



Pacific
Community
Communauté
du Pacifique

5th Meeting of the Expert Group on Disaster-related Statistics in Asia and the Pacific

20 – 22 September, Incheon, Korea

*Session 3: Using census data for developing
community-based hazard exposure statistics for Pacific
Island States*

What is SPC?



- Pacific Community (SPC) - Principal scientific and technical organization in the Pacific region, proudly supporting development since 1947. Owned and governed by 26 country and territory members of which 22 receive support. - www.spc.int
- SPC's Statistics for Development Division (SDD) aims to strengthen the capacity of national statistical systems and social and economic planning agencies to provide policy-makers and analysts with important demographic, economic and social indicators for planning and decision making - <http://sdd.spc.int>
- SPC's Geoscience Division (GSD) is the region's principal provider of geoscientific services, in work areas such as Ocean and Coastal Geoscience, Disaster Risk Reduction, Climate Change, Water and Sanitation, Natural Resource Economics, Geothermal Energy, Geological Resources and Surveys etc. <http://gsd.spc.int/>

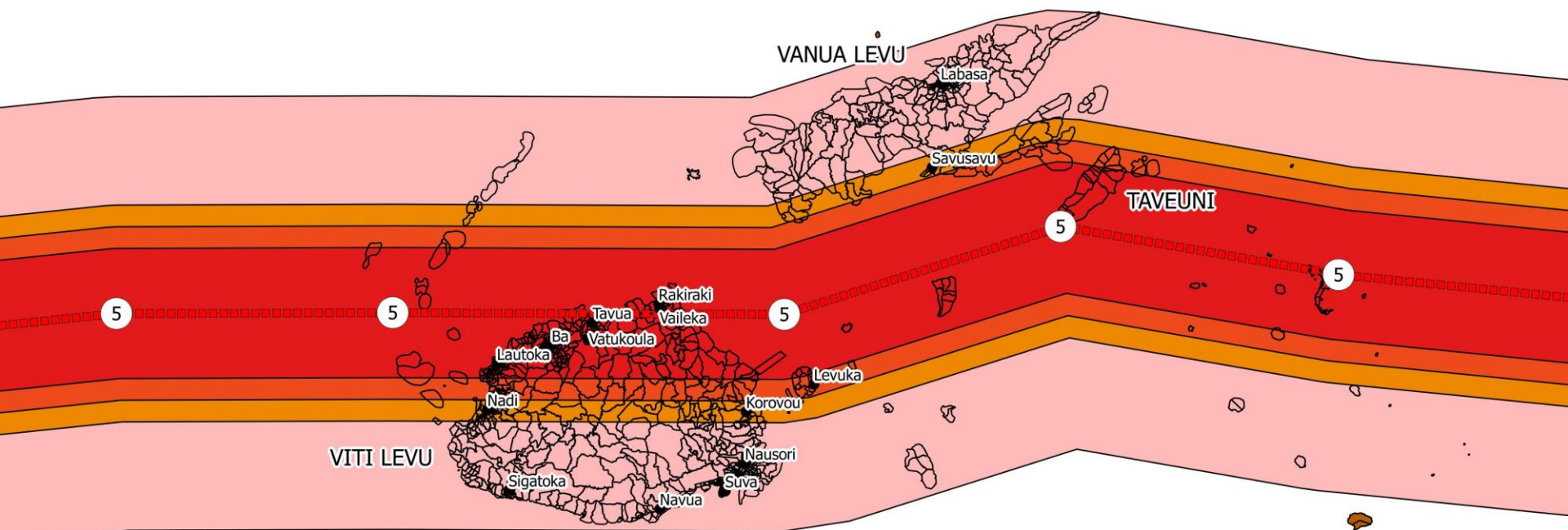
Overview



- Real-time access to data is key – Cyclone Winston population projections
- Providing access to population statistics (Statistics for Dev. Division)
 - PopGIS mapping application to disseminate population datasets and to assist during disaster event
 - SDMX Open data portal
 - Table Joining Service (TJS)
 - Coastal mapping
- Preparedness/planning + disaster management (Geoscience Division)
 - PacGEO
 - PCRAFI
 - Riskscape
 - PacSafe

CYCLONE WINSTON POTENTIAL IMPACTED POPULATION - 23/02/16

**NOTE : Population figures projected to 2015 using age distribution from 2007
Population and Housing Census then prorated to match total projected population**



Legend

- Intensity
- Cyclone track
- 0-30km: Likely to be severely to extremely affected
- 30-40km: Likely to be seriously to severely affected
- 40-50km: Likely to be moderately to seriously affected
- 50-100km: Likely to be somewhat to moderately affected
- Fiji EAs

0 50 100 km



	0-30km	30-40km	40-50km	50-100km
Total	208070	50662	88996	496281
Male	106875	26530	45481	250770
Female	101195	24132	43515	245511
Children under 18	70218	18691	31244	169737
Children under 5	20887	5642	9685	51174
Children under 1	2103	565	975	5153
Pregnant and lactating mothers	4550	1108	1946	10854

NOTE: EAs which were split by a buffer zone have their populations apportioned to each buffer



Census/HIES indicators?



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- Population counts/location (many countries now use GPS for HH locations), breakdown by age/sex
- Educational status – highest qualification, current attendance
- Health status – height, weight, ongoing illnesses
- Communication status – access to internet, mobile phone ownership
- Household consumption/expenditure
- Poverty/income data
- Household characteristics – construction material, sanitation, energy, water access/use
- And more...

PopGIS

- Simple data visualization/analysis tool
- Various levels of geography from Enumeration Areas to Provinces
- 13 countries + 1 regional SDG/core indicator database (migrating to SDGs)
- <http://prism.spc.int/regional-data-and-tools/popgis2>



Regional Mapping
(Released Qtr 2 2014)



Cook Islands
(Released Qtr 4 2015)



Fiji Islands
(Released Qtr 3 2014)



FSM
(Released Qtr 3 2014)



Kiribati
(Released Qtr 1 2015)



Marshall Islands
(Released Qtr 2 2017)



Nauru
(Released Qtr 1 2017)



New Caledonia
(Released Qtr 1 2016)



Palau
(Released Qtr 4 2016)



Solomon Islands
(Released Qtr 2 2014)



Tonga
(Released Qtr 4 2015)



Tuvalu
(Released Qtr 3 2014)



Vanuatu
(Released Qtr 1 2015)



Wallis and Futuna
(Released Qtr 2 2017)

Next Releases

- Niue



1 - D4. Functional age groups - Total population - 2015 projections

Add another indicator...

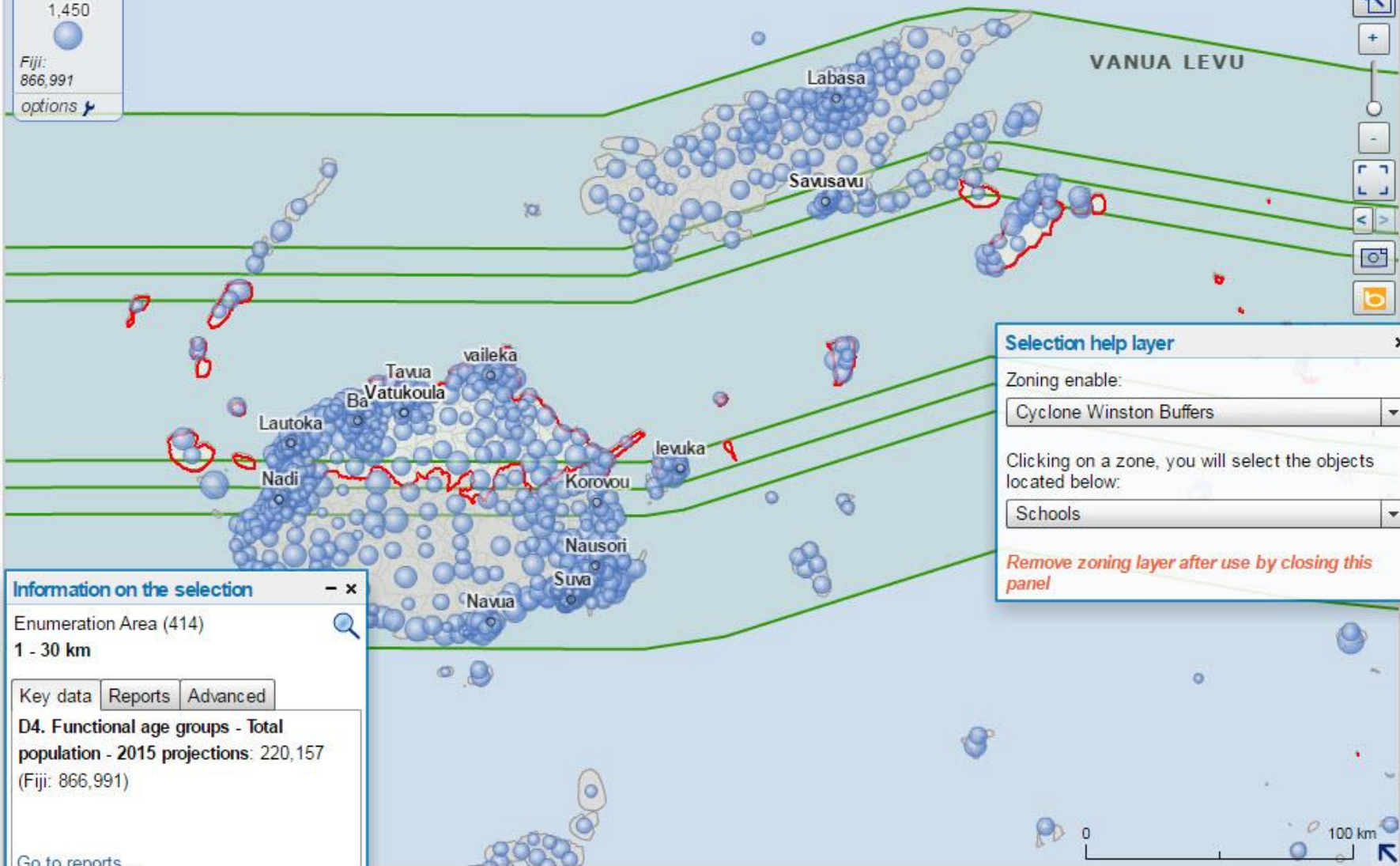
Display Search Print / Export

1

1,450

Fiji: 866,991

options



Selection help layer

Zoning enable:

Cyclone Winston Buffers

Clicking on a zone, you will select the objects located below:

Schools

Remove zoning layer after use by closing this panel

Information on the selection

Enumeration Area (414)

1 - 30 km

Key data Reports Advanced

D4. Functional age groups - Total population - 2015 projections: 220,157
(Fiji: 866,991)

Go to reports...



Fiji

popgis2@spc.int
PopGIS 2.0 Online Mapping

LOAD GET PREFERENCES

T Text

Maps

Data

View 1 / 3: Enumeration area

2 maps

1 - School - Type of School

Add another indicator...

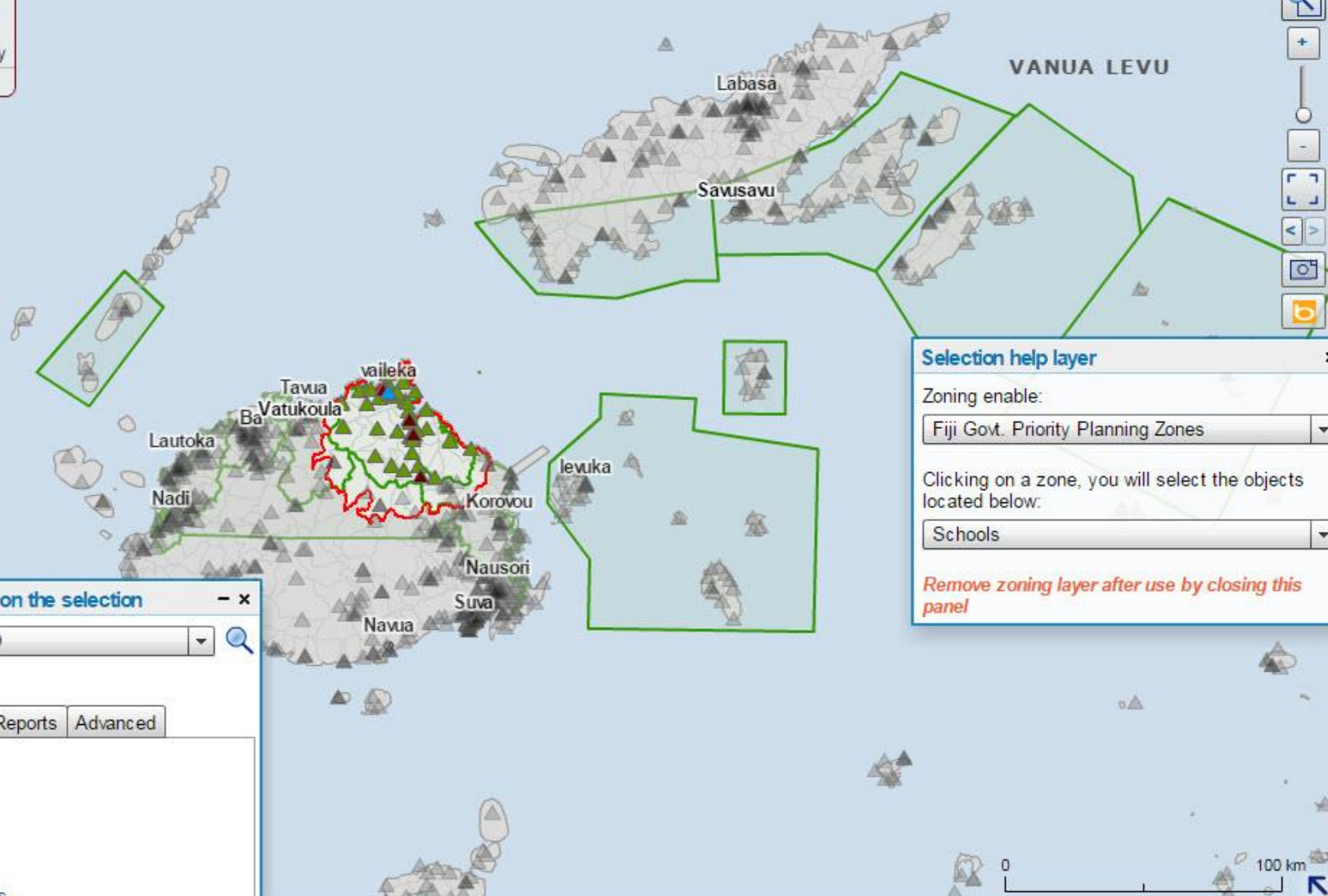
1

- Unknown
- Primary
- Secondary

options

Display Search Print / Export

Map navigation controls: search, zoom in (+), zoom out (-), full screen, previous view, next view, home, and a logo.



Selection help layer

Zoning enable:
 Fiji Govt. Priority Planning Zones

Clicking on a zone, you will select the objects located below:
 Schools

Remove zoning layer after use by closing this panel

Information on the selection

Schools: 49

8 - Ra

Key data Reports Advanced

Go to reports...





Fiji

popgis2@spc.int
PopGIS 2.0 Online Mapping

LOAD GET PREFERENCES

T Text

Maps

Data

View 1 / 3: Enumeration area ▾

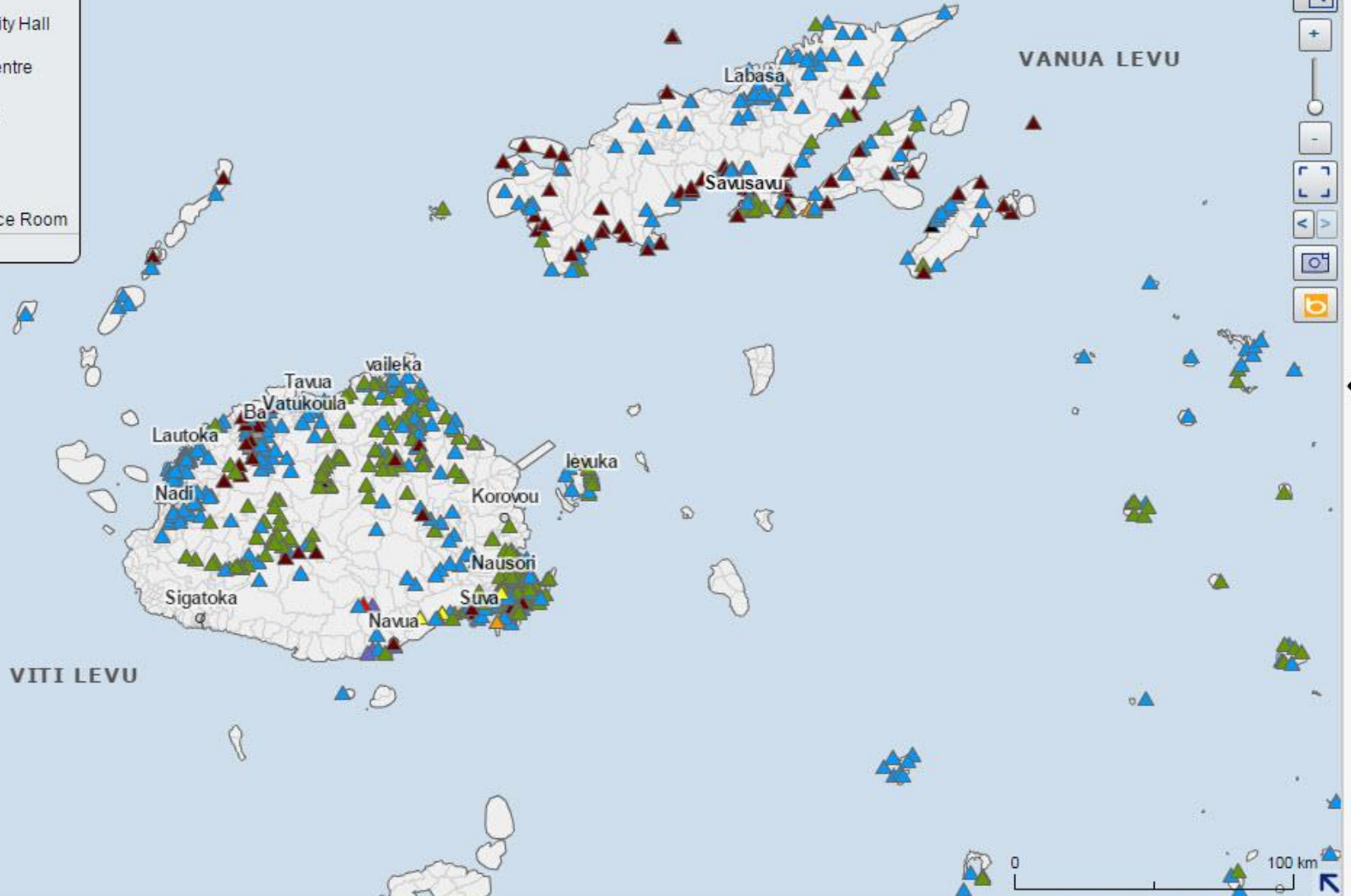
2 maps □□

1 - Type of Evactuation Centre ⓘ x

[Add another indicator...](#)

Display ▾ Search ▾ Print / Export ▾

- 1**
- School
 - Community Hall
 - Church
 - Health Centre
 - Complex
 - Institution
 - Village
 - Centre
 - Hospital
 - Temple
 - Conference Room
- options*



1 px = 522.0 m - EPSG 32760 x: 449,415 y: 8,111,963

NMDI Database



- National Minimum Development Indicators
- 7 themes:
 - Population and development,
 - Human development,
 - Agriculture and forestry,
 - Public health,
 - Communication and infrastructure,
 - Fisheries and aquaculture,
 - MDGs
- <http://www.spc.int/nmdi>

The screenshot shows the NMDI Database website. The header includes the NMDI logo and the text 'National Minimum Development Indicators Version 2.0'. The navigation menu has 'Home', 'Custom Reports', 'Reference Library', and 'Contact'. The main content area features a welcome message and a grid of seven thematic categories, each with a list of sub-topics and a speech bubble icon. The categories are: Population & Development (Population, Poverty, Education, Economic Development, Labour Force, Social Services Provisions); Agriculture & Forestry (Households, National Economy, Natural Resources); Public Health (Vital Statistics, Vector Borne Diseases (Malaria), Communicable Diseases (TB), Sexual Health (HIV/AIDS & STI), Maternal Health, Child Health, Non-Communicable Diseases, Environmental Health, Health Systems); Human Development (Gender, Youth, Culture); Fisheries & Aquaculture (Economics - Labour Market Activity, Economics - Macro Aspects, Sustainable Livelihoods and Food Security); Communication & Infrastructure (Information Technology (IT), Energy, Transport); and Other Links (Civil Registration and Vital Statistics - www.pacific-crvs.org, Pacific Islands Forum Secretariat Forum). At the bottom right, there is a section titled 'Access MDG Data' with a grid of eight MDG icons and their descriptions.

SDMX Portal



- Maintenance, storage, dissemination of data + structural metadata
- SDMX (Statistical Data and Metadata eXchange) standard
- Machine-to-machine readable
- Downloadable in many formats

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT **OECD.Stat**

Click here to Login | Contact us | User Guide | Home
English | Français

Search [Getting Started](#)

Data by theme Popular queries

Find in Themes [Reset](#)

All Themes

- General Statistics
- Agriculture and Fisheries
- Demography and Population
- Development
- Economic Projections
- Education and Training
- Environment
- Finance
- Globalisation
- Health
 - Health expenditure and financing
 - Health Status
 - Mortality
 - Life expectancy
 - Causes of mortality
 - Maternal and infant mortality
 - Potential years of life lost
 - Morbidity
 - Perceived health status
 - Perceived health status by age and gender
 - Perceived health status by socio-economic status
 - Infant health
 - Dental health
 - Communicable diseases
 - Cancer
 - Injuries
 - Absence from work due to illness
 - Non-Medical Determinants of Health
 - Health Care Resources
 - Health Workforce Migration
 - Health Care Utilisation
 - Health Care Quality Indicators
 - Pharmaceutical Market
 - Long-Term Care Resources and Utilisation

Health Status : Life expectancy

Customise Export Draw chart My Queries

Variable	Measure	Country	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Life expectancy at birth	Females/Years	Australia	73.9	74.4	74.2	74.2	73.9	74.2	74	74.5	74.2	74.6	74.2	74.9	75.4	75.5	75.4	76.2	76.3	76.8	77.2	77.8	78.1	78.4
		Austria	71.9	72.8	72.5	72.7	73.2	73	73.4	73.4	73.5	73.3	73.5	73.7	74.1	74.6	74.7	74.7	75.1	75.5	75.7	76	76.1	76.5
		Belgium	72.8	73.6	73.2	73.1	73.9	73.8	73.8	74.2	73.9	74.1	74.2	74.4	74.8	75	75.3	75.5	76.2	76.1	76.6	76.7	77.1	
		Canada	..	74.2	..	..	..	75.2	..	..	..	..	76.4	..	..	..	..	77.5	..	..	78.8	78.9	79	
		Chile	..	..	..	..	..	..	..	..	..	..	65.4	..	..	..	..	..	..	..	..	..	..
		Czech Republic	73.5	73.6	72.9	73.6	73.8	73.5	73.9	73.8	73.5	73.2	73.1	73.4	73.7	73.8	73.6	74.1	74.3	74.3	74.4	74.4	74	74.4
		Denmark	74.4	..	..	..	..	..	74.9	75.4	75.6	75.9	75.9	76.1	76.3	76.9	77.1	76.8	77.9	77.6	77.5	77.3	77.5	
		Estonia	73.1	73.3	73.2	73.6	74.2	74.3	74.4	74.8	74.5	74.4	74.5	74.8	74.7	74.7	75.1	74.8	74.4	74.5	74.5	74.2	74.3	74.1
		Finland	72.5	..	72.6	..	..	..	..	73.7	..	75	74.2	74.9	75.5	75.4	75.9	76.3	76.9	77.6	77.5	78	78.2	
		France	73.6	74.4	73.9	74.1	75.1	75	75.2	75.2	75.2	75.1	75.9	75.9	76.2	76.3	76.7	76.9	77.2	77.8	77.9	78.3	78.4	78.5
		Germany	71.7	72.3	72.6	72.8	73.4	73.3	73.5	73.8	73.4	73.3	73.6	73.8	74.1	74.4	74.6	74.5	75	75.7	75.7	76	76.2	76.4
		Greece	..	73.8	73.4	73.7	73.8	74.3	74.7	74.2	74.2	75	76	76.2	75.9	76.2	76.8	76.7	76.7	77	77.5	77.8	77.5	77.9
		Hungary	70.2	71.2	70.1	71.3	71.9	71.5	72.3	72.1	72	72.1	72.1	72.1	72.7	72.6	72.3	72.5	72.6	73.1	72.8	73.2	72.8	73
		Iceland	..	76.3	76.2	76.1	76.4	76.4	76.6	76.5	76.4	77.3	76.5	76.9	77.6	78	79	80.2	79.6	79.6	..	80.4	79.8	
		Ireland	71.9	..	..	..	..	..	..	..	..	..	73.5	..	..	..	..	..	..	..	74.9	75	75.6	75.6
		Israel	..	..	..	..	..	..	..	..	..	..	..	73.4	72.8	73.2	73.3	73.9	74.8	74.7	75	75.3	75.7	75.9
		Italy	..	72.3	..	..	..	..	..	..	..	..	74.9	..	..	75.6	75.8	76	76.7	77.2	77.5	77.4	77.6	
		Japan	70.2	70.8	71.2	72.3	72.9	72.9	73.6	74.2	74.3	74.7	74.7	75.6	75.9	76	76.3	76.9	77.4	78	78.3	78.9	78.8	79.1
		Korea	..	..	..	..	..	..	..	..	..	..	65.8	66.3	66.8	67.3	67.8	68.2	68.6	69.1	69.5	69.9	70.4	70.9
		Latvia	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
		Luxembourg	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

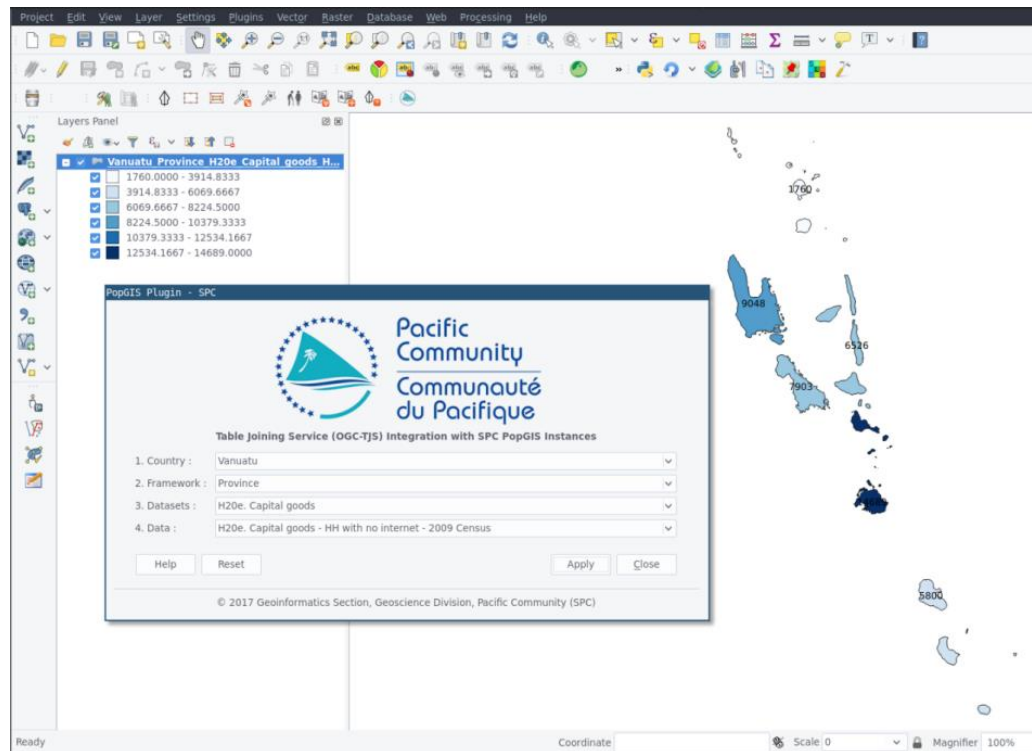
Legend:
B Break
E Estimated value
P Provisional value

Data extracted on 14 Sep 2017 03:46 UTC (GMT) from OECD.Stat

Table Joining Service



- PopGIS-> QGIS plugin : <https://github.com/sopac/popgis-plugin>



- Future => TJS over SDMX to create web map services

Coastal mapping



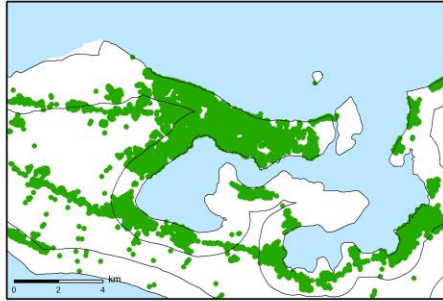
- Determine populations within 1km, 5km and 10km of the coast for all Pacific Island Countries and Territories
- Big demand for food security + disaster preparedness/management



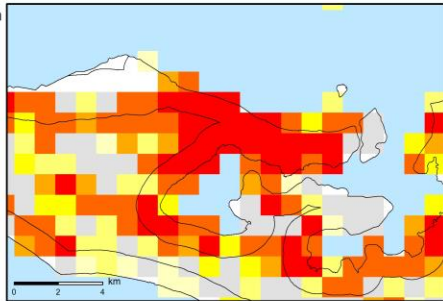
- <https://pacstats.maps.arcgis.com/apps/MapJournal/index.html?appid=2b5cad0e20e642de96db85b377fc128c>
- Some countries have HH-level GPS – ideal scenario, no modelling needed
- Landscan 2015 / SEDAC-CIESIN GPWv4 used as proxies when no GPS
- Waiting for release of new Worldpop dataset – multi-temporal 2000-2020 global 100m resolution datasets based on multiple variables.
(<https://www.nature.com/articles/sdata20171>)

TONGA

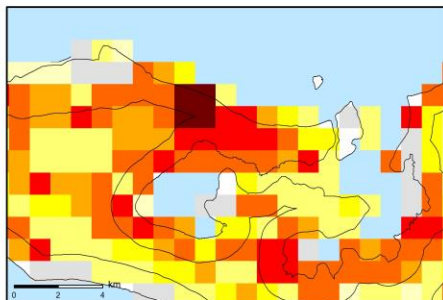
Household locations
Tonga: 2016 Census
Fiji: 2007 Census
Samoa: 2011 Census



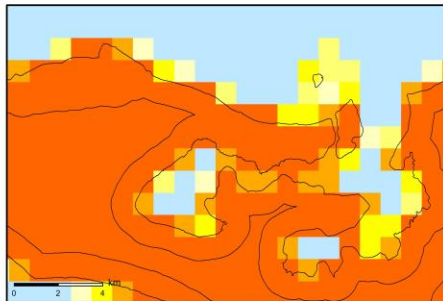
Population Grid based on
Household locations
Tonga: 2016 Census
Fiji: 2007 Census
Samoa: 2011 Census



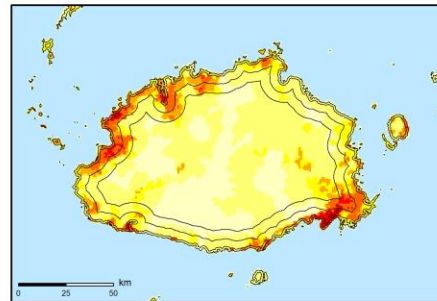
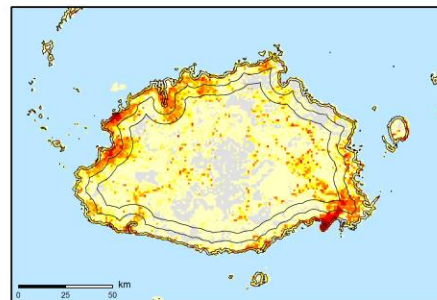
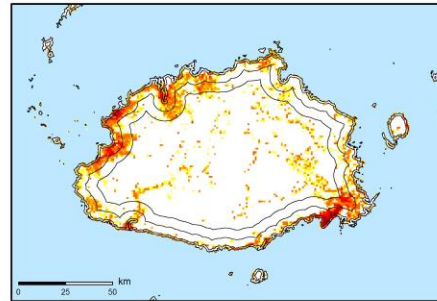
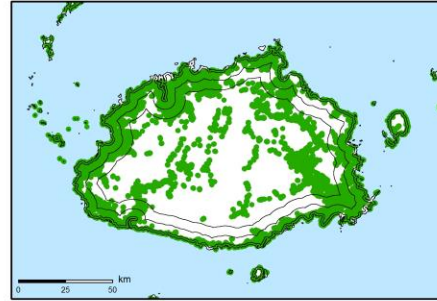
Landsat™ 2015



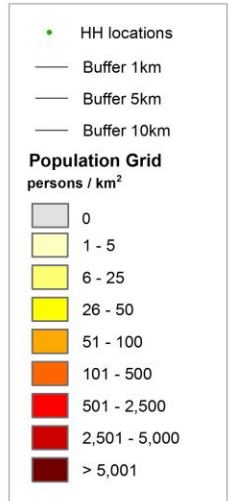
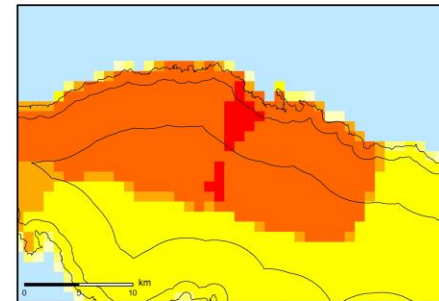
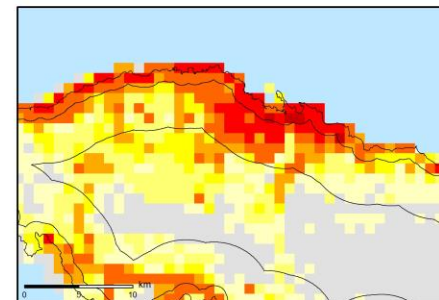
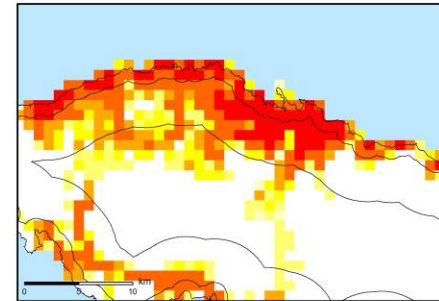
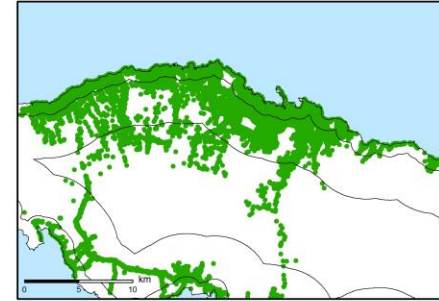
GPWv4
(UN-Adjusted Population
Count 2015)



FIJI



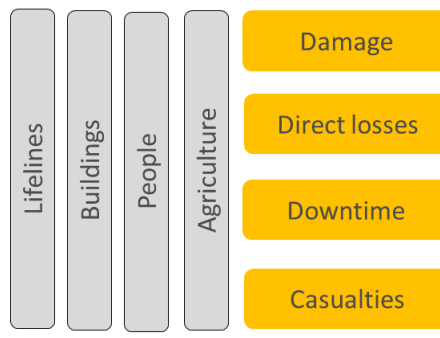
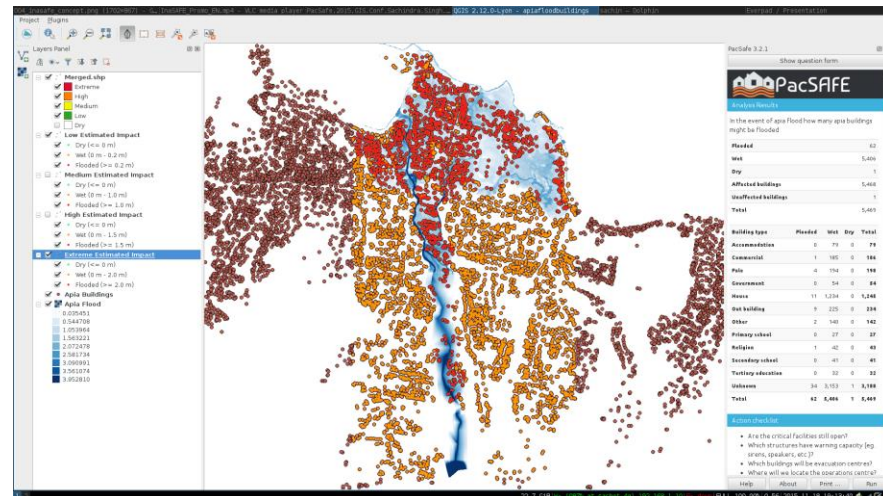
SAMOA



Hazard Prep/Assessment



- Multiple available tools which can be used for evidence-based natural hazards risk assessment.
- Baseline data:
 - PacGeo
 - PCRAFI => PacRIS
- Disaster info/reporting:
 - PDN
 - PDaLo
 - PDNA
- Risk assessment tools:
 - RiskScape + PacSafe



Earthquakes

Tsunamis

Volcanic ash fall

Floods

Wind

?

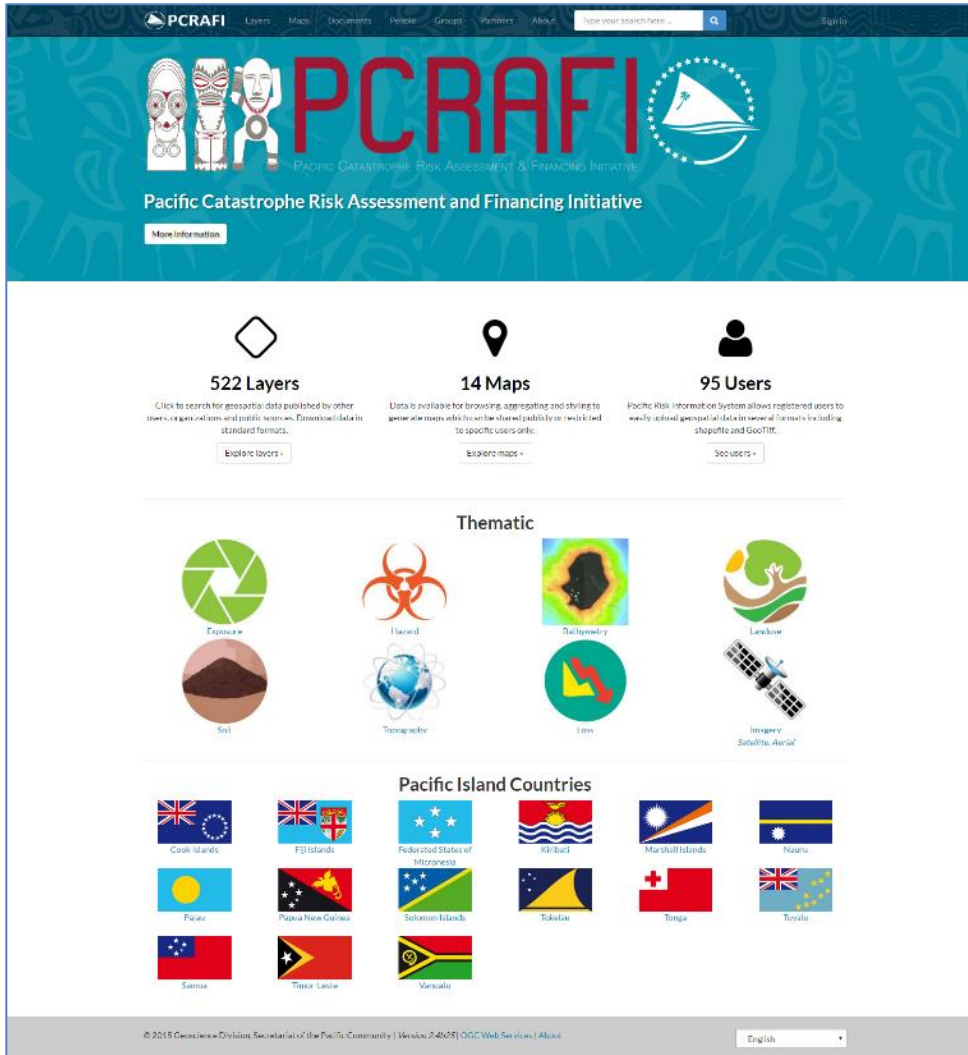
PacGEO



The screenshot shows the PacGeo website interface. At the top, there is a navigation bar with links for Layers, Maps, Documents, People, Groups, and Help, along with a search bar and a user profile icon for 'sachin'. Below the navigation bar is a large banner with the PacGeo logo and the text: 'An open access geospatial data repository for the Pacific Region providing premier geophysical, geodetic, and marine spatial data sets.' It also mentions that it was developed through collaboration between the GeoScience Division of Secretariat of the Pacific Community (GSD/SPC), University of Sydney, Geoscience Australia (GA), and GRID-Arendal. Logos for Pacific Community, Australian Aid, The University of Sydney, Australian Government, and GRID-Arendal are displayed. Below the banner, there are four main sections: '906 Layers', '952 Documents', 'Spatial Maps', and '41 Users'. Each section has a brief description and a button to explore further. At the bottom, there is a section for 'Pacific Island Countries' with flags and names for Cook Islands, Fiji Islands, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands, Tokelau, Tonga, and Tuvalu. The footer contains copyright information and a language dropdown menu set to English.

- Deployed in 2013
- Cloud-based
- 900~ layers
- 950~ related documents
- 40~ Users across PICs trained
- www.pacgeo.org

PacRIS



The screenshot shows the PCRAFI website interface. At the top, there is a navigation bar with links for Layers, Maps, Documents, People, Groups, Partners, and About, along with a search bar. The main header features the PCRAFI logo and the text "Pacific Catastrophe Risk Assessment and Financing Initiative". Below the header, there are three main sections: "522 Layers" (with a search icon), "14 Maps" (with a location pin icon), and "95 Users" (with a user icon). Each section has a brief description and a "More information" button. Below these sections is a "Thematic" section with icons for various data types: Elevation, Hazard, Oceanography, Land Use, Soil, Topography, LULU, and Imagery (Satellite, Aerial). At the bottom, there is a "Pacific Island Countries" section displaying flags for Cook Islands, Fiji Islands, Federated States of Micronesia, Kiribati, Marshall Islands, Niue, Palau, Papua New Guinea, Solomon Islands, Tokelau, Tonga, and Tuvalu. The footer contains copyright information and a language selector set to English.

- Pacific Risk Information System
- Products of PCRAFI Phase 1
- Derived from largest field surveys taken in the Pacific
- Inputs for vulnerability assessment:
 - Sat imagery, admin boundaries, pop. censuses, agriculture, infrastructure
- Inputs for hazard assessment:
 - Topo. maps, surface soil, bathy., geodetic + fault data, surface geology
- Datasets being updated
- <http://pcrafi.spc.int/>

PDaLO, PDN, PCRAFI, PDNA



?	PDN	PDaLo	PCRAFI	PDNA
Which data is hosted	<ul style="list-style-type: none"> Alerts Documents - Situation reports, newspaper articles, assessments etc. – new and history Link to PDaLo Contacts Calendar 	<ul style="list-style-type: none"> Damage and loss data - validated and quality controlled 	<ul style="list-style-type: none"> Historical Hazard and Loss Database Probabilistic Hazard Models Geo-referenced Exposure Database Catastrophe Risk Models and Profiles 	<ul style="list-style-type: none"> Methodology Values - damage, loss, macroeconomic impact Data stored in PDaLo
Volume	+11,000 Documents +750 Contacts +750 Calendar	Total – 1176 Conseq – 600 PDN – 564 New – 12	~100 GB Spatial and tabular data Reports	Reports Data - restricted
How can the information be accessed	www.pacificdisaster.net	www.pdalo.net	pcrafi.spc.int	Reports stored in Pacific Disaster Net
Who prepares information and knowledge to support decision making	Pacific Disaster Net Team	National technical agencies Partners	Government PDNA Sector experts	Government PDNA Sector experts

RiskScape + PacSafe



- Efforts undertaken to align currently active risk tool development projects:
 - PARTneR (RiskScape) + PACSAFE



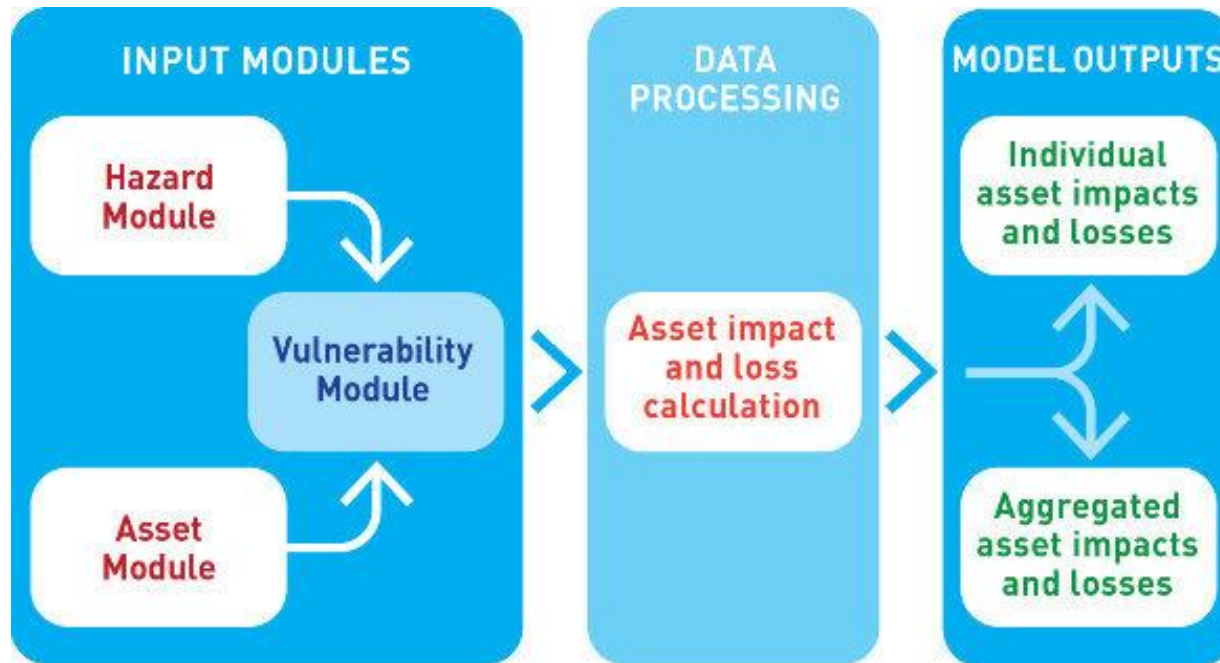
PARTneR vs PacSAFE



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	RiskScape	PacSAFE
Hazards	<ul style="list-style-type: none"> ✓ Earthquakes ✓ River flooding ✓ Coastal flooding ✓ Tsunami ✓ Volcanic ash fall ✓ Cyclone winds ✓ Hazard footprints 	<ul style="list-style-type: none"> ✓ Earthquake ✓ Floods ✓ Volcanoes and volcanic ash ✓ Cyclone winds ✓ Tsunami
Tool outputs	<ul style="list-style-type: none"> ✓ Economic loss ✓ Infrastructure and building damage levels and loss ✓ Population affected, killed or injured ✓ Exposure 	<ul style="list-style-type: none"> ✓ Numbers of buildings / infrastructure affected ✓ Population affected / displaced ✓ Response needs
Primary Users	<p>National Disaster Management Offices Planning Agencies Infrastructure providers Researchers</p>	<p>National Disaster Management Offices Response Agencies</p>
Initial country partners	<p>Samoa, Vanuatu</p>	<p>Tonga</p>

PARTneR project



RiskScape
framework

Hazard types:

- Flood
- Landslide
- Wind
- Storm surge/tide
- Tsunami
- Earthquake
- Snowfall
- Volcano etc

Key Outputs:

- Asset exposures
- Damage states
- Reinstatement costs
- Human losses
- Human displacement
- Exported as .csv or .kml



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