

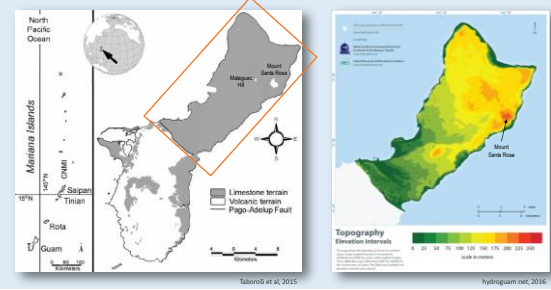
Vadose Hydrology at Jinapsan Cave, Northern Guam



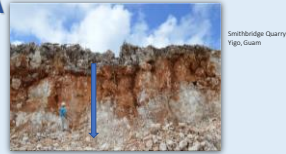
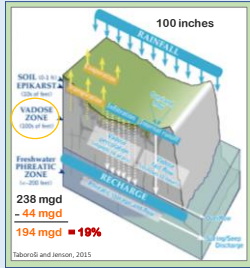
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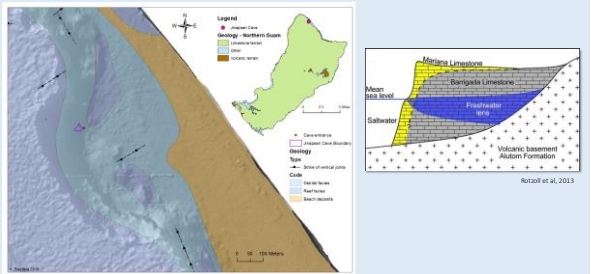
Northern Guam Lens Aquifer (NGLA)



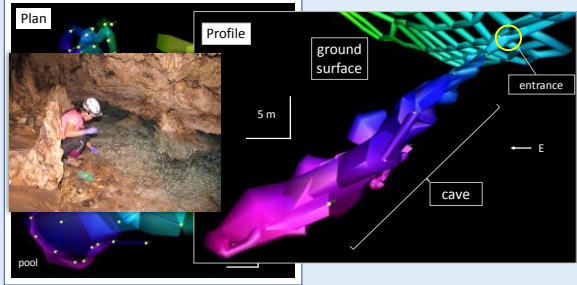
Components of the NGLA



Study Site - Jinapsan Cave



Jinapsan Cave 3-D cave models



Jinapsan Cave



Jinapsan Cave

Big Room

- staircase ceiling
- rubble floor from breakdown
- ceiling fracture network
 - visible by black staining

Cross sections

Results

- Rates vary by 3 orders of magnitude

Entire Record	Trinity	Flatman	Station 1	Station 2	Stumpy's Brother	Stumpy	Amidala
Drip counts (N)	94	94	93	94	86	87	68
Mean (drips/hr)	2613	244.9	46.9	43.8	41.3	7.7	6.0
Std. deviation (st)	1052	72.3	35.0	16.7	4.1	4.5	10.3
Relative s.d. (st/μ)	0.40	0.30	0.75	0.38	0.10	0.58	1.73
Min	1160	103.8	0.03	26.0	33.0	0.15	0.73
Max	5840	366.1	184.6	122.0	50.7	25.7	49.0
Normalized min (min/μ)	1.1	1.4	0.00084	1.6	8.0	0.033	0.071
Normalized max (max/μ)	5.6	5.1	5.3	7.3	12.2	5.7	4.7
Range	4680	262.3	184.6	96.0	17.7	25.6	48.2

Results

- Monotonic, seasonal
- Sawtooth fluctuations
- Intra-seasonal exceptions

A, B, C... events of interest
 1 = suspect; probable error
 2 = spurious; definite error

Results

Category	Flow matrix	Diagnostic Characteristics	Station
Fast Precipitation	Fracture	• Drips start a few hours after significant rainstorms • Reach maximum drip rates within 1-2 days, then decay after 2-3 weeks • Drips occur when perennal or seasonal drip discharge capacities are exceeded and epistal storage is completely filled and overflows	Amidala
Intermediate	Fracture	• Dry during dry seasons • Dripping restarts more after seasonal rainfall • Higher discharge rates and fluctuations than perennal drips • Longer recession	Trinity, Flatman, Station 1, Station 2, Stumpy's Brother
Slow Precipitation	Matrix	• Drips discharge throughout year • Drip rates increase after season through • Low discharge • Long recession	Amidala

Further thoughts

Tumon Bay
 studentconverse.com