U.S. FLEET ACTIVITIES

OKINAWA

DISASTER PREPAREDNESS PAMPHLET

Volume 1: TSUNAMIS

Dated: June 2011

GENERAL INFORMATION

Tsunamis (pronounced soo-ná-mees), also known as seismic sea waves (mistakenly called "tidal waves"), are a series of enormous waves created by an underwater disturbance such as an earthquake, landslide, volcanic eruption, or meteorite. A tsunami can move hundreds of miles per hour in the open ocean and smash into land with waves hundreds of feet high.

From the point where a tsunami originates, waves travel outward in all directions much like waves in a pond where a rock has been thrown. Once the wave approaches the shore, it builds in height depending on the topography of the coastline and the ocean floor. There may be a series of waves, with each wave being larger than the one before. That is why one beach area a few miles away might experience a small tsunami while another beach nearby experiences a bigger tsunami.

A tsunami may be forecast to hit one side of the island yet cause tsunami-like effects on the opposite side due to the wrap-around effect.

If a major earthquake or landslide occurs close to shore, the first wave in a series could reach the beaches in only a few minutes. We may not have time to issue warnings to areas at highest risk.

Drowning is the most common cause of death associated with a tsunami.

Tsunamis and the receding water are very destructive to structures in the run-up zone. Other hazards include flooding, contamination of drinking water, and fires from gas lines or ruptured tanks.

THE TSUNAMI THREAT TO OKINAWA

Tsunamis pose the most destructive natural threat to Okinawa. They are near impossible to predict and strike with little to no warning, leaving as little as 20 minutes for us to react.

The Ryukyu Trench is about 100 kilometers (62 miles) off the East coast of Okinawa. The trench could shift and create an 8.5 magnitude earthquake that could trigger a tsunami 20 meters (66 feet) high. The wave could travel 600 miles per hour and strike Eastern Okinawa in **20 minutes**.

KNOW WHERE YOU LIVE

You need to know if you live in a low-lying tsunami threat area. The diagrams included in this pamphlet provide color coded maps depicting rough estimates of various elevations. Also included in the back of this pamphlet (page 7) are a list of web sites that can be used to identify potential threats to low lying areas.

ACTIONS BEFORE/DURING A TSUNAMI

The following are guidelines should a tsunami be forecast:

- **Turn on your radio and/or TV** to learn if there is a tsunami warning following an earthquake, especially if you are in a coastal area. AFN radio (FM 89.1, AM 648) and AFM TV (channel 14 on base; channel 8 off base) are good source of information. NHK is a local Japanese news station (ch. 20) that provides in depth coverage in multiple languages

- **Move inland to higher ground IMMEDIATLEY** and stay there until the all clear has been sounded.

- **Stay away from the beach.** Never go down to the beach to watch for a tsunami. If you can see the wave, you are too close and will not be able to outrun it

- **Monitor web sites if time permits**. See web links on page 7.

- **CAUTION - If there is noticeable recession in water away from the shoreline this is nature's tsunami warning. Heed the warning.** You should to higher areas immediately.

- **Muster**: As soon as possible after all clear is sounded, contact your unit leadership and/or others for direction/guidance. Report to unit work spaces or alternate sites if directed. CFAO and Tenant units submit muster reports to the CFAO EOC (Admin Watch) at 634-9304/9306.

TERMS

Familiarize yourself with these terms to help identify a tsunami hazard:

Advisory: Issued when an earthquake occurs and might generate a tsunami or produce strong currents or waves dangerous to those in or near the water. Coastal regions are at the greatest risk. The threat may continue for several hours after the arrival of the initial wave, but significant widespread inundation is not expected for areas under an advisory. Appropriate actions to be taken by local officials may include closing beaches, evacuating harbors and marinas, and the repositioning of ships to deep waters when there is time to safely do so. Advisories are normally updated to continue the advisory, expand/contract affected areas, upgrade to a warning, or cancel the advisory.

Information Statement: An earthquake occurred or a tsunami watch, advisory, or warning was issued for another section of the ocean. In most cases, information statements are issued to indicate there is no threat of a destructive tsunami and to prevent unnecessary evacuations as the earthquake may have been felt in coastal areas. An information statement may, in appropriate situations, caution about the possibility of destructive local tsunamis. Information statements may be re-issued with additional information, though normally these messages are not updated. However, a watch, advisory, or warning may be issued for the area, if necessary, after analysis and/or updated information becomes available.

Warning: A potential tsunami with significant widespread inundation is imminent or expected. Warnings alert the public that widespread, dangerous coastal flooding accompanied by powerful currents is possible and may continue for several hours after arrival of the initial wave. Warnings also alert emergency management officials to take action for the entire tsunami hazard zone. Appropriate actions to be taken by local officials may include the evacuation of low-lying coastal areas, and the repositioning of ships to deep waters when there is time to safely do so. Warnings may be updated, adjusted geographically, downgraded, or canceled. To provide the earliest possible alert, initial warnings are normally based only on seismic information.

Watch: A tsunami was or may have been generated, but is at least two hours travel time to the area in watch status. The watch area may be upgraded to an advisory or warning or canceled based on updated information and analysis. Therefore, emergency management officials and the public should prepare to take action. Watches are normally issued based on seismic information without confirmation that a destructive tsunami is underway.

BASIC DISASTER "GO" KITS

There are six basics you should stock in your home and have ready to take with you if a tsunami causes major damages to shore infrastructure and compromise basic life needs:

- ☒ **Water**: one gallon per day per person would be the ideal
- ☒ **Food**: 3-day supply of non-perishable food. Select foods that require no refrigeration, preparation or cooking and little or no water. If you must heat food, pack a can of sterno. Select food items that are compact and lightweight. Avoid foods that will make you thirsty. Choose salt-free crackers, whole grain cereals, and canned foods with high liquid content. Include a selection of the following food items in your Disaster Go Kit:
  - ☒ A manual can opener.
  - ☒ Ready-to-eat canned meats, fruits and vegetables
  - ☒ Canned juices, milk, soup (if powdered, store extra water)
  - ☒ Staples such as sugar, salt, pepper
  - ☒ High energy foods such as peanut butter, jelly, crackers, granola bars, trail mix
  - ☒ Vitamins
  - ☒ Foods for infants, elderly persons or persons with special dietary needs
  - ☒ Comfort / stress foods--cookies, hard candy, sweetened cereals, lollipops, instant coffee, tea bags
- ☒ **First aid supplies**: A first aid kit for your home and one for each car should include:
  - ☒ Sterile adhesive bandages in assorted sizes
  - ☒ 2-inch sterile gauze pads (4-6)
  - ☒ 4-inch sterile gauze pads (4-6)
  - ☒ Hypoallergenic adhesive tape
  - ☒ Triangular bandages (3)
  - ☒ 2-inch sterile roller bandages (3 rolls)
  - ☒ 3-inch sterile roller bandages (3 rolls
  - ☒ Scissors
  - ☒ Tweezers
  - ☒ Needle

- ☒ Moistened towelettes
- ☒ Antiseptic
- ☒ Thermometer
- ☒ Tongue blades (2)
- ☒ Tube of petroleum jelly or other lubricant
- ☒ Assorted sizes of safety pins
- ☒ Cleansing agent/soap
- ☒ Latex gloves (2 pair) Sunscreen

Non-prescription drugs

- ☒ Aspirin or nonaspirin pain reliever
- ☒ Anti-diarrhea medication
- ☒ Antacid (for stomach upset)
- ☒ Syrup of Ipecac (use to induce vomiting if advised by the Poison Control Center)
- ☒ Laxative
- ☒ Activated charcoal (use if advised by the Poison Control Center)

Contact the local American Red Cross chapter to obtain a basic first aid manual.

- ☒ **Clothing, bedding and sanitation supplies**
- ☒ **Tools**
- ☒ **Special items**

Keep the items that you would most likely need during an evacuation in easy-to-carry containers (often referred to as “go-bags”). Possible containers include a large, covered trash container; a camping backpack; or a duffle bag.

IMPORTANT TELEPHONE NUMBERS

ON BASE:

Fire, Security, Medical/Ambulance: 911
CFAO Quarterdeck: 632-7653
Weather Information: 634-4081
CFAO Emergency Management Officer: 634-9331/9335

OFF BASE:

US 911 Operator: 911-1911
Japanese Fire/Ambulance: 119
Japanese Police: 110
Japanese Coast Guard: 118
US Naval Hospital: 893-1984
Kadena Base Operator: 938-1111
Foster Base Operator: 911-5111 or 970-5555

OTHER INFORMATION

Here are some very useful web sites:

http://flood.firetree.net/?ll=26.3124,127.9136&z=3&m=0: Zoom to your area of interest (i.e., White Beach). In the upper right, click on "Satellite." In the upper left corner, click a tsunami wave height. Watch the image add a dark blue overlay to reflect areas hit by the tsunami wave height that you chose. Test the results of the "Tsunami Threat to Okinawa" mentioned previously in this pamphlet: 20 meter wave height.

Track real-time tsunami threat information on the Japan Meteorological Agency's (JMA) web site at http://www.jma.go.jp/en/tsunami/joho.html or from the National Oceanic and Atmospheric Administration (NOAA) web site at http://www.prh.noaa.gov/ptwc

http://www.mapion.co.jp/map/admi47.html links to a Japanese web site that will give you detailed elevations. To use it, open the site, and click on an area of interest. After it zooms in, click any area (you'll see a small red plus sign), then look in the upper right under the green pyramids to see the elevation in meters.

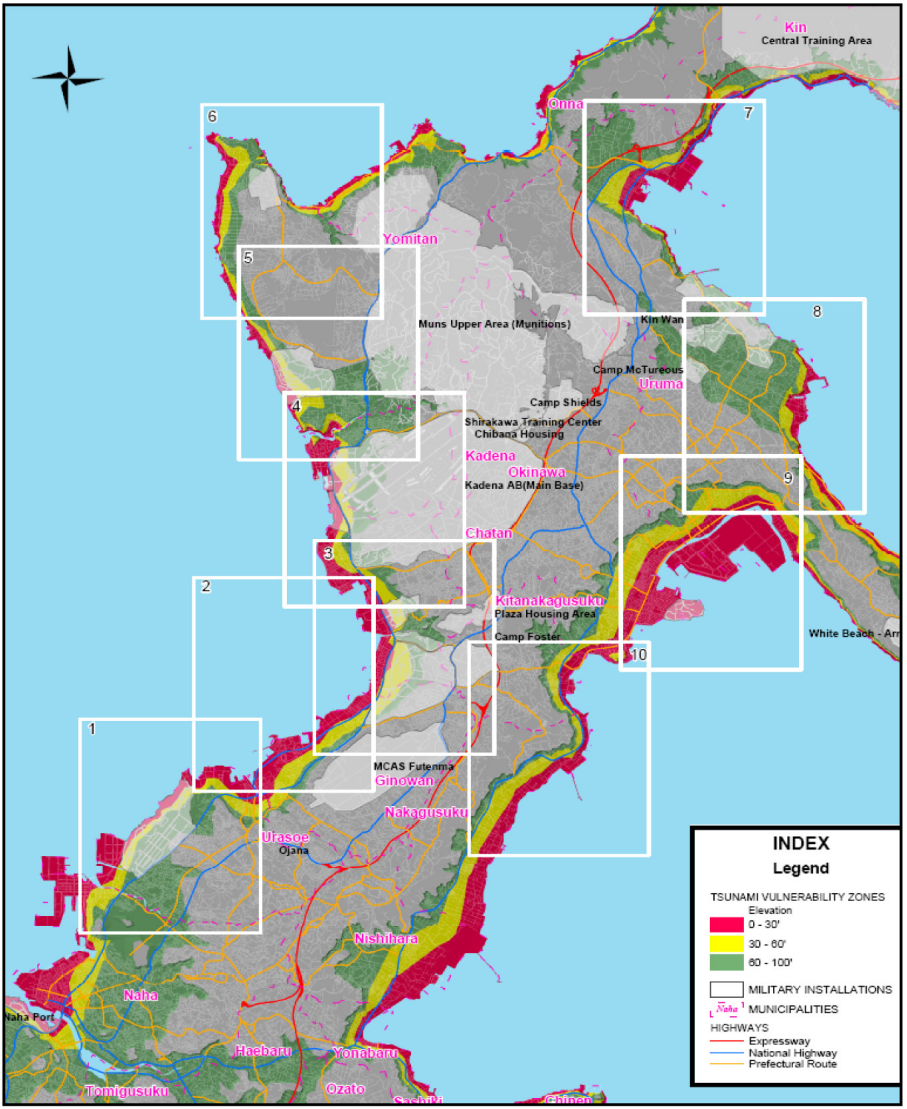
Learn about tsunamis and get training from the Federal Emergency Management Agency (FEMA) at http://www.fema.gov/hazard/tsunami/index.shtm

The Japanese web site at http://seis.sci.u-ryukyu.ac.jp/hazard/tsunami-okinawaIs/tsunami20110512.htm provides a depiction of the tsunami threat to

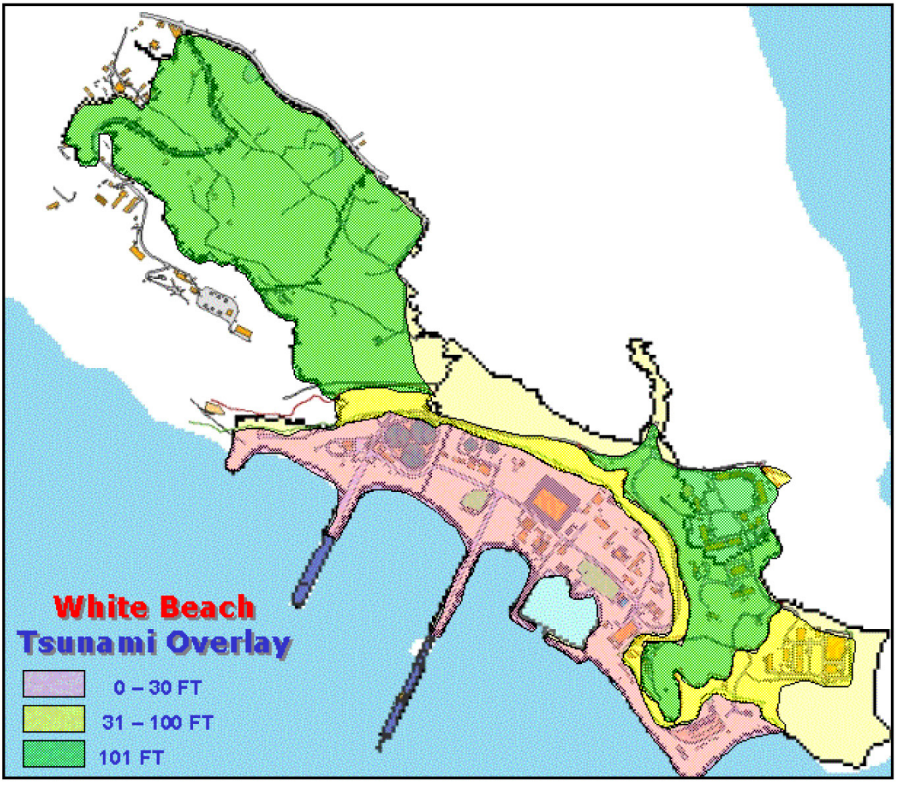
OKINAWA VULNERABILITY ZONES

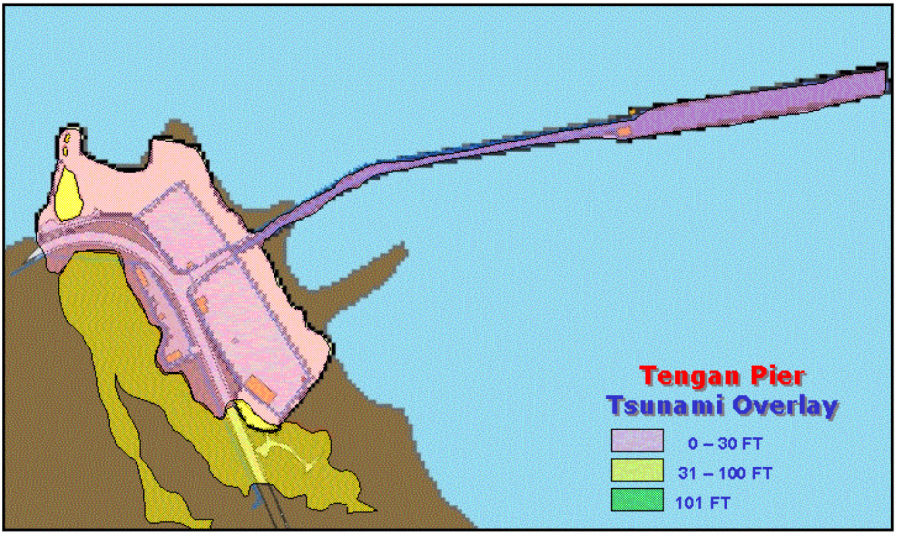
This map provides a macro view of some low-lying tsunami-threat zones on Okinawa. Installation-specific maps are also provided in this pamphlet. Since the maps' elevations depict measurements in feet, the following conversions to meters (rounded off) are provided:

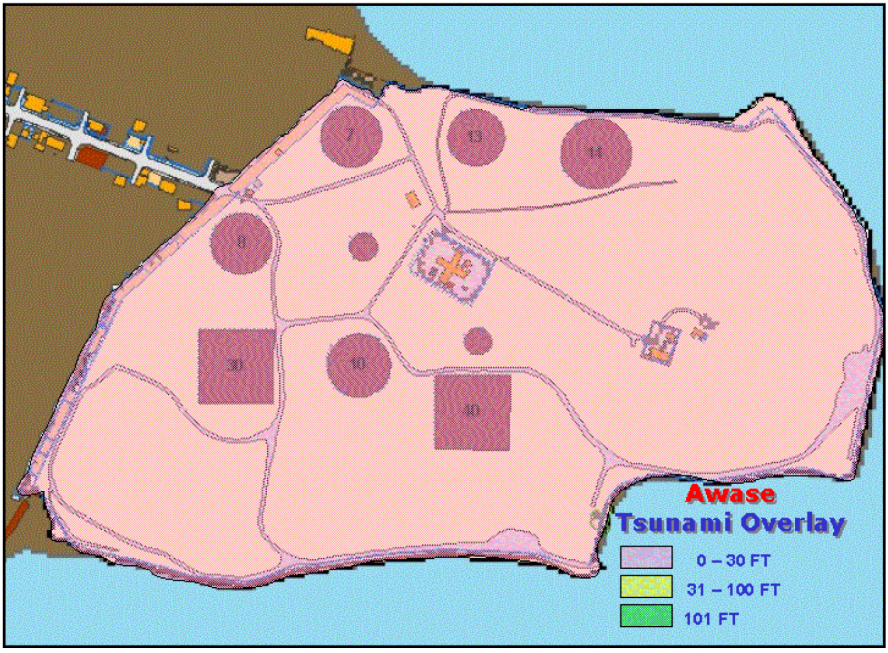
- 30 feet: 9 meters
- 60 feet: 18 meters
- 100 feet: 31 meters



INSTALLATION VULNERABILITY ZONES



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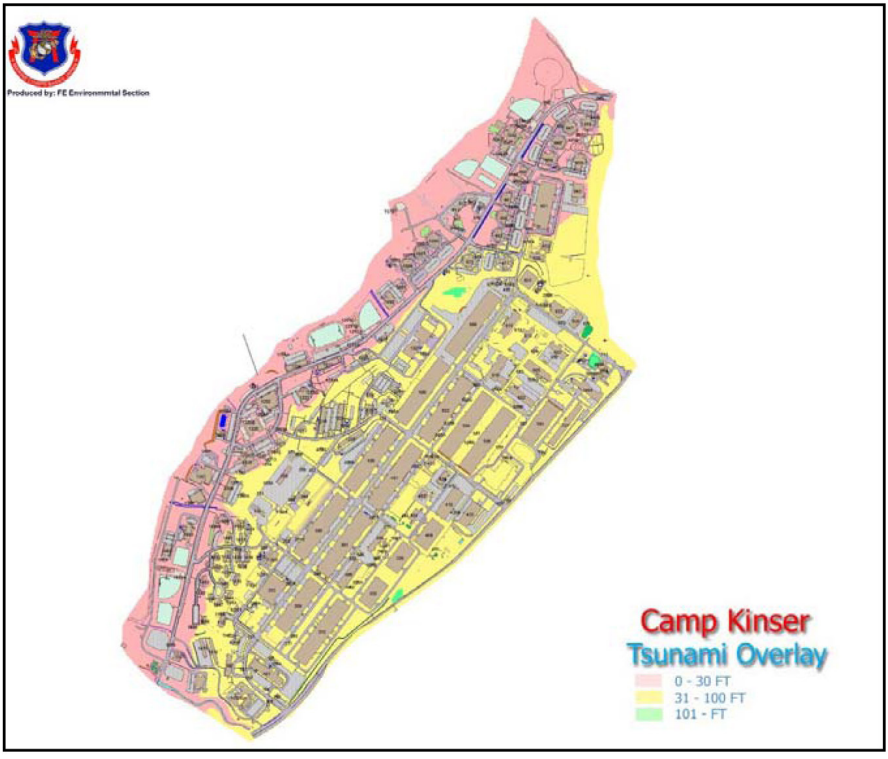
Tsunami Overlay
0 – 30 FT
31 – 100 FT
101 FT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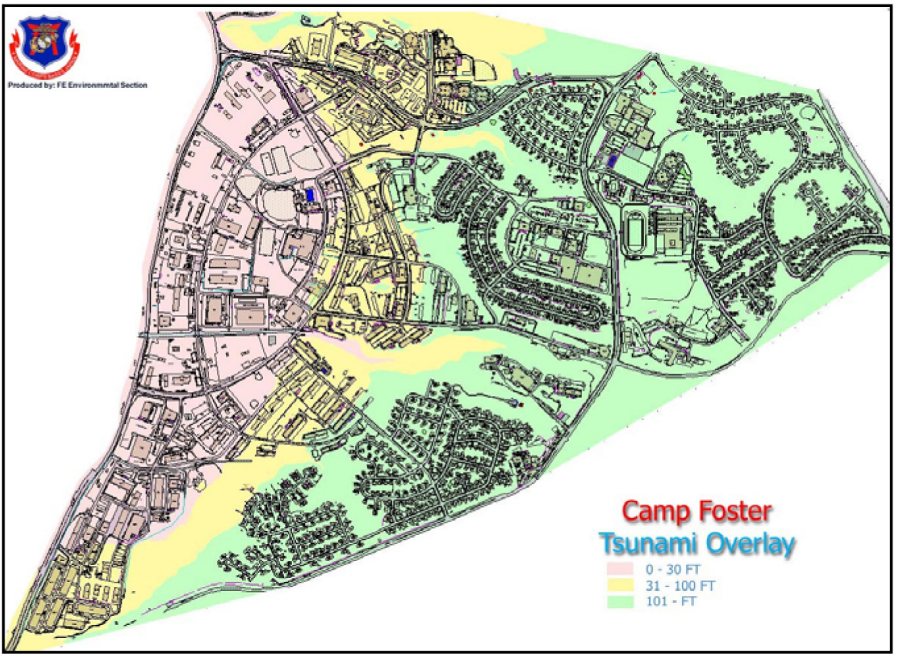
Tsunami Overlay
0 - 30 FT
31 - 100 FT
101 - FT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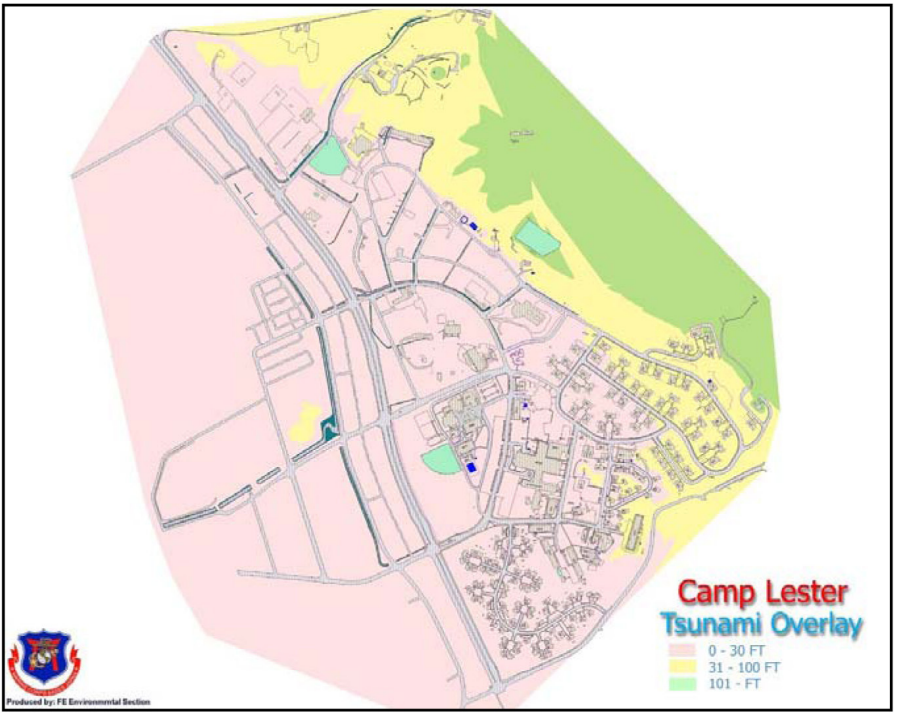
Camp Foster
Tsunami Overlay
0 - 30 FT
31 - 100 FT
101 - FT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Tsunami Overlay
0 - 30 FT
31 - 100 FT
101 - FT
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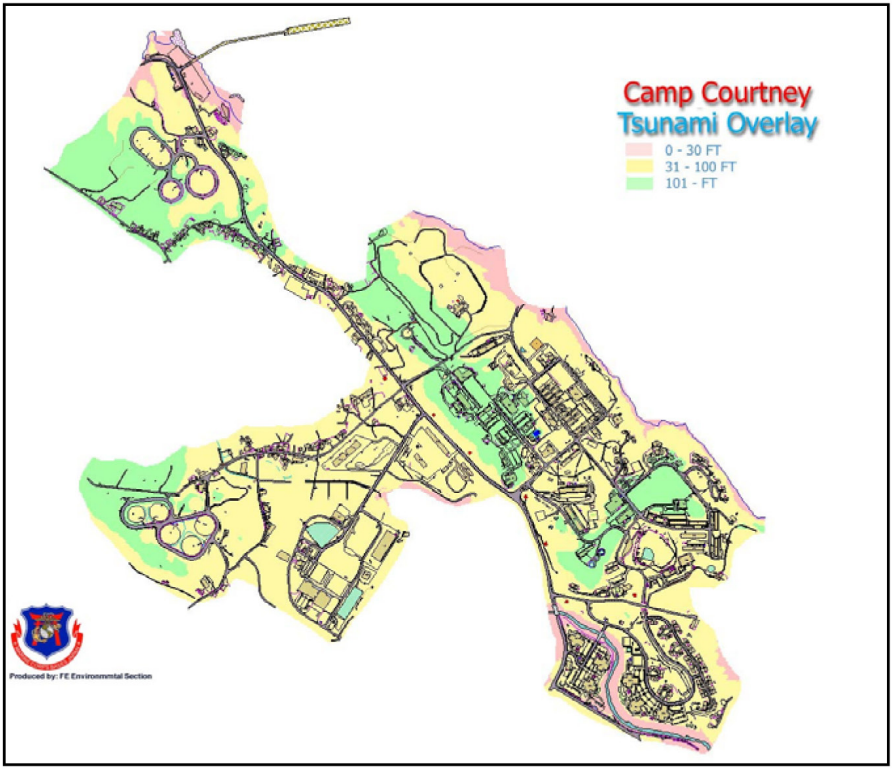
Camp Courtney
Tsunami Overlay
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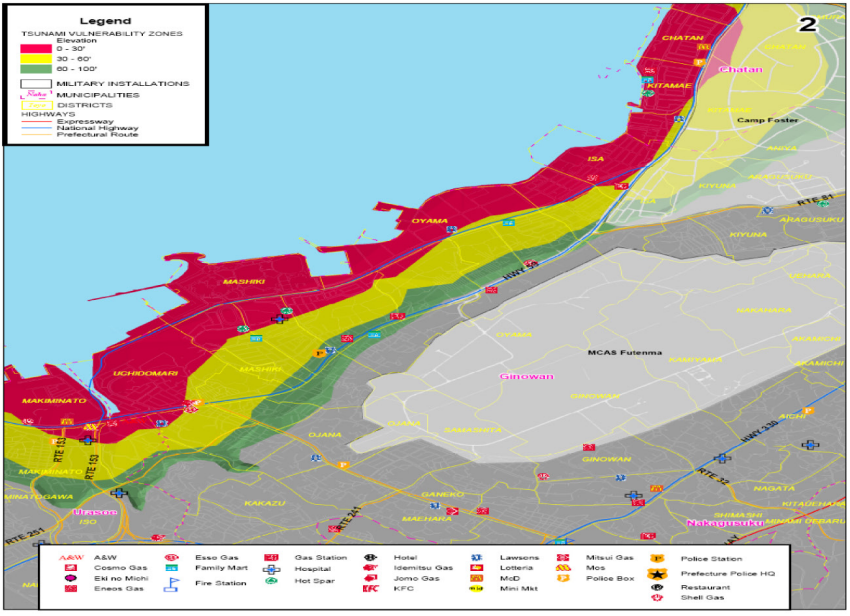
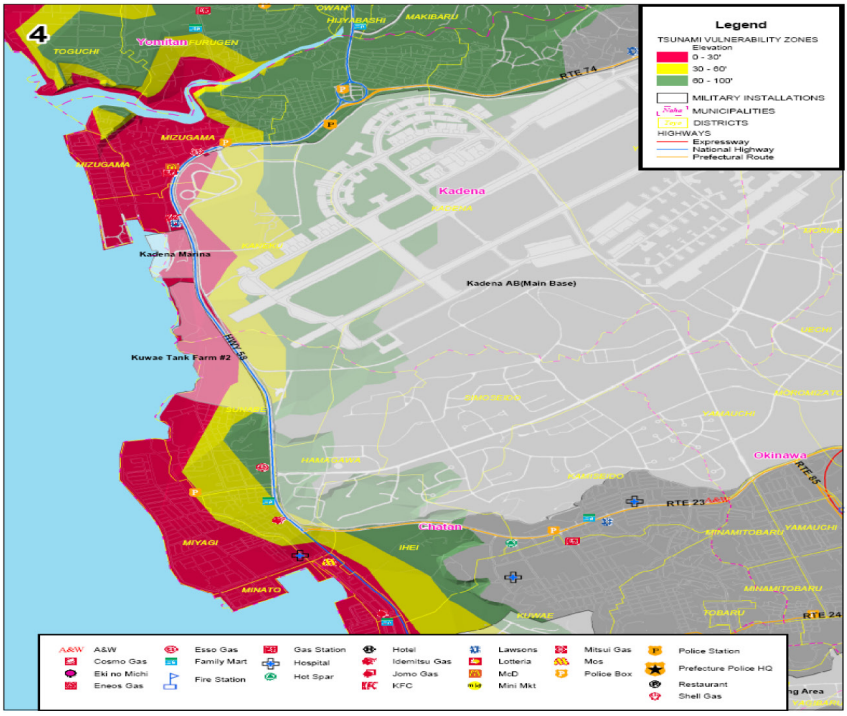
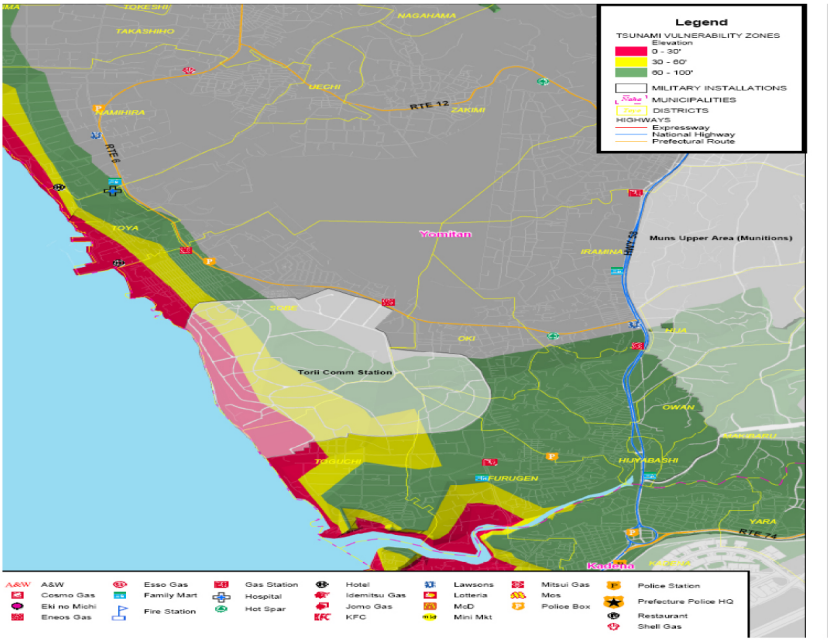
MCAS Futenma

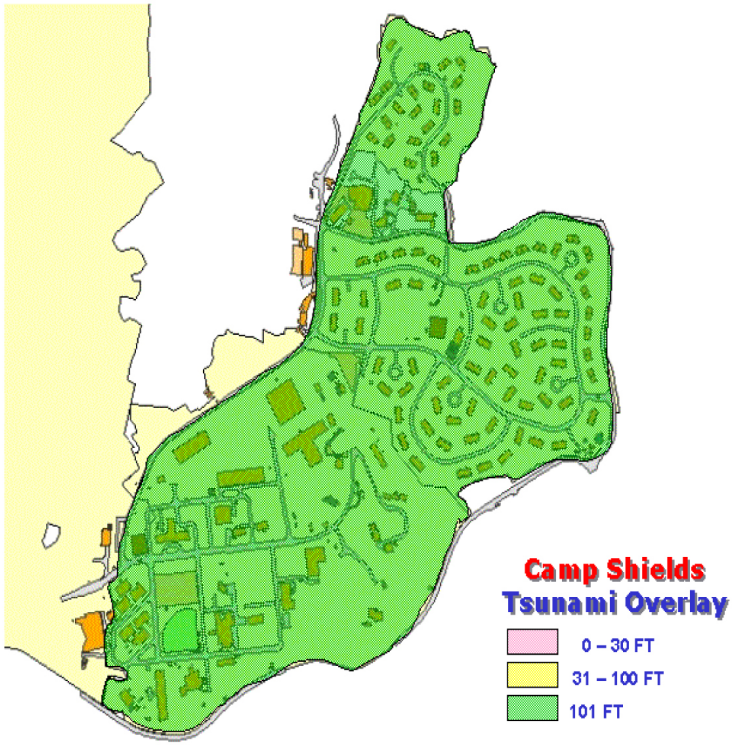


Kadena Air Base



Torii Station





Okinawa. Though the web site is in Japanese, it is easy to see the Ryukyu Trench and tsunami wave action expected should there be an 8.5 magnitude earthquake from the trench.

Also see COMFLEACT OKINAWA INSTRUCTION 3440.2_ or the CFAO Emergency Management Plan available through CFAO Admin or the Emergency Management Office (634-9331)


COMMANDER FLEET ACTIVITIES
OKINAWA