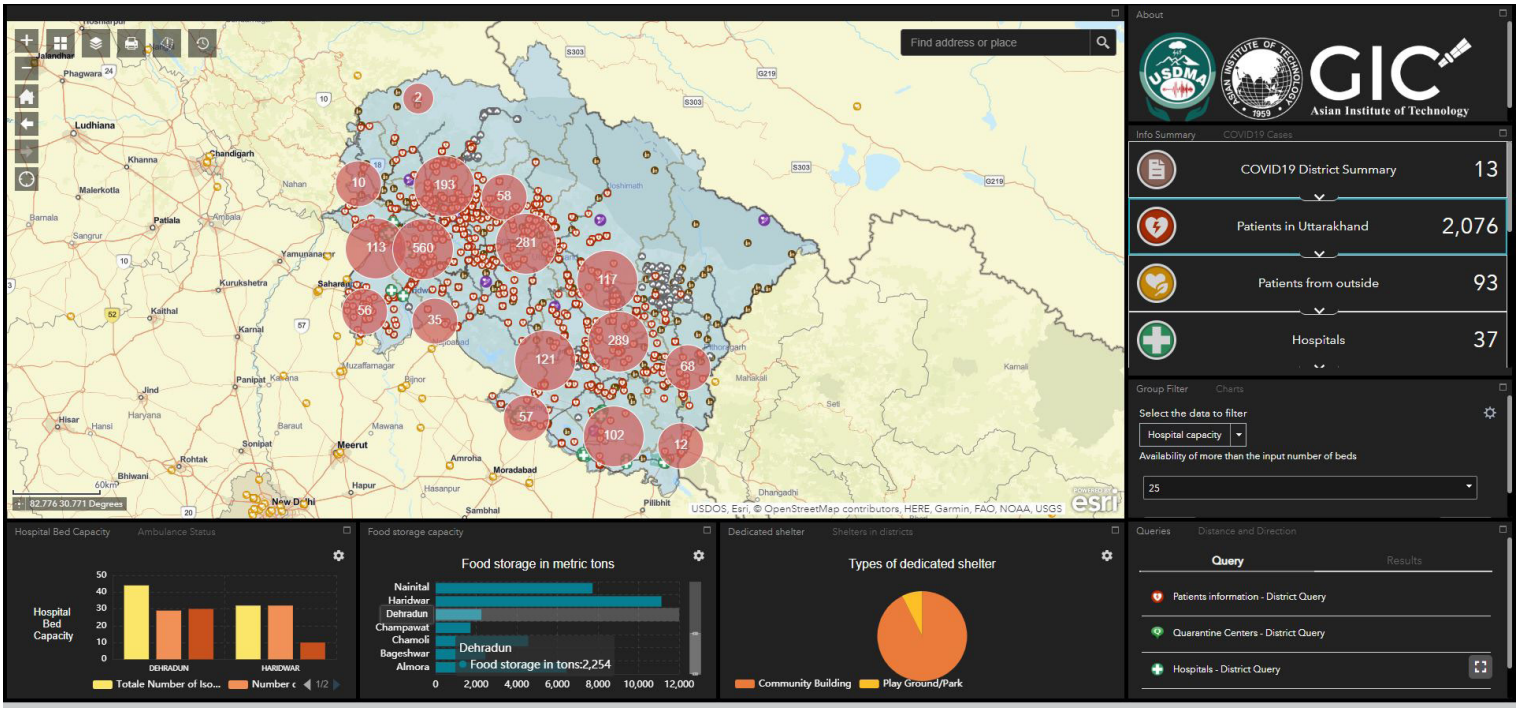
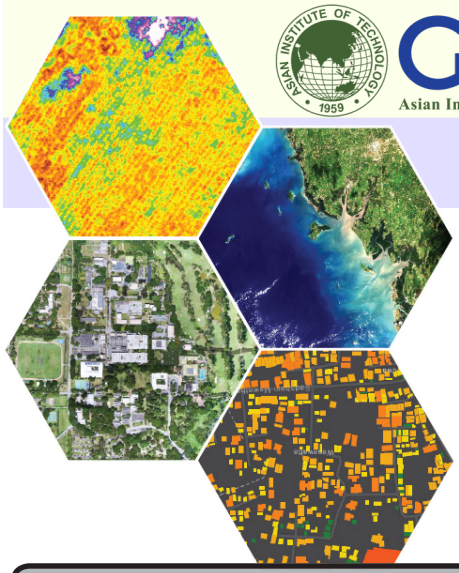


GIC's COVID-19 monitoring module for Uttarakhand, India (above)



GEOINFORMATICS CENTER

July 2020 NEWSLETTER

In This Issue

COVID-19 Module for DSS Platform

The Geoinformatics Center (GIC) has created a COVID-19 dashboard for the previously developed Uttarakhand Decision Support System (DSS) to monitor the COVID climate and available related resources for the northern Indian state.

The Decision Support System was created by GIC in 2019 under the World Bank Uttarakhand Disaster Recovery Project Initiative. The DSS was initially purposed for response, monitoring, analysis, and reporting processes for natural disasters. The onset of the global COVID-19 pandemic offered a unique opportunity to look beyond natural disasters, increasing functionality to include health crises as well. The platform accesses a consolidated database featuring model predictions, baseline data, as well as direct-feed real time data to facilitate a smooth decision-making process for Uttarakhand's state-run Emergency Operations Centers.

The dashboard accesses information for a variety of healthcare information types including the number of COVID-19 positive patients, medical labs capable of COVID-19 testing, ambulance availability, etc.

Being able to visualize these data in a single portal helps decision-makers to understand the current COVID landscape from local to state level. One major advantage of the COVID-19 dashboard is its integration into the Uttarakhand Decision Support System. Government officials throughout the state are already trained in the DSS for disaster management. Adding COVID monitoring capability provides a convenient approach for government officials to improve their decision-making process for appropriate response across the state.

UNEP CounterMeasure Phase 1 - Complete

The final stakeholder conference for Phase 1 of the United Nations Environment Program's (UNEP) CounterMeasure Project was held online from May 25-28, 2020 to examine activities from the project's first phase and to consider how to proceed for future phases. (https://www.conference2020.countermeasure.asia/)

The Geoinformatics Center played a key role in the development and implementation of the Lower Mekong River Basin portion of Counter Measure Phase 1. As mentioned previously in the January 2020 edition of the GIC Newsletter, the GIC team organized river beach cleanup and data collection events at the two Thailand pilot sites, as well as led a few sessions related to the project at the 2019 Sea of Solutions workshop at UNESCAP (Bangkok). Additionally, GIC developed a regional model for monitoring river basin plastic leakage by targeting land-based sources of plastic pollution. The model incorporated data from five pilot sites in Cambodia, Lao PDR, Thailand, and Vietnam to determine plastic leakage density using a fuzzy overlay approach. Furthermore, GIC developed a geospatial web portal for accessing the results of the plastic leakage density assessment as well as a dashboard displaying plastic data for each pilot site. GIC's CounterMeasure dashboard can be accessed at: https://platform.countermeasure.asia

The final stakeholder conference featured seven informational sessions in which regional experts relayed their progress in studying the plastic blight facing Asian river systems. GIC team members led two sessions, imparting progress made over the course of the last year in studying Lower Mekong plastic pollution. Topics consisted of data collection and survey methodology for plastic leakage pathway development, the application of GIS for plastic leakage assessment and monitoring, drone survey of beach plastics with machine learning analysis, and lessons learned from CounterMEASURE Phase 1.

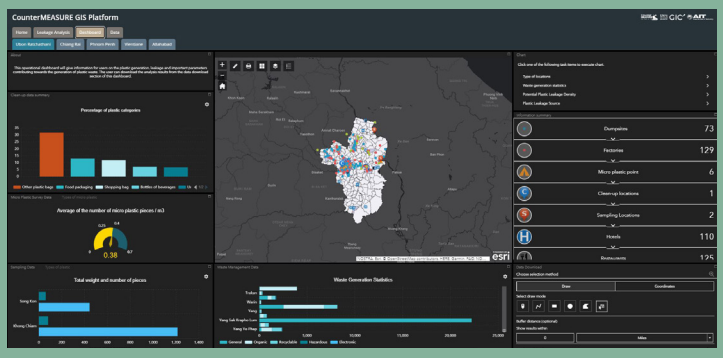
Regional experts leading the stakeholder conference hailed from multiple sectors including academia, the private sector, and both government and non-government organizations. Entities represented included: UNEP; Japan Ministry of Foreign Affairs, Kagoshima University (Japan); GIC, AIT Regional Resource Center for Asia and the Pacific, Ubon Ratchathani University (Thailand); GA Circular, TERI, Development Alternatives, Chintan, and Birla Institute of Management Technology (India).

A workshop was held on the final day of the conference to explore the challenges and opportunities in reducing plastic pollution in Asian rivers. The workshop featured parallel breakout sessions which put a focus on policy and data collection. Here, participants had the opportunity to share their project implementation experiences from the India and Mekong pilot sites, as well as discuss what policies would be necessary based on these experiences to reduce riverine plastic pollution.

CounterMeasure is a joint initiative between the United Nations Environment Program (UNEP) and the Japanese Government that aims to identify and mediate sources of plastic pollution for Asian river basins. During Phase 1 a focus was put on studying the Lower Mekong River Basin in Thailand and the Ganges River Basin in India.

An animated video describing CounterMeasure Phase 1 activities can be found at the following URL: https://youtu.be/L6NO4d_4SgU

At this point, Phase 2 for CounterMeasure is still under discussion. Look for updates at our website: http://geoinfo.ait.ac.th/



GIC's CounterMeasure dashboard display

Counter MEASURE FOR PLASTIC FREE RIVERS

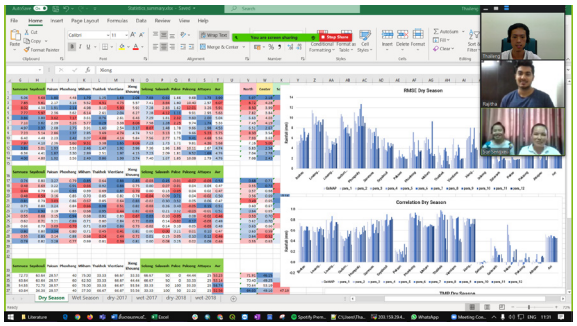
UN environment programme

From the People of Japan

ASIAN INSTITUTE OF TECHNOLOGY 1959

GIC Asian Institute of Technology

Lao Climate Downscaling



The Geoinformatics Center (GIC) is currently assessing seasonal performance of a Weather Research and Forecasting (WRF) model for Lao PDR in order to prepare the country 's approach to agriculture for future climate change scenarios.

The WRF model incorporates a number of varied datasets in order to make climate predictions for future scenarios. The Global Data Assimilation System – Final data (GDAS FNL) features daily climate data for a wealth of climate data types, for example, dew point temperature, heat flux, and precipitation amount, among others. Input from ERA-interim data on the other hand provides access to forty years of historic climate data as a global atmospheric reanalysis. Additionally, an ensemble of physics input options are included in the model.

Ongoing WRF Model tests are data intensive, requiring realitively long runs to completion. It can take three or more days to perform a model test based on 12 member ensembles which create 48 simulations for 30 day forecasts.

GIC is collaborating with the Lao PDR Department of Agricultural Land Management - Ministry of Agriculture and Forestry (DALaM) and Department of Meteorology and Hydrology (DMH) to explore future climate scenarios with a focus on how agriculture is affected. During COVID-19 quarantine GIC, DALaM, and DMH engaged in numerous video calls to coordinate WRF model activities. Combining expertise from the three entities has been essential as this is the first ever study of its kind to be carried out in Lao PDR. Once fine-tuned, the climate model could be applied to other countries in the region as well.

This project is managed by FAO Laos under the 'Strengthening Agro-Climatic Monitoring and Information Systems' (SAMIS) project. For more information on the SAMIS project please visit: http://www.fao.org/in-action/samis/en/

VTOL UAV Development

GIC has completed the first field demonstration of its custom vertical take-off and landing fixed wing unmanned aerial vehicle (VTOL UAV) on July 3, 2020 at Mini RC Airfield in Klong Samwa, Bangkok, Thailand.

The demonstration served as an opportunity to showcase the VTOL UAV's new telemetry system. Telemetry is handled by an innovative 4G setup that creates an improved connection between the UAV and base station for monitoring during missions. Previously, a radio connection was used which quickly degraded beyond short distances.

The most challenging aspects of the build were achieving proper motor alignment and tuning for optimum multi-rotor performance. In its current state, the VTOL UAV has an endurance of 36 minutes with 15% battery remaining.

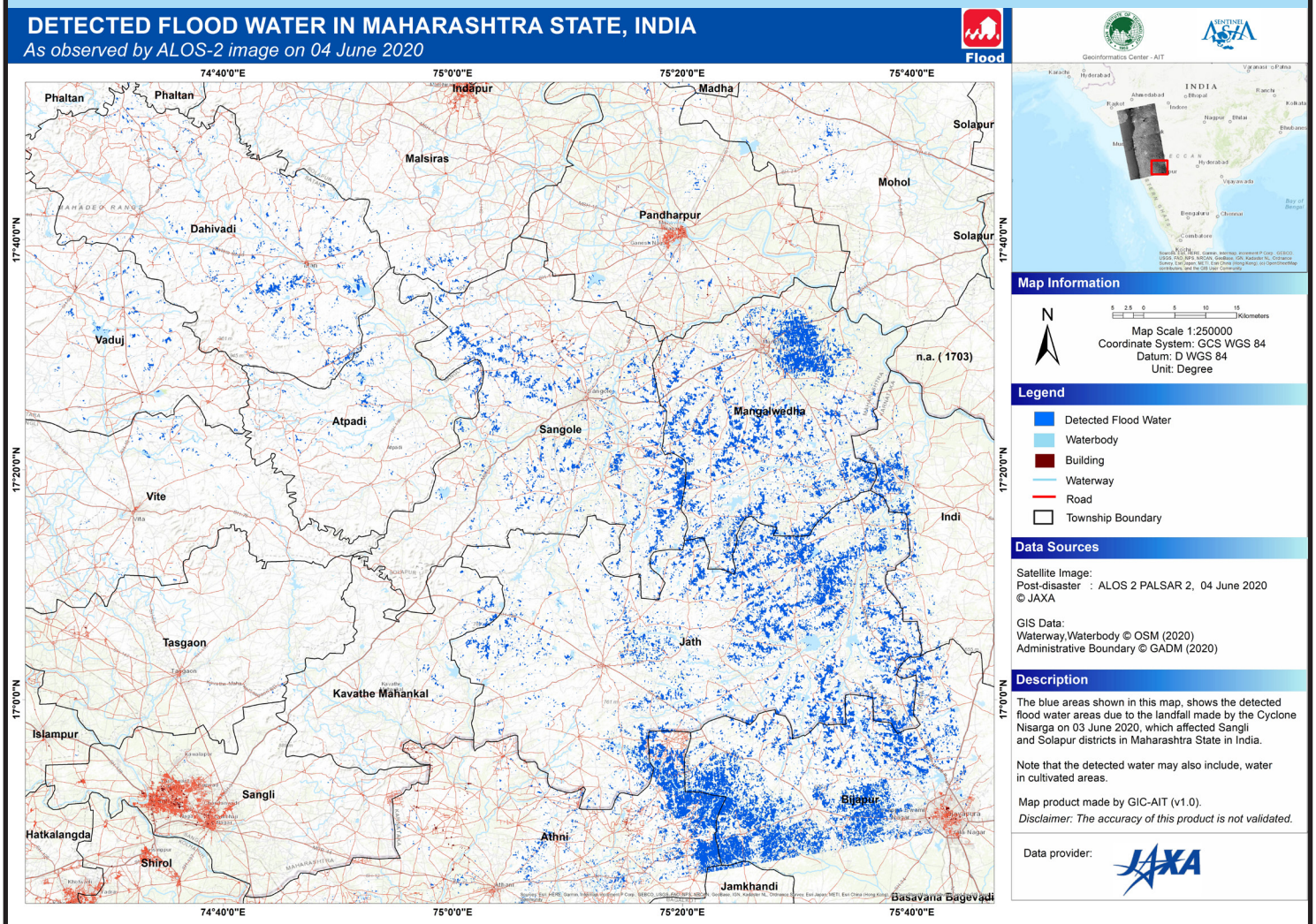
The VTOL UAV was built and configured at GIC with parts sourced online for a significant savings over commercial options. Initial planning and parts acquisition for GIC's VTOL UAV started in May 2019. However, the majority of assembly and tuning took place from May –June 2020 during the COVID-19 quarantine.

The vision of the VTOL fixed wing configuration is to remove the limitations of fixed wing UAV by appending multiple rotors. LiPO battery powered fixed wing UAV missions can last 45 -90 minutes, considered "long endurance". However, their design leads them to perform belly landings which cause stress to the fixed wing body; they also require large open spaces for take-off and landing. Multi-rotor UAV on the other hand sacrifice endurance for improved stability and vertical take-off and landing, opening options for launching/ landing in more restrictive spaces. Fixed wing UAV equipped with a multi-rotor setup use the multi-rotors to launch and land, then transition to single engine fixed wing operation once airborne.

Camera system configuration is currently underway. Once complete, the VTOL UAV will perform its first mapping mission later in July 2020.

VTOL demo at Mini RC Airfield, Bangkok, Thailand

Featured Sentinel Asia Value Added Product: India Flood - June 2020



The above image is a valued added product (VAP) created by GIC depicting flooding in India's Maharashtra State in early June 2020. Flood waters appear dark blue in the map as opposed to the light blue perennial water bodies. The flooding is result of Cyclone Nisarga, which made landfall 94km south of Mumbai on June 03, 2020. Both coastal and inland areas in Maharashtra State were affected. 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. Maps like the one above are disseminated to national governments and line agencies during disasters to improve response activities. Since the 2020 COVID-19 lockdown began GIC has produced 14 VAPs for 4 disasters in the region.

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