Diversifying HayWired Communication

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March 2022

ACKNOWLEDGEMENTS

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1   Project description and objectives

The overarching goal of the Diversifying HayWired Communication project was to assist the United States Geological Survey (USGS) in identifying and engaging key stakeholders representing diverse communities within the San Francisco Bay Area regarding the findings of the HayWired scenario, which highlights the impacts of a hypothetical magnitude 7.0 earthquake on the Hayward Fault and its aftershocks. The findings of the Volume 3 of the USGS Scientific Investigations Report highlight the societal consequences of damages and disruptions expected to result from the events described in the scenario, including impacts to socially vulnerable populations[1]. This project sought to build on insights from the Volume 3 report to answer the following questions:

- What stakeholder groups in the San Francisco Bay Area can be most effectively engaged regarding the findings of the HayWired scenario to assist with relaying key takeaways to underrepresented communities and diverse cultural and ethnic groups?

- What are the priorities, interests, and concerns of the identified stakeholder groups, and how do these issues link to concepts addressed in the HayWired scenario?

- What are the communication needs of target audiences represented by the stakeholders engaged, and what kinds of products will best resonate with them?

The activities discussed in this report were implemented by a group of doctoral students from historically underrepresented backgrounds within the disaster-related sciences selected through a partnership with the William Averette Anderson Fund for Hazard and Disaster Mitigation Education and Research (hereinafter referred to as the Bill Anderson Fund, or BAF). The Bill Anderson Fund Fellows represent a range of academic disciplines and backgrounds that expand the range of creative inputs, lived experiences, and insights into the needs of marginalized communities. They include Mojeed Bello (Morgan State University), Jennifer Blanks (Texas A&M University), Paula Buchanan (Jacksonville State University), Judanne Lennox-Morrison (Texas A&M University), TyKeara Mims (Texas A&M University), and Jean-Claude Ndongo (Florida Atlantic University). The project was coordinated and overseen by Dr. Nnenia Campbell (Research Associate with the Natural Hazards Center at the University of Colorado Boulder and Deputy Director of the Bill Anderson Fund), Dr. Maryia Markhvida (Lecturer at Stanford University), and Dr. Anne Wein (Operations Research Analyst, USGS).

A kickoff meeting between the project coordinators representing the HayWired team, the Natural Hazards Center, and the Bill Anderson Fund Fellows was held on August 19, 2021 to outline project activities and review priorities. The original scope of work of the project had to be modified due to significant administrative delays of the project start date to ensure that the team would be able to develop deliverables and present them at the USGS HayWired Volume 3 Rollout Event that took place on October 21, 2021, the anniversary of the 1868 Hayward Fault Earthquake. These changes in approach are described in greater detail below. The overall project duration including this report was four months.

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[1] Volume 3 report and additional findings from the HayWired scenario can be found in the following link: https://www.usgs.gov/programs/science-application-for-risk-reduction/science/haywired-scenario

HayWired Scenario Engagement and Communication

The USGS is the science arm of the Department of Interior in the U.S. government. The USGS Natural Hazards Mission Area (NHMA) develops and applies hazard science to help promote the safety, security, and economic well-being of the Nation. Within the NHMA, USGS is largely responsible for monitoring, conducting scientific investigations, producing hazard assessments, and providing situational awareness of geological hazards (Holmes et al. 2012).

The USGS does not have the authority to make policy or recommendations. By working with partners, cooperators, and customers, NHMA delivers actionable assessments of natural hazards and risk and helps develop effective strategies to achieve resilient communities. Therefore, partnerships with decisionmakers, policymakers, and advisory organizations are critical to the use of hazard science. Some of these avenues are well established—for example, the use of earthquake science in building codes.

Starting in 2005, in response to emergency manager requests for credible multi-hazard scenarios for exercises, the (now) Science Application for Risk Reduction (SAFFR) led scenarios that translated the best available hazard science into engineering damages and societal consequences. The HayWired scenario is the fourth scenario co-produced with contributions by more than a hundred physical scientists; engineers; utility, telecommunications, and transportation providers; land use planners; and economists. Innovations in societal consequences of the HayWired scenario include investigations of telecommunications, exposure of collocated infrastructure to multiple hazards, communities-at-risk, economic and business impacts and resilience, and earthquake early warning (Detweiler and Wein 2021; Wein et al. 2021).

Consequently, scenario stakeholders expanded from emergency managers to communities and businesses. The HayWired coalition was set up to welcome organizations to follow the HayWired scenario findings. Members of the coalition helped to lead events (e.g., Pacific Earthquake Engineering Research Center organized the fire following earthquake workshop) and develop products (e.g., Earthquake Country Alliance, California Resiliency Alliance, Cal OES, and Federal Emergency Management Agency collaborated on the HayWired exercise toolkit[2]). The coalition was invited to the HayWired chapter webinars and volume rollout events. Consequently, there is a spectrum of engagement across the co-production of the scenario and communications involving provision and receipt of information and knowledge creation.

Recent (2021) Executive orders (EOs 13985, 14008) and White House memoranda direct federal agencies to advance equity, improve support for underserved communities, enhance nation-to-nation relationships with tribal communities, and restore trust in government through scientific integrity. Given the new emphasis on community and economic perspectives in the HayWired scenario and recent executive orders from President Biden, this pilot project was designed to leverage the expertise and experience of BAF Fellows to boost understanding of approaches to tailoring communication content and channels for underrepresented groups and organizations. At

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[2] Haywired scenario toolkit can be found in the following link: https://www.earthquakecountry.org/haywired/.

the time, the HayWired scenario was in the final stages of publication, such that the communication of developed content was the phase this project addressed.

2 Summary of research process

The framework initially envisioned for this project involved a multistage data collection process that would enable the project team to develop rich, detailed insights into the interests and needs of diverse communities in the Bay Area. The project plan involved: 1) coordinating with USGS partners to identify stakeholders and priority areas to organize outreach and guide future HayWired engagement strategies; 2) conducting informal primary data collection (e.g., interviews, qualitative content analysis) with representatives of stakeholder groups and relevant documents; 3) analyzing and synthesizing data into summary products that highlight stakeholder motivations, priorities, competencies, and other key information; 4) developing a design persona to summarize each stakeholder group analysis; and 5) developing tailored information products for stakeholder groups and the target populations they represent.

These activities were intended to collect detailed information regarding the needs of target populations including underrepresented communities and diverse cultural and ethnic groups in the Bay Area; set the stage for USGS to establish lines of communication with key stakeholder groups; and ultimately, inform the development of exemplar information products and processes that could inform future communication efforts. However, the time allocated for these activities was significantly curtailed due to delays in launching the project. Thus, while the approach described above was retained as the guiding vision for this work, some elements were modified in real time to accommodate the truncated schedule. The sections below outline the process followed by the Diversifying HayWired Communication project team and how it was modified to accommodate emergent challenges.

2.1 Interviews

Informal interviews conducted via telephone or videoconference with contacts from stakeholder organizations serving diverse communities throughout the Bay Area served as a key component of the project plan. The purpose of interviews was two-fold. First, these discussions were intended to provide insights into the specific priorities, concerns, and disaster preparedness needs of the various stakeholder groups. Second, the interviews were intended to identify opportunities for ongoing USGS engagement and outreach with stakeholder organizations that have not historically been engaged through outreach regarding the HayWired scenario.

However, it can take time to identify and connect with relevant stakeholders, and time constraints severely curtailed the feasibility of reliance on interviews as a primary mechanism for data collection. The loss of critical weeks due to the delayed project start date reduced the time available to implement the team's interview strategy. To compensate for these challenges and speed the process of contacting potential interviewees, the project team sought to leverage and expand existing networks within the HayWired coalition as opposed to independently identifying stakeholders that were active in the region. The BAF Fellows and USGS collaborators contacted: 1) organizations that had reached out to the HayWired team previously (successfully accomplished); 2) organizations that had signed up for HayWired coalition events (somewhat

successfully accomplished); and 3) contacts recommended by HayWired Coalition partners with connections to other organizations (unsuccessful).

The project team retained interview outreach as one of its information-gathering strategies and conducted a total of three interviews.[3] The original project design was also modified to expand one of the planned deliverables, a database of stakeholder groups serving marginalized populations in the Bay Area, to mitigate the limited data collection. This alternative approach involved the adoption of an environmental scan, which utilized publicly available data to gather information about a broader range of stakeholder organizations with greater efficiency.

2.2 Environmental scan

Environmental scans are an information collection technique used to conduct secondary research on a topic before deciding to implement any project, deliverable, program, or other action. This technique utilizes public-facing content and information, often gathered from websites and search engines such as Google. Environmental scans provide a solid foundation of content about a topic, especially when deliverable deadlines are short. Federal agencies like the Department of Health and Human Services, specifically the Centers for Disease Control and Prevention, use environmental scans to get a quick "snapshot" of a research area of interest, and to support future primary research activities (Koo et al., 2016).

There are five steps in the environmental scan process:

1. Identify the environmental scanning needs of the organization or team seeking to implement an action or activity. For example, what are the questions to answer, and/or issues or problems to solve?
2. Gather (scan for) information. For example, what type of stakeholder groups should be included in the environmental scan for this project, and what are the criteria used to evaluate them?
3. Analyze information. For example, what are the themes, "pain points" (persistent challenges/problems), etc. of the stakeholder groups chosen in the previous step?
4. Communicate results from the information and its analysis to the organization or team. For example, in this project, the Fellows presented the findings of their environmental scan to USGS and HayWired Partners.
5. The organization or team makes informed decisions based on the results. For example, the results from this project were used to determine which categories of stakeholder groups could be effectively targeted for earthquake-related outreach and how message formats and content should be tailored to each.

The key to conducting an effective environmental scan is to identify information from reputable sources, such as organizational websites and databases of peer-reviewed materials and content.

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[3] Interviews were conducted with representatives of one minority business association and two grassroots community groups. One of the community groups was developed in response to COVID-19 and had a public health focus, while the other had a broader focus on racial and economic equity in the area. Additional details about these interviews are provided in Appendix A.

Because of the incredibly short timeline of project deliverables, the environmental scan was used to collect information about the various for-profit, nonprofit, and governmental agencies that provide services to marginalized communities in the San Francisco Bay Area. The project team used stakeholder organizations' websites and social media pages to document their missions, programs and initiatives, relevant program details, and reflections on key organizational activities and priorities that may be of interest to the HayWired Coalition or linked to issues outlined in the HayWired scenario. Information from the environmental scan was then used to produce design personas for six of the organizational categories, such as financial security programs for lower-income communities. A detailed list of organizational categories for this project is included in Appendix B, along with a link to the environmental scan database.

2.3 Design personas

The project team developed design personas, or summary profiles, of the various categories of stakeholder organizations examined by the project team. The personas were intended to synthesize data obtained through the environmental scan and interviews into formats that could be used as a reference for future USGS outreach. To populate the personas, the Fellows analyzed details related to seven thematic areas for each organization within a category, including:

1. Demographic served
2. Motivations (derived primarily through mission statements)
3. Priorities (identified through programs/activities)
4. Key activities (derived from organizational lists of programs and initiatives)
5. Core competencies (e.g., organizations' key areas of knowledge and expertise based on their work)
6. Communication channels (e.g., how the organizations communicate with their constituencies)
7. Frustrations/pain points (e.g., challenges faced by the organizations' constituencies such as homelessness or economic disadvantage, issues to which the organizations are responding, and challenges to service delivery, such as lack of access to technology and other resources)

The project team created a total of six design personas (see examples in Section 4), each of which corresponded to a category of stakeholder. These personas served as the foundation of a series of information products that were tailored to the target groups.

2.4 Information product development

The Fellows developed a total of six products based on the personas that were most directly relevant to their interests and professional training. The organizational categories represented include:

- energy and environmental justice organizations
- grassroots organizations
- financial security programs for lower-income communities
- mutual aid networks
- chambers of commerce

- public and mental health organizations

To develop the information products, the Fellows reviewed the thematic details for each persona to determine what kinds of content and formats would be most appropriate for the information products they sought to design. The objective was to tailor the products so that they would reflect stakeholder organizations' interests and priorities, resonate with the organizations' constituencies, and be easily shareable in the course of the organizations' routine activities. For instance, details about what types of communication channels organizations typically used to communicate with their clients or communities guided the product formats (e.g., infographic, video, web application). Summaries of key organizational activities (e.g., solar panel installation, business planning services) shaped the kinds of content featured within the products (see examples in Section 4).

3 Accomplishments

In addition to its overall objective of prototyping information products related to the HayWired Scenario, the Diversifying HayWired Communication project sought to generate insights that would continue to inform practices related to risk communication and stakeholder engagement within the HayWired coalition and USGS.

3.1 Processes

Throughout the development and implementation of this project, the team reflected on opportunities for HayWired to replicate or expand on its efforts in the future. The process of conducting an environmental scan and developing design personas provides a model for identifying organizations that serve marginalized communities and documenting how their missions and operations relate to the objectives of an initiative such as HayWired. This method can facilitate more inclusive engagement and lead to opportunities for these organizations to interface with future HayWired coalition activities.

3.2 Products

The six information products developed by the project team also illustrated how details about stakeholder organizations' concerns, priorities, and communication needs (e.g., information documented in the environmental scan and through informal interviews) could be leveraged as data sources to tailor risk communication materials for various audience segments. Specifically, the use of design personas to analyze and synthesize this information provided an evidence base for the team to glean what kinds of content would be most relevant to the organizational types of interest and what kinds of formats would be compatible with the information channels they already used. For example, the products reflected the following considerations:

- A practical and affordable solution to power disruption and communication needs (e.g., a Flywheel for energy justice organizations)
- Earthquake information that is easier to access by highly mobile populations (e.g., app for grassroot organizations and homeless service providers)

- Earthquake information that is easier to share and that details how groups can scale up existing operations in response to an earthquake (e.g., infographic with checklist for mutual aid organizations)
- Discovery of financial resources for disasters (e.g., choose your own adventure game for organizations concerned with financial insecurity)
- Information about earthquake health outcomes communicated through established networks that are inclusive (e.g., a video for health care workers and public health organizations)
- An interactive and personalized communication channel (e.g., a mascot with resources for business preparedness for chambers of commerce)

4 Information product summaries

Based on the research conducted as part of this project, six information products targeting communication to a diverse set of stakeholders were developed.

4.1 Information Product: Building a Flywheel Cell Phone Charger

4.1.1 Overview of Organization Type

According to the U.S. Census Bureau Latino and Asian populations are the fastest growing racial/ethnic groups in California, rising by 25% and 11.2%, respectively, in the past decade (U.S. Census Bureau, 2021). More than 480,000 African Americans live in the Bay Area's nine counties, accounting for 6.7 percent of the area residents as of 2010.

Low-income and minority communities are disproportionately vulnerable to climate change, earthquakes, and other hazards. These underserved groups tend to lack equal access to clean energy and experience disproportionate exposure to poor environmental conditions such as toxic releases and other forms of pollution. These communities also often lack access to digital communication and other technologies that could advance social wellbeing and economic development. This information product is designed for organizations that respond to both of these issues as stipulated below:

- Energy justice organizations work to bring clean energy solutions to marginalized communities. They work with affordable housing providers to install clean energy systems.
- Digital divide organizations work to increase access to communications and other technologies in marginalized communities. They work with low-income communities to provide affordable access to internet connectivity, ensure each resident has a working digital device, and promote digital literacy.

4.1.2 Design Persona Worksheet

BAF-HAYWIRED DESIGN PERSONA

ORGANIZATION TYPE

Energy and Environmental Justice Organizations

SUMMARY

These non-profit community-based organizations serve low-income as well as racial and ethnic minority communities in the Bay Area. They promote environmental justice and energy justice by engaging in advocacy and operating solar energy and educational programs.

CORE MOTIVATIONS

• An equitable transition to renewable energy
• Local renewable power generation
• Elimination of environmental harms
• Environmental, health, and technology equity

COMMUNICATION CHANNELS

• Mailing lists
• Website
• Online forms/surveys
• Social media

CORE COMPETENCIES

• Community engagement/outreach
• Coalition-building
• Clean energy solutions
• Volunteer management

KEY ACTIVITIES

• Administering low-income solar programs
• Policy advocacy
• Providing educational programming about clean energy and environmental issues
• Partnering with non-profit organizations and government entities

FRUSTRATIONS/PAIN POINTS

• Historic disinvestment and inadequate opportunities for economic empowerment
• Pollution inequity and disproportionate energy burdens
• Displacement/lack of affordable housing

DEMOGRAPHIC SERVED

• Low-income communities
• Black, Indigenous, and People of Color

PRIORITIES

• Partner with government entities to improve equity in energy and environmental programs
• Provide access to clean energy
• Improve environmental conditions in pollution-burdened communities
• Develop coalitions to strengthen advocacy efforts across marginalized communities
• Improve access to economic opportunities and job development in the clean energy sector

4.1.3 Information Product Summary

The product **– Building a Flywheel Cell Phone Charger –** is an off grid, alternate energy communication product that crucially needs to be used to support disaster preparedness and response. The design described below can be used by energy and environmental justice organizations that work with target audiences including underserved African American - Black, Latino, and Asian communities. The product provides generated alternate energy and communication access post-disaster. The charger can be used during and after a disaster to generate energy using leftover household materials with little to no cost. Instructions are provided to charge a cellphone during a disaster to text, not talk.

The product**, Building a Flywheel Cell Phone Charger,** is suitable for marginalized communities that are often unprepared for disasters due to a lack of resources. It is designed to educate people of color, Latinos, underserved minorities in the Bay Area, and energy justice organizations. Also, it provides alternative energy sources that are easy for anyone to create during emergencies. Income barriers and lack of available supplies require low-cost solutions. Access to solar panels is limited in low-income communities. Disruptions are likely to further limit the availability of supplies for alternative energy solutions in the immediate aftermath of a large earthquake. Individuals will need instructions on how to communicate via cell phone after a disaster.

Materials (List of supplies):

- Induction Motor or Fan Motor
- Wood
- House Fan Blade or Bicycle Wheel
- Capacitor, Rechargeable Battery
- Two Terminal Wire/Charging Wire

Figure 1. Flywheel Cell Phone Charger (Illustration by Mojeed Bello)
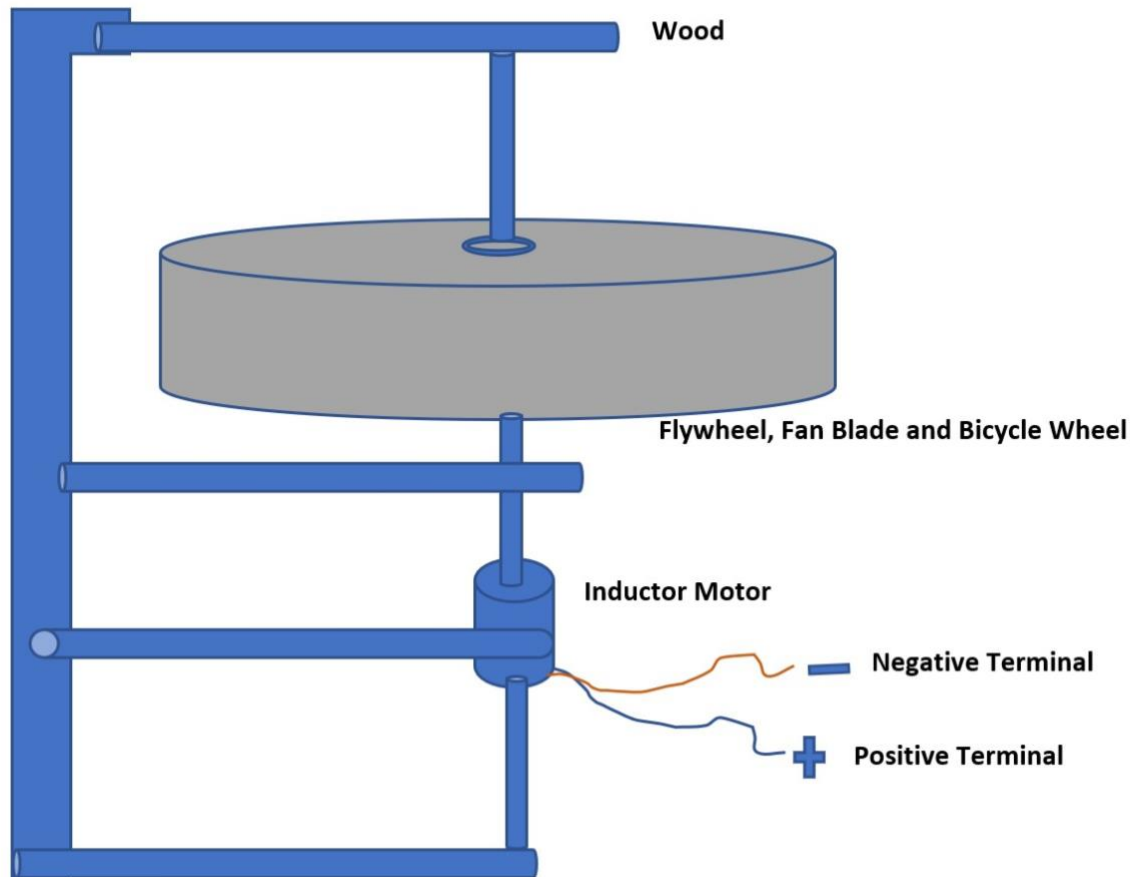
Three steps of Building Installations

1. Construct a simple wood base to mount an induction motor and hold it;
2. Connect the drive rod to shaft, and flywheel/bicycle wheel/fan blade;
3. Connect the two terminal wires/charging wire/USB charge wire to your cell phone.

4.2 Information Product: HayWired Scenario App

4.2.1 Overview of Organization Type

The organizations considered for this information project are grassroots organizations. By definition, grassroots organizations are primarily individuals who are advocating for a local, national, or international cause. They typically operate and survive from donations and other fundraising efforts; however, they can qualify for grants and awards. Grassroots organizations use collective action at the local level to effect change for issues that have impacted the community for a certain amount of time.

This project examined the East Oakland Collective and grassroots organizations who have similar goals and missions. The exemplar, East Oakland Collective, is a collective group of millennials-plus who are invested in resolving various issues which greatly impact East Oakland. The organization is composed of life-long residents, homeowners, and allies in this area. It is invested in creating a better future for the underserved populations and communities.

The mission statement of the East Oakland Collective is to interrogate and resolve issues towards racial and economic equity. This is executed via civic engagement and leadership, economic empowerment, neighborhood and transportation planning, and homelessness services and solutions. These types of organizations follow a ground-up community engagement approach to empower their constituents.

4.2.2   Design Persona Worksheet

BAF-HAYWIRED DESIGN PERSONA

ORGANIZATION TYPE

Grassroots Organizations

SUMMARY

These organizations are typically spearheaded by church pastors, community leaders, and other stakeholders who are deeply connected to the organization's cause and mission. They tend to work with a wide range of constituents and associate with organizations that have overlapping goals. They are generally funded through donations and grants.

CORE MOTIVATIONS

• Economic inequality
• Homelessness
• Inadequate transportation access
• Neighborhood planning needs

COMMUNICATION CHANNELS

• Email
• Text messaging
• Social media (e.g., Facebook, Instagram, Twitter)

CORE COMPETENCIES

• Fundraising for programs and services
• Community engagement
• Allocating resources such as information

KEY ACTIVITIES

• Disseminating educational resources (e.g., regarding finances, housing security, and building toward affordable homeownership)
• Providing free meals to community
• Coordinating carpool services
• Supporting job re-entry

FRUSTRATIONS/PAIN POINTS

• Lack of capacity to start new initiatives
•Inadequate funding for direct service provision
• Low number of volunteers

DEMOGRAPHIC SERVED

• Houseless populations
• Low-income communities
• Black, Indigenous, and People of Color

PRIORITIES

• Providing civic engagement and leadership
• Supporting economic empowerment
• Engaging in neighborhood and transportation planning
• Delivering homelessness services and solutions

4.2.3 Information Product Summary

Based on key themes identified in the design personas, a mobile app offers an innovative approach to share the HayWired scenario and earthquake preparedness resources. The HayWired scenario app can centralize USGS social media platforms such as Twitter, Instagram and Facebook. It can also support multimedia content like infographics, news or radio broadcasts, and earthquake preparedness videos. Lastly, it provides a way to easily share resources such as maps of shelters, fault lines, and earthquake maps with severity ranking. Mobile apps reach a larger audience, hold multimedia capacity for videos and infographics, and allow dense information to be simplified. This mobile app provides the USGS an opportunity to relay information in a way that is easily accessible and more public facing.

Social networks are important to disaster mitigation and preparedness. Smaller organizations that are closely connected to communities, such as grassroots organizations and mutual aid networks, provide critical services in lieu of formal agencies. Due to the frequent (sometimes rapid, in other cases delayed) movement of these networks, it is important that information is easily exchanged between the organizations and their constituents. The mobile app format serves as a convenient resource for grassroots organizations because it enables users to access and share information as efficiently. This functionality is particularly important for groups serving highly mobile constituencies, such as people experiencing homelessness.
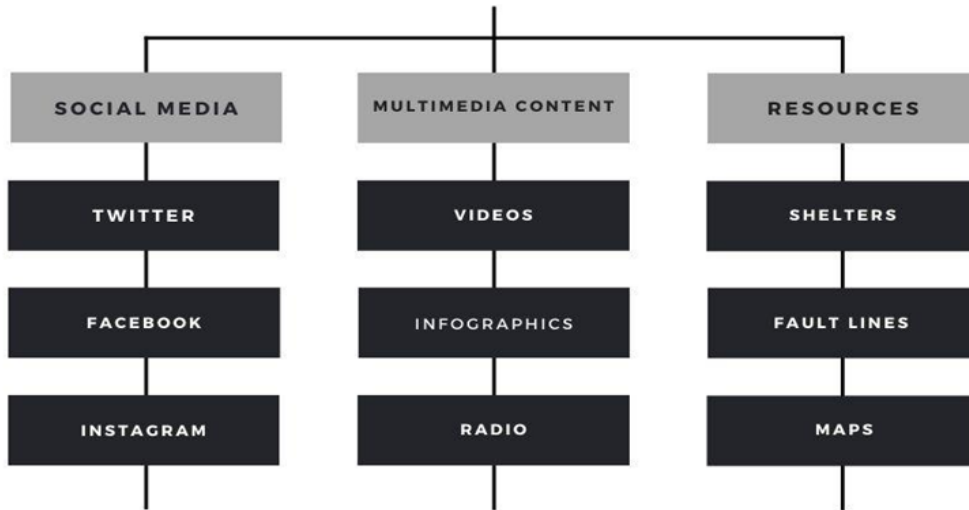
Figure 3: Mobile App Design

4.3   Information Product: Mutual Aid Infographic

4.3.1   Overview of Organization Type

With an increase in the complexity and intensity of disaster across the world there has been movement to assess and reinvent top-down approaches to providing disaster aid. There has been a rapid socio-political shift since the failures of Hurricane Katrina, as federal and state agencies have come under question for their ability to effectively and expeditiously provide and distribute aid to those impacted. In response, there has been a refocus on grassroots community organizing and organizations to provide timely, empathetic, and necessary relief to those who need it the most (Zenney, 2019).

Mutual aid networks are a form of collective care and resistance to conventional nonprofit and philanthropic approaches. Mutual aid groups respond to a wide variety of needs during an event, ranging from emotional to material support. These organizations have been particularly active in the San Francisco Bay Area where the effects on marginalized communities have been disproportionate since the start of the COVID-19 pandemic. Mutual aid is distinctly different from charity as there are no conditions on who is deserving of help such as persons suffering from substance abuse, the unhoused, sex workers, and other groups that might not meet established parameters to receive state and/or federal aid.

These organizations were selected because they represent a current paradigm shift in disaster relief as a means of anti-racist and anti-capitalist resistance. Racialized and capitalistic outcomes feature heavily in conventional approaches. More specifically, the use of mutual aid is a historic part of community organizing in the San Francisco Bay Area.

4.3.2 Design Persona Worksheet

BAF-HAYWIRED DESIGN PERSONA

ORGANIZATION TYPE
Mutual Aid Networks

SUMMARY
The Bay Area's mutual aid networks provide social services and material funding to persons who request it and expect nothing in return. Mutual aid is a means of collective care and is a core part of community organizing in Black and indigenous communities that is explicitly different from charity.

CORE MOTIVATIONS

• Providing care unconditionally in lieu of lengthy bureaucratic processes and conditions that limit access to care provided by the government
• Extending care and material support to those who might not be able to access it (e.g., to individuals without documentation, persons with substance use disorder, etc.)
• Filling hyper-localized needs of communities that are ignored by state and federal aid in disasters

COMMUNICATION CHANNELS
• Facebook Groups
• Google Forms
• Text Messaging

CORE COMPETENCIES
• Managing volunteers, resources, and financial aid
• Communicating and delivering aid to persons outside of and without access to social safety net
• Grassroots organizing
• Interpersonal communication with groups often ignored/unreachable

KEY ACTIVITIES
• Matching care requests with volunteers
• Providing social services (including during disasters)
• Monitoring volunteers to meet various care and material support requests
• Organizing and streamlining unsolicited donations

FRUSTRATIONS/PAIN POINTS
• No core organizational structure or means of monitoring
• No physical headquarters
• Networks emerge out of need/disappear if need subsides
• Shifting leadership

DEMOGRAPHIC SERVED
• Unhoused people
• Convicted felons
• Low-income households
• Elderly people
• Disabled people
• Sex workers

PRIORITIES
• Providing funding to those who need it
• Delivery of care
• Matching volunteers to specific needs
• Prioritizing all care requests so that people feel that they are being treated with dignity in receiving help and are encouraged to offer help the next time around
• Managing unsolicited donations in the initial post-disaster phase

4.3.3 Information Product Summary

The infographic is used as a knowledge sharing and mobilization feature for mutual aid networks. Because mutual aid networks are community led, they are often very localized and might not be getting the support, financial or otherwise, to assist the most affected in the communities. The risk communication tool design was an easy-to-use checklist designed for mutual aid network organizers and community members. The goal of the checklist is to provide some guidance on the key items needed in the post impact of an earthquake with similar damage to the HayWired scenario.

The infographic provides basic information on earthquake risks and the specific way that mutual aid networks might be able to help meet those needs. The underside of the graphic has a checklist that can serve as a baseline for the most immediate needs in the aftermath of an earthquake for community organizers, volunteers, and persons interested in providing material aid. The checklist was created using the anticipated effects of displacement, fatalities, nonfatal injuries, and loss of shelter in the HayWired scenario.

The format of the product was designed with the key ways in which mutual aid networks communicate in mind and can be incorporated into their most used communication platforms like Google Forms and Facebook. The infographic can also be incorporated into existing digital media communication and any other digital application development.

Figure 4: Mutual Aid Infographic

4.4 Information Product: Choose Your Own Disaster Board Game

4.4.1 Overview of Organization Type

The targeted organizational type provides financial security improvement programs that serve lower-income communities of color. This organizational type was selected because of the importance of financial security before, during, and after disasters. These types of organizations were chosen because they provide financial security programs for working-class Black and Latino communities, which is especially important because these groups have a history of having low "social equity" and are often marginalized by society.

4.4.2   Design Persona Worksheet

BAF-HAYWIRED DESIGN PERSONA

ORGANIZATION TYPE	SUMMARY
Financial Security Programs for Lower-Income Communities	These organizations operate social and financial support programs that serve marginalized, working-class minority populations to foster more equitable and economically stable communities.

CORE MOTIVATIONS

• Eradicate poverty
• Improve economic opportunity in working-class communities
• Build generational wealth

COMMUNICATION CHANNELS

• Bilingual information channels
• Websites
• Social media

CORE COMPETENCIES

• Addressing financial and housing needs among low-income residents
• Methods to increase residents' rights through civic engagement
• Partnerships with nonprofits, churches, schools, etc.

KEY ACTIVITIES

• Administering economic development and financial assistance programs
• Facilitating residents' civic engagement, cultivating leadership, and advocating for residents' rights
• Partnering with and developing networks among existing nonprofit organizations, educational programs, and civic institutions

FRUSTRATIONS/PAIN POINTS

• Lack of financial support for affordable housing
• Lack of legislation for policies to support housing as a human right
• Mitigation of systemic racism and its symptom of generational poverty

DEMOGRAPHIC SERVED

Working-class Black and Latino communities in the Bay Area regardless of US citizenship status (including undocumented immigrants)

PRIORITIES

Eliminating racial wealth inequalities and fostering social equity by empowering neighborhoods in the San Francisco Bay Area with the resources needed to improve economic conditions

4.4.3 Information Product Summary

The "Choose Your Own Disaster Board Game" information product is focused on the following organization type: financial security programs for lower-income communities, specifically organizations that provide services to communities of color. This product also complements content related to the last organizational type featured in this section: Chambers of Commerce (see Section 4.6). Chambers of Commerce and financial security programs work in conjunction to make marginalized groups more financially resilient before, during, and after disasters.

This information product is designed to address specific pain points experienced by the aforementioned communities – such as lack of financial support and historic marginalization – by addressing the communication challenges of sharing information and other resources with these communities to help them more effectively mitigate and prepare for disasters. "Choose Your Own Disaster Board Game" is a combination of the Choose Your Own Adventure young adult fiction books, and a "Create Your Own Board Game" kit, and features Geo the Bear as a game piece and part of the artwork of the game.

Figure 4: Board Game Diagram

Concept Development for Final Information Product   **Final Information Product**

The "Choose Your Own Disaster Board Game" uses gamification, defined as the application of typical elements of game playing to encourage engagement with a product or service as an education and outreach tool. As an information product, the "Choose Your Own Disaster Board Game" helps communities more effectively navigate the process of accessing disaster assistance information and other related resources.

Versions of the "Choose Your Own Disaster Board Game" focus on different disaster types (from earthquakes to floods to wildfires) and are produced for multiple types of communication platforms (such as the physical board game prototype as a proof of concept and a future mobile phone app with responsive design). Each version of the "Choose Your Own Disaster Board Game" focuses on the proactive phases of emergency management (mitigation and preparedness) that focus on what people can do before disasters occur to be more resilient. In conclusion, Geo the Bear and the "Choose Your Own Disaster Board Game" series create information product synergy with the potential to connect all information products under one theme, while also having the potential to have information products at all four phases of emergency management.

4.5 Information Product: Health Care Video

4.5.1 Overview of Organization Type

This information product focused on organizations that provide services to marginalized communities including racial and ethnic minorities and low-income populations. These organizations include public and mental health institutions, healthcare facilities, and community health organizations, which play a key role in emergency preparedness and response efforts.

Health organizations were selected because they have:

- established networks for delivering services and distributing communications;
- a relationship with local communities and understand the needs of their constituents;
- the ability to respond quickly and effectively to local issues;
- access to fiscal and physical resources which can be used to aid communities.

In the event of a large-scale earthquake, the HayWired scenario demonstrates that hundreds of thousands of people in the San Francisco Bay Area would be forcibly displaced by damage to the built environment, fires, and other immediate hazards. The populations health entities serve may be unaware of their risk or unable to implement preventive measures such as retrofitting their home or purchasing emergency rations. Therefore, marginalized communities may be disproportionately affected by displacement, as well as loss of communications, transportation services, and utilities. Communities may need access to physical and mental health services in addition to interim housing solutions. They may also need access to resources such as face masks to protect themselves from environmental hazards and to prevent the spread of pathogens (especially during the COVID-19 pandemic). Public health entities and healthcare facilities are in a unique position to disseminate information and provide services to communities before, during, and after an event.

A need for accessible earthquake risk and preparedness information has been identified throughout this project. Health entities routinely communicate with their constituents via their websites, social media platforms, community programs, and other networks. While they generally do not use these communication networks to disseminate earthquake preparedness information, there is an opportunity for the HayWired coalition to partner with these organizations and leverage their communications networks and expertise. Communications networks can be used to reach vulnerable populations that interact with the health sector. The HayWired coalition can also leverage health promotion and communications best practices utilized by the health sector to communicate information about community and personal risk or health outcomes in the event of a large-scale earthquake. These practices result in information products that are educational, visually appealing, easily digestible for the public, and account for factors such as cultural and religious identities, regionality, and literacy.

4.5.2   Design Persona Worksheet

BAF-HAYWIRED DESIGN PERSONA

ORGANIZATION TYPE

Public Health and Mental Health Organizations

SUMMARY

These organizations provide health care services and programs to populations in need throughout the Bay Area. They specialize in fundraising, service delivery, and community engagement.

CORE MOTIVATIONS

• Providing affordable, high-quality health care services
• Increasing access to healthcare services
• Improving community health and wellness

COMMUNICATION CHANNELS

• Websites
• Press releases
• Programs
• Community partners

CORE COMPETENCIES

• Service delivery and connecting individuals to resources
• Engaging target populations (providing information and operating programs)
• Strategic partnerships
• Leveraging resources

KEY ACTIVITIES

• Funding and implementing community health programs
• Providing primary care and health services
• Forming strategic partnerships and providing funding to organizations with related missions
• Engaging residents and community partners in the planning, evaluation, and implementation of health activities/programs
• Providing programmatic data to inform health research and initiatives

FRUSTRATIONS/PAIN POINTS

• State and federal policies and budgetary restrictions
• Inadequacy of funding sources

DEMOGRAPHIC SERVED

• Whole community
• Specialization in providing care to low-income and vulnerable (e.g., aging, disabled, and medically vulnerable) populations

PRIORITIES

• Service delivery
• Accessing/disseminating funding
• Developing/maintaining strategic partnerships
• Community engagement and involvement

4.5.3 Information Product Summary

A video was created to help health professionals in the Bay Area better understand the needs of their constituents before, during, and after an earthquake.

The video can incorporate other information products such as Geo the Bear (see Section 4.6) and the "Choose Your Own Disaster Board Game".

The goal of the video is to provide targeted information which can be used by health professionals to educate their clients about local hazards and to inform organizational earthquake response measures among health entities.

This video can easily be shared using communications channels available to the HayWired Coalition and health entities.
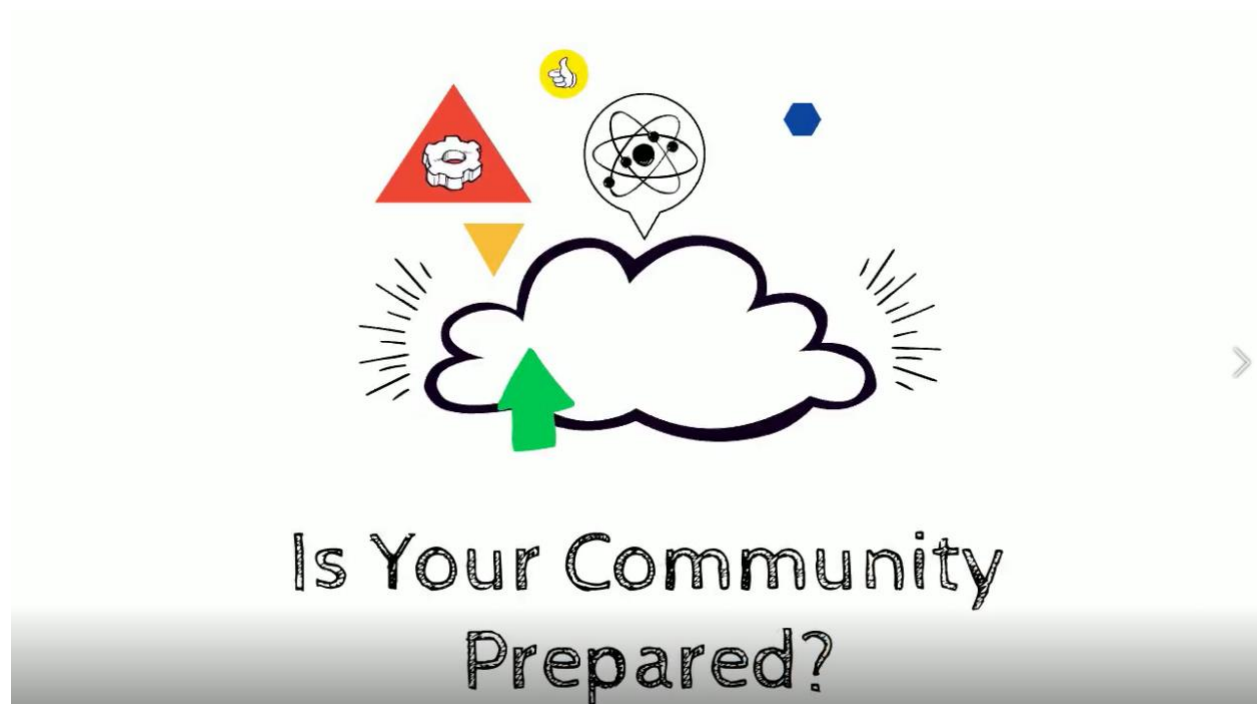
Link to the Video Information Product

4.6 Information Product: Geo the Bear Mascot

4.6.1 Overview of Organization Type

The organizations of focus for this product are chambers of commerce. They are networks of businesses, nonprofits, and public agencies that advocate for businesses and provide valuable resources and benefits to their members. Chambers of commerce represent various entities ranging from cities to ethnic groups. Some of the chambers in the Bay Area are the San Francisco Chamber of Commerce, the Oakland African American Chamber of Commerce, and the San Francisco Bay Area Hispanic Chamber of Commerce. The research was concentrated on the Oakland Metropolitan Chamber of Commerce and the Hayward Chamber of Commerce as they have developed strategic plans and partnerships to assist marginalized groups and minority-owned small businesses within their footprint. In addition, these chambers communicate extensively with their stakeholders through their websites, social media accounts, and flyers to advertise various community events hosted by them or their members.

The mission of these chambers of commerce is to secure the economic future of their communities and enhance the quality of life in their respective cities. The chambers advocate for economic and workforce development, housing and commercial space affordability, and public policy that will account for the needs of marginalized communities. They facilitate access to business planning and financing by providing platforms where various businesses of all sizes and from various fields can network among themselves and with public officials, nonprofit organizations, and members of the community. Furthermore, they believe that diversity, equity, and inclusion are integral to the economic future of their communities.

The Oakland Chamber of Commerce supports business creation and sustainability for Bay Area residents who are Black, Indigenous and People of Color by facilitating access to corporate grants. Likewise, the Hayward Chamber of Commerce facilitated the creation of the Black Business Roundtable in 2021 to increase the representation of Black-owned businesses in the chamber and support business creation and growth by Black entrepreneurs in Hayward.

4.6.2 Design Persona Worksheet

BAF-HAYWIRED DESIGN PERSONA

ORGANIZATION TYPE

Bay Area Chambers of Commerce

SUMMARY

These networks of businesses, nonprofits, and public agencies advocate for Bay Area area businesses and provide valuable resources and benefits to their members. Many chambers assist and support small businesses owned by members of marginalized communities.

CORE MOTIVATIONS

• Securing the economic future of the community and enhancing quality of life in the city.
• The chambers believe that diversity, equity, and inclusion are integral to the economic future of the city.

COMMUNICATION CHANNELS

• Websites
• Social media, esp. LinkedIn, Facebook, and Twitter (10K + connections overall).
• Email distribution lists
• In-person or virtual events at the chamber or at various businesses' locations

CORE COMPETENCIES

• Facilitating access to business planning and financing by providing platforms where various businesses of all sizes and from various fields can network among themselves and with public officials, nonprofit organizations, and members of the community

KEY ACTIVITIES

• Facilitating access to business networking, planning, and financing.
• Advocating for economic and workforce development, housing and commercial space affordability, and public policy that will account for the needs of marginalized communities

FRUSTRATIONS/PAIN POINTS

• Lack of affordability of commercial space and residential housing
• Lack of jobs and business opportunities for residents of historically disadvantaged areas
• Scarcity of business financing options for businesses owned by members of marginalized communities

DEMOGRAPHIC SERVED

• Minority-owned small businesses
• Ventures owned by members of marginalized communities

PRIORITIES

Supporting business creation and sustainability for Bay Area residents who are Black, Indigenous and People of Color by facilitating access to corporate grants and other forms of business financing, including in-kind donations or transactions with other chamber members

4.6.3 Information Product Summary

This product leverages the chambers' role as a connector between the HayWired coalition, businesses in the Bay Area including those owned by marginalized groups, and the communities in which those businesses operate. The product recommendation is a mascot that would be a spokesperson of the HayWired coalition and represent the partnership among the various agencies engaged in disaster and earthquake preparedness and recovery (USGS, ECA, CRA, CalOES, and FEMA).

The proposed mascot would be a bear named Geo. Geo would carry a backpack that contains information materials such as the HayWired Business Exercise toolkit, earthquake preparedness and recovery supplies, checklists of supplies, a digital device such as a tablet or a laptop to access disaster videos and apps, and a disaster-themed board game. Geo would also attend different events organized or co-sponsored by the chambers of commerce. These events would be held on the chambers' premises, at various business locations, and at community events such as fairs or back-to-school events sponsored by businesses or at disaster recovery events. Such gatherings would serve as networking platforms in which businesses, including those from marginalized communities, can network among themselves and with public officials, members of the community, and the various agencies involved in the HayWired coalition and represented by Geo the Bear.

Figure 5: Geo the Bear Prototype

5   Reflections and recommendations

5.1   Lessons learned

During the project, the team learned several lessons and grouped them into the following themes: *the efficiency of environmental scans, challenges with reaching unacquainted organizations, insights from understanding how organizations communicate, the importance of building trust and relationships, the need to include local communities in the research process, the effect of limited access to financial resources, and the value of interdisciplinary work.*

The environmental scans were simple tools that helped the team swiftly collect important information on the targeted organizations and their stakeholders. Given the short duration of the project, the scans constituted the most efficient approach to establishing the frameworks that were used to study each organization and their corresponding communities with the ultimate goal of providing suitable product recommendations.

Upon completion of the environmental scan, the team observed two types of communications. The first form of communication was between the project team and the organizations that they approached, and the second type consisted of the means through which the organizations contact the communities that they serve.

Under the first type of communication, the project team members reached out to the contact persons listed on the organization's website via email and telephone. Unfortunately, this approach was unsuccessful as none of the team members heard back from the organization's representatives. However, when project team members were introduced to organizational representatives by the HayWired team, they successfully secured and completed interviews with those individuals. The lesson learned in this case is that direct introductions or referrals by the HayWired team (e.g., a known local entity) facilitated contact between the project team and local organizations.

The second type of communication centered around the interaction between the organizations and their stakeholders. The team found that most of the organizations already communicate with local communities via their websites, social media accounts, flyers, and email distribution lists. Following the interviews, the team found that there was a clear need to make disaster preparedness and risk information available to the public in simple and familiar formats such as posters, flyers, or even smartphone applications. The lesson learned is that earthquake preparedness messages (such as the ones in the HayWired scenario) are best disseminated by leveraging existing communication channels.

Good communication builds trust, which can be enhanced with the early inclusion of the subject of a study or outreach activity, especially with marginalized and disadvantaged communities (Berke et al., 2011; Campbell, 2021). Building trust with groups and people with diverse needs inevitably impacts how risk communication, especially scientific risk communication, is received. Members of the HayWired scenario team served as allies and facilitated warm introductions between project team members and representatives of marginalized communities and organizations in the Bay Area. The manner in which the introductions were conducted represented an acknowledgement of marginalized groups as equal participants and collaborators

in the project. The team noted that it is crucial to actively involve people, their experiences, and perceptions in the project when developing risk communication materials for diverse groups. This facilitates synergy between the needs of the communities and the HayWired coalition's message of earthquake preparedness.

The project team also found that many individuals and businesses from marginalized communities did not have a disaster plan in place due to a lack of financial resources and time to commit to disaster planning. The organizations and businesses in those communities are often very small and short-staffed. In many instances, business owners or organizations' volunteers are responsible for multiple key tasks, which leave them unable to dedicate time and already scarce resources to earthquake planning processes that may be costly. With proper support, including partnerships and mentorship, these organizations could potentially bridge the gap between science and practice.

Lastly, throughout the project, the team was reminded of the value of interdisciplinary work as the members hailed from different academic disciplines and were located in different geographical areas representing five time zones. The Fellows had backgrounds in public health, urban planning, financial services, public administration, electrical engineering, and emergency management. These varied disciplinary lenses and professional experiences guided the kinds of organizational types to which their information products were tailored. Despite the time zone differences, they worked well together and managed to coordinate their product recommendations under a coherent theme and presented their work in a timely and successful manner.

5.2 Outcome themes

The outcomes of this project can be thematically mapped into the following sections. Recommendations and reflections can be aligned with one or two of the following sections shown in the figure below.

Figure 2. Project outcome themes

| Intentional Outreach, Project Design and Engagement | Inclusive & Participatory Techniques for Sceintific Data Collection | Participatory Action Research (PAR) Methodologies | Culturally Competent Risk Communication | Grant/In Kind Support for Seismic Preparedness |

Intentional Outreach, Project Design, and Engagement. This theme specifically addresses recommendations and reflections based on refining communication and engagement strategies for diverse communities, such as creating timelines that facilitate sustained and intentional outreach with important community institutions like churches, schools, and small business associations. The environmental scan method can support intentional outreach by creating awareness of these stakeholders. Project teams that more closely reflect community groups they are seeking to engage can increase the effectiveness of the engagement. Setting goals and metrics for these activities, monitoring processes, and outcomes supports transparency and accountability while also enabling course correction as needed to maintain progress toward desired outcomes.

Inclusive and Participatory Techniques for Scientific Data Collection. This theme specifically addresses the need to engage with communities using participatory options such as Public Participatory Geographic Information Systems (PPGIS) and participatory assessment techniques for infrastructure (Hendricks, et al, 2018). Utilizing PPGIS and public private partnerships in community consultations and scientific data collection can stimulate more localized discussions around a large earthquake similar to the one described in the HayWired scenario.

Utilizing Participatory Action Research Methodologies. A shift towards or the inclusion of participatory action research methodologies and other supportive qualitative methods in the design process of these scenarios can support the inclusion of more local voices. Incorporating varying techniques inclusive of participatory assessment techniques for infrastructure (PATI) (Hendricks et al, 2018) can begin to diversify the type and quality of the information that are obtained from these communities. Incorporating more participatory methodologies in the workflow

processes of scientific agencies like the USGS, can support more social science led research that can adequately show the variety of needs from different communities and organizations.

Culturally Competent Risk Communication. This theme reflects on the importance of creating information for diverse communities that is informed by these communities. The likelihood of success in mounting preparedness activities is directly related to how risk is communicated to these groups. Language, gender norms, and even societal roles can influence who receives and inevitably processes risk information to be able to conduct household/organizational preparedness activities. Risk information should be widely distributed and readily available to partner organizations and community members.

Grant/In Kind Support for Seismic Preparedness. Recognizing the disadvantages of these communities, creating short-medium term grants or in-kind support for seismic preparedness can help set a foundation for future re-engagement on projects like the HayWired scenario. Providing information without having the resources to prevent the likelihood of damage detailed in the HayWired scenario will still leave these communities and organizations at increased risk. Grant and/or in-kind support can resemble micro projects aimed at communities and businesses for capacity building.

5.3 Recommendations for future engagements

5.3.1 Intentional Outreach, Project Design, and Engagement

Before outreach activities, it is imperative to define what community engagement is for the respective organization(s) and to assess where scientific research entities believe community engagement "fits" into their process. This can be achieved by conducting an environmental scan or similar assessment of the organizational landscape, leveraging community science, and using PPGIS to assist in scenario development (Hendricks et al., 2018). Stakeholders such as schools, churches, and civic organizations–fundamental institutions of diverse communities–can be intentionally engaged early in scenario development. During project design, it is advantageous to utilize an asset-based management approach to mobilize community resources by identifying how these assets can be used to meet priorities of the research body—for example, by engaging with environmental clubs and targeting Science, Technology, Engineering and Mathematics (STEM)-focused programs and neighborhood groups.

Typically, participatory work involves community members from early-on (e.g., before major project activities are initiated) by identifying a shared purpose and establishing working groups composed of diverse individuals in initial data collection efforts. Research organizations such as the USGS can also work with stakeholders to create frameworks for knowledge products (like the HayWired scenario) that link knowledge production (e.g., data collection, analysis, interpretation) to communication and coalition-building. These frameworks can help inform and develop core strategies that create a "big picture" of the actual project that links scenario outputs to broader outcomes. For instance, one approach that the HayWired coalition can implement is utilizing informal data collection methods (e.g., workshops and unstructured interviews) to get a better understanding of existing gaps, concerns, and unmet needs in the community. The USGS can

then collaborate with representatives of each organization to increase their capacity in sharing and understanding the HayWired scenario outcomes and products (such as the scenario exercise toolkit). One specific measure that can be used to incentivize participation is hosting a series of informational sessions at key community institutions such as churches, offering multiple sessions throughout the week to accommodate the work schedules of the target community.

5.3.2 Participatory Action Research (PAR) Methodologies

It is key to identify influential and trusted individuals as well as existing networks within marginalized communities to partner with and help them facilitate communication regarding earthquake preparedness and recovery. Once organizations are targeted, conversation dialogues or interview scripts can be helpful in navigating conversations with interviewees. The interview guides can include scripts for introductory phone calls, formal interview questions to collect information relevant to creating information products, and follow-up interviews. The HayWired coalition could use the example of the Center for Communications Community (C3) at UCLA which fosters participatory journalism by partnering with marginalized communities and providing a platform for community members' voices in storytelling and news reporting (Rodriguez, 2005). By working with social media influencers or local journalists from the Bay Area, especially those from marginalized communities, the HayWired coalition can ensure that its message of earthquake preparedness is disseminated by trusted and locally experienced individuals who can serve as bridges between the USGS, its partners, and marginalized communities.

5.3.3 Culturally Competent Risk Communication

The HayWired coalition can leverage communications best practices from other sectors, such as public health, to create information products that are educational, visually appealing, and easily digestible for the public, as well as to account for factors such as cultural and religious identities, regionality, and literacy. The fact that the USGS does not have the authority to make policy or to prescribe preparedness actions is a barrier that other sectors also encounter. The USGS can partner with local coalitions and nonprofit organizations to lobby or implement needed reforms at the regional or local level.

Ideally, community input would be considered from the very beginning of this process to create a product that directly addresses their actual needs rather than those perceived by the USGS. However, the HayWired coalition can continue to partner with organizations that serve marginalized communities to develop and disseminate information products. To ensure the information products reach a wide and diverse audience, the coalition may consider promoting the product in public spaces such as billboards, bus stops, and newspaper flyers within the communities of interest. To increase accessibility, the information products themselves can be available in public spaces such as the library, DMV office, and other high-traffic government facilities.

5.3.4 Grant/In Kind Support for Seismic Preparedness

It would be helpful to determine whether USGS or other agencies have contacts within targeted communities or organizations and can facilitate introductions to these organizations. USGS can

make the environmental scan a standard initial procedure to identify existing preparedness activities and efforts at the local level and take a collaborative approach from the beginning by prioritizing local voices and information needs. The HayWired coalition and future projects similar to the HayWired scenario could partner with local nonprofit organizations that focus on civic engagement and participation in local public policy. The participants of such programs could be anyone from teenagers to retirees who are passionate about making a difference and who can learn about earthquake preparedness. Their familiarity with their communities will allow them to use the best approach and language to teach their communities about preparedness and help create trust between the local population and the HayWired coalition (Skidmore & Craig, 2005).

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Appendix A: Interview summaries

<u>Jean-Claude Ndongo's Interview:</u>

As part of my research on chambers of commerce, I conducted a telephone interview of an influential member of the business community in the Bay Area. The interviewee is affiliated with a network of Black-owned businesses; she stated that many businesses owned by members of marginalized groups often lack the financial resources necessary to be adequately staffed or prepared for the physical, financial, and operational impact that an earthquake or other disasters may have on their businesses. In addition, many of those businesses rarely have a disaster plan in place and often lack disaster recovery supplies. She added that the network with which she is affiliated has partnered with business consultants to help its members access grants and business planning services. In addition, through a partnership with a major internet and cable provider in the area, members of the network and other businesses from marginalized communities in the Bay Area have recently benefited from assistance with internet access and the creation of websites. The interviewee also noted that many of those businesses communicate with the network, the chambers of commerce, and their customers through social media, email distribution lists, and text messages. Consequently, she suggested that earthquake preparedness information could be shared with them using the following means: checklists in paper and PDF formats, videos, or digital applications that could be accessed on an electronic device.

<u>TyKeara Mims's Interview:</u>

I interviewed the founder of a community-based initiative to learn more about the hazard communications needs of health entities and their constituents. The goal of the organization is to promote health and safety among residents of the South of Market region of San Francisco by distributing facemasks. To fulfill this goal, volunteers provide free facemasks to community members, focusing on unhoused populations and persons experiencing addiction. Volunteers also provide instructions on how to use and properly care for facemasks.

During the interview, the interviewee acknowledged that her community was at risk for fires, and other hazards in the event of a large-scale earthquake in the Bay Area. She also emphasized that the lack of earthquake preparedness information being shared with the community is a key barrier to preparedness efforts. To address these barriers, she suggested implementing a training program and providing community members with resources to retrofit their homes.

There are community organizations that are familiar with the USGS and the needs of their community when it comes to disasters. There are also people in these communities who are aware of hazard mitigation measures that could be implemented but may not have the resources to communicate these measures with the community.

With the proper support–consisting of funding, partnerships, and training–these organizations could potentially bridge the gap between science and practice.

She also suggested that signage be posted within the community to identify muster points or safe places and routes in the event of an earthquake. Furthermore, she suggested partnering with large corporations, local organizations, small businesses, health departments, and nonprofit

organizations to connect with community members. A key takeaway from this interview was the importance of building capacity or partnerships with people who are invested in the science and are present in the community.

Jennifer Blanks's Interview:

I interviewed one of the leading administrators at a community-based racial and economic equity organization in Oakland to learn about their existing efforts to educate their constituents on disaster preparedness. I learned the organization has limited resources and means of communication to share information with their constituents – those who are houseless, those who rely on public or shared transportation, and those who are unemployed. The person I spoke with emphasized they lacked capacity to do anything outside of their current scope or range of services, including sharing information that is curated by the USGS. Based on the call, I believe one reason they lack capacity to share the tool is due to meeting the urgent needs of the community they serve. The interviewee mentioned they could possibly share the information if they did not need to be responsible for editing or creating new information, social media posts, etc. to inform their community partners about the resource.

Appendix B: Environmental scan database

Organizational categories used in the Environmental Scan include the following:

- energy and environmental justice organizations
- grassroots organizations
- financial security programs for lower-income communities
- mutual aid networks
- chambers of commerce
- public and mental health organizations

See project webpage to review the full database.