Environmental Systems and Societies

LAB REPORT:
Coral Reef Ecosystem – Line Intercept Transect

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TUNAS MUDA
INTERNATIONAL SCHOOL

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DATA COLLECTION

Raw Data:

SITE 1	
DISTANCE (m)	**SAND/CORAL**
25 - 25.7	Sand, dead corals
25.7 - 26.2	CSM
26.2 - 27.1	Sand, dead corals
27.1 - 27.8	Others (algae)
27.8 – 29.1	Sand, dead corals
29.1 – 30.35	CM
30.35 – 32	Sand, dead corals
32 – 32.6	Soft coral (*Si mularia sp)*
32.6 – 33.6	Sand, dead corals
33.6 – 34.3	Soft coral (*Si mularia sp)*
34.3 – 35.4	Sand, dead corals
35.4 – 35.6	CM
35.6 – 36.3	Sand, dead corals
36.3 – 37	CB
37 – 37.1	Sand, dead corals
37.1 – 37.3	CE
37.3 – 40.2	Sand, dead corals
40.2 – 40.4	Soft coral (*Si mularia sp)*

40.4 – 42.2	Others
42.2 – 43.8	Sand, dead corals
43.8 – 44.6	Soft coral (*Si mularia sp)*
44.6 - 45	Others

SITE 2	
DISTANCE	**SAND/CORAL**
25 - 25.5	Sand, dead corals
25.5 - 26	CM
26 - 27.7	Sand, dead corals
27.7 - 28.8	CM
28.8 - 29.5	Soft coral (*Si mularia sp)*
29.5 - 30.2	Sand, dead corals
30.2 - 30.8	Soft coral (*Si mularia sp)*
30.8 - 31.2	CB
31.2 - 31.7	Sand, dead corals
31.7 - 32.8	CSM
32.8 - 33.25	Sand, dead corals
33.25 - 33.55	CB
33.55 - 34.2	Sand, dead corals
34.2 - 34.5	CB
34.5 - 38.4	Soft coral (*Si mularia sp)*
38.4 - 38.7	Sand, dead corals
38.7 - 39	CE
39 - 40.3	CSM
40.3 - 41.6	Sand, dead corals
41.6 - 41.8	CM
41.8 – 42.8	CSM
42.8 – 43.7	CE
43.7 - 45	CB

Processed Data:

$$Percentage\ cover = \frac{Total\ lengh\ of\ category \times 100}{Length\ of\ transect}$$

SITE 1

CORAL	
TYPE	**CALCULATION**
CSM	$\frac{0.5 \times 100}{20} = 2.5\ \%$
CM	$\frac{1.45 \times 100}{20} = 7.25\ \%$
Soft coral (*si mularia sp)*	$\frac{2.4 \times 100}{20} = 12\ \%$
CB	$\frac{0.7 \times 100}{20} = 3.5\ \%$
CE	$\frac{0.2 \times 100}{20} = 1\ \%$
Total percentage cover:	

$$\frac{5.15 \times 100}{20} = 25.75\ \%$$

OTHERS	
TYPE	**CALCULATION**
Sand, dead corals	$\frac{14.15 \times 100}{20} = 70.75\ \%$
Algae	$\frac{0.7 \times 100}{20} = 3.5\ \%$
Total percentage cover: $\frac{14.85 \times 100}{20} = 74.25\ \%$	

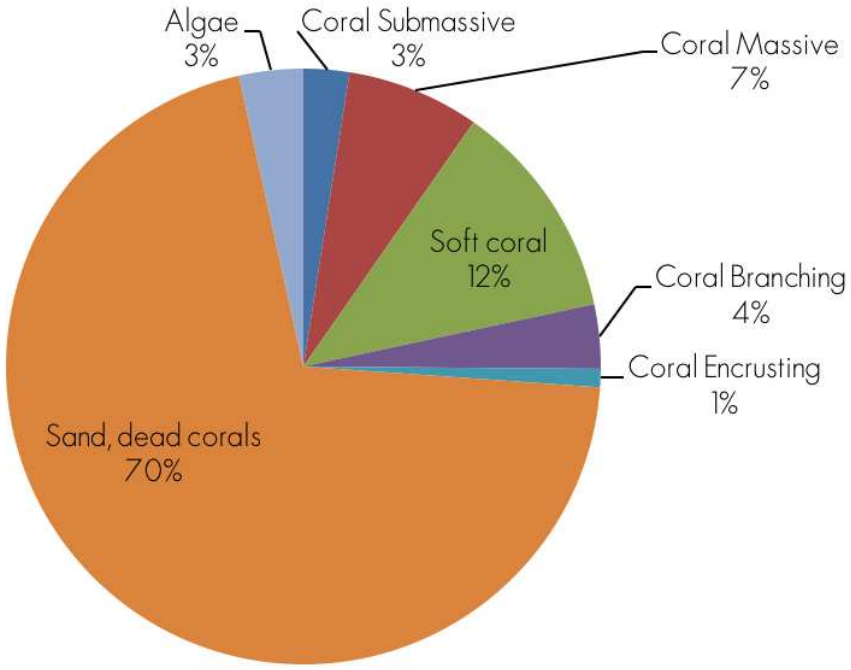
SITE 2

CORAL	
TYPE	**CALCULATION**
CSM	$\frac{3.4 \times 100}{20} = 17\ \%$
CM	$\frac{1.8 \times 100}{20} = 9\ \%$
Soft coral (*si mularia sp)*	$\frac{5.2 \times 100}{20} = 26\ \%$
CB	$\frac{2.3 \times 100}{20} = 11.5\ \%$
CE	$\frac{1.6 \times 100}{20} = 8\ \%$
Total percentage cover: $\frac{13.9 \times 100}{20} = 69.5\ \%$	

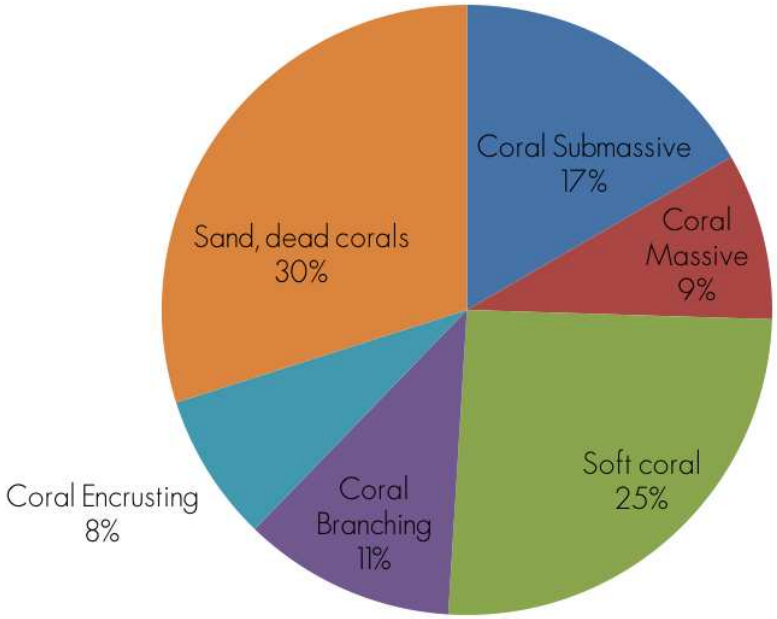
OTHERS	
TYPE	**CALCULATION**
Sand, dead corals	$\frac{6.1 \times 100}{20} = 30.5\ \%$
Total percentage cover: $\frac{6.1 \times 100}{20} = 30.5\ \%$	

DATA ANALYSIS

SITE 1:



SITE 2:



Coral reefs are some of the most diverse and valuable ecosystems on Earth. They support more species per unit area than any other marine environment, including about 4,000 species of fish, 800 species of hard corals and hundreds of other species. It is important to realize that reefs are not only biologically rich and a source of beauty but they also provide many services to the communities they support. If the reef is degraded, destroyed or bleached, those services will be impacted.

This experiment aims to assess the sessile benthic community of coral reefs in around the Pramuka Island (one of the islands amongst the Thousand Islands located in Indonesia), specifically at the northwest side of the island, which in this experiment is known as Site 1, as well as Karang Sempit, or Site 2. By conducting the experiment in these two areas, we can determine the percentage cover of corals between different areas around the Island, how civilization has affected the health condition and the existence of coral reefs.

From the data processing and the pie charts above, we can immediately notice the difference of percentage covers between both sites. The life of corals at the first site is not as nutritious as Site 2, as we can see that the percentage cover of sand and dead corals at Site 1 is certainly bigger. This occurrence might have been caused due to a number of occasions; it could be both naturally or could have been affected by anthropogenic activities around the site of the experiment.

Site 1 is actually located closer to the shore, while a boat ride was needed to reach the other site. This indicates a number of things that might have been the causes of the low percentage cover of corals in Site 1. As it is located closer to the shore, the corals that grow around that specific area are automatically more open and sensitive to human activities that harmed their existence.

Human activities involved daily around the island, such as the ones involving boats, divers, and fishermen on the reef can physically destroy or kill the coral, resulting in reef death.

Propellers and anchors can break apart and crush coral, destroying years, if not decades, of coral growth. Poorly informed and negligent divers also harm corals by touching and standing on them. Even if a coral is not visibly harmed, human touch can make them more vulnerable to death and disease. As people of the island rely on coral reefs for food, the closer the corals are, the easier people can exploit them.

Other than what have been said, the pie charts above also show us the different types of corals that survive in each area. In this case, soft corals seem to be the dominant kind of all corals in both sites, while Coral Encrusting were found less during the ex periment. Soft corals grow quickly in captivity and are easily divided into new individuals, which then became an aspect of why soft corals have the largest percentage cover among the other corals.

CONCLUSION

In conclusion, the different numbers of percentage covers of the corals in both areas are mainly affected by the different locations. This becomes very clear as the dead corals dominate the number of corals found at Site 1. On the other hand, Site 2 is very rich in corals as the percentage of livin g corals exceeded the dead corals. This is possible due to the different amount of human activities that have affected the two areas. As Site 1 is located closer to the shoreline, the possibilities of interfering with human activities are automatically greater, which then have resulted a p oor number of percentage covers of corals.

EVALUATION

I noticed that during the experiment, there are some factors that might have caused unjustified end results. Due to our limited experience in snorkeling, and basica lly interacting with the marine life, it was very difficult to obtain exact results. There might have been a few miscounting of corals, as it was quite a challenge to stay stable in the water. During the experiment, being very careful towards the surround ings was very important, as corals and sea urchins were everywhere. To avoid stepping on the corals and sea urchins, we had to be extra careful, and this might have caused more miscounting and misidentifying the corals, as moving in the water were completely different than doing experiments on land. More time might also present better results. As time was very limited, we might have miscounted and misidentified some of the corals along the line transect.

REFLECTION

This experiment was ended successfull y in a way that I now understand the process of Line Intercept Transect, assessing the sessile benthic community of coral reefs and calculating the percentage covers of both living and dead corals. Although I could have obtained better results by being ful ly prepared, especially in understanding the step -by-step process of method. Asking myself the question: what can go wrong? This could have prevented the careless human errors that have occurred during the experiment.

Aside from improvements, I have to sa y that this experiment have lead me to new understandings, concepts, knowledge, as well as manners and attitudes toward a project. I believe I have shown effort by being proactive throughout the experiment. But most

importantly, I learnt a very important lesson regarding the environment, especially understanding the importance of the coral reef, how such ecosystems support a variety of human needs. They are importance for subsistence, fisheries, tourism, shoreline protection, and yield compounds that are i mportant in the development of new medicines.

APPENDIX

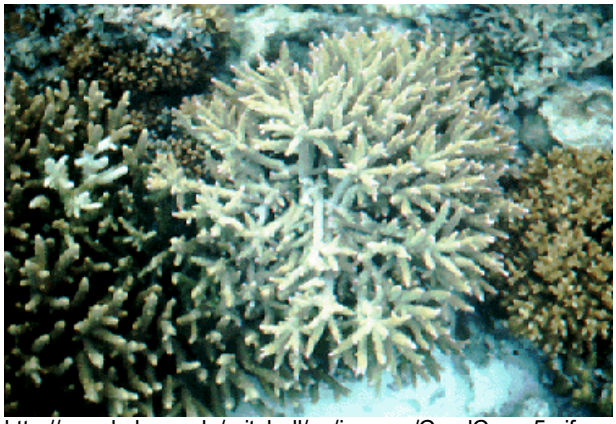
http://www.getahugetank.com/images/Massive_Coral.jpg

CM
Coral Massive

http://2.bp.blogspot.com/

CSM
Coral Submassive

CB
Coral Branching



http://people.hws.edu/mitchell/oz/images/CoralComp5.gif

http://oceanservice.noaa.gov/education/kits/corals/media/coral03g_480.jpg

CE
Coral Encrusting

http://www.malapascua.net/images/gallery/diving/soft-corals-at-small-beach.jpg

Soft Coral
(*Simularia sp*)

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