

# Pacific Earth Observation Coordination Meeting



25<sup>th</sup> June, 2019

Tanoa Plaza, Suva

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## Introduction

The first Pacific Earth Observation (EO) Coordination Meeting took place on the 25<sup>th</sup> of June 2019 at the Tanoa Plaza Hotel in Suva, Fiji. Key international and regional partners and stakeholders were brought together to discuss current EO initiatives in the Pacific, challenges and opportunities to improve coordination and collaboration in support of Pacific island countries and territories. This included an overview of the current space, identification of overlaps to reduce redundancy and gaps to maximise benefits of current and future EO tools and services. 35 participants<sup>1</sup> from 16 organisations were represented at the one-day meeting.

The key points that emerged from the meeting discussions were:

- The meeting helped to further the initial conversations held in Brisbane<sup>2</sup>
- There was agreement that there are an increasing number of EO actors and initiatives engaged in the Pacific
- Information sharing and communication between partners are critical moving forward
- SPC would provide a summary of the meeting report along with a calendar of events to facilitate future conversations and collaborations
- GEO week provides a great opportunity to include Pacific Island voices at a high level to highlight needs and directions for EO support in the future
- Share a contact list of meeting participants to encourage contact and communication

### 1. EO Coordination Welcome, Introductions and Expectations

A welcome and overview was given to participants and partners to the meeting by Allan Illingworth from SPC. The introductory session facilitated a discussion on expectations and keywords from the meeting to guide the day's plenary discussions and meeting outcomes (Figure 1).



Figure 1 : Keywords captured during introductory session

<sup>1</sup> See Annex 2 for Participant List

<sup>2</sup> CSIRO Earth Observation Platform for the Pacific Meeting- Brisbane October 2018

There was a large emphasis for sustainable projects, capacity building (to maximize data and current opportunities) as well building relationships that could be strengthened through a collaborative Pacific EO group.

## 2. Mapping the EO Space

### Summary

This session presented survey summary results received prior to the meeting. In total, 10 organisation responses were received, with majority of these organisations having Pacific projects in the EO space across a range of thematic areas<sup>3</sup>.

There is a high utilisation of medium resolution sensors such as Landsat, Sentinel – for nation-wide assessments/classifications that require atleast 30m pixel resolutions, as well as very high-resolution sensors such as Digital Globe (now MAXAR) imageries (Figure 2). There is multi-sensor utilisation across numerous projects due to physical site factors eg. Terrain and size, as well as utilisation purpose (project deliverables). Most products derived from these sensors and associated licensing modality and ease of access impacts overall post project sustainability measures.

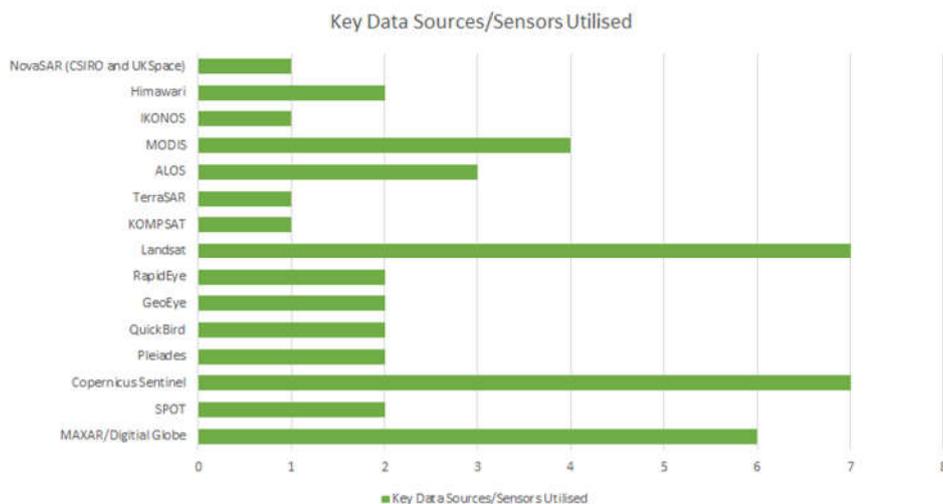


Figure 2: Key data sources and sensors utilised - via EO survey

### Discussions and Group Breakout

Following the summary presentation, a discussion session around the opportunities and challenges on the core service types was held in four separate groups. A detailed summary is annexed<sup>4</sup>.

The following key points emerged from the plenary discussions:

- i. Capacity Building
  - Provision of trainings that are tailored to meet identified needs and capacity development, conducted locally, using local available data
  - Involvement of policy makers to identify value in capacity building for technical staff
  - Turn focus away from process based trainings to core principles and target theoretical knowledge that can be applied to a range of tools/application software

<sup>3</sup> Survey results summary presentation will be made available

<sup>4</sup> Discussion points for the discussed service types can be found in Annex 1

- ii. Data Processing (Data, information and processing systems)
  - Capturing and processing of datasets conducted by organisations under legislature to have authoritative datasets especially in government sector (to reduce data redundancy, maximise available resources to improve data value)
  - Engagement of relevant experts (local knowledge, infrastructure/engineer awareness, spatial capabilities) in the processing and capturing of relevant data (to encourage re-usability of data, reduce redundancy of datasets)
  - Address issues through a regional hub (sharing surveyed ground controls, etc) to improve data quality and processing
- iii. Data Acquisition (Observation Systems)
  - Recommended utilisation of long-range UAV's for outer island imagery acquisition, over very high-medium resolution satellite sensors – identification of need to explore open source solutions to process UAV data (Open Drone Map, etc.)
  - Cloud computing opportunity to acquire, store and process relevant data, however internet accessibility must be considered for smaller atoll islands
  - Identification of imagery sources available, platforms and possible applications and data examples – information hub for Pacific region
- iv. Crowd-Sourced Data
  - Opportunity to increase awareness in regards to the service type
  - Potential to develop platforms/applications to capture and disseminate crowd-sourced data for various thematic applications – eg. Building damage verification, infrastructure asset recording
  - Opportunities for crowd-funding/crowd-sourcing approaches to finance development of the area

### 3. The way forward – next steps and future events/opportunities

An open discussion was facilitated to discuss and share opportunities, events as well as relevant experiences for the direction and growth of EO in the Pacific. Find below key ideal steps, events and opportunities discussed:

#### Platforms for Data Access and Standards (Regional Data Hub and Open Data Cube)

- Opportunity to expand/focus existing regional data hubs – Geoscience Australia, CSIRO, SPC
- Inclusion of technical information for regional members (available satellite imagery, assistance and opportunities available, etc)
- Consider adopting open standards for interoperability of existing and planned development of open data cubes

#### Pacific EO Working Group

- Leverage on available pacific platforms to raise awareness and share knowledge as a Pacific focused EO Group:
  - Fiji Geospatial and Information Management Council
  - Pacific GIS and Remote Sensing Council including Annual Conference
  - Pacific Geospatial and Surveyors Council Meeting 2019
  - STAR Conference
  - FOSS4G Oceania 2019
  - Existing GIS-PacNet mailing list

- Expand existing geospatial working groups to include wider participation from universities, regional countries and governmental ministries
- Increase in utilisation of social networking to gain exposure of EO in the Pacific eg. Twitter, FB, etc

### GEO Week 2019

- Opportunity to engage with likeminded professionals across the regional to promote ideals and developments that require high-level agreements and decision making

### Opportunities and Best Practices

- Identify platform to best share best practices and standards adopted in the Pacific for implementation
- Data quality assurances – should be linked to map validation esp. in Disaster Management
- Data ownership and licensing issues discussed for strengthening data dissemination
- Improving knowledge on crowd-sourcing data, and associated value. Events for crowd-sourced data can be run through existing mechanisms eg. Side events at conferences, etc
- Involvement crowd-sourced data collected through community based projects. Funding opportunities for crowd-funded activities

### Regional Training, Workshops and Conference Event Calendars

- Document and capture thematics of various trainings delivered and planned to help identify synergies and combine trainings with partner organisations
- USP Remote Sensing Summer School on Ocean Colour, has been identified as a regular annual workshop that can build capacity in the thematic area of Ocean Colour and Remote Sensing

## 4. EO Technical Discussions

The afternoon sessions consisted of technical discussions surrounding opportunities and challenges in various thematic areas. These sessions covered brief presentations (highlighted below) and open plenary discussions on current projects and services available in the Pacific EO space provided by the representative organisations.

### Presentation – GEO Week 2019 by Emma Luke – Geoscience Australia

GEO Week 2019 (Group on Earth Observation) Ministerial Summit, will be held from the 4-9<sup>th</sup> of November, 2019. As presented a range of member governments, non-profit, commercial and research organisations are expected to meeting in Canberra Australia. A number of side events of which cater to the expected diverse group of attendees, including technical experts, scientists and contributors to the industry, were presented as being largely beneficial for Pacific involvement and engagement. The week's events is expected to focus on the delivery of GEO's Strategic Plan for emphasising the importance of data as a fundamental input for daily operations and overall strategic economic decision-making.

Weblink: <https://www.earthobservations.org/geoweeek19.php?t=home>

### Presentation – Open Data Cube Hack at Catapult by Leith Alex – Geoscience Australia

The presentation elaborated on the work conducted by Geoscience Australia on ‘*Water Observation from space (Pre- hack hack)*’, with the use of Sentinel 1 data. The team ran a few derivative products through Landsat data to identify waterbodies and non-waterbodies. The activity utilised Open Geospatial Consortium (OGC) web services.

The work included Fractional Cover i.e analysis that identifies the percentage of a pixel that is covered by a certain land type i.e Green, Non-Green (NG) and Bare. This was done through Sentinel 1, a radar sensor convenient for regions like Fiji which is usually cloudy.

### Presentation – Geospatial QHUBS by Remi Andreoli - BlueCHAM

A QHUB is an innovative device for convergence, enhancement and operating of geospatial knowledge relating to a territory. It benefits governments, communities, research organizations, companies and industry in responding in a concerted manner to socio environmental issues. The user has the freedom to choose and operate the services he needs online. It is constantly evolving in relation to its ecosystem: observation satellites, apps, data, analysis algorithms, crowdsourcing, interoperability protocols, artificial intelligence processes or participatory exchanges.

QHUBS uses interoperability to connect people, facilities and resources. It provides up to date data, to process algorithm which in turn minimises costs. The application was used in:

- New Caledonia – QHUB connected the first look web service directly to the hub and captured a daily acquisition of satellite imagery at very high resolution. The information was provided to the French Defence and the Maritime Surveillance of New Caledonia within 30mins of the satellite acquisition. This was done to identify the risks of reef pollution at the North side of the island.
- Vanuatu TC Pam during disaster response. QHUB provided very high-resolution data analytics directly as web services. This information was used by rescuers and field staff.

Weblink: <http://www.bluecham.net/?lang=en>

### Presentation - Common Sensing Overall Project Update by Jennifer Draper – Satellite Applications Catapult

The overall aim of Common Sensing is to improve national resilience towards climate change, including disaster risk reduction and food production, and contribute to sustainable development in Fiji, Solomon Islands and Vanuatu, through the support of derived remote-sensed information.

By developing satellite-based information services to address the challenges and needs for each country, the project envisages to strengthen each country’s capacity to improve their national climate resilience and disaster risk management.

Common Sensing has four thematic focus areas i) Climate Information (ii) Food Security (iii) Disaster Risk and (iv) Climate Finance.

The presentation highlighted priority needs to be addressed in designing capacity development activities i.e

- Engage with decision makers through awareness-raising events on the benefits of earth-observation and geospatial information technologies for climate change resilience.

- Develop skill sets among decision makers and sectoral experts on translating technical information to meaningful data for informed decision making
- Design tailored capacity development programmes that fit each partner country's context.
- Engage academia and existing user groups to ensure knowledge sustainability
- Provide technical support to identified key stakeholders by placing Technical Advisors in each country
- Create synergy with the existing regional/national projects and initiatives.

Weblink: <http://commonsensing.org.gridhosted.co.uk/>

### Open Discussion: Existing Regional Government Projects – Opportunities and Challenges

An update on existing projects initiatives were provided by representatives from Vanuatu and Tuvalu.

#### **Vanuatu:** Van KIRAP Project

There is a lack of available oceanic data, in comparison to climate data in Vanuatu due to focus of thematic areas. In order to strengthen ocean monitoring activities, 5 key sectors are involved including Fisheries, Infrastructure, Water, Agriculture and Climate Change. Key project activities include:

- Developing ocean science services for stakeholders where key sectors would be able to use climate information services as a tool for decision making at the sectoral level
- Strengthening ocean network in Vanuatu through the new Ocean Affairs Office which was recently established under the Ministry of Foreign Affairs
- Marine Spatial Planning awareness i.e 200 nautical miles from the coast to the reef. This is also part of the community's marine governance activity

#### **Tuvalu:** Maximising existing acquired remotely sensed data

Expecting to collect baseline datasets from LiDAR imagery acquisition for 2019. The need to maximise the data that has been acquired (including the LiDAR imagery) was raised, particularly with the potential to utilise open source software as a solution to ensure sustainability as opposed to commercial options eg. Open Drone Map as opposed to Pix4D

## Annex

### ANNEX 1: Mapping the EO Space - Group Discussions on Flip Charts

#### Capacity Building and Training

Issues around capacity building and training – Pacific Islands is at the end user

- Target groups for specific trainings
- Getting policy makers on board
- Trainings for problem solving (fit-for-purpose training). Follow-up on hands on trainings
- Transfer of knowledge/outcomes of trainings

#### Opportunities

- Availability and access to certified trainings – The increase in internet bandwidth has enabled access to cloud based basic GIS training which are easier and simple to follow. The University of the South Pacific has also recently introduced a new Degree programme
- Design Training that is suitable for the Pacific/Asia etc.
  - Discussions also highlighted the existing Geographic Information Systems Professional (Asia-Pacific) (GISP-AP) Certification which professionals can apply for
- University in Netherlands that provide advanced GIS training.
- Conduct train the trainer's workshops
- Secondments and internships to Australia and/or New Zealand
- Having Diplomatic influence and opportunities and involving high level decision makers
- The development of policies that enables people to be trained
- The availability of open source software and open data
- Use existing platforms and regional strategies such as the PGSC Strategy
- Shifting from end user to data production
- Data is now easily interpreted compared to 20yrs ago

#### Challenges

- Brain drain – high turnover and loss of highly skilled technical staff
- There is a lack of national policies and frameworks and it is difficult to get policy decision makers on board
- Funding issues for trainings
- Lack of accredited trainings
- Institutions need support to retain data processing capacities. There is a high turnover of technical staff due to issues around money, job satisfaction and work conditions.
- Different organisations have different priorities
- Software licensing (commercial vs open source solutions)
- Lack of knowledge and awareness about open data and open source software
- There is more focus on process-based learning instead of core principles
- Sustainable access to and sharing of tools and data
- Software & systems complexity
- Internet speed and access is not the same for all countries
- The need for succession/sustainable planning

## Data/Image Processing (Data, Information and Processing Systems)

### Opportunities

- Data and sharing of raw data can be processed and re-used through an information hub.
- Potential for national, regional and global collaboration
- Availability of services such as the Online GPS Processing Service (AUSPOS) – a free online GPS data processing facility provided by Geoscience Australia
- Availability of products for weekly solutions and data modelling tools
- The COSPPAC Project provides real time data
- Transfer of knowledge at all levels (hardware, software, GNSS, image processing, QGIS)
- Cloud computing is an opportunity depending on access
- Having an open source agenda is an opportunity to be open to new solutions from other regions

### Challenges

- Data quality – data received from various sources are not always of high quality.
- Access to complete data sets and data sharing requires authoritative approval e.g Fiji
- Lack of or having no capacity and infrastructure to process and use data i.e people, hardware, software
- Financial constrains
- Data interoperability and compatibility
- Cost, license and sustainability of hardware and software
- Slow internet for data processing
- Data statistics and analysis and validation a challenge

## Data Acquisition (Observation Systems)

The following were listed as both an opportunity and a challenge:

- Rectifying aerial data needed, go back in time to see environmental changes
- Some data/observation are only suitable for volcanic islands compared to low islands.
- Scanning and archiving of data
- Data awareness in-country

### Opportunities

- Establishing a data repository
- UAV captures data for coastal and marine
- UN Charter Data Acquisition provides post-disaster images sourced by space agencies. The data is processed and provided to countries free of charge
- Increased interest in collaboration between agencies for data
- Remote sensing platforms are more accessible
- Data discovery made more easier
- The need for policies to enable the work to get done
- A number of donors require open data licensing for output datasets
- Demonstration project with World Bank – optimised use of drone for disasters, to have long range UAV for access to all outer islands

### Challenges

- Minimal sharing of local data (issues with licensing, long procedure)
- No MOA in place for sharing of data

- Duplication of data, work and spending
- Access to commercial data is a challenge (financing, and maximisation of datasets)
- Data back-up and data management (Inconsistent sources of data and meta-data)
- Data interoperability
- Vendor locking
- Local topography and climate causes issues around processing of the data (cloud cover, high reflectance)
- Islands are too small for Landsat – for base mapping and for multi-temporal mapping  
Government to invest in accessing some of that data.
- Application and accessibility of in-situ data
- How countries access data that has been captured during and after disasters, by various agencies – is it available? Accessible? Is it free?
- Maintaining the connectivity in country to provide data after big disasters.

## Crowd-Sourcing Data

### Opportunity

- Information and data dissemination platforms
- Utilising open crowd-sourcing data platforms such as open street map, open drone map (high-res photogrammetry), Tomnod (for disaster recovery only)
- Promote Innovation
- Potential to get the involvement and engagement of communities
- Having organisations such as the boy scouts and girl guides to gather information
- Map validation
- Hybrid approach – simple application
- Education
- Pacific flying labs, and associated initiatives

### Challenges

- Privacy of data
- Less understood (lack of awareness, issue with maintaining enthusiasm)
- Spatial challenges – small islands, big oceans
- Least utilised service type of application due to low awareness in the Pacific – Privacy concern, data ownership, data quality assurance
- Data ownership of government agencies
- Political agendas
- No one size fits all solution
- Data quality assurance i.e map validation can be a challenge
- Perceived need for authoritative data over crowd sourced (Data collection methodologies and reliability)
- Project sustainability
- Communicating opportunity
- Coordination of data
- Lack of foundational data like addressing
- Government support

## ANNEX 2: Key Sli.do Comments

### What is the most important point(s) you are going to take back to your team/organisation/government from this meeting?

- Don't forget to go to FOSS4G.
- Sustainable use of GIS specialist in relevant sectors.
- There is an ocean of data and information out there - we just need to find a way to coordinate and make this available and visible.
- Visit Fiji, it's very beautiful!
- Name and purpose of organisations in the area RS + GIS.
- Data sharing is still key.
- Collaboration and local engagement.
- More work needed to get a common EO framework designed and established.
- It was an interactive, open and constructive meeting.
- Awareness of local work already ongoing and how newer solutions/projects could supplement and support them rather than replace them.
- Available opportunities.
- Collaboration is key
- Data accessibility
- Importance of standardisation of EO data and platforms.
- Opportunities around collaboration and partnership
- SPC is already using the Open Data Cube, so I will engage with them to support them in the ways that I can.
- Providing long-term solutions and enabling people to take their learnings home and apply them are two key lessons for me.
- Collaboration to address challenges.
- Synergies
- There is will; we just need to find synergies

### What suggestions do you have for a future meeting?

- Presentations of what each organization has to offer.
- This was great!!
- Focus on a few technical challenges at a time
- More govt agency representation.
- Two days would be ideal. It would give you an opportunity to play out a number of scenarios and better showcase technical and policy solutions.
- Training workshops?
- Showcasing of products\solutions being created.
- More time for preparation.
- Ongoing projects could present their projects in some detail for comment and input.
- Make recommendations at this meeting and meet at some point in the future to assess progress against those recommendations
- Separate side meetings.
- Stocktake of existing projects in the pipeline for collaboration.
- Side meeting.
- Cocktail
- Engage more government reps from the Pacific including Fiji
- Technical presentations
- More meetings

## ANNEX 3: Participants List

Name	Organisation	Email
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## ANNEX 4 : Calendar of Events 2019

MONTH	EVENT	DATE	LOCATION
JUNE	Workshop on the Applications of Global Navigation Satellite Systems <a href="http://www.unoosa.org/oosa/en/ourwork/psa/schedule/2019/2019-un-fiji-workshop-on-the-applications-of-gnss.html">http://www.unoosa.org/oosa/en/ourwork/psa/schedule/2019/2019-un-fiji-workshop-on-the-applications-of-gnss.html</a>	24-28 June	USP, Suva, Fiji
	Pacific Earth Observation Coordination Meeting	25 June	Suva, Fiji
JULY	IEEE Geoscience and Remote Sensing Society Symposium (IGARSS 2019) <a href="https://igarss2019.org/">https://igarss2019.org/</a>	July 28-2 August	Yokohama, Japan
AUGUST	9 <sup>th</sup> Session of the United Nations Committee of Experts on Global Geospatial Information Management <a href="http://ggim.un.org/">http://ggim.un.org/</a>	7-9 August	New York
SEPTEMBER	GeoInformation for Disaster Management (Gi4DM 2019) <a href="http://www.gi4dm2019.org/">http://www.gi4dm2019.org/</a>	3-9 September	Prague, Czech Republic
	5 <sup>th</sup> International Conference on GIS and Remote Sensing <a href="https://gis-remotesensing.environmentalconferences.org/">https://gis-remotesensing.environmentalconferences.org/</a>	16-17 September	Rome, Italy
OCTOBER	70 <sup>th</sup> International Astronautical Congress <a href="https://www.iac2019.org/">https://www.iac2019.org/</a>	21-25 October	Washington, D.C
NOVEMBER	GEO Week and Ministerial Summit <a href="https://www.earthobservations.org/geoweeek19.php">https://www.earthobservations.org/geoweeek19.php</a>	3-9 November	Canberra, Australia
	FOSS4G SotM Oceania 2019 <a href="https://www.osgeo.org/events/foss4g-sotm-oceania-2019/">https://www.osgeo.org/events/foss4g-sotm-oceania-2019/</a>	12-15 November	Wellington, New Zealand
	Science, Technology and Resources Network (STAR) Conference <a href="http://star.gsd.spc.int/">http://star.gsd.spc.int/</a>	18-22 November	Suva, Fiji
	Pacific GIS and Remote Sensing User Conference <a href="http://gisconference.gsd.spc.int/">http://gisconference.gsd.spc.int/</a>	25-28 November	Suva, Fiji
DECEMBER			