



IMPLEMENTING
THE NEW
URBAN AGENDA
IN THE PACIFIC

pu f5

PRESENTATIONS SIDE EVENT 7

SIDE EVENT 7: UAV Mapping for Informal Settlements in Fiji

Host

Sponsors and Co-organizers



UN HABITAT
FOR A BETTER URBAN FUTURE



MONASH University



Commonwealth
Local Government
Forum

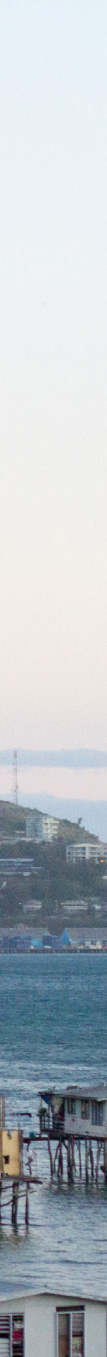


**UNITED NATIONS
ESCAP**
Economic and Social Commission for Asia and the Pacific



**PACIFIC ISLANDS
FORUM SECRETARIAT**

rise
REVITALISING INFORMAL
SETTLEMENTS AND
THEIR ENVIRONMENTS



SIDE EVENT 7:

UAV Mapping for Informal Settlements in Fiji

Day 3 (3 July, 2019. Nadi, Republic of Fiji).

Organized by: The University of the South Pacific & Pacific Flying Labs.



Speakers:

- Ms. Aleen Elisha Prasad - Research Assistant, University of the South Pacific
- Ms. Amrita Lal - Coordinator for Pacific Flying Labs, University of the South Pacific


With the increased popularity of unmanned aerial vehicles (UAV) in the GIS & Remote sensing industry, their importance and hence demand for this technology is growing rapidly. UAV's has proven their potential to be a valuable tool in GIS through producing on demand, real time data and imagery which enables us to map current situations. At the University of the South Pacific, through Pacific Flying Labs, we are implementing state of the art technology to conduct mapping of informal settlements with the use of UAV's & high precision RTK system. Our aim is to contribute to the growing baseline data through mapping and modelling coastal Fijian villages and informal settlements around Fiji.

UAV MAPPING FOR INFORMAL SETTLEMENTS IN FIJI

Ms. Aleen Elisha Prasad - Research Assistant, University of the South Pacific











School of Geography, Earth Science & Environment



UAV Mapping for Informal Settlements in Fiji

Fifth Pacific Urban Forum

Outreach underpinned by Scientific Research

	<h1>HELLO!</h1>			
Dr. Nick Rollings Associate Professor			Dr. Nathan Wales Lecturer	
				
Semisi Ketenilagi	Amrita Lal	Kolora Qaviti	Waisale Rakusanavanua	Aleen Prasad

Geospatial Science Research

Technology and Tradition

Using technology where it makes a difference
South Pacific Flying Labs



Outreach based on scientific research.

Collaboration

- Ministry of Lands & Mineral resources
- Ministry of women, Children & Poverty Alleviation
- GIZ REDD+
- Red cross
- UN Habitat



Undergraduate, Postgraduates & Academic Staff

a powerful partnership for empowering youth and community awareness of longer term environmental change



Research is built in our academic programmes at USP

Capacity Building for undergraduates



Outreach underpinned by Scientific Research

UAV/ Drone Application

UAV Application

- Agriculture farming/ precision agriculture
- Environmental Management
- GIS and Remote sensing
- **UAV Mapping to support planning**
- 3D modeling
- Emergency response services & disaster recovery
- Architecture and Engineering

Benefits

- Economical – up to 90% compared to traditional methods
- Easy to Fly - Ready to go system with automated flight planning (Network not required)
- Accuracy – High accurate products
- High resolution aerial imagery
- Multiple data points in one short flight
- Operational in hazardous & hard to reach areas

Limitations

- Flight time – different platforms
- Data storage
- Launch methods
- Safety
- Privacy

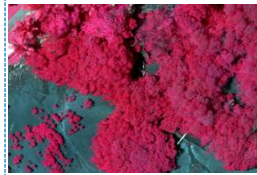
Outreach underpinned by Scientific Research

UAV Library



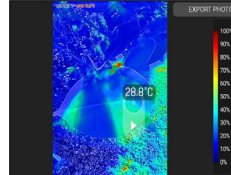
RGB photogrammetry

- Mavic Pro
- Phantom 4
- Inspire 2
- SenseFly eBee



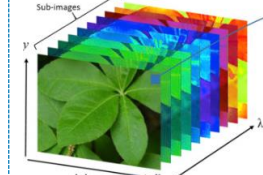
Multi Spectral Sensor

- Parrot Sequoia+
- links spectral library to imagery



Thermal Sensor

- Parrot Bebop-Pro Thermal



Hyperspectral

- AeroTestra
- Bay spec

Outreach underpinned by Scientific Research

Drone Laws in Fiji

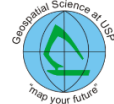
- Drones may not be operated within 3 kilometers (2 miles) of a domestic airport or 5 kilometers (3 miles) of an international airport or airfield.
- Do not fly drone more than 200 feet vertically.
- Do not fly drones in a manner that may impair the safe operations of aircrafts.
- Visual contact with drone must be maintained at all times.
- Do not fly over airstrips, helipads, fuel depots, private homes, moving vehicles, populous areas, or sporting events.
- Do not fly drones over sensitive areas such as hospitals, prisons, government institutions, the House of Parliament, police stations or military barracks and institutions.
- Do not operate drones at resorts without prior permission from the resort's management

Team of CASA Certified UAV Pilots

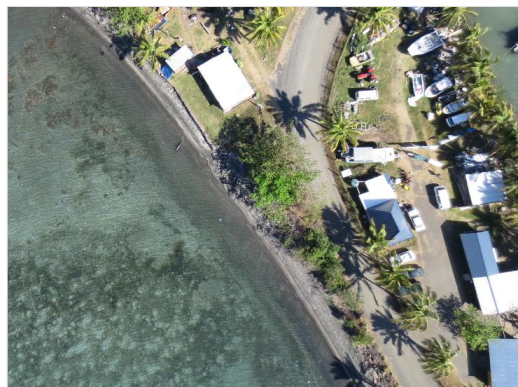
- Dr. Nicholas Rollings
- Semisi Ketenilagi
- Amrita Lal
- Tarish Obed
- Waisale Rakusanavanua
- Aleen Prasad

Outreach underpinned by Scientific Research

Village/Settlement Profiling

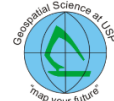


Photo/Image



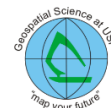
Outreach underpinned by Scientific Research

UAV/ Drone Mapping Results



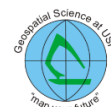
Outreach underpinned by Scientific Research

UAV/ Drone Mapping Results



Outreach underpinned by Scientific Research

Village/Settlement Profiling

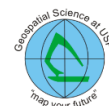


<https://cloud.pix4d.com/pro/project/276860/map?shareToken=eabc8064-d8c2-4f4f-9c4f-d7cb7304306b>

Outreach underpinned by Scientific Research

Village Profiling - Naboutini Village

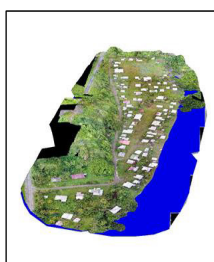
Naboutini Village



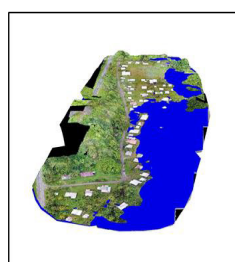
0.5 m



1 m



2m



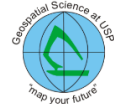
3m

Outreach underpinned by Scientific Research

Village Profiling - Naboutini Village



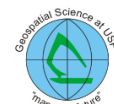
+



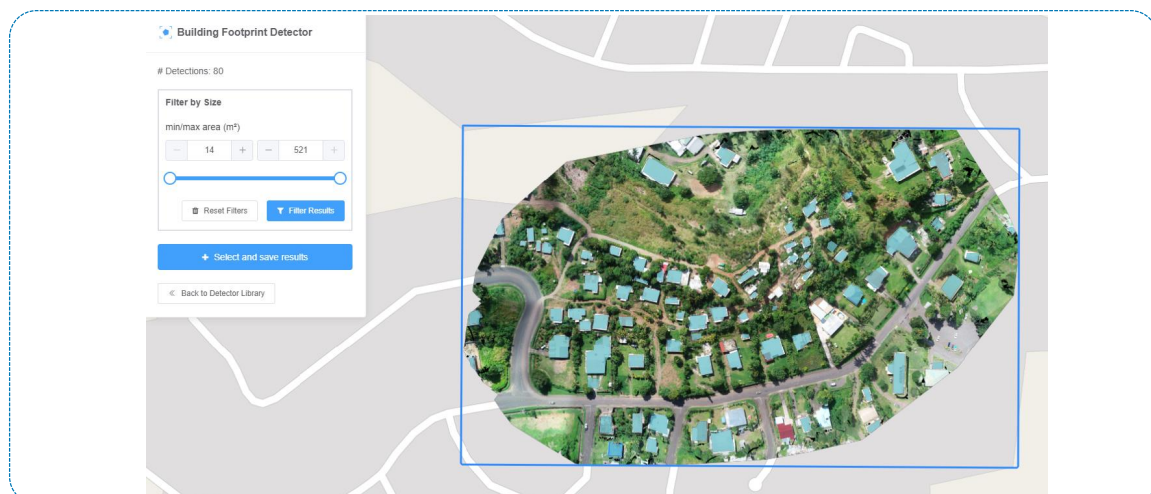
AI Object Detection on drone images



Outreach underpinned by Scientific Research

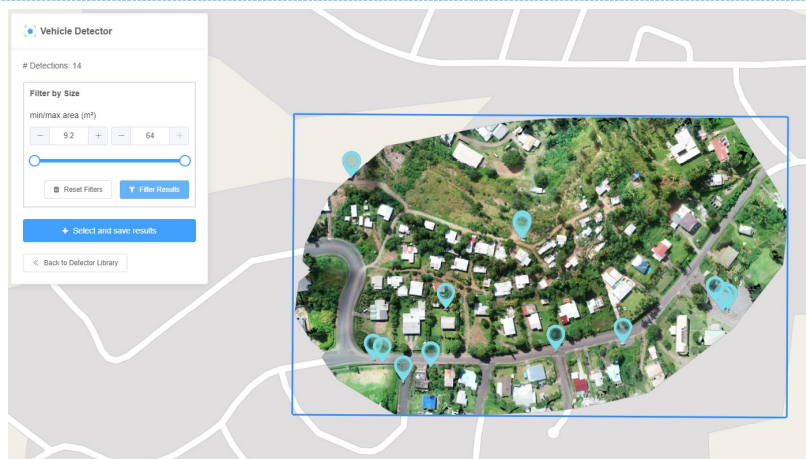


Building Footprint Detector



Outreach underpinned by Scientific Research

Vehicle Detector



Outreach underpinned by Scientific Research

Hangar 360

<https://viewer.hangar.com/360?assetId=gjvomVXr>

Outreach underpinned by Scientific Research



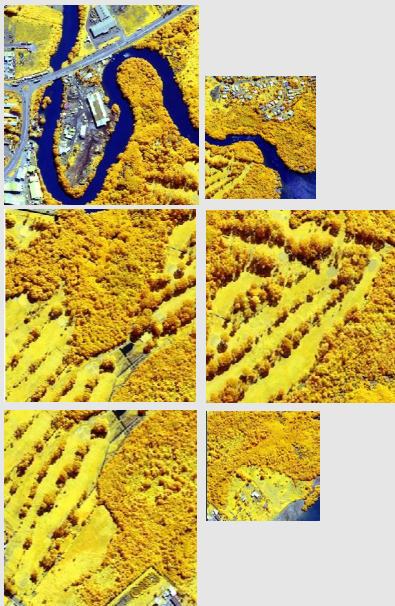
Collaborative Projects



- **GIZ REDD+**
Forest Degradation Mapping
- **The University of New Caledonia**
Social spatial dynamics of informal settlements in the Pacific Island Countries.
- **The Ministry of Women, Children and Poverty Alleviation**
 - Village Profiling for Serua
 - Highland & Coastal area.



Outreach underpinned by Scientific Research



Thank You



+ (679) 3232620



rollings_n@usp.ac.fj



The University of the South Pacific
Laucala Campus
Private Mail Bag
Suva, Fiji.



www.usp.ac.fj/geo
www.geospatialscience.org





@PUF2019



Pacific Urban Platform



pacific_urban_forum



<http://www.fukuoka.unhabitat.org/info/news/puf.html>

