

## Re-location of the Gardi Subdug community due to sea level rise



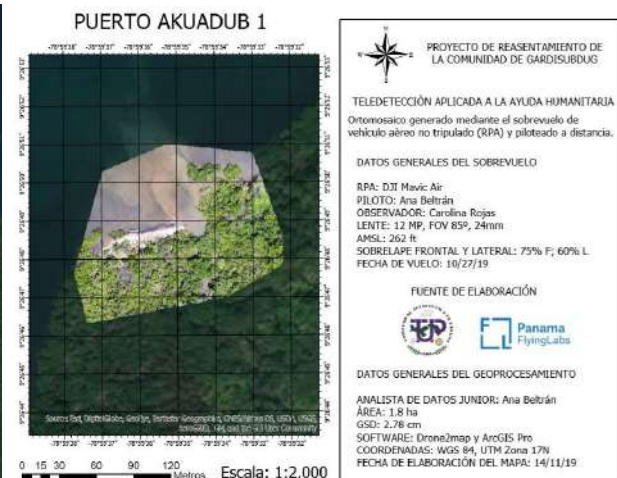
*Orthomosaic of a school*



*Orthomosaic of Gardi Subdug Island*



*Identified flight areas*



*The deliverable from Akuadub Port 1 created with the help of ArcGIS Pro*

OVERVIEW	
<b>Flying Labs</b>	Panama Flying Labs
<b>Geographic area</b>	San Blas (Panamá)
<b>Date</b>	October - December 2019
<b>Sector program</b>	DevRobotics

SCOPE	
<b>Stakeholders (clients)</b>	Gardi Sugdub Committee, funded by the Inter-American Development Bank
<b>Challenge</b>	The community of Gardi Sugdub is located on an island off the Caribbean coast of Panama. Due to climate changes and rising sea levels, the island is sinking. In addition, there has been a considerable increase in the population within the island. That is why an agreement to relocate the population to the mainland was established. In order to do this, it is necessary to know the possible areas, where such relocation could be carried out. A significant number of areas to consider, relatively distant from each other and often with difficult access, poses another challenge, requiring more time and resources.
<b>Scope</b>	Developing a plan for the relocation of the community was the main objective of the project. Its scope included identification of the areas that would be inhabited on the mainland, as well as other areas that would be used (for example location of a new school or the ports). To do this, drones were used to capture aerial images. Further processing and analysis of the data, including the generation of orthomosaics, are intended to support the decision-making process.
<b>Outcome</b>	<p>Phase 1: Recognition of the eight (8) areas to be flown over: Kantule Port, Plots, Gardi Subdug Island, School, Neighborhood, River mouth, Akuadub Port 1, Akuadub Port 2.</p> <p>Phase 2: Capture of drone images over each of the areas. To carry out this phase, the team had to travel to the areas of interest. These areas are mountainous and forested, so roads allowing the team to pass by car were not available all the way. For this reason, the team used a boat to reach many of the areas. Also, the fact that electricity was not available in all places and at all times, presented an additional difficulty - it limited the time in which the drone's batteries were recharged.</p> <p>Phase 3: Processing and analysis of the data captured. Once the image acquisition was completed, the data was processed using Pix4Dmapper software to generate orthomosaics of each of the areas.</p>
<b>Next steps</b>	One of the next steps will include workshops, during which different community stakeholders will be able to use the delivered orthomosaics to plan the re-location to the identified areas.

<b>DATA ACQUISITION</b>	
<b>Size of area</b>	159.84 ha (1.5984 km <sup>2</sup> )
<b>Drone</b>	DJI Mavic Air
<b>Sensor(s)</b>	RGB camera
<b>Flight plan software</b>	Pix4Dcapture
<b>Flight height</b>	65-90 m above ground level
<b>GSD (Accuracy)</b>	2.81 cm/pix
<b>Number of images acquired</b>	1849
<b>Number of flights</b>	22
<b>Time invested in data acquisition</b>	10 hr
<b>Georeferencing</b>	Onboard GPS

<b>DATA PROCESSING &amp; ANALYSIS</b>	
<b>Processing software</b>	Pix4Dmapper and Drone2map
<b>Processing time</b>	30 hr 17 min
<b>Data products</b>	Orthomosaic
<b>Analysis tools</b>	ArcGIS Pro
<b>Analysis outputs</b>	Orthomosaic
<b>Final outputs shared with stakeholders</b>	Orthomosaics created using ArcGIS Pro
<b>Data sharing</b>	Google Drive