

Conference Summary: The Pacific Islands GIS and RS User Conference 2017, Suva

The 2017 Pacific Islands GIS and RS User Conference took place in Suva, Fiji from Monday, 27/11/ to Thursday, 30/11/ followed by workshops on Friday, 01/12/. This year's annual conference attracted approximately 160 attendances per day with the major group coming from the Pacific region, Australia and New Zealand. During the workshop a total of 66 talks were given subdivided in 4 sessions per day and 16 groups of interest (4 institutional, 20 data, 1 coastal, 4 disaster, 1 DTM, 4 forest, 4 environment, 1 geology, 4 utility, 9 maritime, 1 agriculture, 1 GNS, 1 software, 4 UAV, 1 student and 4 discussion).

The conference was opened by Hon. Faiyaz Koya the Minister for Industry, Trade and Tourism followed by the Philipp Müller Memorial Address presented by Andrew Jones of Director SPC GEM (Pacific Community, Division of Geoscience, Energy, and Maritime) and a conference overview given by Conference Wolf Forstreuter who was also the conference organiser.

Before the technical talks were presented, the institutional talks took place. The first talk was presented also by Wolf Forstreuter who gave the audience an update about *The Pacific GIS & Remote Sensing Council (PRSGC)*, followed by the presentation of M. Powers-Tora who focused on the *Pacific Surveyors and Geospatial Council (PSGC)*. While then P. Helmholtz with her talk about the *ISPRS - International Society for Photogrammetry and Remote Sensing: Serving society with information from images* build on Wolf's talk showing the already existing connections of ISPRS and PRSGC, C. Pearson build on M. Powers-Tora talking presenting about *The MOU between the New Zealand Institute of Surveyors and the PGSC*. Nevertheless, during the conference further associations and departments used the opportunity to provide updates to the audience. While on the first day V. Waqa talked about *Photogrammetry developments at the Fiji Lands Department*, D. Hutchinson talked about the *Spatial Industries Business Association (SIBA)* and their support for the Pacific Island Initiatives on the second day. The last speaker of the opening session was P. Kinne from Digital Globe talking about *New Constellations, New Capabilities, and Future Opportunities of satellite based imagery platforms*.

One of the topics within the technical papers which returned in a number of presentations was open data and data sharing. The first presentation related to this topic was given by S. Ackerly from GeoSciences Australia providing with a general overview what open data means followed by a number of presentations through the conference. While the talks presented by J. Korovulavula, J. Wainiqolo and L. De La Rua focused on local (Fiji related) topics such as the *Openmaptool for National Disaster Management Office [NDMO]*, and *Improving collection and access to high-quality statistical data*, the talk given by M. Kottermair was centred around the *Digital Atlas of Micronesia*. The talk presented by M. Isenburg took the audience to the other side of the world and used the case study of the Buchenwald concentration camp how open data can be used to uncover information which otherwise wouldn't have been found.

GIS developments and applications within government authorities were also discussed at the workshop. For instance, J. Sullivan talked about the latest QGIS Plugin developments, V. Folau about a climate and disaster risk mapping toolkit implemented in QGIS (an exercise for school students) and J. Kaitu'u about the customise GIS tool QBook Moodle. GIS applications were discussed regarding the use of GIS within the water authority of Fiji, the use of GIS within the Fiji elections office (presented by V. Viuyanuca), the GIS tool called GEE for Water Resource Management (by A. Singh) and the monitoring and spatial analysis the status of biodiversity among Fanga'uta Lagoon Catchments (by S. Pale).

Another big topic was related to costal mapping. In this context there were a number of talks focusing mainly on the different platforms suitable for maritime related mapping. These sensors included UAV platforms presented by M. Kottermair, high resolution satellite images presented by R. Andreoli, RADAR presented by H. Gautam and a combination of sensors as presented in the talk by T. Schroeter from CSIRO. In addition, T. Nagano talked about the Remote Sensing Technology Center of Japan (RESTEC) especially about Satellite Derived Bathymetry and derived products such as for flood modelling and hazard mapping as well as agricultural applications. T. Nagano especially emphasised that there is a high interest of RESTEC to work together with pacific nations. This talk was just one of many who focused on for Pacific Islands highly interested topic of risk predication, flood impact assessment and tsunami risk management. Other talks covering this topic as well were present by J. Giblin about the PARTner Project, the talk by L. Power about the PacSAGE project and the talk by M. LeDuff about *Integrated Tsunami Risk Management in Loyalty Islands (New Caledonia)*. Furthermore, there were a number of presentations related to the determination of costal boundaries e.g. the talks by M. Vakautawale, J. Sullivan, R. Andreoli and Fritz. Another costal important aspect – the monitoring of maritime incidents - was presented by R. Andreoli who uses remote sensing and point cloud to address the issue. Nevertheless, also environmental related maritime presentations were given such as by P. Gassner about managing marine biodiversity in Pacific Island countries, E. Anderson about the results of a long term study of the monitoring of estuarine circulation in the Rewa River (Fiji), the talk given by C. Dupouy about the use of satellite data to monitor the production of phytoplankton in the tropical Pacific islands – the focus of the COMETE project, the talk given by T. Koliyavu about *Characterizing Chlorophyll plumes in Fiji Waters from Ocean Color Remote Sensing (OCRS)*, G. Wattlez' talk about deriving biogeochemical parameters from MODIS data, and the talk given by C. Dupouy about the use of satellite data to monitor the production of phytoplankton in the tropical Pacific islands – the focus of the COMETE project.

On the other hand V. Tupua from the Fiji Forestry Department talked about *Forest Change Detection in Fiji* which focused on the deforestation between 2006 and 2016 using Landsat 7 and 8 as well as Sentinel 2 satellite images. While V. Turpua presented the results, L. Rokotuiwa Kaya used the opportunity to report about the accuracy assessment of this specific project, the talk by J. Magnifico was set more broadly and showed the digital transformation in agriculture. A further vegetation mapping related talk was presented by R. Kaku who focused on *GIS/RS multi-scale approach for the assessment of mangrove species composition and coverage* using WorldView 2 images

There were also a number of UAV related talks which included the introduction of different platforms by A. Lai in her talk about *WeRobotics Pacific Flying Lab* and by R. Russell in his talk about the long endurance, autonomous deep-stall landing Drone Technology. R. Russell reported in his second talk about the interesting application of using drone mapping of informal settlements in support of census. Finally, A. Prasad talked about the visualisation and assessment of coordinates and elevations precision derived from UAVs.

Nevertheless, not only the platform of UAVs but also the latest airborne and satellite platforms were covered at the conference. While M. Khin focused on airborne solutions, satellite systems were in the focus of the presentations given by A. Nicolae (about European Union's Copernicus Marine Service) and P. Kinne (about the opportunity of satellite borne radar, imagery and elevation borne information especially for the pacific area as well as about the next generation of DigitalGlobe's satellite platforms). In contrast, J. Messenet talked about adding value by combining all those above mentioned data paltforms.

Further topics varied from point cloud processing to GIS application and health related talks. For instance, two point clouds related presentation were given by M. Isenburg about *Integrating External Ground Points in Forests to Create DTMs from Dense-Matching Photogrammetry*, and about using *Point Clouds in Browser*. A talk about planning related utilisation of GIS tools, more specific *Integrating GIS tools for the Port Vila Urban Development (PVUDP)* was presented by W. Ganileo. Furthermore, K. Mathers from Hexagon talking about Smart M.App, GeoApp.UAS and other online data processing applications, and W. Eade from Allterra talked about Trimble TerraFlex and Trimble Catalyst Android Solutions. Last but not least the talk by P. Helmholtz about the use of Photogrammetry and Remote Sensing for the assessment of human burn wounds offered an interesting application of familiar topic applied to less familiar images. Finally, on the last day the local host (the University of South Pacific (USP)) used one of the talks to introduce their Geospatial Science Program. This talk was given by A.Prasad

Nevertheless, the participants were able to network not only during the four days of the conference but also during a number of social events at night time. The ice breaker cocktail party on Monday night took place at USP and was kindly sponsored by DigitalGlobe. On Tuesday night conference visitors could join the Yaqona Ceremony also at USP followed by the Pacific Islands Spatial Excellence Awards on Wednesday night. Congratulations to the winners of the excellence awards which are the Government of French Polynesia with their project about the Tahiti Urban Flash Floods Emergency Response (category People and Community), Bluecham ASA with their project about the high precision coastline mapping at global scale (Category: Innovation and commercialisation), and again Bluecham SAS with their project about satellite intelligence to serve maritime surveillance (category: Technical excellence). The conference closed was officially closed by R. Howorth followed by another cocktail party at SPC on Thursday night.

Since Its Inception in 1999 the Pacific Islands GIS Conference Committee has always composed of enthusiastic Voluntary Individuals. All visitors want to thank especially Wolf Forstreuter, Salote Viti,

Malakai V, Litia Gaunavou, Sachindra Singh, Amrit Raj, Leba Gaunavinaka, Keleni Rasqisia and all other volunteers for organising this conference.



**PACIFIC GIS AND
REMOTE SENSING COUNCIL**



Pacific Islands GIS and RS User Conference 2017

Version 28.02.18

**Pacific GIS and Remote Sensing Council,
P.O. Box 3786 Samabula, Suva, Fiji.**

**14 Bhimji Street Wailoku, Suva.
3322193**

1 Overview

The Pacific GIS and Remote Sensing Council (PGRSC) was established to oversee the activities of the Pacific Islands Annual GIS & RS User Conference and in response to the need to outsource the conference administration and procurement processes outside of SPC.

The Council's board members, constitution and all institutional arrangements were achieved within a limited time frame as it was paramount for the council to open a bank account that will accommodate all funds directed towards the logistics and activities of the GIS & RS User Conference.

This document briefly describes the role and purpose of the PGRSC. More detailed information such as the Council's constitution can be downloaded from the PGRSC website.

2 Purpose

The constitution states five objectives of the Council:

1. To promote the development of GIS and Remote Sensing (RS) data, technologies, methods and services for the pacific region;
2. To enable collaboration and share lessons learnt across regional agencies and commercial parties;
3. To discuss and establish methods in building adaptation for the Pacific environment for solutions working already well outside the region;
4. To manage the distribution, publication and awareness of conference outcomes;
5. To establish robust links with other GIS, RS and scientific bodies regionally and globally.

The Council was initially established to oversee the 2017 GIS&RS User Conference and was later recognised as a body that could promote and help support further developments of GIS & RS tools in the region.

3 The Structure of the Council

The Council will hold a minimum of three Trustees and five Board Members besides the GIS & RS Conference Committee.



PS Malakai Finau

3.1 The Trustees

The Trustees are the guardians of the Council and are accountable for the organisation. These are persons who are familiar with the objectives of the Council. The three Trustees are:

Permanent Secretary Lands and Mineral Resources **Malakai Finau**. Malakai Finau is also Chair of the STAR conference¹ and Chair of the Fiji Geospatial Information Management Council¹. Mr. Finau therefore serves as a link to both Pacific decision making

¹ Detailed description in chapter Links to Other Organisations.

bodies. Malakai Finau was also the former Director of the Fiji Mineral Resources Department, an organisation that has over the years, worked closely with the GIS and RS conference and community.



Dr. Russell Howorth

Dr. Russell Howorth worked many years at SOPAC² (now the Geoscience, Energy, and Maritime Division of SPC) and at the end of his term served as the Director. SOPAC was the leading Pacific organisation regarding GIS and RS. He is still Director of the Circum-Pacific Council³. Dr Russell Howorth is also a trustee of STAR.

Rajendra Singh comes with extensive experience in Education and Training. He served Ministry of Education at various levels up to Director of Primary Education in Fiji. He also worked for FNU and USP. He served voluntary organisations at leadership levels. He is an author and publisher. His exemplary contribution towards education and the community at large culminated in his appointment as a Commissioner for Oaths and received Member of the Order of Fiji Award.



Rajendra Singh

3.2 The Board

The Board of PGRSC makes far-reaching and all financial decisions. To have a Board is a requirement for a Council in Fiji. The current board members are:

- Wolf Forstreuter (Chair), SPC
- Leba Gaunavinaka, Lands Department
- Litia Volau Gaunavou, SPC
- Akosita Lewai, Forestry Department
- Keleni Raqisia, SPC
- Sachindra Singh, SPC
- Amrit Raj, USP (will be replaced)
- Salote N. Viti, Lands Department

3.3 The Committee

The PGRSC Committee is the most active arm of the Council and meets every two weeks. Most decisions and activities are made and carried out by the Committee members. The current Committee members are:

- | | |
|---|---|
| <ul style="list-style-type: none"> • Amrit Raj, USP • Anare Motokula, SPC • Carrol Chan, SPC | <ul style="list-style-type: none"> • Filimoni Yaya, SPC • Hirdeshni Gautam, SPC • Ilaisa Senikuraciri, Forestry Department |
|---|---|

² SOPAC = Secretariat of Pacific Applied Geoscience Commission later integrated in SPC

³ Detailed description in chapter Links to Other Organisations.

- Ilisanaias (Koroi) Koroigasagasa, Forestry Department
- Kataebati Bataua, SPC
- Keleni Raqisia, SPC
- Lanietta Rokotuiwakaya, SPC
- Leba Gaunavinaka, Lands Department
- Litia Volau Gaunavou, SPC
- Malakai Vakautawale, SPC
- Moria Duribalavu Gaunavou, SPC
- Naomi Jackson, SPC
- Navneet Lal, SPC
- Sachindra Singh, SPC
- Salote N. Viti, Lands Department
- Seini Nabou, Consultant
- Sereima Kalouniviti, SPC
- Wolf Forstreuter, SPC.

All Council Board members are members of the Committee as well, however not all committee members are part of the board.

4 History of the Council

The Pacific Islands GIS&RS User Conference 2017 prompted the establishment of the Pacific GIS and Remote Sensing Council as explained above. However, the annual Conference results in the outcomes of the monthly GIS&RS User Groups.

4.1 The Fiji GIS&RS User Groups

In 1991 the Management Services Division of the Forestry Department (MSD-Forestry) established together with the Fiji Land Information Support Centre (FLIS) monthly GIS and Remote Sensing User Group Meetings. The first meeting was conducted in Colo-i-Suva, at the MSD-Forestry. These meetings attracted a number of organisations with the idea to establish a GIS within their sectors. Meetings were held the first Tuesday every month at a different location to experience the working environment of various GIS users. The purpose was to (i) avoid duplication of work and to share data instead of re-producing, (ii) to share knowledge especially when methods required adaptation to Pacific environment, (iii) to enhance personal contacts which simplifies data exchange. The format was as informal as possible to encourage inexperienced GIS users to talk. The meetings has a fixed structure, all institutions present



Fiji GIS&RS User Group Meeting, 1993 in Fiji Forestry Department. Jo Wakolo is explaining the need of raster based GIS for forest applications.

introduce themselves, explain what they had carried out during the last four weeks and what they intend to do during the next month. This was followed by short presentations explaining new applications, software or hardware. Very soon the Fiji Government formed a Fiji Land Information Council with members of different Government institutions, which always met one day after the informal GIS&RS User Meeting to get the information discussed in the informal meeting.

4.2 The Fiji Annual GIS&RS User Conference

In 1998 USP, under the guidance of James Britton, approached the Fiji Lands Department to jointly conduct a two day National Conference, which was then extended to a 3 day conference in 1999. In 1999 the first participants were from outside of Fiji. The first poster competition was conducted in 2001, and has since been an integral activity of the platform. The first companies moved in, in 2003, with the arrival of image vendors. In the same year, the EU funded a regional project at SOPAC assisting GIS and RS application in Pacific Island Countries. This resulted in the renaming of the Fiji Conference.

4.3 The Pacific Islands GIS&RS User Conference

In 2004 the National Conference was renamed as the 'Pacific Islands GIS&RS User Conference' due to the increasing interests of participants that came from Pacific Island countries. In 2005 ISPRS joined the initiative and was part of the first discussion session of the Conference. The former president John Trinder helped to guide the discussion sessions (see picture to the right). The discussion session is an important session of the Conference and has since been held every year. The session provides



John Trinder (ISPRS), Wolf Forstreuter (Fiji GIS&RS User Group) and Les Allison (PICISOC) guiding the discussion on GIS&RS method development for Pacific Island Countries.

an opportunity for companies, scientists and GIS &RS users to meet and share ideas. Many applications, which required an adaptation to Pacific environment, were discussed at the Conference and implemented during the following years. Besides this the Conference is the platform for exchange of experiences of GIS&RS users by different island countries.

4.4 Outlook

The formation of the PGRSC was a necessary follow up of User Group and Conference in enabling the 2017 Conference. The next step will be to regionalise the Conference more than it currently is. The council currently established focal points in all Pacific Islands to share the information about the Conference but also to organise presentations and ideas by the countries to building up to the next Conference. Here the three vehicles for information dissemination will become an even more important role.

5 The Vehicles for Information Dissemination

The Council has three “vehicles” to disseminate information:

1. Pacific Islands GIS&RS Newsletter
2. Information distributing e-mail list GIS-PacNet
3. The Pacific Islands GIS&RS User Conference including website and Facebook site.

5.1 The Pacific Islands GIS&RS User Conference

The Pacific Islands GIS&RS User Conference is an ideal vehicle for transferring information and data to Pacific island states. As mentioned GIS users are isolated in remote island countries with limited possibility to engage with scientists and companies. This is not only the case during the discussion session, the Conference provides avenues to meet during the coffee breaks with a daily social function during the evening, where many Conference participants are present.

5.2 The Pacific Islands GIS&RS Newsletter

The first GIS and RS Newsletter was published in 1993 and distributed in Fiji. There was a need for a regular information platform as there was no Fiji medium (i) to report and document the monthly GIS&RS User Meeting, (ii) to distribute new developments in the areas of GIS, RS and upcoming GPS applications, (iii) to report about data available in Fiji.

The Newsletter started as a simple print out of a WordPerfect written A4 document edited by Wolf Forstreuter and Les Allinson. In 1994 SOPAC’s Director supported the Newsletter with professional staff and Lala Bukarau joining the team. James Britton (USP) joined the newsletters working group in 1998. During the time users of other Pacific states were interested in the newsletter where SOPAC printed and posted to Pacific island countries.

Shortly afterwards, a network was established of national focal points, which then produced bigger quantities and which was distributed to subscribers in country. By the end of the nineties the Newsletter was downloadable from the SOPAC website and the postage of newsletters continued as the countries e-mail access was very limited.

The newsletter can still be printed if there is a need, however, this is an exception. The last issue was published two years ago as there was no time which could be allocated to this publication. The PGRSC took ownership and the newsletter will be published again in regular intervals.

The importance is that the newsletter is the only publication, which focuses on spatial data application in Pacific Island Countries.

5.3 GIS-PacNet

The e-mail distribution and communication list ‘GIS-PacNet’ was established by Franck Martin with the intention to have a platform to help MapInfo GIS software users to operate their GIS. This was about 1995 or 1996 where e-mail started and SOPAC was the pioneer and Fiji distributor.

The mailing list was seldom utilised to asked questions as this is not the Pacific nature or culture, however, the list very soon distributed news in the areas GIS, RS, database and GPS applications.

The minutes of the monthly GIS&RS User Meetings were distributed whenever issues of regional relevance were discussed.

The list has nearly 700 members and the interesting part is that they are distributed all over the Pacific and today with better Internet than 20 years ago the remotest village can be reached. The list was hosted at SPC, but had to move to PICISOC⁴.

6 The Link to other Organisations

The Council has strong links to other organisations with similar objectives. The links are institutionally where Trustees of the Council are at the same time Trustees of related organisations and there are links through the web site and working relationships.



STAR = Pacific Science, Technology and Resource Network. Originally an advisory group for SOPAC annual session. Today an own Council. The chairman is Permanent Secretary Malakai Finau. Russell Howorth is one of the Trustees of STAR, Russell Howorth and Malakai Finau are Trustees of the Pacific GIS & Remote Sensing Council.

FGIMC = Fiji Geospatial Information Management Council. This Council is a Fiji Government advisory group, which meets every 3 month and advises Government bodies in technical questions in geospatial area. FGIMC also conducts a national GIS and RS conference normally on the Friday before the Pacific Islands GIS&RS User Conference. The chairman is Permanent Secretary Malakai Finau. There was a cabinet decision in 1991 on the formation of a Council.



ISPRS = International Society for Photogrammetry and Remote Sensing. ISPRS was first time present at the Conference in 2005. Since that time the Conference always displays posters and material on behalf of ISPRS. ISPRS distributes its information and bulletins through the PGRSC network.



CIRCUM-PACIFIC COUNCIL

CPC = The Circum-Pacific Council is an international, non-governmental, tax-exempt association of earth scientists, engineers, and oceanographers who represent government, industry, academia, and other organisations and institutes with interests primarily in the Pacific region. CPC was founded in 1972 as a cooperative organisation between the U.S. Government (U.S. Geological Survey) and industry (petroleum and mining companies) to improve upon scientific communication and exchange of information about geology and natural resources of the Pacific Basin and surrounding land regions. The PGRSC Trustee Russell Howorth is one of the CPC Directors.



SPC = Pacific Community (before South Pacific Community). The Pacific Community is the principal scientific and technical organisation in the Pacific region. It is an international development organisation owned and governed by its 26 country and territory members. With more than 600 staff, the organisation's headquarters are in Nouméa, New Caledonia, and it has regional offices in Suva, Fiji, and Pohnpei, Federated States of Micronesia,

⁴ PICISOC = Pacific Islands Chapter of the Internet Society

as well as a country office in Honiara, Solomon Islands, and field staff in other Pacific locations. Most Board and Committee members of PGRSC are working at SPC and the job description covers objectives of the Council.

PICISOC = The Pacific Islands Chapter of the Internet Society serves the Society's purposes by serving the interests of the global Internet community through its presence in the Pacific Islands. It focuses on local issues and developments, and as an impartial advisor to governments and the public on matters of significant interest to Pacific Island people. PICISOC first came into being in 1994 as IT-PacNET when a group of technical guys working for SOPAC decided to set up a support organisation. Through their association with regional organisations they were able to expand the organisation, and finally join the group up with the Internet Society in 2002. The 600+ regional members of PICISOC come from 22 countries which constitute the Pacific region (they are all members of the Pacific Islands Forum).



SIBA = Spatial Industries Business Association is the leading association representing the Spatial Industry. SIBA is committed to working with Government and Academia to build a more innovative, in Australia and the Pacific. SIBA provides a network of businesses, tender alerts, networking and collaboration opportunities, professional development, think tanks and direct business opportunities. SIBA is present during the Conference and uses the platform to hand out the spatial business award. The Council is helping to distribute the message to apply for the award through GIS-PacNet.



PGSC = The Pacific Geospatial and Surveyors Council provides a regional network and forum for Pacific Island geospatial information and survey authorities to address regional challenges. The priorities include: Building the capacity of regional surveyors; Improving and standardising geospatial information. The PGSC has a strategy but is not officially founded yet. Naturally there is an overlap and link between GIS&RS and the group of surveyors. The surveyors meetings were partly held during the Pacific Islands GIS&RS Conference.

