

to go in CCSP/SI-25

TRIP REPORT NO. 22

GEOLOGICAL IMPACTS OF CYCLONE NAMU  
ON THE COASTAL PLAIN OF GUADALCANAL,  
SOLOMON ISLANDS - JUNE 1986

by

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## INTRODUCTION

In November-December 1985, coastal mapping and nearshore sediment sampling was undertaken over the Guadalcanal coastal plain (CCSP/SI-25). A report is in preparation. Cyclone Namu struck on May 20th 1986 and it was decided to revisit the area in early June to observe changes caused by flooding and wave action and to carry out an aerial photographic reconnaissance.

## DAILY ACTIVITIES

Thursday 5/6/86

- Departed Suva, travelled to Solomon Islands.
- Discussed work programme and results of coastal mapping project with Stephen Danitofea and Rodney Walshaw.
- Patrick Nanau (SI geologist working on coastal mapping project) has resigned. He may convert resignation to 6 months leave without pay but, in effect, this means that now no one in Solomon Islands is actively involved in the coastal and nearshore mapping project.
- Arranged meetings with Physical Planning Division and Energy Section of Natural Resources.
- Began planning low level aerial photography of coastal plain and river valleys with Stephen Danitofea, explained objectives of work programme to James Saliga and members of the National Disaster Council (NDC) (Barry Clark, Milton Sipisphere, and George Lepping). Received approval to use Solair Islander aircraft; NDC to cover charter costs.
- Invited Australian Film Commission film crew make to video from aircraft but the proposed flying height is too much for them.
- Discussed effects of logging on recent flooding with Geoffery Dennis (ex-public administrator and botanist), inspected 1944 air photo mosaics in his possession and arranged to borrow them to compare river patterns and forest cover in 1944 with that shown on 1984 photos.
- Discussed flood damage and cyclone effects in regard to logging, land clearing and cultivation with Ron Cannarella (Forestry officer with Guadalcanal Province).

Friday 6/6/86

- Meeting with Donald Kudu, (Chief Planning Officer, Physical Planning Division) and Stephen Danitofea. Discussed plans for recording flood damage and the use of geological mapping for planning future developments on the Lungga delta. Kudu will take part in the aerial reconnaissance.

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- Meeting with Richard Haist (Energy Section of Natural Resources), Graham Baines (Environmental Section of Natural Resources), Donald Kudu and Joe Hackler (Physical Planner with Guadalcanal Province). Discussed geological inputs for planning developments on the coastal plain, especially in the Lungga delta region.
- Development proposals here include : two industrial estates, ship docking facilities, a new hospital, a village resettlement, fuel storage tanks with an offshore unloading terminal and a LPG terminal and storage area.
- Planned boat survey for Monday to Wednesday next week with Kiplin Kalena and Anthony Bana (field assistants with the Geology Division). Arranged field equipment and purchased outboard motor fuel.
- Plotted flight path for air photography with Stephen Danitofea and worked out flying heights.
- Requested service message to be sent to Tumumbosa village to notify Patrick Nanau of coastal inspection.
- Made flight arrangements for Saturday morning through Stephen Booth (acting flight controller for NDC).
- Had further discussions with Ron Cannarella and Joe Hackler on coastal mapping etc.
- Met Fred Taylor; discussed sea level changes around Guadalcanal and elsewhere.
- Made appointment to see Australian High Commissioner (Max Gaylord) next week.

Saturday 7/6/86

- At Henderson Airport. Inspected plane, discussed flight plan with Solair pilot. Arranged to fly at 4100 feet to cover a ground area of 1000 x 1460m with each frame. Rear door removed from Islander for photography. Unable to take vertical photographs because of slipstream and difficulty for pilot to navigate directly above winding river channels. Will shoot high obliques using two cameras alternatively.
- Personnel  
Bob Miln (pilot)  
Stephen Booth (navigator, flight path recorder)  
Peter Roy (photographer)  
Ron Cannarella (re-loading cameras, recording film data)  
Donald Kuku - official observer  
Selwin Owen (New Zealand radio journalist) - observer  
French Polynesian politician and friends - tourists.
- The flight took one and half hours, covered about 290 line kms and used 7 rolls of 36 frame film.

Sunday 8/6/86

- Photographing coast around Honiara
- Rang Australian High Commissioner and described programme of activities.

Monday 9/6/86

- Packed field equipment at Geology Division. Launched boat and departed Honiara with Anthony Bana and Kiplin Kalena (boat operators), Ron Cannarella and Joe Hackler.
- Arrived Tumumbosa Village, 23 km east of Honiara. Tried unsuccessfully to contact Patrick Nanau. Discussed field work with Clifford Siria (ex-headmaster of Kuku school) and Rubin Selei (Chairman of District Committee). Arranged to stay in village on Tuesday night.
- Departed village to inspect and photograph coastline of Tadhimboko Bay and the lower reaches of Ngalmibiu River.
- Returned to Honiara.

Tuesday 10/6/86

- Departed Honiara with Anthony Bana. Returned to Tumumbosa Village to pick up Clifford Siria and Rubin Selei.
- Inspected coast to east of village and the lower reaches of Mbokokimbo and Nggurambusu Rivers and Tiviale and Taiva Creeks. Collected bulk beach sample at Mouth of Nggurambusu River.
- Returned to Tumumbosa Village for the night. Questioned locals about flood and storm damage : food gardens are mostly washed out or buried under mud. Without aid, many people will face starvation within the next 4-5 months.

Wednesday 11/6/86

- Departed Tumumbosa Village. Inspected and photographed shorelines of Tetere and Tenaru Bays and the lower reaches of the Mberande, Mbalisuna, Matepono and Lungga rivers.
- Returned to Honiara.
- Visited Government information centre for data on Cyclone Namu.
- Arranged meetings for tomorrow with Geoff Dennis and Tim Nolan (Principal Forestry Officer, Forestry Division, Ministry of Natural Resources).

Thursday 12/6/86

- At Geology Division to check on processing of heavy minerals in 22 bulk beach samples collected in 1985. At least two separations have been completed and about 7 unprocessed samples were located; the remaining samples and the analytical results were not found. Compiled a new list of sample numbers and instructions for analysis; left copies plus location map with Stephen Booth. Left copies of draft maps showing coastal geology, offshore morphology and sediments for Stephen Danitofea.
- Meeting with Tim Nolan (Forestry Division) and Graham Baines. Discussed extent of logging and its possible effects on flooding, the creation of log jams etc. Copied map showing where logging had been carried out in the past 15 years. According to Nolan, logging has been confined to areas below 400m on slopes less than (?) 30 degree even though logging companies are given much larger lease areas.
- Collected 1944 air photo mosaic from Geoff Dennis.
- Discussed meteorological conditions at the time of Cyclone Namu with Mark Navin (Principal Meteorological Officer, Solomon Islands Meteorological Office). Obtained copies of wind and rainfall records for May 1986.
- Depart Honiara, return to Suva.

SUMMARY OF OBSERVATIONS

1. Cyclone Namu caused worse damage than any other cyclone in living memory or custom history of the people of Solomon Islands. The main areas affected were SE Malaita, the eastern and southern parts of Guadalcanal and a number of small islands.
2. Flood waters meters deep covered the coastal plain of Guadalcanal and in places deposited a layer of sediment a meter or more thick. Flood waters escaped to the sea via the main river mouths and their associated swamps. They also cut channels through the beachridges at the coast; this destroyed some coastal villages and was the main cause for the fallen trees on the coast.
3. Cyclone winds destroyed vegetation in the hills (especially on east facing slopes) but had little effect the coastal plain.
4. Flood damage is most pronounced in the lower reaches of the Lungga, Ngalimbiu, Mberande and Nggurambusu Rivers. These show massive sand and gravel bars in the channels, destructive overbank flow, bank erosion and piles of forest debris. These effects extend upstream from near the river mouths. The channels are navigable for only one or two kilometers.

5. The Matepono, Mbalisuna and Mbokokimbo Rivers show least damage in their lower reaches. They have relatively narrow and deep channels, navigable for many kilometers upstream and carry a generally fine sediment load. Overbank flow, was relatively non-destructive and build-up of forest debris was far less extensive than in the other rivers.
6. In the upper river valleys landslides were extremely widespread and destructive. The Lungga was less affected than catchments further to the east which presumably were closer to the cyclone.
7. Catastrophic flooding occurred on the morning of Monday May 20th following 3 days of heavy rain (about 340 mm total were measured at Henderson Airport but presumably much more rain fell in the hills). It is probable that trees, uprooted by the cyclonic winds, triggered massive land slips into the valleys. The rapid addition of supersaturated material increased river volume and created a surge of sediment-laden water and logs to rush downstream. This event caused most of the flood damage.
8. Erosion of the coast is minimal. Because the cyclone passed to the east and south of Guadalcanal, the north coast was largely protected from strong wave action. Maximum wave height is estimated to be 1.5m; this corresponds to the level of wave debris deposited on the shore face around Honiara.
9. Beach erosion and scarping occurred during the height of the storm but was reduced once forest timber from the rivers started piling up on the coast. In many areas the beaches have accreted over the past few weeks; in these areas large piles of logs remain. In non-accreting sectors, beach faces are scarped and relatively steeply sloping; here logs have not accumulated.
10. Winds measured at Henderson Airport immediately before and during the cyclone were from the west and reached mean speeds of 45 knots (maximum gust speed 63 knots). Despite this, large amounts of timber from the Lungga River accumulated on the western side of the delta and along the shoreline of eastern Honiara. This suggests that current flow in Honiara Bay was towards the west despite the prevailing winds in the opposite direction.
11. Large rafts of logs are reported to occur in the ocean ESE of Guadalcanal for distances of hundreds of nautical miles.