Guidelines and Best Practices for Tsunami Evacuation Mapping Guidelines

DRAFT Developed by the NTHMP Mitigation and Education (MES) Subcommittee June 2010
Revised August-September 2010
Reviewed and finalized by the MES [insert date here]

Purpose of Tsunami Evacuation Map Guidelines:
The purpose of these guidelines are to promote a consistent visual look and feel in evacuation maps produced by NTHMP-funded entities. Currently, there is not a consistent approach to evacuation map development by agencies producing these products. This can lead to confusion in the public and incorrect assumptions about tsunami evacuation maps. Groups and agencies producing tsunami evacuation maps are strongly encouraged to adopt these guidelines.

Intended audience:
These guidelines and best practices are intended for the purpose of public education and outreach in order to support the goals of reduction of loss of life during a tsunami event. Though these guidelines apply to partners who receive NTHMP funding, they are also recommended for use by other organizations looking for direction in producing tsunami evacuation maps.

Objective and scope of the guidelines:
- To promote a consistent look and feel to tsunami evacuation maps in order to provide information upon which citizens may base their actions;
- Facilitate emergency management planning activities;
- Depict the area of effect from a tsunami;
- Create viable maps through a thorough assessment of local risks.

Proposed Mapping Guidelines
Tsunami evacuation map recommendations from the Mapping and Modeling Subcommittee that were reviewed and finalized in January 2010.

1. Tsunami evacuation maps (Map products may include printed maps, digital map files, or interactive web-based maps.):
   - All evacuation maps should include a title, scale, geographic location (coordinates), intended use, and appropriate explanatory information.
   - All evacuation maps should be accompanied by technical documentation on how the map was made and intended use of map.
• Evacuation maps should delineate zones that should be evacuated in the event of a tsunami.
• When detailed tsunami inundation assessments (i.e., inundation map) are available, the evacuation area should encompass all areas the inundation map indicates will be inundated. If this is not the case, as determined by collaboration between modelers and emergency managers, then a detailed explanation shall be provided.
• Evacuation maps should include streets, bridges, escape direction arrows, assembly areas and well known landmarks to help people identify the avenues of egress and safe locations.
• Evacuation zones should be legible for all users, including people with color vision disabilities.
• When possible evacuation maps should identify all appropriate modes of evacuation (e.g., via foot, vehicle, vertical, and marine evacuation).
• When possible, maps should identify features that may impede evacuation during or after an event such as terrain obstacles, areas of unstable land or other earthquake-related ground or structure failures. These areas should be identified by professional geologists with the purpose to inform the public of unstable areas.
• Evacuation zone boundaries should, wherever possible, conform to logical administrative boundaries (e.g., Roads, property lines, etc.).

Basic Map Content

• Evacuation zone will be indicated by a contrasting color from the surrounding landscape. Multiple evacuation zones can be used, depending on local hazard. (For instance, local and distant source tsunamis)
• Designated evacuation routes will be indicated by bolded streets and directional arrows leading away from the coast.
• Bilingual where possible, with English and a secondary language
• Brief instructions on what to do in event of a tsunami.
• If in an electronic form, GIS Data to create the map should be provided with metadata about source, projection, data use restrictions and considerations.
Map Format

Example of an evacuation map using standards

- Tsunami Evacuation Sign
- Title
- Location
- Short bilingual instructions
- Explanation of colors & zones
- Evacuation zone in yellow
- Optional 2nd zone in orange
- Evacuation route arrows in black
- Geographic features
- Named assembly points
- Legend
- Second pane if necessary
- Sponsoring agencies
- Date
Symbols

- Recommend a modified adoption of the Homeland Security Mapping Standard symbols, found in ANSI INCITS 415-2006. They are available as a true type font at www.fgdc.gov/HSWG

![Symbol Library for Evacuation Maps](image)

**Figure 1. Standardized Mapping symbols**

- Symbols should be black. If they are against a dark background, a line of white should separate the symbol from the background image.
- Symbols should be easily perceived in terms of size and scalable according the size of the final map product.
- Symbols should have precise meaning without a need for explanation on the map other than in the legend.
Colors

- Readable by the color blind
  - Avoid putting the color red next to the dark green color.
- Reproducible in black and white

<table>
<thead>
<tr>
<th>Palette for tsunami evacuation mapping guidelines</th>
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<tbody>
<tr>
<td>Color</td>
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<td>Dark Green</td>
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<td>Light Green</td>
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Figure 2. Standardized Cooler for evacuation mapping
Resources:
Homeland Security Working Group Emergency Symbology
http://www.fgdc.gov/HSWG/index.html

Field Guide to Humanitarian Mapping

Emergency and Hazards Mapping Symbology

Color Blind Image Corrections
http://www.vischeck.com/daltonize/

Cannon Beach Tsunami Evacuation Map

Crescent City Tsunami Evacuation Map
http://www.crescentcity.org/Forms/Tsunami_Preparedness_Crescent%20City.pdf

State of California Tsunami Inundation Maps
http://tsunami.ca.gov