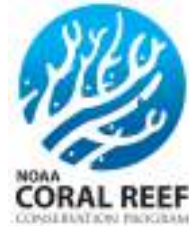


Managing an Urban Watershed: Garapan, Saipan, CNMI

Marianas Terrestrial Conservation
Guam
November 18, 2017



Katie Graziano
Watershed Coordinator
CNMI Bureau of Environmental & Coastal Quality





'Garapan' Watershed

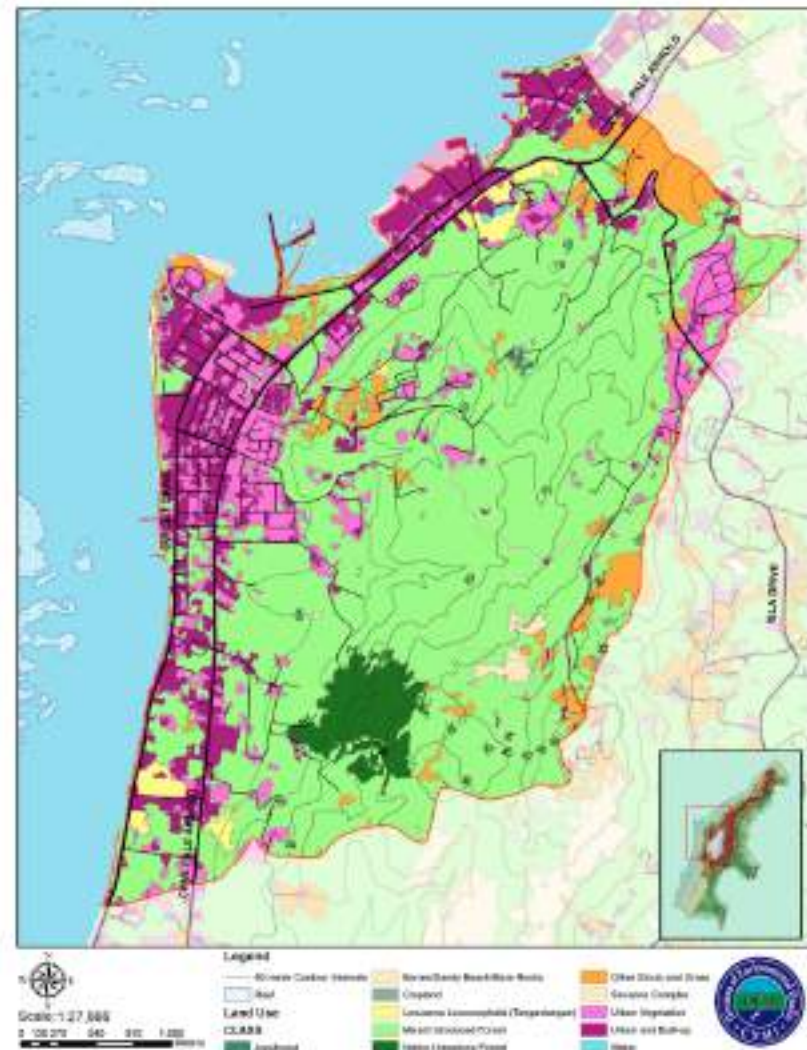
West Takpochao Central Sub-watershed

- Highly urbanized
- 2.2 square miles (5.71 km²)
- 4,000 residents (2010 census)
- >15 languages and dialects
- Drains into the Saipan Lagoon

Watershed Boundaries,
Saipan, CNMI

Land Use

- Upper watershed composed of family compounds, farms, and mixed introduced forest
- Native limestone forest, 21 bird spp., streams
- Highly developed lower watershed with hotels, restaurants and shops
- AMP, Sandy beach shoreline



Fishing, tourism, recreation, and habitat



Photo credit: Scott Eck



Photo: kiteboardsaipan.com



Challenges

- Rapid Development
- Impervious Cover
- Infrastructure
- Flooding and Water Quality
- Improper/illegal land clearing
- Population density and diversity

Management Approach

- Garapan Conservation Action Plan (CAP)
- 65+ stakeholder participants
- 30+ partner organizations
- Identified targets, threats, and strategic actions.

Garapan Watershed Conservation Action Plan



Photo: the West Tapochan watershed viewed from Mt. Tapochan (courtesy of Mike Quast)



Commonwealth of the Northern Mariana Islands
Office of the Governor
Division of Environmental Quality
June 2013

Garapan CAP

9 Conservation Targets

Strategies

- Education and outreach
- Regulations and enforcement
- Engineering and infrastructure

BMPS

- Research and monitoring
- Community steward

30 Objectives

Enforcement / Outreach Campaign: Garapan Field Surveillance Project

October 2016 – 2017 (and cont'd)

- MINA Tasi Watch Rangers report violations and provide outreach.
- 1,674 field surveillance hours, 88 violations reported
- Challenges: lack of enforcement, language barriers, non-compliance



Outreach and Education: Watershed Warriors

2015 – 2017

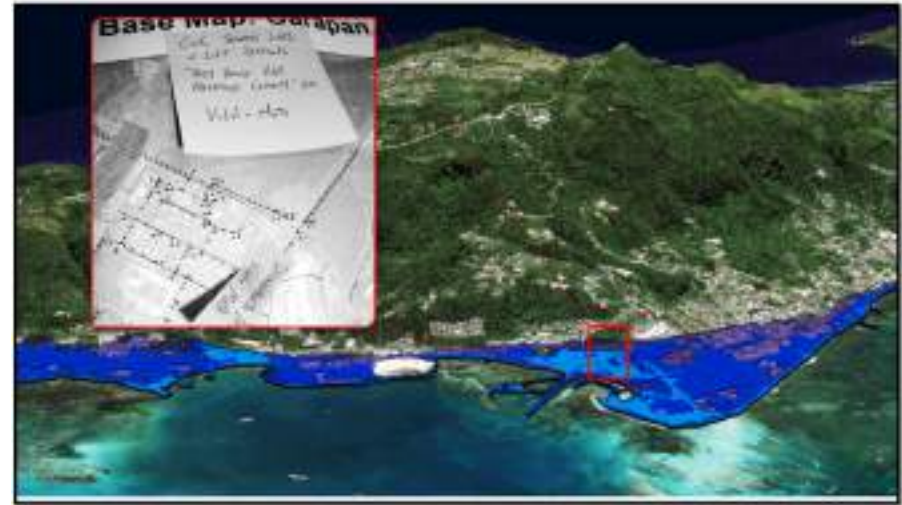
- Sixteen site-specific lesson plans
- Funded local field trips
- 4th grade at Garapan Elementary School
- 50 students per year



Upcoming projects

2018 – 2020

- “Better Buildings” development incentives
- Tour Operator Training
- Microbial Source Tracking
- Garapan CAP Update



Conclusions

- Garapan is possibly the most challenging watershed in the CNMI.
- The CAP is a collaborative management plan, but heavy on lower watershed.
- Implementation is happening.
- New development offers critical opportunity.



Next Steps

- Learn from watersheds that have already experienced periods of rapid development.
- Revise the CAP to strengthen collaborative process.
- Better incorporate ecosystem based management in all parts of the watershed.

Questions?



Contact:

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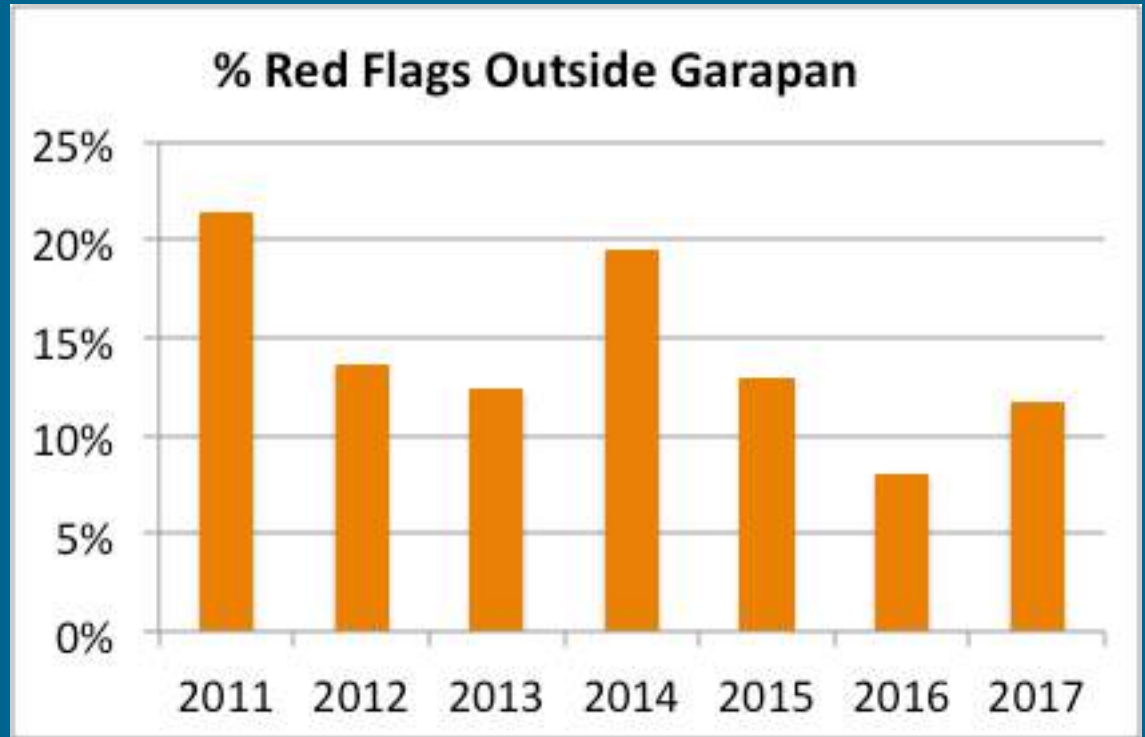
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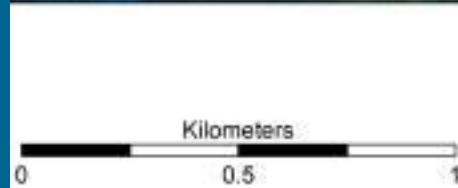
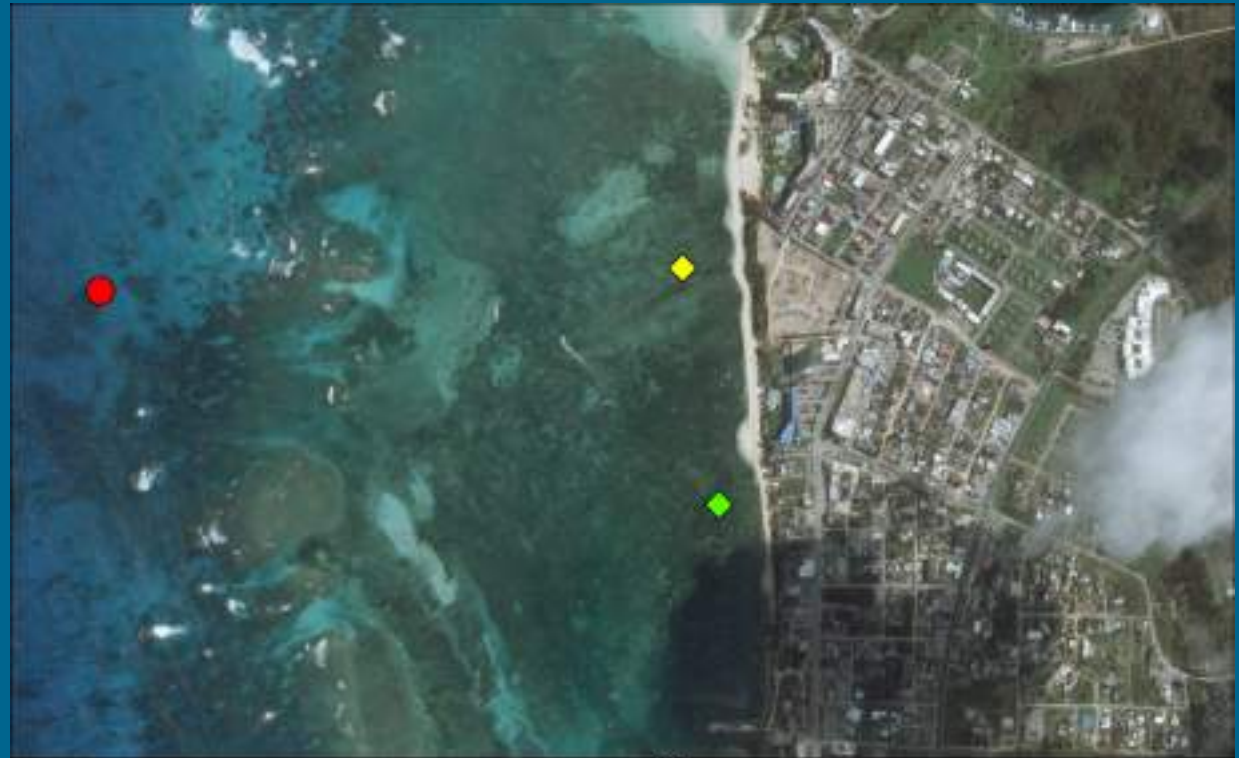


Water Quality Monitoring

- 11 monitoring sites, sampled weekly
- High occurrence of 'Red Flags' at certain sites



Marine Monitoring



- Outside Garapan
- ◆ Hafa Adai
- ◆ Fiesta

Marine Monitoring: Coral Reefs

- Increase in accreting surface.

