UNESCO-IOC / NOAA ITIC Training Program in Hawaii (ITP-TEWS Hawaii)
TSUNAMI EARLY WARNING SYSTEMS
AND THE PACIFIC TSUNAMI WARNING CENTER (PTWC) ENHANCED PRODUCTS
TSUNAMI EVACUATION PLANNING AND UNESCO IOC TSUNAMI READY PROGRAMME
15-26 September 2025, Honolulu, Hawaii

unesco
Intergovernmental Oceanographic Commission

Evacuation maps when inundation modeling is not possible or practical

Case Study – Caribbean Example

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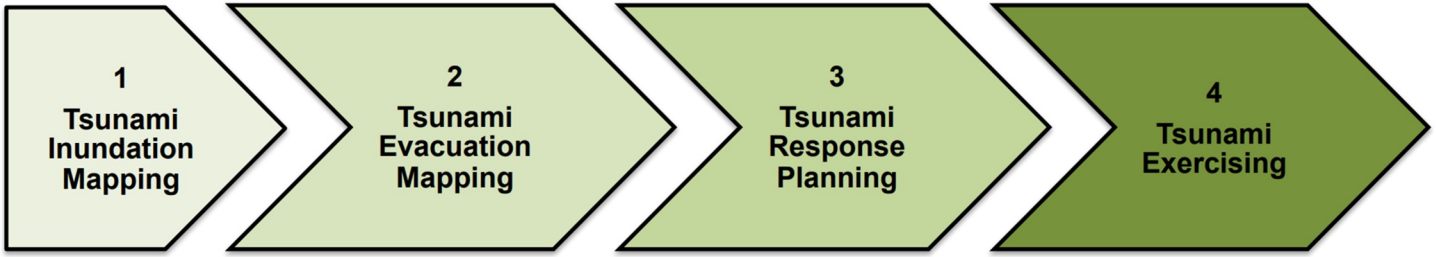
Deputy Director, ITIC

Acknowledgement: Desiree Bayouth García,
ex CIMAS/UCAR contractor supporting ITIC-CAR TR Projects

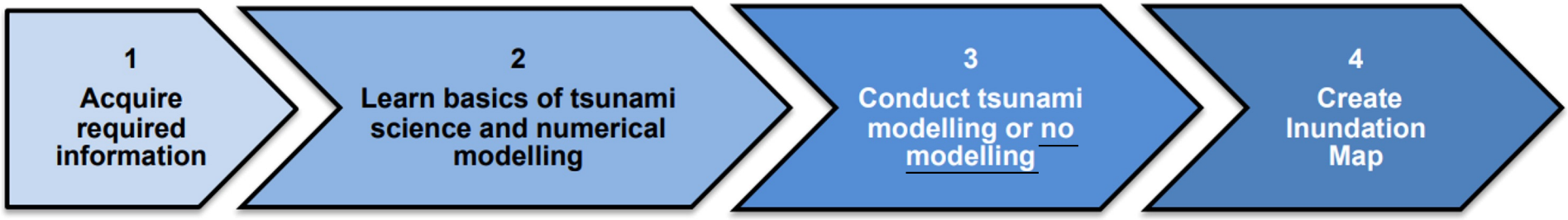
Pacific Community
Communauté du Pacifique

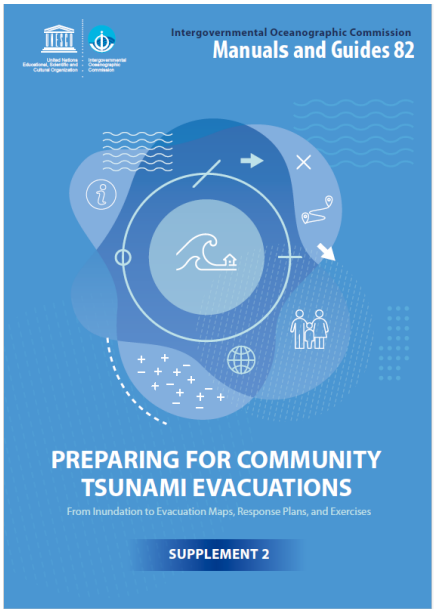
Introduction



	TSUNAMI READY INDICATORS
I	**ASSESSMENT (ASSESS)**
1	**ASSESS-1**. Tsunami hazard zones are mapped and designated.
2	**ASSESS-2**. The number of people at risk in the tsunami hazard zone is estimated.
3	**ASSESS-3**. Economic, infrastructural, political, and social resources are identified.
II	**PREPAREDNESS (PREP)**
4	**PREP-1**. Easily understood tsunami evacuation maps are approved.
5	**PREP-2**. Tsunami information including signage is publicly displayed.
6	**PREP-3**. Outreach and public awareness and education resources are available and distributed.
7	**PREP-4**. Outreach or educational activities are held at least three times a year.
8	**PREP-5**: A community tsunami exercise is conducted at least every two years.
III	**RESPONSE (RESP)**
9	**RESP-1**. A community tsunami emergency response plan is approved.
10	**RESP-2**. The capacity to manage emergency response operations during a tsunami is in place.
11	**RESP-3**. Redundant and reliable means to timely receive 24-hour official tsunami alerts are in place.
12	**RESP-4**. Redundant and reliable means to timely disseminate 24-hour official tsunami alerts to the public are in place.

IOC Manuals and Guides 82
Preparing for Community Tsunami Evacuations





Module 1 – Identifying Tsunami Inundation Areas
Module 2 – Developing Tsunami Evacuation Maps

Basis for Maximum Credible Tsunami Inundation Maps

- **Model inundations based on maximum credible tsunamis from all potential tsunami sources and use maximum inundation of all scenarios at each place long the coast**

Otherwise

- **Use any inundation model results where they exist**
- **Use any known inundations from historical tsunami events**
- **Use any known inundations from storm surge**
- **Use a safe elevation above sea level**
- **Use a safe distance inland from the coast**
- **Combine the above in a conservative way**

Caribbean Case Study - Jamaica

Tsunami Response Plan and Standard Operating Procedures

Old Harbour Bay

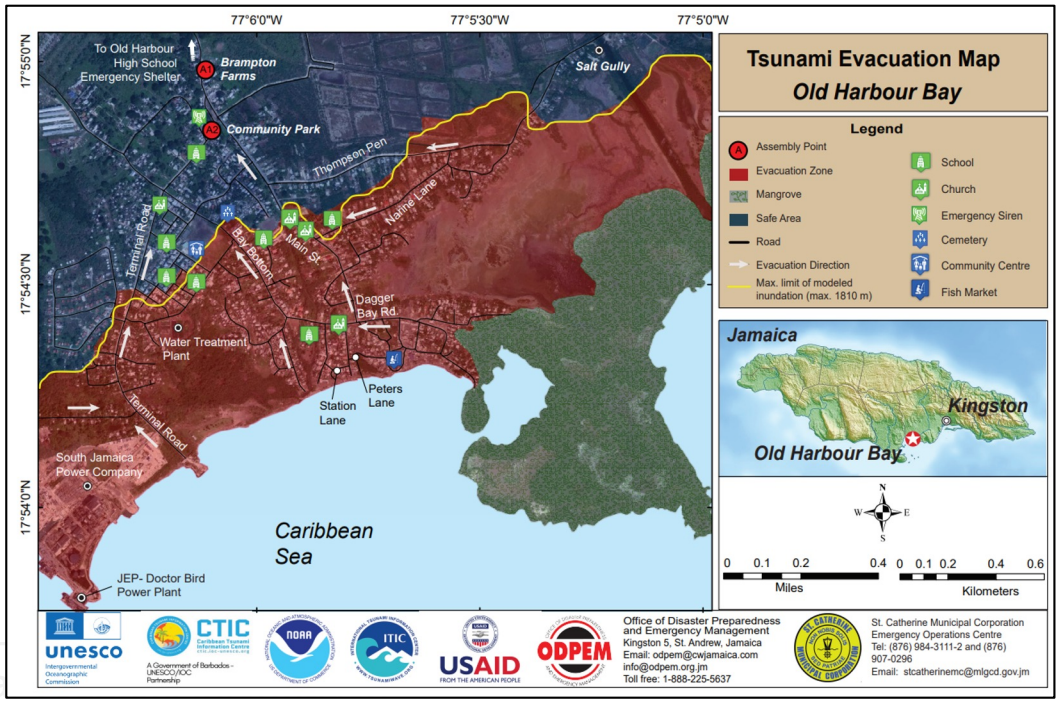
Community tsunami inundation zone

Modeling

National

Island wide tsunami inundation zone

No modeling



Caribbean Case Study - Jamaica

Tsunami Response Plan and Standard Operating Procedures

Old Harbour Bay

Community tsunami inundation zone

↓

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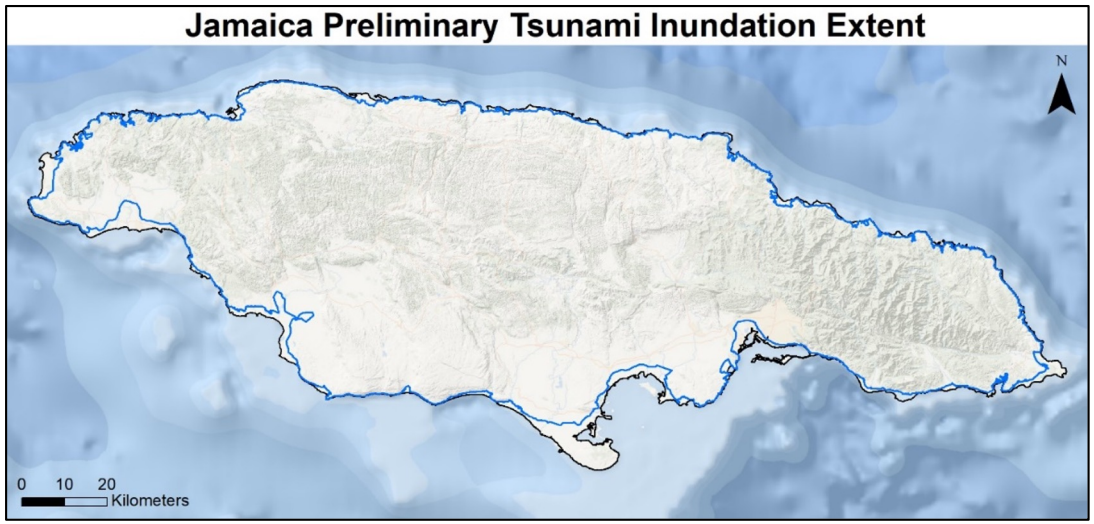
National

Island wide tsunami inundation zone

↓

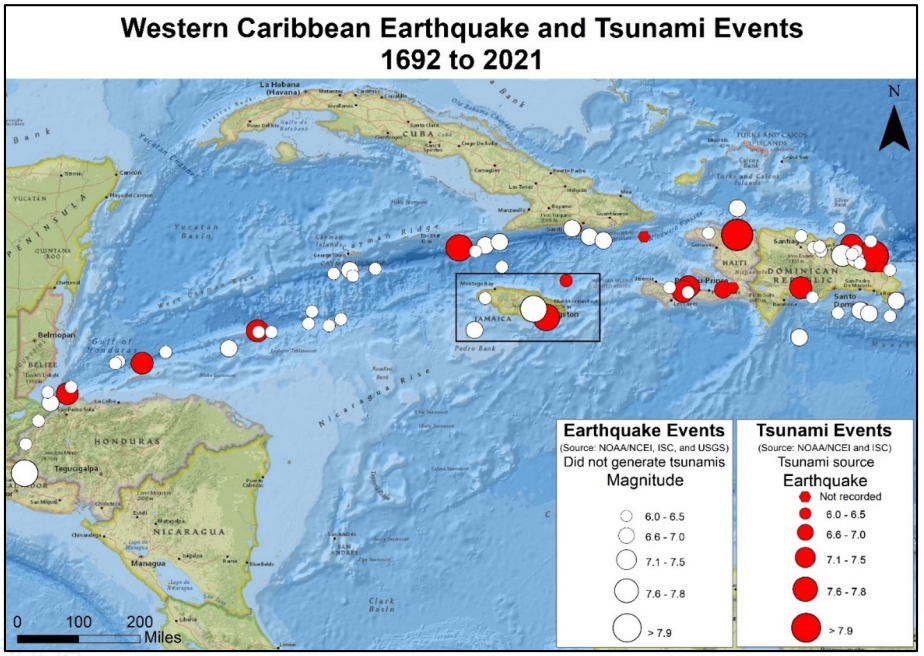
No modeling



Caribbean Case Study - Jamaica

Following the MG-82 guidelines

- **Use of GIS tools to support Jamaica's Tsunami Ready recognition**
- **Event and runup data obtained from**
  1. NOAAs National Center for Environmental Information (NCEI)
  2. International Seismological Center – Global Earthquake Model (ISC-GEM) Global Instrumental Earthquake Catalogue
  3. United States Geological Survey (USGS) Earthquake Catalogue



Caribbean Case Study - Jamaica

Following the MG-82 guidelines

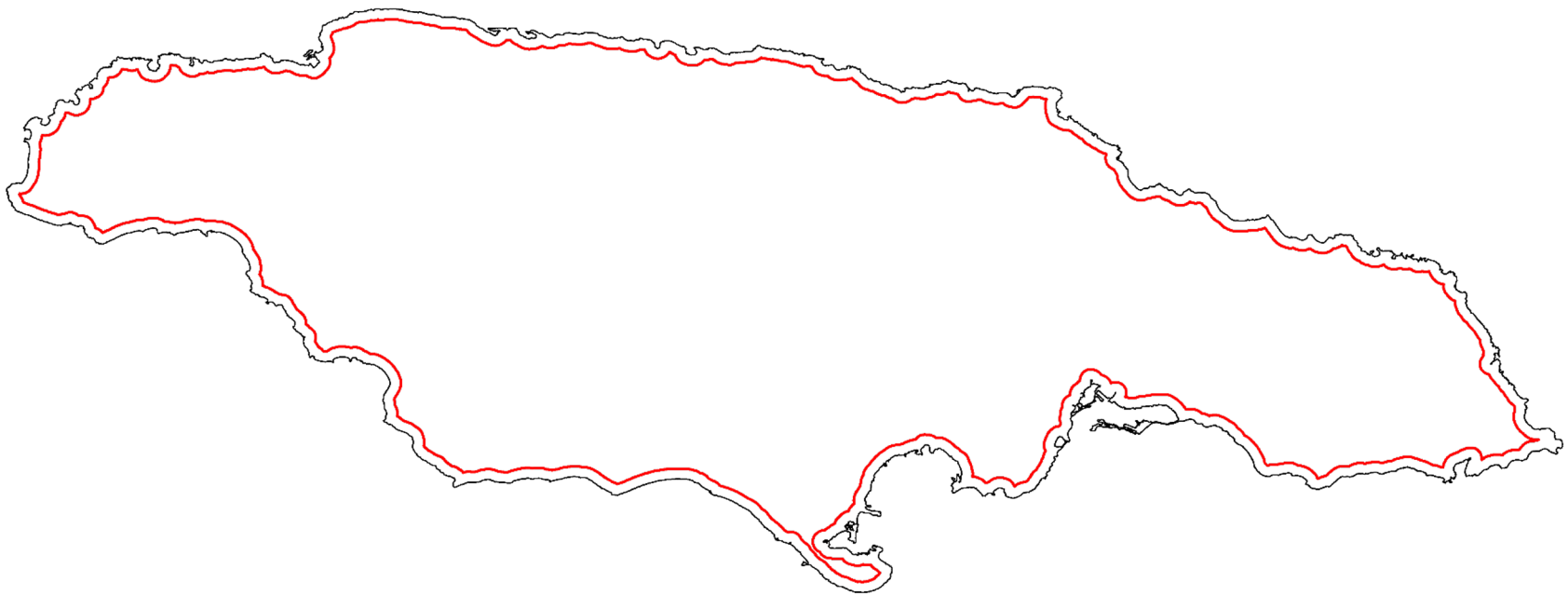
- **Local and historical data provided by Jamaica's Office of Disaster Preparedness and Emergency Management (ODPEM)**
  - Island's outline
  - Digital elevation model (DEM)
  - Hurricane Allen storm surge data
  - Coastal inundation data

- **Establish a nationwide preliminary inundation extent using the provided datasets, GIS software, ArcMap, and consulting ODPEM on specific mapping considerations and parameters**
  - 10 m elevation and 1.6 km distance from the shoreline

Caribbean Case Study - Jamaica

Jamaica's outline

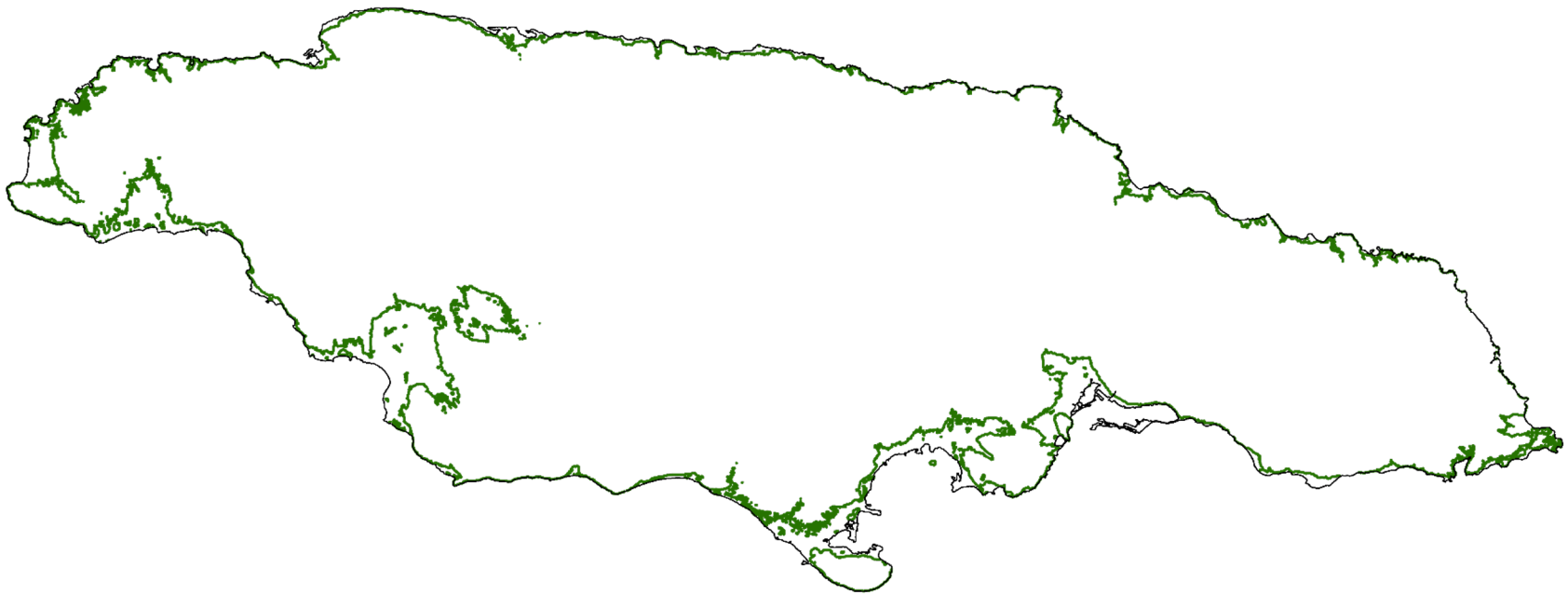
Caribbean Case Study - Jamaica



1.6 km inland buffer

Use this boundary if the minimum elevation above sea level is not closer to the coast and if known or model inundations do not extend further inland

Caribbean Case Study - Jamaica



Jamaica DEM – 10 m contour

Use this boundary if it is closer to the coast than the inland buffer distance and where there are no known modeled inundations.

Caribbean Case Study - Jamaica

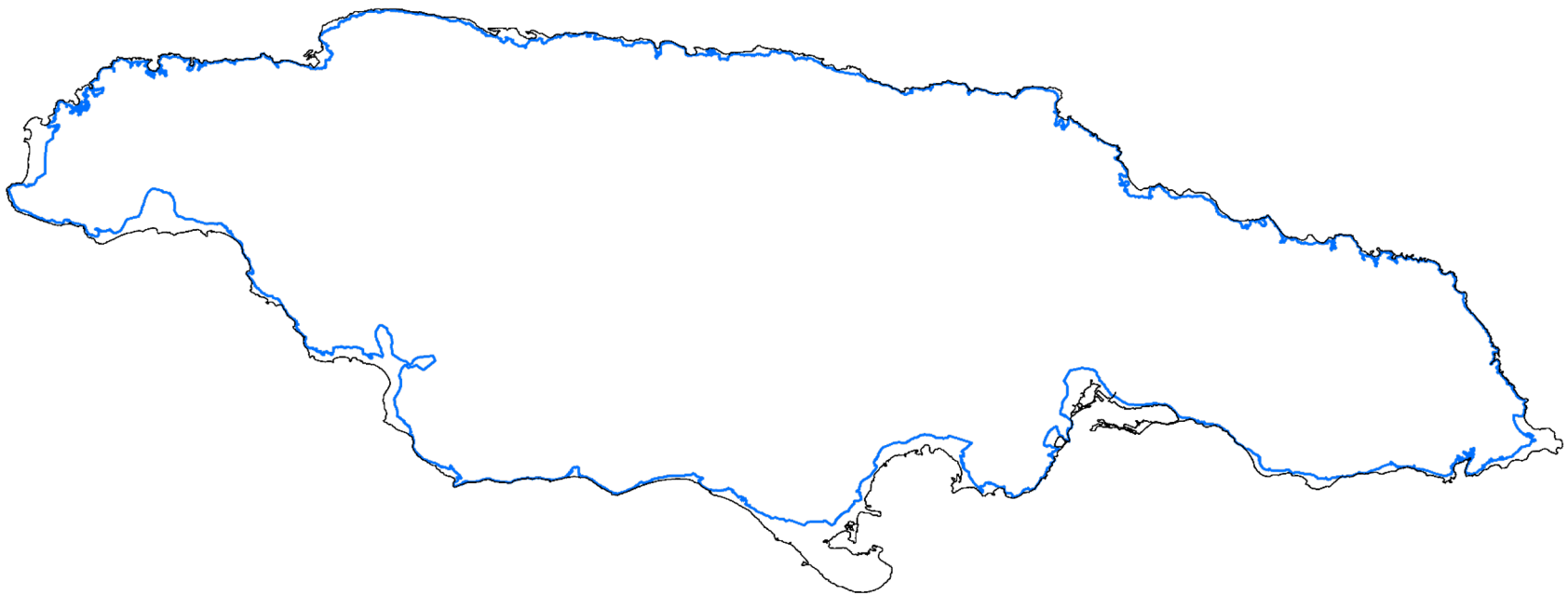
Known or Modeled Coastal Inundation

Use this boundary where it exists with a safety factor added.

Caribbean Case Study - Jamaica

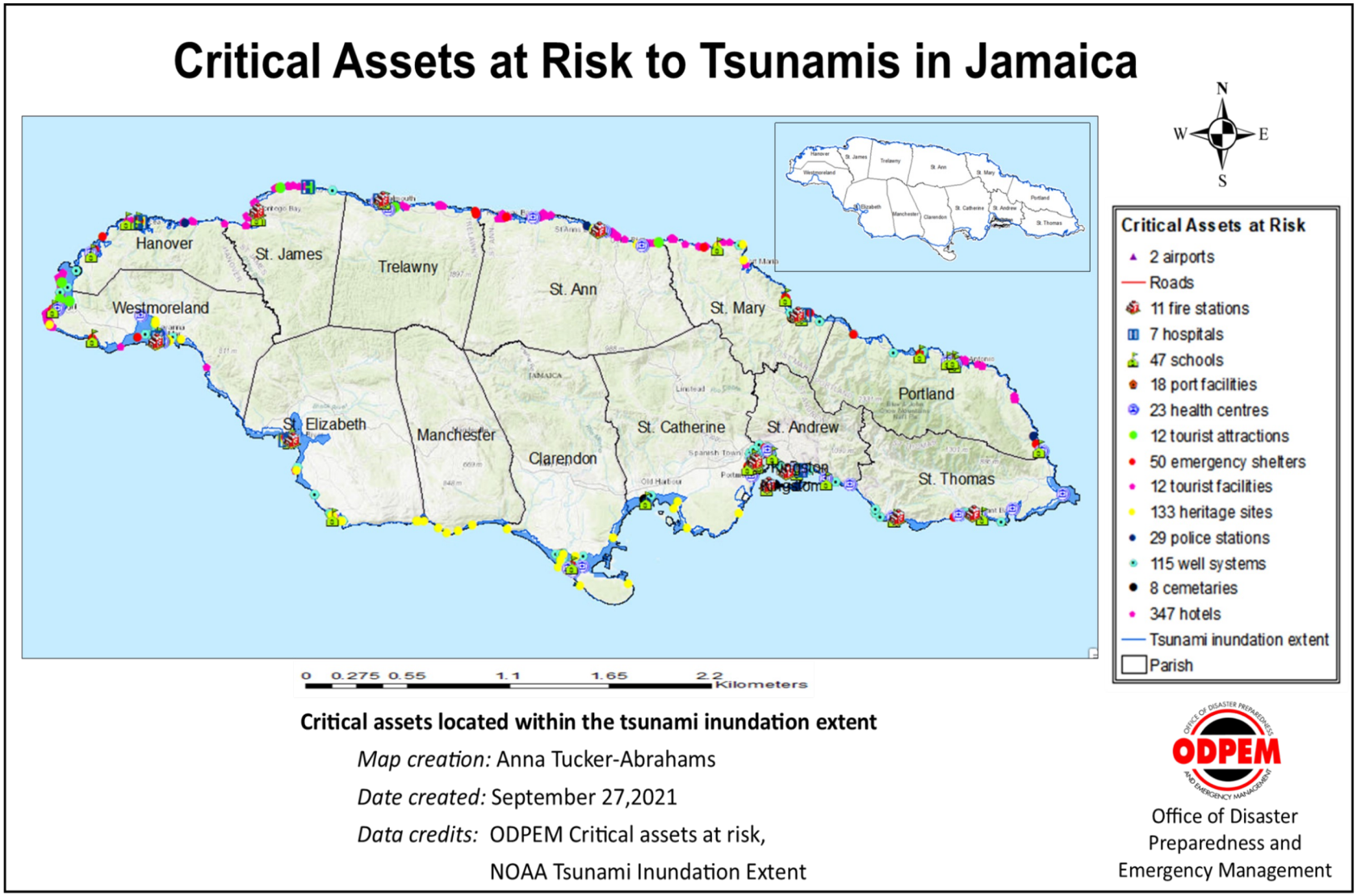
Evaluate the three sets of data superimposed to make a conservative map of expected maximum inundation

Caribbean Case Study - Jamaica



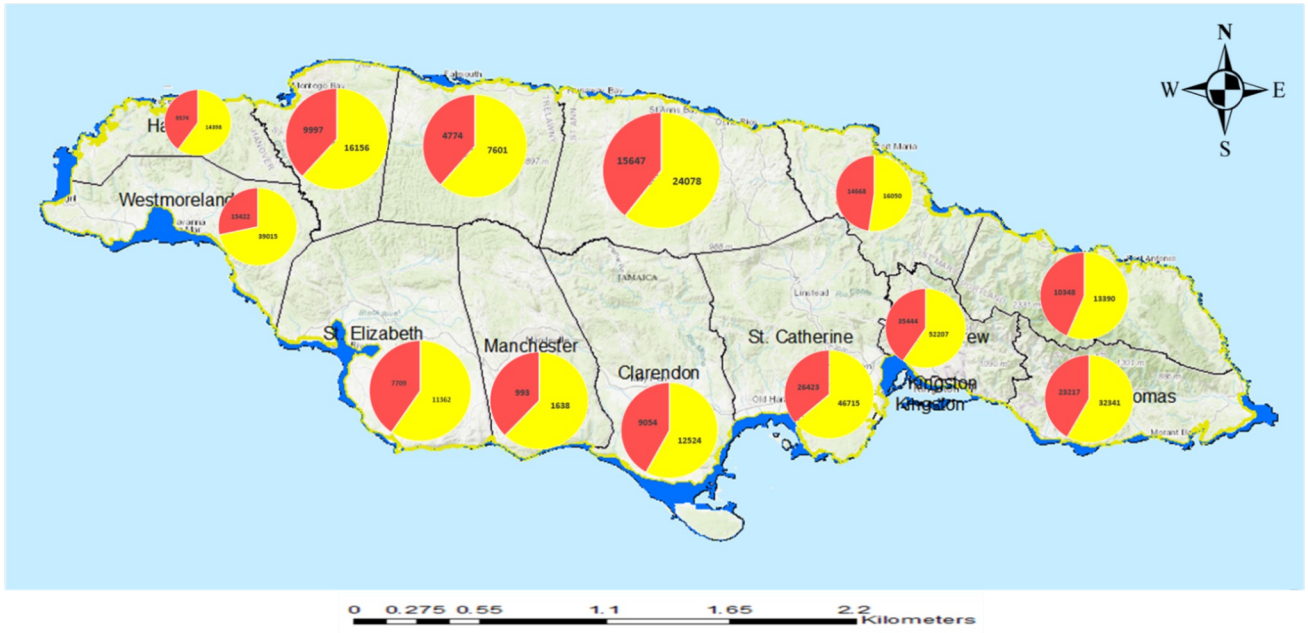
Produce the map of expected maximum tsunami inundation

Caribbean Case Study - Jamaica



Caribbean Case Study - Jamaica

Exposed Coastal Population within Tsunami Inundation Extent



Parish	Exposed Population	
	15-64yrs	<15/>64yrs
Clarendon	12,524	9,054
St. Catherine	46,716	26,423
KSA	52,207	35,444
St. Elizabeth	11,362	7,709
St. Ann	24,078	15,647
St. Mary	16,050	14,668
St. James	16,156	9,997
Manchester	1,638	993
Hanover	14,398	9,574
Trelawny	7,601	4,774
Westmoreland	39,015	15,422
Portland	13,390	10,348
St. Thomas	32,341	23217
Total	**287,476**	**183,270**

LEGEND

- Exposed Population (15—64yrs)
- Exposed Population (<15yrs & >64yrs)
- Tsunami Inundation Extent
- Coastal Inundation Areas
- Parish Boundary

Exposed population within the tsunami inundation extent

Map creation: Anna Tucker-Abrahams
Date created: September 27,2021
Data credits: STATIN Census 2011, NOAA Tsunami Inundation Extent

ODPEM
Office of Disaster Preparedness and Emergency Management

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Thank You

Christa von Hillebrandt-Andrade
Deputy Director, ITIC

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