PALAU COUNTRY REPORT

NOAA National Weather Service

Weather Service Office - Palau

Republic of Palau

Joint Meeting of RA II WIGOS Project and RA V TT-SU

Jakarta, Indonesia / 11 October 2018

BMKG Headquarter

[1] Your country reports will be posted on the meeting's web page.

Background

- The Republic of Palau consists of eight principal islands and more than 250 smaller ones lying roughly 500 miles southeast of the Philippines. The islands of Palau constitute part of the Caroline Islands chain.
- Palau is an archipelago of over 500 islands, part of the Micronesia region in the western Pacific Ocean. Koror Island is home to the former capital, also named Koror, and is the islands' commercial center. The larger Babeldaob has the present capital, Ngerulmud, plus mountains and sandy beaches on its east coast. In its north, ancient basalt monoliths known as Badrulchau lie in grassy fields surrounded by palm trees.
- Population: 21,503 (2016) World Bank
- Official languages: English, Palauan
- Recognized regional languages: Japanese; Sonsorolese; Tobian
- Climate: Pleasantly warm climate year-round with an annual mean temperature of 82°F (27 °C). Rainfall can occur throughout the year and the annual average is 150 inches. The average relative humidity is 82% and although rain falls more frequently between July and October, there is still much sunshine.

Short Description of NMHS Activities

Our Mission:

Provide weather, water, and climate data, forecasts and warnings for the protection of life and property and enhancement of the national economy.

We build partnerships with state and national agencies, law enforcement, academia, media and the public. We provide our partners with weather information and forecasts to make our communities increasingly ready, resilient, and responsive when hazardous weather strikes.

Major national economic sectors relying on NMHSs

- National Emergency Management Office
- Bureau of Public Safety
- Division of Fire & Rescue
- Ministry of Health
- Ministry of Education
- Bureau of Agriculture
- Division of Transportation
- Division of Marine Law Enforcement
- Koror State Rangers
- Other State Rangers
- Bureau of Agriculture
- Other Private Sectors
- Media

Current Observational System Overview

I. Surface observations

The synoptic surface weather observing program exists to provide weather data to support forecast programs. Weather data are encoded in a numeric format for international exchange, at the main synoptic reporting times of 0300, 0900, 1500 and 2100 UTC. Synoptic surface observations include, at a minimum, information on amount of sky cover, wind, visibility, temperature, pressure and weather.

II. Upper-air observations

The upper-air observing program is done twice daily at 0000 and 1200 UTC, unless extenuating and justifiable circumstances prevent it. The system utilized is the Transitional Radiosonde Observing System (TROS) with a 403 MHz frequency, to provide a vertical profile of pressure, temperature, relative humidity and wind velocity through the use of balloon bourne radiosonde.

III. Marine observations

Palau lacks marine observation equipment. There are no ocean buoys around Palau. There is a tide gauge in Malakal maintained and operated by University of Hawaii at Manoa in close association with other agencies, one being NOAA. Locally, tide data is used to monitor earthquake generated tsunami events. Regionally, tide data is used in assimilation into operational models, calibration of satellite altimetry data, production of oceanic products and research. Palau's coral research centers may have more ocean observing equipment but it is not accessible to public users. Forecasters have to result to model data to forecast marine conditions. Surf observations are reported every 0900 and 1500 UTC from the east and south side of Palau.

Current Observational System Overview

IV. Aircraft-based observations
Not applicable

V. Satellite observations
The NOAA Geogstationary satellite and the Japan Meteorological Agency's Satellite Meteorological Center's HimawariCast Satellite Reception system with Sataid programs are used to observe and analyze surface and upper air interactions with land and ocean, and monitor weather and climate conditions.

VI. Weather Radar observations
Not applicable

VII. Other observation platforms
Coop stations from two other locations observe and report daily minimum and maximum temperatures.

Major historical hydro-meteorological disasters

- Drought Episode 2016
  - Palau congress appropriated US$2 million for relief efforts.
  - No casualties
- Super Typhoon Hayian – November 7, 2013
  - Total damage estimated to US$ 5.9 million in damages across six sectors (Education, Utilities, Health, Agriculture, Public Works, Housing)
  - No casualties.
- Super Typhoon Bopha – December 2, 2012
  - Total damage amounted to US$10.1 million with repair costs estimated at US$15-20 million; Palau congress allocated US$10 million for relief while international donors provided a collective $235,000 in aid.
  - No casulaties.

Access, Processing and Application of Satellite Data and Products

I. List of satellites/instruments currently used operationally for NWP, nowcasting and other applications
   - NOAA Geostationary and Polar Orbiting Satellites
   - Himawari Satellite Reception (Himawaricast) system with SATAID program
   - Japan Meteorological Agency Meteorological Satellite Center (JMA MSC) Himawari Real Time (on line)
   - AAFB Guam Radar
   - Taiwan Central Weather Bureau (CWB) and Philippine (PAGASA) Satellite Images
   - Other countries' satellite images which includes ROP that can offer more information than the ones currently listed above

II. Current capabilities of access, processing and archiving of satellite data and products
   - Himawaricast received through JMA's communication satellite
     - Surface Analysis on low and high resolution images
     - No archiving unless it is a used to provide a weather briefing or it is a potential hazard to Palau
   - Internet sources
     - On line sources used to loop images faster to be able to see cloud development and dissipation.
     - Used to get more specific details and information on a weather phenomenon mainly a tropical cyclone
     - No archiving unless it is a used to provide a weather briefing or it is a potential hazard to Palau

Access, Processing and Application of Satellite Data and Products

I. Current satellite data applications

  I. Key application areas

    - Monitoring Weather and Climate conditions
      - Intertropical convergence zones: Tropical Cyclones, circulations, disturbances, troughs, shear lines, frontal systems
      - Monsoon: surges, depressions and troughs
    - Observing and analyzing surface and upper air interactions with land and ocean

  II. Satellite-based products

    - Visible Imagery
    - Infrared Imagery
    - Near Infrared Imagery
    - Water Vapor Imagery
    - ASCAT Wind Data
    - Microwave Imagery
    - Alitimeter Data

Abstract (updates on status and plan of satellite data access, processing, application and training)

- WSO Palau utilizes Japan Meteorological Agency's (JMA) Satellite Meteorological Center's HimawariCast Satellite Reception system with Sataid program to observe and analyze near real time satellite images that are only 10 minutes behind the actual time.
- Surf analysis are done on both low and high resolution images with an overlay of JMA's numerical weather prediction models and ASCAT polar orbiting data for ocean surface winds, respectively. This information is used with various sources to produce a local forecast.
- NOAA Geogstationary satellite data are also used in operations. Although it may be 30-60 minutes behind, it can be looped faster than HimawariCast.
- Training is limited to JMA and NOAA products. There are user's guide to HimawariCast and some training at the time of installation and upgrades.
- NOAA trainings are limited to Pacific Desk training for observers and fully paid scholarship at UH Manoa for Atmospheric Science nominee.

Satellite data and product requirements, training needs and infrastructure

- Satellite data and product requirements:

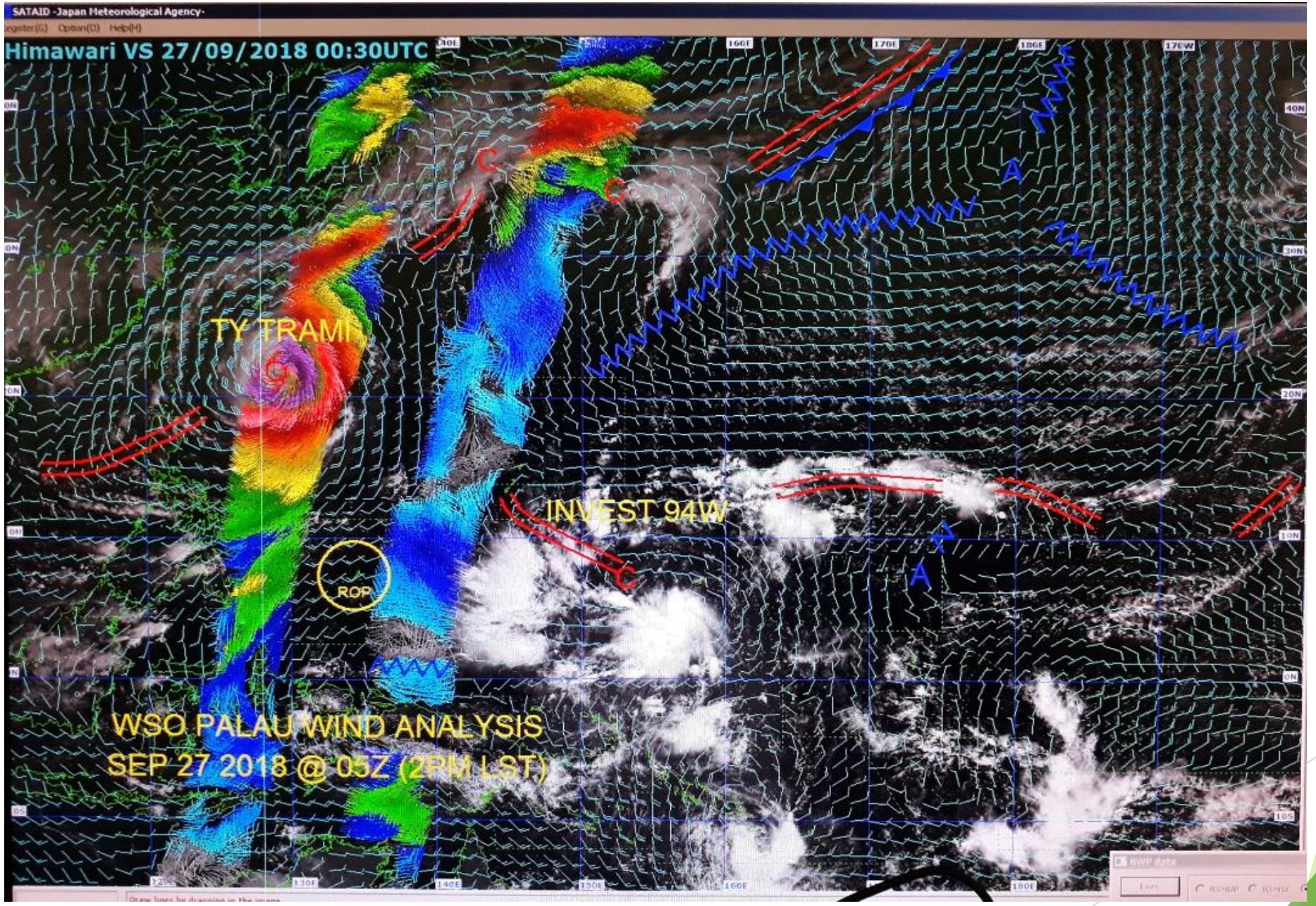
  10-min multi-spectral imagery for tropical cyclone forecasting and for current weather conditions

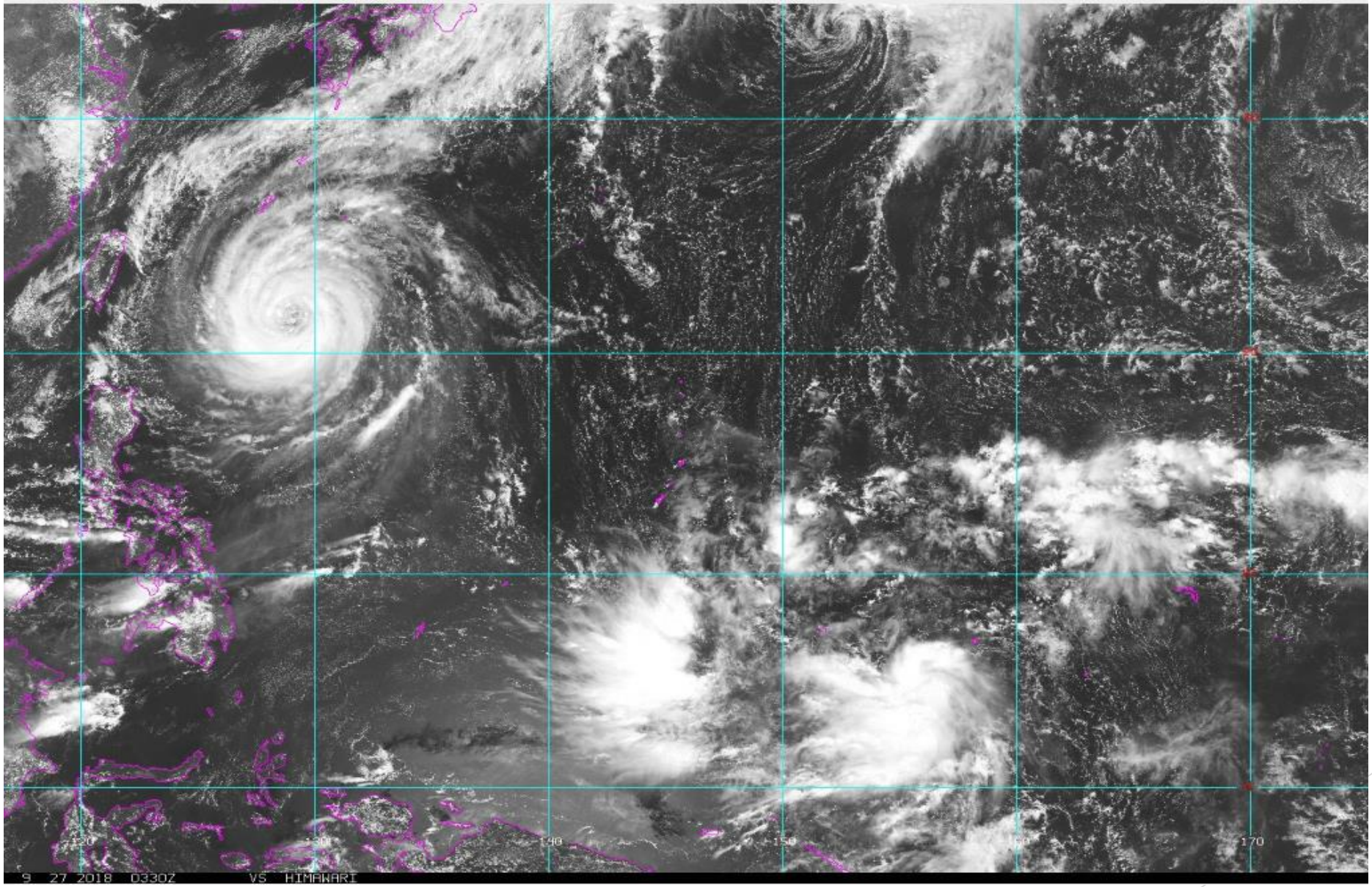
- Training needs:

  Interpreting various types of satellite images and combining with other resources to provide accurate weather information and forecasts.

- Technical infrastructure issues to access and process/visualize satellite data:

  HimawariCast data originates from Himawari Satellite to JMA to JMA's communication satellite then to WSO Palau. Thus, no internet is needed. Internet fluctuates in Palau, so this is the best source of satellite information. If WSO Palau could be provided with internet sources of real time data and high resolution products, regardless of country of origin, it would be beneficial to WSO Palau efforts.


SATAID -Japan Meteorological Agency-
Himawari VS 27/09/2018 00:30UTC
TY TRAMI
INVEST 94W
ROP
WSO PALAU WIND ANALYSIS
SEP 27 2018 @ 05Z (2PM LST)


120
130
140
150
160
170
9 27 2018 0330Z VS HIMAWARI

Mesulang and Thank you!!

Country Report

by

Joyleen Tmatk Temengil

National Weather Service, Palau

P. O. Box 520

Koror, Republic of Palau 96940

Phone No. (680) 587-1033

Fax No. (680) 587-1436

Email: Joyleen.Tmatk@noaa.gov