Tending the Living Forest: A Conversation for California

THE FIRES NEXT TIME

A Public Art Installation

LIVING FORESTS

CENTER FOR THE STUDY OF THE FORCE MAJEURE

UNIVERSITY OF CALIFORNIA SANTA CRUZ

hubX


7,571
FIRES REPORTED BY CALFIRE IN 2018
WILDFIRES RAVAGED 1.8 MILLION ACRES IN CALIFORNIA.
If we continue the way we're going, all 32 million fire endangered acres in California will burn in the next 20 years. Catastrophic Fire presents both a crisis and an opportunity to change our narrative about what a healthy forest is and looks like.

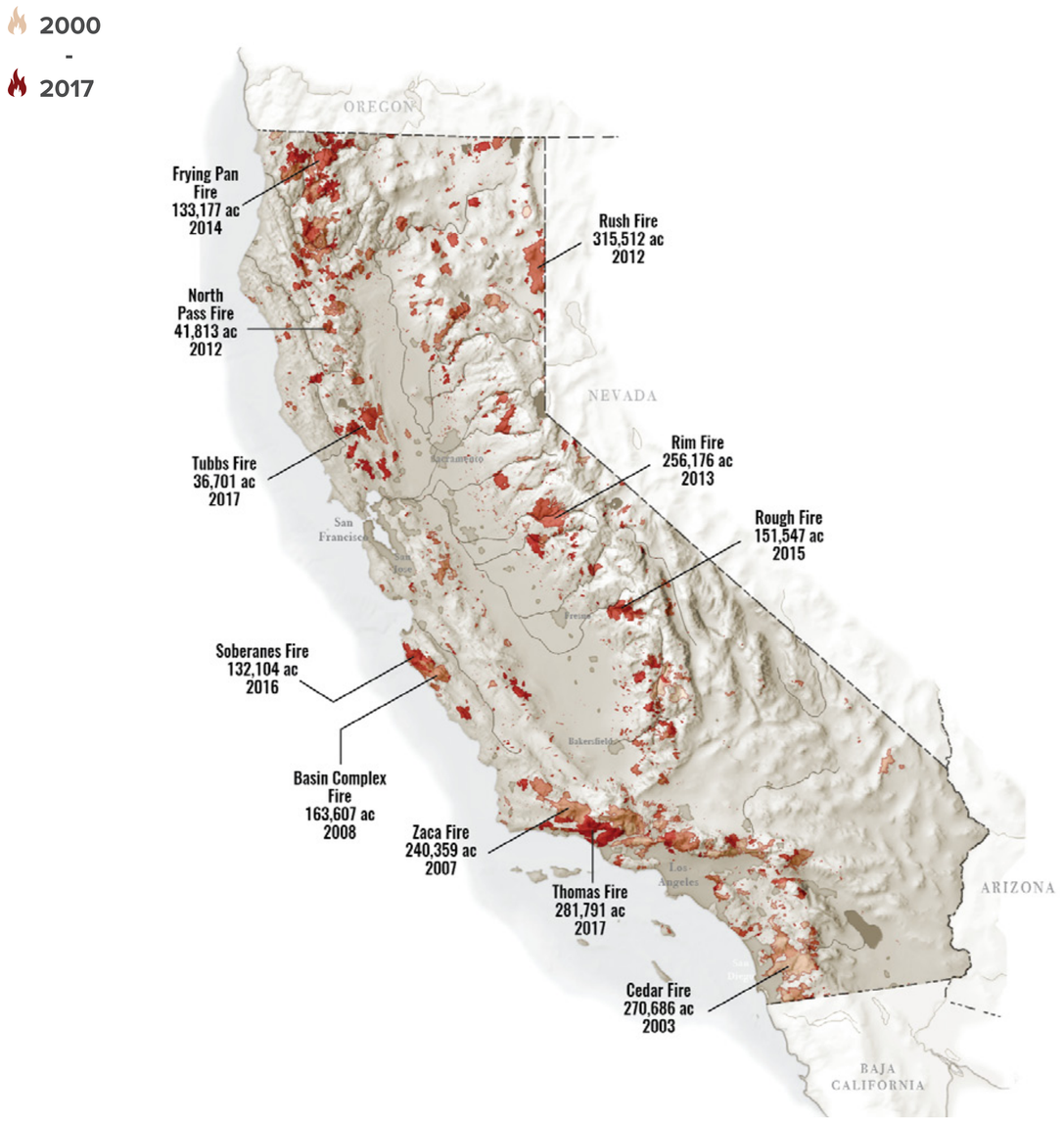
BRINGING FIRES TO LIFE

Fire can either destroy or benefit western forests. Understanding what kind of fire benefits people, wildlife, and forests is key.

The rise in catastrophic fires caused by climate stress presents an unparalleled opportunity for changing our dialog with natural systems. For the past 150 years we have been managing our forests in ways that don't match the environmental conditions under which they have developed and thrived. Climate stress is only making that mismatch worse.

It's a complex issue; at the same time the science is increasingly well understood. We need to find ways to help the general public understand it quickly, meaningfully, and in a way that makes people want to get involved and engaged with solutions.

The costs of doing nothing are enormous. The 2018 Camp Fire alone generated over $13 billion dollars in claims. The benefits of doing it right will yield tremendous results: fewer damaging fires, less erosion, improved air and water quality and public health benefits we're just beginning to understand.



FORESTS ARE DYNAMIC

We need a new awareness about fire, wilderness, and how to rebuild healthy regenerative forests

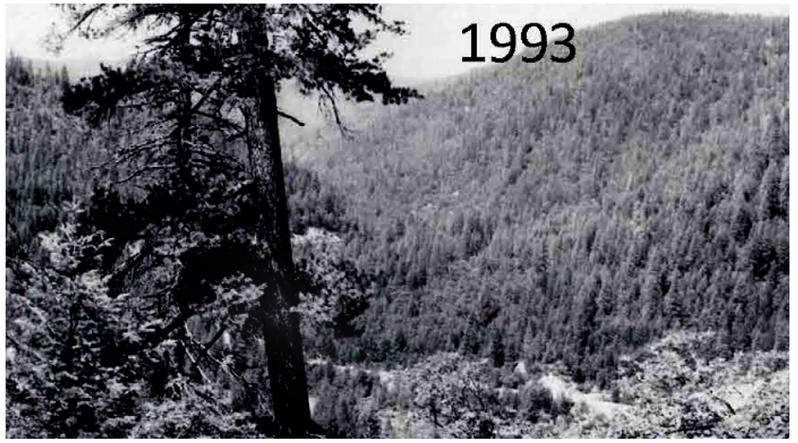
Without a different approach, California's forests will continue to burn. The forests that we see today look nothing like the forests of over a century ago. Thankfully, panoramic photos were taken at the turn of the last century from thousands of western mountaintop lookouts, and they show a fair approximation of the forest that we inherited. The best word to describe these forests of old is "patchy."

Unlike today's wildfires, past fires tended to benefit the forest *"...The way the forest grew shaped the way fire behaved on the landscape... Once a patch of forest burned, it helped to prevent the flow of fire across the landscape. A way to think about it is, the burned patches helped the rest of the forest to be forest."*

- Paul Hessburg, TED X Talk Bend, OR, 2017

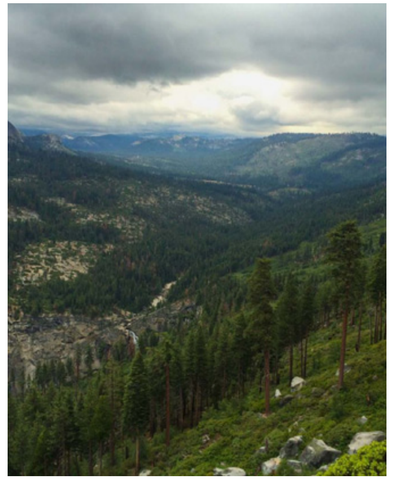
It's important to understand that this landscape was open, with meadows and open canopy forests, and it was the grasses of the meadows and the understories of the open forest that many of the fires were carried.

Yosemite Valley from Columbia Pt. 1899. Credit: Robert Gibbens, H.G Peabody



Yosemite Valley from Columbia Pt. 1961 / inset 1994. Credit: Robert Gibbens and Lloyd Davis.

Above: Open meadows occupy much of the valley floor. By the 1860s, native peoples had largely been forcefully vacated from the valley, and by 1899 (date of this photo), young conifers can be seen encroaching in drier sites. Stands of mature Black Oak and large confers are scattered across the landscape.
Above: A transition towards taller and denser stands of ponderosa pine and incense cedar has occurred. Woody plants are beginning to cover much of the wetter sites on the valley floor.
Below: The Illouette Valley, a 40-year experiment to allow fire rather than suppressing it results in a forest more resilient to fire and stress.



Both photos: Examples of 'patchy' forest in the Illouette Valley at Yosemite National Park, 2017, Photo Credit: John Hester

CATASTROPHIC FIRE IS A OPPORTUNITY TO CHANGE OUR NARRATIVE ABOUT WHAT A HEALTHY FOREST IS.

We think of forests as unbroken canopies of green. Surprisingly that idealized vision does not apply very well to western fire adapted forests. We need a broader understanding in the public at large of what a western forest looks like and what has to change to get us there.

We've designed this installation to get people emotionally connected, not just intellectually informed. Our goal is to get the public to buy into a more ecological vision and share it so we create an audience of advocates.

THE FIRES NEXT TIME EXPERIENCE

Giving citizens a deeper understanding of a complex issue

A hands-on interactive experience that brings to life the differences between where we are today and where we need to move to bring our forests back into balance. The experience will give participants a chance to see the difference and make a difference. This installation is designed to be engaging, exciting, and informative. It's built to attract a large audience and give them practical solutions to a seemingly intractable problem.

SIERRA MIXED CONIFER FOREST

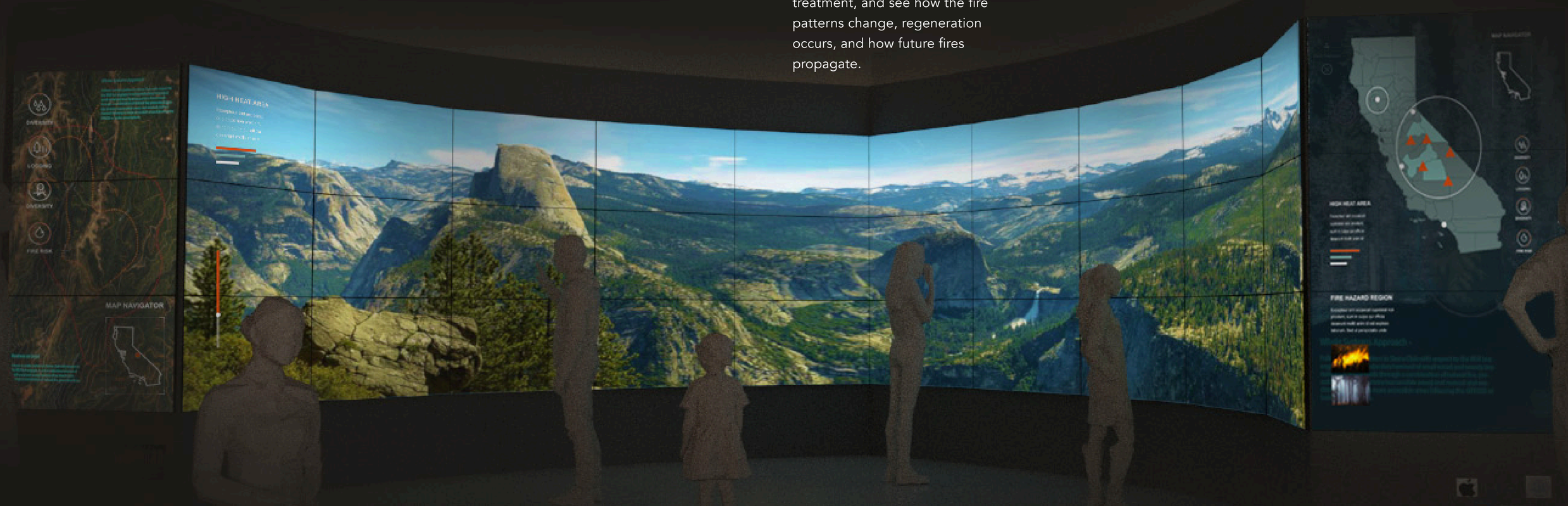
This forest type is adapted to frequent low intensity fires. We will show how fires interact in three forest structures: surface, ladder, and canopy. Users will be able to see a current landscape catch fire and then select an alternative scenario of that same landscape after ecologically informed treatment, and see how the fire patterns change, regeneration occurs, and how future fires propagate.

FOOTHILLS AND RANGELAND

Participants can select a model that focuses on the tens of millions of acres of rangeland, chaparral, gray pine, and oak woodland that are also at annual risk of burning, see how strategies here may differ from the higher elevation Sierra Mixed Conifer areas.

WILDLAND URBAN INTERFACE

We will give a focus to the built environment, especially housing and communities in the Wildland Urban Interface, and visualize various fire hardening regimes and how they might affect fire outcomes in those regions.



DIFFERENT MODELS DIFFERENT OUTCOMES

Engaging with your future

In addition to simulating the experience of what fire looks like in different geographies, we will also build into the model simulations of impacts from different treatments over time. Users can select different treatment patterns and see the predicted impacts on soil and atmospheric carbon, habitat, soil moisture, resilience to wildfire, and other key environmental measures.

We will model multiple treatment scenarios to visualize the carbon, water, habitat, and other key impacts arising from very different fire management schemes:

Simulation scales for Community Center, Library, Class Room, or Community Center

BUSINESS AS USUAL

Current practice: limited fuels treatment on public land, limited private land treatment in the wildland urban interface, primarily focused on suppressing fires after they start, but with some fire break, prescribed burn, and other prevention techniques. Overall forest biomass untreated except by fire and disease. This is our control scenario.

LET THE WILDLANDS BURN

A hands-off approach to fire, although a focus remains on protecting housing and built environment in the wildland-urban interface, including community fire treatments. Let it burn policy for all federal and state lands with limited prescribed fire or fire suppression. Keep current private land management controls in place. Assumes fires and biomass will balance out over time.

TRADITIONAL FOREST MANAGEMENT

Major increase in salvage timbering to remove standing dead trees along with scaling up traditional logging operations (with some mitigation for environmentally sensitive areas). A scaling up of biomass removal for power, cogen, biochar, and other large scale uses.

HYBRID OR WHOLE SYSTEMS APPROACH

Protects the wildland urban interface but engages in active reduction/removal of smaller trees and woody biomass from forestlands through a combination of natural fire (in less accessible areas) and prescribed burning, and manual and mechanical thinning in more accessible areas to move toward the patchy forests of old.

ONE ENGINE, MANY SPACES

The program interface and the resources adapt to various environments to maximize impact with multiple audiences.

LIBRARIES/COMMUNITY SPACES

Addressing public concerns in a community settings such as a library, community centers or related public spaces through interactive displays, access to engaging research materials and online simulations.

IN CLASSROOMS/ON-LINE

Adding curriculum guides to the materials used in libraries produces and exciting way to teach the principles and advantages of sound land and fire management.

SCIENCE MUSEUMS

The interactive, online and research materials will also produce exciting museum experiences.

LARGE PUBLIC SPACES

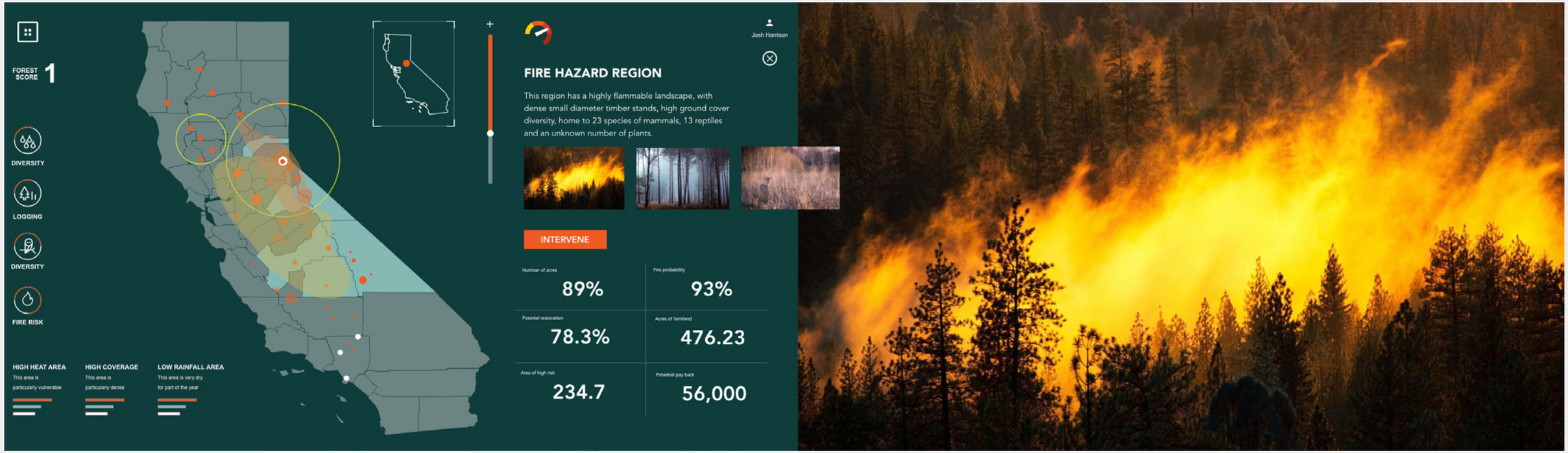
Key components of the interactive display can provide a memorable public information experience in large venues such as Airports and malls. In this way the program also reaches the general public.

ONLINE GAME OVERVIEW

The heart of the Fires Next Time will be a interactive game-based simulation:

Players can go through 4 views, which represent levels of accomplishment: Opening View; Strategist View; Planner View; Expert View.

These views represent the degree of complexity of the system with which the play is interacting.
They are represented as expanding areas of complexity, not linear levels.



OPENING VIEW

The beginning of the simulation game uses archival materials to take players through an actual land management case that has led to a catastrophic wildfire in recent years. Players can then experiment by changing a few key land management practices, such as using managed burns instead of a no-fire policy, to see how that could change the probability of the catastrophic fire that actually occurred.

STRATEGIST VIEW

Now the player is ready to go more deeply into the variety of issues that go into land management strategy and the wide range of outcomes that rely on those strategies. Players pick the type of environment they want to manage – Sierra mixed conifer forests, foothills and rangeland or wildland/urban interface – and run simulations to see the different outcomes that different management strategies produce. Players at this level also have access to an online research library that they can use to inform their simulation strategies.

PLANNER VIEW

This view provides a more detailed map and environmental information – for example tree species locations and aquifer maps – so that players can now decide, not only what overall strategies to use, but also where to implement those strategies. For example, players now choose exactly where to conduct controlled burns and how often, what specific trees to log and where to allow building developments. Now the resource library is even more extensive, and detailed outcome data can be seen in various formats.

EXPERT VIEW

Having mastered the Planner level, players now try their hands at the most challenging environments, where past policy mistakes lead to difficult decisions. Here, players use the same screen format and types of information as they did in the Planner level, but with these most challenging cases.

COMMUNITY & PUBLIC PARTICIPATION

We provide tools for people to participate, and add their own stories to the experience.

TAKING IT WITH YOU

When used as a public display in community spaces, museums or large public spaces, visitors can take elements of the exhibition home or distribute them via social media on smart phones and other devices.

I WANT TO KNOW MORE

Via a QR code, or similar technology, participants can access a range of deeper support materials on fire, California ecology, wood utilization, and other relevant issues. These would include TED Talks and other videos by citizens and experts, links to studies, books, and links to other peoples stories. In-depth treatment of new ways to use wood including mass timber, biochar, fibers, and more.

FIRESTORY CORPS

Kiosk that allows people to share their own fire experiences. This could be staffed or self managed, and would also include a way to upload photos or videos to a curated website.

WHAT I CAN DO

Individuals, community leaders, and policy makers alike can find links to organizations that are working in a range of issues. We can also include social media tools to help people self-organize as well as contact appropriate state, federal, and local offices.

Installation scales for use in school class room or campus facility

Visualization of fire moving up a hillside

AUDIENCE & SCALE

A public art experience & a sophisticated educational tool for schools and institutions

INTENSITY OF EXPERIENCE

We've built a platform that scales to engage the general public, policy professionals, and secondary / college students. To reach the widest and most general audience, the exhibit can be tailored to airports or shopping malls. In 2018, SFO alone experienced 57 million visitors. In these settings, this exhibit has the ability to capture many thousands, if not millions. As the focus goes to institutions such as libraries, community centers, or similar public spaces, the opportunities to engage in a deeper more sophisticated experience arise.

Finally, as a school based educational tool, The Fires Next Time can support a full curriculum on forest and fire ecology, potentially in a fully gamified format for middle and high schools and a less structured research experience for college and graduate work.

BREADTH OF DELIVERY

Our digital partner and platform developer, Underground Engine, has established a record of translating sophisticated environmental concepts into interactive experiences for the classroom and the public. They are currently developing interactive programming for the Institute for the Study of Ecological and Evolutionary Climate Impacts (ISEECI), the University of California's multi-campus consortium. ISEECI leverages the UC Natural Reserve System as a biologically and geographically diverse laboratory to study the effects of climate change on California ecosystems.

We are not apart from nature; we are a part of nature. This is a central contradiction of modern life. Our challenge as humans, activists and artists is to bring us back into the system of which we are only a part.

The **Living Forests Project** is an initiative of the Center for the Study of the Force Majeure. Living Forests™ was founded in 2015 in partnership with the Sagehen Creek Forest Research Station to support a whole systems approach to the crisis of fire and drought in California and the Intermountain West. Living Forests was awarded Wood Innovations Grant by the US Forest Service in 2017 to create a Wood Utilization Team (WUT) for the Central Sierra and Western Nevada to develop a detailed landscape survey of over 300,000 acres.

We are completing a feasibility study on alternative uses of small diameter trees and other woody biomass that must be removed from much of California's forests in order to replace high-intensity wildfire with necessary (and much less destructive) low-intensity fire which California forests are historically adapted.

The Center for the Study of the Force Majeure, based at the University of California, Santa Cruz, brings together artists, scientists, engineers, planners, and visionaries to design mitigation systems and policies that respond to the issues raised by global temperature rise at the scale that they present.

HubX is a learning lab led by Emmy Award winning interactive and digital designers working at the intersection of technology, science, art, and education. HubX offers hands-on workshops using new and immersive technology like camera and sensor based Interactive Media (VR/AR), Simulation & Sim Art, Audio & Video, 3-D Printing, and much more. It is a registered non-profit 501(c)(3) charitable organization.

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