



# SOLOMON ISLANDS

*Point Cruz Yacht Club, Honiara*

## 1. COUNTRY INTRODUCTION

### **Description:**

The Solomon Islands are comprised of about 1000 very scattered islands of diverse size. These islands have a total land area of 28,370 square kilometres consisting of volcanic peaks rising up to 2,500 metres, and low lying coral islands less than 3m above sea level. The Solomon Islands are divided into 9 provinces with a total population of approximately 523,000 (2009 estimate) who are almost exclusively of Melanesian descent.

### **Economy:**

The economy consists of a mixed subsistence agriculture, fishing, and forestry on which over 80% of the population depend. Log exports and fisheries remain the major foreign exchange earner for the country. Over-reliance on single commodities magnify the country's susceptibility to external shocks. The islands are rich in mineral resources but these are comparatively under developed apart from the Gold Ridge mine which was scheduled for reopening in early 2011.

### **Water Availability:**

Water resources availability in Solomon Islands varies considerably for each island but on the larger islands can be considered as very abundant.

It ranges from sizeable rivers on the larger mountainous islands with dense rainforests, to those small low-lying atolls and islets which rely upon rainwater harvesting and maybe a thin fresh water lens for their freshwater needs. For example Honiara has abundant water in the Lungga River but limited means and financial resources to extract, treat, and reticulate it. Much of the water provided for Honiara is sourced from small streams, springs and groundwater abstraction bores.

### **Island Vulnerability:**

Cyclones, flooding, drought and seismic events periodically affect the Solomon Islands. Sea level rise also poses a threat to the smaller low islands. Soil erosion and increased sediment load in rivers result from human activities such as large scale clearing from mining and logging activities, as well as impacts from traditional subsistence slash and burn farming, increasing urban development and residential housing. Potential pollution and contamination of water resources have been identified from untreated domestic sewage, small industry discharges (eg fish processing), hydrocarbons from oil storage tanks, mine drainage and leaching discharges from mine waste, and residues of agricultural fertilizers and pesticides. The extent of this contamination is





*Site refurbishment, Lungga River, Guadalcanal*

currently not well understood due to a lack of recent data.

### **Power generation:**

The Solomon's has significant potential for hydropower generation for large, mini and micro hydroelectricity. Apart from some small localised community mini and micro plants, there has been no substantial investment in this sector that has progressed beyond a feasibility study to energy production.

### **Health:**

Water quality analysis available within the Solomon Islands is limited. Faecal coliform and high nutrients have been detected in samples taken from boreholes with the indication that waste water leachate contamination from overflowing septic tanks during heavy rains is a common occurrence and is impacting on water supplies.

### **Environment and Tourism:**

Solomon Islands is recognised for its high level of biological diversity in terrestrial and marine environments. The coral reefs, shallow lagoons and mangroves of Solomon Islands are amongst the most biologically diverse in the world. However, many reefs appear to be currently at most risk due to continued exploitation for food and other resources through the use of unsustainable and destructive harvesting methods. Industrial, agricultural and sewage pollution of water courses, logging and coastal development also threaten coastal, reef and mangrove habitat. Tourism is still a very small

sector and has little impact on watershed and coastal ecosystems at present. Tourism numbers reached 13,748 in 2007 (Solomon Islands National Statistics Office).

## **2. GEOGRAPHIC**

The scattered archipelago of the Solomon Islands, about 1,000 mountainous islands and low-lying coral atolls, lie east of Papua New Guinea and northeast of Australia in the South West Pacific Ocean, between latitudes 5° and 12°S of the equator and longitude 155° and 170°E. The islands include the large high islands of Guadalcanal, Malaita, Santa Isabel, San Cristóbal, Choiseul, New Georgia, and the Santa Cruz Group with many diverse smaller islands. The island chains together measure some 1500 kms in total length. The islands in the archipelago are of two types: they are either of volcanic origin or are coral atolls. The six main islands in the group are volcanic, and are mountainous, blanketed with dense rain forests, with some of the volcanoes on the islands considered active. The lowest point on the islands is the coral atolls at only a few metres above sea level, while the highest is Mount Popomanaseu at 2,310m, on the Island of Guadalcanal. The island chain experiences regular seismic activity, more recently in 2007, a devastating earthquake and tsunami was experienced in the western province with dozens of lives being lost and thousands being dislocated. The provincial capital of Gizo was the worst hit area. The capital city of Honiara is located on the north of Guadalcanal Island.

Map of Solomon Islands



Source: CIA World Factbook, 2007

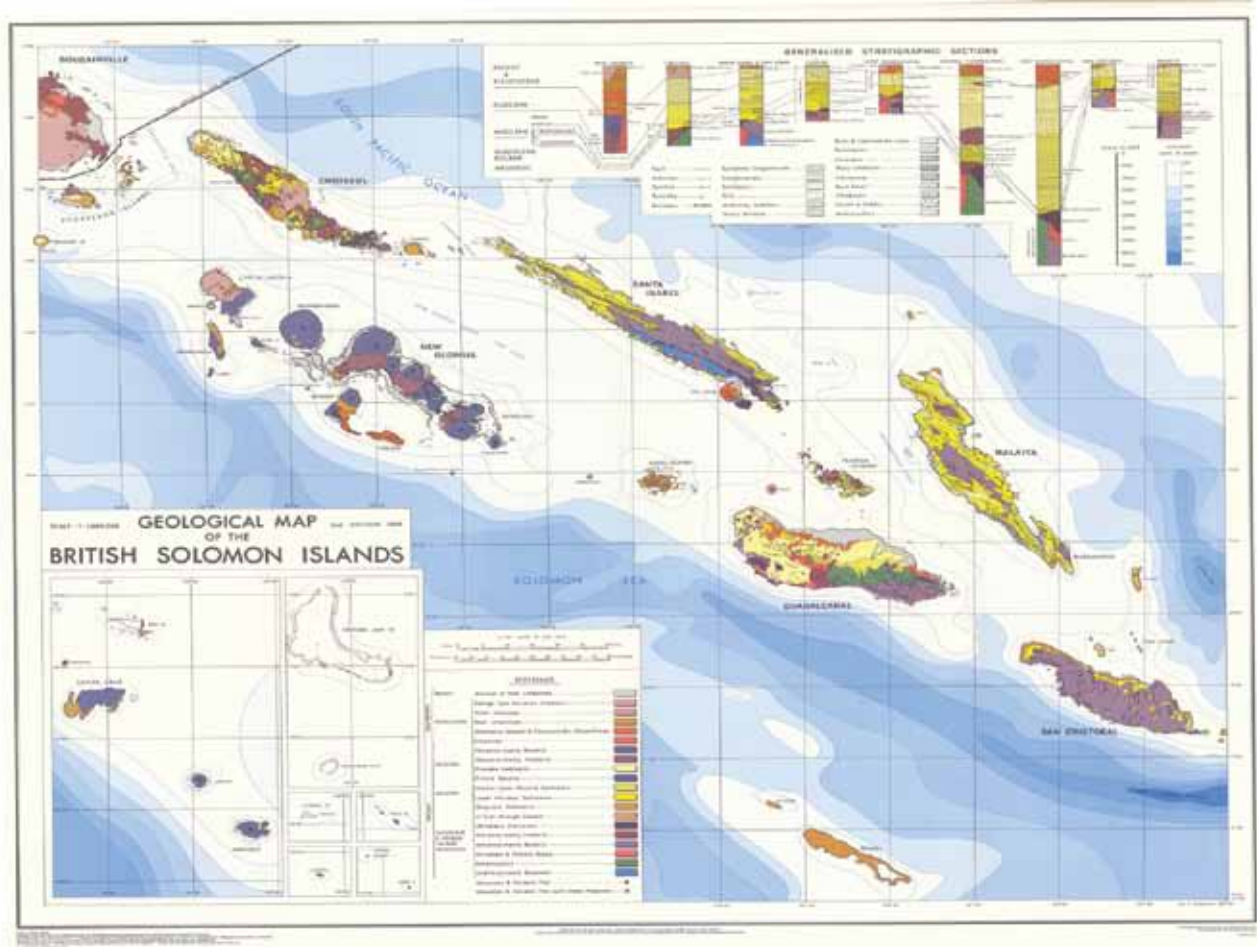
Map of Guadalcanal Island showing Lungga River catchment



(after Falkland and Abawi, 2006)



## Solomon Islands Geological Map 1983



[http://eusoils.jrc.ec.europa.eu/esdb\\_archive/EUDASM/Asia/lists/coc.htm](http://eusoils.jrc.ec.europa.eu/esdb_archive/EUDASM/Asia/lists/coc.htm)

### 3. CLIMATIC

The Solomon Islands has a climate typical of many tropical areas, being characterised by moderately high and uniform temperature and humidity, with abundant rainfall in all months, in most areas, especially in the mountains. The range of average maximum temperature deviation is approximately 2°C throughout the year. Rainfall is the least uniform of the climatic elements, as topographical effects cause significant variations between locations. The average annual rainfall is mostly within the range of 3,000 to 5,000 millimetres with the majority of monthly rainfall amounts in excess of 200 millimetres, with the exception of Honiara which experiences a distinct dry period from May to November. The wettest months are during

the Northwest monsoon season, with reduced rainfall during February when the equatorial trough is normally furthest south. Locations on the southern sides of the larger islands also tend to have a rainfall maximum between June and September. As there are no rainfalls stations at altitude (with long-term averages) the effect of increasing rainfall with height above mean sea level is unrecorded and an isohyetal map is currently not available. Depending on the local topography, rainfall will increase with elevation, with a maximum falling expected at about the 600 to 1,000 metres level on windward slopes. It is possible that the heaviest average yearly rainfall could reach up to 9,000mm at some elevated sites. The extreme falls seem to be confined to the transition months of December and April when



*Lungga Gorge, site of possible hydroelectric power plant*

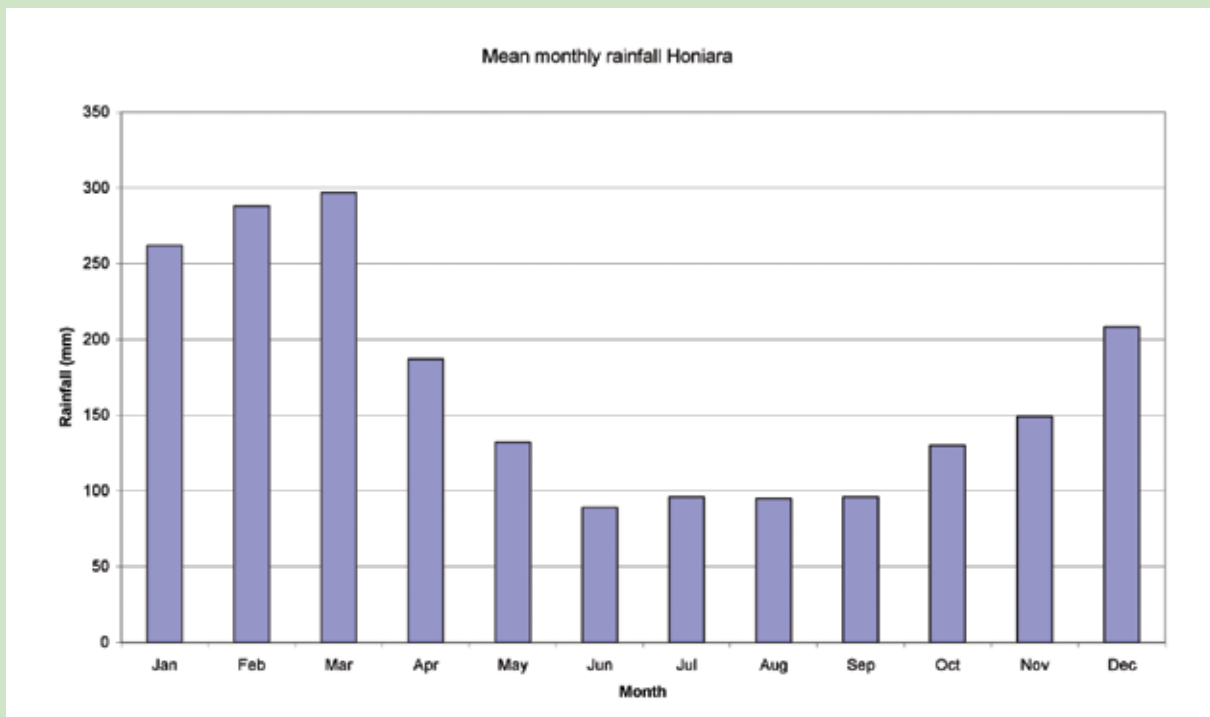
the equatorial trough is migrating across the islands. The islands because of their proximity to the equator, are less subject to the damaging effects of tropical cyclones than elsewhere in the southwest Pacific, though cyclones still pose a serious threat each year. Additionally due to the low latitudes of the Solomon's, atmospheric pressure has only a small variation from month to month, recording little change from day to day except when a tropical cyclone is in the area.

#### Monthly Mean Climate Data for Honiara, Guadalcanal

Observation Item	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Period for the Mean
Temperature (°C)	27.5	27.2	27.4	27.2	27	26.5	26.5	26.2	26.8	26.9	27.4	27.4	27.0	Jan 2000 – Dec 2008
Precipitation (mm)	262	288	297	187	132	89	96	95	96	130	149	208	1937	Nov 1954 – Aug 2009

*Source: Solomon Islands Meteorological Service*

#### Monthly Mean Rainfalls Honiara, Guadalcanal





*Rove Stream, Honiara botanical gardens, stream gauging*

Prior to the implementation of Pacific HYCOS, 2007-2010, the NHS had in large ceased to operate a regular field program with no operational automatic raingauges. To address this shortfall, 6 automatic raingauges were installed in the Honiara and Guadalcanal Plains area, including one at the main Solomon Islands Meteorological Service synoptic station located at Henderson Field, Honiara International Airport. Apart from the long term Solomon Islands Meteorological Service, SIMS, daily data, there is no available data for short or long term rainfall analysis. The following table identifies the new rainfall stations.

Rainfall stations installed by Pacific HYCOS located on Guadalcanal.

No	Station	Elevation (m)	Location and coordinates	Period of observations	Average rainfall
5004652	Honiara	2	Henderson Airfield 9° 25' 44" E 160° 02' 50" S	? - Open	1937
5004051	DGMWR Office	71	Honiara City 9° 26' 20" E 159° 56' 20" S	2009 open	1934 1986 only
5004651	Mt Austin	250	Honiara Hinterland 9° 28' 32" E 159° 58' 49" S	2009 open	NA
5006051	Rate School	52	Lower Tina 9° 30' 10" E 160° 06' 46" S	2009 open	NA
5006950	Tetere Prison	10	Guadalcanal Plains 9° 27' 06" E 160° 12' 40" S	2009 open	NA
333 Temp No	Tina	75	Below Proposed powerhouse 9° 31' 52" E 160° 05' 48" S	2009 open	NA

*NA records too short for analysis*



*Limestone formations, Lungga Gorge*

## 4. WATER RESOURCES

### 4.1 General Description

Due to the diversity and great geographic spread of the Islands, water resources vary from one island to the next where the smaller islands which have no surface water are limited to rainwater harvesting and where geologies permit formation of a thin fresh water lens within a coral island environment. The larger islands have a range of surface water sources from small streams to very large rivers flowing from a high mountainous environment. The longest river in the Solomons is the Lungga River with a catchment area of 377km<sup>2</sup> (SPREP). With rural populations accounting for approximately 85% of the country's population, water supplies for villages and outlying communities from both surface water and groundwater is very important. Limited information is available on the water resource availability, and hydrological data is largely absent due to an inconsistent and fragmented approach being taken for the assessment of this resource. Of the limited data available, most data is confined mostly to Guadalcanal and the Honiara area, along with limited usage data. Groundwater resources are currently not measured. Water losses in reticulated systems are estimated to be as high as 60% within Honiara through system transmission losses. On the larger islands the issue of water quality is considered to be one of the major concerns, particularly in

areas of high impact activities such as logging and mining, or fish processing bounding the coastal fringe. These activities are considered to impact on the riverine and coastal environments due to increased sediment loads especially during times of heavy rains.

Rainfall and river flows are highly variable in certain areas, with protracted dry periods which may compromise drinking water supplies and agricultural yields resulting in severe food shortages, followed by periods of significant flooding and damages. Floods in the high mountains can be particularly damaging to road and bridge infrastructure and villages located close to the rivers. In logging areas, the damages are particularly severe with resultant irreparable soil erosion and mass debris slides of earth.

Development of water resources to date has been primarily for the purpose of potable and domestic needs, with some development for agricultural and industrial purposes and very limited hydro electric energy generation. Groundwater development has mostly taken place in and around Honiara on the island of Guadalcanal for Honiara City water supply. Industrial use of water is currently limited where only light industries are present such as fish processing. Irrigation is currently only at a very small scale, either at village or demonstration level. Irrigated rice on the Guadalcanal Plains using river water was developed in the 1970's with



a robust export industry but this industry slowly collapsed many years ago and the land is now extensively covered with Oil Palm Plantations. Hydroelectric power generation options still remain undeveloped despite a significant international donor investment over many years. There have been feasibility studies undertaken for some quite significant schemes which have not progressed. There appears to be significant development potential of the water sources however the current political situation seems to be a restricting factor for the investment needed to realize this potential. Logging catchments have not been studied by HYCOS but it is understood that uncontrolled sediment runoff to the ocean is very significant at numerous logging sites. The Goldridge Gold Mine has a mine tailings dam but there are some smaller in-stream operations that have few controls for sedimentation and control of mining wastes into the rivers. Apart from a severe localized effect on villagers and the ocean, potable water supplies are considered to not be compromised by degraded water quality, where the current scale of activities is relatively small.

#### **4.2 Major Floods and Droughts**

In 1986 during Cyclone Namu, flooding claimed about 100 lives in the Guadalcanal plains. In 1995, drought severely affected most parts of the country causing severe food shortages. With increasing frequency of climate extremes occurring there is need for a more informed understanding of the potential risks needs to be developed and information disseminated to the general public. Risk from floods continues with Guadalcanal experiencing several severe events in recent decades with loss of life and damages to important infrastructure. Due to reduced capacity within the National Hydrological Service, NHS, a functioning hydrological monitoring program has not been possible and there is no available data for assessment of either droughts or floods enabling more informed decisions on appropriate adaptation and mitigation measures.

#### **4.3 Socio-economic characteristics**

Most Solomon Islanders live in rural

communities based on traditional village and clan social structures and are dependent on subsistence agriculture supplemented by cash cropping, fishing and forest products. Use of water is based on traditional cultural use for fishing, food preparation, laundry and recreation. Limited use is made of water for village based irrigation. Most use can be considered in-stream where any degradation of the resource through destructive catchment uses such as logging or mining, can have a detrimental and long term or permanent effect on the communities which rely upon it. Groundwater use and rainwater harvesting are the only options on the outer small islands. Approximately 16 per cent of the population live in urban areas with increasing migration to cities and towns in the past decade or so contributing to substantial urban unemployment and accompanying social problems. Along with this increased urbanisation is the poor infrastructure including degrading reticulated water supply systems especially in Honiara, where a mix of surface and groundwater is used. Solomon Islands still has limited primary health care facilities and infectious diseases, including water borne disease, still claim lives. There is abundant opportunity with the larger rivers on all larger islands for hydro electric power production for local and industrial use, where current diesel based energy is extremely expensive. Apart from a few small micro and mini hydro systems, there has been little progress to date on hydro electric power generation. This is compounded by the difficulty in sustaining hydrological monitoring systems, or implementing site investigation works and raising capital for construction. A major issue precluding effective data collection programs being sustained is land owner based where damages are often effected to any public or remote monitoring equipment deployed and/or the subject of large compensation claims.

## **5. HYDROLOGICAL INFORMATION**

Hydrological monitoring and assessment commenced in the Solomon Islands in the mid 1960's with the measurement of river flow



commencing on the Lungga River in 1965 under the British Administration. It appears that no other sites were installed until 1977 when the Lungga Gorge station was installed. During the mid 1980's additional rivers stations were constructed collecting very insubstantial data.

The Solomon Islands has no National Hydrological Service, NHS. The function is undertaken by the Hydrology Unit coming under the Department of Mines and Energy, DME, Ministry of Natural Resources which was setup post independence in 1978. Little international assistance has been advanced to the NHS apart from an NZAid funded assistance program running from 1982 to 1996 when significant training and transfer of technology was given in surface water and groundwater hydrology. During this period some quite good data was collected, however on cessation of this assistance, 1996, the hydrology program appears to have quickly waned to the point where data ceased to be collected. This has been compounded by the ethnic disturbances commencing in 1999 and running for 3 years. The reliance on development aid funds seems essential to support any future NHS operations. Many of the NHS staff who were present in the 1980's are still with the Hydrology Unit today, however little succession planning has been considered.

Pacific HYCOS implemented in 2007 and has supplied considerable assistance to the NHS and made the best effort to renew the interest in hydrological data collection. A brief review of the data on the TIDEDA database shows that apart from the Lungga River, the data is of limited use due to many gaps in the record, with sometimes up to 40 or 50% of missing or corrupted data. Few flow discharge measurements have been done since 1996 on the existing stations to establish rating curves limiting the application of the water level data being collected. Donor support, technical assistance and training opportunities since the NZAid Project, has been extremely limited for the Solomon Islands NHS and they have struggled to maintain a consistent and robust field program to collect even basic datasets.

## 5.1 Hydrological Stations

When Pacific HYCOS implemented no hydrological stations were operating in the Solomon Islands. The reasons for no operational hydrological stations are largely institutional, coupled with limited operational budgets. There is a poor recognition within government of the value of the hydrological data, and higher government priorities have resulted in limited resources for the skilled and capable staff being able to undertake relevant hydrological activities. The following number of hydro meteorological sites are listed on the Solomon's TIDEDA database system;

- Instantaneous Water level and flow, 12
- Periodic discharge only, 26
- Rainfall, 17
- Groundwater, 37

As indicated the review by Pacific HYCOS in 2007, identified that no sites were operational and essentially no data had been collected or added to the database since the mid 1990's, despite some good equipment being on hand. Transport to access the sites and empowerment of staff to undertake this work seems to be a contributing factor.

## 5.2 Study Catchment Introduction

Pacific HYCOS in discussion with the Solomon Islands DME, elected to support the Lungga River catchment as the main study catchment. This is the only catchment with some long term data available and rating curves established, however data collection ceased in the mid 1990's. Pacific HYCOS supported the installation of two additional river flow stations plus a number of raingauges on Guadalcanal. The Lungga River is on the city boundary of Honiara, has periodic flooding problems, has encroaching urban sprawl, hydro electric power options and is an important local asset for recreation, and small business such as the local car washing industry with in-stream use.





Bilibili (bamboo raft) Lungga river

Pacific HYCOS also supported new sites on the much smaller largely spring fed Rove Stream rising in the Honiara foothills, important for water supply, and the Tina River to the east of Honiara, an important Hydro electric development option. Despite the close proximity of these stations to Honiara (the Rove is 1 km from the Office located securely in the Botanic gardens) these stations could not be sustained by the hydrological staff of DME, where no effective data has been collected from these sites since they were installed 2 years ago.

### 5.2.1 General Description

All three study catchments rise on the northern side of Guadalcanal Island and range from the Rove, a small spring fed stream, to the Tina a significant river with hydro electric potential to the Lungga river, Solomon's largest. The stream upper catchments are forested, with lower clearings being pasture land with limited animal grazing and village food production, this terrain

is interspersed with some deeply incised rugged gorges. Access to rivers on Guadalcanal depends on road availability and conditions. In rural areas the roads are very bad and impassable during the wet season. Much of the islands have no road access.

### 5.2.2 Measured Hydrological data

Apart from that of the Lungga River, there is little quality hydrological information available for the Solomon Islands. The DME hydrology unit has recently collected some data from the outer islands for rural electrification potential using hydro electric energy, but this data is very limited and with no discharge ratings developed. The following table identify the hydrological stations and their locations which were supported by Pacific HYCOS.

### Hydrological stations supported by Pacific HYCOS

No	Station and number	Location	Area (km <sup>2</sup> )	Observation period	Observation items
1	Lungga 5004601	Highway Bridge 09° 25' 40" S, 160° 01' 41" E	377	1965 to 1996	WL, Q, RF
2	Lungga NA	Betikama College 09° 26' 13" S, 160° 02' 00" E	375	2009 open ?	
3	Rove 5003901	Botanic Gardens 09° 25' 59" S, 159° 56' 28" E	NA	2009 open ?	WL, Q, RF
4	Tina NA	Below Intake NA	NA	2009 open ?	WL, Q, RF

WL = Waterlevel, Q = discharge flow, RF = Rainfall ? assumed to be open NA not available



*Lungga River, construction of security housing*

### Catchment 1 – Lungga at Highway Bridge

The longest period record for any measured river station in Solomon Islands is on the Lungga River at the Bridge Station No: 5004601, with a catchment area of 377 km<sup>2</sup>. The period of hydrological data is from 1965 to 1996, when the site ceased to be operational and maintained. To address this problem, Pacific HYCOS using equipment supplied under UNESCO funding in 2006 upgraded the Lungga station in 2008 to a fully operational station. The site was vandalised and all equipment taken within 3 months of its installation. Better security measures were implemented and the site upgraded with Pacific HYCOS funded equipment but despite high security measures, it was vandalised again within 2 days of commissioning. The site was abandoned and in 2010 the DME relocated the station 2 km upstream to Betikama College where it is located within a secure school compound. The DME Hydrology Unit has been unable to supply any data from this new site to date for this publication. Therefore only historic data can be presented. Security issues such as these can be an ongoing problem in many Melanesian Countries.

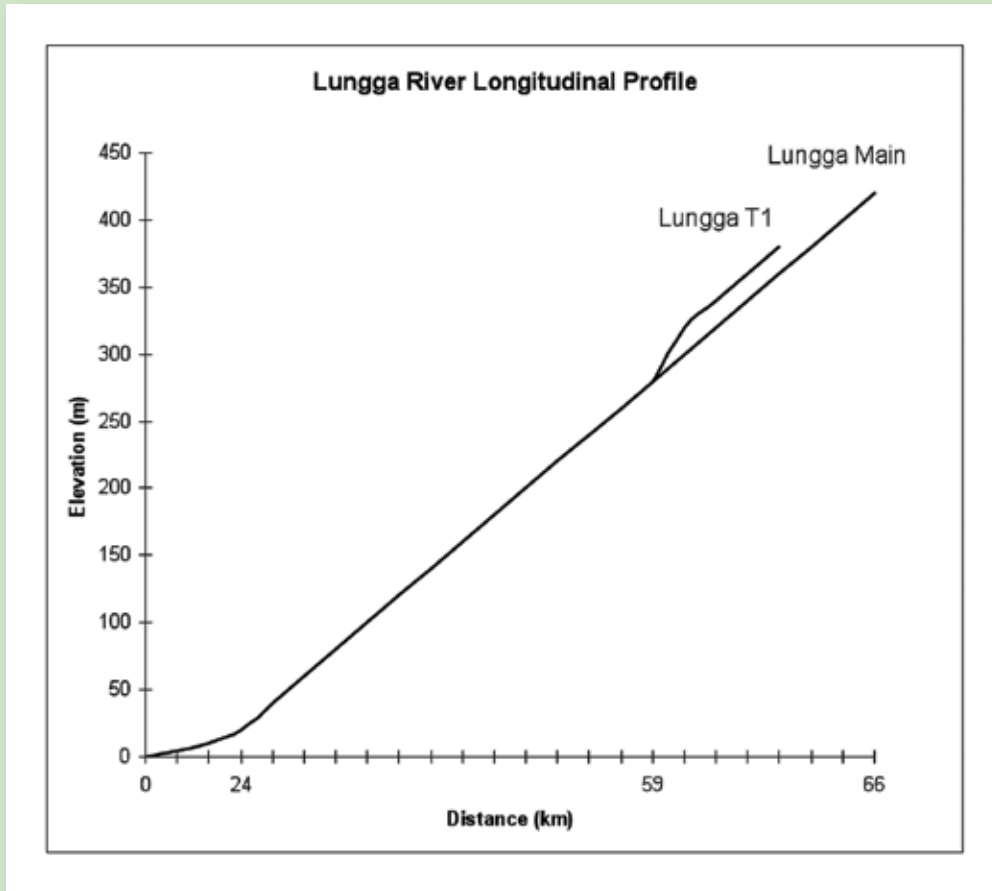
Map of North West Guadalcanal showing the Lungga Catchment.



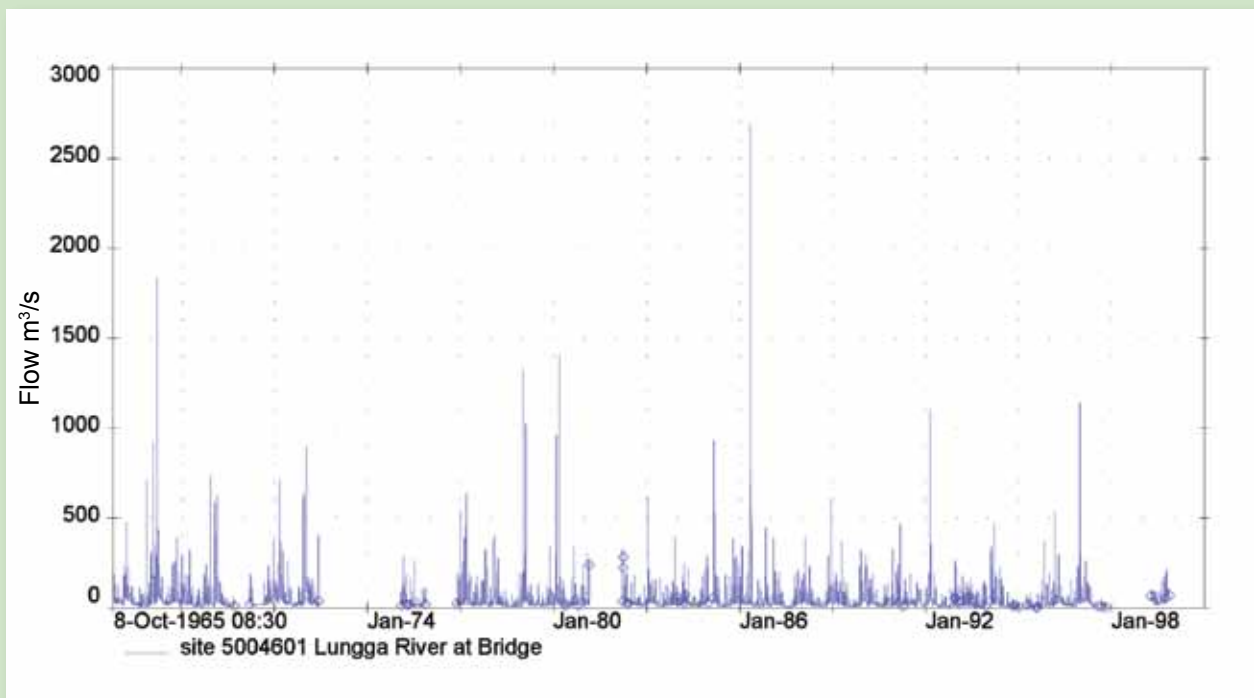
Source: SOPAC 2010



Lungga River longitudinal profile.



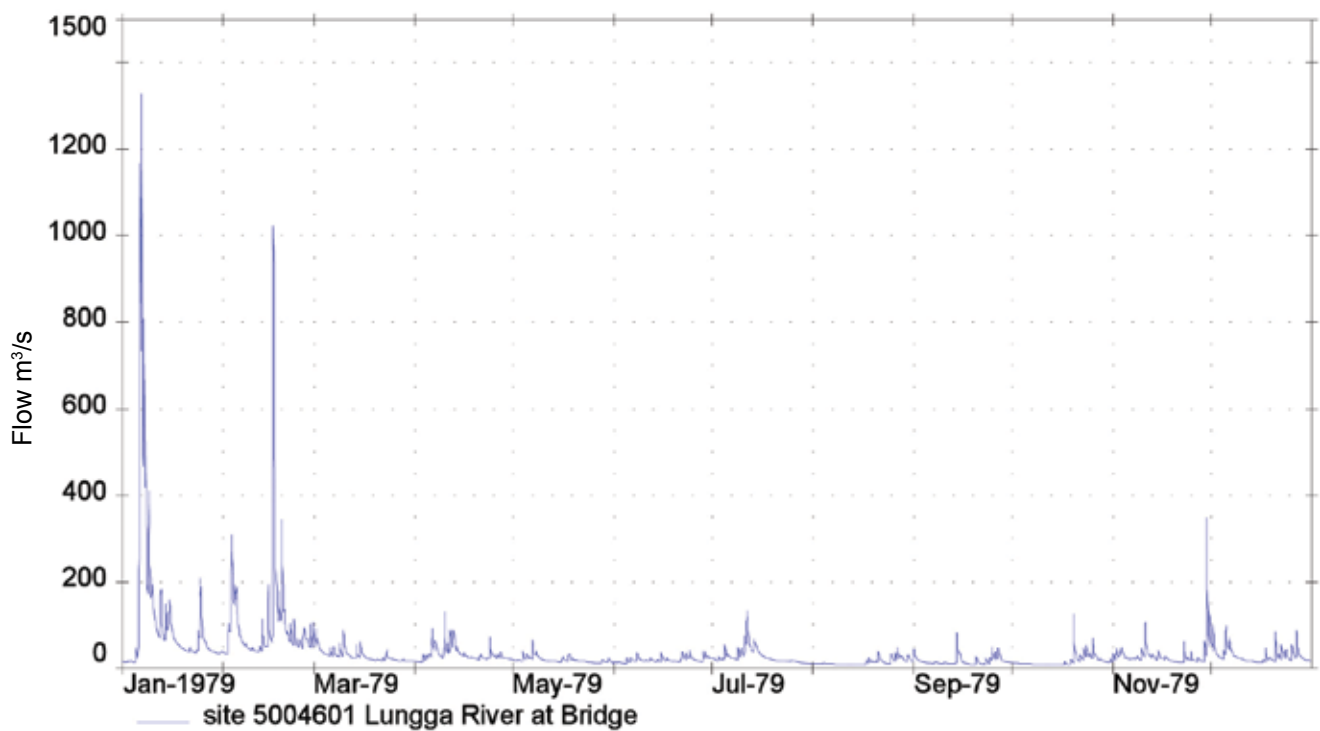
Long Term Variation of discharge (Instantaneous), Lungga River, Station No. 5004601





*Lungga River, water level measurement instrumentation*

Long Term Variation of discharge (Instantaneous), Lungga River, Station No. 5004601



Source is hydro.mtd Site 5004601 Lungga River at Bridge  
 From 8-Oct-1965 08:30:00 to 1-Jan-2001 24:00:00  
 Interval = 0  
 Flow m<sup>3</sup>/s

Year	Mean	Coeff. of Var	Minimum	Date	Maximum	Date
*1965	41.561	0.49	24.848	16-Dec-1965 05:07	186.75	31-Oct-1965 21:21
1966	39.824	1.03	4.7860	12-Sep-1966 03:33	709.78	16-Nov-1966 16:27
1967	56.388	1.31	15.184	25-Dec-1967 08:24	1836.9	29-Mar-1967 01:47
1968	37.019	1.08	5.2790	7-Sep-1968 02:18	733.81	12-Dec-1968 15:08
*1969	35.421	1.46	6.2240	26-Aug-1969 06:12	623.78	27-Feb-1969 02:11
*1970	34.083	0.84	12.197	28-Apr-1970 16:47	380.32	29-Dec-1970 01:47
1971	49.817	1.14	10.266	27-Sep-1971 11:51	715.07	8-Mar-1971 12:53
*1972	64.178	1.70	9.0010	26-May-1972 12:00	899.53	11-Jan-1972 20:01
1973	No values for this year					
1974	No values for this year					
*1975	25.954	0.88	5.9270	9-Jul-1975 18:00	291.03	1-Mar-1975 21:06
*1976	27.228	0.72	14.352	18-Dec-1976 00:29	187.57	3-Dec-1976 21:05
1977	44.290	1.17	10.850	8-Dec-1977 08:39	638.93	14-Mar-1977 09:12
1978	24.077	1.14	6.3540	15-Aug-1978 07:30	408.06	7-Feb-1978 22:27
1979	37.625	1.93	7.7890	15-Aug-1979 07:30	1329.2	7-Jan-1979 02:52
*1980	33.983	1.90	9.4970	17-Jun-1980 24:00	1407.7	24-Mar-1980 04:47
*1981	36.868	1.03	13.614	14-Jan-1981 21:15	305.72	31-Jan-1981 23:16
*1982	32.344	0.95	7.3140	6-Dec-1982 12:00	332.05	24-Mar-1982 12:00
*1983	30.608	0.97	6.5060	18-Jul-1983 24:00	619.94	25-Jan-1983 18:42
*1984	29.580	0.81	6.5060	26-Sep-1984 03:10	289.00	17-Dec-1984 21:33
*1985	40.352	1.66	7.1430	21-Jul-1985 16:18	932.99	3-Mar-1985 15:53
1986	38.688	3.01	5.1620	31-Aug-1986 18:00	2693.8	19-May-1986 13:15
1987	30.569	1.10	3.9490	13-Sep-1987 23:30	391.17	5-Feb-1987 01:45
1988	34.552	1.15	6.4590	30-Sep-1988 12:30	609.31	27-Dec-1988 14:15
1989	30.933	0.89	5.7970	31-Aug-1989 18:30	372.74	11-Apr-1989 22:32
*1990	35.939	0.94	5.5820	1-Sep-1990 08:30	328.36	19-Dec-1990 17:15
*1991	34.668	0.81	7.5880	25-Dec-1991 19:30	464.57	15-Mar-1991 00:15
*1992	33.582	1.63	5.3630	13-Oct-1992 13:00	1103.9	25-Feb-1992 05:30
*1993	22.846	1.05	3.1850	8-Nov-1993 00:30	228.45	2-Jan-1993 08:00
*1994	28.703	1.24	2.5470	28-Dec-1994 17:45	473.04	25-Mar-1994 09:30
*1995	18.094	1.31	1.9050	4-Jan-1995 23:30	374.88	25-Oct-1995 23:30
1996	44.468	1.55	6.9120	5-Oct-1996 03:45	1140.8	25-Dec-1996 20:35
*1997	33.877	0.95	4.8380	2-Nov-1997 15:30	291.82	6-Jan-1997 09:50
1998	No values for this year					
*1999	47.858	0.56	12.401	24-Jul-1999 03:15	227.93	21-Oct-1999 21:45

Average Annual Minimum 7.3989 Maximum 964.97 (complete yrs)

\*\* denotes years with gaps in the data or incomplete years

Coeff. of Var. = sd/mean

Minimum is 1.90500 at 4-Jan-1995 23:30:00

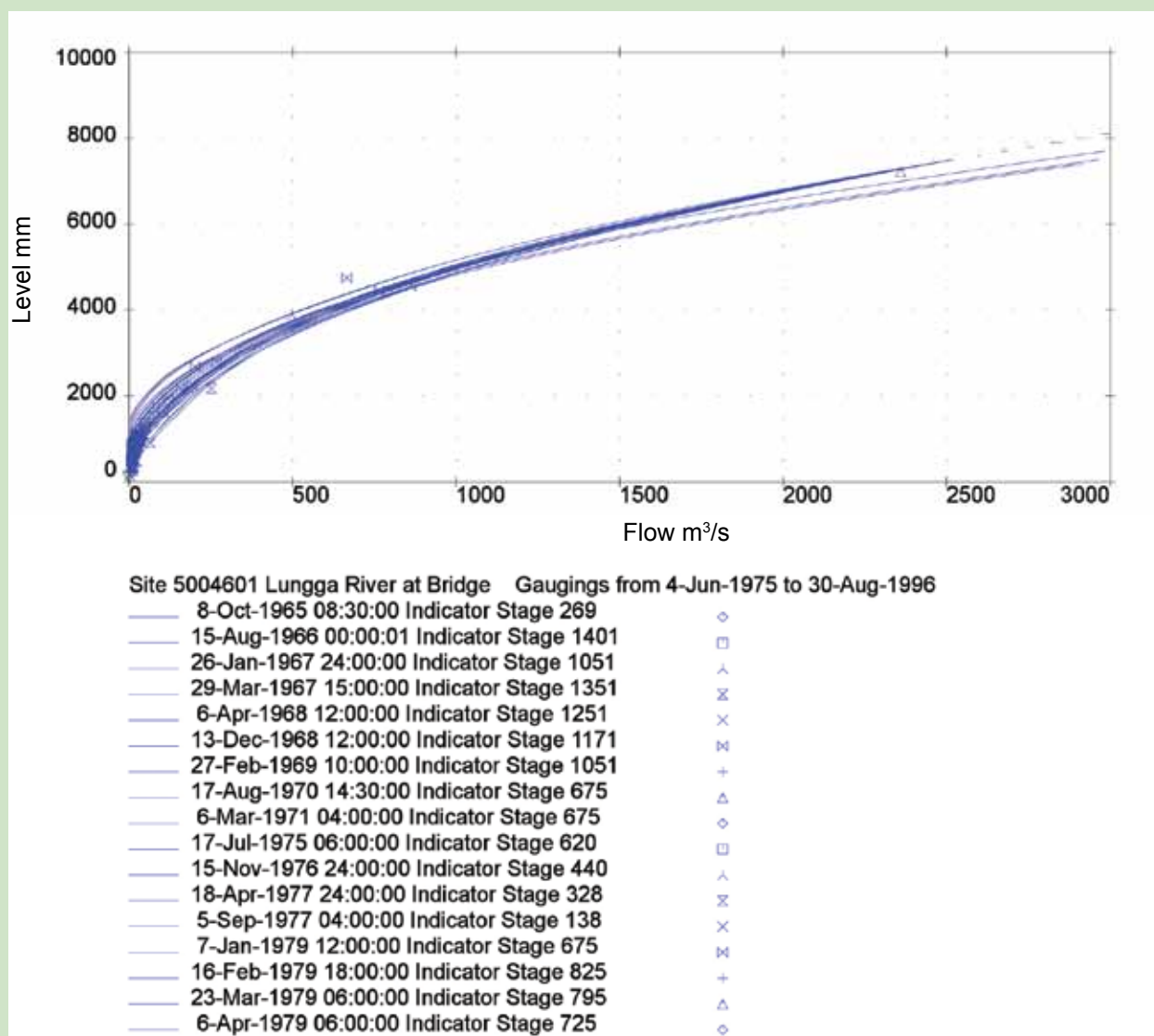
Maximum is 2693.83 at 19-May-1986 13:15:00

Mean is 35.9787

Std. Dev. Is 51.8569

Coeff. of Var. is 1.44

## Discharge rating curve Lungga River - Site No. 5004601



The TIDEDA database identifies 36 discharge ratings developed over 30 years, (not all are shown on the rating curve plot), the last rating was updated in 1992. From the available data and ratings, it is evident that the Lungga is a highly mobile river with at least annual rating changes necessitating regular gaugings in order to monitor the rating curve. The flood portion of the rating curve is very poorly supported by discharge measurements with only one flow measurement undertaken above 650 m<sup>3</sup>/s.

### Lungga River Maximum and Minimum Discharge Statistics

Site Names	Minimum gauged		Date	Maximum gauged		Date	Max level recorded (m)	Date	Total No of discharge measurements
	Level m	Flow m <sup>3</sup> /s		Level m	Flow m <sup>3</sup> /s				
Lungga at Bridge	NA	1.9	04/01/95	7.23	2,694	19/05/86	7.23	19/05/86	216
Rove at Botanic Gardens	Discharge measurements not on database & not accessible, all taken at limited low flow range								6

Note, the new Lungga at Betikama site has no discharge measurements available





*Lungga River, Honiara carwash, a commercial venture*

The last known discharge measurement was undertaken at Lungga Bridge in August 1996 and the last filed discharge rating was updated in February 1992. The maximum rated discharge is 2,964 m<sup>3</sup>/s on 19th May 1986, this was effectively the flood peak of the cyclone Namu event. The Tina River has no discharge measurements filed at this stage on the database.

## 6. COMMENT

In general there is limited usable hydrological data available for the Solomon Islands due to poor and fragmented records, few discharge measurements being undertaken and uncertainty in any rating curves which have been developed. This is despite the Solomon's commencing hydrological monitoring over 40 years ago and having some 100's of station years of data. Over the last decade very little hydrological data has been collected, in part due to institutional limitations, commitments and limited ongoing financial support for operations. The data that is available is useful for the basic calibration of catchment models and for identification of some individual storm or drought sequences and only if they were measured. A minimum of 10 years of consistent and continuous data is needed for hydrological statistics to be derived and a review of the data has shown this to be lacking. The staff of DME Hydrology Unit have shown a fair level of commitment during Pacific HYCOS to the

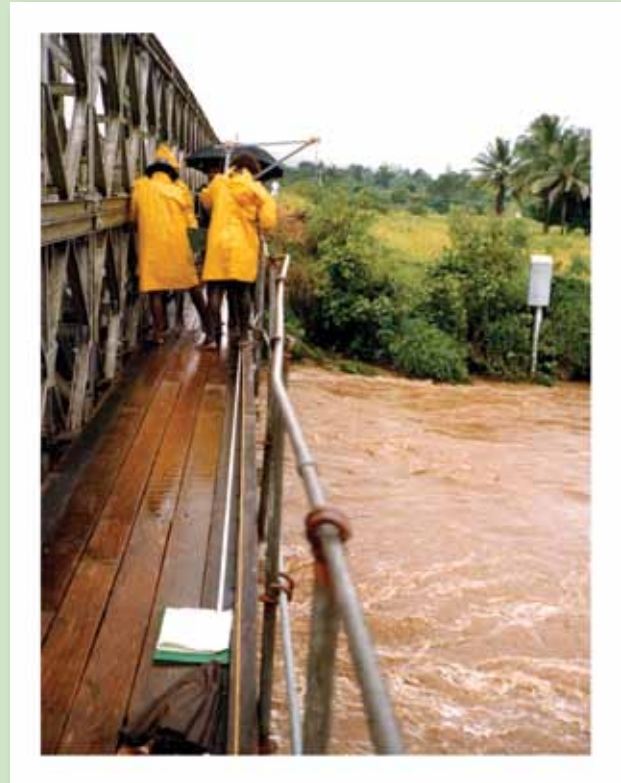
collection of hydrological data but will require continued support to ensure the development of robust datasets for the short to medium term. Where these datasets are available they will assist government and stakeholders alike to make a more informed assessment on the development and sustainability options of the nation's water resources. It is unfortunate that the NHS staff have had little to no access since the NZAid Project to training courses, capacity building or professional development either in the Solomon's or offshore, and their skills and capacity to undertake such work remain much depleted for operational hydrology. There are no professional hydrologists within the DME Hydrology Unit who might be able to better advance the operational program, and develop capacity and address the serious and ongoing issues recognised during the Pacific HYCOS implementation and the preparation of this publication. The hydrology program is driven from a largely technical base with only modest skill levels.



## 7. PHOTOGRAPHS



*Lungga Bridge during Cyclone Namu in May 1986  
(Source Bob Curry)*



*Undertaking flood discharge measurements Lungga River  
from the Highway bridge during Cyclone Namu 1986,  
note the water level station on the left bank. (Source Bob  
Curry)*



*Refurbishment of Lungga at Bridge Station in June 2008*



*Inspection of Ngalimbu River, downstream of Tina  
River inflow, looking south to the mountain spine of  
Guadalcanal*



*Automatic raingauge located at Rate School, Guadalcanal  
foothills*

