PREPTalks
New perspectives for emergency managers

Discussion Guide

Who is at Risk?
Mapping of Potential Hazard Exposure

PrepTalks Discussion Guides are companion documents to PrepTalk video presentations and question-and-answer (Q&A) sessions. When used together with the videos, these guides help translate the research and expertise showcased in each presentation into action steps to improve disaster preparedness.

Dr. Robert Chen: Who is at Risk? Rapid Mapping of Potential Hazard Exposure

Dr. Chen's PrepTalk outlines the different ways data mapping can be used to help emergency managers identify those at risk before, during, and after a disaster. Dr. Chen is Director of the Center for International Earth Science Information Network (CIESIN), a unit of Columbia University's Earth Institute. He manages the National Aeronautics and Space Administration (NASA) Socioeconomic Data and Applications Center (SEDAC); part of NASA's network of Earth Science Data Centers.

Partners for the Discussion

To apply the geospatial datasets, socioeconomic census data, and analytical techniques discussed in Dr. Chen's PrepTalk to your community, we encourage you to bring Geographic Information System (GIS) specialists together with emergency managers and others in involved in planning for response and recovery to various hazards, urban planners, the Warning Coordination Meteorologist from your local National Weather Service (NWS) Weather Forecast Office, data scientists at local universities, and preparedness outreach coordinators.

After watching Dr. Chen's presentation and the Q&A session, use this Discussion Guide and additional resources to discuss how to leverage available data and mapping services. Talk about how these resources can ensure your planning, exercises, training, and outreach appropriately reflects the community you serve.

Discussion Prompts

Topic One: Using Census Data and Mapping Capabilities to Prepare for a Disaster

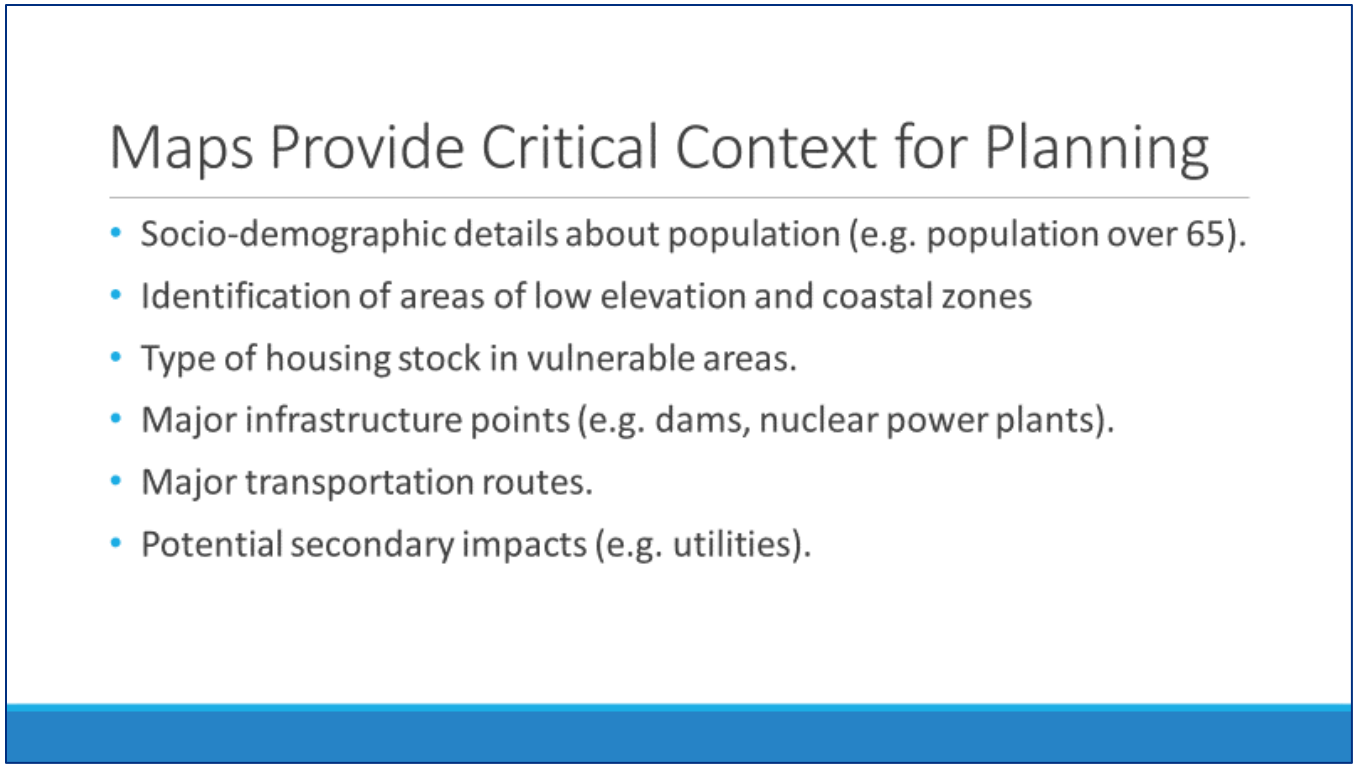
> *It's always good to [use maps to] explain where population centers are and who is vulnerable.*
>
> Dr. Robert Chen

In his PrepTalk, Dr. Chen outlines how maps not only show where people are in a community but provide important context. Geospatial analysis can clarify the identification and location of vulnerable populations, at-risk infrastructure, and other community characteristics that could help achieve preparedness, response and recovery objectives. Use Dr. Chen's PrepTalk, describing the types of community details that can inform plans, as a springboard for discussion.

FEMA · iAEM International Association of Emergency Managers · NEMA National Emergency Management Association · NHSC National Homeland Security Consortium · Center for Homeland Defense and Security, Naval Postgraduate School

- Discuss what types of population, infrastructure, and hazard risk details would enhance your community plans.
- Use the PrepTalks "Using Census Data to Understand Your Community" guide to find data from the American Community Survey (ACS). The ACS provides population data on the following characteristics:
    - Social Characteristics: Education, Marital Status, Relationships, Fertility, Grandparents…
    - Economic Characteristics: Income, Employment, Occupation, Commuting to Work…
    - Housing Characteristics: Occupancy and Structure, Housing Value and Costs, Utilities…
    - Demographic Characteristics: Sex and Age, Race, Hispanic Origin, Housing Units…

  Researching the census data for your community can help you:
    - Identify population segments that may need a tailored approach to preparedness education;
    - Provide information to design more realistic community exercises;
    - Provide insights to enhance alerts and warning systems and make them more effective at any time of day;
    - Give planners a clearer understanding of the likely numbers of people needing group care or assistance with an evacuation during an incident; and
    - Strategize how to build social capital in the community (see Dr. Daniel Aldrich's PrepTalk).
- Share and explore different mapping resources that would be useful in the preparedness stage of planning. There is a growing number of federal agencies that provide geo-coded data. See the Additional Resources section at the end of this guide for a beginning list of potential resources. Please note that some resources are designed for non-technical users, while others may require greater knowledge and skill.
- Discuss how to update plans to incorporate the latest mapping capabilities.
    - Use this data to help optimize the location and supply needs of emergency shelters.
    - Create a plan to evacuate people accounting for those with special needs and those without vehicles.
    - Identify areas where emergency information should be provided in multiple languages.



Source: Chen PrepTalk

Topic Two: Consider How Mapping Capabilities Can Support Disaster Response

Dr. Chen describes the importance of having access to quick estimates of population or other data during an event. This might provide the size of a population under a specific NWS warning, or whether a wildfire is threatening a heavily populated area, or even analyzing how a flood might disrupt a major transportation corridor. Based on these examples:

- Identify and document the mapping resources that can provide quick estimates or real-time mapping for hazards that can affect your community. Determine who can provide and disseminate this information during an event.
- Discuss how you can use maps to better convey hazard risk to the public. Dr. Dennis Mileti's PrepTalk on Modernizing Public Warning Messaging noted the importance of helping people understand whether a risk was relevant to them. Identifying specific areas at risk, visualized with a map of the area, can be extremely helpful in quickly conveying who is at risk and reducing delays in people taking appropriate protective actions.

> *For NWS warning areas, would you like to know the population in [the impact area] polygon?*
>
> Dr. Robert Chen

Topic Three: Identify Ways that Mapping Can Improve Recovery

Dr. Chen notes that additional mapping capabilities can be useful in the recovery phase. For example, looking at nighttime lights to detect changes in the electrical grid, or for adjoining jurisdictions to figure out how to most effectively deliver resources to an impacted area. As a working group discuss:

- What real-time information would be helpful as you begin to implement your community's recovery plans?
- What communities are more vulnerable to disaster and may need additional support in their recovery process?

Recommended Next Steps

Create a plan and timeline with your working group to:

- Conduct census data research on your community.
- Identify people with GIS and mapping capabilities within your community and make plans to augment needed skillsets.
- Update plans and processes as needed with mapping resources, including procedures for real-time analysis and distribution.
- Consider including a mapping function in your next tabletop exercise to assess how maps can be used in the response to an event.

Additional Resources

- **Using Census Data to Understand Your Community**: Step-by-step guide for finding annual demographic data on your community. https://www.fema.gov/media-library-data/1519920554016-c83b6082ef7392c6c70dee309d1fdd36/PrepTalks_Dr.Chen_Using_Census_Data.pdf
- **United States Census Bureau:**
    - American FactFinder: Provides population estimates, demographic and housing, housing characteristic, economic characteristics and educational attainment. https://factfinder.census.gov
    - QuickFacts provides statistics for all states and counties, and for cities and towns with a population of 5,000 or more. https://www.census.gov/quickfacts
    - OnTheMap For Emergency Management: Maps show up to date Federal Disaster Declarations combined with county level data. https://onthemap.ces.census.gov/em/
    - Recorded Webinar: Emergency Planning and Response with Census Bureau and NOAA Resources. https://www.census.gov/programs-surveys/acs/guidance/training-presentations/emergency-planning.html
    - Recorded Webinar: Intro to ACS https://www.census.gov/programs-surveys/acs/guidance/training-presentations/acs-intro.html

- **Agency for Toxic Substances and Disease Registry (ATSDR) Geospatial Research, Analysis and Services Program:** ATSDR Social Vulnerability Index (SVI) tool indicates a community's relative social vulnerability to a hazard using 15 social factors including unemployment, disability, poverty, lack of access to a vehicle. https://svi.cdc.gov/
- **NASA Socioeconomic Data and Applications Center (SEDAC):** SEDAC serves as an "Information Gateway" to support the integration of socioeconomic and earth science data. http://sedac.ciesin.columbia.edu/data/sets/browse
- **Homeland Infrastructure Foundation-Level Data (HIFLD):** This site provides geospatial data to support community preparedness and resiliency. There is a wide variety of map data including weather radar stations, cellular service areas, public schools, fixed rail transit systems, pharmacies and more. https://hifld-geoplatform.opendata.arcgis.com/
- **Geospatial Platform:** This site provides shared and trusted geospatial data, services and applications for use by the public and by government agencies and partners to meet their mission needs. The Catalog has more than 15,000 datasets contributed by the National Oceanic and Atmospheric Administration, U.S. Geological Survey, U.S. Department of Agriculture, U.S. Census Bureau, U.S. Department of Transportation, and more. https://www.geoplatform.gov/
- **NASA Earth Observing System Data and Information System:** This resource provides earth science data from various sources including satellites, aircraft and field measurement. https://earthdata.nasa.gov
- **Earth Observatory Natural Event Tracker (EONET)**: The EONET is NASA's repository of metadata about natural events. https://eonet.sci.gsfc.nasa.gov/
- **Google Earth Pro:** This geospatial software application which offers the ability to analyze and capture geographical data. https://www.google.com/earth/desktop/