

GARAPAN WATERSHED

US Coral Reef Task Force
Business Meeting, Saipan, CNMI
September 22, 2016

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'Garapan' Watershed

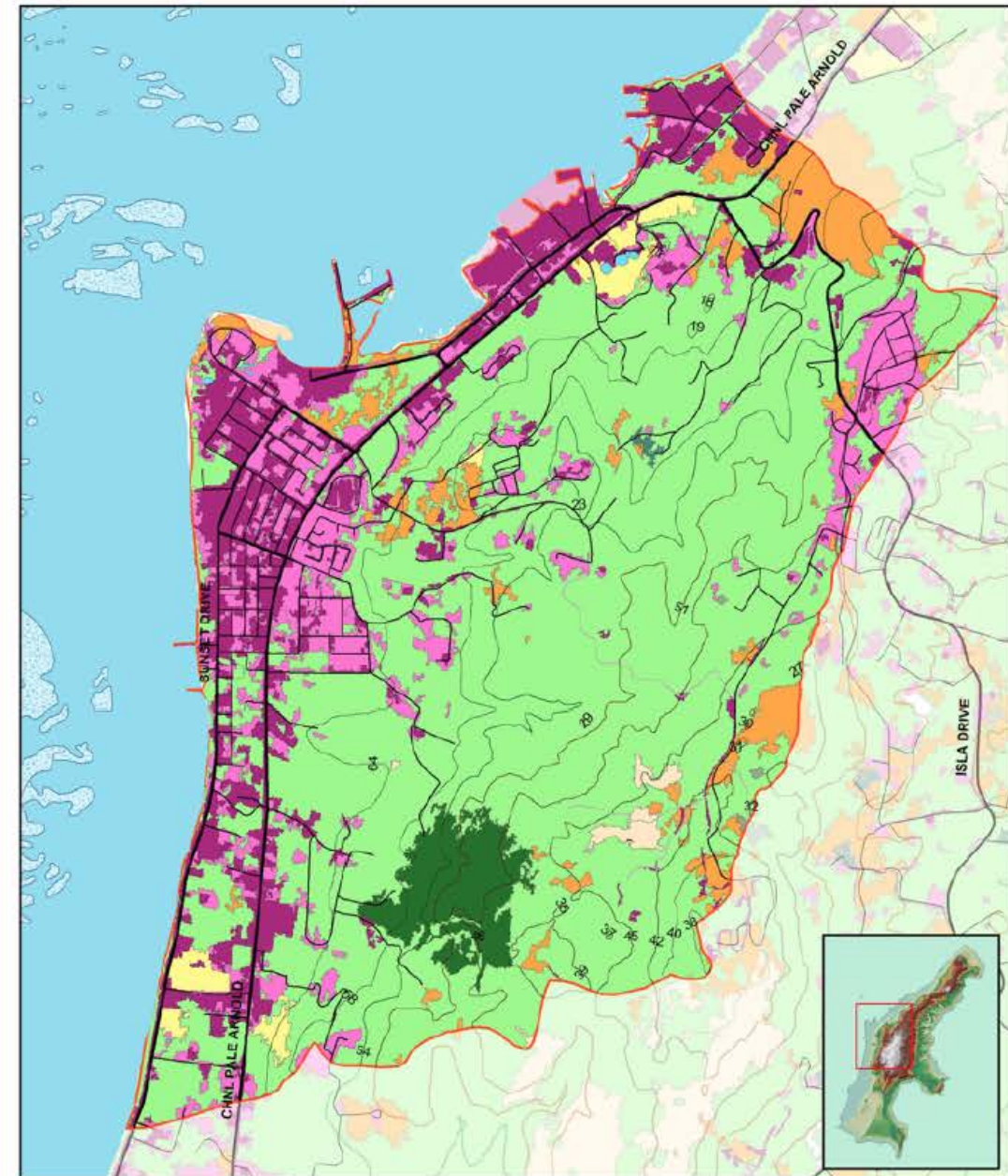
West Takpochao Central Sub-watershed

- 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
- Highly developed lower watershed with hotels, restaurants and shops
- Sloping sandy beach shoreline





Recreation and Resources

- Sandy beaches and a protected lagoon attract fishing, swimming, boating, marine sports.
- Waters enjoyed by tourists and residents alike.



Water Quality

Issues

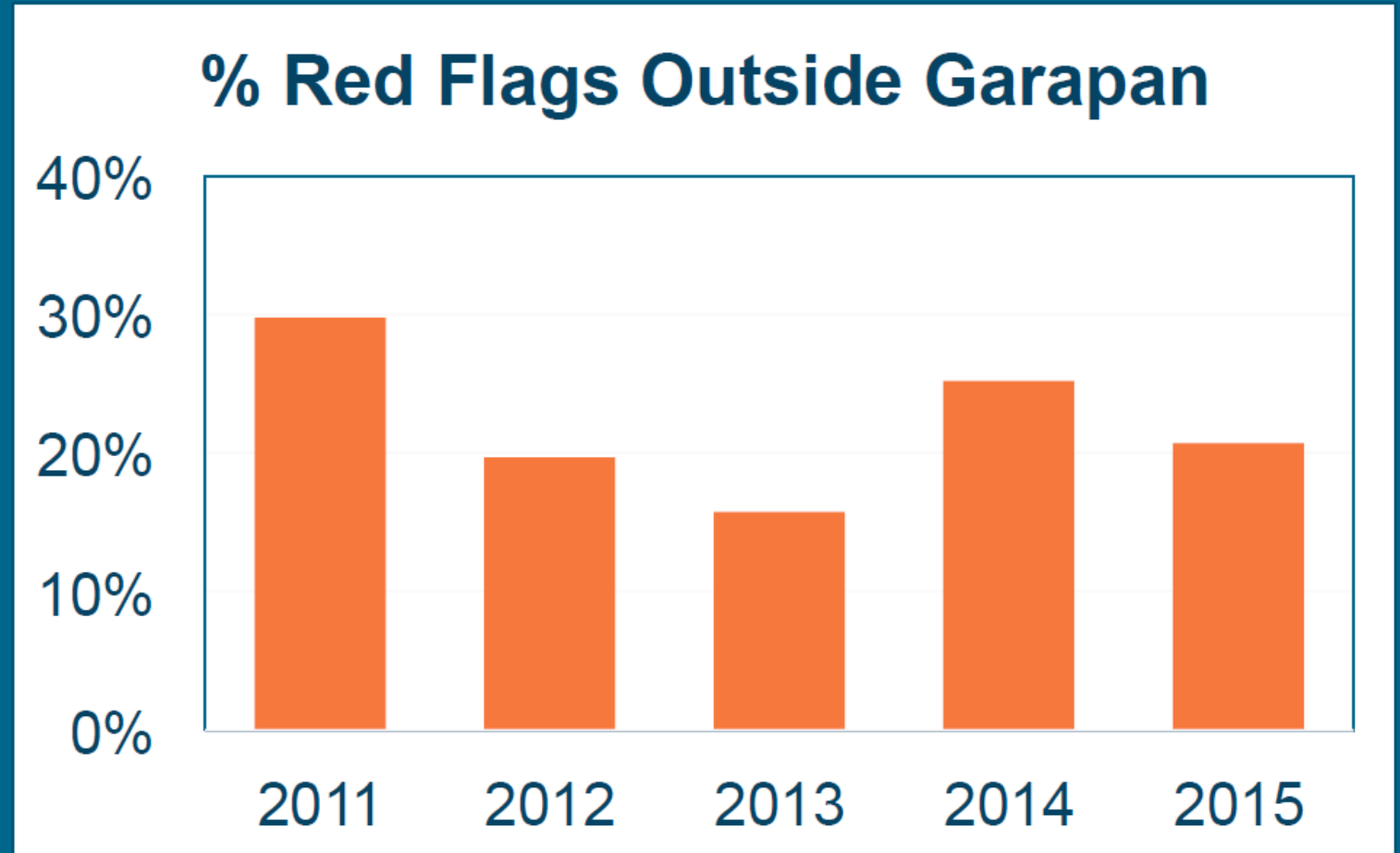
- Sewer infrastructure
- Rapid development activities
- Impervious cover
- Flashy stormwater runoff
- Improper/illegal land clearing

Threats

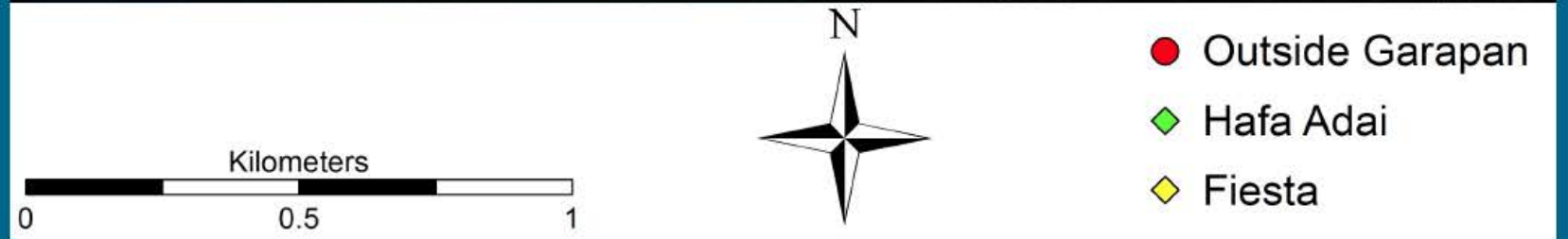
- Bacteria
- Nutrients
- Chemicals
- Sediments
- Grease/oil

Water Quality Monitoring

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

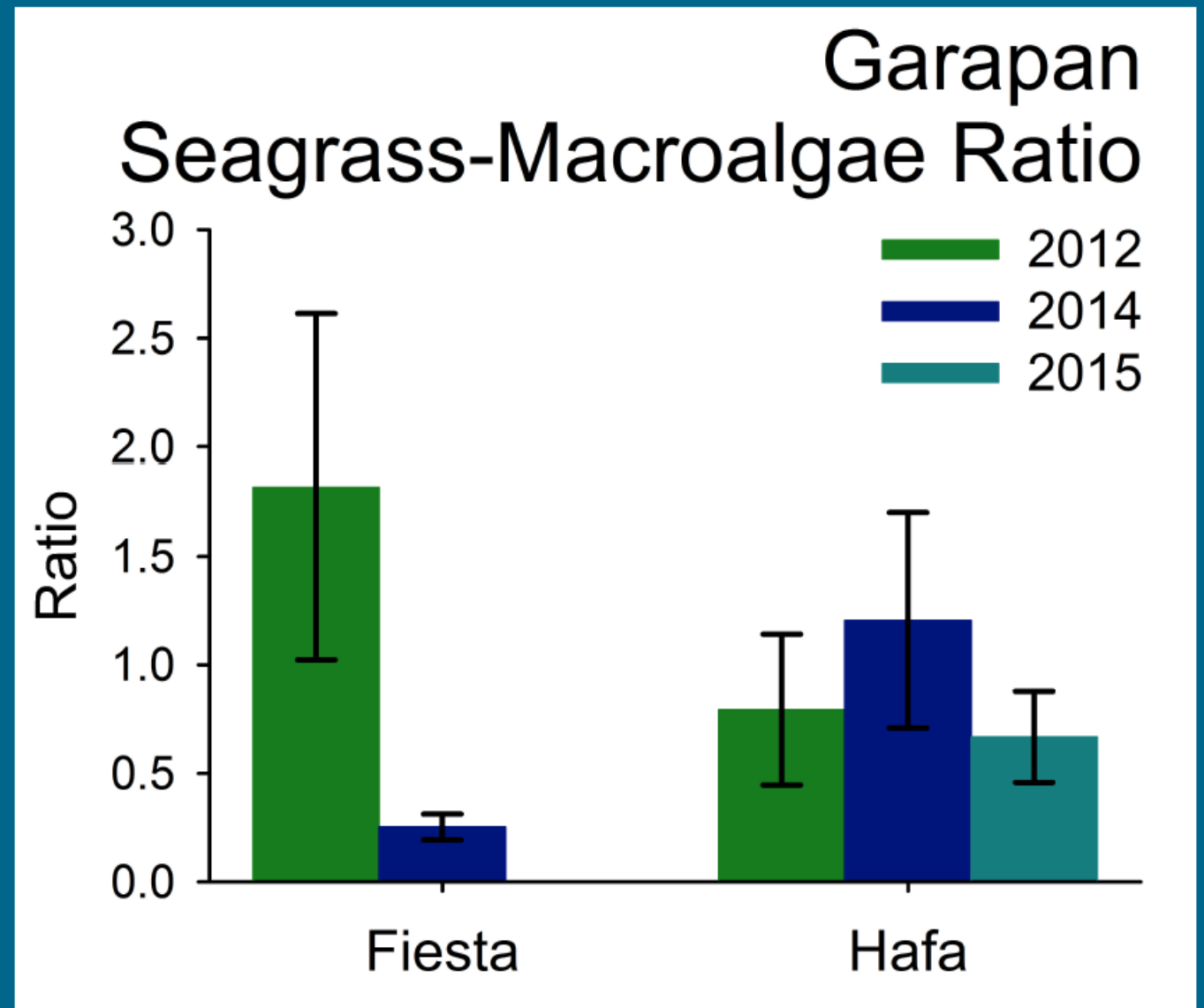


Marine Monitoring



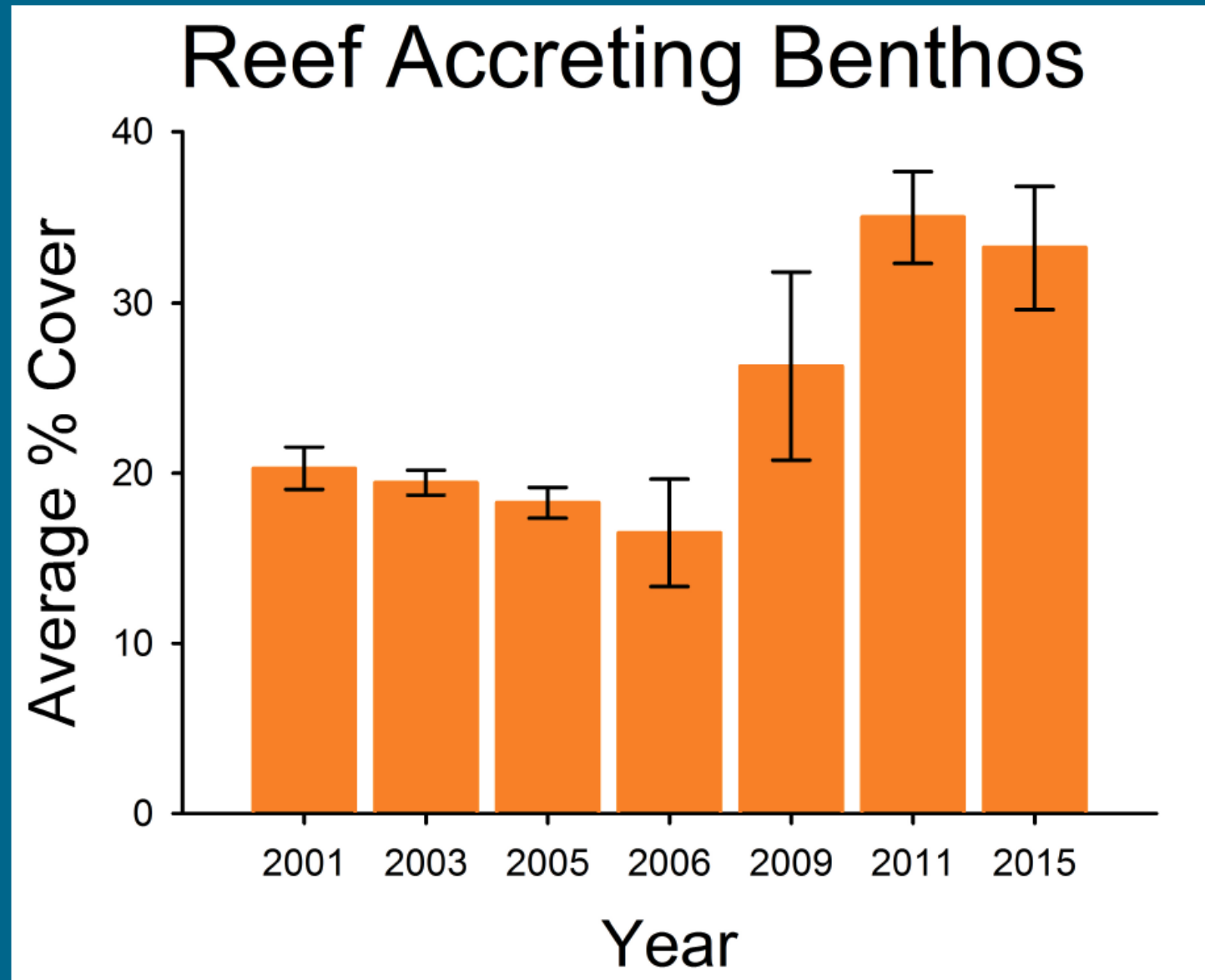
Marine Monitoring: Seagrass

- Decline in seagrass at Fiesta Drainage.
- Hafa Adai Drainage has no significant trends.



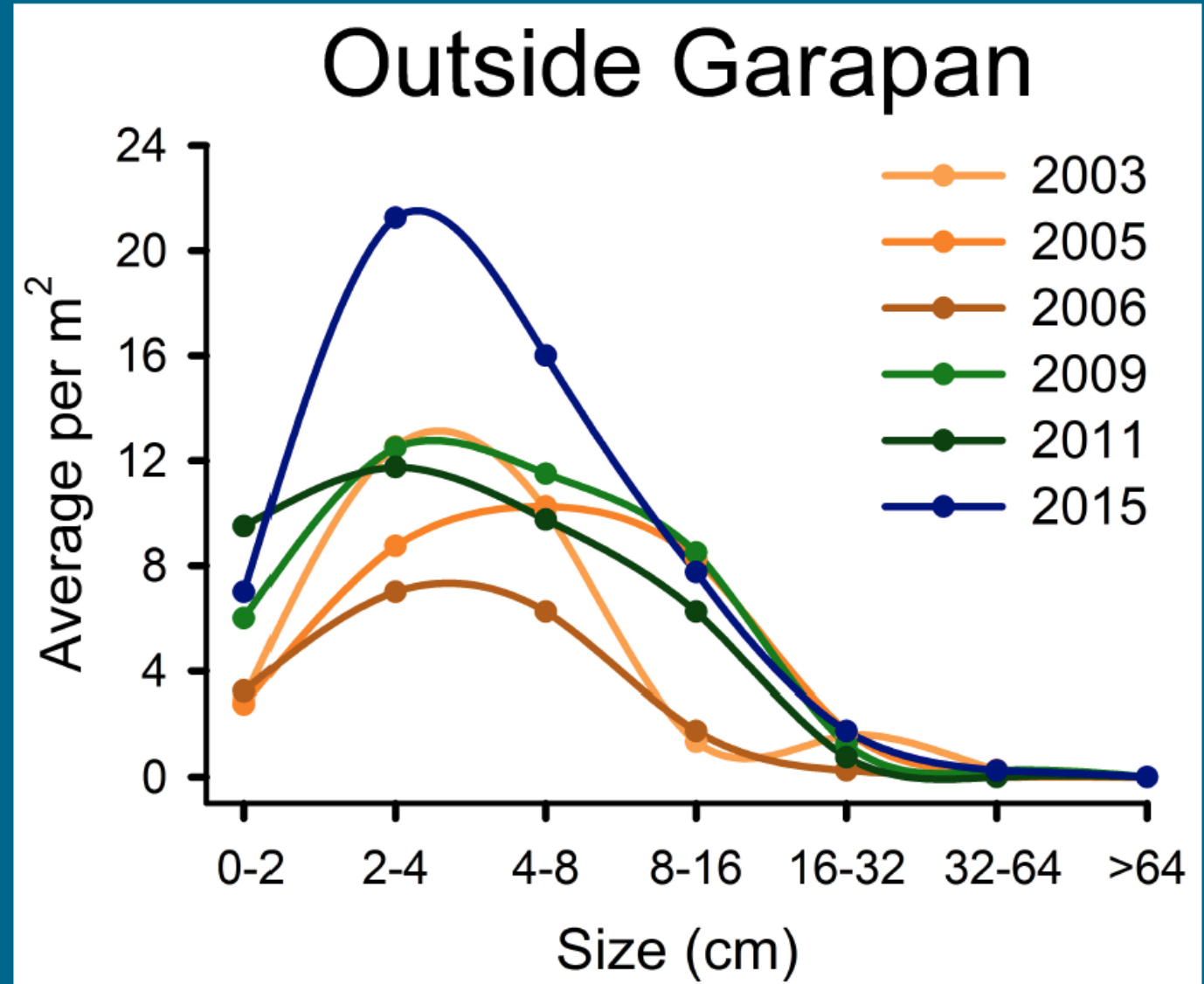
Marine Monitoring: Coral Reefs

- Increase in accreting surface.



Marine Monitoring- Coral Reefs

- 2015 had significantly more small coral (2-8 cm.) per m²
- Indicates higher rate of coral recruitment.



Management Approach

- Garapan Conservation Action Plan (CAP)
- ‘Open Standards for the Practice of Conservation’
- 65+ stakeholder participants
- 30+ partner organizations
- Identified targets, threats, and strategic actions.

Garapan Watershed Conservation Action Plan



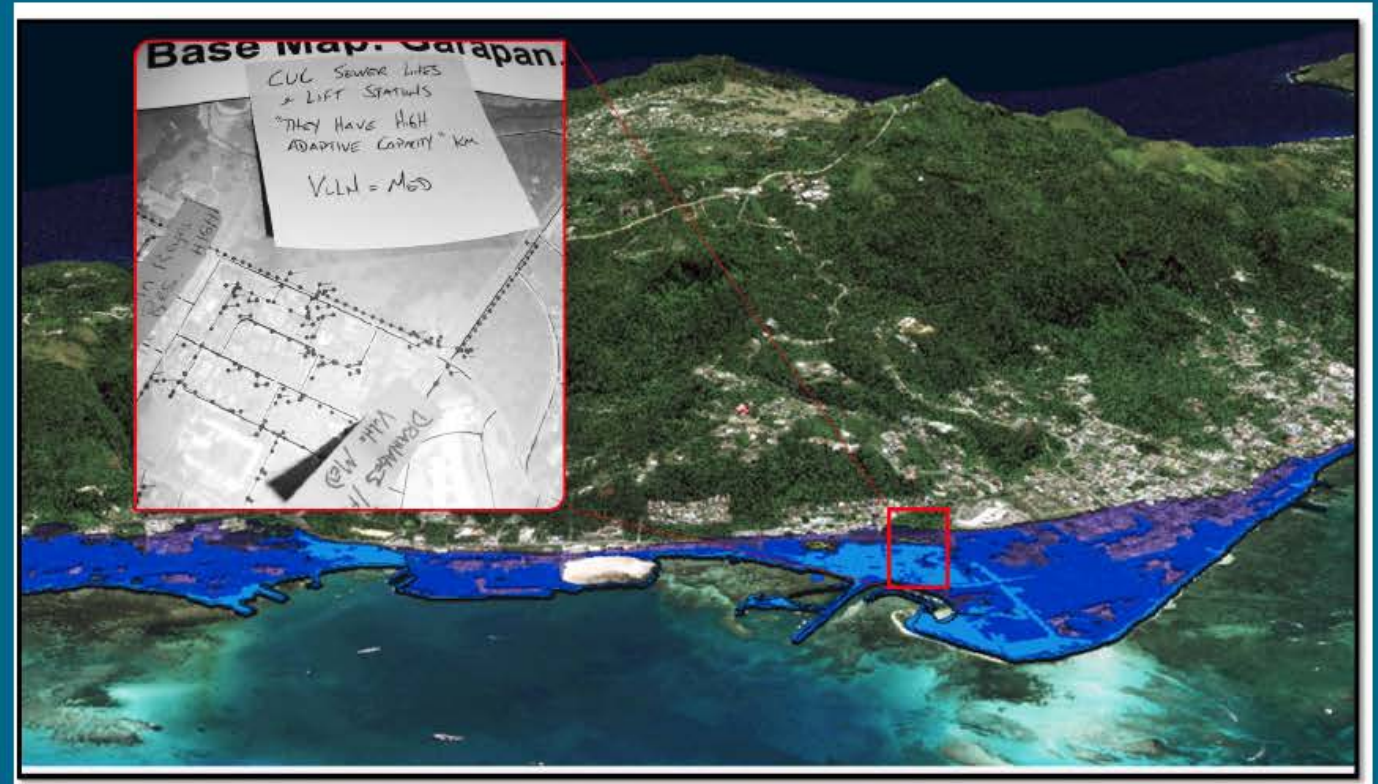
Photo: the West Talojochas watershed viewed from Mt. Talojochas (courtesy of John Quast)



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

Climate Change Integration in the CAP

- 2014 “Climate Change Vulnerability Assessment for the Island of Saipan, CNMI”
- Strategic actions reviewed to enhance resilience
- One of the first CNMI plans to mainstream climate change adaptation.



Garapan CAP Strategies

- **Conduct education and outreach** campaigns
- **Improve regulations and enforcement**
- **Employ engineering and infrastructure BMPS**
- **Increase research and monitoring**
- **Promote community stewardship** incentives

Outreach and Education: Watershed Warriors

2015 and 2016, ongoing

- Sixteen site-specific lesson plans
- Free local field trips
- 4th grade at Garapan Elementary School
- 50 students in both 2015 and 2016



Stormwater BMPS: PIWI Training

May 2015

- Three day Pacific Island Watershed Institute workshop
- IDDE, Stormwater BMPS, Unpaved Roads
- Water samples indicate chronic sewage leakage
- New drainage maps and concept designs for GapGap Rd.



Enforcement / Outreach Campaign: Garapan Field Surveillance Project

October 2016

- Volunteer field agents assist with reporting, enforcement, and education.
- Outreach materials and signs about clean water and litter in Garapan.
- Barrier removal activities to decrease littering.



Conclusions

- Garapan is possibly the most challenging watershed in the CNMI.
- Water quality is poor but stable.
- Coral reef health shows positive trends, but seagrass health at drainage sites has declined.
- New development offers critical opportunity.



Next Steps

- Learn from watersheds that have already experienced periods of rapid development.
- Follow-up trainings and workshops with actions.
- Identify and remove barriers to implementing existing plans
- Manage the CAP to better track progress and link actions to impacts.

Questions?

