ITIC Training Program

PRESENTATION

Sunday Sept 12, 2004 8:45 am IR Image- Grand Cayman Just Outside Eye-wall

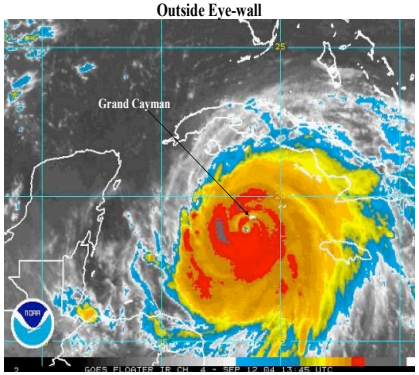
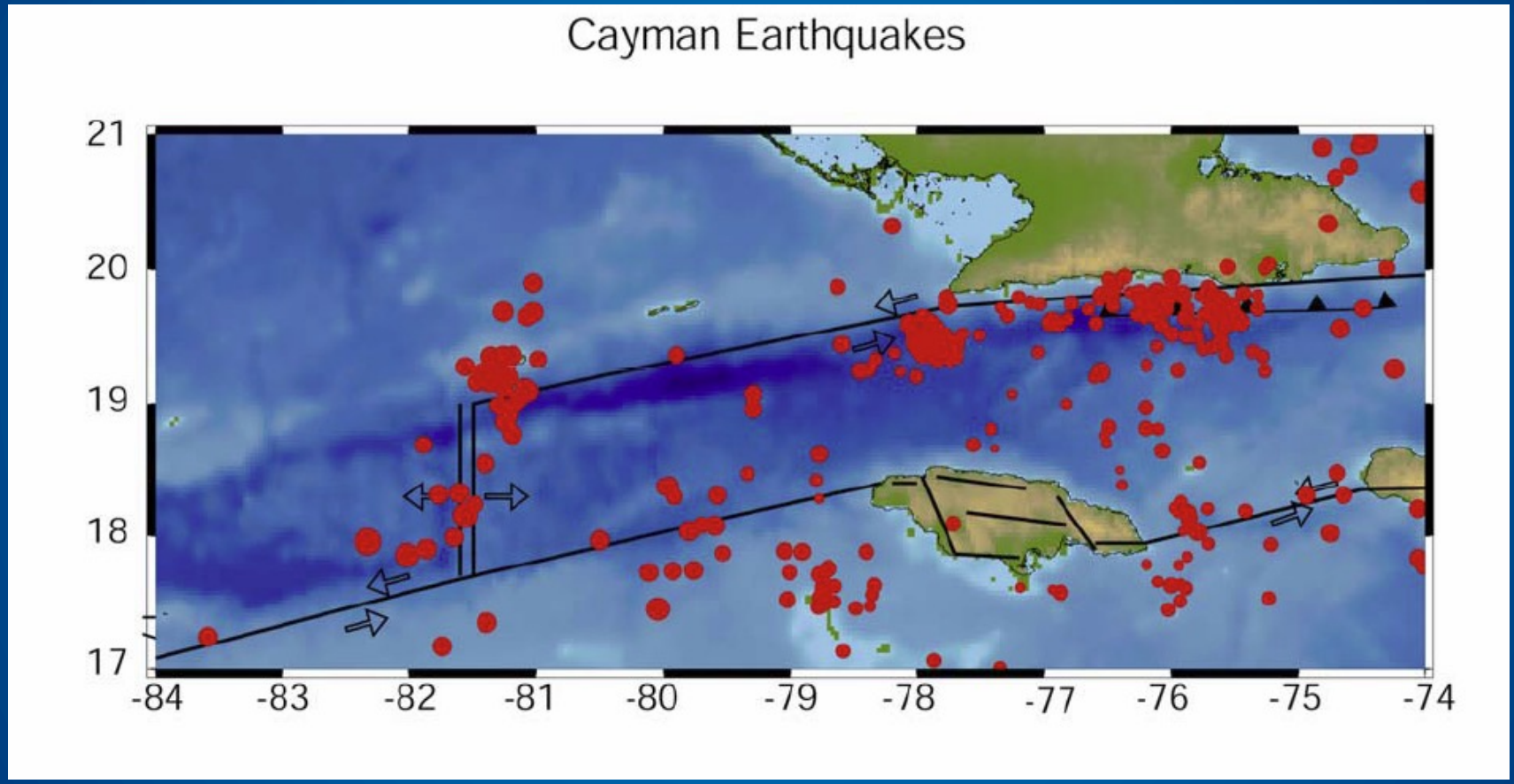


PLATE BOUNDARIES



Several large earthquakes (M>7.0) have occurred in our region in the last few decades. The Swan Islands Transform Fault generated two of the largest strike-slip earthquakes in the Caribbean – a M 7.3 event in 2009 and a M 7.8 event in 2018.

On the Oriente Fault in addition to the 7.7 M event we experienced in 2020 (which damaged 300 homes and killed one person in Cuba), there was 7.7 M in 1852 and and 7.4 M event in 1917

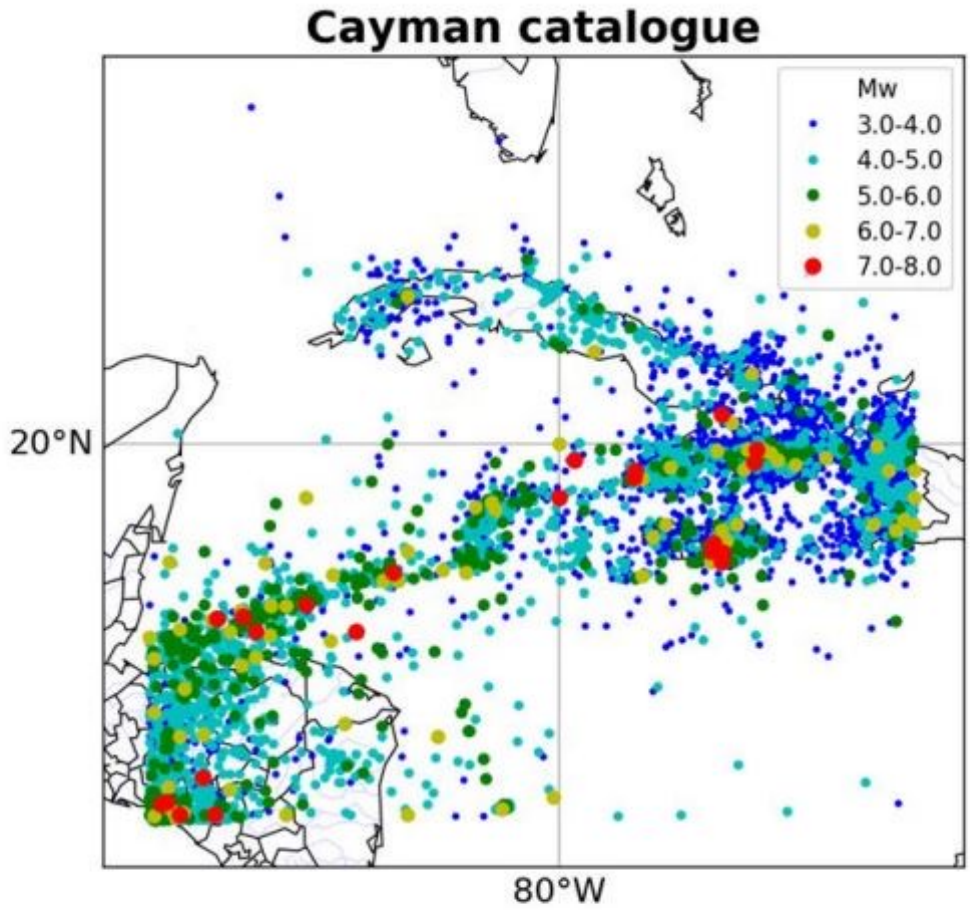
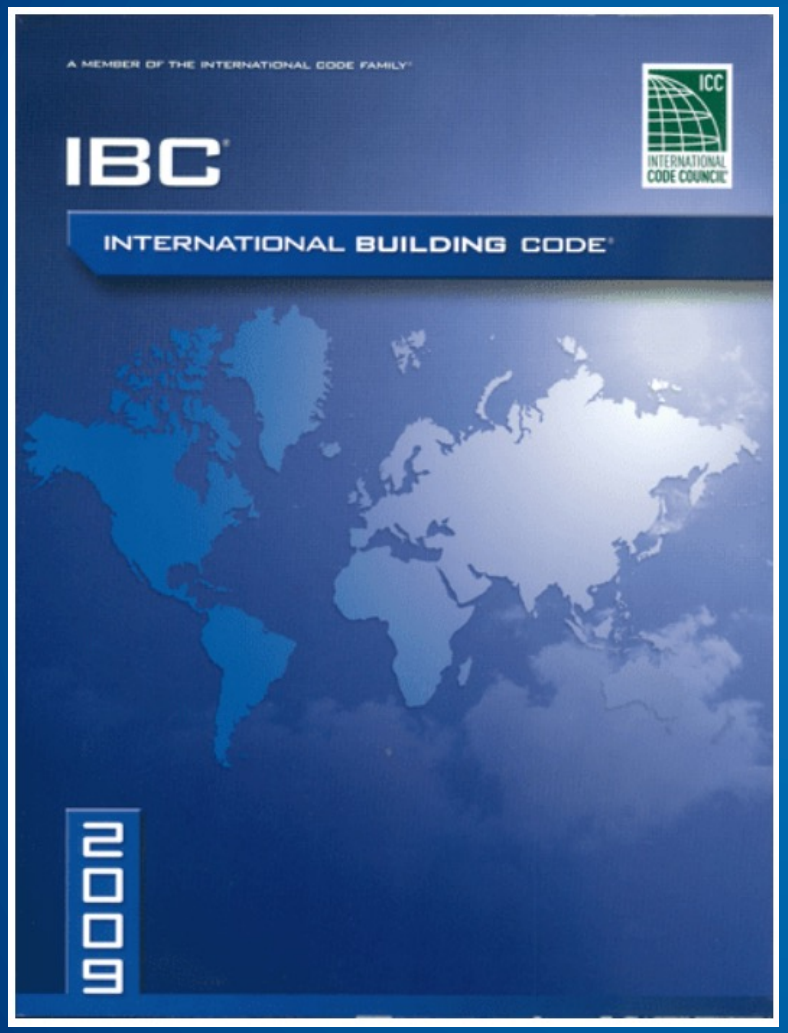
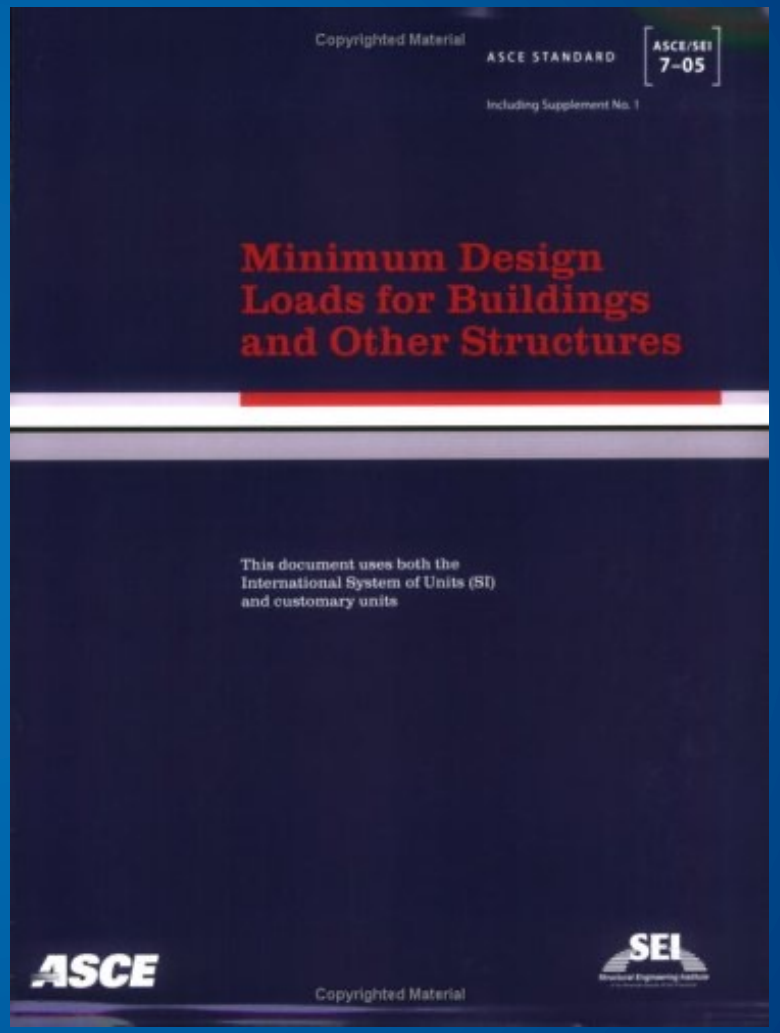


Figure 3.2. Earthquake catalogue for the Cayman region. The catalogue contains 8640 events with magnitude spanning in the range $3.0 \leq M_w \leq 7.9$ and time lapse from 1528 AD to 2019.

Source: Probabilistic Seismic Hazard Assessment at the Cayman Islands December 2021 (Page 22)
Carlo G. Lai, Elisa Zuccolo, Barbara Borzi EUCENTRE, Yen-Shin Chen, Marco Pagani GEM Foundation

Building Code





THE CAYMAN ISLANDS NATIONAL HAZARD MANAGEMENT PLAN

Hazard Management Plans

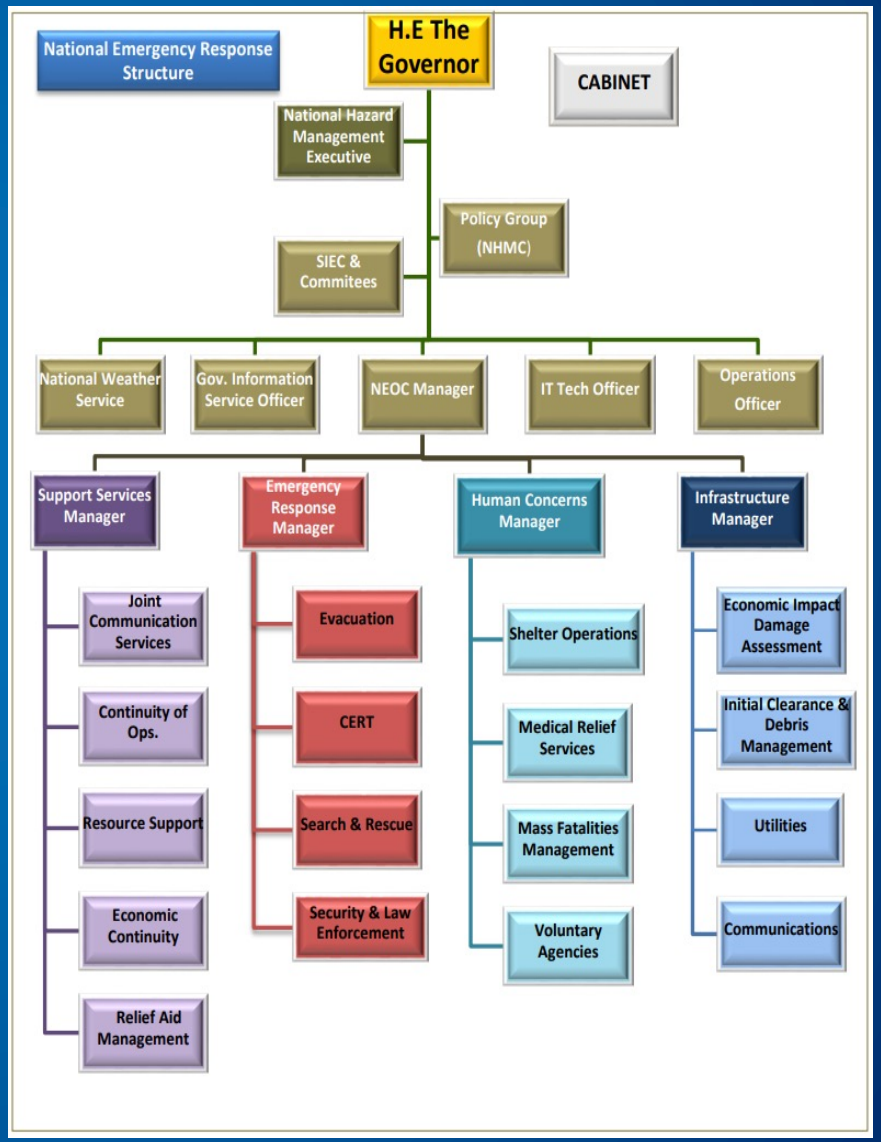
July 29, 2021
Plan
Vol 3F National Marine Oil Spill Contingency Plan

July 31, 2019
Plan
Volume 1 - National Hazard Management Plan (Main Plan)

August 30, 2019
Plan
National Hurricane Plan

March 31, 2019
Plan
Volume 3C- National Tsunami Plan

Previous 1 2 Next



PTWC Tsunami Warning Focal Points

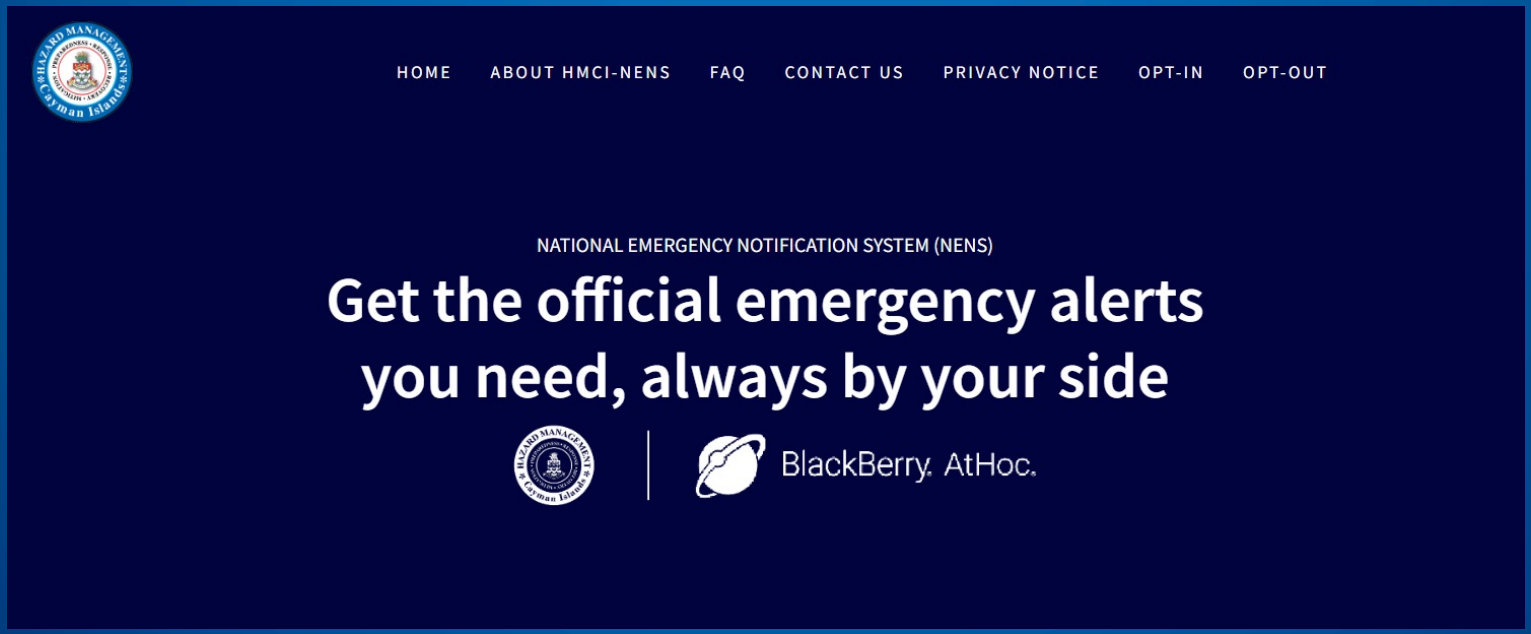
Department of Public Safety Communications

Cayman Islands Government

NATIONAL WEATHER SERVICE

Official Weather Source of the Cayman Islands

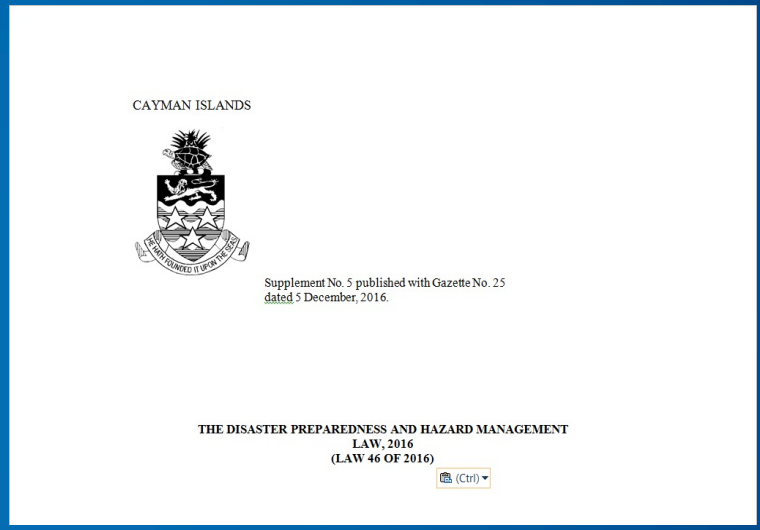
- Role of JCS
- HMCI Communications Capacity
- National Emergency Notifications System (Phases)



THE DISASTER PREPAREDNESS AND HAZARD MANAGEMENT LAW, 2016
(LAW 46 OF 2016)
(2019 Revision)

The Disaster Preparedness And Hazard Management Law, 2016 was passed in the Legislative Assembly on 5 December 2016 providing HMCI with the legislative authority to carry out its responsibilities.

This law was revised in 2019 and a couple of amendments were made including Emergency Notifications /Disaster Fund etc.



CAYMAN ISLANDS

Supplement No. 5 published with Gazette No. 25 dated 5 December, 2016.

THE DISASTER PREPAREDNESS AND HAZARD MANAGEMENT LAW, 2016
(LAW 46 OF 2016)

This legislation (amongst other things):

- Enables Government to declare evacuation / disaster zones
- Enables Government to cancel leave / rescind vacation for Government Employees
- Once NEOC is activated Government workers may be redeployed to other tasks if needed
- Once NEOC is activated Government can requisition any and all Government buildings, vehicles and other assets to respond to the crisis

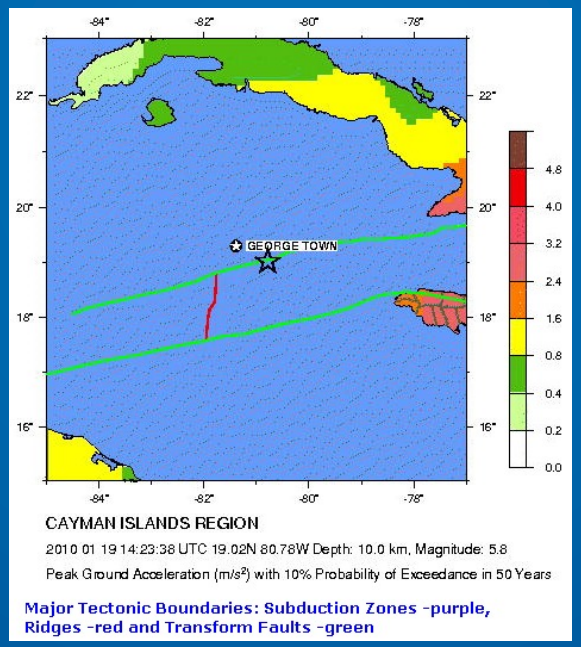
Earthquakes

14 December 2004

- 6.8 Magnitude

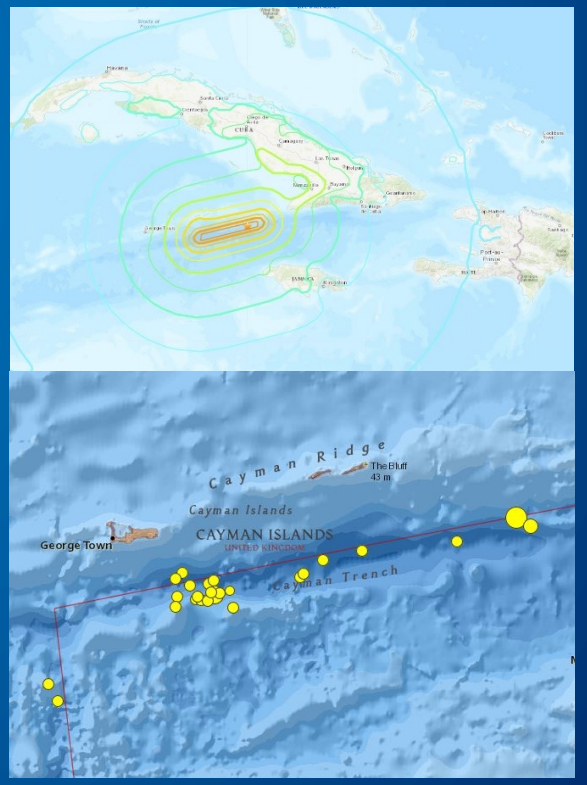
19 January 2010

- 5.9 Magnitude

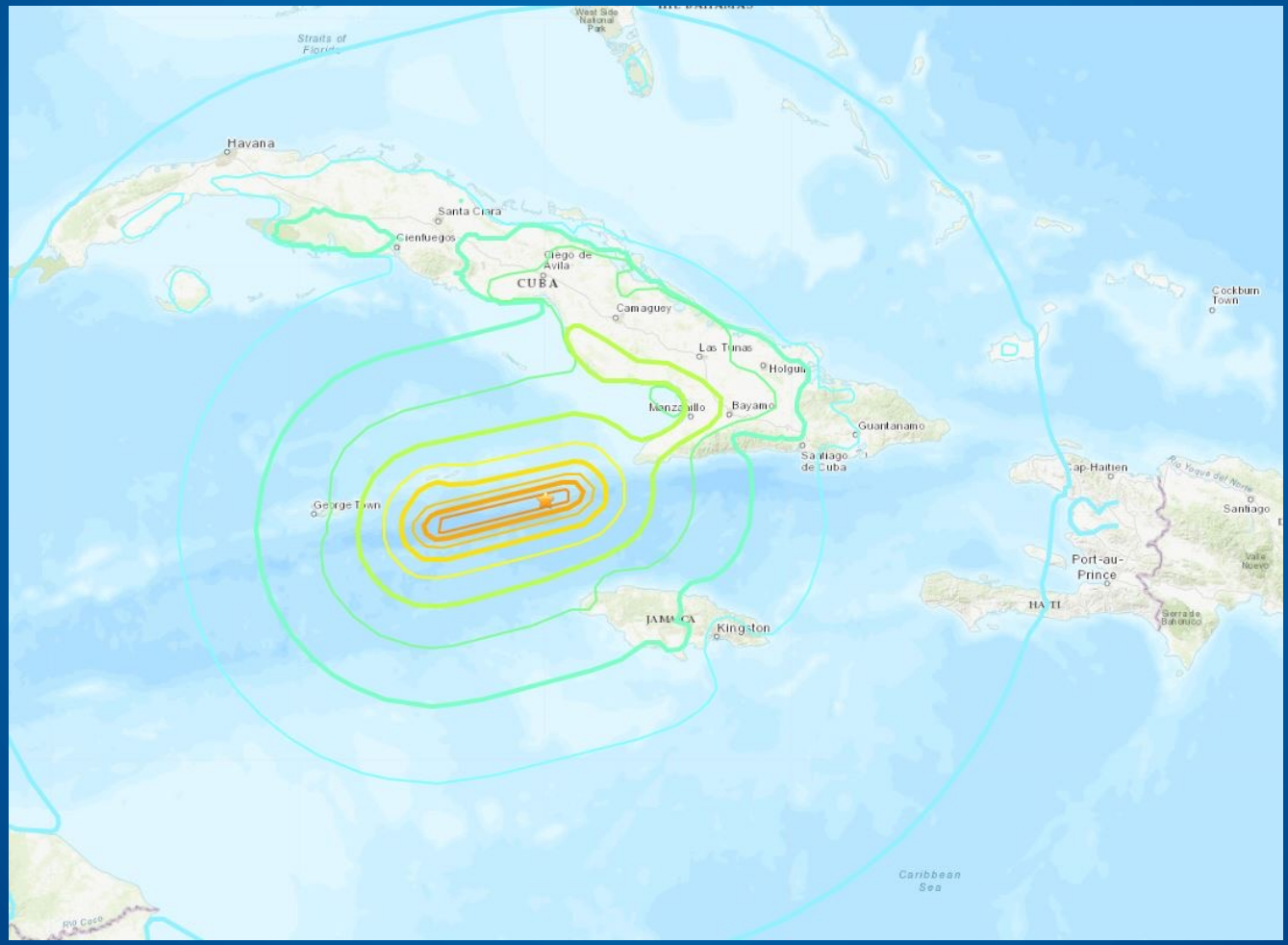


28 January 2020

- 7.7 Magnitude



7.7 Magnitude Earthquake
January 28, 2020

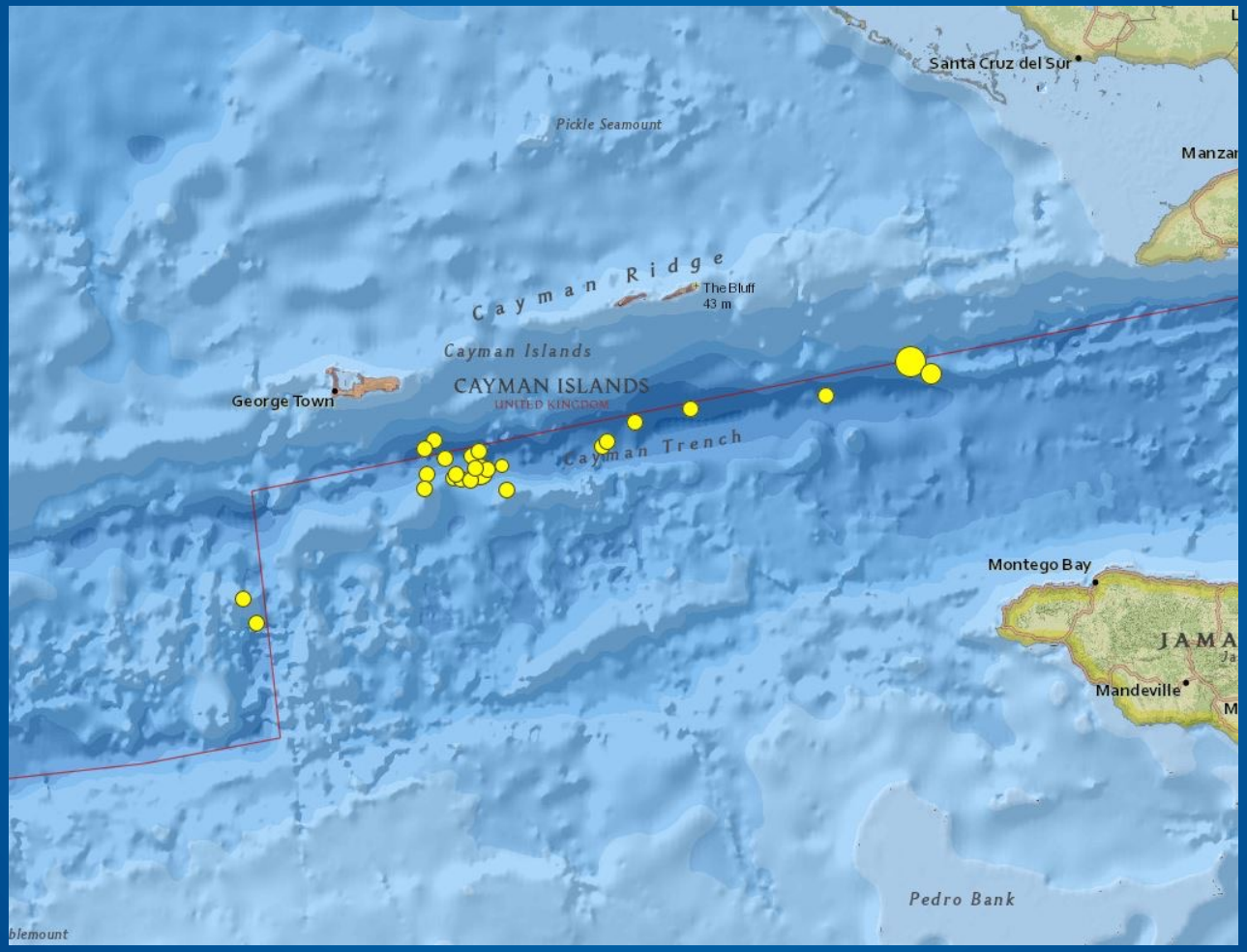


8 Inch Tsunami Recorded on our UNESCO Tsunami Warning Sensor in George Town Harbour

The sensor uses both radar and pressure sensors to measure sea level

The sensor was funded through a UNESCO grant and was installed in 2014 by German company OTT with assistance from Hazard Management Cayman Islands, Lands and Survey, Port Authority and Department of Environment

Aftershocks



2020 Earthquake Activity

28th January Earthquake Activity Cayman Region
> 7.7 M, 80 miles east of Cayman Brac (and Tsunami Warning)
> 4.5 M, 44 miles off East End
> 3.9 M, 37 miles off East End
> 4.1 M, 65 miles off East End
> 4.7 M, 75 miles off East End
> 4.9 M, 19 miles South East of East End
> 6.1 M, 35 miles South East of East End
> 4.4 M, 37 miles South East of East End
> 4.4 M, 65 miles ESE of East End
> 4.4 M, 30 miles SE of East End
> 4.4 M, 25 miles SE of East End
> 4.4M, 32 miles SE of East End
> 4.3 M, 33 miles SE of East End
> 4.4 M, 31 miles SE of East End
> 4.1 M, 31 miles SE of East End

29th January Earthquake Activity Cayman Region
> 4.3 M, 35 miles SE East End
> 5.1 M, 71 miles East of East End

30th January Earthquake Activity Cayman Region
> 4.0 M, 20 miles SSE of East End
> 4.0 M, 33 miles SE of East End
> 4.7M 26 miles SSE of East End

1st February Earthquake Activity Cayman Region
> 4.2 M, 30 miles SSE of East End

2nd February Earthquake Activity Cayman Region
> 4.4 M, 72 miles East of East End
> 4.2 M, 66 miles SSW of George Town
> 4.1 M 72 miles SSW of George Town

19th February Earthquake Activity Cayman Region
> 4.4 M, 30 miles S of Bodden Town

22nd March Earthquake Activity Cayman Region
> 4.6 M, 32 miles SE of East End

23rd March Earthquake Activity Cayman Region
> 4.3 M, 30 miles SSE of East End

25th March Earthquake Activity Cayman Region
> 4.0 M, 38 miles S of George Town

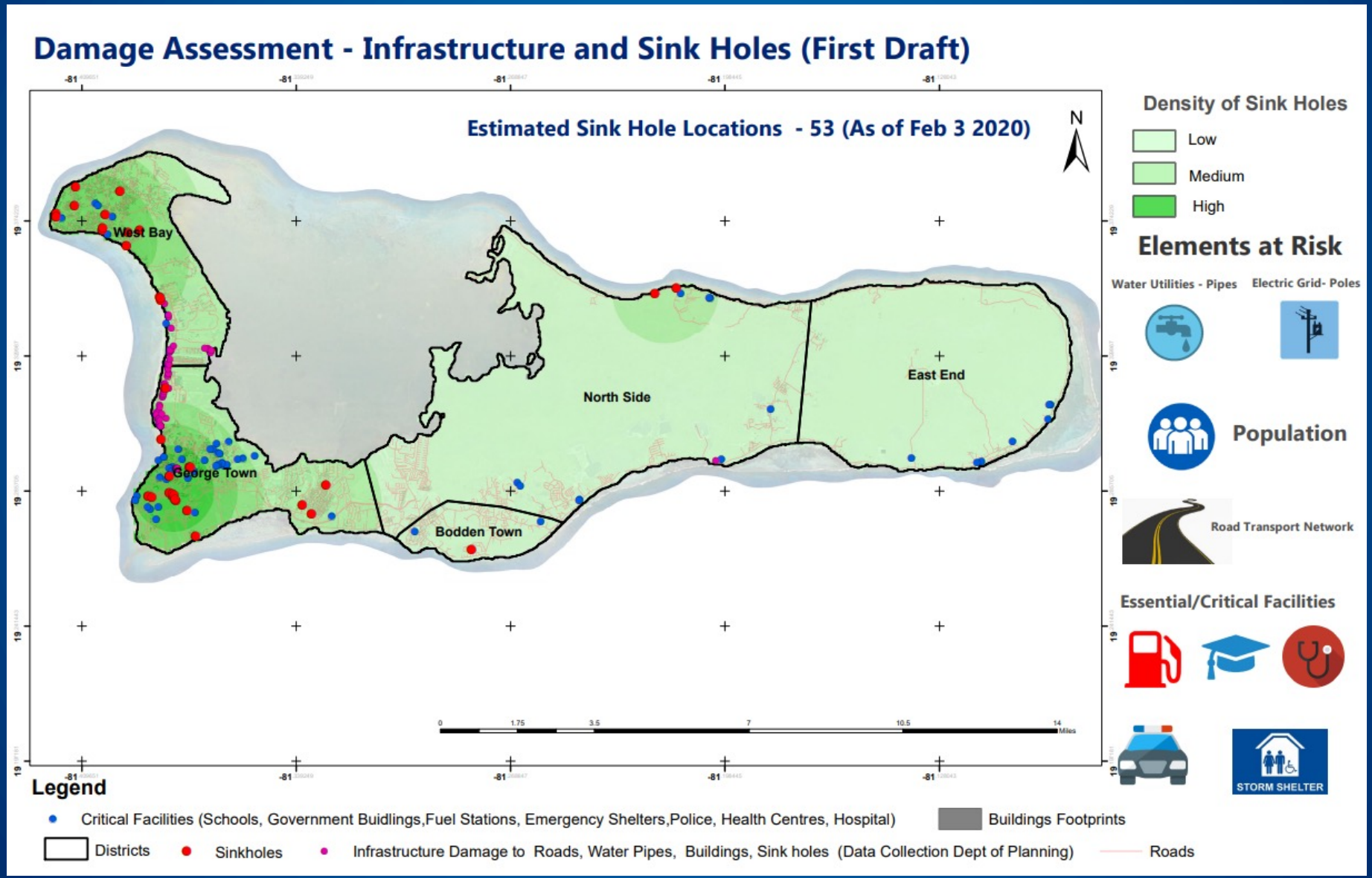
16th April Earthquake Activity Western Caribbean Sea
> 6.3 M, 40 miles N of Bay Islands Honduras (Tsunami information statement)

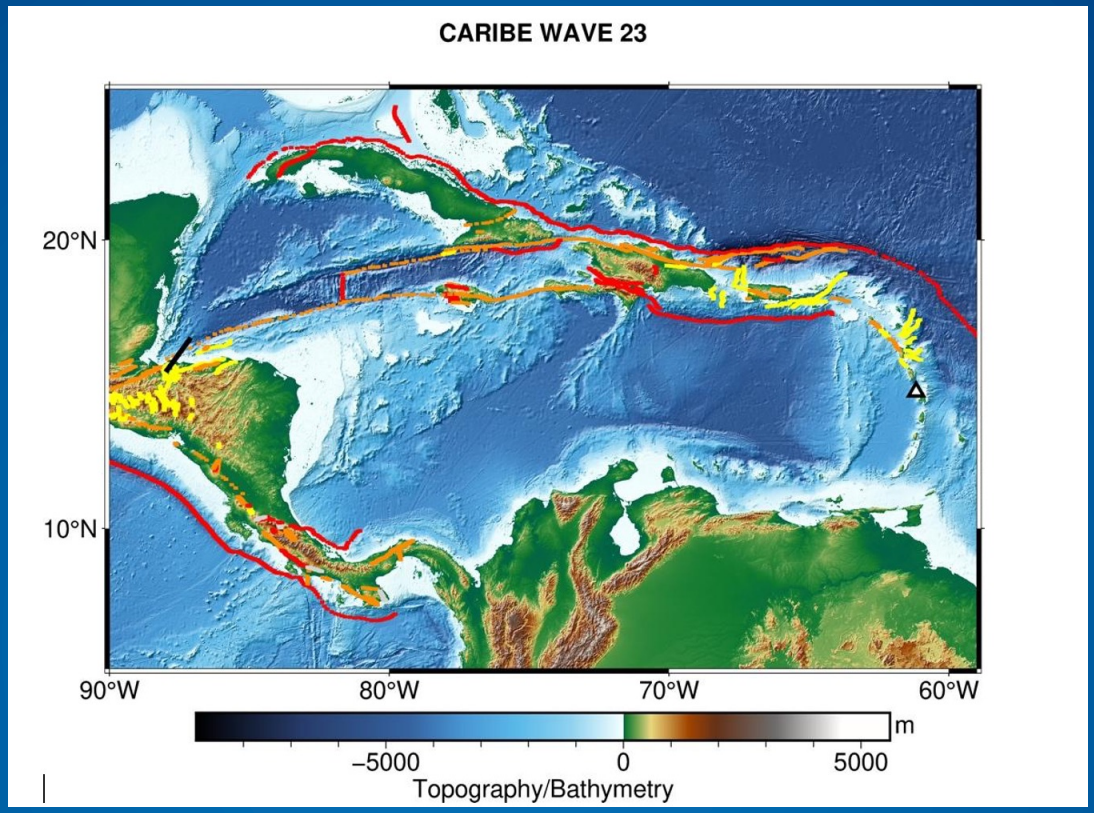
28th March Earthquake Activity Cayman Region
> 4.1 M, 23 miles S of George Town

8th September Earthquake Activity Cayman Region
> 4.5 M, 64 miles ESE of East End

25th November Earthquake Activity Cayman Region
> 4.4 M, 30 miles S of George Town

Numerous sinkholes opened up after the January 28th earthquake





- Most schools in the Cayman Islands signed and took part in the 2023 Caribe Wave Tsunami Exercise
- Past years we have used the exercise to consider our response plans and evacuation options for the cruise landing area in George Town
- Also members of the NEOC Joint Communications Emergency Support Team have used the exercise to consider their roles and responsibilities

Public Awareness

Be prepared for a TSUNAMI

KNOW WHEN TO ACT

NATURAL SIGNS!
If the sea is pulling back from the shore, a sudden rise in sea levels or a loud roar coming from the sea.

AN EARTHQUAKE!
If you feel an earthquake that makes it hard to stand or lasts longer than a minute.

KNOW HOW TO ACT

ON LAND!
Move immediately to upper floors of concrete building or to higher ground. Stay in your safe, elevated spot until the all clear is given by officials.

Only go outside if it is necessary to find safe, elevated shelter.

AT SEA!
If you are already in a boat, go out to deep water.

If you think a tsunami may have been generated, DO NOT WAIT FOR AN OFFICIAL TSUNAMI WARNING! There may not be time to issue one. Take action now!

Follow HMCI on Facebook and Twitter for up-to-date earthquake information and safety tips.

gisdivision.ky | © Crown Copyright 2020

How to stay TSUNAMI SAFE

PREPARE BEFORE

- **Learn the signs of a potential tsunami** such as an earthquake, a loud roar from the sea, or unusual signs such as a sudden rise or wall of water or sudden draining showing the sea floor.
- **Know and practice your evacuation plan** and map out your routes from home, work and play. Pick shelters at least 2 floors up or higher.
- **Create a family emergency communication plan** that has an off-island contact. Plan where to meet if you get separated.

SURVIVE DURING

- **If there is a warning,** either natural signs or an official warning, move immediately to the upper floors of a concrete building or to higher ground.
- **If you are in a boat,** face the direction of the waves and head out to sea. If you are in a harbour, go to at least the 2nd floor of a concrete building.
- **Avoid the coastline** and head as much inland as possible to find high ground (at least 2 floors up).
- **Leave immediately** if you are told to do so.

SAFETY AFTER

- **Listen to local alerts and authorities** for information on areas to avoid and shelter locations.
- **Avoid wading in floodwater,** which can contain dangerous debris. Water may be deeper than it appears.
- **Be aware of the risk of electrocution.** Underground or downed power lines can electronically charge water. Do not touch electrical equipment if it is wet or if you are standing in water.
- **Document property damage** with photographs. Conduct an inventory and contact your insurance company for assistance.
- **Save phone calls for emergencies.** Use text messagesor social media to communicate with family and friends.
- **Stay away** from damaged buildings and roads.

gisdivision.ky | © Crown Copyright 2020

Public Awareness

Earthquake and Tsunami Preparedness Cayman Islands

Get your vehicle to higher ground!

Sea-level rise exponentially increases coastal food frequency

The present-day 50-year extreme water level (i.e., 2% annual chance of exceedance, based on historical records) will be exceeded annually before 2050 for most (i.e., 70%) of the coastal regions in the United States. Looking even farther into the future, the present-day 50-year extreme water level will be exceeded almost every day during peak tide (i.e., daily mean higher high water) before the end of the 21st century for 90% of the U.S. coast.

European Centre for Training and Research in Earthquake Engineering Foundation

GEM Foundation

Report of the activities described in the contract between The Cayman Islands Government and The European Centre for Training and Research In Earthquake Engineering Foundation and The GEM Foundation (of 2020-02-19)

Probabilistic Seismic Hazard Assessment at the Cayman Islands

Carlo G. Lai, Elisa Zuccolo, Barbara Borzi

EUCENTRE, Pavia, Italy

Yen-Shin Chen, Marco Pagani

GEM, Pavia, Italy

16 December 2021

Cayman Islands Tsunami Model

NOAA Center for Tsunami Research

Pacific Marine Environmental Lab

Model Delivery Date: September 23, 2023

New Direction and Future Developments

- Smart flood early warning detection system
- Storm Surge and Wave Modeling
- Automatic Weather Stations
- Impact Based Forecasting
- Expanding Notifications Systems (NENS)

Cayman Islands Government

OFFICIAL SOURCES OF INFO

Radio Cayman 1 89.9 89.9 Cayman Islands

HAZARD MANAGEMENT Cayman Islands
PREPAREDNESS • RESPONSE • RECOVERY • MITIGATION

CAYMAN ISLANDS NATIONAL WEATHER SERVICE

NATIONAL WEATHER SERVICE

Official Weather Source of the Cayman Islands

HMCI Contacts

- Website: Caymanprepared.ky
- Facebook @Caymanprepared
- Twitter @CINEOC
- Instagram @Caymanprepared
- YouTube: Hazard Management Cayman Islands

THANK YOU!

ANY QUESTIONS?

For more information: CaymanPrepared.gov.ky