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?

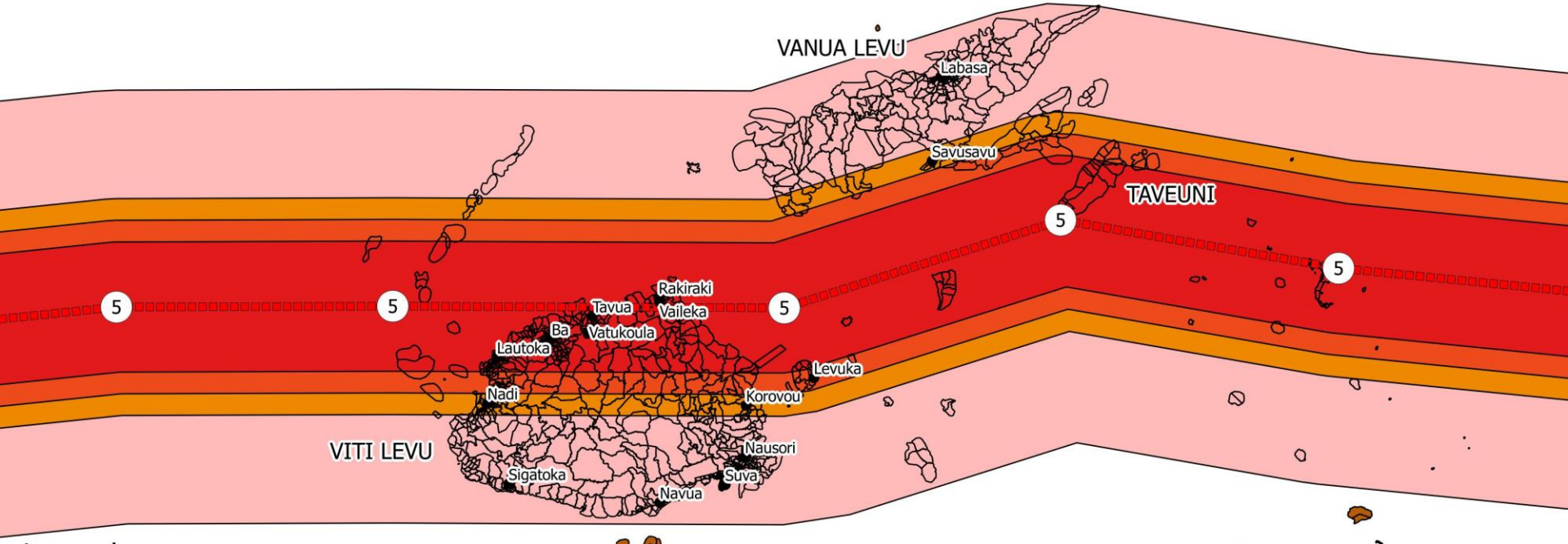
- Pacific Community (SPC) - Principal scientific and technical organization in the Pacific region, proudly supporting development since 1947. Owned and governed by 26 country and territory members of which 22 receive support. - www.spc.int
- SPC's Statistics for Development Division (SDD) aims to strengthen 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

Map produced by Phil Bright (philb@spc.int), Statistics for Development Division, SPC, 23-02-16

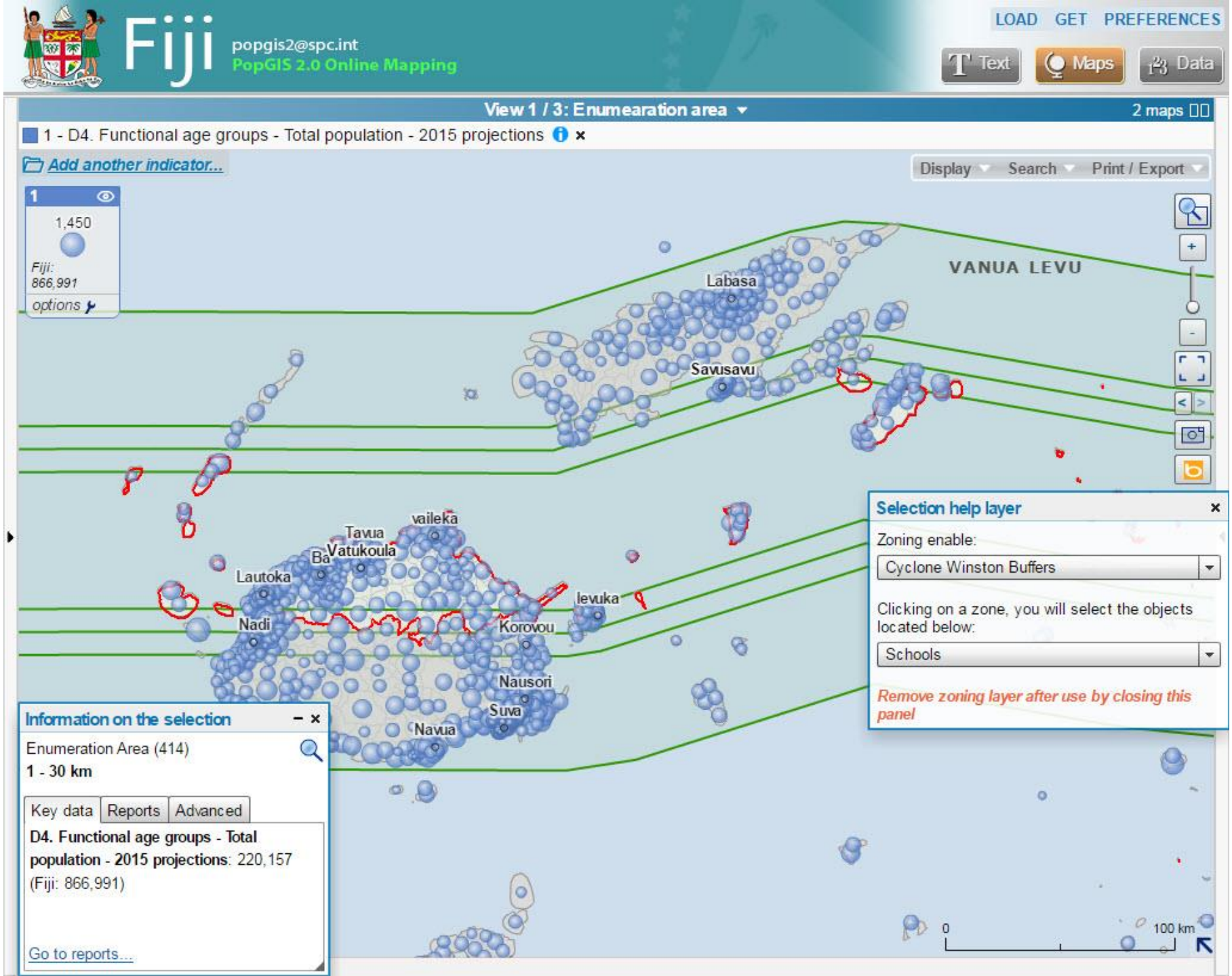
Pacific Community
Communauté du Pacifique

Census/HIES indicators?

- 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


Fiji
popgis2@spc.int
PopGIS 2.0 Online Mapping
LOAD GET PREFERENCES
Text Maps Data
View 1 / 3: Enumearation area
2 maps
1 - D4. Functional age groups - Total population - 2015 projections
Add another indicator...
Display Search Print / Export
1
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Fiji:
866,991
options
VANUA LEVU
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Nadi
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Korovou
Nausori
Suva
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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
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D4. Functional age groups - Total population - 2015 projections: 220,157
(Fiji: 866,991)
Go to reports...
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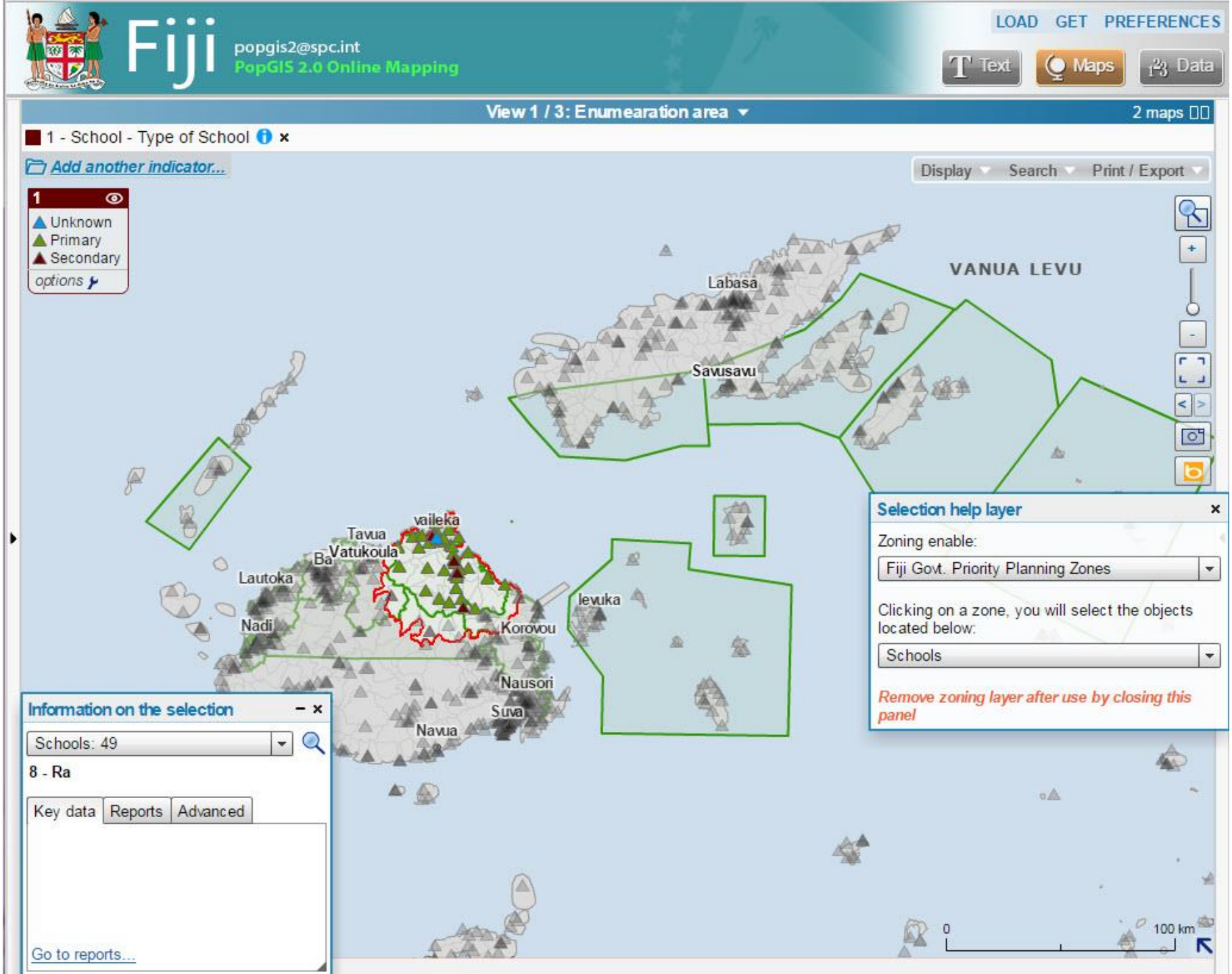
Fiji
popgis2@spc.int
PopGIS 2.0 Online Mapping
LOAD GET PREFERENCES
Text Maps Data
View 1 / 3: Enumearation area
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1 - School - Type of School
Add another indicator...
Display Search Print / Export
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Primary
Secondary
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VANUA LEVU
Labasa
Savusavu
vaileka
Tavua
Vatukoula
Ba
Lautoka
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Korovou
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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
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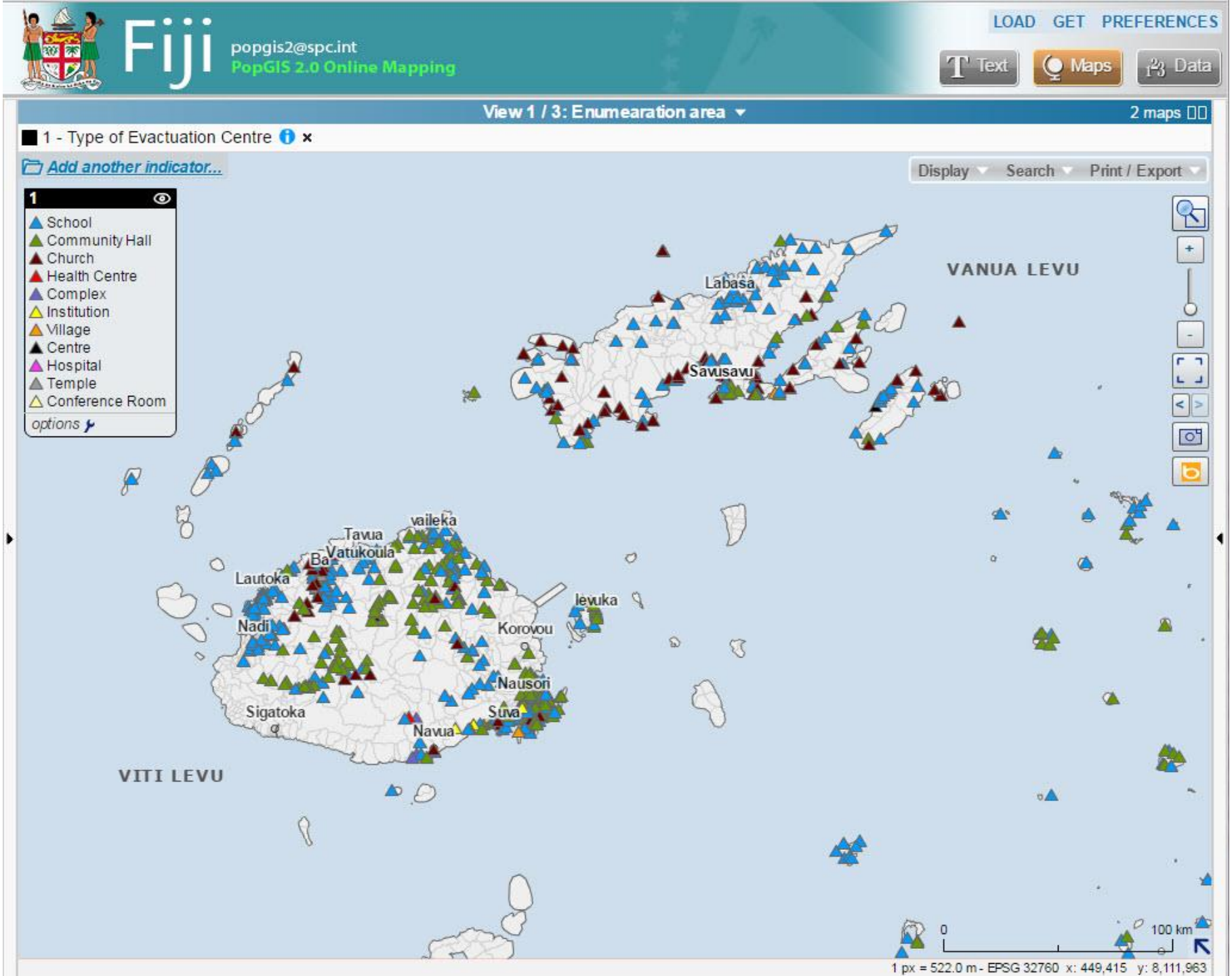
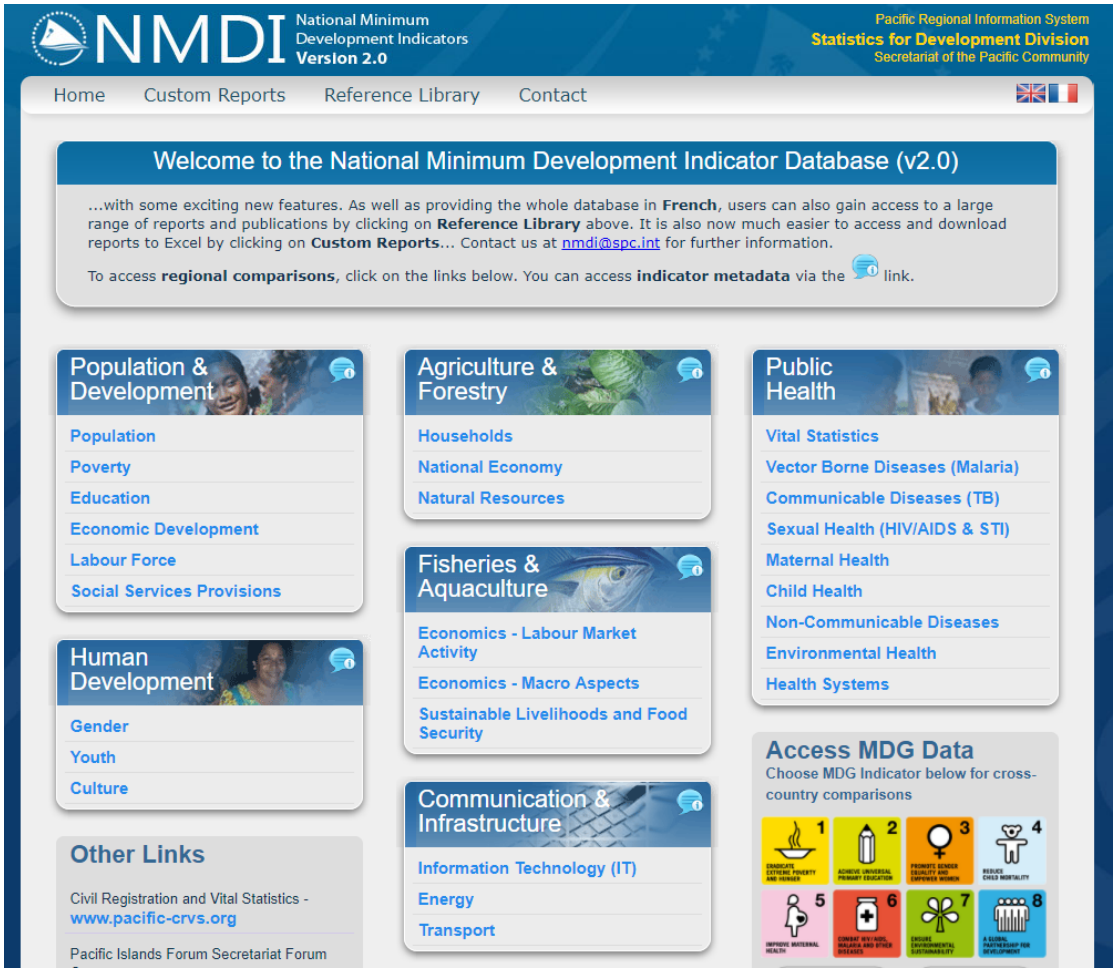

Fiji
popgis2@spc.int
PopGIS 2.0 Online Mapping
LOAD
GET
PREFERENCES
Text
Maps
Data
View 1 / 3: Enumearation area
2 maps
1 - Type of Evactuation Centre
Add another indicator...
Display
Search
Print / Export
1
School
Community Hall
Church
Health Centre
Complex
Institution
Village
Centre
Hospital
Temple
Conference Room
options
VANUA LEVU
Labasa
Savusavu
VITI LEVU
Tavua
vaileka
Vatukoula
Ba
Lautoka
Nadi
Sigatoka
Navua
Suva
Nausori
Korovou
levuka
0
100 km
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



SDMX Portal

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

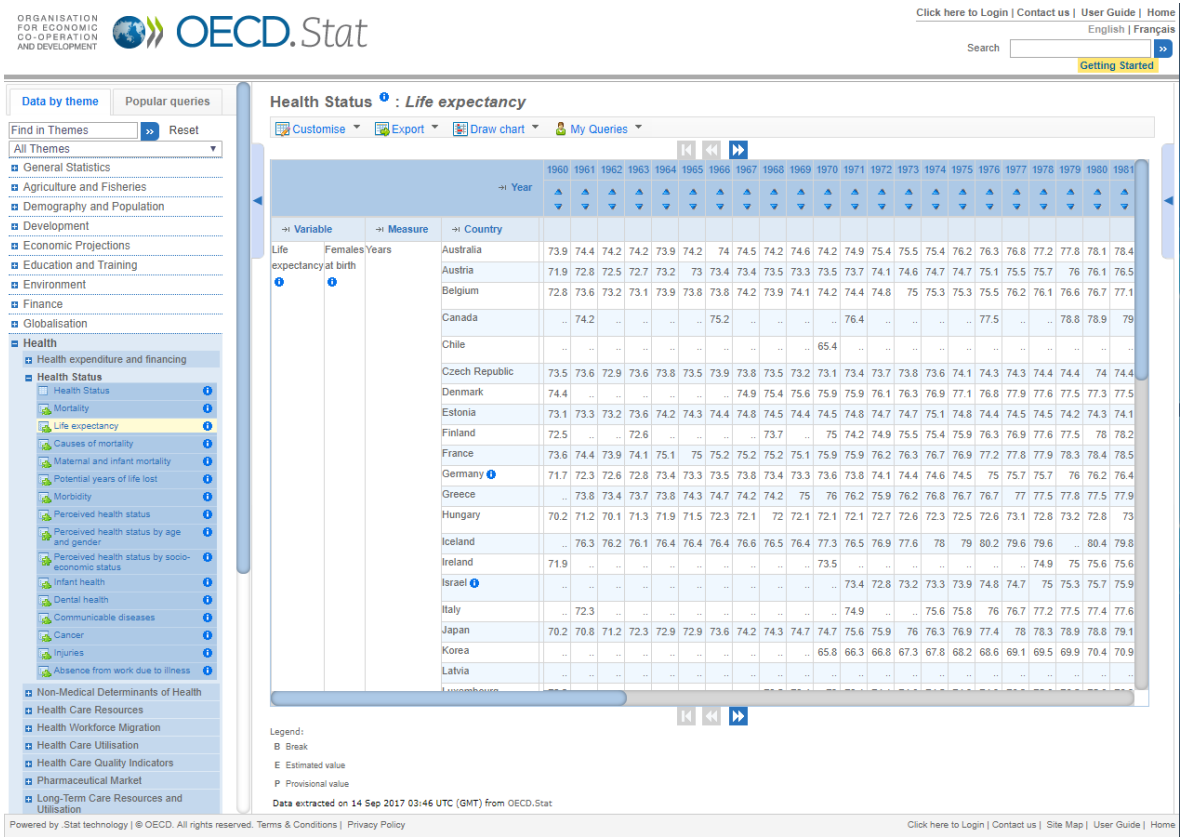
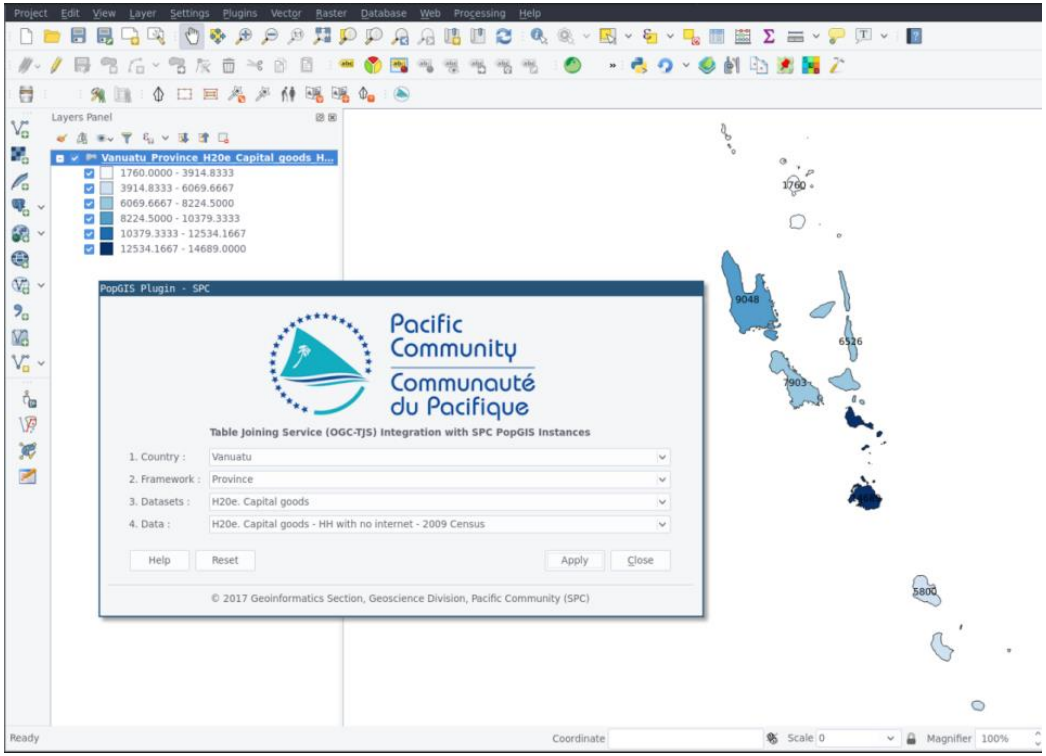


Table Joining Service

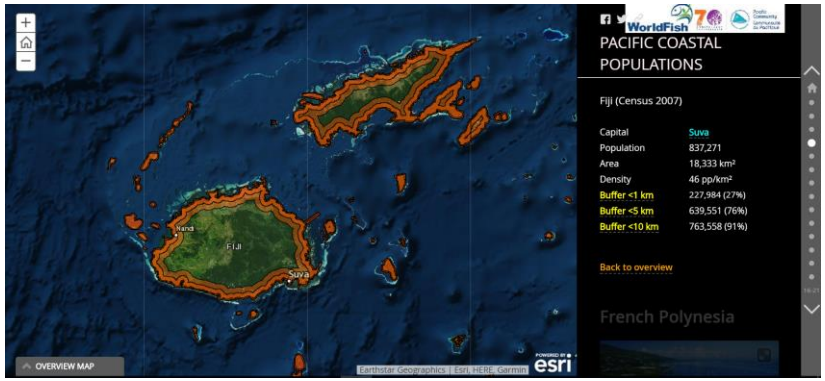
- PopGIS-> QGIS plugin : https://github.com/sopac/popgis-plugin



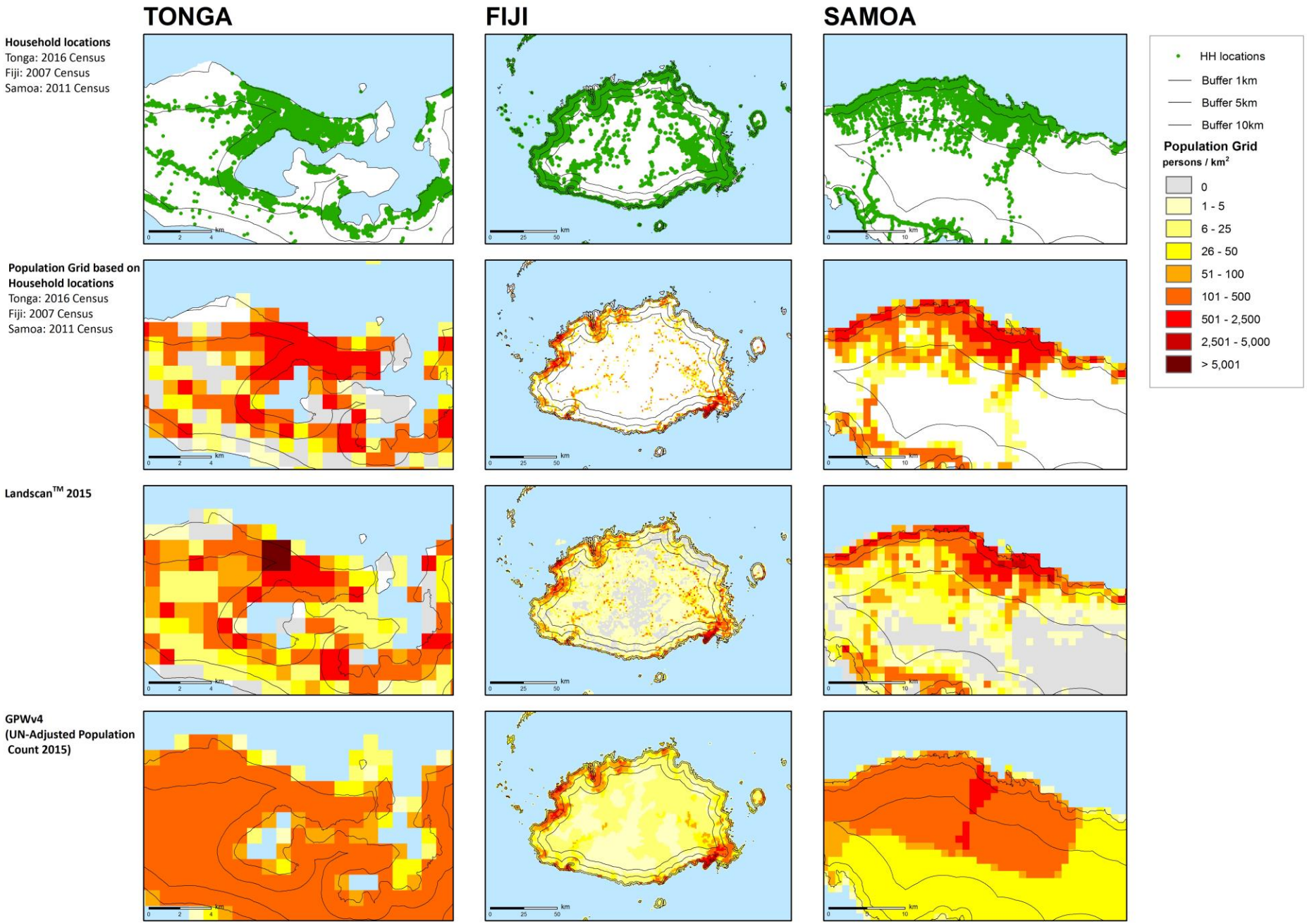
- Future => TJS over SDMX to create web map services

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

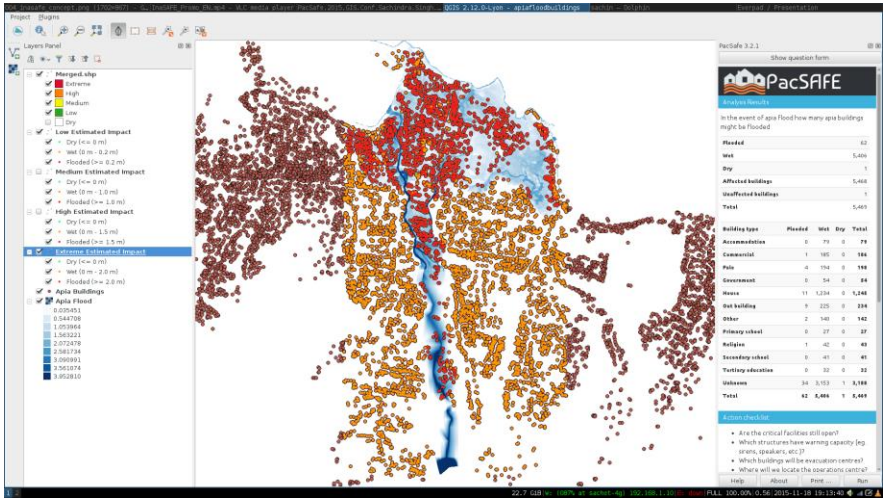


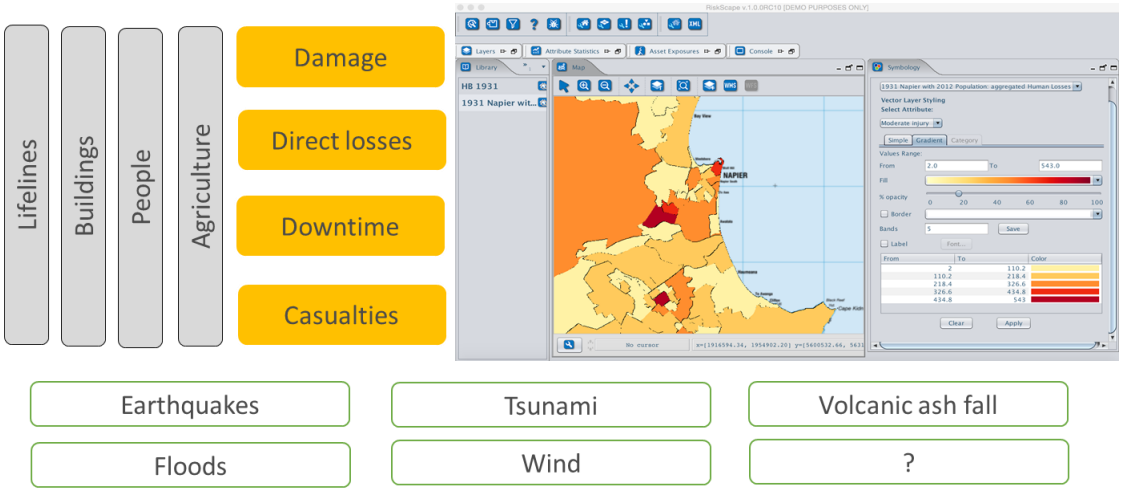
- https://pacstats.maps.arcgis.com/apps/MapJournal/index.html?appid=2b5cad0e20e642de96db85b377fc128c
- Some countries have HH-level GPS – ideal scenario, no modelling needed
- Landscan 2015 / SEDAC-CIESIN GPWv4 used as proxies when no GPS
- Waiting for release of new Worldpop dataset – multi-temporal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


TONGA
FIJI
SAMOA
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
Landscan™ 2015
GPWv4 (UN-Adjusted Population Count 2015)
HH locations
Buffer 1km
Buffer 5km
Buffer 10km
Population Grid
persons / km²
0
1 - 5
6 - 25
26 - 50
51 - 100
101 - 500
501 - 2,500
2,501 - 5,000
> 5,001

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





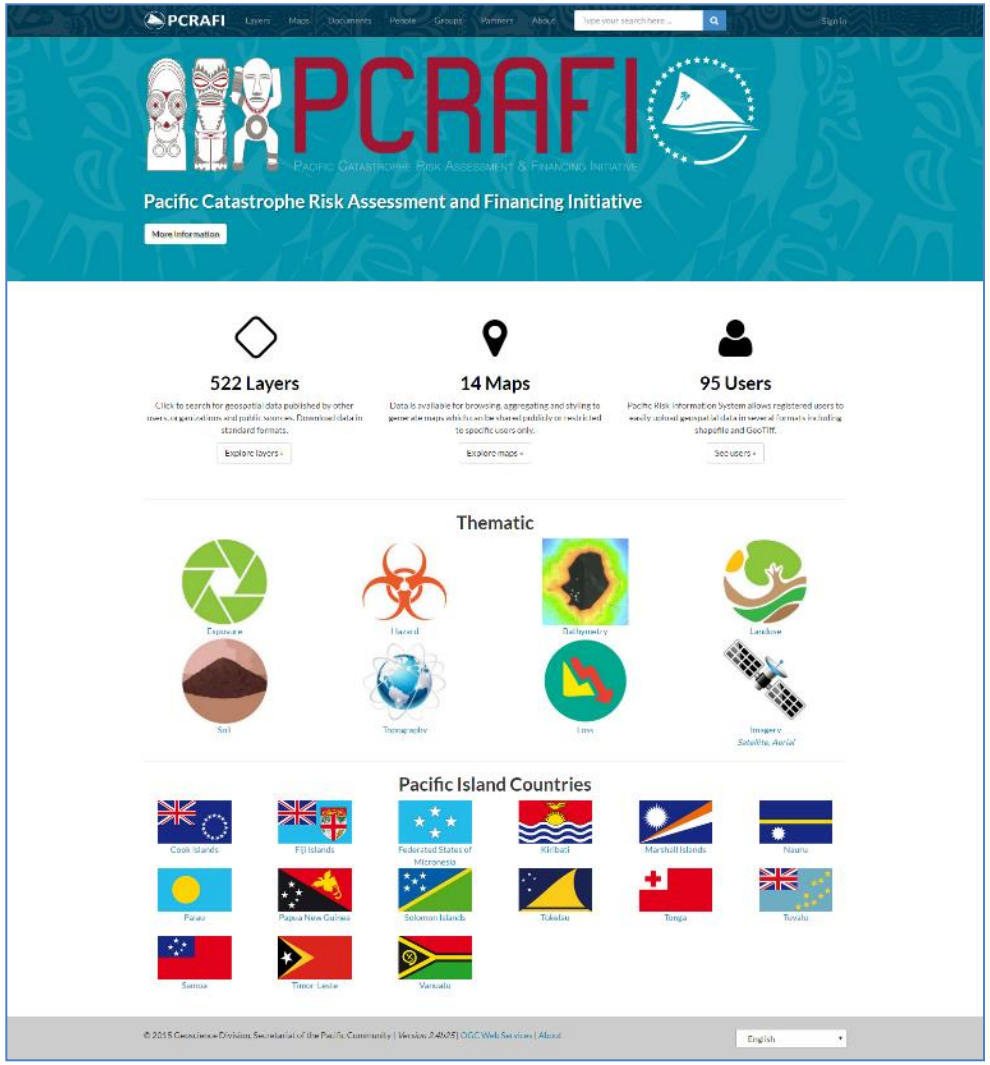
Earthquakes | Tsunami | Volcanic ash fall

Floods | Wind | ?

PacGEO

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

PacRIS



- 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	• Alerts • Documents - Situation reports, newspaper articles, assessments etc. – new and history • Link to PDaLo • Contacts • Calendar	• Damage and loss data - validated and quality controlled	• Historical Hazard and Loss Database • Probabilistic Hazard Models • Geo-referenced Exposure Database • Catastrophe Risk Models and Profiles	• 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

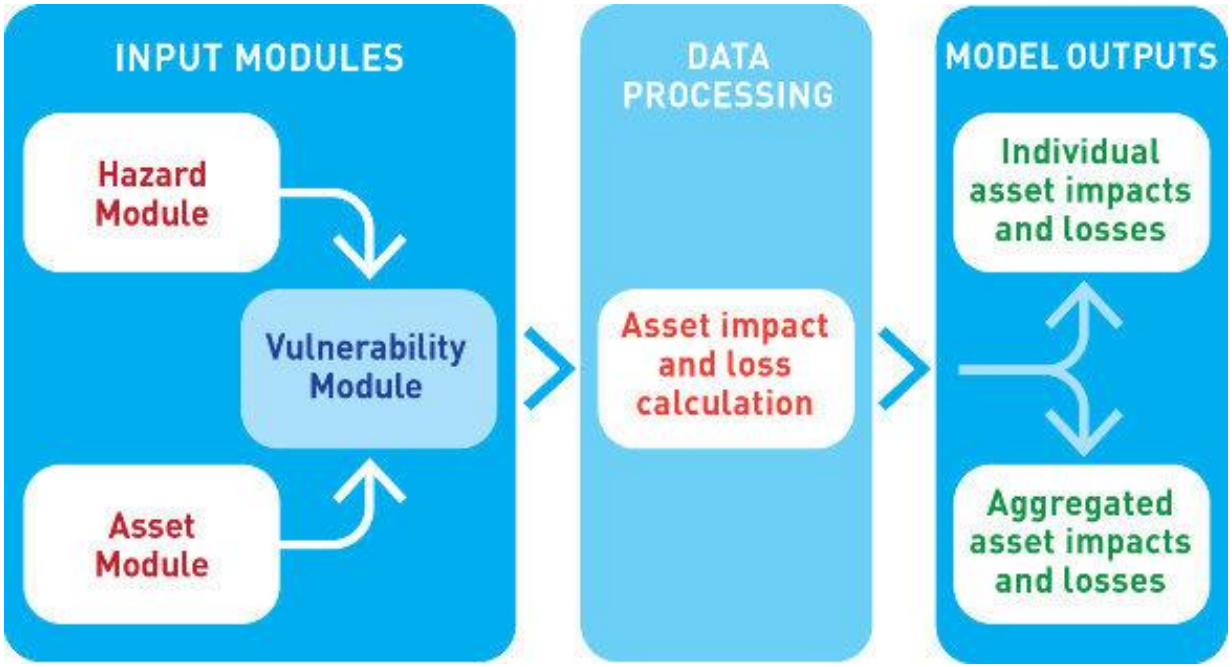
- Efforts undertaken to align currently active risk tool development projects:
  - PARTneR (RiskScape) + PACSAFE

PARTneR vs PacSAFE

	RiskScape	PacSAFE
Hazards	✔ Earthquakes ✔ River flooding ✔ Coastal flooding ✔ Tsunami ✔ Volcanic ash fall ✔ Cyclone winds ✔ Hazard footprints	✔ Earthquake ✔ Floods ✔ Volcanoes and volcanic ash ✔ Cyclone winds ✔ Tsunami
Tool outputs	✔ Economic loss ✔ Infrastructure and building damage levels and loss ✔ Population affected, killed or injured ✔ Exposure	✔ Numbers of buildings / infrastructure affected ✔ Population affected / displaced ✔ Response needs
Primary Users	National Disaster Management Offices Planning Agencies Infrastructure providers Researchers	National Disaster Management Offices Response Agencies
Initial country partners	Samoa, Vanuatu	Tonga

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