Group Photo of Joint Project Team Meeting of Sentinel Asia, September 2023

GIC GEOINFORMATICS CENTER

October 2023 NEWSLETTER

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Joint Project Team Meeting for Sentinel Asia

(22/9) As the Principal Data Analysis Node (P-DAN) of Sentinel Asia, GIC was invited to the 8th Joint Project Team Meeting (JPTM) for Sentinel Asia in Jakarta, Indonesia from 17th to 18th September 2023.

The meeting was held back-to-back with the 29th session of the Asia-Pacific Regional Space Agency Forum (APRSAF-29) from 17th to 22nd September 2023. The JPTM of Sentinel Asia outcomes were reported at the Satellite Applications for Societal Benefit Working Group (SAWG) session of APRSAF-29.

The objectives of the meeting were to incubate the sharing session among the Sentinel Asia members in the Asia-Pacific Region on disaster management activities, experiences, and challenges in their organizations and respective countries. GIC shared a presentation with the title "Improving Sentinel Asia's Emergency Response Activities: SAR Data Analysis and Mobile-app Development", which was presented by Mr. Syams Nashrrullah (Research Specialist) and co-authored with Ms. Angsana Chaksan (Senior Research Associate).

GIC Presenting in 8th JPT Meeting about Disaster Portfolio

AMS National Action Plans on Waste Management

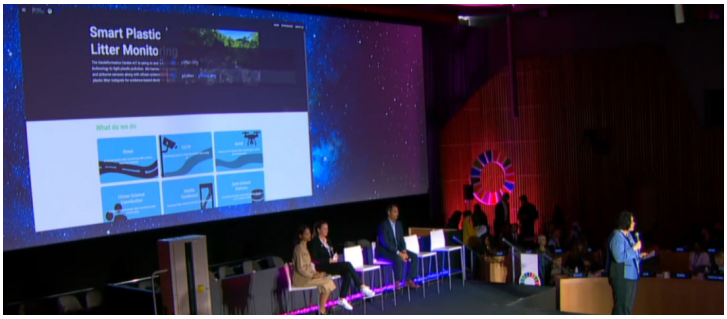
(28/9) Exacerbating plastic waste and legally binding the global plastic treaty made significant steps for the ASEAN Member States (AMS) to generate the proper actions and develop its National Action Plans. The development was aided by the regional training workshop in Bangkok, Thailand, from 26th to 28th September 2023.

Built with the scientific and evidence-based workflow, GIC learnt with the policymakers from international organizations and local authorities to develop a sound solid waste management (SWM) framework. GIC shared in the full-day session on identifying challenges and opportunities in plastic inventory, leakage estimation, and monitoring tools.

Plastic leakage modelling and mapping, developed in 2019, took the step as the GIC initiative to aid National Action Plans. With the flow of waste management assessment through the Waste Flow Diagram and data collection with the Mobile app, the framework enables the plastic waste hotspots in the city to occupy effective waste management. The framework aided with the city's continuous monitoring, which was discussed among the stakeholders.

Regional training workshop was held in two sessions: Discussions among stakeholder (left) and Clean-up activities (right)

Digital Solutions of pLitter aired in SDG Digital Day



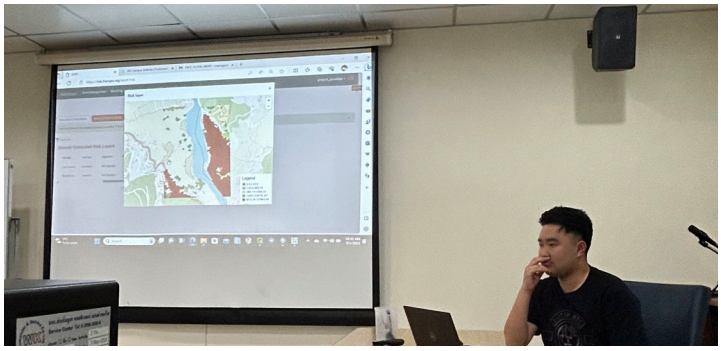
pLitter in UN SDG Digital Day

(17/9) Calling the initiatives of global challenges with the digital solutions approach, GIC was honoured to be addressed in the solutions of SDG14, Life Below Water. The project in which GIC is involved, CounterMEASURE, stood out among the 300 applicants as one of the prominent solutions to end plastic pollution by 2030.

GIC initiated a digital platform for smart litter monitoring called pLitter. pLitter emphasized the workflow integration of human involvement, mapping concepts, and machine algorithms to harmonize plastic monitoring in robustness. pLitter, as a solution, was getting the call and presented by on-behalf of the UN Environment Programme (UNEP).

The output of the showcase delivers the message and acknowledgement of the optimistic innovation on the plastic pollution issue. Later, the outcomes were hoped for the different stakeholders to implement pLitter and plastic in the digital platform as one of the solutions for local plastic waste.

Did you Know?
Flood Risk Assessment



Participants were demonstrating their Flood Risk Assessment in Processing Data (left) and Project Presentation (right)

(1/9) The assessment of flood risk is an essential aspect of managing flood hazards, involving the examination of potential flood-related impacts on individuals, infrastructure, and the environment. GIC organized a tailor-made training, which commenced with an exploration of fundamental concepts on disaster risk assessments, hazards, elements-at-risk, exposure, vulnerability, loss, risk analysis, risk reduction alternatives and cost-benefit analysis.

During the trainingm, the sample datasets in IL-WIS and RiskChanges where participants learned to assess the exposure and loss emanating from the flood for various elements-at-risk. Building footprints from Microsoft, OSM and Google were used and pre-processed in QGIS along with flood maps produced from FastFlood application. The dataset also generated physical vulnerability curves from their experience for loss and risk estimation. The results were shown as spatial maps overlayed on different assets with risk information represented as aggregated Average Annual Loss (AAL). Participants also discussed the flood risk and damage in their communities and the current government policies associated with flood risk reduction and management.

Did you Know?
How Geospatial Technologies included in Building Resilience?

Data Pattern explained in the 6th Internal Workshop

(18/8) The Geoinformatics Center conducts a monthly internal workshop to share ideas and research on various themes. During one of the sessions held on 18th August, Hillson Ghimire, Research Associate at GIC, shared his insights from his participation in the 10th ISEPEI summer school titled "Geospatial Technologies for Achieving Sustainable Development Goals (SDGs) – Building Resilience".

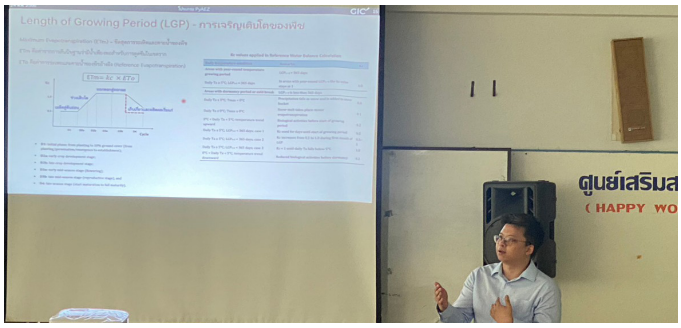
In his presentation, Ghimire discussed the action to resilience, which involves preparedness, cooperation, wisdom to withstand, and making regulatory changes for good. In every step of these challenges, monitoring of our environment becomes crucial. Hence, Earth Observation (EO) and Geospatial Technologies play an essential role in building a more sustainable earth through the ability to understand the impact of activities on our natural systems in various thematic areas such as Disaster Resilience, Climate Change, Agriculture, Forest, Water Resource, etc.

The participants of the ISEPEI summer school were policymakers and researchers from a wide range of nations, fostering the exchange of ideas, knowledge sharing, and collaboration opportunities. Several organizations, notably UNOOSA, FAO, GEF, EU, and private companies like ESRI and Google, actively participated and shared their experience in Geospatial Technology for Building Resilience.

Geospatial in Agriculture: PyAEZ for Irrigation Experts

(24/8) The irrigation professionals were equipped by utilizing CROPWAT, a software application developed by FAO to assist in water management and agricultural planning by estimating crop water requirements and irrigation scheduling. To compile the workflow, PyAEZ, jointly developed by GIC, aligned with the tool to assist the crop zonation.

PyAEZ, or python package in Agro-ecological Zonation (AEZ), is a built-in open-source tool which develops the land evaluation to support sustainable agricultural development. With the developed six modules, PyAEZ workflow required climate, soil, terrain, administrative, soil properties and crop parameters data. The alignment with CROPWAT was incubated with the agricultural planning by in-country staff.



Explanation of Length of Growing Period which covered under PyAEZ

Geospatial in Environmental: Microplastic Monitoring Perspective

(4/9) The study has sorted out microplastics for the past years, including gathering the sources, addressing the challenges and opportunities, and developing the strategies. GIC has been using recent geospatial technology and intends to make a robust approach which can be extended to map the strategy for microplastics in the environment.

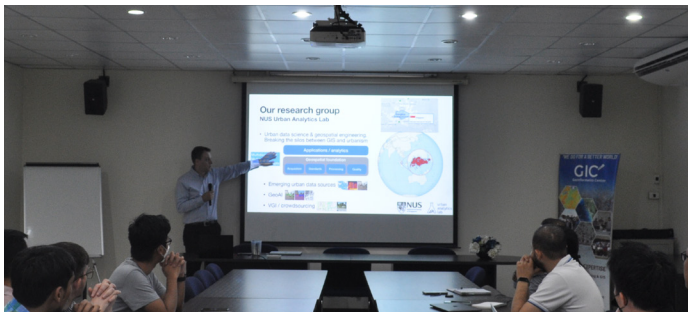
A seminar on microplastic studies at Kasetsart University developed insights into the geospatial approach to detecting unseen plastics. Recent studies showed microplastics in landfills and applied in different seasons. However, the source is still unknown.

The geospatial perspective gives insights into how plastic can be detected through the image's plastic index range and compiled with the high-resolution image. The solutions applied with the mapping solutions to see the sources of microplastics.

Insights on Microplastic Mapping using Geospatial Technologies

Geospatial in Urban Modelling: Enabling Datasets and AI

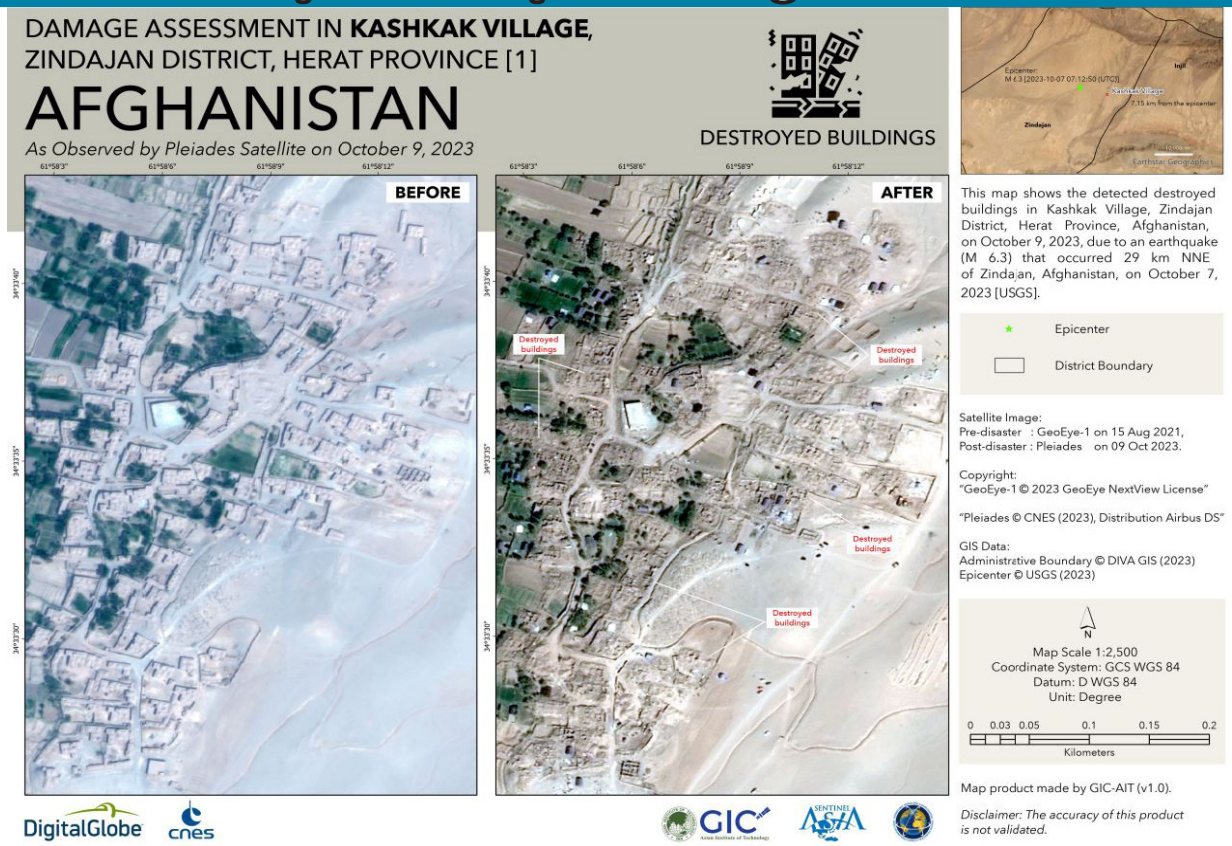
(27/7) Geospatial covered the different modelling approaches, including urban modelling. Lectured by Prof. Filip Biljecki from NUS Urban Analytics Lab, there are three approaches for enabling urban modelling: urban data sources, Geo-AI, and crowdsourcing.



Dr. Filip Biljecki shared about NUS Urban Analytics Lab in Urban Modelling Approaches

In this context, urban modelling consisted of building datasets and street-level imagery to be interpreted. The focus was to enable the algorithm and find an effective way to gain the dataset and enhance the data quality. Some study cases included reconstructing using a single view image, GANmapper – a geospatial data translation based on building patterns, sensing cities from the accommodation reviews, and other things related to open-source data like OpenStreetMap.

Disaster Activation: Map of Earthquake in Afghanistan



Value-added Product of Damaged Building Detection, created by Geoinformatics Center

(7/10) In the western Herat province, a magnitude 6.3 earthquake struck Afghanistan on 7th October 2023, precisely 40 km from of the west Herat city, also the country's third-largest region. Approximately 2,400 casualties have been reported. Thousands of buildings have been destroyed, and heaps of rubble and debris can be found in the villages. International aid groups do all they can to provide survivors with medical care, food, water and shelter.

GIC contributes by delivering the information for the disaster response to help support local and international organizations. Senior Research Associate Angsana Chaksan, stood up as the value adder for the activation call, which UNOSAT managed. GIC generated the map of affected and destroyed buildings, which assisted the disaster response activities for the immediate evacuation.

The map was generated from high-resolution optical satellite images for pre and post-disaster occurrences. The assessed buildings information improved with the participatory and local datasets.

To find out more on activation, here disaster-scharter.org.