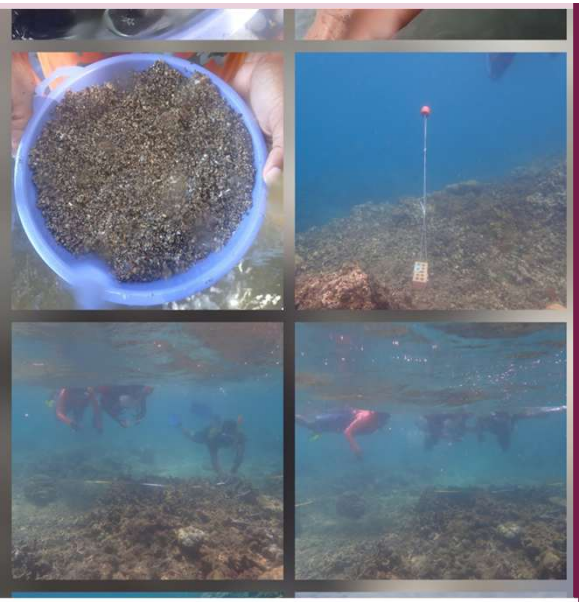


IMPACT OF SEDIMENTATION FROM LAND-BASED RUNOFF ON CORAL COVER (HC) & LIGHT AVAILABILITY - by Alyntha

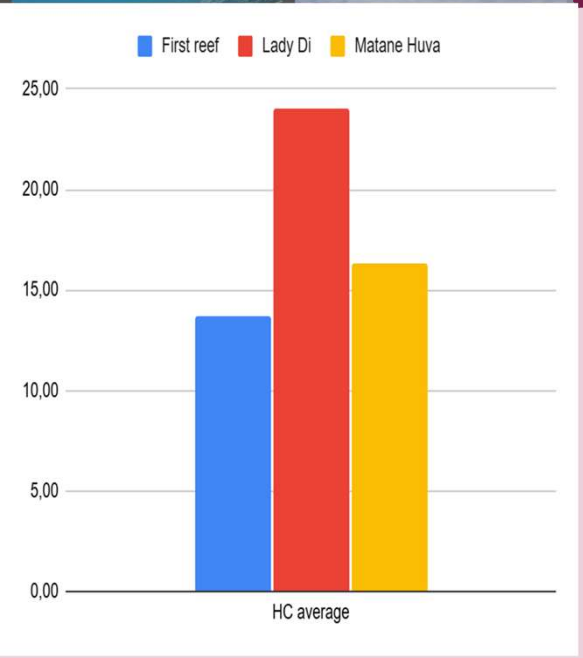
Research question

Does sedimentation from land-based runoff influence coral cover and light availability?

Method

Sites:
3 reefs (First reef, Matane Huva & Lady Di).

Methods:
Benthic survey (HC %) using LPT, Underwater loggers (1-3pm) & Sedimentation suspension time (at water outlet, 5m and 10m in).



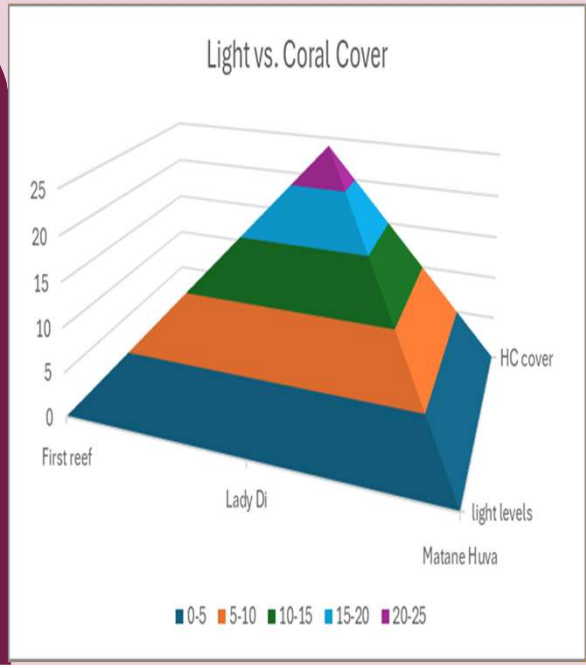
Result and implications

Coral cover (HC): Highest at Lady Di, lowest at First reef; no significant differences (mainly influenced by the distance from the Walindi outlet).

Light: Highly variable; influenced by weather.

Light vs coral: Weak, non-significant relationship. The graph indicates **no clear positive relationship between light levels and hard coral cover** across the sites.

The lack of significant differences is likely due to data being collected over three consecutive days, while sedimentation from the Walindi outlet appears to reduce coral cover at First Reef and decreases offshore, allowing higher coral cover at the furthest site, Lady Di.



HUMAN IMPACT ON COASTAL AND MARINE ENVIRONMENT- by Amadila

Background

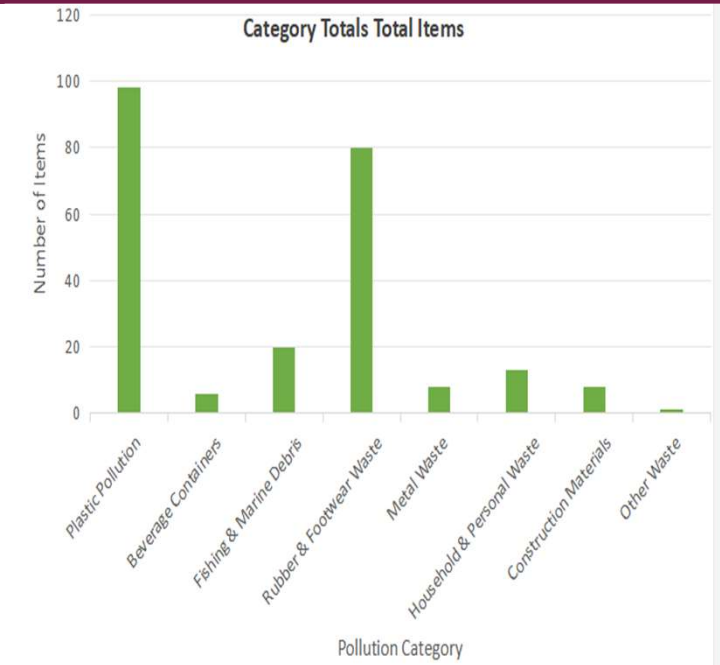
Human activities such as waste disposal and fishing can cause pollution in coastal and marine environments.The area observed is along the beach from Walindi to MND.

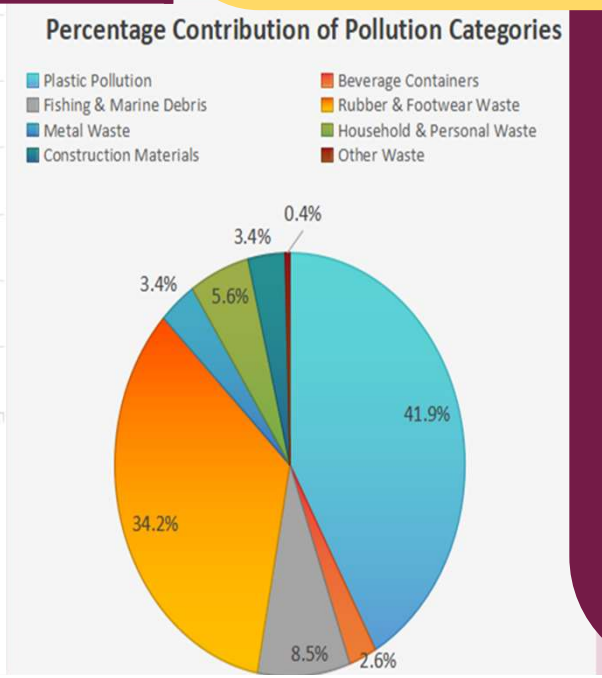
Research question

Which category contributes the highest proportion to the overall marine pollution?

Method

This study investigated human impacts on the coastal and marine environment with a focus on pollution. Pollution items were visually surveyed and categorized into 8 different categories.

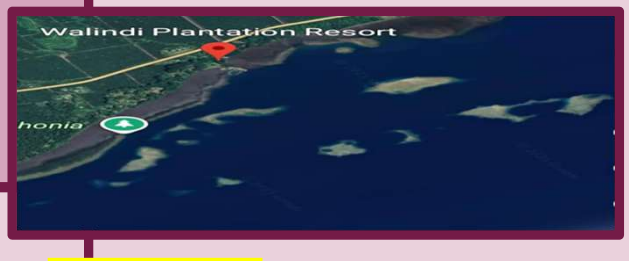




Result and implication

Plastic pollution was the dominant category, contributing approximately 41.9% of the total waste recorded. Rubber and footwear waste followed at 34.2%. Fishing and marine debris accounted for 8.5%, while other categories such as household waste, metal waste, and construction materials contributed smaller proportions.

Monitoring temperature and predicting coral bleaching risks- by Beatrice



Background

Coral reefs are highly sensitive to increases in sea temperature. Prolonged high temperatures can cause coral bleaching and mortality.

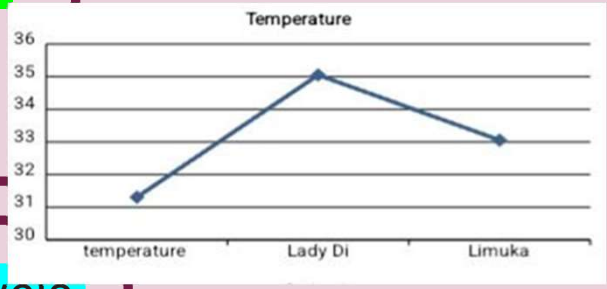
Research question

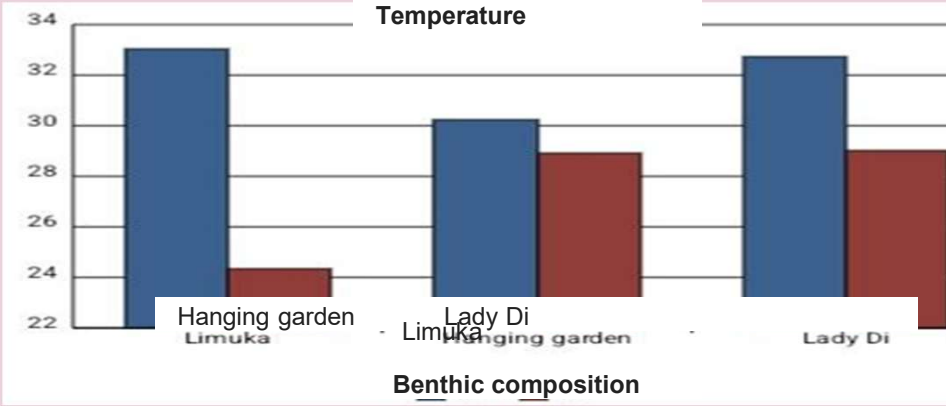
Are temperature reaching levels that may trigger coral bleaching.

Methods

*Benthic survey (LPTs is used)

*HBO Logger





Results and Implications

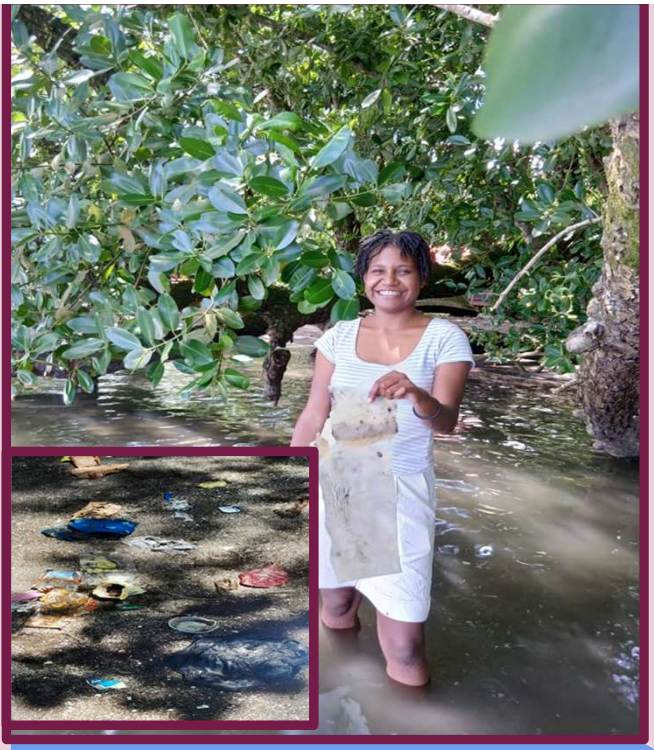
The results indicate positive relationships between the three variables.

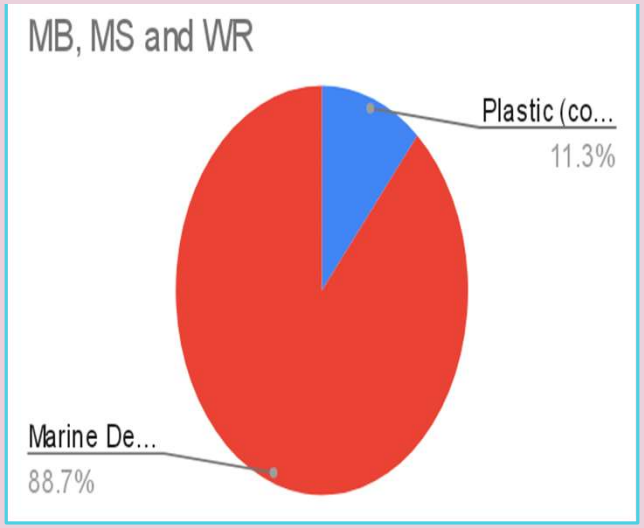
As the temperature increases recently killed coral (RKC) levels and rubble (RB) levels increase.

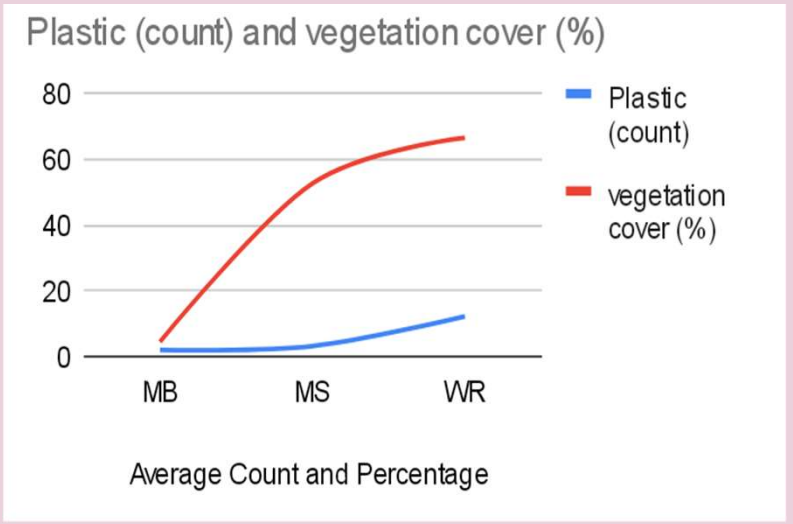
Conclusion and Recommendations

Temperature is also one of the key driver of coral bleaching so, there should be continuous installment of loggers and implement reef management and conservation measures.

Marine Pollution on Coastal Vegetation-Iona Polomon







Research question

What relationship exists between the density of plastic waste and the vegetation cover?

Method

- **Sites**: three in total.
- **Estimations**: vegetation cover; plastic count, assessed as marine debris within a quadrat (measured every meter up the transect line).

Result and implications

1. Both vegetation cover and plastic debris show gradual increase
2. Trend line will converge at a certain point along the transect.

THE IMPACT OF PLASTIC POLLUTION ON MARINE LIVES.

Aim

To determine the level of plastic pollution in the area

Research Question

How does plastic pollution affects coral reef health?

Method

Site selection

Lady Di

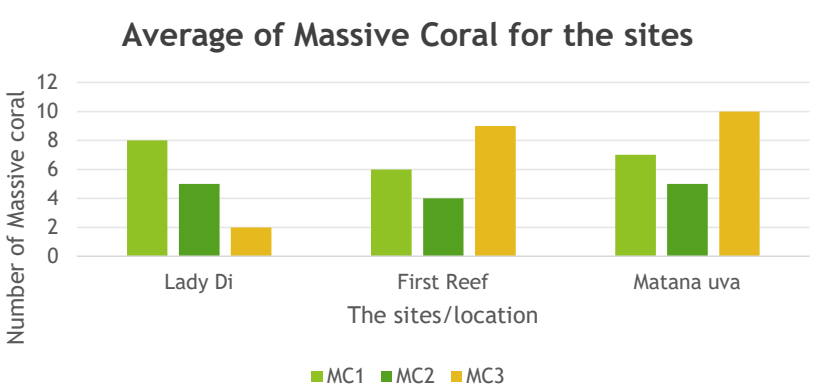
Matane Huva

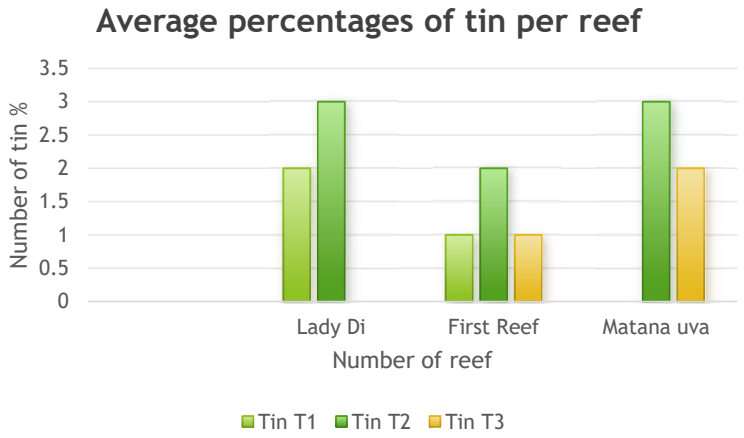
First Reef

Benthic for Massive coral and observation plastic

Result

The two graphs represent the average for can drink (Tin) and massive coral

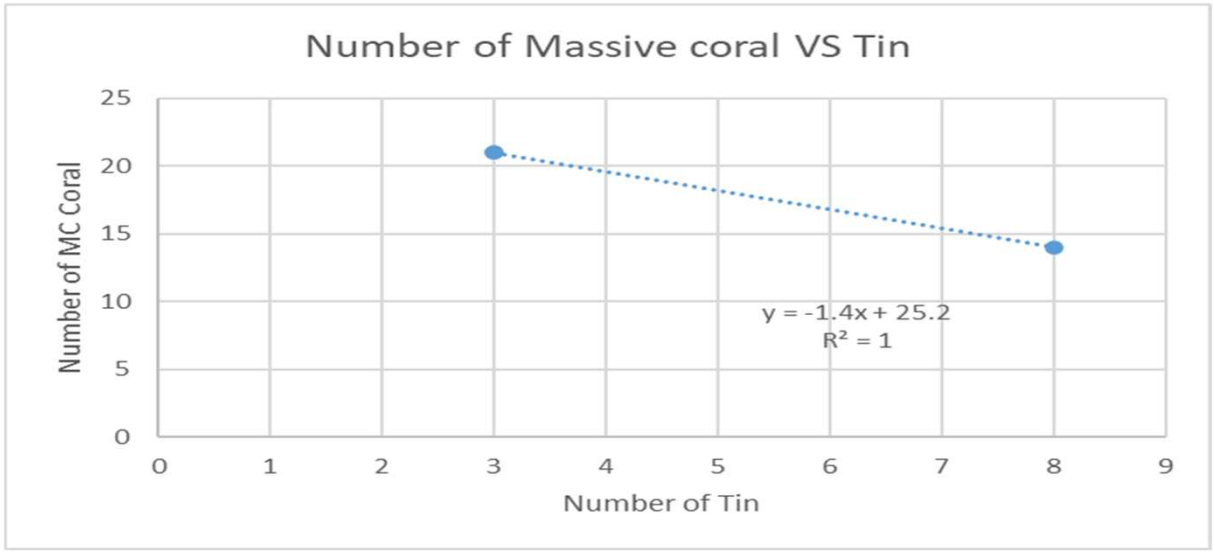




1st graph indicate that Matane Huva has large number of massive coral compared to First reef and Lady Di

2nd Graph represent the average percentages of plastics found at the three sites. Lady Di and Matane Huva has the similar average percentages which means there is lots of plastics found at the area while first reef has less plastic.

Diagram representing the correlation of Massive Coral and Tin sample

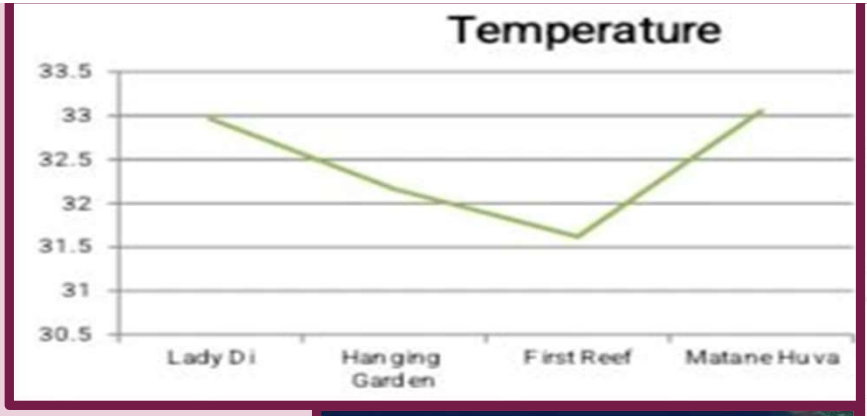


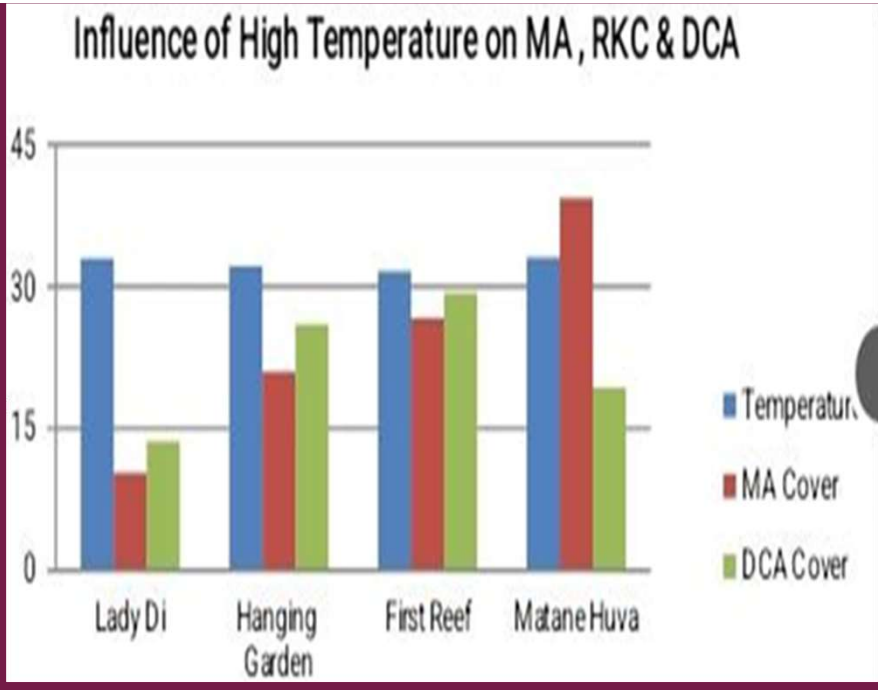
There is a relationship between this two variables which is massive coral and tin the other increases the other decreases based on the correlation value which is -1.

The negative respond which is the number of massive coral increase the cans value decrease.

END OF PRESENTATION
THANK YOU

Understanding the influence of high temperatures on coral reefs- by Josephine





Aim: To assess the relationship between water temperature and coral health.

Research question

Does high water temperature affect coral health?

Method

Sites: Lady Di, Hanging Garden, First Reef, Matane Huva.

Quantitative data collection: Benthic (LPT) & Logger data collection

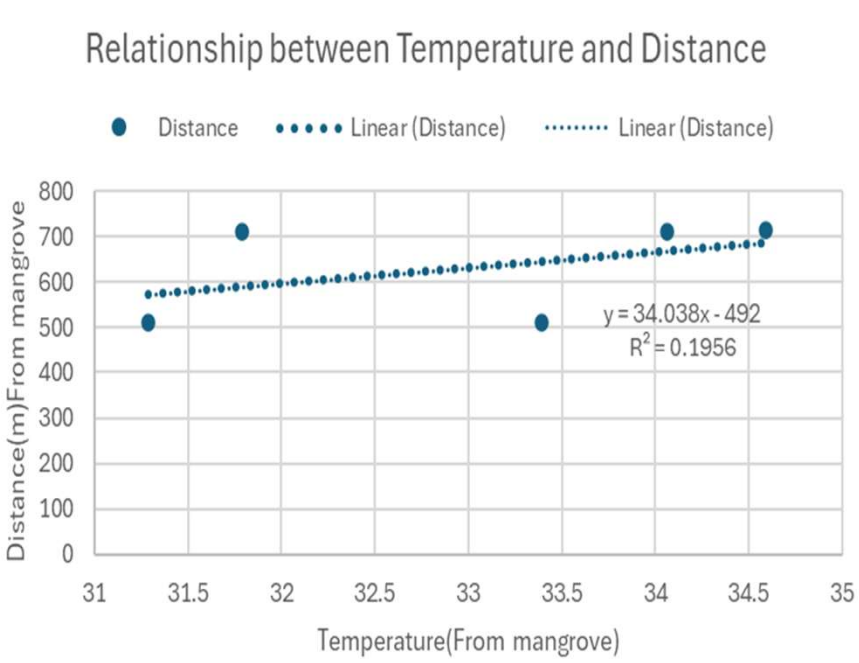
Result & Implications

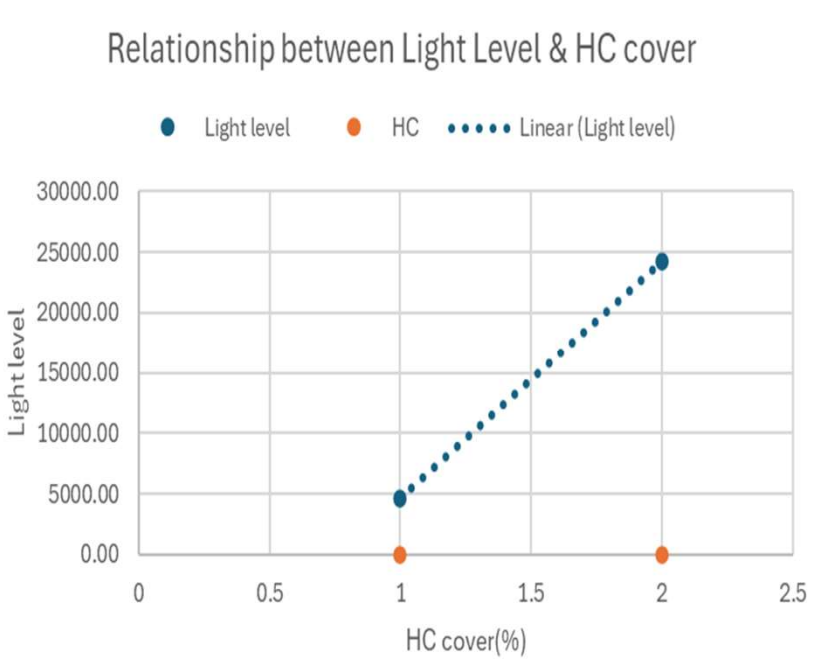
The results show a negative correlation. The more temperatures increased, the more dead coral (DCA) and macroalgae (MA) was found.

Integrating Mangrove and Coral Health- by Olendo

Background

Mangroves protect the coastline,
help in coral health.





Aim

To determine if mangrove presence mitigates thermal stress on nearby coral reefs.

Research question

How do mangroves affect coral health in relation to temperature, distance, light levels and coral cover?

Method

This research project was done within MND (Walindi, Kimbe Bay).

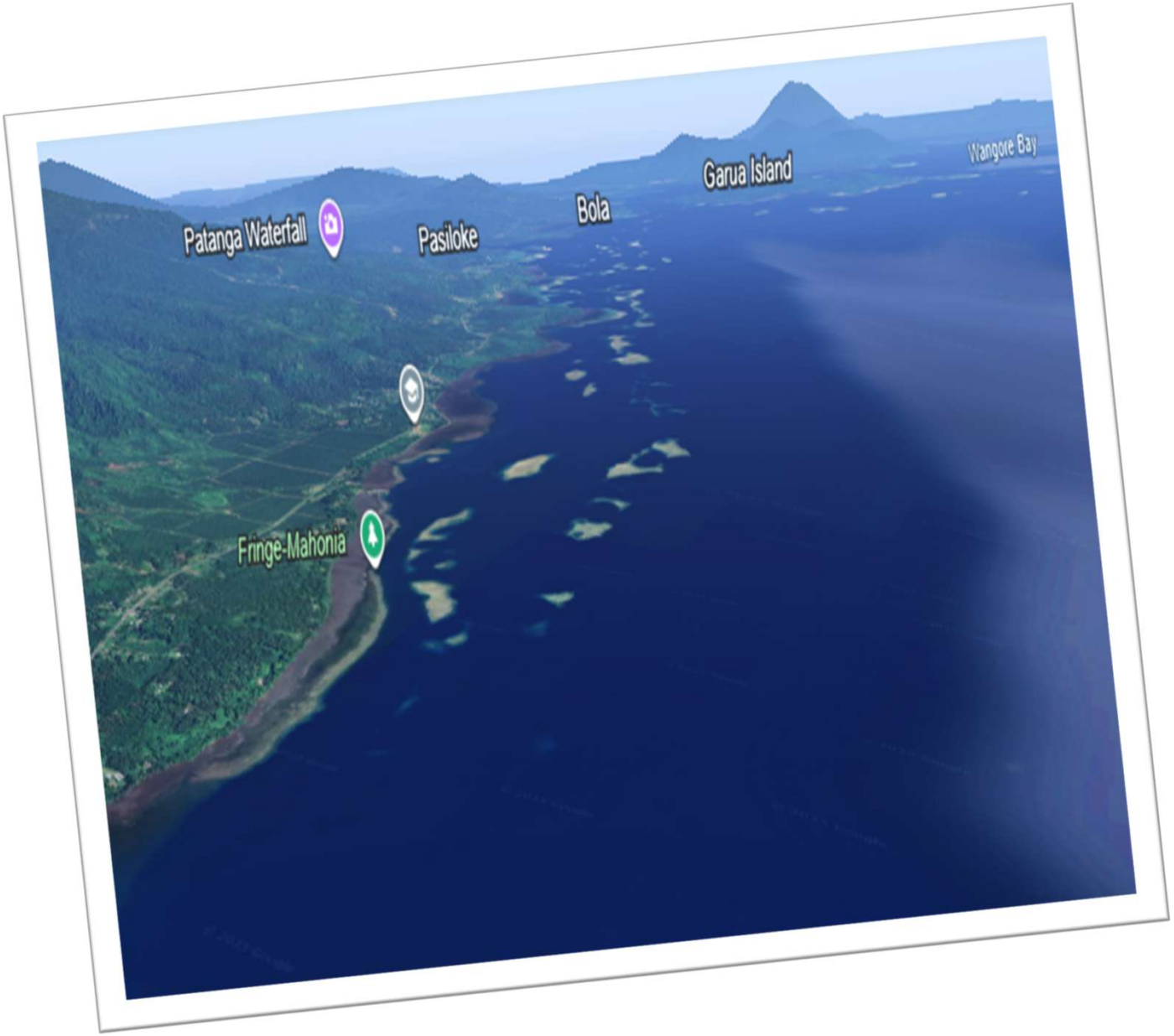
Sites: Mangrove, BGG, FR

Quantitative aspects: Logger (Temperature, Light); Benthic survey (LPT); Google Earth (Distance, Location); Correlations (Scatter plots).

Results and implications

-Weak positive relationship between temperature and distance. As the distances increases, the temperature is slightly increased.

-Strong positive relationship between light level and hard coral (HC) cover. As the light level increases the HC also increases.



Assessing the effects of oil spill on coral reef in Kimbe Bay

PRESENTATION OUTLINE

1. Introduction
2. Research Question
3. Literature review
4. Research Gap
5. Hypothesis
6. Aim and Objectives
7. Materials and Method
8. Result and Discussion
9. Conclusion and Recommendation
10. Acknowledgement
11. References

Introduction

- Coral reefs are vital marine ecosystems that support high biodiversity and coastal livelihoods, and Kimbe Bay is recognized as a globally significant coral reef region; however, oil spills introduce toxic hydrocarbons that can threaten coral reef health.

- This study assesses the effects of oil spills on coral reefs in Kimbe Bay by comparing reef conditions at different distances from the oil spill site—using the closest reef (Big Gawa Gawa) and the farthest reef (Lady Di), since no proper reef occurs at the Walindi boat stop—to determine whether oil contamination impacts coral health.

Research Question:

What are the effect of oil on coral cover in Kimbe bay?

Literature Review

- Oil spills introduce petroleum hydrocarbons into marine environments, which can cause **significant reductions in live coral cover and increased coral mortality** through direct smothering, tissue damage, and toxic exposure (NOAA, 2010; NRC, 2003). Corals exposed to oil may experience bleaching, reduced photosynthetic efficiency, and partial or total colony death, particularly in shallow reef environments where oil contact is prolonged (Guzmán and Holst, 1993).
- Hydrocarbon pollution has also been shown to **impair coral growth, reproduction, and larval development**, leading to reduced recruitment and slower reef recovery (Negri et al., 2016). Experimental studies demonstrate that even low concentrations of oil-derived compounds can inhibit coral larval settlement and survival, especially when exposure occurs during spawning periods (Negri and Heyward, 2001). These sub-lethal effects weaken reef resilience and long-term sustainability.

Research Gap

- Limited research on oil spill impacts on coral reefs in Kimbe bay
- Lack of site-specific data for Kimbe Bay

Challenges & Limitations:

- Just do an observation by taking photo of oil spill without proper lab test.
- No proper benthic survey on oil spill reef sites.

Hypothesis

- **H_1:** Oil spills significantly reduce live coral cover
- **H_2:** Coral reefs closer to oil spill sources show higher impacts
- **H_0:** Oil spills have no significant effect on coral reef condition

Aim and Objectives

Aim:

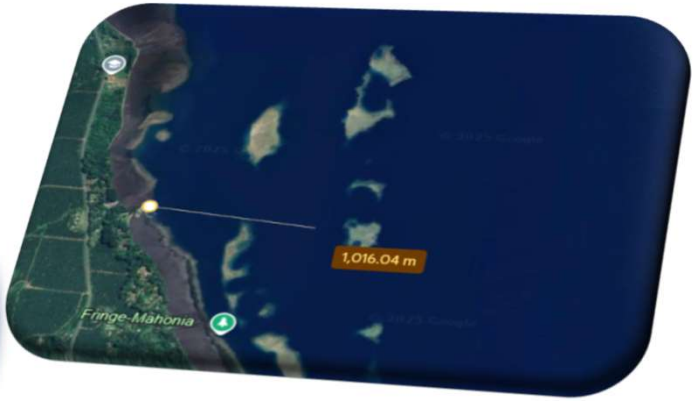
- To assess the effects of oil spills on coral reefs (hard corals) in Kimbe Bay

Objectives:

- Assess coral composition and reef condition
- Compare impacted and non-impacted reef sites, with the distance to and from.
- Analyze the relationship between oil spill proximity and reef health

Materials and Methods

- **Study Area:** Kimbe Bay, West New Britain Province



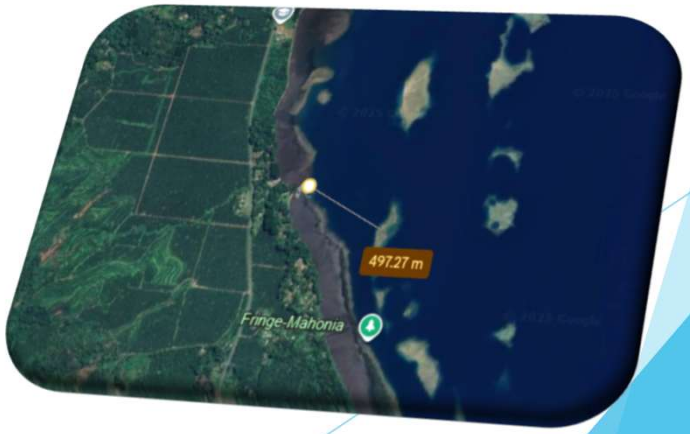
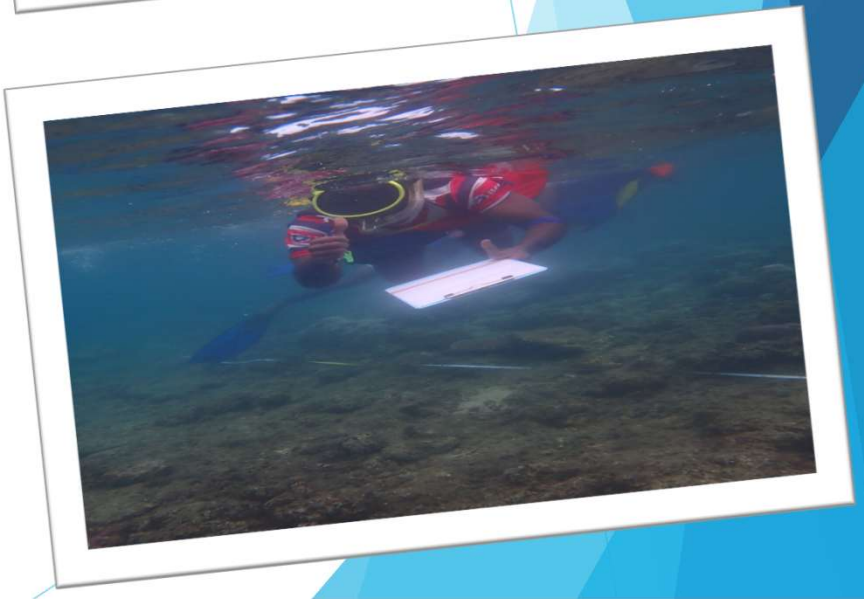


Figure above source taken from the Goggle Earth

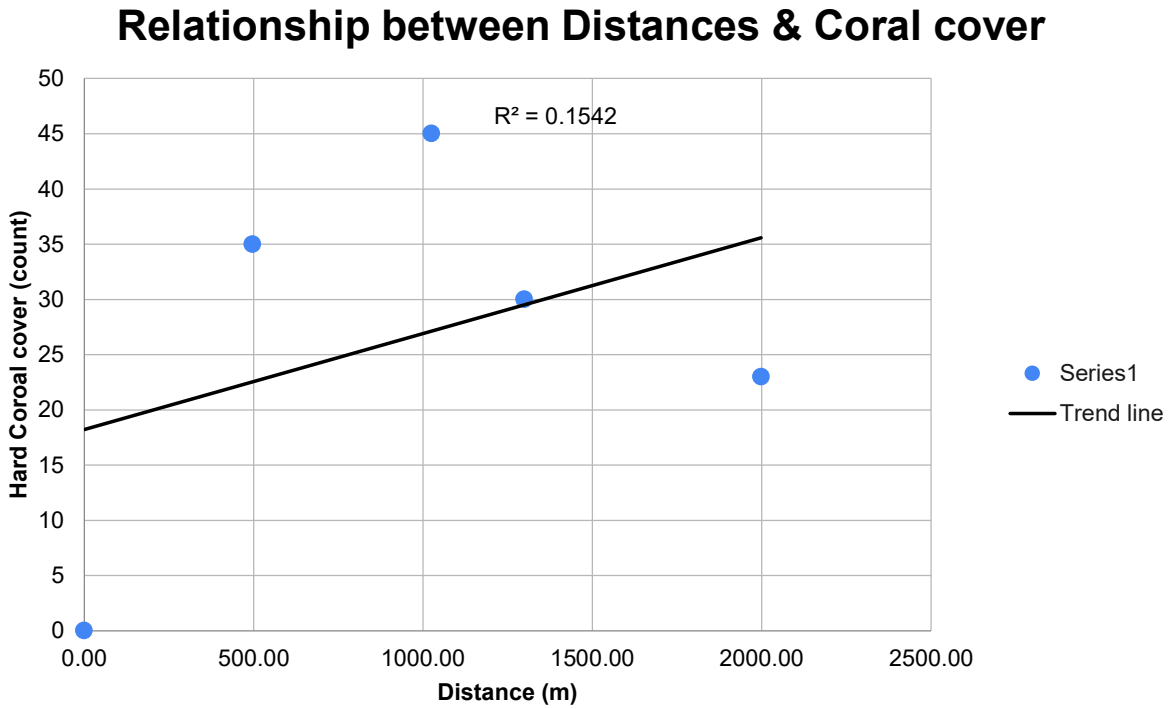
Cont...

- **Data Collection:**
  - Benthic survey-coral reef (hard corals)
  - Photographic evidence of oil spill
- **Tools:** Transect tape, underwater camera, Water proof A4 Paper, Snorkels, Mobile Phone, Pencil, Biro, Clipboard and the online software applications (ImageJ).
- **Data Analysis:** Percentage cover & scatter plot.



Results and Discussion

Results:



The scatter plot analysis between distance from the oil spill source and the hard coral diversity produce a correlation coefficient of r=0.1542, indicating a very weak positive relationship. This suggests that distance from the oil source has only a minimal influence on hard coral diversity at the survey sites.

Conclusion and Recommendations

Conclusion:

- A very weak relationship (r=0.1542) was found between distance from the oil spill source and hard coral diversity.
- Oil spill impacts on hard coral cover appear localized and not strongly distance dependent.
- Other environmental factors (currents) likely play a greater role in influencing coral diversity

Recommendations:

- Conduct long-term monitoring to detect chronic oil spill effects
- Include hydrocarbon analysis in water and sediments
- Strengthen oil spill prevention and rapid response in Kimbe bay

Acknowledgement

- Special thank to the instructors
- Supervisors and lecturers
- Fieldwork team members
- Boat skippers and securities.

References

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RELATIONSHIP BETWEEN SCARUS RIVULATUS ABUNDANCE and MACROALGAE COVER ON CORAL REEF

RESEARCH QUESTION: THE ASSOCIATION BETWEEN REEF GRAZER AND CORAL BENTHOS COMPETITION ON THE REEFS (MACROALGAE).

METHODS:

- BENTHIC SURVEY: Line Point Transect method was used to identify the percentage composition of reef cover in the 4 different reefs.
- FISH ID SURVEY: The fish density of each reef was conducted through the Rapid Survey Method in 4 different sites and 3 replicate each to assess the differences.

Graph showing the abundance of *Scarus rivulatus* (Parrotfish)and Macroalgae.

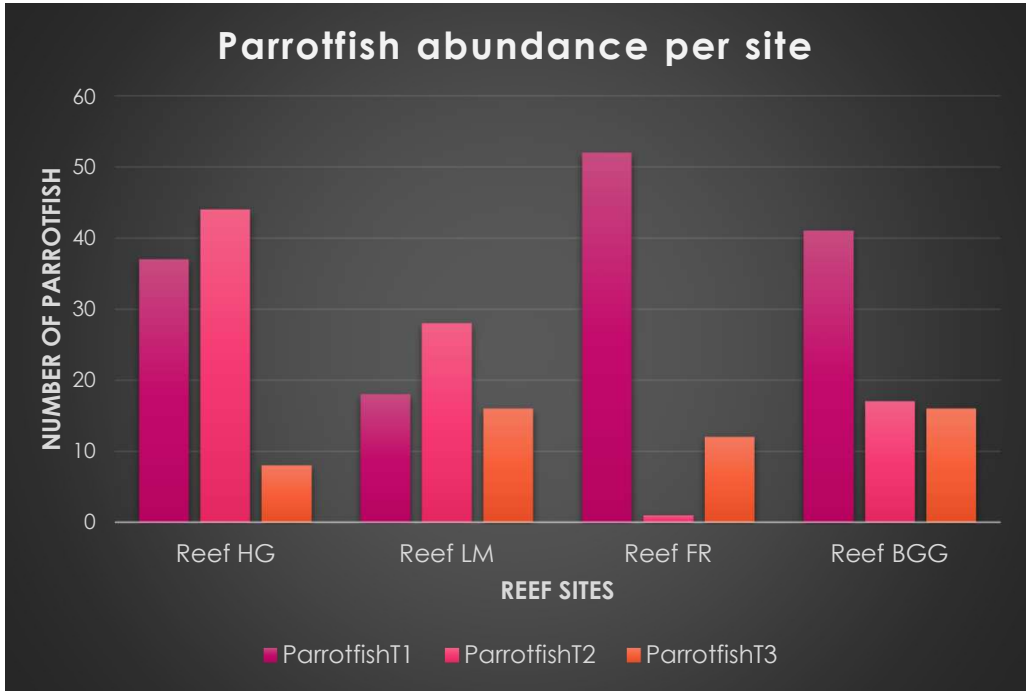


Figure1: Shows the abundance of Parrotfish per sites.

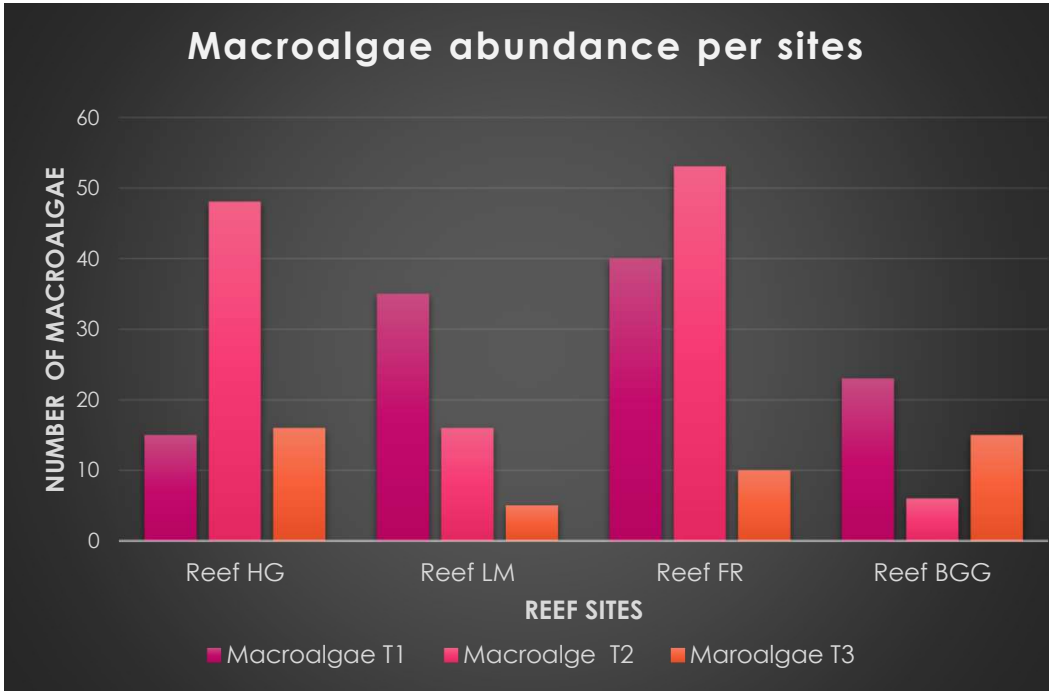


Figure 2: Show the abundance of Macroalgae per sites.

Discussion

- Parrotfish per sites.
  - The F value is less than the critical value of Fu for alpha level 0.05, so it fail to reject the null hypotheses by saying:
  - There is no association between the parrotfish abundance between the reef sites.
- Macroalgae per sites.
  - The F value is less than the critical value of Fu for alpha level 0.05, so it reject the null hypotheses by saying:
  - There is no association between the macroalgae abundance between the reef sites.

RESULT and IMPLICATION

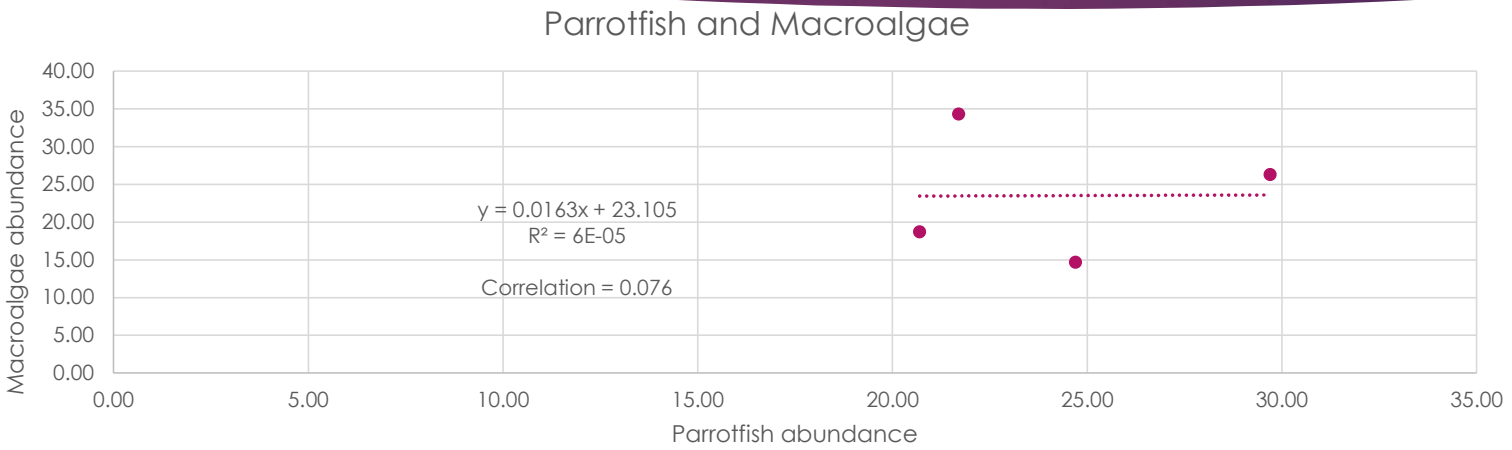
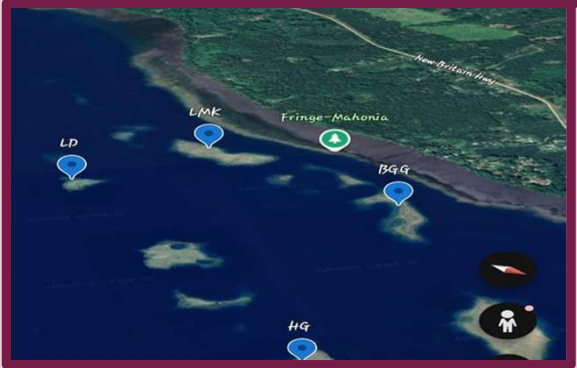


Figure 3: Show the scatted plot diagram of Parrotfish and Macroalgae.

- There is a positive correlation with the calculated value of (0.076)
- There is no relationship between parrotfish and macroalgae.

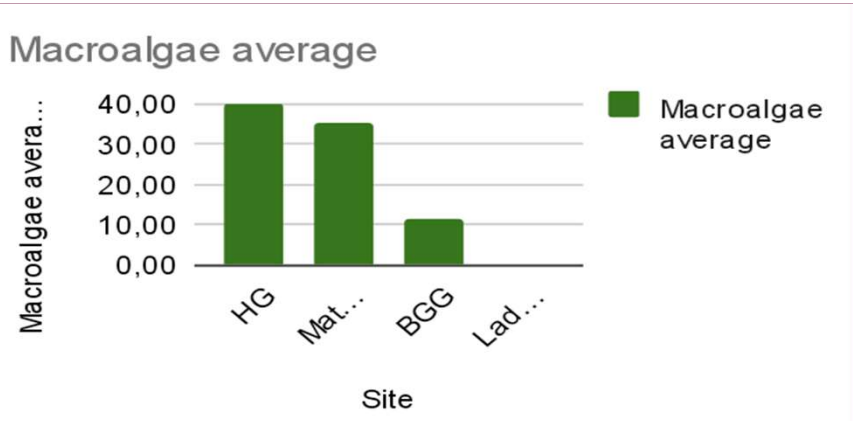
Assessment of current threats within the Kimbe Bay LMMAs - by Venessa

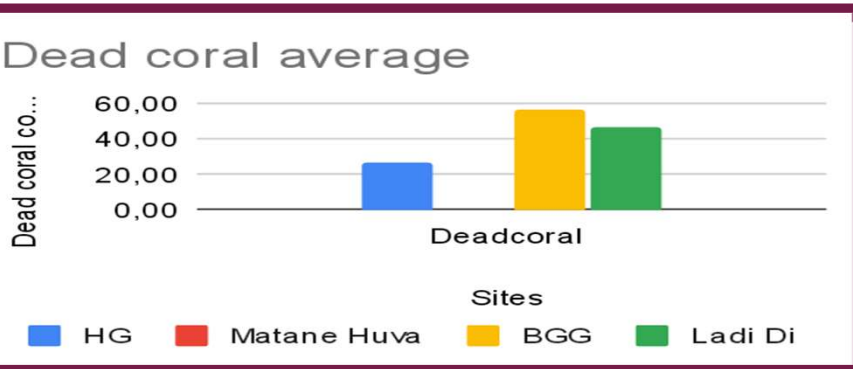
Aim: To find out how macroalgae cover and dead coral cover are influenced by both global threats like climate change, and local human activities.



Sites: Kimbe Bay LMMAs (HG, Matani Huva, BGG and Ladi Di)

Methods: Benthic survey (LPT)





Research question: How do global threats affect macroalgae cover and dead coral cover?

Results: There is no significant correlation between macroalgae and dead coral cover, calculated across the four reef sites.

Implication:In essence, Macroalgae cover and Dead coral cover are clear visual sign that Kimbe Bay reefs are struggling facing threats beyond fishing activities etc, Demanding effort to improve water quality and combat Climate change to restore these vital ecosystem.

Slide 6

1 @Fletcher double check my slides it overlap may you help fix mine.
Venessa Lerris, 18/12/2025

ASSESSMENT OF WATER QUALITY:

- Impact of coastal development of water quality

RESEARCH QUESTION:

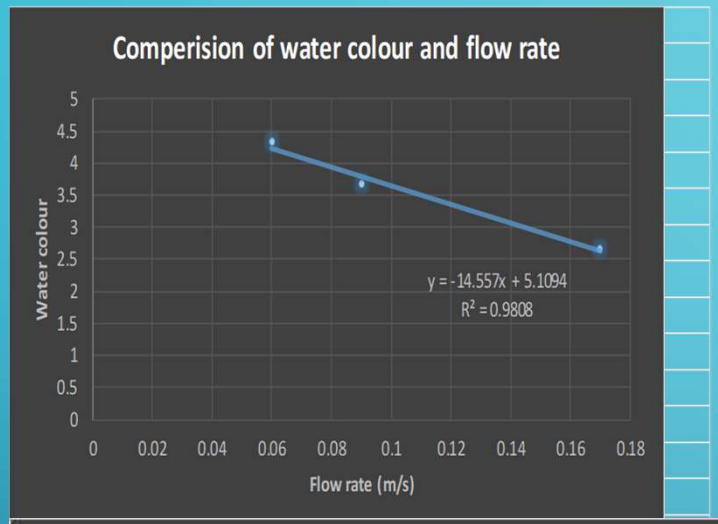
- How does the water's color affect the water flow rate?

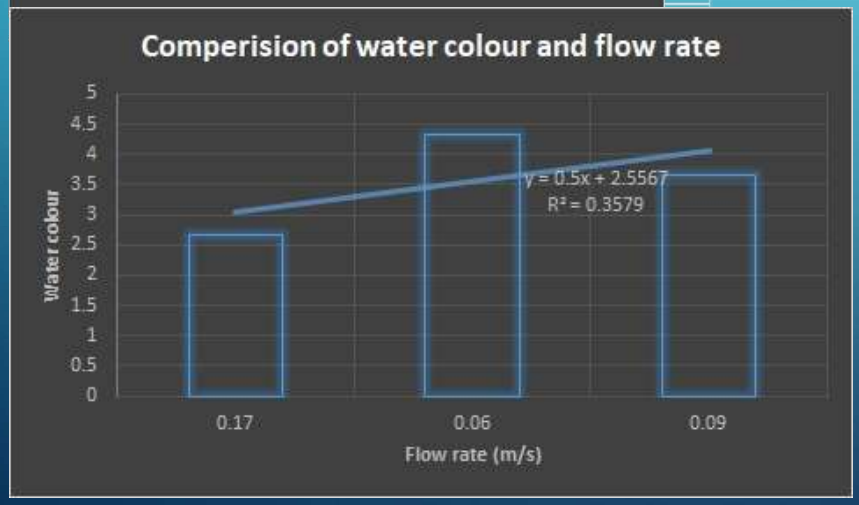
METHOD

- Watercolor: The color of water was collected through observation
- Water flow rate: The flowing rate of each site was measured using transect, float and a GPS (I marked a section of 5m in length for each channel, and I measured the rate by timing the float from the starting point to the end of the transect length which is 5m length and arm stretch length from each site. The flow rate is calculated using the formula: flow rate=distance (m)/time(second)

SUPPORTED ARTICLE: Research findings from TURAK,J. (2022), Dr Maya Srinivani (2021)and Galbraith, W. (2020).

RESULT AND IMPLICATION





- There is a negative correlation between watercolor and flow rate. (-0.5982413623)
- 'r' indicates an inverse relationship.

THANK YOU FOR YOUR TIME AND ATTENTION

ANY Q??