, will dominate federal money
Disaster Costs – Increases will pressure fed budget
Geopolitical – Increasing conflict and big defense needs
Demographic – Aging population + low birthrate + poor immigration policy = no easy scalable workforce for forestry labor
Technology – AI and cheap satellites will change wildfire DSS
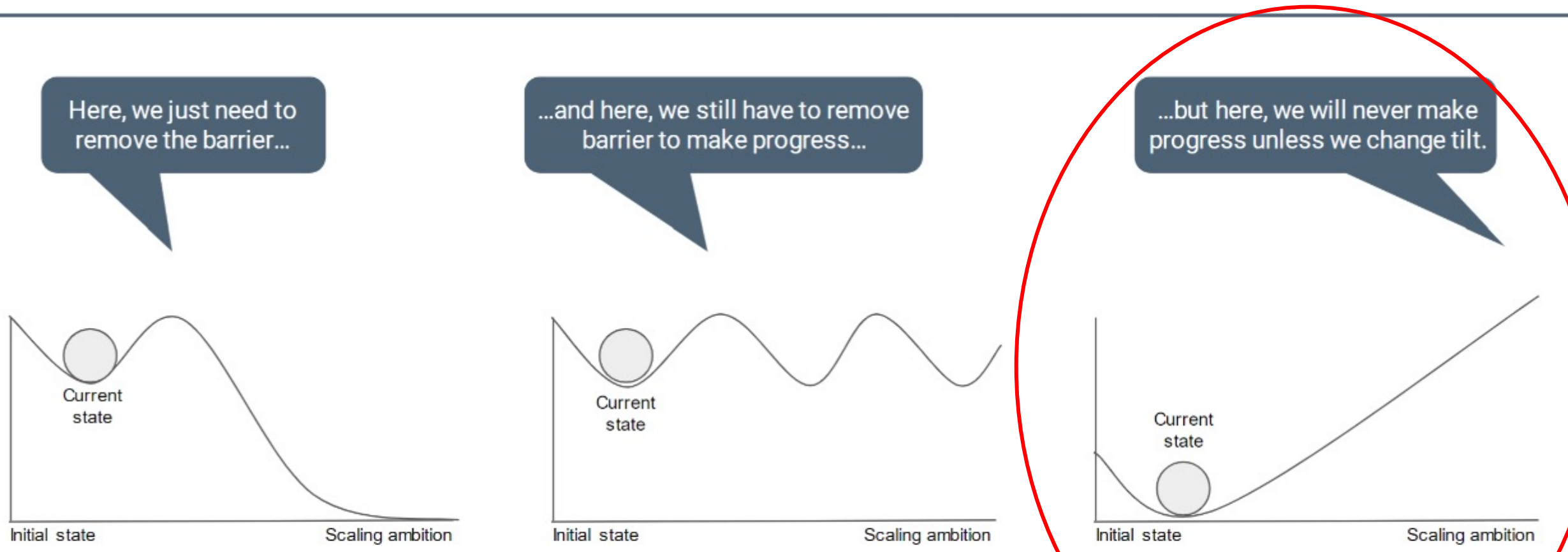
Scaling and System Tilt

Understand your current system direction.

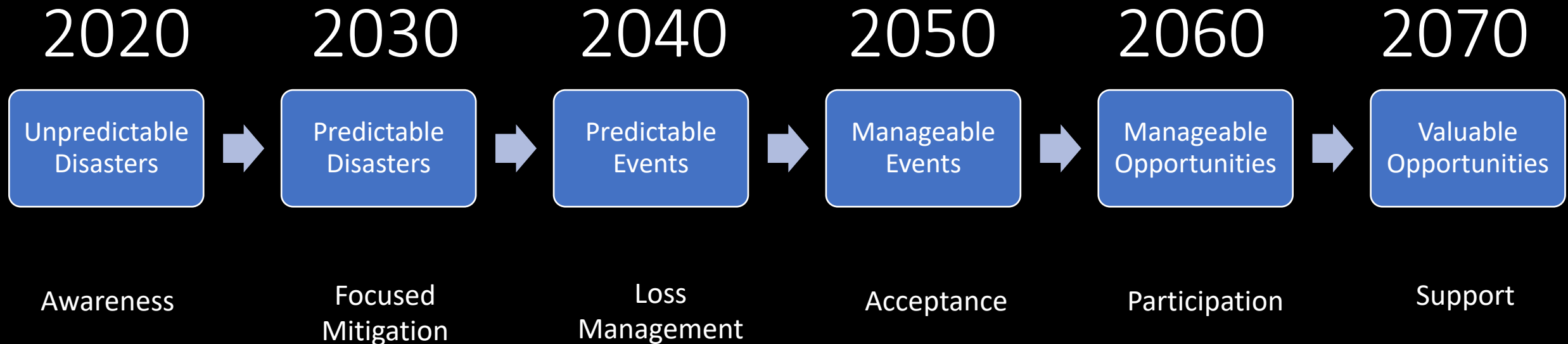# A "Metaphor" for Understanding Overall System Tilt Versus Barriers
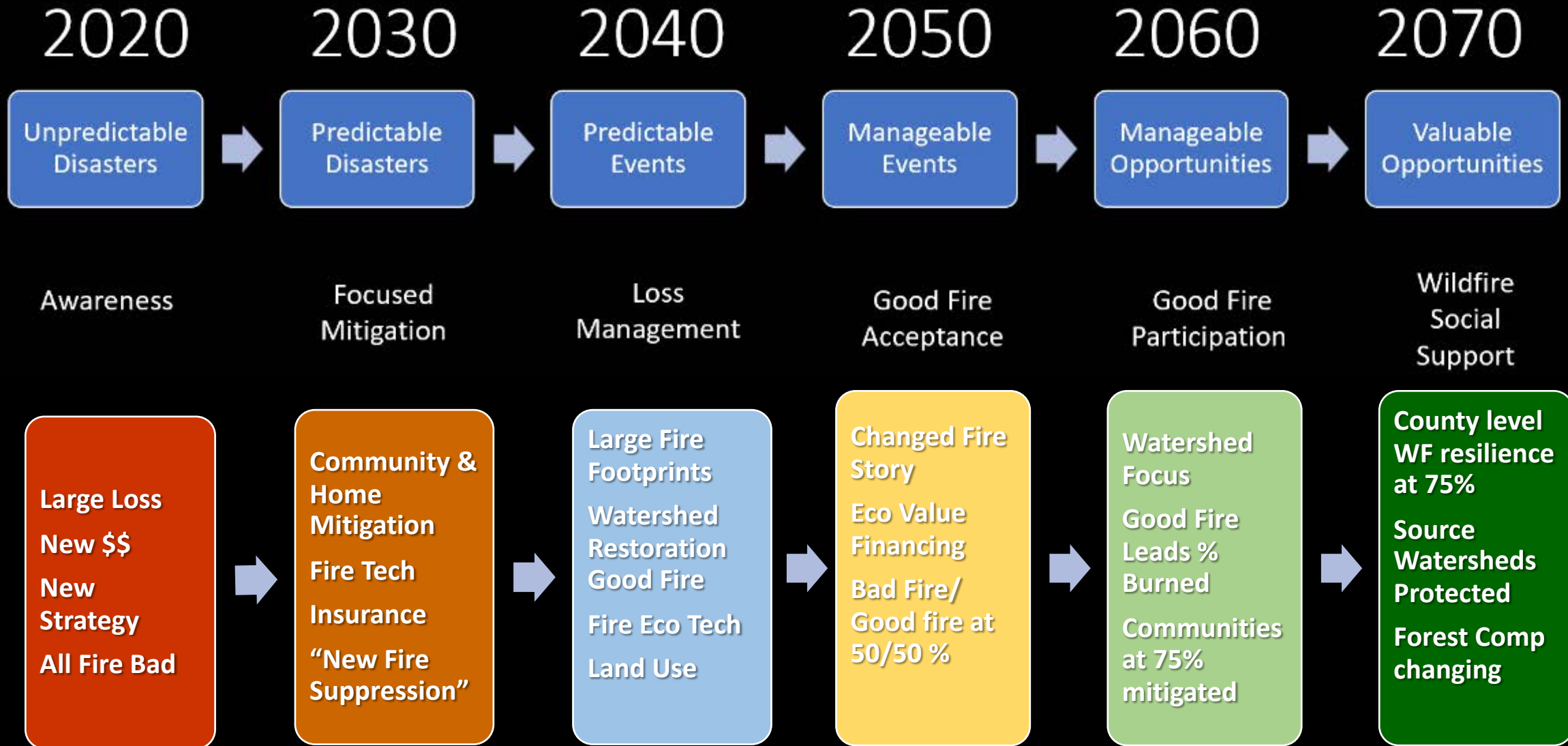
Climate

Wildfire

Triage
(Accept your traded losses)

1. Create a 50-year strategy
2. Shift the fire story
3. Re-calibrate fire suppression
4. Focus on financial levers

1. Create a National Wildfire 50-year Strategy

2020		2030		2040		2050		2060		2070
Unpredictable Disasters	→	Predictable Disasters	→	Predictable Events	→	Manageable Events	→	Manageable Opportunities	→	Valuable Opportunities

Awareness   Focused Mitigation   Loss Management   Acceptance   Participation   Support

Create a National Wildfire 50-year Strategy

2020	2030	2040	2050	2060	2070
Unpredictable Disasters	Predictable Disasters	Predictable Events	Manageable Events	Manageable Opportunities	Valuable Opportunities
Awareness	Focused Mitigation	Loss Management	Good Fire Acceptance	Good Fire Participation	Wildfire Social Support
Large Loss **New $$** **New Strategy** **All Fire Bad**	**Community & Home Mitigation** **Fire Tech** **Insurance** **"New Fire Suppression"**	**Large Fire Footprints** **Watershed Restoration Good Fire** **Fire Eco Tech** **Land Use**	**Changed Fire Story** **Eco Value Financing** **Bad Fire/ Good fire at 50/50 %**	**Watershed Focus** **Good Fire Leads % Burned** **Communities at 75% mitigated**	**County level WF resilience at 75%** **Source Watersheds Protected** **Forest Comp changing**

2. Shift the fire story

Bad Fire

Good Fire

2020	2030	2040	2050	2060	2070
Unpredictable Disasters	Predictable Disasters	Predictable Events	Manageable Events	Manageable Opportunities	Valuable Opportunities
Awareness	Focused Mitigation	Loss Management	Acceptance	Participation	Support

3. Recalibrate Fire Suppression

All fire is managed fire – immediate suppression, beneficial, pfire, extended suppression, monitored suppression.

Every ignition receives the same analysis, same planning, same resource access rights.

Every acre of fire is calculated for its beneficial value in real time and shared to all.
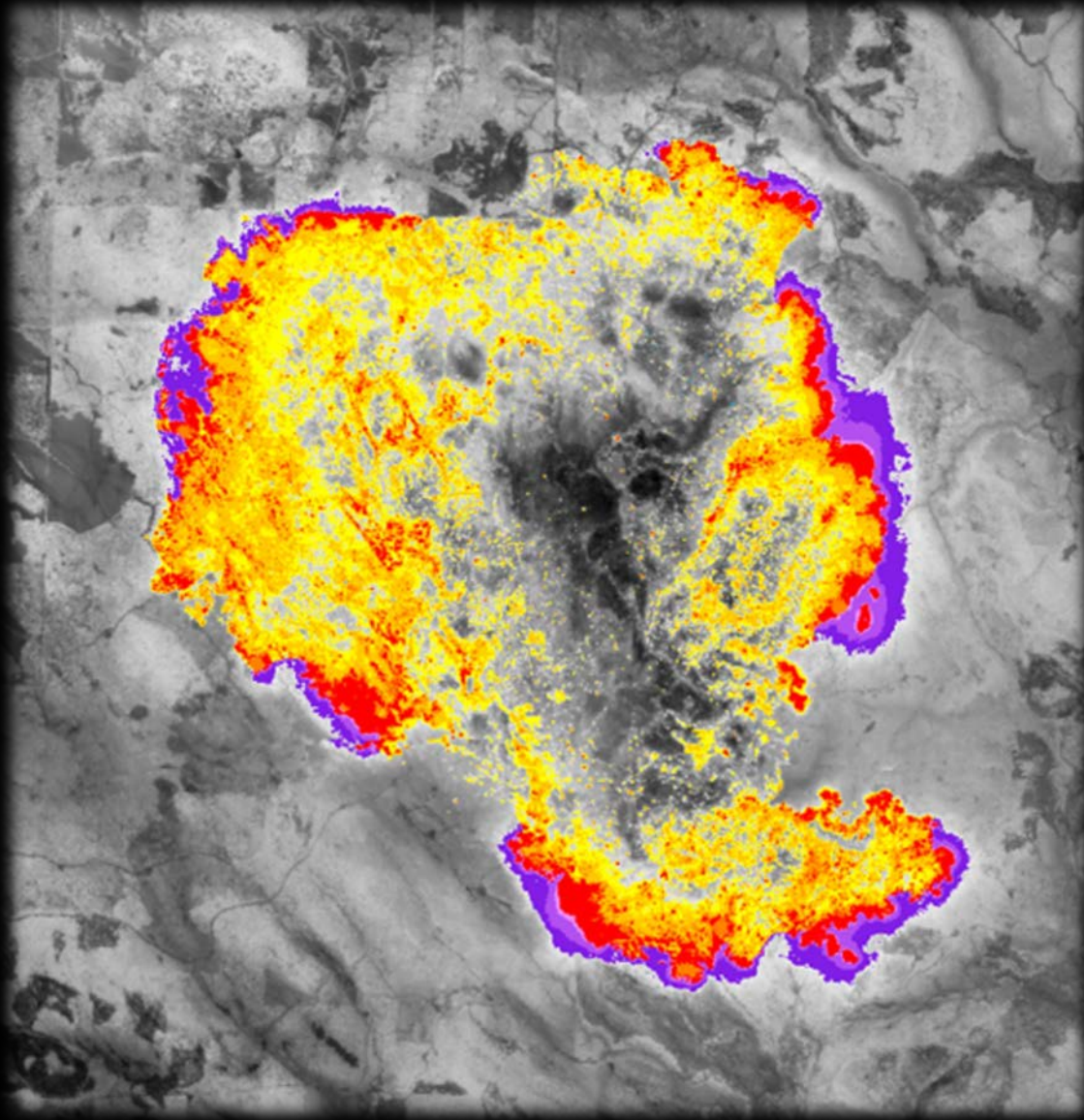
Make fire intensity the key driver

FIRESAT CONSTELLATION

A non-profit satellite system providing low-latency, high-resolution, broad coverage data to better inform wildfire fighting strategies, and better understand the impact wildfires have on carbon and climate.

Active Fire Data Product Types

Fire Detected
····················
Confidence: 4
Location: 37.4217, -122.094

Muon Space / SATMgmt LLC Proprietary Information
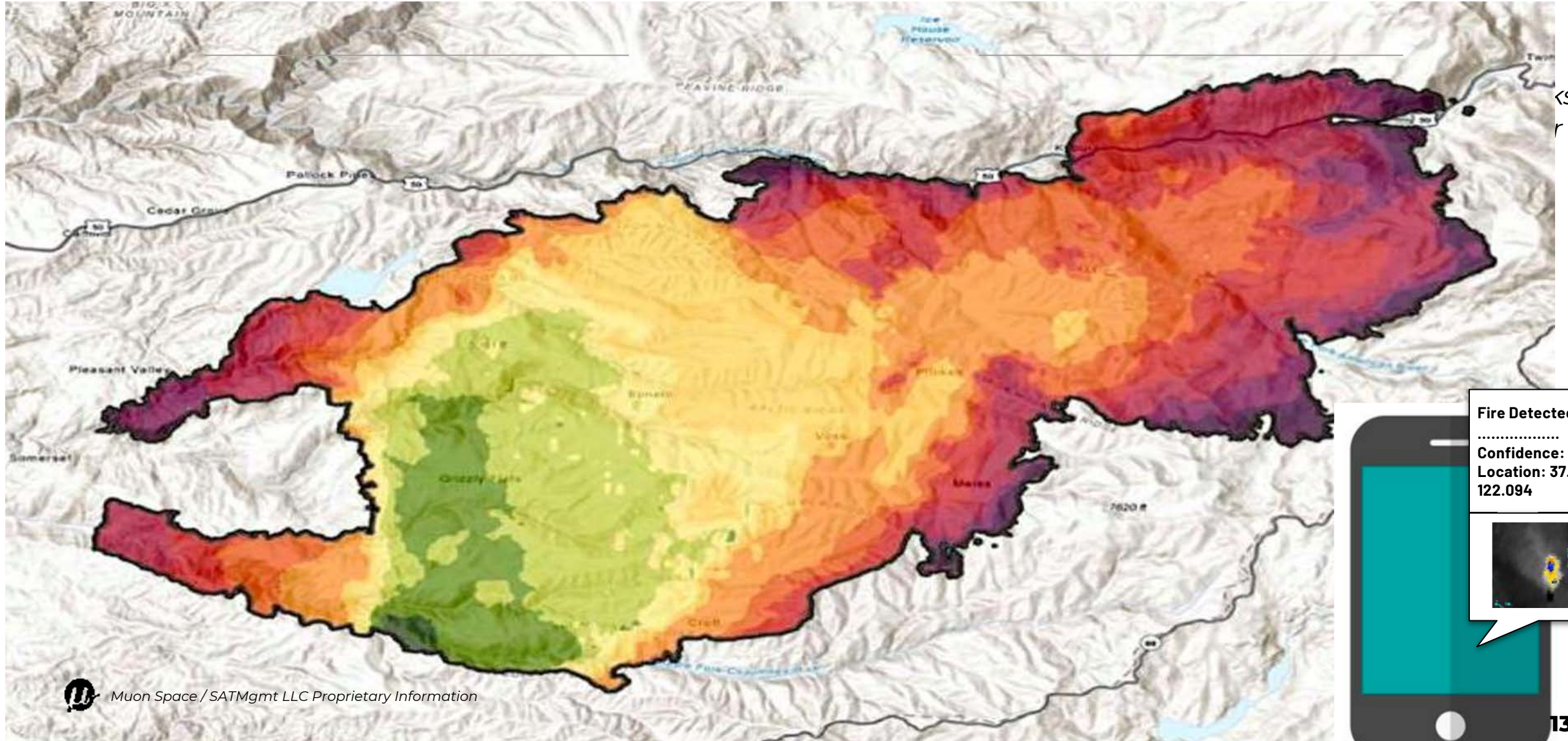
All about the heat

4. Focus on financial levers

The fastest way to change system tilt is to make something profitable.

- Link government incentives to good behavior for resilience actions
- Focus on water and carbon values
- Natural Capital and Ecosystem Service Payments
- Use Wall Street - water exchanges, commodities, carbon coin
- Reverse the improvement assumption for development on land

Thank you for your invitation.

Climate Change is a transformational global event.

Wildfire Strategies will only succeed if they are also transformational. Our current strategies will largely fail.

Have a clear and detailed 50-year plan

Shift the fire story

Recalibrate suppression

Focus on finance

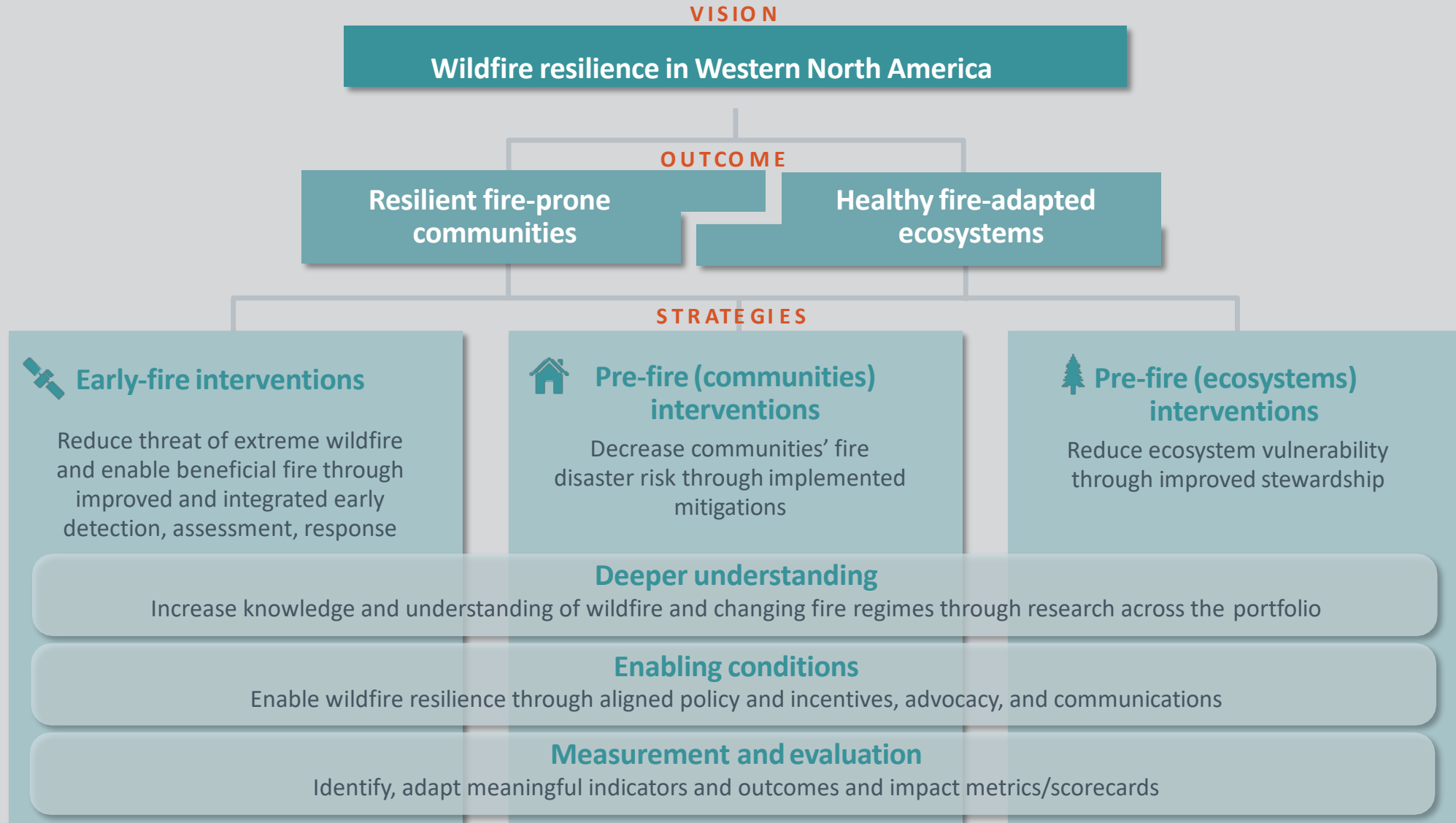# Wildfire Resilience Initiative

Kate Dargan Marquis

- Introductory Overview

Vision: wildfire resilience in Western North America, where beneficial fire is the dominant contributor to annual area burned by 2075.
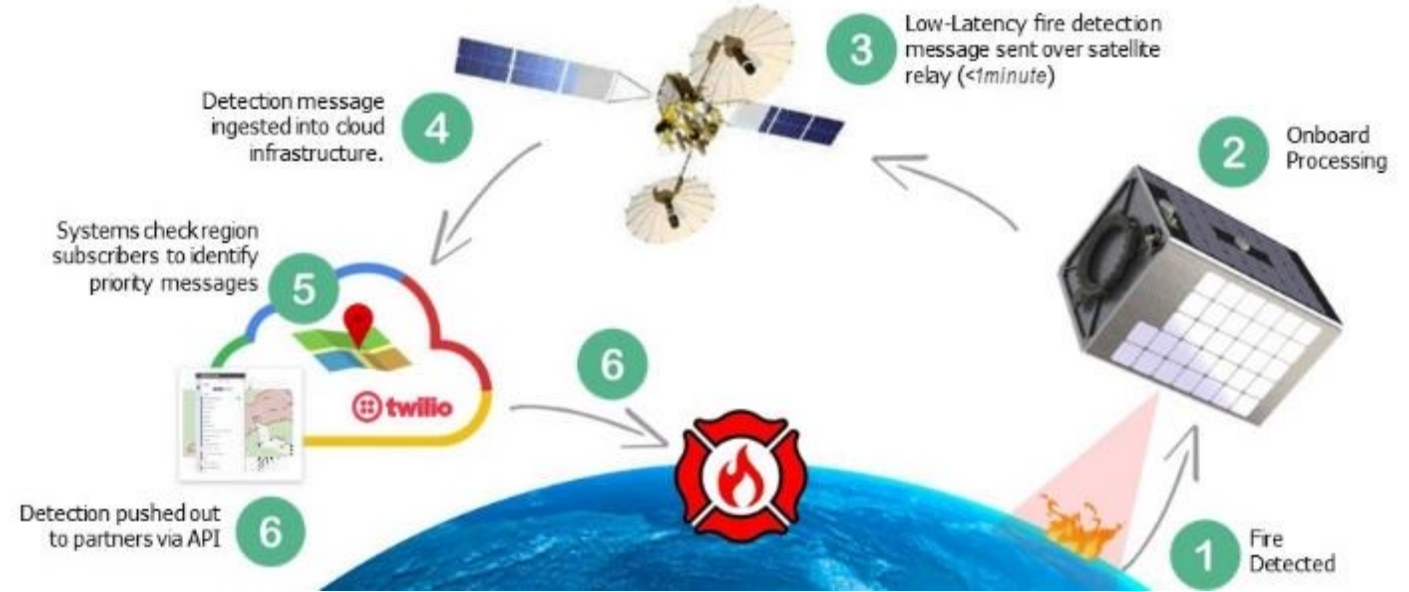
Strategy hierarchy

VISION

Wildfire resilience in Western North America

OUTCOME

Resilient fire-prone communities

Healthy fire-adapted ecosystems

STRATEGIES

Early-fire interventions

Reduce threat of extreme wildfire and enable beneficial fire through improved and integrated early detection, assessment, response

Pre-fire (communities) interventions

Decrease communities' fire disaster risk through implemented mitigations

Pre-fire (ecosystems) interventions

Reduce ecosystem vulnerability through improved stewardship

Deeper understanding

Increase knowledge and understanding of wildfire and changing fire regimes through research across the portfolio

Enabling conditions

Enable wildfire resilience through aligned policy and incentives, advocacy, and communications

Measurement and evaluation

Identify, adapt meaningful indicators and outcomes and impact metrics/scorecards

Early-fire interventions

Initiative vision, outcome, goals

GOALS

Early Fire Interventions - 100% of wildland fire (both beneficial and severe fire, based on science-informed data) ignitions and detections to be confirmed and transmitted to responders **within 15 minutes** in Western North America.
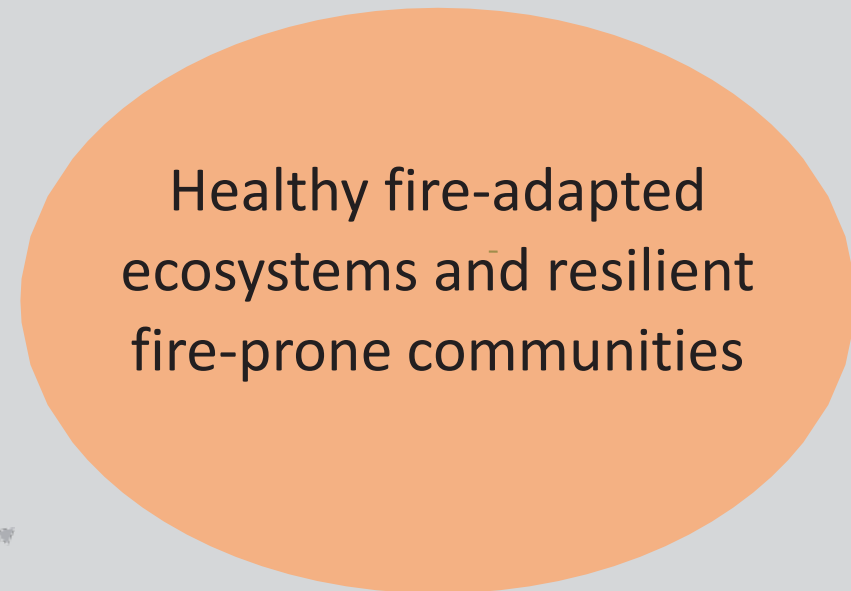
OUTCOME
2035

VISION
2075

Healthy fire-adapted ecosystems and resilient fire-prone communities

Wildfire resilience in Western North America, where beneficial fire is the dominant contributor to annual area burned

FIRESAT

A WILDFIRE-FIRST CONSTELLATION

A non-profit satellite system providing low-latency, high-resolution, broad coverage data to better inform wildfire fighting strategies, and better understand the impact wildfires have on carbon and climate.

July 12, 2023

BASELINE DESIGN

Accurately detect new fire starts, project fire growth, and understand fire impact through near-continuous monitoring of all regions with a constellation of 50+ Low-Earth Orbiting (LEO) satellites

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Better equip first responders with 10+ updates on fire progression during the critical first 2-hours, allowing for earlier containment

5 observations per hour

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- Average 80m resolution (appx 1 acre)
- Ability to detect hotspots 5-7m across

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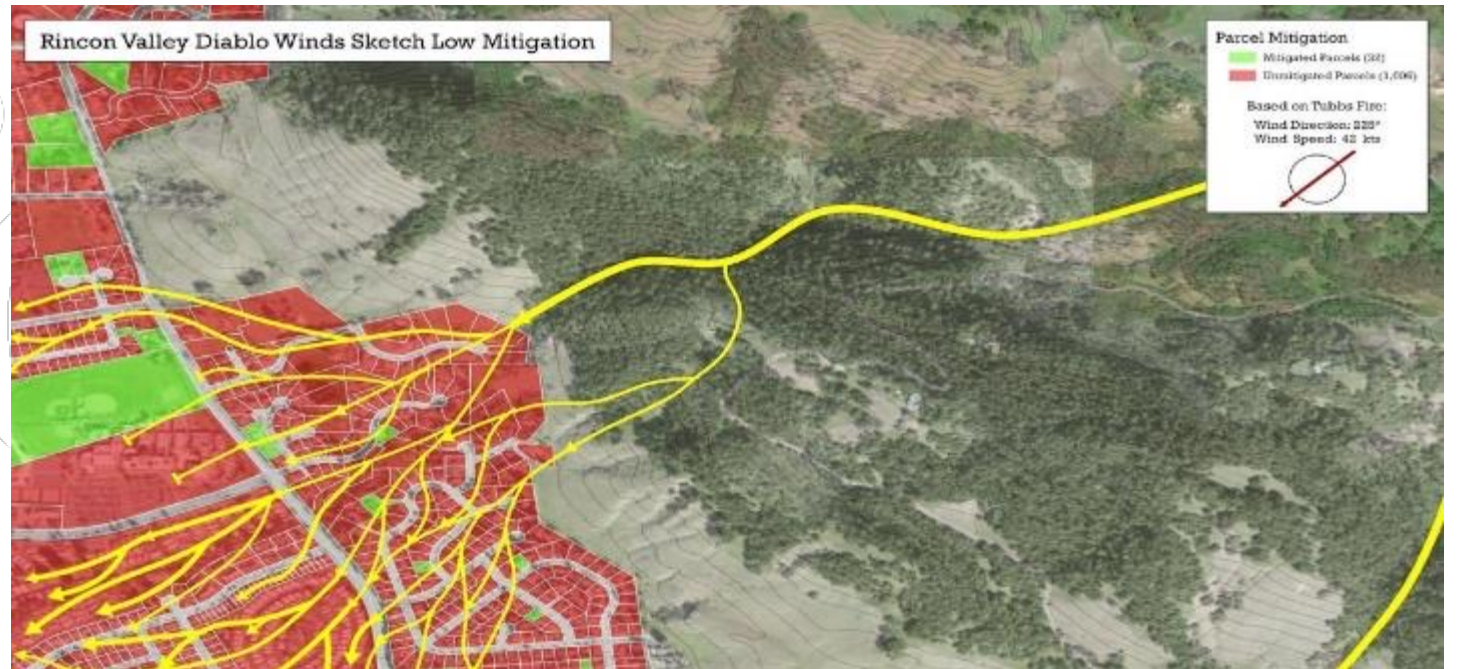- Ability to detect hotspots 5-7m across

Multi-spectral observations:
- see fires through smoke and clouds
- identify false positives to increase confidence for resources
- observe real-time intensity variations within a large fire
- Maintain continuous observation offire during day or night

Pre-fire (communities) interventions

Rincon Valley Diablo Winds Sketch Low Mitigation

Initiative vision, outcome, goals

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Pre-Fire Community Interventions - Property loss will have **stabilized** through risk mitigations sufficient to **disrupt fire pathways** and **structure-to-structure conflagration** in developed wildland-urban interface communities.
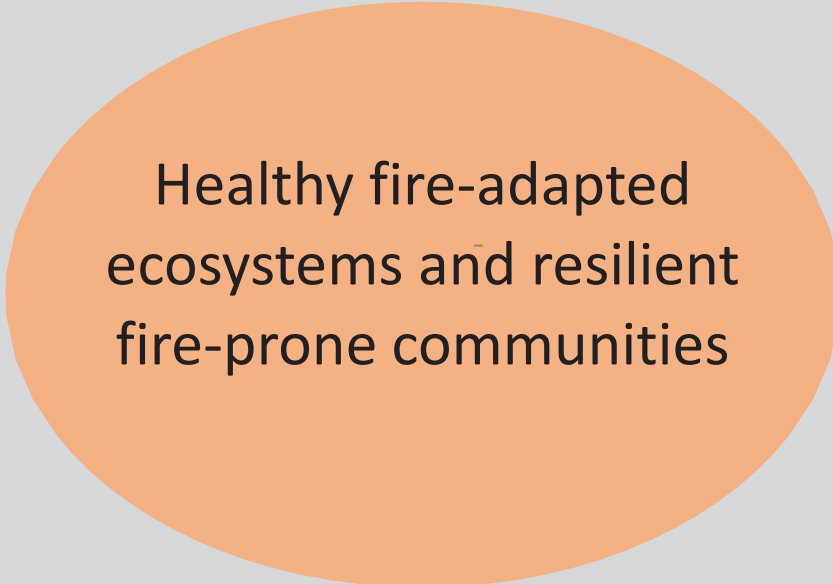
O U T C O M E
2035

VISION
2075

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Wildfire resilience in Western North America, where beneficial fire is the dominant contributor to annual area burned

Pre-fire (ecosystems) interventions

Initiative vision, outcome, goals

GORDON AND BETTY
MOORE
FOUNDATION

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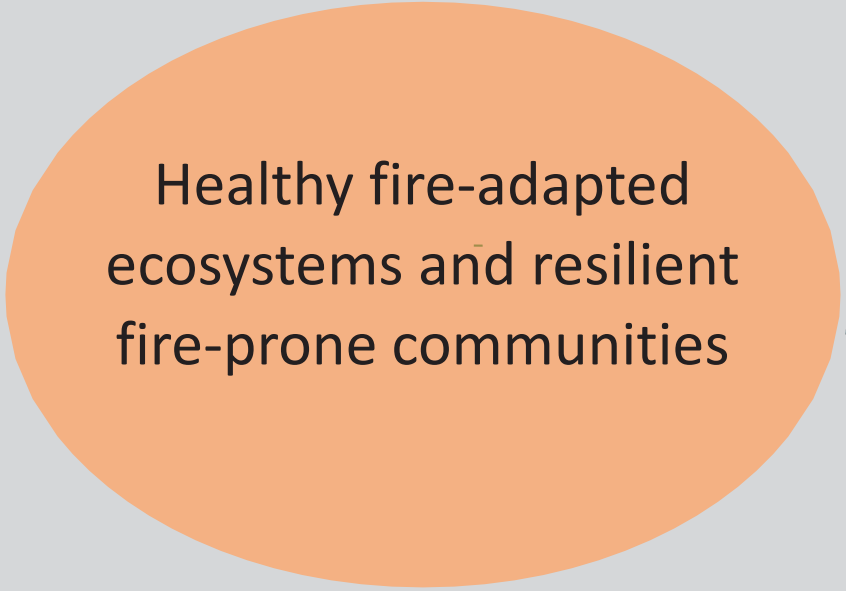
Pre-Fire Ecosystem Interventions - Annual acres burned at **low-to-moderate severity** will have **increased by 50%** in aggregate, and annual acres burned at **high severity have decreased by 10%** in aggregate.

OUTCOME
2035

VISION
2075

Healthy fire-adapted ecosystems and resilient fire-prone communities

Wildfire resilience in Western North America, where beneficial fire is the dominant contributor to annual area burned

Aligning Actors

Wildfire resilience in Western North America, where beneficial fire is the is the dominant contributor to annual area burned

Wildfire Resilience Community Mapping

Intermediate outcomes

GORDON AND BETTY MOORE FOUNDATION

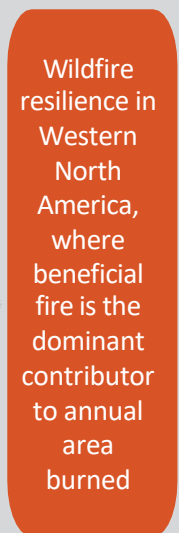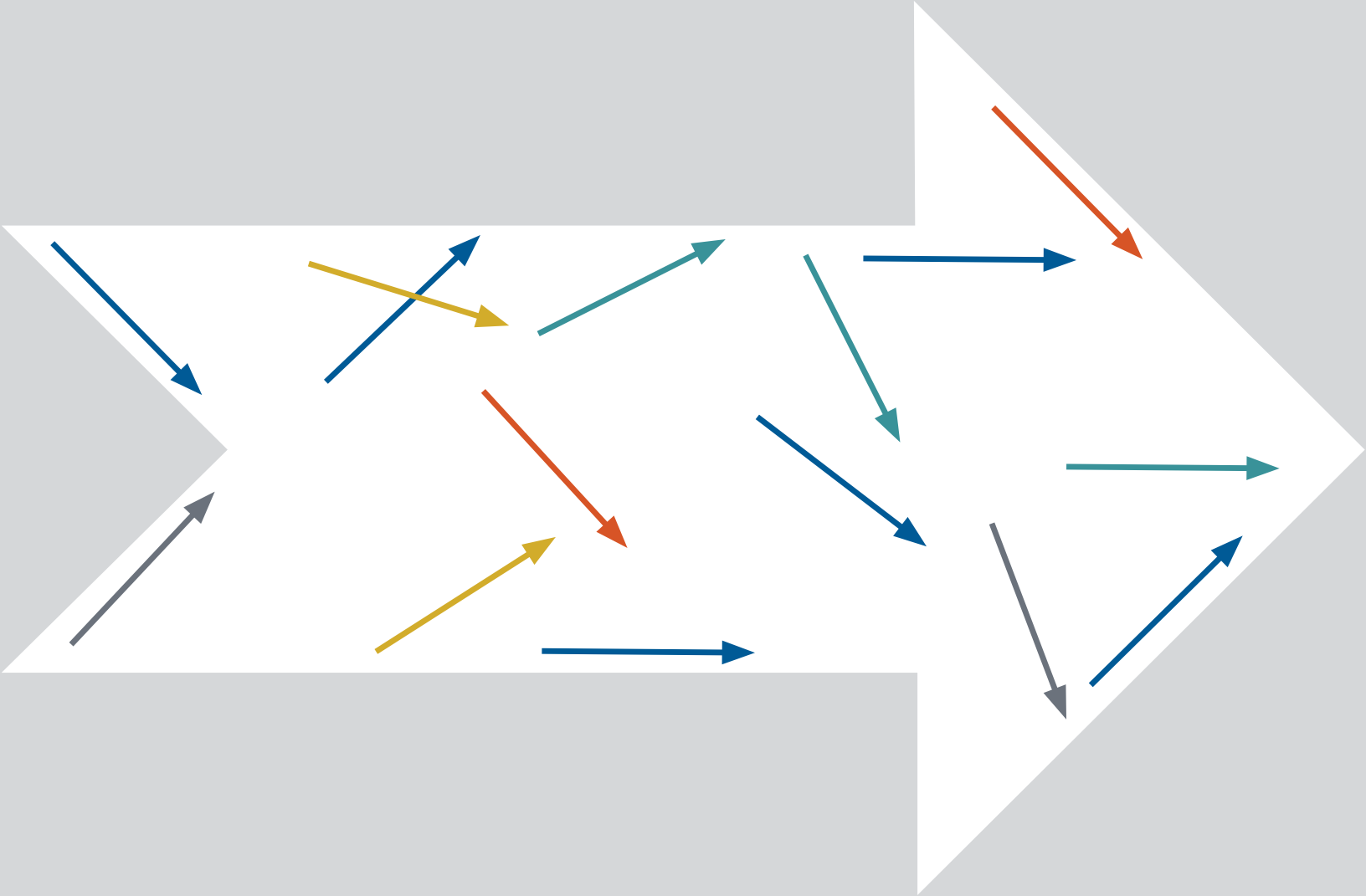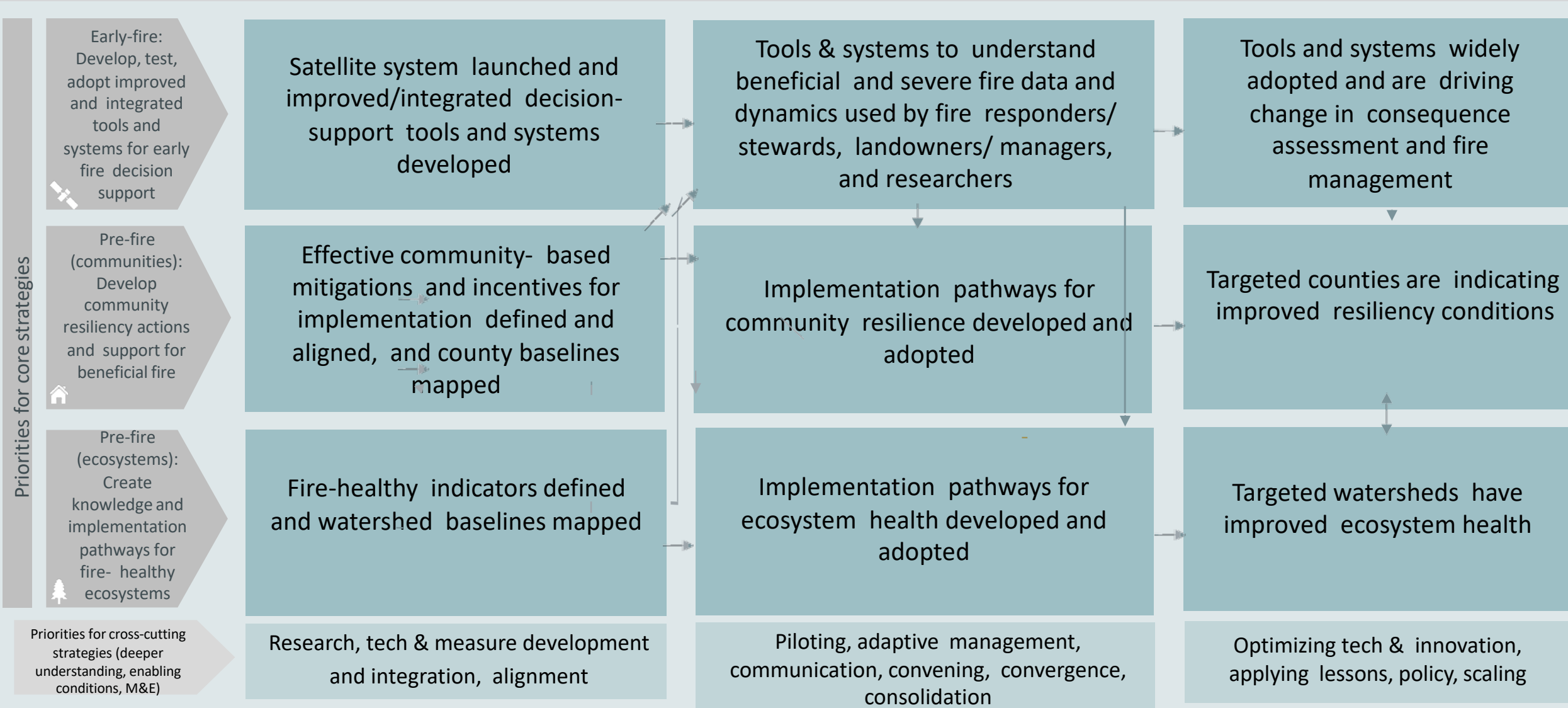**Priorities for core strategies**

Early-fire: Develop, test, adopt improved and integrated tools and systems for early fire decision support

Pre-fire (communities): Develop community resiliency actions and support for beneficial fire

Pre-fire (ecosystems): Create knowledge and implementation pathways for fire-healthy ecosystems

Priorities for cross-cutting strategies (deeper understanding, enabling conditions, M&E)

Satellite system launched and improved/integrated decision-support tools and systems developed	Tools & systems to understand beneficial and severe fire data and dynamics used by fire responders/ stewards, landowners/ managers, and researchers	Tools and systems widely adopted and are driving change in consequence assessment and fire management
Effective community-based mitigations and incentives for implementation defined and aligned, and county baselines mapped	Implementation pathways for community resilience developed and adopted	Targeted counties are indicating improved resiliency conditions
Fire-healthy indicators defined and watershed baselines mapped	Implementation pathways for ecosystem health developed and adopted	Targeted watersheds have improved ecosystem health
Research, tech & measure development and integration, alignment	Piloting, adaptive management, communication, convening, convergence, consolidation	Optimizing tech & innovation, applying lessons, policy, scaling

Leadership: Strategic leadership and engagement of actors (funders, agencies, private sector) into an effective Action Plan.

Continuum of change
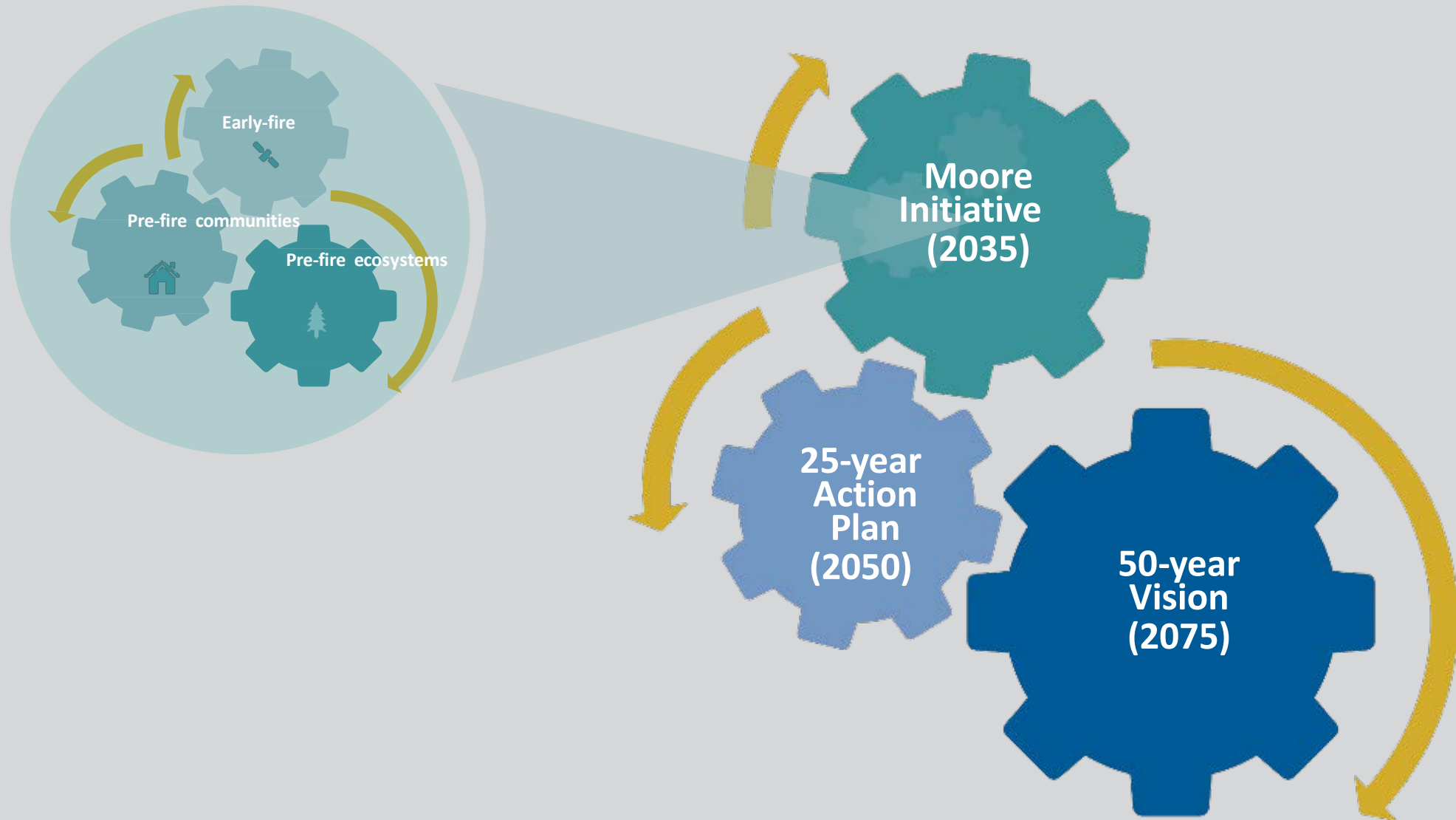
Thank you   ~   Wildfire Resilience Initiative Team   ~   Gordon and Betty Moore Foundation