Disaster Risk Reduction

Disaster Prevention and Mitigation
DOST National and Regional Initiatives
PHL-MICROSAT

The PHL Microsat Program aims to build, launch and effectively utilize micro-satellite technology for multispectral, high precision earth observation.
Program Overview

**Project 1**
Headed by Dr. Marc Talampas of the Electrical and Electronics Engineering Institute (UP EEI), focuses on the development of the microsatellites.

**Project 2**
Headed by Engr. Alvin Retamar of the Advance Science and Technology Institute (DOST-ASTI), takes charge of the ground receiving station for the Philippine Microsatellite.

**Project 3**
Headed by Engr. Mark Tupas of the Training Center for Applied Geodesy and Photogrammetry (UP-TCAGP), is in charge of the Data Processing, Archiving and Distribution subsystem development.

**Project 4**
Headed by Dr. Enrico Paringit of UP-TCAGP, is in charge of the Calibration and Validation of Remote Sensing instruments.

**Project 5**
Headed by Dr. Gay Perez of the Institute of Environmental Science and Meteorology (UP IESM), leads the development of remote sensing data products.
DIWATA I

Diwata-1, was launched from the International Space Station (ISS) on the first quarter of 2016. It will be a Low Earth Orbit (LEO) Satellite with an estimated altitude of 400 to 420 kilometers and a speed of around 7 kilometers per second.
Payload

1. High Precision Telescope (HPT)
2. Multispectral Imager with LCTF (MSI)
3. Wide Field CCD, Panchromatic (WFC)
4. Medium Field CCD, Color (MFC)
DIWATA 2

- Determining the extent of damages from disasters
- Monitoring natural and cultural heritage sites
- Monitoring changes in vegetation
- Observing cloud patterns and weather disturbances
Payload

1. High Precision Telescope (SMI)
2. Spaceborne Multispectral Imager (SMI) with Liquid Crystal Tunable Filter (LCTF)
3. Wide Field Camera (WFC)
4. Middle Field Camera (MFC)
5. Enhanced Resolution Camera (ERC)
6. Amateur Radio Unit (ARU)
It is expected to provide remote sensing information that help address the needs of the Philippines for assessment of damages associated with disasters, as well as studying agriculture, fishery, forestry and changes in the environment.
APPLICATIONS

IMAGE BROWSER

View all captured images from Diwata-1 by choosing a specific region in the Philippines.

BROWSE IMAGES
DEPLOYMENT OF EARLY WARNING SYSTEM IN DISASTER PRONE AREAS

The DEWS is a project undertaken in cooperation with the Philippine Atmospheric, Geophysical and Astronomical Services Administration (DOST-PAGASA) and DOST Regional Offices.
It involves the installation of hydrometeorological devices (hydromets) such as Automated Rain Gauge (ARG) and Water Level Monitoring Station (WLMS) in different river systems and secondary tributaries to provide data that will be useful in protecting the lives, property and livelihood in various communities.
To complement these systems of hydrometeorological devices, an early warning system composed of sirens or beacons will be installed in communities affected by floods. The use of sirens or beacons as early warning of natural hazards is one of global best practices in informing unsuspecting communities thus improving disaster risk reduction.
Warning Levels

- Alert level: 40% of the river capacity based on hydrologic survey
- Alarm level: 60% of the river capacity based on hydrologic survey
- Critical level: 80% of the river capacity based on hydrologic survey
- Recession/Termination: Less to 39% and continuous lowering down of the river capacity
WARNING SCRIPT

1. ALERT level – PAG-IINGAT AT PAGHAHANDA
   Ang babalang ito ay para sa pag-iingat at paghahanda ng publiko, dahil ang 'lebel' ng tubig mula sa malapit na ilog ay umabot na sa pamantayang PAGHAHANDA at ito’y patuloy na tumataas at tinatayang tataas pa. Ang lahat ng mga naninirahan sa tabi ng ilog at karatig pook ay pinapayuhang mag-ingat.

2. ALARM level — HUMANDA NA SA PAGLIKAS
   Ang babalang ito ay paghahanda na sa paglikas. Sa kasalukuyan, ang 'lebel' ng tubig ay patuloy na tumataas at umabot na sa pamantayang NAKAKABAHALA. Ang pagbaha ay inaasahan sa mga patag at mabababang karatig pook. Pinapayuhan ang lahat ng mga naninirahan sa tabi ng ilog at mabababang pook na mag-ingat at maghanda na sa paglikas.
3. CRITICAL level – PAGLIKAS o EVACUATION

Ang babalang ito ay paglikas o evacuation. Ang 'lebel' ng tubig mula sa malapit na ilog ay patuloy sa pagtaas at umabot na sa pamantayang MAPANGANIB na inaasahang magdudulot ng malawakang pagbaha sa kapatagan at mabababang lugar. Pinapayuhan ang lahat ng mga naninirahan sa tabi ng ilog at karatig pook na lumikas na at magtungo sa pinakamalapit na evacuation center.

4. TERMINATION OF WARNING ISSUE

Ang 'lebel' ng tubig mula sa malapit na ilog ay tuluyan nang bumaba at ito ay hindi na magdudulot ng panganib sa mga naninirahan malapit sa ilog. Lahat ng babala sa pagbaha ay tinigil na.
Bgy. Andap, before and after typhoon Pablo images
Aerial view of debris flow deposit at Barangay Andap, New Bataan, Compostela Valley
Debris flow field in New Bataan, Compostela Valley
Debris flow field in New Bataan, Compostela Valley
Debris flow field in New Bataan. Volume of deposit – 25-30 million cubic meters
Department of Science and Technology
Davao Region
This time around, a better-prepared Cagayan de Oro reports zero casualties

By: Abigail Kwok, InterAksyon.com
December 5, 2012 10:42 AM

MANILA, Philippines – Cagayan de Oro City achieved a target of zero casualties during typhoon Pablo, in contrast to its experience in 2011 when tropical storm Sendong claimed hundreds of lives.

"Because we have now an instrument. Yung mga early warning device na ginagamit sa aming (which were used in our) decision-making. We prepared in advance because of the early warning, kahit wala pa si (even without) Pablo. Tapos pag landfall nya (And when it made landfall) we decided immediately, pinalawak yung (expanded) high-risk areas kasi may (there were) manifestation sa early warning system na talagang malakas ang ulan at agos ng tubig (that the rains and water currents were strong). We had enough time unlike in Sendong na talagang walang nag-aadvise (when no one was advising us)," Cuenca said.
Is a hazard and risk simulation software that aims to produce hazard and risk maps **IMMEDIATELY** after the occurrence of a strong and potentially damaging earthquake.

1. PRODUCES SEISMIC HAZARD MAPS
   a. Ground Shaking
   b. Liquefaction
   c. Earthquake-induced Landslides
   d. Tsunamis

2. BUILDS EXPOSURE DATABASE
   a. Population, buildings, bridges, lifelines, critical facilities, hospitals, fire stations, etc.

3. COMPUTES EARTHQUAKE RISK
   a. Physical Damage
   b. Fatalities
   c. Economic Loss
GEOSAFER MINDANAO

Geo-informatics for the Systematic Assessment of Flood Effects and Risks for a Resilient Mindanao: aimed to cover the rest of Mindanao flood-prone areas with flood hazard maps through the cooperation of 5 Higher Education Institutions from Mindanao
Flood Modelling
Components of airborne LIDAR survey:
- GPS
- IMU
- Laser Rangefinder
Project HANDA

is an ICT-enabled Disaster Risk Reduction and Management (DRRM) system developed by DOST CALABARZON used in the dissemination of disaster-related updates.
monitoring of data from ASTI-developed hydromet sensors and warning/alarming of LGUs.
weather bulletins from pagasa and volcano and earthquake bulletins from phivolcs

**Bulletins | Earthquake Information**

DateTime: 14 Sep 2017 08:13:18 AM  
Location: 18.90N, 121.21E 035 km S 10 W of Calayan Cagayan  
Depth of Focus Km: 033  
Origin: TECTONIC  
Magnitude: Ms 2.4  
Expecting Damage: NO  
Expecting Aftershocks: NO  
Issued On: 14 Sep 2017 08:26 AM

DateTime: 13 Sep 2017 11:21:28 PM  
Location: 15.42N, 118.94E 103 km S 89 W of Palaui Zambales  
Depth of Focus Km: 018  
Origin: TECTONIC  
Magnitude: Ms 2.1  
Expecting Damage: NO  
Expecting Aftershocks: NO  
Issued On: 13 September 2017 11:30 PM

DateTime: 13 Sep 2017 11:03:23 PM  
Location: 12.79N, 123.66E 014 km S 25 E of Donsol Sorsogon  
Depth of Focus Km: 004  
Origin: TECTONIC

**Bulletins | Weather Bulletin**

Issued at: 4:00 AM today 14 September 2017

SYNOPSIS: Intertropical Convergence Zone ITCZ affecting Palawan and Mindanao

SYNOPSIS: Intertropical Convergence Zone ITCZ affecting Palawan and Mindanao. Predicted Mean Sea Level Pressure Analysis 8:00 AM today 14 September 2017 Predicted Mean Sea Level Wind Analysis 8:00 AM today 14 September 2017 Satellite Image Surface Map Analysis TYPHOON TALIM 3:00 AM TROPICAL STORM DOKSURI 3:00 AM LOCATION: 700 KM NORTHEAST OF BASCO BATANES 26.1N 124.9E LOCATION: 740 KM WEST OF IBA ZAMBALES 15.8N 113.1E MAXIMUM SUSTAINED WINDS: 130 KPH MAXIMUM SUSTAINED WINDS: 95 KPH GUSTINESS: UP TO 160 KPH GUSTINESS: UP TO 105 KPH MOVEMENT: NORTH NORTHWEST AT 13 KPH MOVEMENT: WEST NORTHWEST AT 18 KPH FORECAST WEATHER CONDITIONS Place Weather Condition Caused by Impacts Palawan Cloudy skies with scattered rainshowers and thunderstorms. Intertropical Convergence Zone ITCZ Possible lightning occasional heavy rains strong winds and flash flooding. Mindanao Partly cloudy to cloudy skies with rainshowers and thunderstorms Intertropical Convergence Zone ITCZ Possible lightning occasional heavy rains strong winds and flash flooding. Metro Manila and the rest of the country Partly cloudy to cloudy skies apart from isolated rainshowers Localized thunderstorms Possible lightning occasional heavy rains strong winds. FORECAST WIND AND COASTAL WATER CONDITIONS Place Winds Coastal Waters Speed Direction Luzon and Visayas Moderate to Strong South to Southeast Moderate to Rough Mindanao Light to Moderate Southwest to South Slight to Moderate EXTREMES OF TEMPERATURE AND RELATIVE HUMIDITY FOR THE 24-HOUR PERIOD ENDING AT 8:00 PM TODAY Recorded at PAGASA Synoptic Station Science Garden Diliman Quezon City YESTERDAY Temperature C Maximum 32.8 1:00PM Relative Humidity Maximum 95 6:00 AM Minimum 24.5 6:00 AM Minimum 58 1:00 PM TIDES AND ASTRONOMICAL INFORMATION Over Metro Manila Today Tomorrow Today Tomorrow Tidal Predictions for Manila Bay m Courtesy of NAMRIA High - - - Sunset 5:45 AM - Low 12:09 PM 0.18 - - Sunset 5:58 PM - High - - 3:21 AM 1.
TEXTBLAST (Text Broadcast Level Automated Sending Tool)

Development of a system that integrates Project HANDA to existing SMS based information system of OCD XI.
## Other source of information

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<th>Scale/Coverage</th>
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<td>PAGASA</td>
<td>Twice daily</td>
<td>National</td>
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<td>Current rainfall</td>
<td>DOST-ASTI</td>
<td>15-min interval</td>
<td>600 stations</td>
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<td>4-hr rainfall forecast</td>
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<tr>
<td>7-day forecast</td>
<td>NOAH-WISE</td>
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<td>Rainfall warning</td>
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<td>Thunderstorm advisory</td>
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<td>Storm Surge advisory</td>
<td>PAGASA-NOAH</td>
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<tr>
<td>Flood monitoring</td>
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<td>Hazard Risk Assessment</td>
<td>DOST-IOC</td>
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Mobile Applications

NOAH

ARKO

Flood Patrol

Raincheck PH
Flood Patrol

Select Action:
- Reports
  - Send Flood Report
- View Flood History
  - View map of past flood reports
- Emergency Hot Lines
  - Call PAGASA, PNP, etc.
- About
  - Learn more about Flood Patrol

Press the zoom in and zoom out icons to magnify the view and see areas prone to flooding. Press Help button for instructions.
ARKO

Tropical Storm QUEDAN
Forecast Track as of October 05, 2013
02:00 PM
Source: PAGASA

My Places
- Current Location
  - Villar, Makati City
- Edison’s Gym
  - Santolan, Pasig City
- Jordan’s Cafe
  - Estrella, Taytay, Rizal
- My Place
  - Muzon, Taytay, Rizal
- Neil’s Office
  - Ortigas Ave., Pasig City
RaincheckPH

Department of Science and Technology
Nationwide Operational Assessment of Hazards
WebSAFE

In the event of a flood in **Tagum City, Davao del Norte**, how many people might need evacuation?

If you are in Davao City, how many people might need evacuation?

**UPON ALERT**

1. Issue Directives
2. Convene LDRRMC
3. Prepare Administrative and Logistic support

**A**
- Activate ICS
- Supply/Asset Management
- Budget and Finance

**B**
- }

WebSAFE, an impact assessment tool based on InsaSAFE, is a joint effort of Project NOAH and The World Bank.