Webinar for the launch of the latest APCICT Academy module (above)

GIC AIT GEOINFORMATICS CENTER
Asian Institute of Technology
October 2020 NEWSLETTER

Virtual Launch of APCICT Module on ICT for DRM

The Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT/ESCAP) lanched an updated module for it's online Virtual Academy dedicated to Information and Communication Technology (ICT) for Disaster Risk Management (DRM) on 27 August 2020.

Dr. Manzul Kumar Hazarika, Director of the Geoinformatics Center (AIT-GIC), moderated a webinar to launch the new online DRM learning module. Dr. Hazarika, along with Prof. Cees van Westen (ITC - Univ. of Twente, Netherlands), gave an overview of the topics covered in the new module. They were joined by experts from the Government of India, the World Bank, UNDRR, and UNESCAP who offered unique insights into benefits and challenges of using ICT for disaster risk management. A recording of the webinar on YouTube can be found here.

The DRM module was developed by Dr. Manzul Kumar Hazarika (AIT-GIC), Prof. Cees van Westen (ITC - Univ. of Twente, Netherlands), and Mr. Syams Nashrullah (AIT-GIC) to give insight into best practices for applying available ICT techology to DRM processes. The module is comprised of seven chapters focusing on information needed for DRM situations, as well as applications of ICT to key areas of DRM including mitigation, preparedness, reponse/relief, and recovery/reconstruction.

APCICT looks forward to organizing training courses for interested organizations in the Asia-Pacific region upon request. To learn more about the module including learning outcomes please follow the link to APCICT's site here.

1

World Cleanup Day 2020 Activities

GIC participated in two waterside cleanup activities in Chiang Rai and Rayong, Thailand on Saturday September 19 to celebrate World Cleanup Day 2020.

One GIC team collaborated with Trash Hero to cleanup a city park in Chiang Rai's Thoeng district. The park lies on the eastern bank of the Ing River, one of the Mekong River's major tributaries in northern Thailand. More than fifty volunteers including students from Teung Wittayakom School worked diligently to collect trash from both the park and adjoining riverside area.

In total, volunteers collected more than 90 kg of trash, which included a significant amount of plastic waste. A field survey of the cleanup area brought new insight to the plastic leakage phenomena occurring in Chiang Rai waterbodies. It was evident that the current COVID climate was contributing to this as disposable facemasks were found among the riverside plastic waste.

GIC is active in the Chiang Rai region as part of the United Nations Environment Program's CounterMEASURE Program, which is an initiative currently underway in Southeast Asia and India to curb marine plastic litter by studying plastic pollution at its sources.

A second team from GIC joined AIT's Marine Plastic Abatement (MPA) Program for a cleanup activity at Moonlight Beach in Thailand's Rayong province.

Eighty volunteers including MPA students, faculty, and GIC staff worked together to collect trash at a half-kilometer stretch of the beach. The cleanup area was divided into six zones to characterize the types of waste found in each one.

Volunteers collected nearly 5,000 pieces of trash in total. At the end of the cleanup activity, collected trash was counted and separated into plastics/non-plastics, then by plastic type. Analysis revealed that the most prevalent plastic waste found included plastic beverage bottles, plastic pieces 2.5cm or smaller, plastic fishing nets, and food wrappers.

In addition to the cleanup, GIC team members used 360° cameras to collect digital images of the site before the cleanup began. The images are part of a new training dataset for a plastic waste data platform currently under development. The platform uses deep learning to identify plastic waste in digital images.

Both World Cleanup Day 2020 events were eye-opening experiences for the GIC team members involved; they demonstrated the need for new policies to curtail the use of single-use plastics in Asia to preserve of our vital Asia-Pacific waterways.
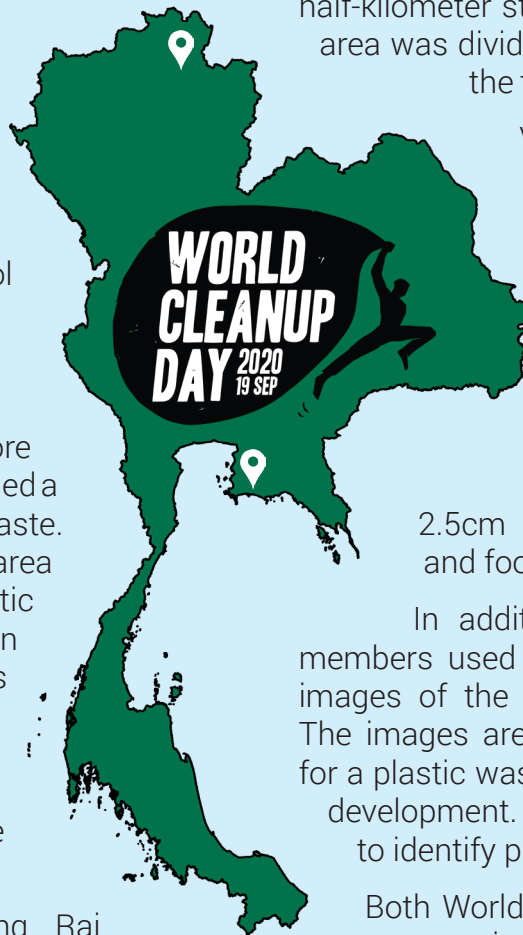
Left: Volunteers gather trash at Teung City Park and Riverside area in Chiang Rai, Thailand

Center & Right: MPA students, faculty, and GIC staff collect trash and marine plastic at Moonlight Beach, Rayong, Thailand. Small plastic pieces less than 2.5cm in size were abundant at the beach site.

New & Free Training Courses from GIC

GIC is excited to announce three new free online training courses for 2020.

The courses are suitable for anyone looking to add to their personal geospatial toolset. Courses focus on current topics for geospatial professionals including Deep Learning, Google Earth Engine, and Python-based geospatial data analysis.

The training courses were developed by GIC's machine learning expert, Mr. Lakmal Deshapriya. The courses are free and accessible online 24/7 at the GIC Website Training Page and on GIC's Github page.

Deep Learning for Sat Image Analysis

The deep learning course covers the fundamentals of applying machine learning to satellite image analysis. Participants begin with basic regression analysis and progress to neural networks, CNN's, and U-Net for building extraction & landcover mapping. Those who have prior experience with Numpy and linear algebra are set to gain the most from this course. Please note that Deep Learning algorithms tend to be resource hungry, so access to a computer with a decent GPU / Google Colab is a plus.

Basics of Google Earth Engine

The Google Earth Engine Course provides an introduction to vector and raster data manipulation with the Google Earth Engine Code Editor. Participants will use Javascript to access the vast catalog of satellite imagery available in Earth Engine, create charts for data visualization, and complete a water extent analysis case study.

Python for Geospatial Analysis

The Python course teaches participants how to use the scripting language to perform common tasks with vector and raster data that they would ordinarily perform in a GIS with a graphical user interface. Users will gain experience accessing some of the most popular Python libraries for geospatial analysis, including numpy, gdal, matplotlib, and geopandas.

Webinar on Sustainable Technologies in Rural Agriculture

AIT-GIC and Tezpur University (Assam, India) jointly organized a webinar on sustainable technologies in rural development on August 31, 2020.

The webinar coincided with the 150th birth anniversary of Mahatma Gandhi, so presenters shared their experience from a Gandhian perspective. GIC's Dr. Manzul Kumar Hazarika delivered a keynote speech on Applications of Geoinformatics in Agriculture and Rural Development.

In his speech, Dr. Hazarika highlighted some of GIC's current related activities including applications of Agro-ecological Zonation and drones in agriculture.


New Python Tool for Agro-ecological Zonation

FAO has been addressing food security issues for nearly forty years by developing a methodology for assessing agricultural resources and potential called Agro-ecological Zonation (AEZ). While already a formidable convention, AEZ needed updating for modern systems and to be made more user-friendly for agriculture officers in the Asia-Pacific Region. The Geoinformatics Center collaborated with the Food and Agriculture Organization of the United Nations Regional Office for Asia and the Pacific (FAO-RAP) to develop a modern, accessible tool for Agro-ecological Zonation (AEZ) implementation. The resulting Python Package tool for AEZ (PyAEZ) provides a standard framework for land resource inventory and appraisal while adhering to the established FAO Land Evaluation Framework. PyAEZ's underlying algorithm uses numerous data inputs in simulated crop cycles to assess suitability and productivity of selected crops, and additionally estimates maximum yield under particular climate, soil, and terrain conditions.

Featured Sentinel Asia Value Added Product: Vietnam Flood - September 2020

DETECTED FLOOD WATER IN HA TINH PROVINCE, VIETNAM
As observed by THEOS-1 image on 23 September 2020

Flood

Geoinformatics Center - AIT

Map Information

N

| 1 0.5 0 | 1 | 2 | 3 | 4 |

Kilometers
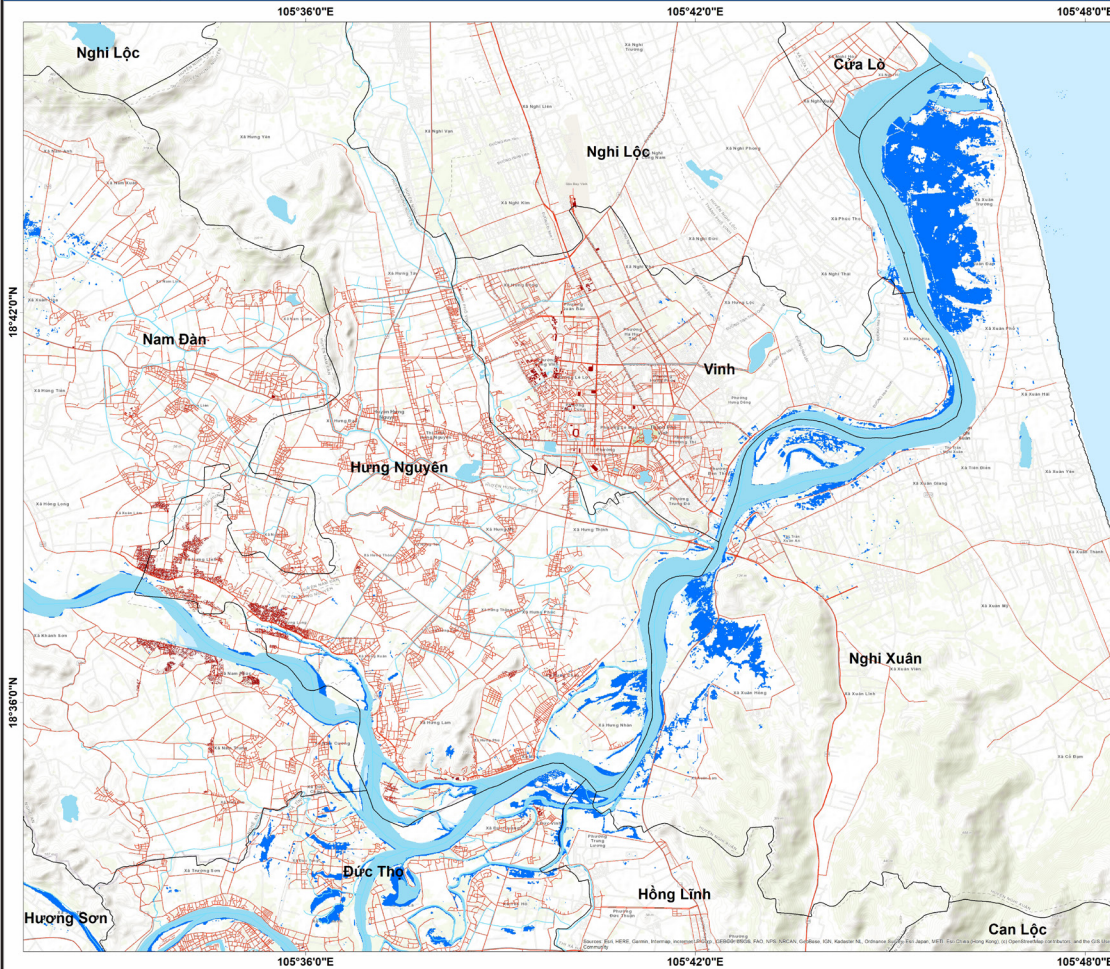
Map Scale 1:50000
Coordinate System: GCS WGS 84
Datum: D WGS 84
Unit: Degree

Legend

- **Detected Flood Water**
- **Waterbody**
- **Building**
- **Waterway**
- **Road**
- **District Boundary**

Data Sources

Satellite Image:
Post-disaster   : THEOS-1, 23 September 2020
©GISTDA (2020)

GIS Data:
Waterway,Waterbody,Building,Road © OSM (2020)
Administrative Boundary © GADM (2020)

Description

The blue areas shown in this map indicate the flood water areas detected in Nghi Xuan, Hung Nguyen and Vinh districts in Vietnam on 23 September 2020.

Note that the detected water may also include water in cultivated areas.

Map product made by GIC-AIT (v1.0).
Disclaimer: The accuracy of this product is not validated.

Data provider:

GISTDA

GIC created the above valued added product (VAP) in response to flooding in Vietnam's Ha Tinh and Quang Ngai provinces on 18 September 2020. Flood waters appear dark blue in the map as opposed to the light blue perennial water bodies. The majority of the area received 200-300mm of rainfall, with some locales spiking at 400mm. Based on the Typhoon Level 10-13 scenario, it is expected that approximately 107,000 households were evacuated.

GIC operates as the Principal Data Analysis Node (P-DAN) for the Sentinel Asia Program, a collective managed by the Asia-Pacific Regional Space Agency Forum to aid in disaster management with space technology. VAPs like the one above are disseminated to national governments and line agencies during disasters to improve response activities. To date GIC has produced 31 VAP's for Sentinel Asia since the start of the COVID epidemic.

GIC
Asian Institute of Technology

GeoInformatics Center
14.08247° N, 100.6132° E