

Request for Approval under the “Generic Clearance for Participatory Science and Crowdsourcing Projects” (OMB Control Number: 2080-0083; EPA ICR Number: 2521.48)

TITLE OF INFORMATION COLLECTION: Smoke Ready Communities – Examining Local Planning for Response to Wildland Fire Smoke Events

PURPOSE: The incidence of large-scale wildfires increasing along with the potential for wildfire smoke to impact a growing number of communities both near and far from the fire’s location. Local planning for extreme environmental events is not new for local county leaders. However, planning for a significant wildfire smoke episode is new because it represents a different type of extreme environmental event that researchers and practitioners are just beginning to appreciate with respect to impacts and effective mitigation strategies. Despite the growing body of evidence that demonstrates an association between wildfire smoke exposure and adverse individual-level outcomes, very few communities that have an increased risk of wildfire smoke episodes also have formal wildfire smoke response plans.

A range of theoretical models exist for how to bring about improvements in complex social problems like wildfire smoke events. Social science theory suggests that clearly understanding how an issue impacts different stakeholders is critical for identifying appropriate strategies to mitigate adverse effects. We are proposing a community-engaged project that aims to support local efforts to reduce the burden of wildland fire smoke episodes through an applied participatory research study entitled, *Smoke Ready Communities – Examining Local Planning for Response to Wildland Fire Smoke Events*. In this project we are working with county-level multidisciplinary teams and supporting each team as they proceed through a learning, risk assessment, and planning process that will culminate in each county writing a wildfire smoke response plan that reflects their local priorities, needs, and resources.

The purpose of this participatory research is to support local communities in developing a tailored strategy for how their community will respond to future wildfire smoke episodes and advance the state of the science on effective approaches to local collaborative planning processes that support community-defined outcomes related to local response and resilience to wildfire smoke episodes.

NEED AND AUTHORITY FOR COLLECTION: The information is needed to support improved guidance that local leaders can look to as they work to mitigate the burden of wildfire smoke on their communities. Local community leaders have expressed a clear need for guidance on how to approach planning for wildfire smoke episodes in such a way that is effective for reducing smoke exposure among individual community members and yields increased community resilience to future events. However, little is known about local planning processes and strategies that are most effective at reducing community members’ exposure to smoke and increasing overall community readiness and resilience for future smoke events. In this study we will learn directly from interested community members about their experiences with wildfire smoke and participating in a collaborative planning strategy for improved local response.

This information will be collected under the legal authority of the Clean Air Act § 103, 42 U.S.C. § 7403, the National Environmental Education Act, § 4, 20 U.S.C. § 5503, and OMB Memo M-15-16. The Clean Air Act authorizes research into techniques for monitoring and controlling air pollution, including the health effects of air pollution. This study is concerned with low severity health effects of wildfire smoke, a growing contributor to particulate matter air pollution. The National Environmental Education Act, § 4, 20 U.S.C. § 5503 authorizes EPA to develop and support programs to increase environmental literacy. The EPA provides information on air quality and wildfire smoke, but how individuals respond to that information is generally not well known. This study has the potential to improve EPA’s communication

on wildfire smoke through better quantification of responses to air quality messaging. OMB Memo M-15-16 encourages agencies to use approaches such as citizen science, which is a cornerstone of this study.

USES OF RESULTING DATA: The information collected in this study will provide knowledge about how individual community members experience and perceive locally led collaborative planning projects, the effectiveness of a collaborative approach to local wildfire smoke response planning, the relationship between that approach and readiness for future wildfire smoke episodes, and the extent to which a collaborative planning process influences community capacity and subsequently community resilience. This information is not for regulatory use.

DATA COLLECTION METHODS: Data will be collected through semi-structured surveys that use an open-ended questionnaire that asks respondents' experiences and perspectives on the four areas listed below, including their:

- prior experiences with extreme wildland fire smoke events, and how they perceive the impacts of these events on their communities as well as how their community responds to these events,
- perceptions on health risks associated with exposure to smoke and existing strategies an individual can take to reduce exposure,
- mental models for an ideal community-level response to wildland fire smoke and what capacity is needed to support that
- thoughts and goals about developing a local smoke team and local smoke response plan.

Data management: Data will be stored on a secure EPA-administered server. Secondary project files and documentation will reside on the project shared network directory administered by the data custodian.

This project falls under record schedule 1035(b), which has a 20-year retention requirement. Records will be kept in accordance with ORD PPMs 13.2 and 13.4 which can be found here: <http://intranet.ord.epa.gov/about-ord/chapter-13-quality-assurance>. Study materials that are not Federal records according to EPA Records Schedule 0008: Non-records (<http://intranet.epa.gov/records/schedule/final/0008.html>), including copies, intermediate data files, computer programs under development, output not used for any manuscripts or reports, prior versions of analytic software, working papers, draft manuscripts, and technical reference materials, are disposable and may be destroyed when obsolete, superseded or no longer needed for reference.

The Smoke Ready Communities research protocol has been reviewed and approved by the Office of Human Research Ethics University of North Carolina-Chapel Hill Institutional Review Board and was determined to be exempt from further review according to the regulatory "category 2" exemption which include user reports, interview, public observation under 45 CFR 46.101(b). All interview data will be confidential. Each participant will receive a participant ID code and the code key will be kept separate from the data.

PARTICIPANT UNIVERSE:

Category of Respondent	No. of Respondents	Number of responses per respondent	Participation Time per response	Burden Hours
Individuals participating in local smoke response planning teams	50	2	1 hour	100
Totals	50	2	1 hour	100

AGENCY COST: The estimated annual cost to the Federal government is \$41,476. EPA labor costs are calculated using an hourly rate for a GS-13 (step 1, \$103,690) based in Washington, DC¹ including an additional 60% for overhead and benefits. This project is estimated to occupy approximately 25% of an FTE annually. Additional contract support costs are anticipated to support project assistants participating in EPA-based educational and research-trainee programs.

STATISTICAL ANALYSIS: As with any research, the research design and analytical methods depend upon the nature of question(s) guiding the study. The research questions that guide this study ask how are communities preparing for wildland fire smoke intrusion, how do individuals experience those processes, and what are the outcomes of local planning processes on readiness for smoke and community capacity and resilience? These research questions call for qualitative data analysis, as they are not of the nature that would require or involve any statistical analytical methods or approaches. The data used in this analysis are observations of local public planning workshops/meetings and interviews with individuals involved in those processes. No numerical translation, transformation, or statistical analysis will be conducted.

To examine the processes and outcomes we will use a case-based, mixed methods research design. The data collected to address the research objectives of this pilot study are at community- and individual-levels. To characterize the processes involved in community-level planning for wildland fire smoke events members of the research team will observe virtual public workshops and planning meetings to characterize the processes each county chooses for their work. We will use an inductive approach when observing the workshops and meetings because we are exploring how the planning process occurs rather than documenting the extent to which the workshops or meetings follow a predetermined process. Individuals who are involved in the local wildland fire smoke planning will be invited to participate in two interviews one near the beginning of their planning process and the second near the end of the process. We will conduct thematic content analysis of the workshop/meeting observations and individual team member interviews.

DATA QUALITY ASSESSMENT PROCEDURES: As with any research, the research design and analytical methods depend upon the nature of question(s) guiding the study. The research questions that guide this study ask how are communities preparing for wildland fire smoke intrusion, how do individuals experience those processes, and what are the outcomes of local planning processes on readiness for smoke and community capacity and resilience? These research questions call for qualitative data analysis, as they are not of the nature that would require or involve any statistical analytical methods or approaches. The data used in this analysis include interview responses from individuals involved in local wildfire smoke planning. No numerical translation, transformation, or statistical analysis will be conducted.

¹ <https://www.opm.gov/policy-data-oversight/pay-leave/salaries-wages/salary-tables/pdf/2021/DCB.pdf>

Each interview will be recorded and transcribed. Transcripts will be checked for accuracy by comparing audio from the recorded interviews with text in each transcript. Any errors in the transcription process will be corrected. Qualitative analyses of the transcripts will follow established methods for thematic coding. The process will include independent coding by members of the research team followed by a collective team review and discussion. Final codes will be identified by consensus among the research team. The qualitative data will be used in its original state. No data manipulation or transformation will occur.

Rigorous and established qualitative analytical methods will be used for data reduction and qualitative data analysis. The research team will analyze the data included in the county-level cases with the objective of identifying themes and trends within the data using a multi-step qualitative process. Each member of the research team will independently review the cases to identify selections of the cases that are important for the research question and then characterize them with short descriptors or codes. Team members will generate a set of codes, rather than using a pre-determined set of codes across team members. After each person has completed their independent review, the team will meet to collectively reconcile the selections of text and codes that will be included in the case. The team will reconcile the analyses through review of each member's analysis and come to consensus on 1) what selections of text to include in subsequent analyses, and 2) what descriptor codes accurately reflect the content of the selection. We will use the final set of selected text and codes to characterize the processes each county used in their preparedness work, as well as individual perceptions of the impacts of the work on preparedness and resilience outcomes. We will analyze each case and the codes assigned by the team to identify themes, and then we will look across cases to compare and explore how the cases may be similar or dissimilar.

Like quantitative data analysis plans, there are multiple approaches to examine reliability and validity exist in a qualitative data analysis plan. Reliability of the research process and validity of the research data and analysis are demonstrated by careful planning, strict adherence to the data analysis plan and the integration of multiple data sources and types into the data collection and analysis process. Unfortunately, there are few numerical metrics that provide cutoffs for these criteria. In some qualitative data, Cohen's kappa is used to assess inter-rater reliability. This metric is not employed in this study simply because that metric is better suited to research questions and analysis designs that don't require as in-depth subject matter knowledge as the present questions. For that reason, analyst triangulation and member-checking are preferred. Team-based analysis of the data will be used to identify key themes and findings. In this study we will employ multiple analysts, analysis consensus, and a member-check process through which interim findings are shared with stakeholders in each of the groups to assess the credibility of findings.

Following the qualitative thematic analysis process, the research team will share preliminary findings with the local planning teams. We will ask team members to review the findings and provide feedback on any errors in how the team characterized the county's efforts on wildland fire smoke preparedness. The research team will take all respondent feedback, and collectively decide how to correct any errors in the case that respondents identify. Cases with significant errors will be re-analyzed (following the analysis process) and revised.

ADMINISTRATION OF THE INSTRUMENT: (Check all that apply)

☐ Web-based or Social Media

☐ Mail

☒ Telephone

☒ Other: virtual meetings

☐ In-person

INSTRUMENT: The interview guide for the team-member data collection is included below.

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