

Samoa National Early Warning System Progress Report.

Samoa National Earthquakes and
Tsunami Data Center,
Meteorology Division, MNRE

Samoa China Seismograph Network - Communication links



Instrumentation

- **Observation Instrumentation Unit**
 - Broadband seismometer (**BBVS-120**) (1)
 - Accelerometer (**BBAS-2**) (1)
 - Digitizer (**EDAS-24/IP**) (1)
- **Telecommunication System**
 - MDS iNET 300/Yagi antennae system
- **Equipment Manage and Data Acquisition**
 - Notebook computer (1)
- **Power Unit**
 - UPS Power (1)
 - Solar Modules and DC Power (1)



BBVS-120



BBAS-2



Stations in Operation

- USGS AFI – since 1960's (Upolu Is) include 1 Broadband, 1 Short Period & 1 Strong Motion seismometers)
- 5 – SCSN stations since 2010
 - 3 Broad Band Stations (2 in Savaii Is & 1 in Upolu)
 - 2 Short Period Stations (1 in Savaii & 1 in Upolu)
 - 4 strong motions seismometers (2 in Savaii & 2 in Upolu).

Tsunami Information Monitoring and Dissemination System

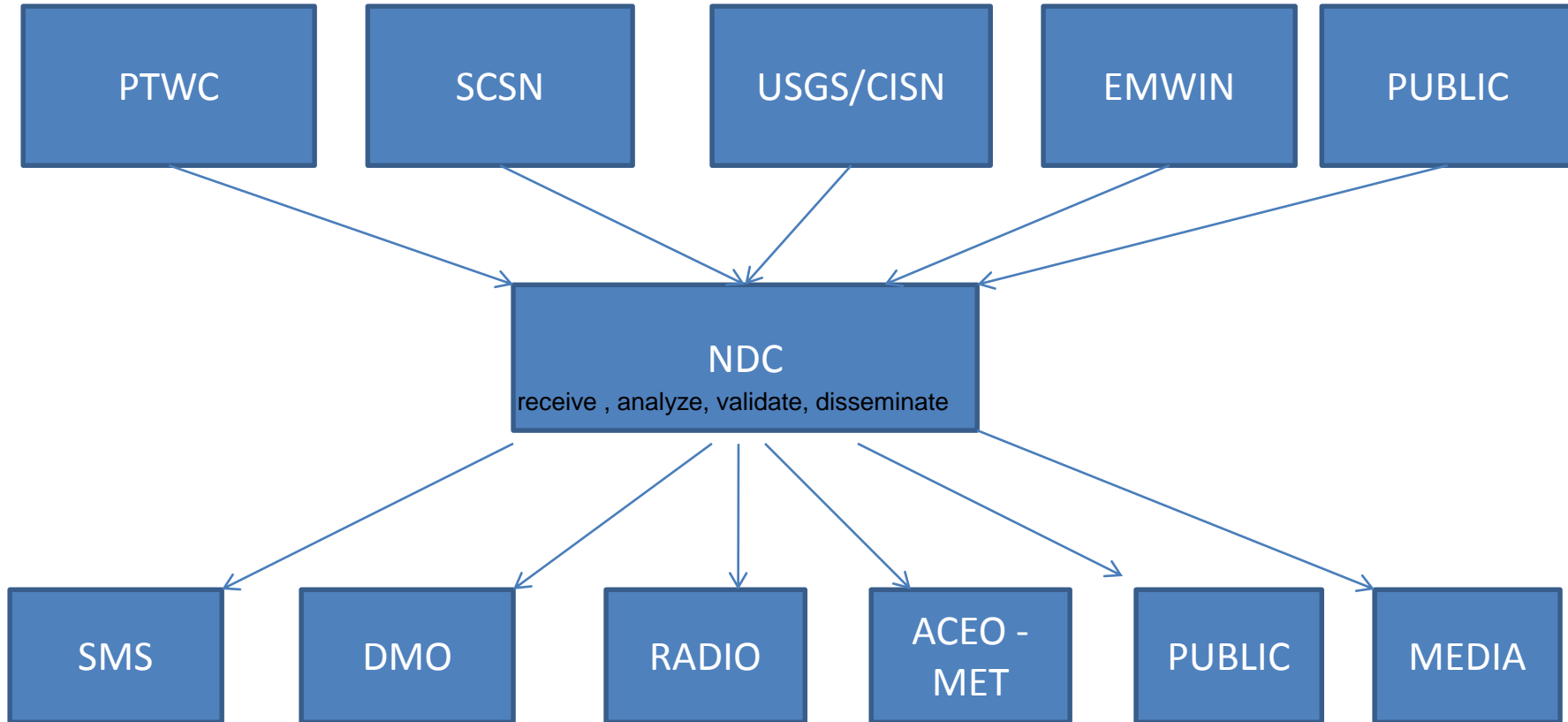
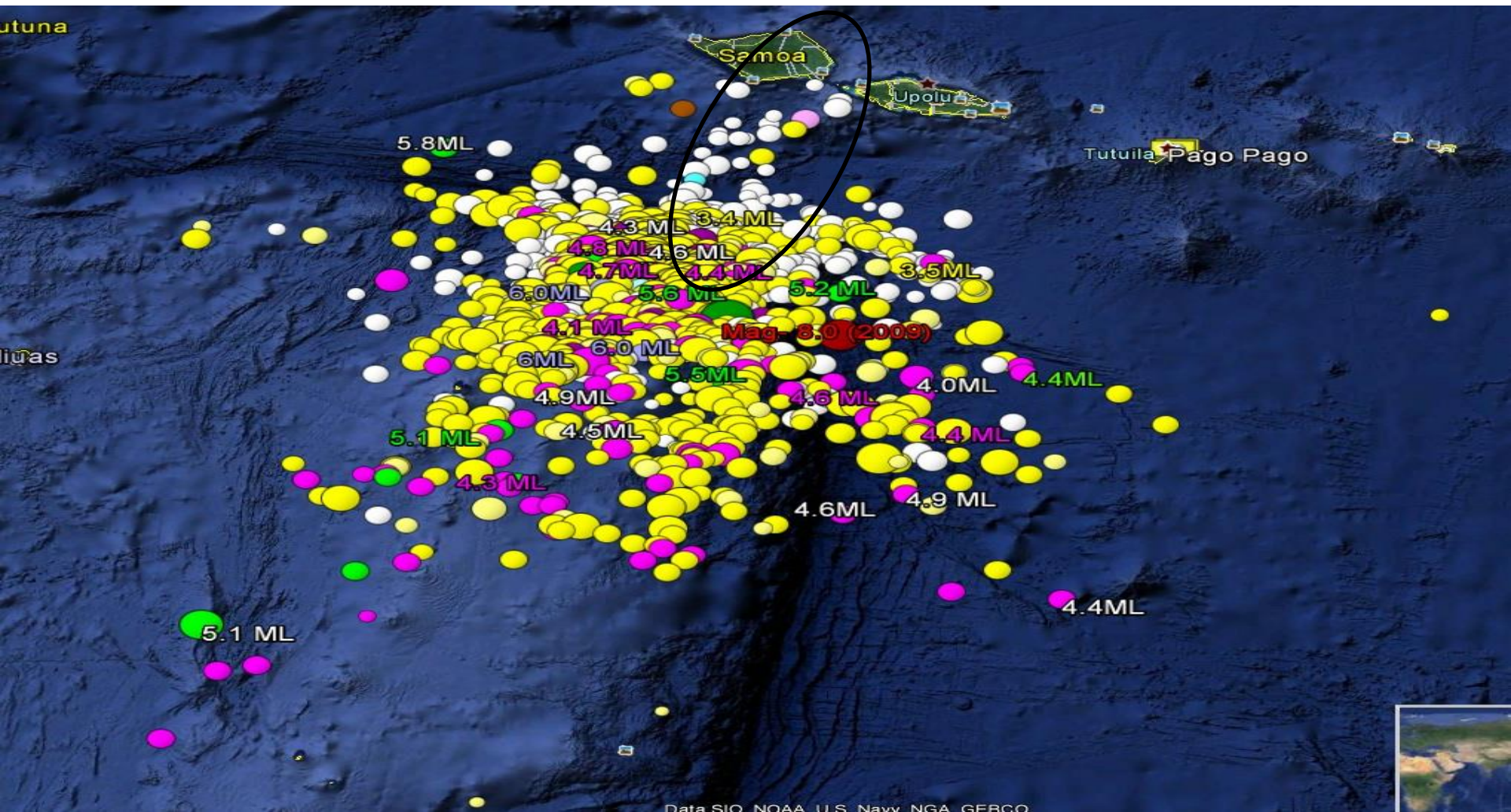


Table 1: Summary of earthquake events (Region 1) analysed from Jan-Dec,2015

SUMMARY Jan-Dec 2015		Monthly summary											
		Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Total number of earthquake events analyzed	2,607 217/month 7/day	236	185	252	331	242	235	224	231	224	179	141	127
Highest magnitude event recorded analyzed	6.4	5.5	4.8	6.4	6.0	6.0	6.0	4.9	4.7	5.1	5.8	4.7	5.3
Lowest magnitude event recorded analyzed	1.5	2.0	2.1	1.9	1.5	2.0	1.9	2.0	1.7	1.8	2.2	2.0	2.1
Mean Average magnitude of events analyzed	3.0	3.02	3.1	3.1	3.0	3.0	2.97	2.9	3.0	2.9	3.1	3.2	3.2
Felt Earthquakes (4.5 /month)	54	6	4	6	6	4	7	3	4	3	4	2	5

Seismicity: Jan – Dec 2015 (Samoa NDC)



Total Felt 2010 (Jan) – 2015 (June)

Total number of earthquake events analysed	147 (2/month)
Highest magnitude event recorded analysed	6.9 (Tonga)
Lowest magnitude event recorded	2.6 (Samoa)
Average magnitude of events analysed	4.9

Threshold Table for Local Felt Earthquakes from Region One (0-300 km - Samoa – Tonga)

THRESHOLD	TEMPLATE TO USE & ACTION TO TAKE
<p style="text-align: center;"> Mag > or = 7.3 Depth < or =50 km Felt - MM5-6 (or JMA MMI 5) </p>	<p style="text-align: center;"> National Warning (Issue Warning Bulletin) </p>
<p style="text-align: center;"> Between Mag 6.5 – 7.2 Depth < or= 50 km, Felt - MM 4 or JMA 4 </p>	<p style="text-align: center;"> National Watch (Issue Watch Bulletin) </p>
<p style="text-align: center;"> Mag between 6.0 – 6.4 Depth < or = 50 km </p>	<p style="text-align: center;"> Advisory (Issue Advisory Bulletin) </p>
<p style="text-align: center;"> Mag between 4.5 – 5.9 Depth < or = 50 km </p>	<p style="text-align: center;"> Information (Issue Information Bulletin) </p>

Internal SOPs for National Warning Centre

- **REGIONAL TSUNAMI WARNING STANDARD OPERATING PROCEDURES**

-
- Step 1: SCSN detects earthquake event/ Receive Earthquake/Tsunami Bulletin from PTWC/ EMWIN receive locally felt Earthquake/phone call from public
-
- Step 2: NDC operator analyses event to determine location Magnitude (max 3-5minutes) Auto pick Assess immediate threat to Samoa (refer to tide charts/Map and Threshold Table
- (Step out and get met technician/driver/groundsmen/night watchman to assist in calling people while analysing event (after hours)). Fill out template
-
- Step 3: Notify ACEO- provide advice based on analysis (Notify Geophysics team to provide support and analysis, refer to Geophysics response procedures)
-
- Step 4: Call Radio stations, TV, DMO
- SEND SMS Messages using IBL
-
- Step 5: Prepare briefing paper for ACEO (Met)/CEO
-
- Step 6: Monitor and follow up Actions
-
- Step 7: Cancellation (endorsed by ACEO (Met)/CEO

Internal SOPs for National Warning Centre

- **LOCAL TSUNAMI WARNING STANDARD OPERATING PROCEDURES (Local events- Region 1 – Take immediate action)**
-
- Step 1: SCSN detects earthquake event/ Receive Earthquake/Tsunami Bulletin from PTWC/EMWIN receive locally felt Earthquake/phone call from public
-
- Step 2: NDC operator analyses event to determine location Magnitude (max 3-5minutes) Auto pick Assess immediate threat to Samoa (refer to tide charts/Map and Threshold Table (Step out call DMO/ get met technician/ driver/groundsmen/night watchman to assist in calling people while analysing event (after hours)). Fill out template
-
- Step 3: Call Radio stations, TV, SEND SMS Messages using IBL
-
- Step 4: Notify ACEO- provide advice based on analysis (Geo team to provide support and analysis, refer to Geo response procedures)
-
-
- Step 5. Prepare briefing paper for ACEO/ (CEO)
-
- Step 6. Monitor and follow up Actions
-
- Step 7. Cancellation (endorse by ACEO Met/CEO)

Lapataiga mo Sunami (Tsunami Warning)

• SAMOA METEOROLOGY DIVISION

• **SPECIAL TSUNAMI BULLETIN** _____

• ISSUED AT : _____ DATE: _____ 2015

• **TSUNAMI WARNING**

• An earthquake with magnitude _____ occurred in the _____ islands region, approximately _____ km _____ of Apia.

• **PUBLIC SAFETY**

• **The public is advised that a TSUNAMI WARNING is in effect for all Samoan low-lying coastal areas.**

• **All people living on low-lying coastal areas and in the lagoon area are advised to leave everything and evacuate to higher designated grounds IMMEDIATELY.**

• **All mariners are advised to move further out into deep waters**

• **All are also advised to inform as many people as possible of this warning.**

• The next Tsunami Bulletin will be issued within the next hour, or sooner if warranted.

• OFISA VAAI TAU SAMOA

• **FAALAUILOA FAAPITOA MO SUNAMI**

• FAAMAUINA ILE ITULA E _____ ASO _____ 2015

• **LAPATAIGA MO SUNAMI**

• O le mafuie e tusa lona malosi ma le _____ ile fua mafuie ma le loloto e _____ kilomita sa afua mai ile motu/ogasami / o _____ ile mamao e _____ kilomita _____ o Apia.

• **MO LE SAOGALEMU LAUTELE**

• **E fautuaina le mamalu o le atunuu ua faamalosia nei LAPATAIGA MO SUNAMI e aafia ai nofoaga maualalalo ma nofoaga tulalata ile sami.**

• **Faamolemole le mamalu o le atunuu ia agai loa i nofoaga saogalemu.**

• **E fautuaina foi le mamalu ole Atunu'u ina ia tatou galulue faatasi e faasoia atu lenei lapataiga i se auala vave mo nisi e le o maua mai lenei lapataiga.**

• (O le isi Faalauiloa ole a maua atu ile isi itula o muamua poo luma mai foi pea iai se suiga)

Faa-le-aogaina o Fautuaga/Nofo Sauniuni/Lapataiga mo Sunami (Tsunami Advisory/Watch/Warning Cancellation)

- SAMOA METEOROLOGY DIVISION
- **SPECIAL TSUNAMI BULLETIN** ____
- ISSUED AT _____ DATE: _____ 2015
-
- **TSUNAMI WATCH/WARNING CANCELLATION**
-
- The public is hereby advised that the TSUNAMI WATCH/WARNING which was in effect for all Samoan low-lying coastal waters has now been CANCELLED.
-
- **REPEAT:** The Tsunami Watch/Warning which was in effect for all Samoan low-lying coastal waters has now been CANCELLED.
- **The public is advised that it is now safe to return to your homes as the threat is over.**
-
- OFISA VAAI TAU SAMOA
- **FAALAUILOA FAAPITOA MO SUNAMI NUMERA** _____
- FAAMAUINA ILE ITULA E _____ ASO _____ 2015
-
- **FAALEAOGAINA O LE NOFO SAUNIUNI /LAPATAIGA MO SUNAMI**
-
- O le NOFO SAUNIUNI/ LAPATAIGA MO SUNAMI sa faamalosia mo nofoaga maualalalo i talafatai o Samoa ua FAA-LE-AOGAINA nei.
-
- **TOE FAAFOFOGA MAI:** O le NOFO SAUNIUNI/ LAPATAIGA MO SUNAMI sa faamalosia mo nofoaga maualalalo i talafatai o Samoa ua FAA-LE-AOGAINA nei.
- **Ua saogalemu foi le toe taliu atu i aiga.**

Current Issues

- Staff on duty has self confidence in urgent situations.
- Improve SMS messages timing
- Enhance reliability of IBL continuously uninterrupted
- Upgrade/Enhance of EWS
- Improve capability of IT personnel

Thank You

Geoscience Section 2016