# Samoa Country Report

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# Outline

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d. Access, processing and application of satellite data and products
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# Abstract (updates on status and plan of satellite data access, processing, application and training)

- Samoa Met access satellite data from the Himawari 8 satellite via the Himawari cast – previously via internet (costly) connection
- Data is visualized on the SATAID software and is utilized in the 24/7 operation
- Accessible on a 10min temporal resolution
- Used for now-casting  and annotations on surface analysis to denote cloud band location
- Other sources of satellite images are from SOHEMI and RAMMB websites (derived products of GOES and Himawari)
- CIMMS satellite derived products are used frequently
- Previously used expensive internet to download images that is time consuming

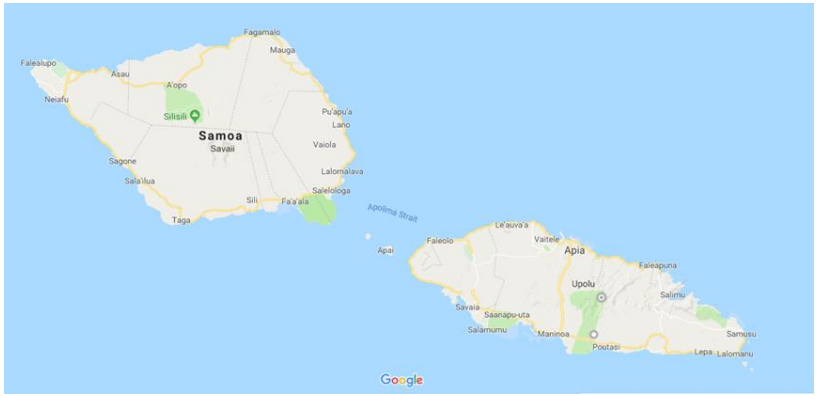
# Satellite data and product requirements, training needs and infrastructure

- Enhancement of available to generate useful satellite products for now-casting and monitoring purposes
- Derive and interpret RGB for Samoa region to products that can be used for public, marine and aviation forecasts
- Provide capability for rainfall estimates derived from satellite images around the South Pacific region
- Much higher temporal resolution (5min or 2.5min) during wet season/tropical cyclone season
- High spatial resolution images for Samoa islands for post-disaster analysis
- Refresher training on Tropical cyclone analysis using SATAID
- Incorporate Himawari cast data directly to the IBL visualization system
- Lightning detection capability for Himawari satellite
- Further useful products and technical support on capacity building regarding satellite data

# Appendix

# Background

- Overview
  - Geography:
    - Comprise of 10 islands, 2 larger islands home to most of Samoa's population
    - Two larger islands are mountainous, result geologically from volcanism.
    - Highest point is Mt Silisili, 1858m.
    - Land area of 2842km
    - Latitude Longitude == 14S, 172W.
  - Population: 195,843 (2016 Census)
- Climate
  - Two distinct seasons, namely wet season (Nov-April) and dry season (May-Oct)
- Major historical hydro-meteorological disasters
  - Tropical cyclones, Gita (2018), Evan (2012), Val (1991), Ofa (1990.
- Major national economic sectors relying on NMHS
  - Tourism
  - Sea and Land Transportation
  - Fishing
  - Agriculture
  - Aviation
  - Construction enterprises



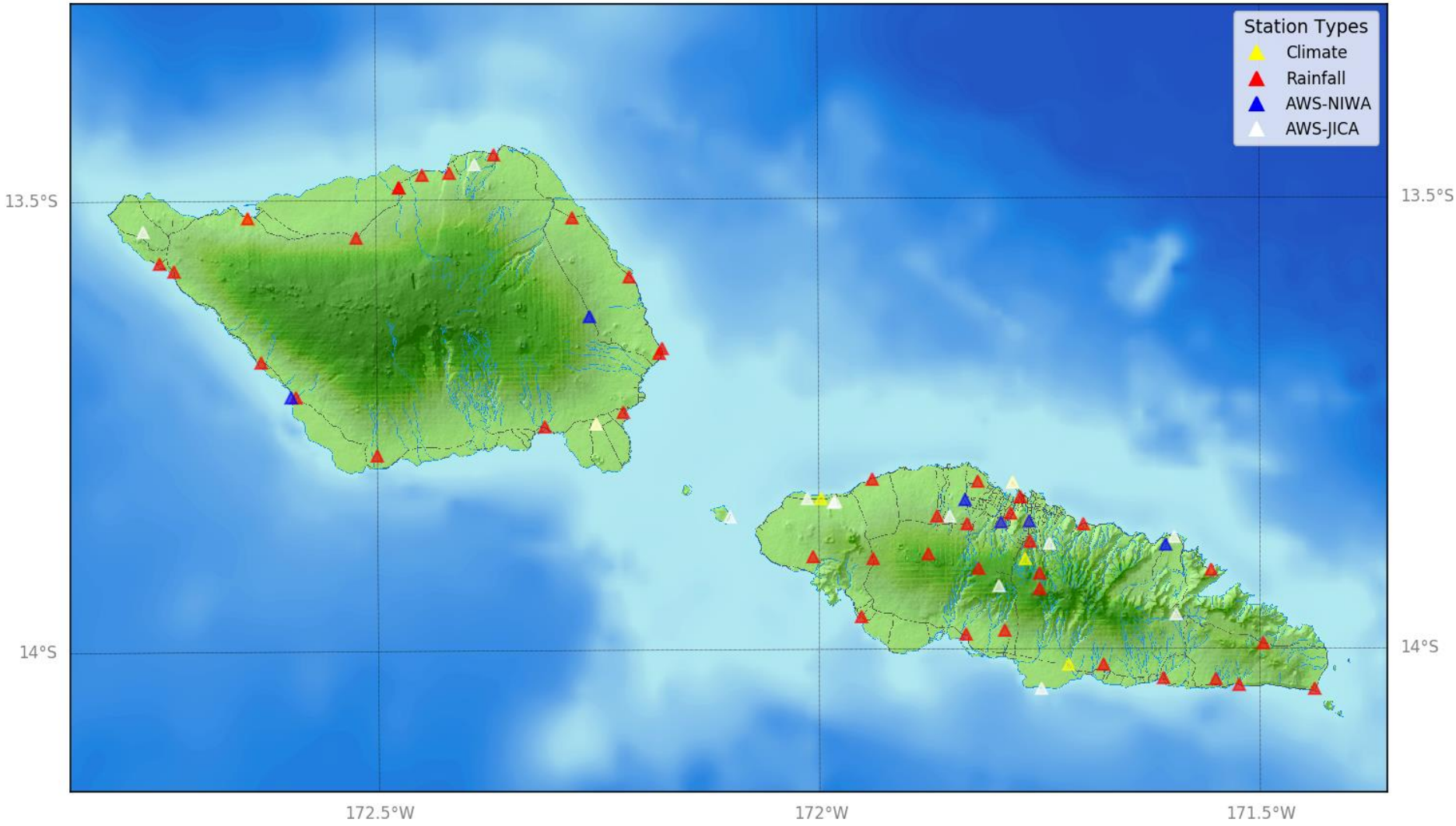
# Short Description of NMHS Activities

- Samoa Meteorology Division is the official source of meteorological, climatological and geo-physical warnings for the Independent State of Samoa
- SMD is also responsible of the following areas.
  - National Tropical Cyclone Warning Center
    Provide cyclone forecasts/warnings and other non-cyclonic severe weather events. Sends alerts via SMS to selected community representatives and response agencies.
  - Local Weather
    Public Weather and Coastal Forecasts for the public (4 times a day), and in course of being certified to provide Aviation Weather Forecasts for all airlines operating within Samoa's air space.
  - Aerodrome and Synoptic Reports
    METAR's for Faleolo International Airport and Synoptic Reports for two manned stations (Faleolo Airport & Apia Headquarters)
  - Seismic Monitoring
    Operates a network of seismograph that provides real time and continuous monitoring of earthquakes and study of ground motion.
  - National Tsunami Warning Center
    Provides tsunami warnings and alerts for Samoa including capability for sending SMS to selected community representatives and agencies.
  - National Climate Early Warning System (CLEWS)
    Provides tailored alerts, climate forecasts, El Nino Southern Oscillation updates, climate summaries, climate trends, climate data
  - Historical Climate Data
    SMD keeps detailed historical data sets on wide range of climate information. This information is often used by businesses such as construction, engineering, commercial agriculture and shipping companies.

# Current Observational System Overview

- Samoa Meteorology Division administers a well established National Weather and Climate Observation Network. The network consists of 42 manual rainfall stations, 8 manual climate stations (2 of which are synoptic stations), 12 automated rain gauges with telemetry capability, 2 Agro Met stations and 19 full automatic weather stations (AWS)
- Radar Wind Profiler at Apia Office
- 2 tide gauges (north and south of main island Upolu)
- Also manages 6 seismic stations

# Samoa Open Climate Station Location Map



# Samoa Seismic Stations Map

# Access, Processing and Application of Satellite Data and Products

1. List of satellites/instruments currently used operationally for NWP, now-casting and other applications
   - Himawari 8 satellite via Himawari Cast
   - RAMMB & SOHEMI websites
   - GOES satellite
   - Observation network
   - Radar wind profiler
2. Current capabilities of access, processing and archiving of satellite data and products
   - Himawari Cast data receiver and storage system
   - Satellite images from RAMMB and SOHEMI archived daily
3. Current satellite data applications
   - Key application areas
     a. Monitoring, now-casting, and forecasting
   - Satellite based products
     a. Identify cloud types and areas affected by severe weather and cloud formation
     b. ASCAT winds for monitoring and forecasting sea state
     c. Real time rainfall watch from the Japan Aeronautical and Exploration Agency (JAXA)
     d. CIMMS satellite derived products

# Satellite Data to address National and Regional Challenges

- A higher temporal resolution is valuable for monitoring purposes in the absence of a Doppler radar and useful for early warnings
- Increase coverage of/deploy more polar orbiting satellites such as ASCAT
- With little number of ocean buoy observations satellite estimates of wave heights and period will be important
- Make available high resolution rainfall estimates for severe weather phenomena such as rainfall estimate products shared by JAXA
- Explore new online sources of satellite information that is freely available for Samoa region to aid in forecasting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Samoa Meteorology Division – MNRE