HYDROMETRIC DATA COLLECTION

APPROPRIATE TECHNOLOGY FOR THE PACIFIC ISLANDS

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HYDROMETRIC DATA COLLECTION - APPROPRIATE TECHNOLOGY FOR THE PACIFIC ISLANDS

- Introduction
- Why do we need hydrometric data?
- How best can we collect the data?
  - Rainfall
  - River level
  - River flows
  - Water quality
  - Telemetry
- Maximising the benefits of the Talise HELP basin
HELP
Hydrology for Environment, Life & Policy
HYDROMETRIC DATA - APPROPRIATE TECHNOLOGY FOR THE PACIFIC ISLANDS

Why do we need hydrometric data?

Increasing political and public interest

- International / national
  - Climate change
  - Sea level changes
- Regional
  - Land use change: afforestation, deforestation, intensive farming, urbanisation
- Local
  - Water supplies, hydro power generation, irrigation, flooding, coastal erosion & ecosystems, sediment
Climate change - temperature

GLOBAL

Data from thermometers.
Clutha River at Balclutha 1947/48 to 1998/99 (data courtesy Contact Energy Ltd)

Annual mean flow ($m^3/s$)

Mean = 536 $m^3/s$

Mean = 612 $m^3/s$
Effects of logging
Effects of agriculture
Effects of mining
What hydrometric data do we need?

- **Rainfall**
  - minimum, means, maximums
  - depth-duration-intensity
- **River flow**
  - minimum, means, maximums, flow duration
- **Water quality**
  - to determine stream health (PAC-SHMAK)
  - presence of heavy metals (mining)
  - sediment (deforestation / mining)
How best can we collect the data?

Rainfall: rain-gauges
Rainfall measurements
Rainfall monitoring
Rainfall monitoring
Rainfall monitoring -
RAIN

drop diameter, intensity, duration

GAUGE:
Geometry, height, material, colour, orifice size, exposure

Tryography of the area around the gauge

Turbulence

Eddies

Splash in

WIND:
Direction, Speed

Site of the gauge

Errors in the gauge: Inclination, leaks, evaporation, splash out, condensation

Errors of measurement

Catch

Estimate of rainfall at a point

Estimation of rainfall at a point

Turbulence

Eddies

Splash in
Raingauge networks

- Used for calculating catchment mean rainfall for water balances
- Calculation by:
  - arithmetic mean
  - Theissen method - polygons
  - Isohyetal
  - Aspect-altitude method
Climate monitoring
Staff gauges
River level monitoring
River level monitoring
River level monitoring
River level monitoring
River level monitoring

Pressure transducers
Gas Purge Stations

Ultrasonic stations
Streamflow measurements
Stream-flow measurement
Stream-flow measurement
Streamflow measurement
Telemetry
Telemetry

GPRS - terrestrial

Globalstar - satellite
Satellite telemetry
Data processing, analyses and dissemination
Community Participation
Maximising the benefits of the Talise HELP basin

- Talise basin on Maewo Island, Vanuatu
- “Evolving” HELP basin status
- Local capacity in Vanuatu (DGMWR)
- Requires in-country in-kind contribution and field support
- Requires UNESCO, WMO & bilateral financial support
- Requires technical advice and support (SOPAC / NIWA)
- Sharing data and information openly
- Other countries use Talise data to extend their own catchment data and vice versa.
These guys enjoy their work!
Thank you for your attention