BIODIVERSITY AND ABUNDANCE OF CORALS

IN KRABI, THAILAND

GROUP 1

PARTICIPANTS

Students: Jarubha Suanklieng, Anawach Anantachoke, Dilokpat Chaiwirat, Pimpawee Piamjomsiri, Kantinan Lumsun, Kuldhira Iemarrom, Panthipha Srisutraporn, Sukrita Rasameephen, Gunyarut Chatkaewmorakot, Vasupint krikieatisaku, Manatsakan Ariyapithak, Pornnutcha Khongton, Poonnama Surachutikarn

School: Samsenwittayalai

Teacher: Nuttanit Karnwitee

Scientist: Khemmanut Nontasorn, Suthima Heampan ,Pornthip Kedthawon, Uthai Kuhapong, Krisnadej Jaroensutasinee, Mullica Jaroensutasinee

INTRODUCTION

ABOUT CORALS

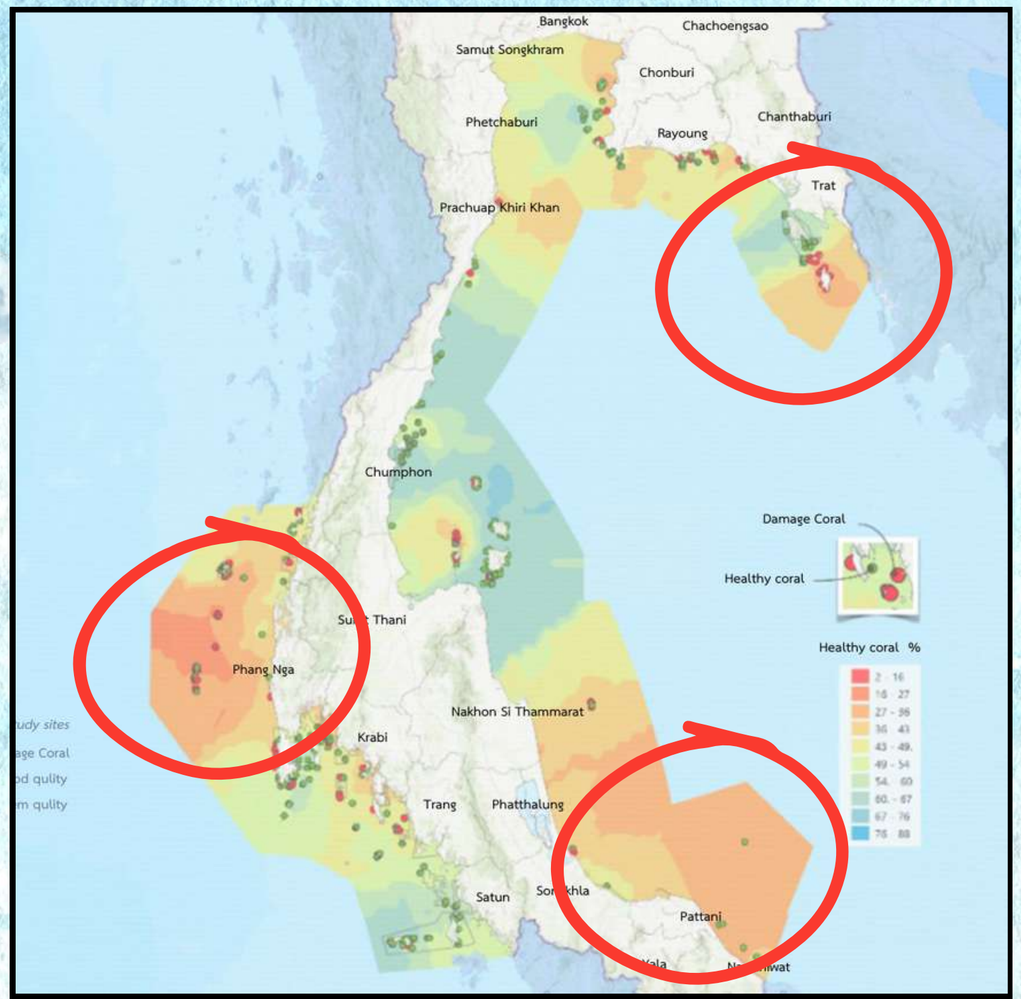
- Coral reefs represent one of the most productive and biodiverse ecosystems in the world, second only to the high diversity found in tropical rainforests.
- Research has shown that increases in water temperature, nutrient (sewage) input, storm water runoff and turbidity or sedimentation are contributing factors to coral disease. Additionally, coral bleaching severely weakens corals and makes them more susceptible to disease.
- Coral reefs are some of the most important ecosystems in the oceans. Many around the world are dying at an alarming rate due to ocean acidification and rising water temperatures from climate change.

BIODIVERSITY AND ABUNDANCE OF CORALS

INTRODUCTION

CORAL STATUS BY PROVINCE FROM 2018 - 2021 IN THAILAND

Corals are maintained and have guidelines for proper care, factors like temperature and water quality, beyond human control, also contribute to coral loss.



INTRODUCTION

Some example cause of the problem

Environment problems

marine pollution

unsustainable tourism

INTRODUCTION

THE BENEFITS OF CONDUCTING RESEARCH

- IT IS POSSIBLE TO MONITOR THE CHANGES IN CORAL REEFS AND CHECK THE STATUS OF THE CORALS ON KOH PODA.

- IN CASES WHERE MATHEMATICA CAN BE USED AND THE RESULTS ARE SIMILAR TO THOSE OBTAINED WITH CPCE, IT WOULD MAKE IT MUCH EASIER TO CALCULATE THE NUMBER AND IDENTIFY THE IMPACT OF CORALS AND THEIR SURROUNDING ENVIRONMENT.

OBJECTIVES

- MONITOR BIODIVERSITY AND ABUNDANCE OF CORALS IN KRABI, THAILAND
- COMPARE EFFICIENCY BETWEEN BOTH OF SOFTWARE THAT WE USE FOR CORAL ANALYSIS

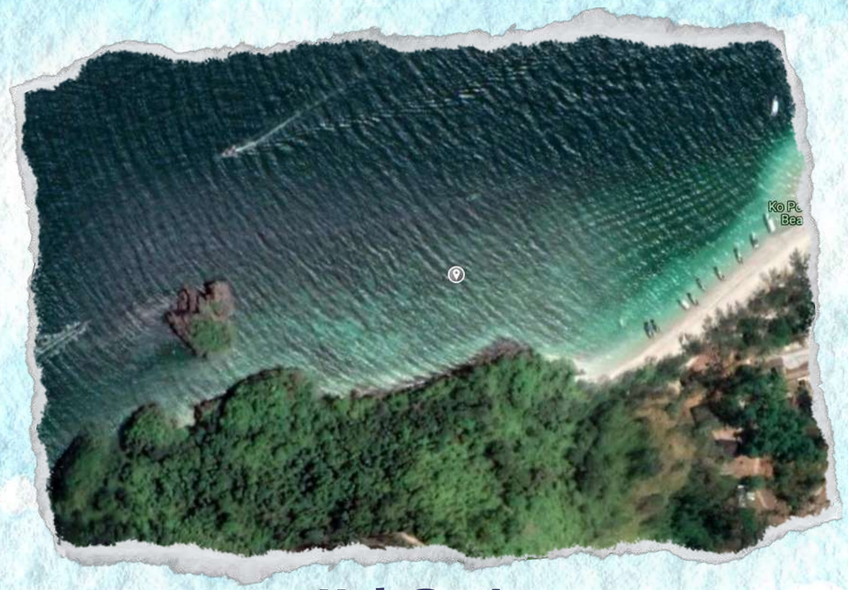
MATERIALS AND METHODS OF CORAL STUDY

MATERIALS AND METHODS

OF CORAL STUDY

STUDY SITES

The study area was Koh Poda (N 7.974617, E 98.809475)
Mueng Krabi District, Krabi Province, Southern Thailand



Koh Poda

coordinate

MATERIALS AND METHODS

OF CORAL STUDY

DATA COLLECTION

- Picture and Video of Corals from

OLYMPUS TG TOUGH

OLYMPUS OMD EM5

CANONPOWER SHORT G1X MARK2

MATERIALS AND METHODS

OF CORAL STUDY

DATA COLLECTION

- Picture and Video of Corals from

SONY RX1004

OSMO ACTION

DATE : 01/03/24

MATERIALS AND METHODS

OF CORAL STUDY

DATA PREPARATION

Select and crop useable picture and video of corals using “Clip Champ”

Convert corals video to panorama using “Image Composite Editor”

Color correcting and sharpening using “Photos in Mac”

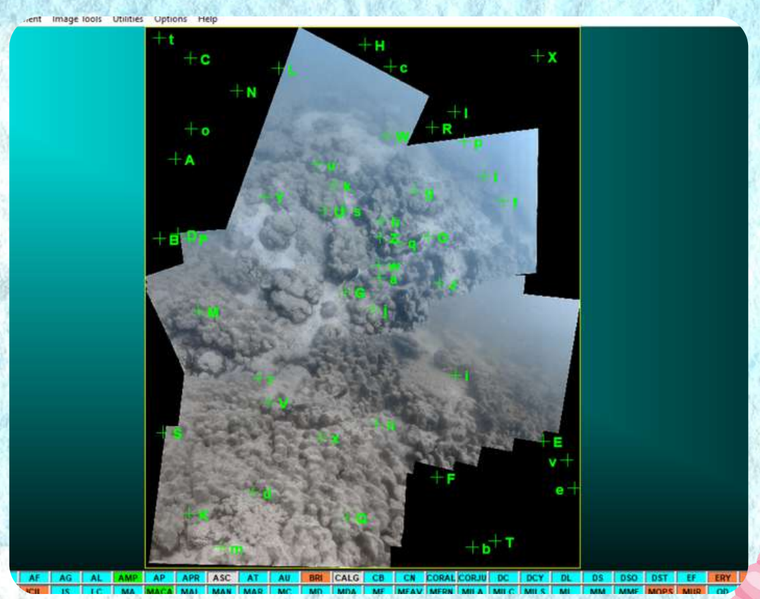
MATERIALS AND METHODS
OF CORAL STUDY

DATA ANALYSIS

CPCe Application

1. Import all picture from preparation step

2.Auto generate 50 randoms point overlay each picture



MATERIALS AND METHODS

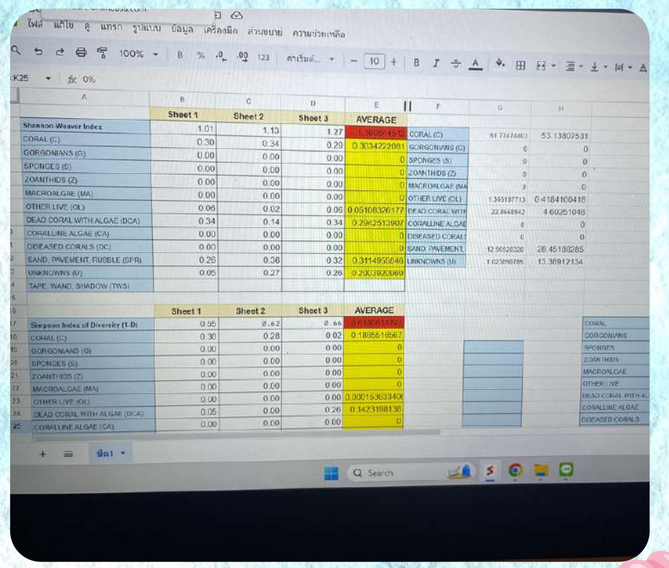
OF CORAL STUDY

DATA ANALYSIS

CPCe Application

3.Identify object type each point in every picture

4.Export Excel file from the program

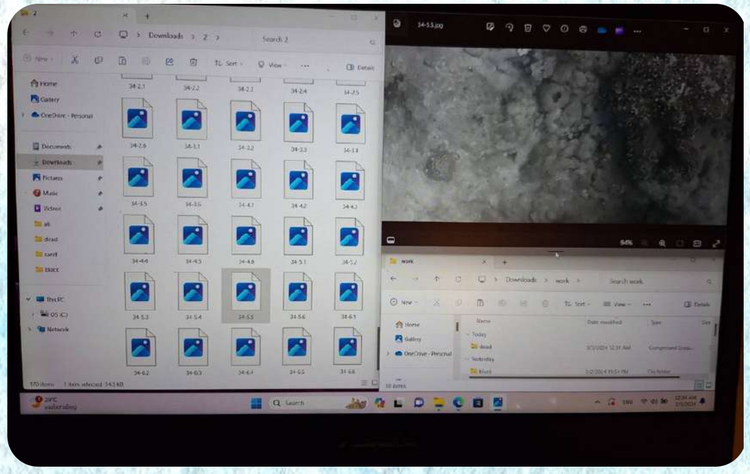


MATERIALS AND METHODS
OF CORAL STUDY

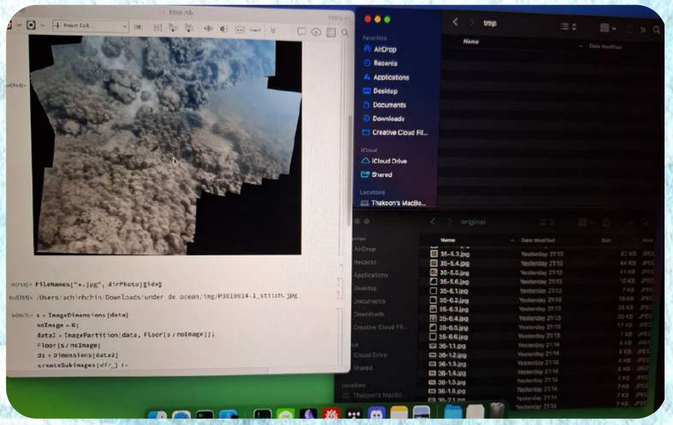
DATA ANALYSIS

Wolfram Mathematica Application

1. Select some picture from total



2. Divide a picture to many small pictures, then identify types of object by hand

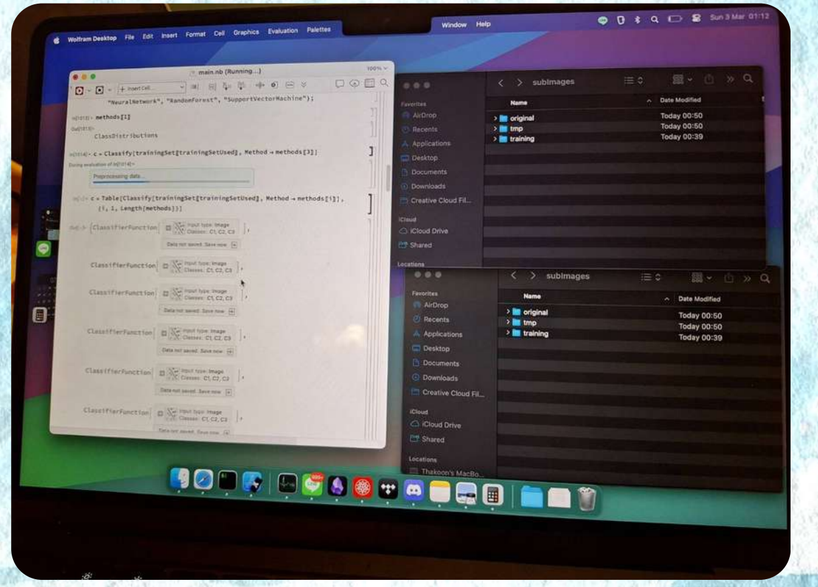


MATERIALS AND METHODS
OF CORAL STUDY

DATA ANALYSIS

Wolfram Mathematica AI

3. Take them to train AI to classify and compare the accuracy between many models

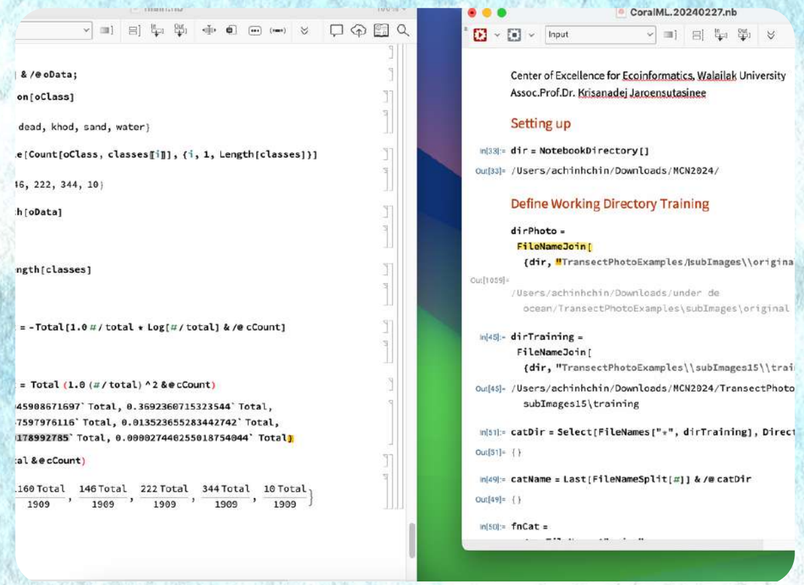


MATERIALS AND METHODS
OF CORAL STUDY

DATA ANALYSIS

Wolfram Mathematica AI

4. Use machine learning model to classify and count objects



MATERIALS AND METHODS OF WATER STUDY

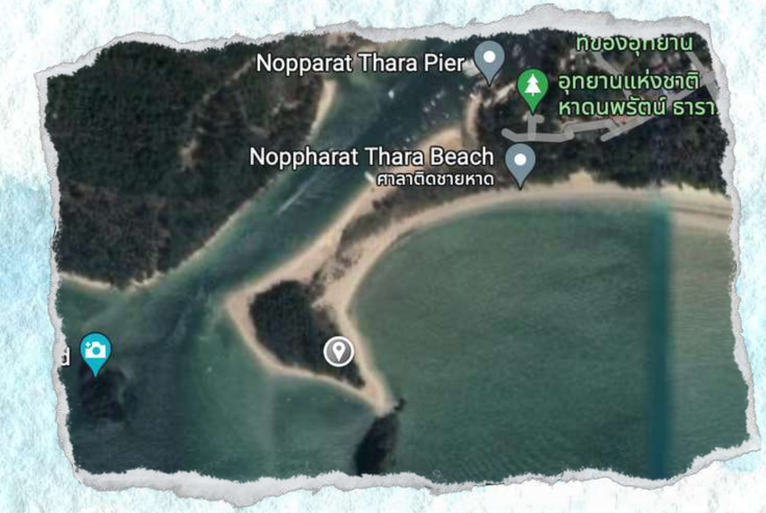
MATERIALS AND METHODS

OF WATER STUDY

DATA COLLECTION

Sample of water data obtained from the Nopharat Thara Beach (N 8.044059, E 98.796690) Mueng Krabi District, Krabi Province, Southern Thailand

1500 ML



Nopharat Thara Beach

coordinate

MATERIALS AND METHODS

OF CORAL STUDY

DATA COLLECTION

Sample of water data obtained from the Koh Poda (N 7.974617, E 98.809475) Mueng Krabi District, Krabi Province, Southern Thailand

500 ml

Koh Poda

coordinate

MEASUREMENT
OF CORAL STUDY

DATA PROCESS

*MAKE SURE THE DIFFERENCE BETWEEN ALL VALUE IS NOT MORE THAN 0.05
OR ELSE YOU NEED TO REPEAT ALL PROCESS AGAIN

1. COLLECT WATER SAMPLES FROM KO PODA AND NOPHARAT THARA BEACH
* FOLLOWING GLOBE DATA COLLECTION METHOD
2.MEASURE EACH VALUE 3 TIMES
*CLEAN THE EQUIPMENT AFTER DIPPING IN THE WATER 2 TIMES
FIRST TIME : WASH BY FILTERED WATER AND WIPE WITH TISSUE
SECOND TIME : WASH BY FILTERED WATER AGAIN AND STABILIZE THE VALUE OF THE EQUIPMENT

AVERAGE FORMULA

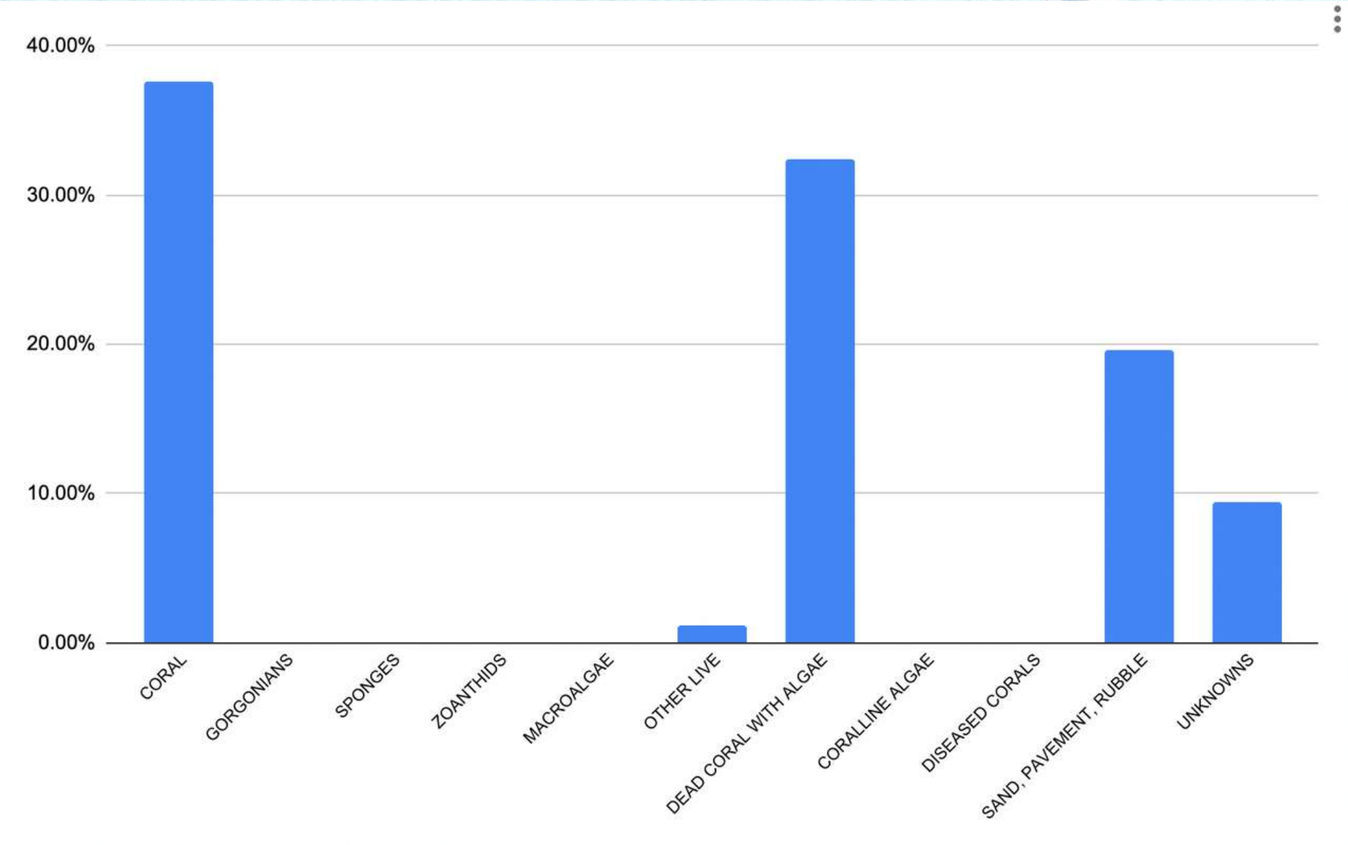
$$\bar{x} = \frac{\sum x}{n}$$

$\bar{x}$	AN AVERAGE
$\sum x$	SUM OF ALL DATA
n	TOTAL NUMBER OF DATA

RESULTS AND DISCUSSION

CORAL RESULTS

CPCe



Shannon–Weaver Index

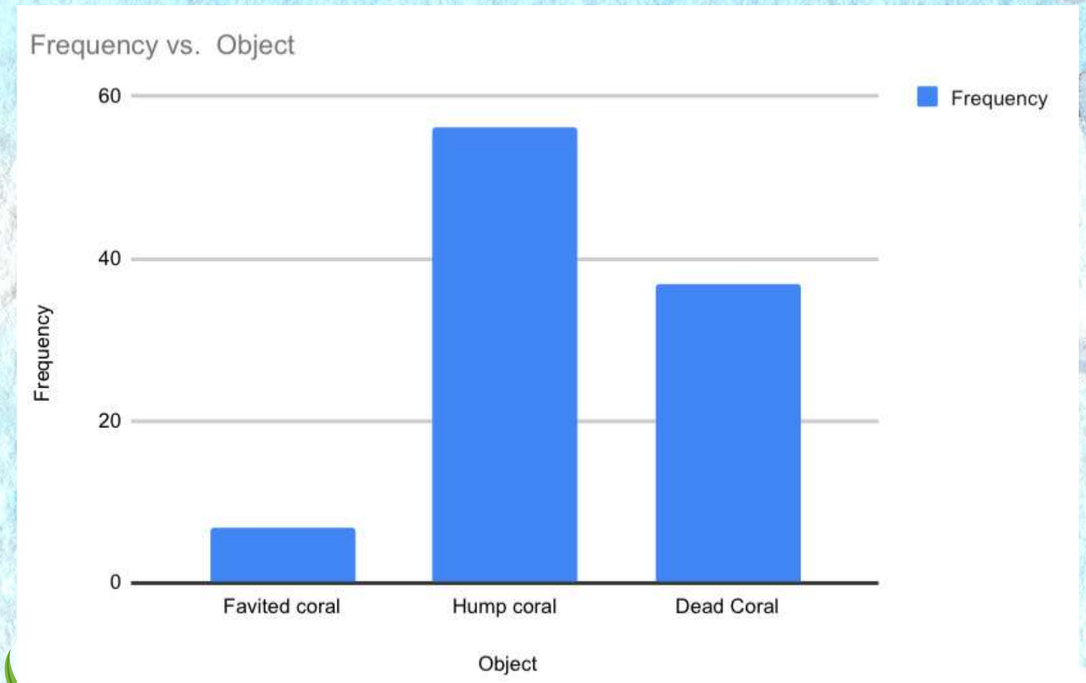
1.161

SIMPSON INDEX OF DIVERSITY(1–D)

0.618

CORAL RESULTS

Wolfram Mathematica



Shannon–Weaver Index

1.146

SIMPSON INDEX OF DIVERSITY(1–D)

0.618

WATER RESULTS

KO PODA

	1	2	3	average
pH	8.54	8.56	8.56	8.55
Salty	17.7	17.7	17.8	17.73%

- APPROPRIATE PH FOR CORAL TO BE ALIVE IS BETWEEN 8.2 AND 8.4
- APPROPRIATE SALTY SOLUTION FOR CORAL TO BE ALIVE IS BETWEEN 30‰ AND 35‰
- THE PH AND SALINITY OF THE WATER IN KO PODA ARE NOT SUITABLE FOR CORAL LIVING.

‰ = PPT (PART PER THOUSAND)

WATER RESULTS

NOPPARAT BEACH

	1	2	3	average
PH	8.44	8.44	8.44	8.44
Salty	17.8‰	17.7‰	17.6‰	17.7‰

‰ = PPT (PART PER THOUSAND)

- APPROPRIATE PH FOR CORAL TO BE ALIVE IS BETWEEN 8.2 AND 8.4
- APPROPRIATE SALTY SOLUTION FOR CORAL TO BE ALIVE IS BETWEEN 30‰ AND 35‰
- THE PH AND SALINITY OF THE WATER IN NOPPARAT BEACH ARE NOT SUITABLE FOR CORAL LIVING.

TROUBLESHOOTING GUIDELINES

1.Increase the punishment for destroying coral reefs.

2.Limit tourists traveling areas.

3.Place artificial coral reefs to restore natural reefs.

4.Installation of mooring buoys To prevent boats from being anchored on coral reefs.

CONCLUSION

The water quality analysis around Koh Podah indicates that the pH levels are adequate for coral survival. However, the salinity is lower than what corals require, explaining why most corals found in this area are dead. Corals cannot thrive in water with salinity levels below a certain threshold.

Additionally, most of the corals encountered are in tourist areas, suggesting other factors contributing to their degradation or death. These include inadequate management by park authorities, sedimentation from coastal erosion and transport ships, and the introduction of pollutants harmful to corals, such as trash disposal in the sea and the use of non-reef safe sunscreen.

REFERENCES

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THANK YOU

For Watching and Listening