Identification of mosquito breeding grounds

Orthomosaic of José Domingo Espinar, San Miguelito district

Area divided into zones with possible mosquito breeding points (yellow dots)

OVERVIEW	
Flying Labs	Panama Flying Labs
Geographic area	Jose Domingo Espinar, San Miguelito District, Panama.
Date	December 2018 - January 2019
Sector program	HealthRobotics

SCOPE	
Stakeholders (clients)	Ministry of Health (MINSA)
Challenge	Currently in Panama City, there is no adequate care or control of mosquito breeding sites, which implies an increase in diseases such as dengue. Keeping track of places where these mosquito breeding sites get developed is complicated and in some cases poses a risk for those responsible for carrying out the work. These people are often required to access building roofs or other hard to reach places.
Scope	This initiative will allow capturing the first sample data to locate possible mosquito breeding sites, by capturing drone images, thus reducing the time needed to identify the breeding sites. This process will allow a faster elimination of those sites. It would also reduce the risk of disease from these mosquitoes and the risk related to carrying out the tasks by those involved in identifying breeding sites.
Outcome	Phase 1: Identification of areas where potential mosquito breeding sites could exist. Phase 2: Distribution of flyers to inform the community about the planned drone flights for that day.

	Phase 3: Acquisition of images using a drone. Phase 4: Processing and analysis of the data captured. The use of a drone to perform this task was very beneficial since it allowed for the identification of mosquito breeding sites in less time compared to how it was done before, providing information faster, more accurately and from an aerial point of view. Through the analysis with QGIS, it was possible to get a map of the possible mosquito breeding sites.
Next steps	Further promotion of this kind identification and monitoring of mosquito breeding sites throughout the territory of Panama. Developing a training programme to teach management personnel on how to use drones to capture images and process the data using different software. As a result, increase the safety of the people in charge of identifying the mosquito breeding sites by eliminating the need to access or climb risky areas, like building roofs.

DATA ACQUISITION	
Size of area	29.93 ha (0.299 km2)
Drone	DJI Phantom 4 Pro V2
Sensor(s)	RGB camera
Flight plan software	Pix4Dcapture
Flight height	121 m above ground level
GSD (Accuracy)	2.69cm/pix
Number of images acquired	489
Number of flights	3
Time invested in data acquisition	45 min 57 sec
Georeferencing	Onboard GPS

DATA PROCESSING & ANALYSIS	
Processing software	Pix4Dmapper
Processing time	3hrs 4min
Data products	Orthomosaic, DTM
Analysis tools	QGIS
Analysis outputs	Orthomosaic and map of identified areas of possible mosquito breeding
Final outputs shared with stakeholders	Orthomosaic, DTMs and map of identified areas of possible mosquito breeding
Data sharing	Hard drive