

Imagining the Future of Science in America

Scenarios for 2020-2022
to spark conversation

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Project Background

In early 2020, Intertidal Agency began a project to understand the challenges and opportunities facing groups supporting scientists, scientific research, and science-based policy in the US. We found a broad interest in creating new narratives about the role of science in society. **In the next decade, who gets to do science, where and how is science done, and what purpose does science serve?**

Our initial interviews fell in the early days of the COVID-19 pandemic and our discussions continued through a spring of Black Lives Matter protests, rising death rates, and growing unemployment. These questions about science's role in society grew all the more relevant in the turbulent and uncertain landscape of 2020.

To advance this conversation, we created this framework of four scenarios designed specifically for talking about the future of science in the US. The scenarios draw on ideas identified by the group as well as research on driving forces and key uncertainties from other scenario planners.

The scenarios are scoped for two years: August 2020-August 2022. This timeframe felt long enough to play out some second and third order effects from current crises, but going beyond it felt too speculative. We hope these scenarios will provide a space to test out current plans, and to envision desired futures for science in the US and how those futures might emerge from (or withstand) the winds of change ahead.

We are grateful for the contributions of all the interviewees and scenario design session participants for their insights and help creating these materials, and for the support of The David and Lucile Packard Foundation. Errors and assumptions are the authors' own.

How to use this deck

Scenario planning is a tool to explore possible futures and how you and your team might respond to them. Scenarios can be used to refine strategies, identify new partners, and challenge your assumptions about what might happen. They're best used as a foil for thinking about where you are now and where you might go, rather than as a forecast. The scenarios themselves might be inaccurate, but the ideas you generate while working through them (either on your own or with colleagues) may be useful whatever comes next.

This deck will walk you through the scenarios we created with input from our science participants. We used a traditional 2x2 scenario matrix, framed by axes illustrating key uncertainties and driving forces.

For each scenario, we provide the **basic assumptions** that go with each axis, describe **conditions at the national level**, and offer a **fictional account of this future**, from the perspective of someone connected to the world of science. These different entry points are intended to spark your imagination in different ways. Pick the entry point(s) that work for you.

We invite you to make these scenarios your own. Do 'just enough' digging in. You're not trying to get everything 'right.' You don't have to think through every possible outcome in a scenario or answer every prompt. Pick a few things key to your work/life and see how they might play out.

As real world conditions change, scenarios have a limited shelf life. The process of scenario thinking — of stretching your mindsets and gaining comfort with uncertainty — is ultimately the most valuable product. We've included resources in the [Appendix](#) if you want to run your own scenario process.

Where you're starting from

Before we dive deeper into the future scenarios, take a few minutes to think about where you're starting from now. This can be your personal starting point or that of your institution, team, or organization.

Mission

Do I have a mission statement for what I/we work on and why? What core values guide my/our choices?

Desired state

What future vision am I working towards? What are some qualities of that future world?

Theory of Change

What are some assumptions I/we hold about how the world works and what actions lead to what outcomes?

Come back to this slide as you work through the scenarios to see how your values and assumptions might be tested in each one, and to reflect on how you might pursue your goals in any scenario.

Key Uncertainties & Driving Forces

We asked participants to brainstorm issues that:

- Were largely outside of their immediate control
- Were having or had the potential to have significant impact on the context in which they or their organizations operate, and/or
- Had important but highly uncertain outcomes

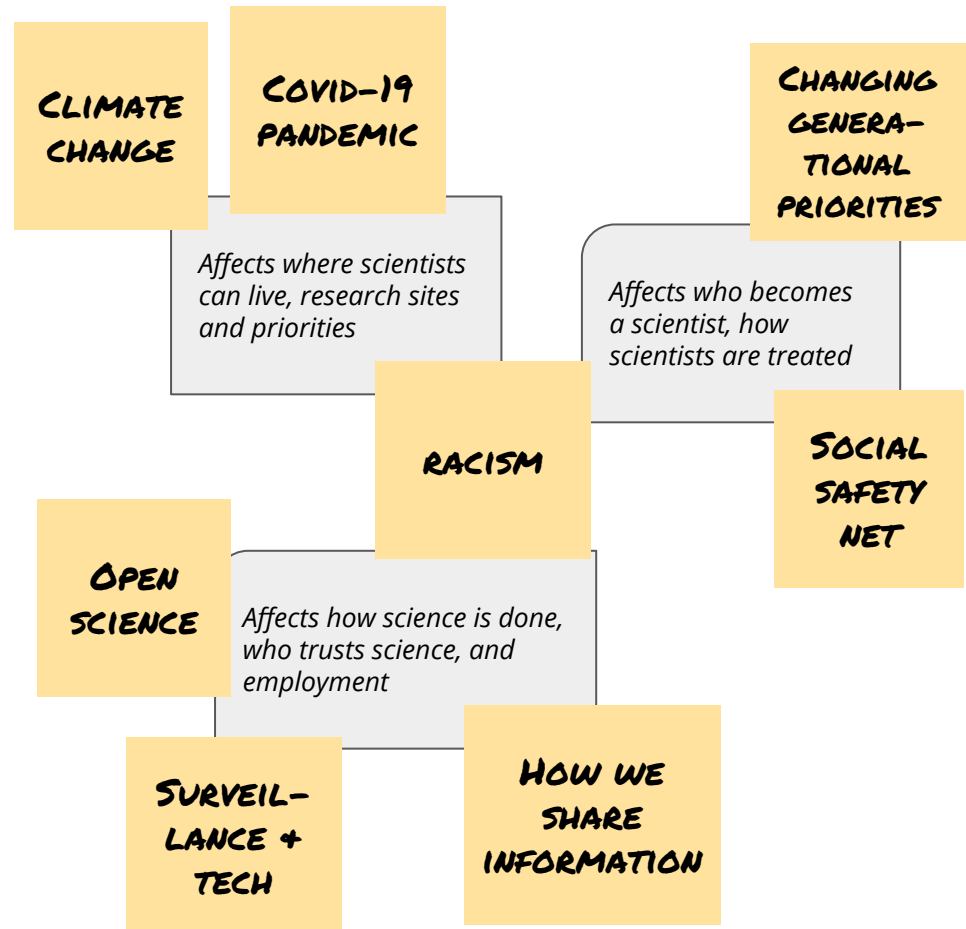
The direct impacts of COVID-19, and society's response to the pandemic, were the biggest drivers affecting all others. We reviewed projections of how the virus could play out in the US over the next two years and used that information to craft axes integrating four other key forces:

Government leadership

Inequity & inequality

The economy

Public trust in science



EXAMPLES FROM OUR BRAINSTORMING

Axis 1: Leadership

Key aspects:

How unified is it (at a national level, within or across states, or not at all)?

How is unity expressed (words, policies, actions)?

How do leaders use science? *For this project, unified leadership that ignored or attacked science was treated as functionally the same as fragmented, polarised leadership.*



Unifying science-driven US leadership

There's a clear direction in the US and federal officials (and/or networks of states) are leading with words and policy.

Fragmented, polarised US leadership

There are strong states and weak states, some aligned with federal policies and some ignoring or attacking them. Misinformation undermines collective action.

Axis 2: Economic Recovery

Within our relatively short time frame (Summer 2020 - Summer 2022) we did not see signals or forecasts that the US economy would recover rapidly. Assuming slow or no recovery, we chose an axis that explored degrees of change and distributional impacts.

Key aspects:

Wealth concentration & inequity

Size and source of available funding, e.g. philanthropic or corporate investments versus government funds



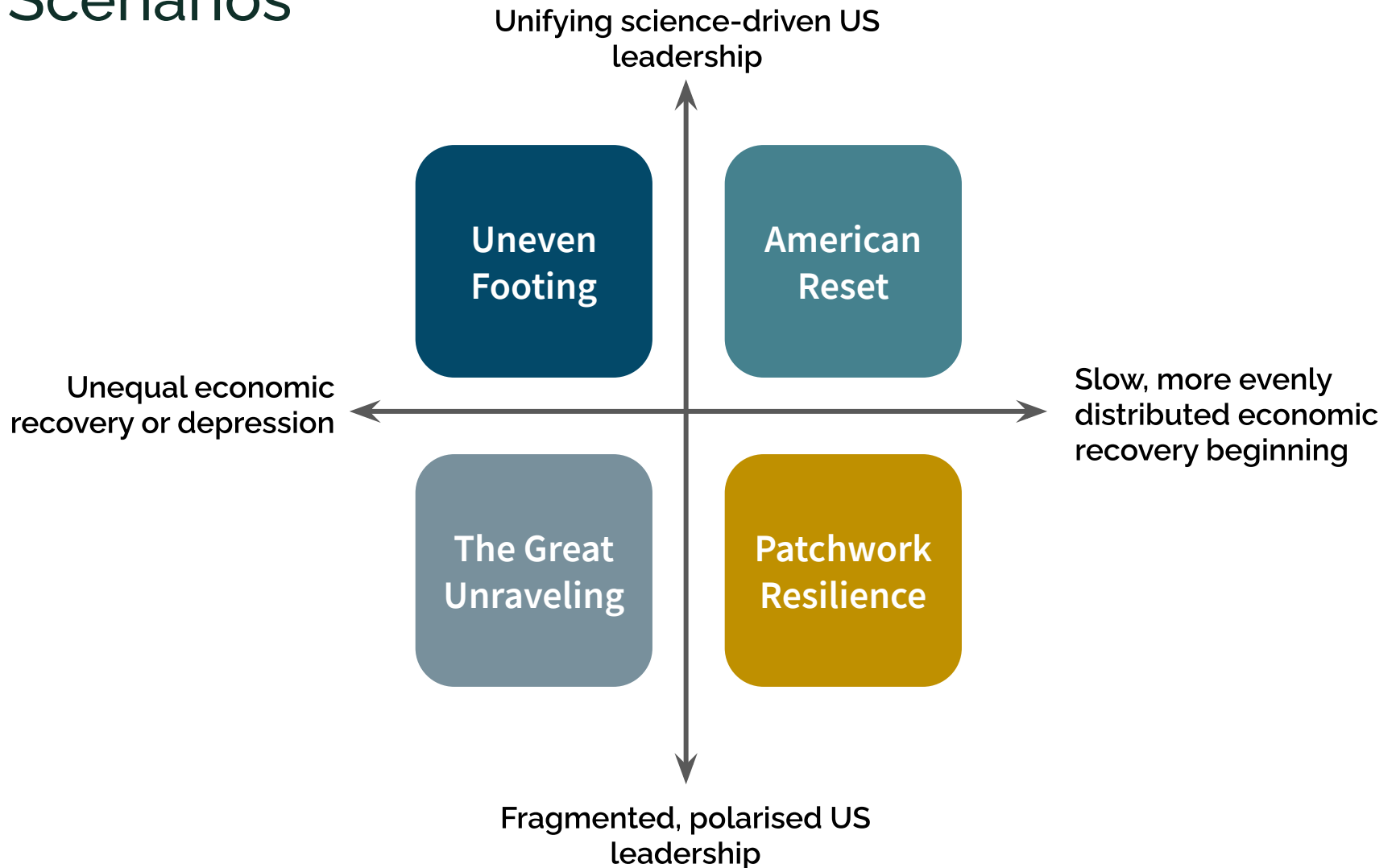
Unequal economic recovery or depression

Oligarchy, large corporations endure and gain power, concentrated private wealth, public funding scarce

Slow, more evenly distributed economic recovery beginning

Public funding stabilizes (federal and/or state) with some investments and policies specifically targeting low-income communities and small businesses

The Four Scenarios



Uneven Footing

BASIC ASSUMPTIONS

- Unifying science-driven US leadership**
- High trust in science, able to push back on some misinformation
 - Some nationwide initiatives



Unequal economic recovery or depression

- High unemployment, stratified by race, class, job type (e.g. low wage essential workers and well paid work-from-home jobs survive)
- High income inequality
- Low public funding, in federal, state and local budgets

Slow, more evenly distributed economic recovery beginning

Fragmented, polarised US leadership

Uneven Footing

SCENARIO DESCRIPTION

Unemployment remains above 10% nationwide, although the effects differ widely by job type and location. Essential workers and those who could work from home kept their paychecks, but the **loss of ⅓ of small businesses** left 20 million people looking for work. Some of the unemployed are doing unpaid family care or home-schooling kids. Others went back to school themselves. Frustration and free time fuel continued protests.

State budget deficits, closed athletic programs, and backlash against the **reopening failures of late 2020 shutter and shrink state universities**, except for those lucky enough to get angel alumni gifts. Community colleges and some well-endowed private schools pivot better to online and hybrid instruction.

There are fewer professor or postdoc positions available, and remote teaching skills are prized over research (unless you're running a COVID-19 lab or a podded-up field station).

The government has big ideas but limited funds to carry them out. National policies keep state borders open for travel but efforts to prevent employment and insurance discrimination based on immuno-status wind up in court, as some industries comply and others fight. Retirements, COVID-19 deaths among older workers, and years of hiring freezes leave **government jobs unfilled**.

With deficit hawks in Congress checking the Administration's big dreams, some relatively **budget friendly proposals** move forward: simplified **student loan repayment plans** and more debt forgiveness, **portable Medicare for all**, plus tax credits to support **job-retraining**.

Public/private partnerships create new research hubs, especially in biotech, which is seen as the field that got us out of the pandemic. Companies and philanthropy lift up programs aligned with their own interests. This sometimes exacerbates inequity and knowledge gaps - **people without patrons don't get research institutes**.

For those who've survived COVID-19 and have the right connections, **there are opportunities to thrive**.

Uneven Footing

A FIRSTHAND ACCOUNT

It's June 2022 and it's the first time I and my fellow Civic Science post-docs have been able to get together in person. We're at a research farm, looking at the stars after a day of talking and harvesting beans. NSF launched this program in the fall of 2021, placing researchers not just in R1 universities but on native reservations, in community colleges, and in field stations with collaborative research programs. With so many scientists out of work and schools closed, they had a record number of applicants. The stipends are small and many of us did supplemental fundraising through scientific societies, mini-grants with private foundations, or GoFundMe. No one had extra travel funds and besides, most of us weren't going to travel until infection rates dropped below 3%.

We've seen the inequity in places we work up close: who has laptops and internet and who doesn't, what communities suffered more deaths, where people moved by choice or economic necessity, and where food and shelter have become common struggles. It's a weird set of job prospects facing us after this program ends. Most public universities aren't hiring and they're pushing faculty into retirement to lighten budgets. Well-endowed private schools are hiring, but they're flooded with applicants and their donors sometimes have strings attached to those named chairs. Federal jobs are scarce too, at least as FTEs. For those of us with kids, we're eyeing states that created their own benefits packages and health care exchanges, in hopes that even if we're soft money we'll have a cushion.

As we talk, one of the fellows mentions a conversation they had with the MacArthur Foundation, part of the "[Ford5](#)" who decided to spend out their funds during the pandemic. What if there was a new way to create a science center as a co-op, grounded in a local community and governed by the members? Like a long-term research station, or the applied engagement of Land and Sea Grant Programs, all of which have largely shut down due to lack of funds. Now these foundations are thinking they could connect global science networks to the places they inhabit. It would be a lot of work, starting and running an institution. It's not the same as just getting to focus on research, but maybe we have to build our next jobs, not just apply for them.

Uneven Footing - initial reflections

We invite you to reflect on what this scenario brings up for you. Consider the ways in which it affirms or challenges how you think about the world.

How does this scenario fit with or challenge my own assumptions about how the world works or the direction we are headed?

What surprised me? What questions am I left holding?

Uneven Footing - the science landscape

Consider the many fields and forms of science. Consider the relationship between science and society. How would the science landscape shift if the world was going in this direction?

How would this affect who pursues a career in science?
Who gets hired, promoted, or tenured?

What kind of science would be prioritized? What fields or methods would get less attention or investment?

Where would science happen - what institutions and geographic locations?

How will science be used by decision makers? By citizens?
How will societal expectations around science change?

Uneven Footing - our work

Consider your organization's current strengths, capabilities and strategies.

What are the core ways your organization or team would operate if the world was going in this direction?

What will the impact be on our department, colleagues, or group? On our external partners, field sites, or volunteers?

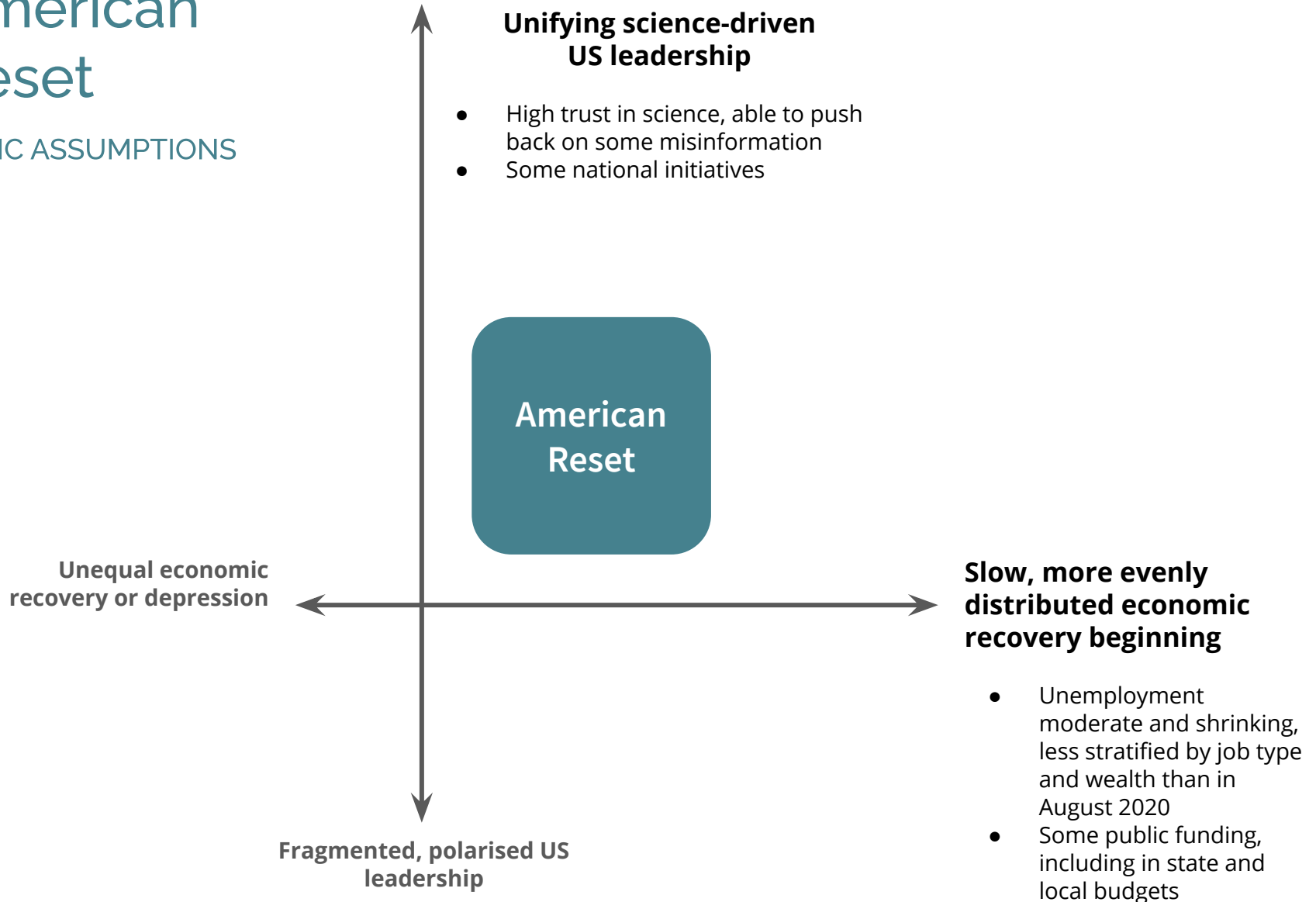
How will science funding generally and our funding specifically be affected?

What is our role? What will we be working on?

How might we change our current strategies, tactics, or partnerships to prepare for this scenario?

American Reset

BASIC ASSUMPTIONS



American Reset

SCENARIO DESCRIPTION

The chaos of 2020 inspired deep reflection and bold action. A new, **coordinated, science-driven approach** to getting COVID-19 under control launched in early 2021 **restoring confidence in US leadership** at home and abroad.

Frontline medical workers, public health officials and researchers are widely seen as **heroes**. Many minimum wage workers - grocery store staff, restaurant staff, janitors - are **recognized for their essential roles**. As businesses and schools gradually reopened, **unemployment started to fall across job types and wage brackets**.

Big, sweeping, federal economic stimulus has supported everything from no-interest small business loans to renewable infrastructure jobs to STEM re-training. **Affordable childcare programs** are helping narrow what had been widening employment and wage gaps for women and low income workers with children.

State funding is also on the rise and the disparities across communities are starting to even out a bit.

Rising interest and trust in science has led to **renewed public and private investment in universities, labs, and R&D**. The open forums that drove COVID-19 discoveries empower scientists to collaborate in new ways. Private philanthropy helps support experiments in citizen science and community-driven research. **Information literacy is seen as vital** and has become a central theme in education.

The protests of 2020 led to **diversity, equity, and inclusion reforms across many US campuses**. A wave of early retirements and departures from teaching during the worst of the pandemic is helping speed diversification of the academy. Some **creative new higher ed instructional and business models** did emerge from the contraction of 2020-2021, but not without a lot of pain.

Informed by lessons of the pandemic, **government agencies are investing in data, disaster response capacity, and top-to-bottom equity audits** of public health policy and implementation.

American Reset

A FIRSTHAND ACCOUNT

I remember the day I started believing this might not be another passing fad but an actual shift. It was my first flight in over a year and a half and it felt strange to do something I used to do all the time. Although CDC data said vaccination rates were increasing, I was still nervous so I decided to wear my favorite face mask (the comfy one that doesn't fog up my glasses). I walked into a meeting convened by some great community organizations, reps from the National Institutes of Health and the National Science Foundation, and private funders. The first hint was that more than the usual suspects were trickling in, some online and more than I expected in person. We had a real mix of races and ethnicities, ages and stages, disciplines, institutions and backgrounds.

Our first conversation - about all the ways the new Community-Driven Health Initiative charged with shaking up the scientific status quo could fail and what they must do to be truly effective - was one of the most honest conversations I've ever seen across funders and grantees.

With lessons of the pandemic ringing in their ears, the new heads of both NIH and NSF are pushing big bold civic science initiatives, and putting their money where their mouths are. We activists in the room could hardly believe how much support for community based orgs and individuals they plan to disperse. They're rolling out ambitious new programs so teachers and students at all levels can learn and do civic science. Hispanic-Serving Institutions, HBCUs, Tribal Colleges and Universities will see big funding increases, too.

The programs aim to increase the diversity of people in science, support community-driven science questions and non-traditional approaches to science, and support the use of science in society. It's a mission I've been working toward all my career. Maybe its time has finally come.

Over the course of the meeting, we poked as many holes in the feds' draft plans as we could. And they actually listened. The design charette sessions to dream up radical new funding programs to promote collaboration between labs and community members were my favorite part. Over drinks on the veranda that night, we swapped stories of personal and professional loss from the worst of the pandemic, but we couldn't help turning back to the day to marvel at the possibility that we might just be witnessing real change unfold before our eyes.

American Reset - initial reflections

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What surprised me? What questions am I left holding?

American Reset - the science landscape

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American Reset - our work

Consider your organization's current strengths, capabilities and strategies.

What are the core ways your organization would operate if the world was going in this direction?

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Great Unraveling

BASIC ASSUMPTIONS

Unequal economic recovery or depression

- High unemployment, stratified by race, class, job type (e.g. low wage essential workers and well paid work-from-home jobs survive)
- High income inequality
- Low public funding, in federal, state and local budgets

Unifying science-driven US leadership

Slow, more evenly distributed economic recovery beginning

The Great Unraveling

Fragmented, polarised US leadership

- High misinformation, low trust in science
- Few or no national initiatives

Great Unraveling

SCENARIO DESCRIPTION

Deep unemployment and a lack of state or federal funds for social services or health care has left people sick, despondent, and angry. Those who still have jobs are at the mercy of their employers.

Stimulus funds and a booming stock market lined the pockets of the top 1% and **widened the wealth and income gap.**

The interests of private donors and philanthropy decide what programs and institutions survive.

Communities with access to donors are able to prop up social services while those without connections suffer.

Mutual aid communities become vital sources of support, exchanging goods and ideas both online and in real life. Tiny fortresses bloom to protect local resources.

Rising and compounding inequities for people of color and ongoing police violence lead to continued protest.

Protestors and armed militia clash in cities across the country.

US politicians, foreign governments, and **groups on both left and right have doubled down on misinformation** campaigns. Vilification, paranoia and blame have spiraled to dangerous levels, adding fuel to already volatile racial and political tensions.

Months of competing, confusing and politicized public health narratives mean **the last shreds of trust in experts have been eroded for the majority of Americans.**

Universities are under fire for reopening in Fall of 2020 without adequate protections. Most prestigious schools survive, but **many public universities and smaller, rural schools contract, merge, or disappear altogether** under the strain. Some institutions adapt well to online and use the moment to innovate and engage, but most retreat to the Ivory Tower and just try to persist.

Great Unraveling

A FIRSTHAND ACCOUNT

For five years, I've run a research lab on the Olympic Peninsula, with a small education center and 30 staff - academics, techs, and government employees who got themselves detailed here for the view (and the endangered species). When we closed in summer 2020, only a skeleton crew stayed on and I kept to my office during the day. Budget gridlock in Congress killed the grant programs we rely on for monitoring and education, and the second government shutdown in December 2020 sent many of my agency staff home for good. If they were vested, they retired. We lost a year of climate monitoring to staff shortages.

We're pretty isolated and case counts have mostly been low, but we need Seattle tourists to keep downtown open. Plus, an influx of wealthy newcomers started buying up houses.

So there were COVID-19 spikes and finger-pointing about who should have done more. Luckily, some locals formed a housing trust, convincing aging boomers to donate their second homes to keep rents affordable for the town's service and care workers, foresters, and fishermen. Not that there's much work for anyone right now, mostly bartering and trades for skills. We're lucky to have places to forage and local farms that trade food for help.

Washington State is broke. Turns out running on sales taxes is a bad strategy when tourism and the consumer economy dry up. Ferries with Canada opened up in August 2021, but you had to show a 'necessity letter' to cross the border. Everyone's angry at Olympia but no one can agree on what they should have done differently. It's something you don't bring up at the diner.

The chaos of school closings and re-openings and the limited internet out here meant you either podded up to make your own community school or you stopped working to be the family tutor. Sometimes I teach science at a local pod but I don't know what they're teaching two blocks over in the QAnon pod.

It's hard to have hope for the future when everyone seems so divided. My online support group of other lab directors keeps me sane. The kindness of a private donor is keeping the lights on and the tanks flowing, but that's about it. The Makah still haven't opened their lands to non-members, but I meet my friend J off-reservation to talk about surviving the seemingly unsurvivable. We hike to the Elwha and watch the salmon leaping upstream to remind ourselves that dams can come down and people can do good things together.

Great Unraveling - initial reflections

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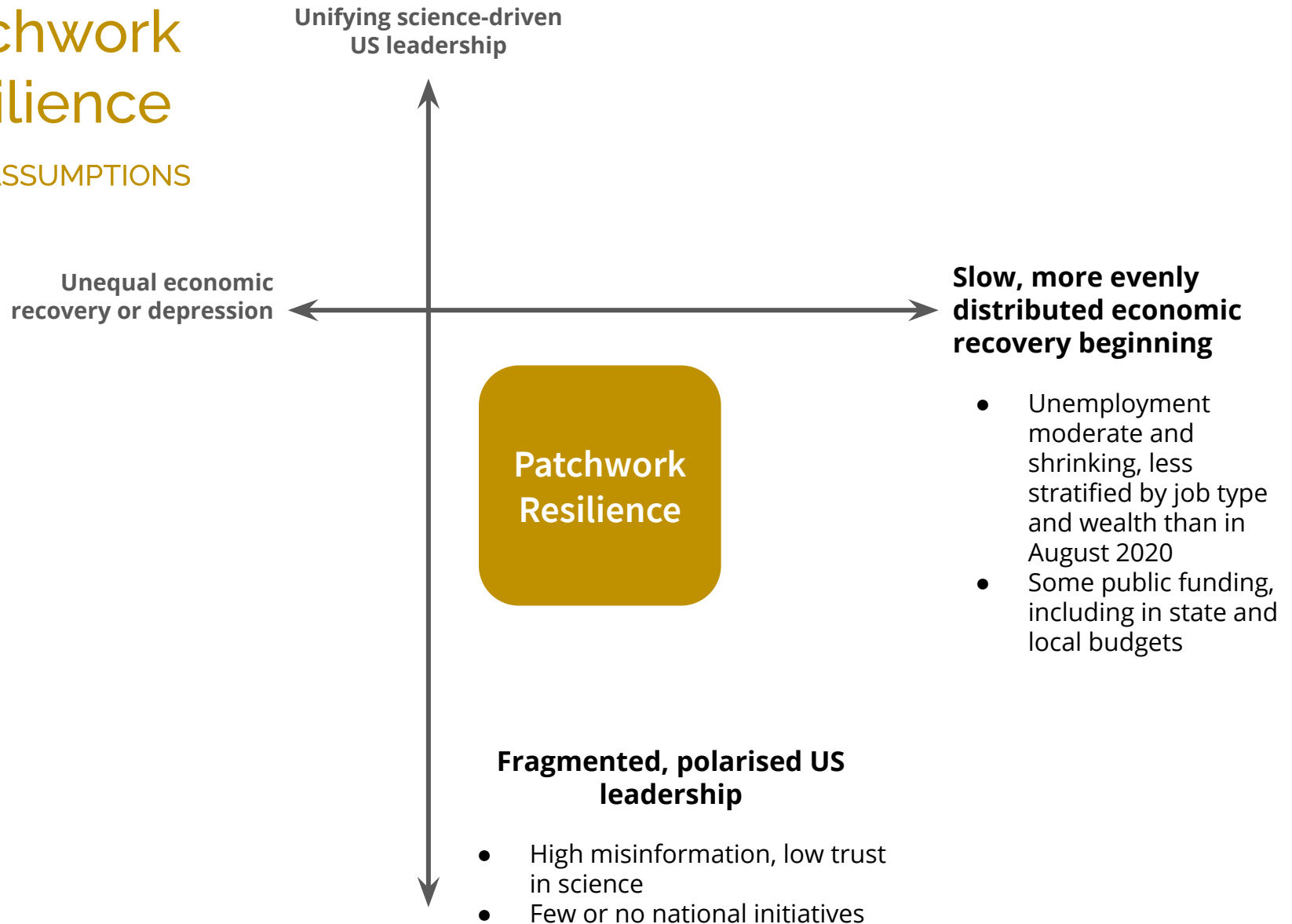
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Patchwork Resilience

BASIC ASSUMPTIONS



Patchwork Resilience

SCENARIO DESCRIPTION

Where you live matters. Cities and states that have resources and focus on keeping COVID-19 under control do OK. Places where people can afford to eat out and pay taxes are doing better than those where work-from-home opportunities were scarce. Communities with strong biomedical infrastructure (including hospitals, biotech research, R1s universities, and med schools) or strong internet attract new residents. **People who can move do,** fleeing expensive areas and high infection zones, seeking states more aligned with their values, and leaving the US altogether.

Gridlock in DC and **breakdowns in national infrastructure** (disaster response, environmental monitoring and enforcement, roads and mail) mean **federal resources are absent or unreliable.** With federal leadership weak, national laws and regulations are unevenly enforced and often end up in court.

Cities and states coordinate on larger projects, both regional and virtual, and partner with private funders and community foundations. **Mutual aid networks for education, childcare, food and shelter** become essential to local resilience.

Jobs and services slowly return, alleviating the survival mindset for many and increasing the public debate over what “normal” we should return to. With **state and local values driving investments and policy** some areas expand health care and guaranteed sick leave while others restrict benefits for non-citizens and build up faith-based programs. Depending on your point of view, these community-driven changes reflect long-overdue fixes in how government serves the people or the tyranny of the minority.

Innovations spring out of local pods and spread through online support networks. Sometimes these innovations break through ideological silos, but **the patchwork has bred mistrust.** Conspiracy theories about why some places are doing better than others are rife, and public health officials have become the punching bag for people’s frustrations.

Patchwork Resilience

A FIRSTHAND ACCOUNT

As a UCLA assistant professor I've spent the last couple years setting up a participatory research project on health impacts of uranium exposure in the Navajo Nation where I grew up. I'm excited to be piloting a project to help the community collect data and advocate for environmental cleanup. Federal funding for this kind of thing totally dried up, but a big corporation launched a "clean water for all" foundation after seeing the high COVID-19 infection rates in communities without reliable water access (including at its own headquarters).

After finally securing a grant and waiting months for case counts to drop, I'm about to head to New Mexico for fieldwork. To get to my field site I'm driving through 10 counties on state watchlists and others that don't believe the virus is real.

I used my initial grant funds to trick out a van I can live in. Data collection time is precious these days and you never know when we might go back into lockdown. Plus, the van feels safer than staying in motels in towns with "SCIENCE = LIES" billboards.

Of course, if we go back to teaching in person, I'll have to find a way to get back in time for fall quarter. If we stay remote, I'll use the satellite hookup in the van to give my students a taste of what field work is like with virtual field days and Instagram live chats with community members. I'm glad the grant covered internet connectivity because there's still no WiFi on most of the reservation.

The cost of the smart sensors is still too high to build out the network we want, but a friend's nonprofit is trying to crack this nut (she left Facebook just before the company imploded from the 2020 voter suppression scandal).

I'll miss my partner while I'm gone, but we've got it easy compared to some. My brother was laid off by the Arizona community college where he teaches. They let a bunch of lecturers go when they contracted with that private online university. He's seriously considering moving his family to Minnesota for a better job and better health coverage. All over, folks are moving out of the pockets where things are hard - if they have the resources and connections to do so. Most of the rest of my family's not that lucky.

Patchwork Resilience - initial reflections

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Patchwork Resilience - the science landscape

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Appendix

“[What if? A scenario planning guide for non-profits](#)” from the Monitor Institute lays out a scenario planning process like the one we used. The Monitor team released a set of scenarios [specifically for COVID-19 and the social sector](#) that may also be helpful.

The [UK Government Futures toolkit](#) includes scenario planning among other strategy methods and may be especially useful for thinking about policy and collaborating with policy-makers.

[Amy Webb’s Axes of Uncertainty](#) method uses similar principles; her [Future Today Institute](#) publishes a range of templates, mainly oriented towards for-profit companies. [Another approach](#) to futures thinking comes from Jamais Cascio, of the Institute for the Future, and draws more on storytelling and playing out second and third order effects.

Your goal isn’t predictions. It’s *preparation* for what comes next. We must shift our mindset from making predictions to being prepared.

- [Amy Webb](#)