2021 Boulder County Fires - Research and Resource Coordination

About this Document: The purpose of this document was to provide an outlet for researchers to communicate information in real time regarding studies that were being launched or planned in response to the 2021 Boulder County Fires—including the Marshall Fire and Middle Fork Fire. This was also a space for researchers and our partners to share ideas regarding research that was needed as well as information about available data, equipment, resources, and funding opportunities. This document has been preserved for archival purposes and is no longer an active collaboration platform. Our hope is that similar approaches will be modeled after future disasters to coordinate research activities and reduce the burden on disaster affected communities.

1. **Enter a Research Project Already Launched**
2. **Enter Details Regarding a Planned Research Study**
3. **Have Data, Equipment, Information, or Other Resources To Share? Enter Details Here**
4. **Have a Research Question, Idea, or Topic You Want to Promote? Enter It Here**
5. **Funding Opportunity? Enter Details Here**

Why We Created this Document: Over the past 70 years, post-disaster research has produced fundamental insights that have reduced harm and suffering and transformed policy, emergency management practice, and building codes and standards. At the same time, disaster zone research can introduce challenges for busy emergency officials as well as for affected residents. As researchers, there is an ethical imperative that we work together to minimize burdens on emergency responders and affected residents while also producing and sharing relevant results. This is an opportunity for our Colorado research community - and our partners across the nation and around the world - to come together to ensure *open communication*, *ethical coordination*, and *meaningful collaboration* to advance science for society.

Who Created this Document: This document was created and maintained by the director of the Natural Hazards Center and the NSF-supported CONVERGE initiative at the University of Colorado Boulder in partnership with the leaders of the Disaster Innovation Group (DIG) through the Colorado State Recovery Task Force for the 2021 Boulder County Fires. New contributions were entered via the suggesting feature and were reviewed and approved daily.

Associated Events: We hope you will view recordings of the four CONVERGE Virtual Forums focused on the 2021 Boulder County Fires.

Questions: If you have questions about this document, please contact Professor Lori Peek, who is director of the Natural Hazards Center and CONVERGE at the University of Colorado Boulder, at Lori.Peek@colorado.edu.

1. Enter a Research Project Already Launched

Please fill out this table if you have already launched a study in response to the 2021 Boulder County Fires.

Study Title	3-5 Comma-Separated Keywords	Brief Study Description (100 words or less)	Researcher First and Last Name(s) and Discipline(s)	Researcher Affiliation(s)	Contact Email(s)	Local Contacts or Other Relevant Partnerships	Indicate if the Research Team has Data or Other Information They are Willing to Share w/ Other Researchers or Local Partners
Response of Water Utilities to the Marshall Wildfire	Water contamination, wildfire, water sampling	Working with Louisville and Superior public works on the recovery of their water	**Andrew Whelton,** Civil, Environmental, & Ecological Engineering	Purdue University CU Boulder Oregon State University	awhelton@purdue.edu brad.wham@colorado.edu erica.fischer@	Louisville and Superior Public Works	

		system after the fire	**Brad Wham,** Civil, Environmental, & Architectural Engineering **Erica Fischer,** Civil & Construction Engineering		oregonstate.edu		
Geotechnical, Lifeline, and Housing Damage	Soils, lifelines, utilities, housing damage	Field investigation of slope stability, housing foundations, retaining walls, housing characteristics that influenced survivability of housing, and decisions being made by jurisdictions based on engineering data. **We already have all housing data from**	**Brad Wham,** Civil, Environmental, & Architectural Engineering **Erica Fischer,** Civil & Construction Engineering **Shideh Dashti,** Geotechnical Engineering & Geomechanics **Abbie Liel,** Structural Engineering &	CU Boulder Oregon State University Purdue University	brad.wham@colorado.edu erica.fischer@oregonstate.edu shideh.dashti@colorado.edu abbie.liel@colorado.edu amy.javernick@colorado.edu awhelton@purdue.edu	Louisville and Superior Public Works Louisville and Superior Building Departments	

		Louisville.	Structural Mechanics **Amy Javernick-Wil,** Construction Engineering and Management **Andrew Whelton,** Civil, Environmental, & Ecological Engineering)				
Indoor Air Quality in Homes Impacted by Smoke from the Marshall Fire	Air quality, smoke, sampling	Field study to measure gas and particle concentrations in homes impacted by the Marshall Fire. Study the impact of different mitigations.	**Joost De Gouw,** CIRES, Chemistry **Michael Hannigan**, Mechanical Engineering **Marina Vance,** Mechanical Engineering **Colleen Reid**, Geography	University of Colorado Boulder	Joost.deGouw@Colorado.EDU Michael.Hannigan@Colorado.EDU Marina.Vance@Colorado.EDU Colleen.Reid@Colorado.EDU Christine.Wiedinmyer@Col	Boulder County Department of Public Health, CDPHE, NOAA	

			Christine Wiedinmyer, CIRES/Mechanical Engineering		orado.EDU		
Outdoor Air Quality in the Marshall Burn Area	Air Quality, AirSampling, VOCs	Drives the NOAA mobile laboratory through the burn area and downwind to create high resolution spatial maps of air pollutants and air toxics	**Steve Brown,** NOAA, Chemistry **Carsten Warneke,** NOAA **Jessical Gilman**, NOAA **Matt Coggon**, NOAA, CIRES **Jeff Peischl,** NOAA, CIRES **Chelsea Stockwell,** NOAA, CIRES	NOAA, CU Chemistry Department, CIRES	steven.s.brown@noaa.gov Carsten.Warneke@noaa.gov jessica.gilman@noaa.gov matthew.m.coggon@noaa.gov jeff.peischl@noaa.gov chelsea.stockwell@noaa.gov	Boulder County Public Health, CDPHE	
Monitoring the Recovery of the Coal Creek Ecosystem Following the Marshall Fire	Water quality, Metals, Nutrients, DOC, microbiome, CPOM	Monitoring of recovery of Coal Creek along the Coal Creek Trail (trace metals, nutrients,	**Diane McKnight** (Environmental Engineering) **Julie Korak**	CU Boulder	diane.mcknight@colorado.edu julie.korak@colorado.edu		

		DOC, periphyton, benthic invertebrates), small molecules, microbiome; CPOM; Samples archived on first snow melt.	(Environmental Engineering) **Cresten Mansfeldt** (Environmental Engineering) **Fernando Rosario-Ortiz** (Environmental Engineering) **Lauren Magliozzi** (Environmental Engineering) **Michael Thurman** (Environmental Engineering) **Imma Ferrer** (Environmental Engineering) **Katherine Lininger** (Department		cresten.mansfeldt@colorado.edu fernando.rosario@colorado.edu lauren.magliozzi@colorado.edu michael.thurman@colorado.edu imma.ferrer@colorado.edu		

			of Geography)				
Monitoring Coal Creek for 12 Wildfire Compounds	Water quality	Monitoring stream water for PCAs, BPCAs, MA, NDAs, and BCAs as part of a multi-utility contaminants of emerging concern collaborative led by Northern Water. Samples only collected on 1/14/22	**Kate Dunlap** **Michelle Wind** (City of Boulder)	CU Boulder conducts the analysis (Mike Thurman and Imma Ferrer)	dunlapk@bouldercolorado.gov windm@bouldercolorado.gov	Northern Water, City of Boulder, Boulder Watershed Collective, Longmont, Greeley, Estes Park, Fort Collins, Loveland, Broomfield, CU Boulder	
Air Samples with Canisters ***Analyses of NOAA Mobile Lab Measurements with TOGA-GC-TOF***		Measurements and analyses of outdoor AQ with canisters	**Eric Apel** NCAR ACOM **Pieternel Levelt** NCAR-ACOM In collaboration with NOAA **Steve Brown** **Jessica**	Eric Apel NCAR ACOM	apel@ucar.edu levelt@ucar.edu	NCAR Directorate Boulder County	

			Gilman (NOAA)				
Public Alert and Warning During the Boulder County Fires	Alert, warning, IPAWS, Wireless Emergency Alerts, Everbridge	Examines the challenges of public alert and warning that were confronted during the fires and explores community participation in improving systems and processes in the future	**Hamilton Bean**, communication	CU Denver	hamilton.bean@ucdenver.edu	N/A hamilton.bean@ucdenver.eduPlease see the note from Katie Dickinsonhere regarding.. "I Have contacts at the National Weather Service to connect you too."	
CAWFE Coupled Weather-Fire Simulation of December 2021 Wildland Fire Behavior & WUI	Fire behavior; numerical simulation, WUI	Numerical simulation of mesoscale to microscale weather, fuel, terrain factors shaping the Boulder County Fires, factors constraining and influencing them. Numerical model output for emissions	**Janice Coen,** atmospheric & wildland fire science	NCAR MMM	janicec@ucar.edu	Case study in support of existing projects. Various external collaborators.	

		inventories.					
Impact of Community Characteristics on the Survival Likelihood of Buildings and Critical Facilities due to the Marshall Fire	Damage, structures, survival likelihood (Prelim data has been collected).	Characteristics of the community as well as the buildings that influenced survivability likelihood of structures.	**Hussam Mahmoud,** civil and environmental engineering	Colorado State University	Hussam.Mahmoud@colostate.edu	Louisville and Superior Building Departments and Boulder County Department of Public Health	
Public Health Support Lessons for the Colorado Fires	Water, waste, wastewater, environmental health	Waste, waste, wastewater, air, environmental health challenges of private homeowners	**Andrew Whelton,** Civil, Environmental, & Ecological Engineering **Christian Ley,** Civil, Environmental, and Architectural Engineering	Purdue University CU Boulder	awhelton@purdue.edu Christian.ley@colorado.edu	Boulder County Public Health	
Rebuilding Decisions by City Building Departments, Neighborhoods, and Homeowners	Building, construction, codes, decisions	Characterizing information needs and the decision-making process for rebuilding by city planning	**Abbie Liel,** Structural Engineering & Structural Mechanics **Amy Javernick-**	CU Boulder	abbie.liel@colorado.edu amy.javernick@colorado.edu koschmann@	City of Louisville Planning and Building Safety Department; Town of	

		and building departments, neighborhood HOAs, and households.	**Will,** Construction Engineering and Management **Matthew Koschmann,** Communication Megan Ellery, Civil Systems		colorado.edu megan.ellery@colorado.edu	Superior Building Department; Boulder County Plans and Permitting Office: Building Code and Plan Review; HOAs; Households	
Fine particulates deposition in fire-affected lakes	Water quality	Measurement of extremely fine particle deposition from smoke and soot. Not specifically targets for public health but rather an improved understanding of fine particle creation by an urban wildfire.	**James Ranville,** Chemistry	Colorado School of Mines	jranvill@mines.edu	City of Louisville Open Space Division	
The	Person-to-	Identify the	**J. Anthony**	CU Boulder	tony.cookson		

relationship between GoFundMe donations and individual rebuilding decisions and financial recovery	person, donation, rebuilding, credit scores, delinquency, mobility	drivers of variation in person-to-person donations. Test whether the depth (total amount) and breadth (total number) of these donations correlate with household rebuilding decisions and financial recoveries.	**Cookson** Finance **Emily Gallagher** Finance / Real Estate		@Colorado.EDU emily.a.gallagher@colorado.edu		
RAPID: Drinking Water System Contamination Response and Recovery Following the 2021 Colorado Wildfires	Water quality, plastics, contamination, drinking water, homes	An integrated field and laboratory study to (1) identify VOCs of concern by exhuming and characterizing damaged plastic components from the DWDS of the collaborating utilities affected by the Marshal	Andrew Whelton, Jeffrey Youngblood Amy Marconnet Amisha Shah David Johnson	Purdue University	awhelton@purdue.edu	National Science Foundation	

		Fire, and 2) simulate and quantify VOC generation profiles from fire-induced damages to plastic water infrastructure materials using PE flat sheets with antioxidant stabilizers as model systems.					
The Boulder Fires: Rapid Integrated Damage Assessment	Boulder fires, Rapid Damage Assessment, Recovery Planning	The project will collect perishable data on damage resulting from the December 2021 Boulder wildfire, using 360 image equipment and processing software to map and characterize the impact of the disaster. The	Karl Kim, Urban and Regional Planning Lily Bui, Urban and Regional Planning Eric Yamashita Urban and Regional Planning Mike Vorce, Technology	Karl Kim, University of Hawai‘i Department of Urban and Regional Planning Lily Bui, University of Hawai‘i Department of Urban and Regional Planning Eric Yamashita University of	Karl Kim, karlk@hawaii.edu Lily Bui, buil@hawaii.edu Eric Yamashita, ericyama@hawaii.edu Mike Vorce, info@sitetour360.com	National Disaster Preparedness Training Center (ndptc.hawaii.edu)	Yes!

		information will be used to support and monitor recovery planning and the development of wildfire risk reduction strategies. The data, imagery and procedures will be made available through workshops and training sessions to the Boulder community to support collective actions to reduce risks and improve recovery capabilities. The lessons will be incorporated into FEMA-certified recovery training		Hawai‘i Department of Urban and Regional Planning Mike Vorce, Founder, Site Tour 360			

		courses offered by the National Disaster Preparedness Training Center.					
NSF RAPID: Can Big Ideas About Resilience Survive the Reality of a Disaster? Built Environment Policy and Recovery After the Marshall Fire	Public policy and urban planning, disaster recovery and place resilience.	This project will examine how local government decision-makers balance household and community recovery needs with long-range climate and resiliency policies. The research team plans to combine longitudinal household surveys and mixed-methods analysis of recovery	**Deserai Crow** (Public Administration; Emergency Management) **Katie Dickinson** (Environmental Health) **Andrew Rumbach** (Urban and Regional Planning) **Betsy Albright** (Duke)	CU Boulder CU Anschutz Duke University Texas A&M University and the Hazard Reduction and Recovery Center	deserai.crow@ucdenver.edu katherine.dickinson@cuanschutz.edu arumbach@arch.tamu.edu elizabeth.albright@duke.edu	City of Louisville; Town of Superior and Boulder County NOTE: Katie lives in Louisville and is in touch with the city; team has connections to Superior and Boulder folks as well as DOLA and FEMA Region VIII. **We have formed a survey working group** to	

		decision-making and planning processes.				coordinate across research teams doing resident surveys and/or key informant interviews in order to **minimize burden on residents and city staff**	
Hazard Education and Awareness Task (HEART Force): Bouncing Forward from the Marshall Fire	K-12 science education, resilience, PBL, teacher professional development	Existing rural education on natural hazard community resilience, deepening partnership in BVSD with middle and high school science classrooms.	**Katya Schloesser,** CIRES Education & Outreach **Alicia Christensen,** CIRES Education & Outreach **Anne Gold,** CIRES Education & Outreach	CU Boulder CU Boulder CU Boulder	katya.schloesser@colorado.edu alicia.christensen@colorado.edu anne.u.gold@colorado.edu	BVSD Boulder Office of Emergency Management Dr. Courtney Welton, Natural Hazards Center	We are always looking for scientists and community experts to work with students as they develop community resilience projects.
Marshall Fire Story Project (MFSP)	Community archive, storytelling, narrative,	The goal of this project is to create a community	**Kate Goldfarb**, Anthropology	CU Boulder	kathryn.goldfarb@colorado.edu		

	processing trauma, community recovery	archive of experiences surrounding the Marshall Fire and its aftermath, including the archiving of GoFundMe campaigns. Story elicitation in English and Spanish.	**Jason Hogstad**, Louisville Historical Museum	City of Louisville	jhogstad@louisvilleco.gov		

2. Enter Information Regarding a Planned Research Study

This table is for researchers who are considering initiating a study in response to the 2021 Boulder County Fires. Please fill out this table so that others can be aware of your efforts and indicate whether you are looking for collaborators. Also, please know that we understand that researchers often do not want to share too much about their study before it is launched! With that in mind, this table is meant to help researchers to connect while also hoping to reduce duplication of effort. Please share as little or as much as you are comfortable.

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Draft Study Title	**3-5 Comma-Separated Keywords**	**Brief Study Description (100 words or less)**	**Researcher First and Last Name(s) and Discipline(s)**	**Researcher Affiliation(s)**	**Contact Email(s)**	**Are You Looking for Collaborators or Other Connections? Other Updates or Questions to Share?**
Influence of Risk Perception on Relocation Decision-making after the 2021 Marshall Fire	Risk Society, Relocation, Displacement, Social Vulnerability, WUI	In this study we will survey wildfire affected people through interviews and questionnaires with an aim to understand the influence of risk and risk perception–as well as factors of social vulnerability–on	**Kristopher Young**, Sociology: Environmental and Social Justice **Tasnim Isaba**, City and Metro Planning	Department of Sociology, University of Utah Department of City and Metro Planning	kristopher.young@soc.utah.edu u1299549@utah.edu (Tasnim)	We hope to connect with folks doing social survey work in Boulder County, who have connections with individuals and community organizations on the ground, and/or who may already be

		household level decision-making to relocate or not from Boulder County, after the 2021 Marshall Fire.				developing questionnaires and semi-structured interview scripts, rather than doing this in isolation, so we might reduce redundancy and the strain on households affected by the 2021 Marshall Fire.
Engaging Wildland Urban Interface (WUI) Neighborhoods in Becoming Wildfire Prepared	**Mitigation, fire prevention, wildland urban interface**	**This study features outreach to wildland urban interface neighborhoods in Boulder (to be determined) to ascertain appropriate firewise measures. Study features focus groups of communities who are motivated and disengaged to determine the perceived**	**Burton St. John III, Public Relations**	**APRD department, CMCI, University of Colorado-Boulder**	**burton.st.john@colorado.edu**	**Would be glad to collaborate with individuals from diverse disciplines and professions.**

		feasibility and efficacy of firewise measures.				
Interpretive Education in the Landscape as a means of Eco-Healing	Collective Trauma, Interpretive Education, Ecological Design	This project is a studio-based research effort that will be conducted in the Fall 2022. This projects aim is to develop methods of community-engaged design that use humility and healing in the context of community trauma. We will collectively develop this research as a collaboration between undergraduate students at CU Boulder, local youth, local non-profit partners, and open space and local and government planning	Emily Greenwood, Landscape Architecture/ Environmental Design		greenwer@colorado.edu	

		officials. The findings of this project will be formatted as design displays, booklets and media that communicates our research on landscapes of community healing and resilience. These will be disseminated to communities that use the open space mountain parks impacted by the Marshall Fire as well as non-profit organizations and local government partners. The study area for this studio is points along the Marshall Fire and, NCAR Fire scars and other locations significant in telling the				

		indigenous, climate change, and wildfire stories in South Boulder.				
Investigation of 2021 Marshall Fire	Housing, decision making, recovery	There is a large gap in knowledge on how to build more resilient communities while balancing the demands of the present with the climate and infrastructure demands of the future. This team and proposal is led by civil engineers and social scientists to investigate damage patterns to civil infrastructure, the influence of that damage on decision-making processes for future planning and construction of infrastructure.	**Erica Fischer** (Civil & Construction Engineering) **Brad Wham** (Civil, Environmental, & Architectural Engineering) **Shideh Dashti** (Geotechnical Engineering & Geomechanics) **Abbie Liel** (Structural Engineering & Structural Mechanics) **Amy Javernick-Will** (Construction Engineering & Management)	Oregon State University CU Boulder Purdue University	erica.fischer@oregonstate.edu	We are looking for **potential collaborators** in sociology and planning. The team is supported by Geotechnical Extreme Event Reconnaissance (GEER) and is in the process of submitting a RAPID proposal to NSF.

			Andrew Whelton (Civil, Environmental, & Ecological Engineering)			
RAPID - Sustained Air Quality Impacts of the Marshall Fire in Boulder County	Indoor air quality, smoke-impacted homes	Field study to measure gas and particle concentrations in homes impacted by the Marshall Fire. Study the impact of different mitigations. Analysis of the data.	**Joost De Gouw** (CIRES, Chemistry) **Michael Hannigan** (Mechanical Engineering) **Marina Vance** (Mechanical Engineering) **Colleen Reid** (Geography) **Christine Wiedinmyer** (CIRES & Mechanical Engineering)	University of Colorado Boulder	Joost.deGouw@Colorado.EDU Michael.Hannigan@Colorado.EDU Marina.Vance@Colorado.EDU Colleen.Reid@Colorado.EDU Christine.Wiedinmyer@Colorado.EDU	Boulder County Department of Public Health, CDPHE, NOAA
Understanding the Processes Controlling the Evolution of the Marshall Fire and Its Impact on Air Quality	Wildfire behavior modeling, characterization and modeling of impacts of the Marshall fire on air quality, weather, and	We plan to use multi-platform observations to characterize the impacts of the Marshall Fire on air quality and then develop a	**Rajesh Kumar** (NCAR, AQ modeling), **Gabi Pfister** (NCAR, AQ modeling),	National Center for Atmospheric Research (NCAR)	rkumar@ucar.edu branko@ucar.edu cenlinhe@ucar.edu	NSF and NASA RAPID

	health	coupled WRF-Fire-Chem system to simulate the behavior of the Marshall Fire and its impact on air quality and public health.	**Branko Kosovic** (NCAR, wildfire behavior modeling), **Forrest Lacey** (NCAR, AQ modeling and low-cost sensor data), **Tim Juliano** (NCAR, wildfire behavior modeling), **Masih Eghdami** (NCAR, wildfire behavior modeling), **Helen Worden** (NCAR, satellite remote sensing), **Cenlin He** (NCAR, AQ modeling), and **Jason Knievel** (NCAR, wildfire behavior modeling and NWP)		hmw@ucar.edu knievel@ucar.edu lacey@ucar.edu masih@ucar.edu pfister@ucar.edu tjuliano@ucar.edu	

Post-event Review: Leveraging recovery/ rebuilding to support risk reduction/ resilience; operationalizing past research to inform BBB	Rebuilding, policy, resilience	Utilizing post-event review capability (PERC) methodology to understand how the recovery/ rebuilding can be leveraged to reduce risk and build resilience to future events and where there are entry points for operationalizing recommendations from past research.	**Rachel Norton** **Karen MacClune** **Kanmani Venkateswaran** ISET, climate/disaster resilience	ISET - International	rachel@i-s-e-t.org karen@i-s-e-t.org	**Looking for collaborators** and/or **to support others** already delving into our RQs
First Exchange of Ideas	Wider research initiative including analyses of the meteo conditions, aq modelling, is there a relation with climate change? We intend to use modelling, ground based and satellite information	A collaborative effort within NCAR with 4 labs to initiate a wider research initiative across NCAR to make a total analysis of this event. These include an analysis of the meteorological conditions that led to this wildfire, an	**Pieternel Levelt** **Jean Francois Lamarque** **William Mahoney** **Gretchen Mullendorf**	NCAR ACOM NCAR GCD NCAR RAL NCAR MMM	levelt@ucar.edu	NCAR Directorate Boulder County NSF RAPID

		analysis if this is expected to happen more often in a changing climate, and a modeling effort with an exact calculation of this wildfire storm including air pollution . We are currently exchanging our ideas and setting up a small program to start with this analysis - and will try to convince our leadership that this is important.				
Tracking the Effects of the Marshall Fire on Pets and People	Pets, Wildfire, Animal Welfare, Veterinarians	This project has three goals. First, it will take a census of lost, found, missing, and deceased pets and assess the means by which these numbers are currently tracked	**Leslie Irvine,** PhD, Sociology **Casara Andre,** DVM	University of Colorado Boulder Front Range Veterinary Medical Reserve Corps	leslie.irvine@colorado.edu casara.andre@rockymountainmrc.org	Open to **collaborators** from other disciplines **Sarah DeYoung** (University of Delaware) emailed Leslie, would like to join perhaps with a focus on trauma

		with the goal of improving tracking lost animals in subsequent disasters. Second, this project will assess the impact of the disaster on the veterinary clinics within the burn zone, examining the material, staffing, and other needs following the fire. Third, this project will explore and, if possible, implement ways to meet the needs raised by the veterinarians.				and grief.
Assessing the Potential for Soil Contamination from the 2021	soil contamination, metals	Plan is to sample soils from residential properties and 'open space' areas inside and	**Noah Fierer** (EBIO/CIRES) **Eve Hinckley** (ENVS/INSTAAR)	CU Boulder CU Boulder	noah.fierer@colorado.edu Eve.Hinckley@colorado.edu	We will plan to work with CDPHE, Boulder County, and possibly other gov't agencies.

Marshall Fire		outside the burn area to quantify how the fire, including the burning of structures, may have impacted soil contamination with heavy metals. https://marshallsoils.colorado.edu/				Also looking for other **collaborators** - especially if someone is interested in other soil pollutants (e.g. PAHs) Project website: https://marshallsoils.colorado.edu/
Survey of Evacuation Behavior in the 2021 Boulder County, CO Grass Fires	Evacuation, emergency response, decision-making	The goal of this project is to examine risk perception, evacuation decisions and travel behavior during the 2021 CO fires via household surveys, and mobile device GPS data. This is a unique opportunity to improve strategies for evacuation planning and real-time decision-making	**Erica Kuligowski**, fire engineering and sociology **Xilei Zhao**, civil and coastal engineering **Ruggiero Lovreglio**, built environment **Tom Cova**, Geography **Daniel Nilsson**, fire engineering **Xiang Yan**, transportation	RMIT University, Melbourne, Australia University of Florida (***Lead***) Massey University, NZ University of Utah University of Canterbury, NZ University of	erica.kuligowski@rmit.edu.au xilei.zhao@essie.ufl.edu	We plan to work with local emergency officials in Boulder County, and would welcome (and appreciate!) help with **introductions to key officials**. We are also coordinating with **Jeannette Sutton** from the University at Albany, SUNY by adding a few questions to our survey that

		by studying evacuation from this event – a fire that impacted a suburban population predominantly inexperienced with wildfire events and, for some, provided little warning about the need to evacuate.	policy and planning	Florida		Jeannette has written, re: households' pre-fire knowledge of and experience with alerting systems, including CodeRED and WEA.
Emergency Messaging for Dynamic and Uncertain Events	Alerts and warnings, risk communication, information technology	The goal of this project is to investigate the challenges of alerting for dynamic and uncertain events, with a focus on wildfire (across multiple jurisdictions and historical events). We will draw from survey items on alert and warning (see Kuligowski et al. entry on evacuation	**Jeannette Sutton,** communication and sociology **Erica Kuligowski,** fire engineering and **Sociology** **Tom Cova,** geography	University at Albany, SUNY RMIT University, Melbourne, Australia University of Utah	jsutton@albany.edu erica.kuligowski@rmit.edu.au	We are interested in obtaining **(after action reports) AARs for wildfire events** and **connecting with alerting authorities** who message about wildfire events to the public.

		above), a database of wireless emergency alerts, historical records of wildfire alerting, and communication with alerting authorities about the challenges of communicating to the public under fast moving conditions.				
Impact of Community Characteristics on the Survival Likelihood of Buildings and Critical Facilities due to the Marshall Fire	Damage, structures, survival likelihood (Prelim data has been collected).	Characteristics of the community as well as the buildings that influenced survivability likelihood of structures	**Hussam Mahmoud**	Colorado State University	Hussam.Mahmoud@colostate.edu	Working on an NSF RAPID
Dome Home Survivability during Significant Loss events Such as the	Structure Damage, Home construction methods and the impact of environmental	Modelling a deeper understanding of how more resilient construction	**Caleb Eastman**	WinterWinds Robotics	Caleb@winterwinds.io	I am looking for **collaborators** studying built environments and learning whether we can

Marshall Fire	events.	methods might impact survivability likelihood of structures during catastrophic events.				improve survivability through changing our home construction methods. In particular I will be studying the impacts the Marshall Fire has had on the home construction types prevalent in the area and the likelihood of survival if Dome homes were in those locations instead, particularly as it relates to house to house fire spread.
Autonomous Mobile and Aerial Robotics Intervention in Woodland Urban Interface Fires	Autonomous Firefighting, Firefighting Cobotics	The role that robots and autonomous systems can take in helping to identify and aid in the suppression of fires, particularly fast moving fires	**Caleb Eastman** **Valerie Eastman** **Jason Henning** **Adam Guetz**	WinterWinds Robotics	Caleb@winterwinds.io	Interested in **collaborators** from Universities interested in Robotic autonomy as well as groups looking to model the fire spread in Unity.

		requires further study. Could autonomous systems have helped firefighters stretch their limited resources? Modeling fire spread and potential intervention strategies using autonomous systems is the goal of this study.				
Emotional Impacts of "Off-Season" Fires on Residents and First Responders	Emotional geographies, climate change, anthropology, qualitative research	The Marshall Fire was an "off-season" fire, and the product of climate-induced drought. Yet - is this important in how local residents and first responders conceptualize the fire? Is this relevant to their emotional responses to this event?	**Meg du Bray**	Hollins University/ Arizona State University	meg.dubray@gmail.com dubraymv@hollins.edu	I am not necessarily looking for collaborators at this moment, but might be when publication/info dissemination becomes possible.

Assessing Household Wildfire Risk and Preparedness in Boulder	Fire risk, trust, WUI, mitigation	Our project proposes to increase understanding of the wildfire risk profile for the Boulder wildland-urban interface (WUI) by assessing current wildfire risk levels to private structures, homeowner actions and behaviors to reduce risks. We also seek to evaluate homeowners trust in OSMP and support for fire mitigation efforts. We will conduct household surveys in high risk WUI neighborhoods adjacent to OSMP lands, in partnership with Boulder Fire-Rescue, to	**Amanda Carrico,** **Karen Bailey,** **Natalie Bennett,** Environmental Studies, CU Boulder	CU Boulder	amanda.carrico@colorado.edu karen.bailey@colorado.edu natalie.bennett@colorado.edu	Unsure, submitted to Boulder OSMP for funding, will work with CU undergrads

		elucidate homeowner actions, behaviors, and trust. We will also conduct updated curbside assessments during the summer of 2022.				
Response to the 2021 Colorado Wildfires	Water, plastics, infrastructure, contamination	This work will elucidate the fundamental processes that control (wildfire caused) thermal damage to, contamination and decontamination of plastic containing systems and the generation of water contamination.	**Andrew Whelton,** Civil and Environmental Engineering **Jeffrey Youngblood,** Materials Engineering **Amy Marconnet,** Mechanical Engineering **David Johnson,** Industrial Engineering and Political Science **Amisha Shah,**	Purdue University	awhelton@purdue.edu	Waiting for response from agency

			Civil and Environmental and Ecological Engineering			
Interactions of wildfires and the built environment	built environment, land development, human settlements, wildland-urban interface, geospatial analysis	We leverage several publicly available and proprietary datasets (e.g., building footprint data, ZTRAX property data, 3d building data including detailed thematic building-level information (building material, owner situation, building age, building function, etc.) to gain deeper understanding of the damage and to learn about how land development, urban expansion, urban sprawl can be made more resilient	**Stefan Leyk** (Geography, Institute of Behavioral Science) **Jennifer Balch** (CIRES, Earth Lab, Geography) **Maxwell Cook, Johannes Uhl** (Earthlab)	CU Boulder	Stefan.Leyk@colorado.edu jennifer.balch@colorado.edu	**We seek to streamline efforts with researchers working on similar topics, potential data exchange**

		and sustainable, less vulnerable.				
Social Capital, Mobility, and Social Media Platforms in the Boulder Fires	Social capital, mobility, social media platforms	We hope to use mixed methods approaches to understand how social ties, mobility, and social media platforms influenced the disasters and their outcomes	**Daniel Aldrich** (Northeastern University) **Courtney Page-Tan** (Embry Riddle Aeronautical University) **Tim Fraser** (Northeastern University) **Garrett Morrow** (Northeastern University)	Northeastern University	daniel.aldrich@gmail.com	
Response and Recovery Challenges Faced by Small Water Systems Attacked by the Colorado Fires	Water, infrastructure, quantity, contamination	This work examines the physical, financial, and social, and challenges of typically under supported water systems in response to fire.	**Andrew Whelton** (Purdue) **Christian Ley** (CU Boulder)	Purdue University	awhelton@purdue.edu	Self-funded
Wildfire impact on elderly communities at wildland-urban	WUI, Elderly populations, Health,	With a focus on the elderly population, the most vulnerable	**Guofeng Cao** (Geography, CU Boulder)	CU Boulder, University of Texas, Arlington	guofeng.cao@colorado.edu zhen.cong@uta.	

interfaces	Big Data	segments of the society, at wildland-urban interfaces, we aim to assess and examine the socioeconomic and health impacts of wildfires on WUI communities and the relationship with building environments and aging infrastructures.	**Zhen Cong** (University of Texas Arlington) **Wei Song** (University of Alabama)	University of Alabama	edu wsong@eng.ua.edu	
Household Capacity Development in the Aftermath of the Marshall Fire	Capacity, resiliency, households, asset-based development	We wish to examine how household capacity has changed in six separate capacity factors (resources, investments, network support, household network, grit, and change) using a recently theorized framework for engineering	**Azadeh Bolhari** (Environmental Engineering) **Shelby Tillema** (Environmental Engineering)	CU Boulder	azadeh.bolhari@colorado.edu shelby.tillema@colorado.edu	While our theorized framework was created with the aid of a sociologist, we would love to collaborate with a sociologist or someone else of a social-sciences background that believes they could be of aid.

		capacity. The timeframe of the data collected for this work will be from before the fire to about a year from now with a chance for possible extension.				

3. Data, Equipment, Information, or Other Resources to Share

Please fill out this table if you have data, information, or other resources that you would like to share with the research community.

What do you have to share? Data? Equipment? Information? Resource?	Brief Description of the Resource	Information on How to Access the Resource	Contributor Name(s)	Contact Email(s)
Air Quality Mitigation informational Website	Web site with regularly updated information and guidance regarding air quality in the homes impacted by the fire.	https://cires.colorado.edu/news/how-mitigate-post-fire-smoke-impacts-your-home	**Christine Wiedinmyer**, CIRES, University of Colorado Boulder	Christine.Wiedinmyer@colorado.edu
CONVERGE Training Modules	These **free online training modules** synthesize decades of hazards and disaster research. They are created for those new to the field and focus on a range of important topics such as **perishable data collection, ethical considerations, vulnerable populations,** and more.	https://converge.colorado.edu/resources/training-modules/	**Rachel Adams, Candace Evans, Lori Peek**, Natural Hazards Center and CONVERGE, University of Colorado Boulder	Rachel.Adams-1@colorado.edu Candace.Evans@colorado.edu Lori.Peek@colorado.edu

CONVERGE Extreme Events Research Check Sheets	These **short, graphical research check sheets** are meant to help hazards and disaster researchers as they design their studies, prepare to enter the field, conduct research, and exit the field. The check sheets offer best practices for extreme events research. .	https://converge.colorado.edu/resources/check-sheets/	**Lori Peek,** Natural Hazards Center and CONVERGE, University of Colorado Boulder	lori.peek@colorado.edu
RAPID Facility: Equipment, software, and support services for disaster reconnaissance research	The NSF-supported RAPID facility provides investigators with the equipment, software, and support services needed to collect, process, and analyze perishable data from natural hazard and disaster events. We have a variety of resources to support engineering and the social and natural sciences (complete list is available via the accompanying link).	https://rapid.designsafe-ci.org	**Jamie Vickery** **Nicole Errett** **Joe Wartman** **Jeffrey Berman** RAPID, University of Washington	vickeryj@uw.edu nerrett@uw.edu wartman@uw.edu jwberman@uw.edu
Social Science Extreme Events Research (SSEER) Network	**SSEER** is a National Science Foundation-supported network for social science hazards and disaster	https://converge.colorado.edu/research-networks/sseer/ Find SSEER	**Lori Peek,** Natural Hazards Center and CONVERGE, University of Colorado Boulder	lori.peek@colorado.edu

	researchers. The network currently involves **1,420 social scientists** globally.	researchers on our interactive map at: https://converge.colorado.edu/research-networks/sseer/researchers-map/		
Academic Hazards and Disaster Research Centers	The Natural Hazards Center has identified 370 academic hazards and disaster research centers, institutes, and labs globally (with 160 in the United States). You can find these centers on our interactive web map.	https://hazards.colorado.edu/resources/research-centers	**Lori Peek,** Natural Hazards Center and CONVERGE, University of Colorado Boulder	lori.peek@colorado.edu
DesignSafe Cyberinfrastructure	DesignSafe is a comprehensive cyberinfrastructure that is part of the NSF-funded Natural Hazard Engineering Research Infrastructure (NHERI) and provides cloud-based tools to **manage, analyze, understand, and publish critical data for research to understand the impacts of natural hazards**. The capabilities within the DesignSafe infrastructure are	https://www.designsafe-ci.org/about/designsafe/	**Ellen Rathje,** DesignSafe, University of Texas-Austin	e.rathje@mail.utexas.edu

	available at no-cost to all researchers working in natural hazards.			
openIDL	openIDL is a new open-source infrastructure for consolidating and querying data from insurance carriers that addresses many of the data privacy and data security concerns typical of the insurance industry. The infrastructure is flexible and domain/use case agnostic and could be leveraged to evaluate the effectiveness of wildfire mitigation activities in terms of correlating actual losses with wildfire mitigation data.	https://openidl.org/ https://wiki.openidl.org/display/HOME/openIDL+Homepage https://github.com/openidl-org	**Matt Hinds-Aldrich,** American Association of Insurance Services - AAIS	matth@aaisonline.com
Disaster Research Response (DR2) Program	The DR2 Program provides training, funding, and a Resources Portal of tools (protocols, questionnaires, community of practice contacts, IRB guidance and pre-screened instruments,	https://www.niehs.nih.gov/research/programs/disaster/index.cfm	**Richard Kwok,** NIH / NIEHS **Aubrey Miller,** NIH / NIEHS	Richard.Kwok@nih.gov miller.aubrey@nih.gov

	etc.) to empower human health research in response to disasters and public health emergencies - including wildfires. All materials are available for free.			
CU Scholar Data Repository	CU Scholar is an open access institutional repository supporting the research and teaching mission of the University of Colorado Boulder. It is intended to serve as a platform for preserving and providing public access to the research activities of members of the CU Boulder community. Scholar currently houses a number of Earth Lab and other enviro dataset for reuse, education, etc. Datasets receive DOI to make them accessible and findable for anyone including CU community members, governmental and other community stakeholders.	https://scholar.colorado.edu/	**Jordan Wrigley,** CRDDS	jordan.wrigley@colorado.edu CRDDS@colorado.edu

Research Data Infrastructure/HPC	Infrastructure to support the curation, storage, access, and long-term preservation of scholarly digital assets and research data including containerization, computational environments, etc.	https://www.colorado.edu/crdds/what-we-do/research-data-infrastructure	**Jordan Wrigley,** CRDDS	CRDDS@colorado.edu
Data Workflow Management and Training	We bring together experts across domains in research computing, research data management, digital humanities, data visualization, and scholarly communication, in order to offer a wide range of events, resources, and support throughout the research data lifecycle including grants and student education.	Training: https://www.colorado.edu/crdds/what-we-do/education-training Grant Support: https://www.colorado.edu/crdds/what-we-do/grant-support	**Jordan Wrigley,** CRDDS	jordan.wrigley@colorado.edu CRDDS@colorado.edu
California Fires: Building Resilience from the Ashes	This **post-event report** draws on insights from research and interviews with wildfire-impacted Californians, including homeowners, business leaders, and university officials, as well as civic and nonprofit representatives involved	https://floodresilience.net/resources/item/california-fires-building-resilience-from-the-ashes/	**Rachel Norton** **Abrina Williams** **Karen MacClune** **Wendy Donahue** **Chris Fetterman**	rachel@i-s-e-t.org

	in risk reduction, response, and recovery to identify lessons learned from the fires and provide clear **recommendations for enhancing wildfire resilience**.		**Jennifer Schneider**	
The Boulder Watershed Collective's Public Questionnaire on Wildfire Webinar Topics in Response to Marshall Fire	In the early weeks after the Marshall fire, Boulder Watershed Collective (BWC) has responded by hoping to plan wildfire webinars in February and March. We sent out a short survey to capture the concerns and many questions of Boulder County residents. We have synthesized those topics in this spreadsheet.	https://docs.google.com/spreadsheets/d/1eN7vDWsGWeDVh4lTLRYyIOgyy9LkXd4NLEumJwgiExA/edit#gid=2132918849	**Erin Fried** **Maya MacHamer**	erin@boulderwatershedcollective.org
Uncrewed Aircraft Systems for in situ Sampling	We can integrate sensors into our uncrewed aircraft systems (drones), work through FAA regulations for operations, and conduct field deployments. We operate both multi-rotor (easy take-off and landing) and fixed-wing	We have the drones but would need to obtain or be given the sensors.	**Eric Frew,** CU AES, IRISS	eric.frew@colorado.edu

	(longer duration and coverage area) drones			
Southern Rockies Fire Science Network	Download and help distribute the ***After the Disaster Guidebook***, a one-stop resource and notebook for wildfire victims, includes federal, state, and local contacts and resources as well as guides to post-fire steps.	***After the Disaster Guidebook – Boulder County*** in both English and Spanish. More information is available on the Extension website. Please share these resources with those in need.	**Ragan Adams,** CSU Office of Engagement and Extension, **Laura Larson,** Boulder County Extension, **Gloria Edwards,** Southern Rockies Fire Science Network E	Ragan.Adams@ColoState.EDU llarson@bouldercounty.org gloria.edwards@colostate.edu
Wildfire Risk to Communities	A free (and very comprehensive) resource provided by US Forest Service that consolidates many of the data, insights, and resources that NFIC, NWCG, USFS, BLM, and the rest of the alphabet soup of federal agencies (and state resources) have available. It is designed to be understood by the general public with limited engineering know-how.	https://wildfirerisk.org/ https://wildfirerisk.org/contact/	This link was shared by Dr. Matt Hinds-Aldrich, American Assoc. Of Insurance Services (but I was not involved with creating or maintaining the resource just sharing it for the good of the order).	matth@aaisonline.com
Wildfire Resource Center	This is a free educational resource created by American Association of	https://www.aaisonline.com/web/guest/wildfire-resource-center	**Dr. Matt Hinds-Aldrich,** American Association of Insurance Services - AAIS	matth@aaisonline.com

	Insurance Services for the benefit of teaching insurance professionals about the complexity of the wildfire peril. This resource does not contain original research but serves as a curated comprehensive overview of the wildfire peril and available resources that may be relevant to researchers who may not be as familiar with the latest in wildfire science, policy, and practices.			
National Integrated Drought Information System (NIDIS) Drought and Wildfire Nexus (NDAWN) Strategy and Network	The NIDIS Drought and Wildfire Nexus (NDAWN) NDAWN is both a strategy and a network. As a strategy, it defines the needs and challenges of fire managers to effectively utilize drought information and aims to meet those needs and to establish a robust drought and wildland fire decision-support	https://www.drought.gov/drought-in-action/nidis-drought-wildfire-nexus-ndawn https://www.drought.gov/about	**Britt Parker,** NOAA NIDIS/CU-Boulder CIRES **Tim Brown,** Western Regional Climate Center/Desert Research Institute	britt.parker@noaa.gov Tim.Brown@dri.edu *The Network includes expertise in wildfire and drought along the fire continuum from pre-ignition, during fire, and post-fire recovery to include social scientists.

	information network. NDAWN also functions as a network at multiple scales, from sub-regional to national. This multi-tiered approach of direct engagement enables NIDIS and its partners to better understand drought impacts for on-the-ground fire management and identify how drought impacts could be mitigated.			
UAS Data	Data Collected by the RAPID Facility in support GEER reconnaissance and research by Fischer, Wham and Whelton	2D Orthomosiacs: https://arcg.is/4TbGO 3D Point Clouds: https://hazmapper.tacc.utexas.edu/hazmapper/project-public/473bc0e5-0da4-492c-afe1-0b0d99d463b3	**Erica Fischer,** Oregon State University **Brad Wham,** CU Boulder **Andrew Whelton** Purdue University **Michael Grilliot and Jeff Berman,** UW RAPID	brad.wham@colorado.edu erica.fischer@oregonstate.edu rapid@uw.edu
WUI Structure/Parcel/Com	The authors of the report compiled methods to protect	https://nvlpubs.nist.gov/nistpubs/TechnicalNotes/NIST.TN.2205.pdf	**Alexander Maranghides, Eric D.**	alexander.maranghides@nist.gov

munity Fire Hazard Mitigation Methodology, NIST Technical Note 2205	against wildfires' two main weapons of choice: flames and airborne pieces of burning debris.		**Link, and Shonali Nazare** Engineering Laboratory, NIST **Steven Hawks and Jim McDougald** California Department of Forestry and Fire Protection (CAL FIRE) **Stephen L. Quarles and Daniel J. Gorham** Insurance Institute for Business & Home Safety (IBHS)	eric.link@nist.gov shonali.nazare@nist.gov
StoryMap: The Marshall Fire	StoryMaps, powered by ArcGIS/esri, allow viewers to learn about events and phenomena through a combination of rich textual description, images, videos, and geographic visualizations. This StoryMap illustrates the events of the Marshall Fire through the lens of the National Oceanic and Atmospheric Administration (NOAA).	https://storymaps.arcgis.com/stories/cd7e211f5d594f9996b061d05670e779	**Theo Stein**, National Oceanic and Atmospheric Administration, Boulder	Theo.Stein@noaa.gov
Marshall Fire - Damage Assessment	The Boulder County government conducted	https://bouldercounty.maps.arcgis.com/apps/we	**Garry Sanfaçon**, Marshall Fire Recovery	gsanfacon@bouldercounty.org

	a detailed damage assessment and created an interactive online map showing areas of damage and destruction for residential and commercial properties.	bappviewer/index.html?id=9f3314c39ad64fac925101aae0bdd62c	Coordinator	
National Interagency Fire Center GIS Data	Downloadable GIS information for the Marshall Fire perimeter.	https://data-nifc.opendata.arcgis.com/datasets/wfigs-wildland-fire-perimeters-full-history/explore?location=39.940778%2C-105.166395%2C11.84	For support from the NIFC team, please click on the link to the right, which will take you to a contact form.	https://forms.office.com/pages/responsepage.aspx?id=4F2CSwVwPUuaFHhBHyhmA14USreJkFhEsrkRJOAmpmtUME1USjgyVVJHUENJQjJVUEU1RlU2UjdZUyQlQCN0PWcu

4. Research Questions, Topics, or Ideas Here

Do you have a question, topic, or idea that you would like to encourage researchers to pursue? If so, please enter that information in the table below.

Research Question, Topic, or Idea in BRIEF (12 words or less)	Brief Description of the Question, Topic, or Idea (100 words or less)	Contributor Name(s) and Affiliation(s)	Contact Email(s)	Are you interested in partnering in this effort? Or are you simply sharing the idea?
Measuring Pre-Fire Preparedness in the Affected Area	Understanding why the areas impacted by the Marshall Fire were or were not adequately prepared for any incidents – including wildfires – and how to ensure that all of Region 8 is prepared for incidents such as this in the future	Daniel Green, FEMA Region 8	daniel.green3@fema.dhs.gov	Partnering/Supporting
Understanding Survivor Knowledge of Best Practices for Wildfire Incidents	Investigating the overall knowledge/skills/capabilities of the affected populace in the face of incidents such as these, in terms of what survivors did know, didn't know, would like to know for future incidents	Daniel Green, FEMA Region 8	daniel.green3@fema.dhs.gov	Partnering/Supporting

Equity & Preparedness - Intersectionality and Less Understood Interactions	Developing a methodology to be used in areas impacted by future incidents to better understand the ways in which inequitable provision of services or socio-economic disparities negatively impact preparedness efforts, and how to rectify these gaps.	Daniel Green, FEMA Region 8	daniel.green3@fema.dhs.gov	Partnering/Supporting
Likelihood of Future Urban/Suburban/Exurban No-Notice Wildfires	Formulating a risk-based methodology to better understand the likelihood of no-notice wildfires impacting densely inhabited areas outside of the wildland-urban interface (WUI) in Region 8.	Daniel Green, FEMA Region 8	daniel.green3@fema.dhs.gov	Partnering/Supporting
Interested in arts and humanities intersections/ collaborations	**Looking for collaborations.** I don't have a specific question, at this point, but I believe in moments of crisis that while the initial needs are food, shelter, clothing, and safety, there are greater human needs that **arts and humanities** can play a role in terms of	Jennifer Ho, Director, Center for Humanities & the Arts and Professor, Ethnic Studies	Jennifer.Ho@colorado.edu	Collaborating

	mental and emotional well being and holistic health.			
Cultural and Collective History/Memory Recovery and Connection to Community Resiliency	Related to Jennifer Ho's entry above. UNESCO guideline for recovery and resiliency through CURE Framework shows this connection. Investigating this connection and specifically the loss and eventual recovery of the Superior Historical Museum.	**Christina Cain**, Cultural and Historic Resources Task Force and CU Museum of Natural History	christina.cain@colorado.edu	Willing to support/ Partnering
Water Curtain	Investigating an autonomous system to protect property from wildfires	**Hank Scott,** CU Aerospace	hank.scott@colorado.edu	Collaborating
Quantifying the Wider Economic Impact of Fires	Quantifying the economic impact of a fire like the Marshall Fire goes beyond counting the cost to rebuild the affected properties. For example, considering other impacts such as emotional, cultural, shopping revenue diverted to other cities, etc.	**Wendy Korotkin,** Boulder Fire Rescue	korotkinw@bouldercolorado.gov	Collaborating Interested in **partnering to create a tool** that fire departments across the country could utilize to measure and quantify the possible broader economic impact to the wider community.

	Could this include **History Colorado's economic benefits studies -** https://www.preservationbenefitscolorado.com/ and https://www.archaeologybenefitscolorado.com/ ? Contact: T McMahon History Colorado todd.mcmahon@state.co.us			
Assessing the Impact to Renters vs. Homeowners	Renters are being impacted differently than homeowners, and little has been to adequately assess these impacts. This includes everything from economic impacts, to if a homeowner is providing thorough recovery/cleaning for houses still standing, if rental rate increases are made due to increased costs, etc.	**Trish Zornio**, science writer	patricia.zornio@gmail.com	Willing to support
Flash flood risk impacts from pre- vs. post-fire surface	Are there changes in regional flash flood risk variables based on fire-	**Kelly Mahoney**, NOAA Physical Sciences Laboratory Research	kelly.mahoney@noaa.gov	partnering/collaborating

hydrologic conditions	impacted land-surface changes, and across a spectrum of possible storm scenarios?	Scientist		
Exploring the role of long-term recovery organizations in fostering equitable housing recovery		**Jamie Vickery**, University of Washington Collaborative on Extreme Event Resilience/RAPID Facility	vickeryj@uw.edu jen.henderson@ttu.edu	partnering/collaborating + Interesting in collaborating on this: Jen Henderson,
Rebuilding attainable, efficient, all electric homes, and net-zero homes	In the spirit of "built back better," how might the rebuilding efforts help exemplify next generation homes, making them healthy, energy and space efficient, all electric and powered by renewable energy? Might there be a way to realize these goals and build local capacity / industry / economy for prefabricated home manufacturing?	**Josie Plaut,** Institute for the Built Environment at CSU	josie.plaut@colostate.edu	Partnering / collaborating including facilitation
Wind-borne sediment transport from Davidson Mesa to surrounding communities	Davidson Mesa was essentially denuded by the Marshall Fire and associated winds. A modeling study is needed to estimate how	**Todd Johnston,** NSIDC, Louisville Resident	Todd.Johnston@colorado.edu	Not a scientist, but potentially willing to participate

	this will impact downwind neighborhoods, municipalities in the future.			
Mitigating Post-Fire Smoke Impacts in Homes	We've reviewed FEMA, EPA, California, Red Cross, Southern Rockies Fire Science Network, industry, etc. guidance (summarized here and in the FAQ) and there's very little information on how to determine what returning residents should do for smoke-impacted but otherwise physically undamaged homes; they're generally at the mercy of remediation companies. Some issues (mostly based on feedback from residents) include: 1) Is the lack of visible ash/soot and odors an indication of safe conditions to return home, or is specialized air and residue monitoring needed? 2) Are ozone generators effective in mitigating	**Bart Croes**, CU-CIRES Visiting Fellow from California's air quality and climate change research and mitigation program	croes.bart@gmail.com 916-798-9540	Partnering/Supporting Note from Elicia Ratajczyk: There are some concerns over other off-gassing, such as VOCs, that are hard to monitor and measure but prevalent from burned or burning items like furniture. These types of gases can make returning homeowners or survivors feel sick as response and recovery takes place.

	(unoccupied) homes or are less odorous toxic byproducts created that will off-gas from walls and other surfaces over time? 3) Is it necessary to replace insulation in walls and attics?			
Assessing Short- and Long-Term Post-Fire Physical and Mental Health Effects	We know very little about how urban wildfires might affect people's health and well-being. NIEHS is funding health surveys and ash analysis for the 2017 California fires; here's an overview. The California ARB put out a report on air quality during the 2018 fires and is funding follow-up health studies (described in the report).	**Bart Croes**, CU-CIRES Visiting Fellow from California's air quality and climate change research and mitigation program	croes.bart@gmail.com 916-798-9540	Partnering/Supporting
Assessment of warm air inversion based on climate change on Chinook wind intensity during winter.	There is very little understood about a warm atmosphere's influence on Chinook wind intensity.	https://www.extremeeventrisk.com/	joshua@extremeeventrisk.com Phone: 720-557-5003	Partnering/Supporting

Wildfire Vulnerability Assessment Tool - GIS Based	In response to a DHS funding request post-9/11, I helped build a GIS-based water resources vulnerability tool which had components that might transfer to a tool for simulating wildfire risks and likelihood and provide a consequence map to help in prediction and planning. The tool was called WRVAT and could be translated into this hazard domain. I believe the tool was "owned" by DHS upon completion. Certainly was developed with public funding.	**Tanya Unger** Lecturer CU Boulder, GIS and DB professional, SCD Hub, Nederland, CO	Tanya.Unger@colorado.edu 720-842-9512	

5. Funding Opportunities

If you have funding available to help support research or if you know of relevant funding opportunities, please enter that information here.

Funding Opportunity / Other Information for Grantees	Brief Description of the Opportunity	Web Link	Contributor Name(s)	Contact Email(s)
National Science Foundation (NSF) Rapid Response Research (RAPID) Funding Mechanism	The RAPID funding mechanism is used for proposals having a severe urgency with regard to availability of, or access to data, facilities or specialized equipment, including quick-response research on natural or anthropogenic disasters and similar unanticipated events. PI(s) **must** contact the NSF program officer(s) whose expertise is most germane to the proposal topic before submitting a RAPID proposal. This will facilitate determining whether the proposed work is appropriate for RAPID funding. ($200k	https://www.nsf.gov/pubs/policydocs/pappguide/nsf09_1/gpg_2.jsp#IID1	***Note:** Any NSF program can fund a RAPID. The program officers for the most relevant programs are listed here, but others welcome RAPIDS. Contact whatever program(s) you consider most relevant to your research idea.* **Jacqueline Meszaros,** Advisor for Natural Hazards, Disasters, and Resilience **Robert O'Connor,** Decision, Risk, and Management Science Program **Daan Liang,**	jmeszaro@nsf.gov roconnor@nsf.gov dliang@nsf.gov jpauschk@nsf.gov ***Note. If you plan to send an inquiry about submitting a RAPID proposal to *multiple programs,* please copy all relevant program directors on one email - rather than sending separate emails. This will help the program directors to more effectively communicate and coordinate in response to inquiries.****

	limit up to a year.		Humans, Decisions, and the Built Environment Program **Joy Pauschke,** Engineering for Civil Infrastructure Program	
CIRES Rapid Innovative Research Program (IRP)	For CIRES researchers to pursue urgent and time-sensitive research activities.		**Christine Wiedinmyer**	Christine.Wiedinmyer@colorado.edu
Natural Hazards Center Quick Response Research Award Program	The Natural Hazards Center's Quick Response Award Program provides training and funds for researchers to quickly collect perishable data following disasters and other extreme events.	https://hazards.colorado.edu/research/quick-response-report/guidelines	**Jennifer Tobin**	haz.research.awards@colorado.edu
Center for Humanities & the Arts (CHA)	Small Grant program for CU Boulder faculty.	https://www.colorado.edu/cha/opportunities/faculty-opportunities/cha-small-grants	**Jennifer Ho,** Director of CHA, CU Boulder	cu-cha@colorado.edu
Fire Grants Help	The most extensive grant listings database available, Fire GrantFinder offers enhanced features for tracking and submitting	https://www.firegrantshelp.com/grants-search/CO/	**Alicia Adelman,** Research and Innovation Office	customersupport@lexipol.com

	grant applications personalized to user needs and project areas. Search federal, state, foundation, and corporate grants available to your community now!			
CU Boulder Outreach Awards and Office for Outreach and Engagement Community Impact and Micro Grants	Our office funds outreach and engagement projects that connect research, teaching, and creative work with communities external to CU Boulder. Funding can be used for project-related expenses such as: student pay, materials, supplies, equipment, travel and more. Each funding type has its own selection criteria, application requirements and allowable expenses. Visit the website to learn more. **DEADLINE FOR THESE GRANTS IS FRIDAY, FEBRUARY 4, 2022.** Other funding	https://www.colorado.edu/outreach/ooe/outreach-funding	Office for Outreach and Engagement: Jeanne McDonald, Associate Director Lisa Schwartz, Community Program Manager Katie Kleinhesselink, Community Program Manager	 jeanne.mcdonald@colorado.edu lisa.h.schwartz@colorado.edu Katie.Kleinhesselink@colorado.edu

	specifically for outreach and engagement projects in response to the fires through our office might become available in the near future. Feel free to reach out to Jeanne, Lisa, or Katie with questions.			
NIST Public Safety Communications Research Division	PSIAP Follow-on Funding for Technical and Business Assistance and Demonstration Projects with Public Safety Agencies NIST PSCR is currently seeking applications from eligible organizations - entities that previously were awarded a grant, cooperative agreement, prize challenge or subaward by a federal entity ('entities with a previous award"),for a public-safety focused communication	https://www.nist.gov/ctl/pscr/commercialization/psiap-taba-demonstration https://www.grants.gov/web/grants/view-opportunity.html?oppId=327052	NIST will consider applications on a continuing/rolling basis as they are received. To ensure consideration, applications must be received by 5:00 p.m. Eastern Time on May 31, 2022.	For any questions, contact PSCR@nist.gov with the subject line "Follow-on Funding for TABA and Demo."

	technology innovation - to propose activities that will either: 1. More rapidly advance their prototypes through needed technical and business assistance (up to $25k); or 2. A demonstration project with a partnering public safety agency, to provide additional testing and research (up to $200k). Acknowledging the technology development and life cycle gap from early-stage research and prototypes to publicly available technology, PSCR is providing these funding opportunities to entities with a previous award in an effort to further propel forward their research and prototypes and more quickly advance needed improvements in			

	communication technology for first responders.			
Fiscal Year 2021 Fire Prevention and Safety (FP&S) Grant Program	This is one of three grant programs that constitute the Department of Homeland Security (DHS), Federal Emergency Management Agency's (FEMA) focus on enhancing the safety of the public and firefighters with respect to fire and fire-related hazards. The FP&S Program provides financial assistance directly to eligible fire departments, national, regional, state, local, tribal and non-profit organizations such as academic (e.g., universities), public health, occupational health, and injury prevention	https://www.fema.gov/grants/preparedness/firefighters/safety-awards/research-development https://www.fema.gov/grants/preparedness/firefighters/safety-awards.		Program Office Contact FireGrants@fema.dhs.gov. Centralized Scheduling and Information Desk (CSID) AskCSID@fema.dhs.gov Grant Programs Directorate (GPD) Award Administration Division ASK-GMD@fema.dhs.gov. FEMA Office of Equal Rights (OER) FEMA-CivilRightsOffice@fema.dhs.gov. Environmental Planning and Historic Preservation GPDEHPinfo@fema.dh

	institutions for fire prevention programs and supporting firefighter health and safety research and development such as clinical studies that address behavioral, social science, and cultural research.			s.gov. Systems Information FEMAGO@fema.dhs.gov
NSF Responses to Disasters	From the website: For individuals from organizations affected by recent natural disasters and considering submission of new proposals, NSF will be flexible regarding meeting stated deadlines. Researchers or sponsored projects office staff from organizations that have been affected by the natural disasters and are unable to meet stated deadlines should contact the cognizant program office to discuss the issue.	https://www.nsf.gov/naturaldisasters/		naturaldisasters@nsf.gov