Watershed Management
Ugum, Piti-Asan, and Geus Watersheds

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Background

1990 – Section 6217, Coastal Zone Act Reauthorization Amendment (Guam Coastal Nonpoint Pollution Control Program)

requires multi-year watershed restoration strategy

1998 – Clean Water Action Plan, Unified Watershed Assessment 13 of 20 Guam watersheds in need of restoration, including Ugum, Piti-Asan, Geus

However…..

There is no baseline data or previous study on The selected Watershed dynamics!
Correlate field hydrological data to determine dynamic behavior of the watershed

Develop baseline information for stream level, flow, and turbidity

Provide recommendations for restoration and/or preservation

Rainfall = 0 in. Turbidity = 0.72 NTU

Rainfall = 1.70 in. Turbidity = 21.45 NTU

Rainfall = 3.68 in. Turbidity = 41.00 NTU
Data Collection

- From previous studies and field visits
- Hydrologic field data
- Soil samples and analyses
- Aerial Photography
Data Collection
Available Information

- GIS-based RUSLE Erosion Model (Park, 2007)

For each Grid Cell:

\[ A = R \times K \times L \times S \times C \times P \]
Field Observations - Ugum
AVERAGE ANNUAL SOIL LOSS MAP of the UGUM WATERSHED

Average Annual Soil Loss (tons/acre yr)
- Green: 0 - 2.5
- Gray: 2.51 - 10.1
- Yellow: 10.2 - 60.4
- Red: 60.5 - 161
- Brown: 162 - 255
- Black: 256 - 1,170
Natural Erosion Contribution
Problems associated with construction
Asan River Stage Discharge Curve

$y = 0.08x + 0.3522$

$R^2 = 0.3587$
Field Observations - Geus

Geus River before Tropical Storm Halong (7/18/2014).

Same location after Tropical Storm Halong (7/30/2014).
Natural Erosion Contribution
Problems associated with human activities
Areas that contributes the most soil erosion
These 3 Watersheds are very dynamic
Soil type is very erodible
Common issues:
- Natural occurrence
  - Badlands
  - Bank erosion
  - Earthquake
  - Typhoon
- Human activities
  - Off-Road activities
  - Fire
Recommendations

- Continued monitoring
- Outreach and public education
- Enforcement of erosion control practices
- Management plan may implement certain vegetation and Hydro seeding
- Watershed management and restoration should be continued for other watersheds

Sh. Khosrowpanah, 2015, “Assessment of Turbidity in the Geus River Watershed in Southern Guam”, Water and Environmental Research Institute of the Western Pacific (WERI), University of Guam, Report No 156, 40 pages
