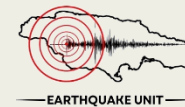


## Recent Seismic Activity & Improvements with Earthquake Monitoring in Jamaica

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## Introduction

- Jamaica is located in the northern Caribbean.
- Area: approximately 10,991 km<sup>2</sup>.
- Historical local events:
  - 1692 Port Royal earthquake
  - 1907 Kingston earthquake
- Recent seismic activity in the region highlights seismic risk and the need for effective mitigation.
- Improvements to the seismic network and NDC at the Earthquake Unit in Jamaica has improved the capacity for earthquake monitoring and research.

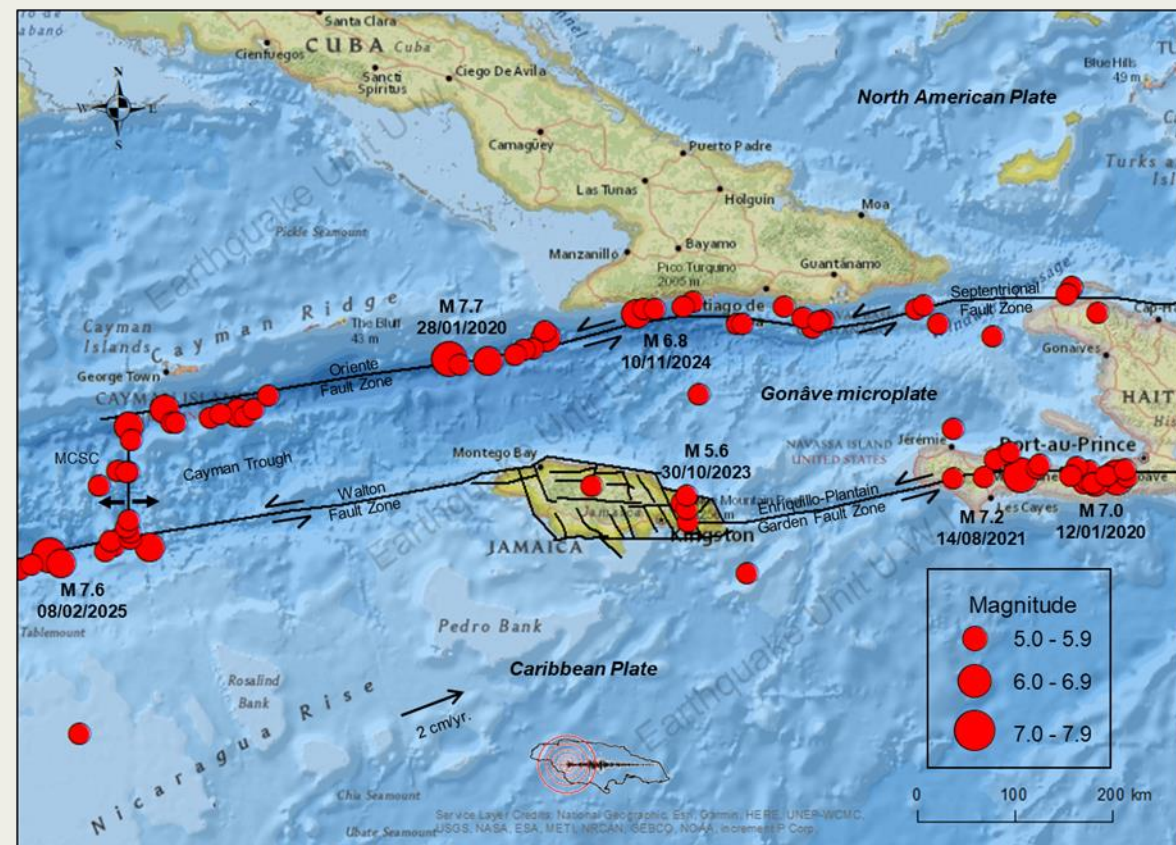


Location of Jamaica in the Caribbean region



## Regional Setting & Tectonics

- Jamaica is located in an intraplate zone between the North American and Caribbean plates.
- The island sits between two major regional scale left-lateral strike-slip faults and is at a high level of risk for seismic activity.
- Notable regional scale faults:
  - ✓ OFZ
  - ✓ WFZ
  - ✓ SFZ
  - ✓ EPGFZ
- Several significant events over the last 50 years.



Regional tectonics and significant recent earthquakes

## Earthquake Unit, U.W.I

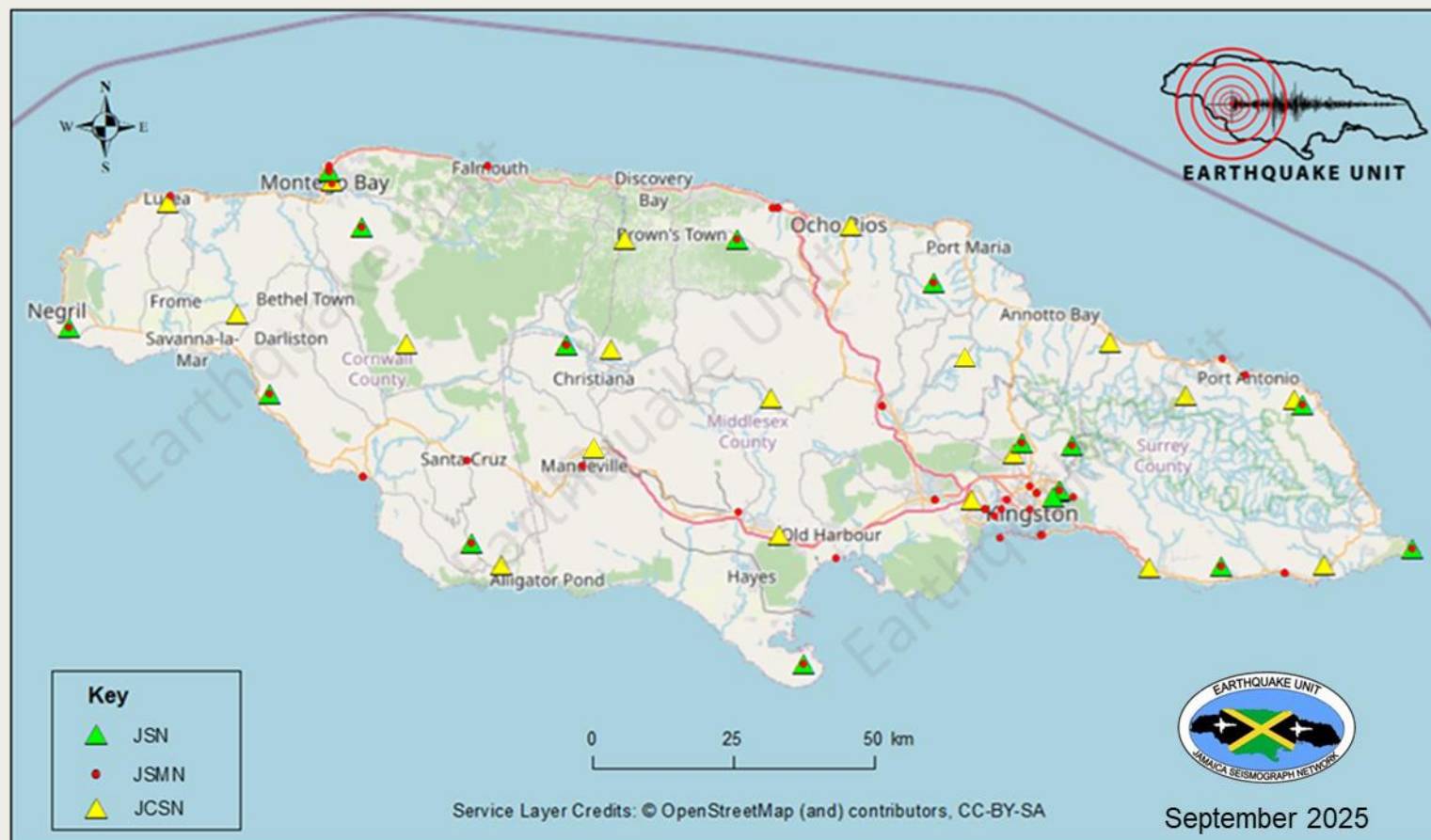
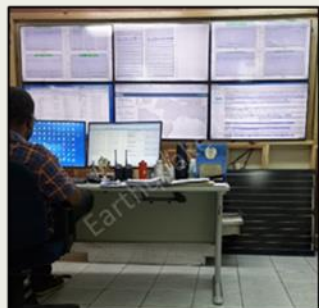
- Hub for national seismic monitoring and research.
- Network Portfolio:
  - ✓ Seismic Networks: JSN, JSMN, JCSN, JAESN
  - ✓ USGS GSN Caribbean Tsunami Warning station
  - ✓ Maintain links to other regional and global networks
  - ✓ UNAVCO Caribbean GPS Observational Network
  - ✓ National Data Centre for the CTBTO
- Research: Earthquake hazards, seismic risk, GPS studies, seismology, tectonics, geological mapping, geophysical surveys, geospatial analysis and disaster management.







## Network Portfolio



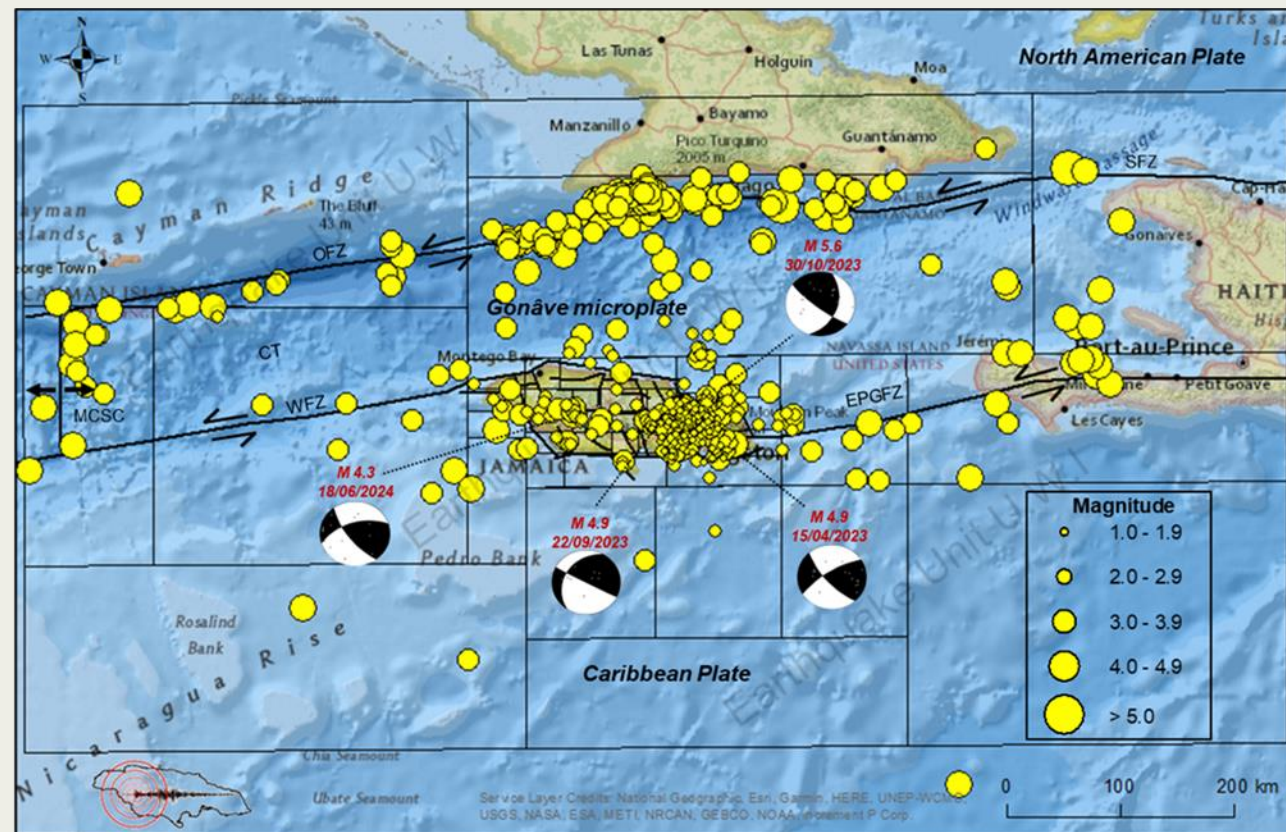
Map showing seismic network in Jamaica





## Seismicity in Jamaica

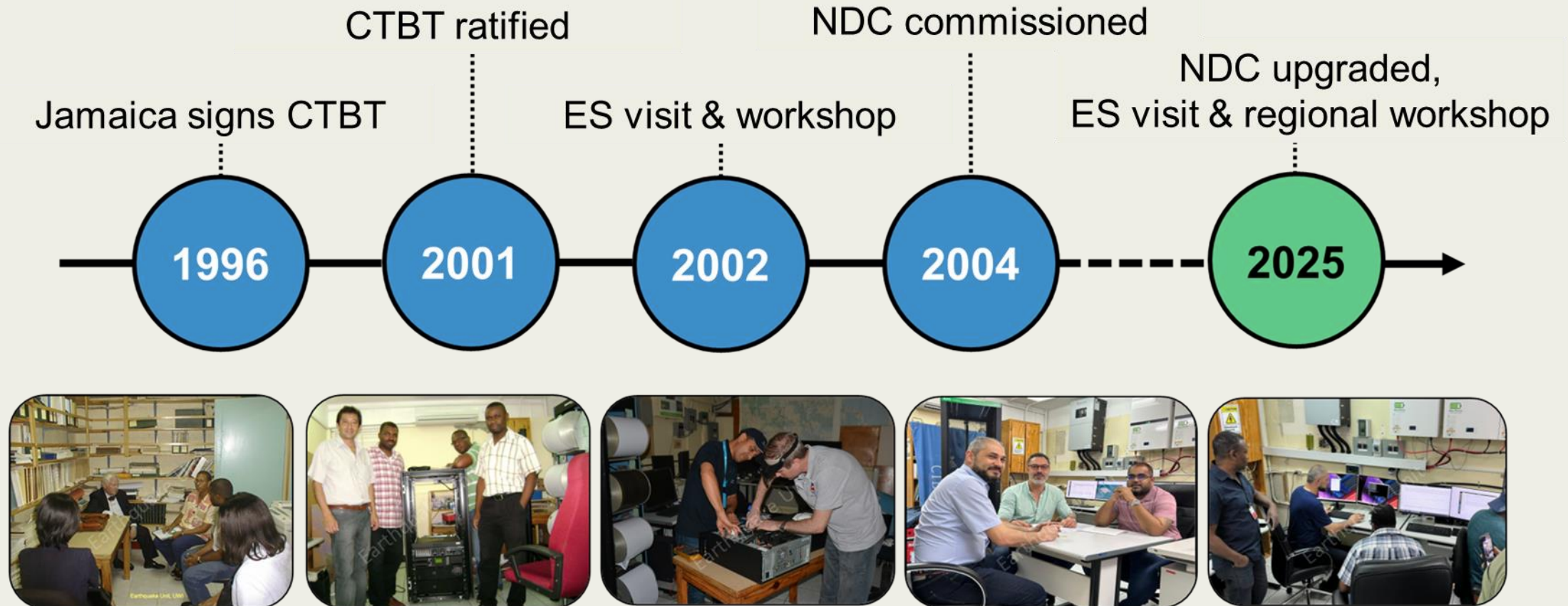
- In 2023 and 2024, the JSN recorded 653 local earthquakes, 285 near region events and over 80 possible local explosions.
- Expansion of the network has allowed for better detection for smaller events.
- Seismic activity is dominant in eastern Jamaica in the Blue Mountain and Enriquillo Plantain Garden sub-areas.
- Focal mechanism solutions produced for well recorded local earthquakes correlate well to active strike-slip and reverse fault segments.



Seismic activity in 2023 & 2024 recorded by the JSN



## History of the CTBTO & Jamaica



## National Data Centre (NDC-JM)

- CTBT verification for the country.
- Access to IMS-IDC data and products.
- Civil and scientific applications using CBS & NDC-in-a-Box.
- Capacity building and training initiatives for young scientists, researchers and local specialists.
- Conferences and workshops.
- Research collaborations and connections to diverse communities involved in nuclear-test-ban monitoring and on-site inspection.

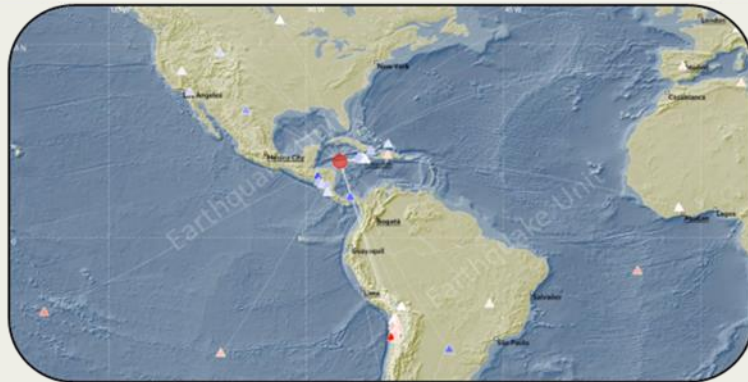






## Improvements with Earthquake Monitoring

### Automatic regional detection using SeisComP



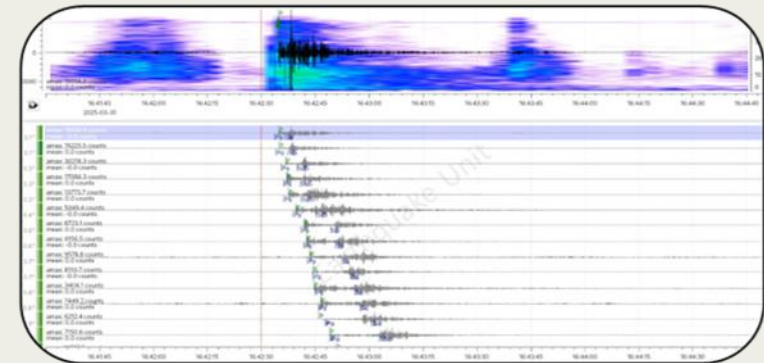
M 7.6 earthquake



### Local earthquake analysis using SeisComP



M 3.1 earthquake





## Summary

- Jamaica is located in a seismically active zone in the northern Caribbean.
- In 2023 and 2024, the EQU (NDC-JM) located 653 local earthquakes, 285 near region events and recorded over 80 possible explosions likely related to local mining and quarrying activities.
- Recent improvements to the seismic network contributes to improved event detection and enhanced data quality for the national seismic monitoring programme.
- Significant decrease in RMS errors, catalogue work, event relocation, refining 1-D velocity model, focal mechanism solutions.
- NDC-JM will continue to build out the local seismic network and utilize CTBTO's IMS-IDC data and products to fill existing gaps and improve the data quality for seismic monitoring and research.

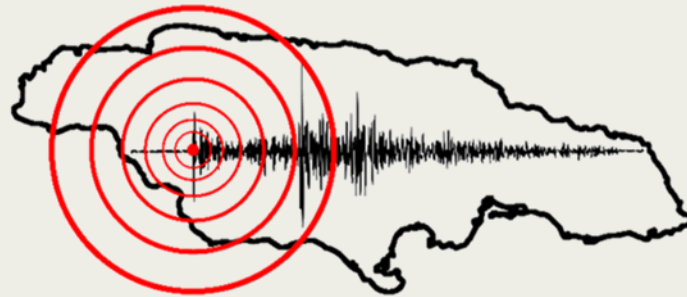




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## END



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