EARTHQUAKE UNIT

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INTRODUCTION

The Earthquake Unit (EQU) is a research unit in the Department of Geography and Geology that is funded directly by the Government of Jamaica (GOJ) as the sole agency responsible for the monitoring of earthquakes and research in seismic hazards in Jamaica. The EQU budget is supported by the Government of Jamaica with allocations through the Ministry of Science Technology Energy and Mining (MSTEM). The EQU acts as a Data Centre for the Comprehensive Test Ban Treaty Organization (CNTBTO) and contributes data to the upcoming Caribbean Tsunami Warning Network in conjunction with the United States Geological Survey (USGS).

WORK OF THE UNIT

The Earthquake Unit (EQU) at the University of the West Indies (UWI), continues to operate the Jamaica Seismograph Network (JSN), Jamaica

Strong Motion Accelerograph Network (JSMAN) and GPS Network along with operating the USGS-GSN broadband digital station at Mount Denham in Manchester. The EQU is also Jamaica's National Data Center (NDC-JM) for the Preparatory Commission for Nuclear Test Ban Treaty Organisation (CTBTO), where we operate equipment to access Seismic data, Hydro-acoustic data, Infrasound data and Radionuclide data from over 337 stations around the world.

For the year August 1, 2016 to July 31, 2017 the focus of the Earthquake Unit was on the upgrading of the Jamaica Seismograph Network (JSN), and the expansion and upgrade of the Jamaica Strong Motion Accelerograph Network, through funding from the World Bank Seismic Support program. The funding was approved and the Jamaica Social Investment Fund (JSIF) handled the procurement of equipment and construction work.

A significant amount of work was done during this period; field work included the investigation and selection of new sites for the installation of new stations, and working with suppliers on specification for the civil works and for all the equipment to be acquired. The upgrading of the EQU included work to improve on the seismograph stations with the building of five new seismometer vaults to accommodate the new digital broadband seismometer that will be purchased and installed at the station and the construction of a new seismic station. We finalized the specification for these sensors; 10 new broadband seismometers, 30 new accelerographs with digitizers were ordered. We started preparation for the upgrading of the solar power system at the Earthquake Unit's Central Recording Station and for the installation at the new stations that were under construction. We also made preparation for the installation of lightning and grounding systems and a communication tower at the Earthquake Unit's Central Recording Station and at the new seismic station to be built at Mount Edgecombe in Westmoreland. We negotiated with the Urban Development Corporation (UDC), to get permission to use lands owned by the UDC at Mount Edgecombe in Westmoreland to build the new seismograph station. The new station will be a 10 foot by 10 foot house for the seismograph station, with solar panels mounted on

the roof to power the equipment at the station. A communication tower will also be installed to enable communication.

NETWORK PERFORMANCE

The JSN continues to operate with twelve (12) short period seismograph stations, four (4) digital broadband stations and seventeen (17) accelerograph stations. For the annual network performance we had two broadband station (STHB and MTDJ) working normally during this period, with close to 100 percent up time and one broadband station (YHJB) working for half the period, due to theft of equipment. The Montego Bay station remained down for most of the period resulting from construction of the communication tower at Kempshot and the subsequent lightning and grounding work undertaken after the towers completion. We installed a broadband station at Portland Cottage but there were issues with the digitizer and communication module which was sent back to the factory for repairs. For this period, we had several damaged Guralp equipment sent back to the factory for repair and re-calibration. This included two Guralp CMG-6TD seismometers that were used for microzonation studies, and two of the Guralp digitizer and communication module which were affected by lightning. The short period stations operated for most of this period, with some stations remaining down longer than normal as we had some delays in getting some of the spares needed; we started work on upgrading the network, which was time consuming

The station at Old Harbour was affected by the changes at the location, as JPS started the construction of a new power plant. Most of the other stations worked for most of this period.

EARTHQUAKES RECORDED

The JSN recorded 89 local events (Table 1) for the period from August 2016 to July 2017, slightly more than in the previous year when 79 were recorded.

The largest 'cluster' of earthquakes was located to the north-east of Kingston in the south-western Blue Mountains Block/Wagwater Belt,

Table 1: Events recorded by the Central Recording Station at the EQU from August 2016 to July 2017; of the 89 local events recorded, eight were felt

EARTHQUAKE EVENT SUMMARY 2016 to 2017

Year	Month	Located Events		Total	Recorded Events					*Total recorded*	Felt Events
		Local	Near	located	Local	Near	Regional	Distant	Blasts		
2016	Aug	0	1	**1**	0	1	7	0	2	***10***	0
2016	Sep	2	3	**5**	2	3	9	0	1	***15***	0
2016	Oct	3	3	**6**	3	3	3	0	6	***15***	0
2016	Nov	7	7	**14**	7	7	6	0	4	***24***	1
2016	Dec	9	1	**10**	9	1	9	0	5	***24***	1
2017	Jan	8	18	**26**	8	18	7	0	6	***39***	2
2017	Feb	8	9	**17**	8	9	10	0	3	***30***	1
2017	Mar	14	2	**16**	14	2	6	0	5	***27***	0
2017	April	9	6	**15**	9	6	9	0	3	***27***	0
2017	May	10	2	**12**	10	2	9	0	3	***24***	0
2017	Jun	12	1	**13**	12	1	8	0	1	***22***	2
2017	Jul	7	5	**12**	7	5	7	0	8	***27***	1
ALL	**Totals**	**89**	**58**	**147**	**89**	**58**	**90**	**0**	**47**	***284***	**8**

which is the main subarea for earthquakes in Jamaica. Scattered earthquakes also occurred elsewhere but there were no other clusters (**Figure 1**).

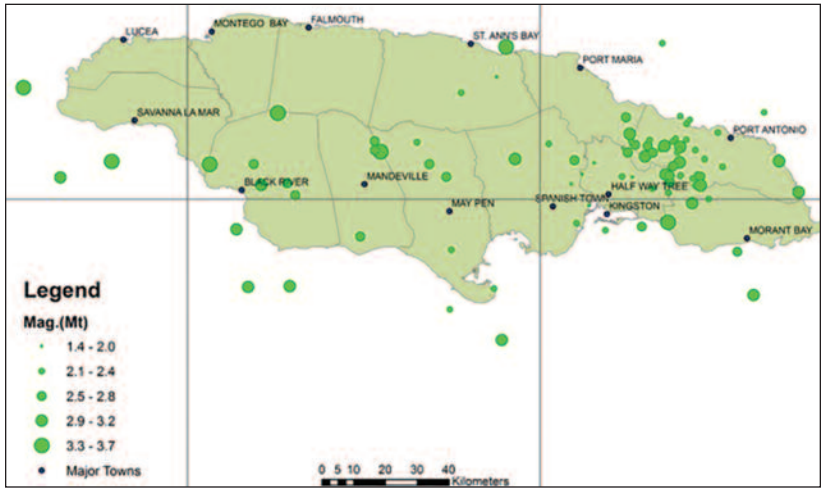

Figure 1. Earthquakes in Jamaica from August 2016 to July 2017

The total number of events processed by the Jamaica Seismic Network was 284, which included: 89 local events, 58 near events, 90 regional events, and 47 blasts (Table 1).

COMMUNITY SERVICE

The Earthquake Unit works in close collaboration with ODPEM and the Jamaica Institution of Engineers in disseminating the findings of research. The EQU also provides information/advice that is of national significance to both institutions.