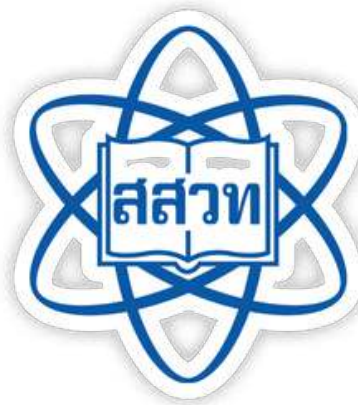




Effects of soil quality on the carbon storage of seagrass in Pak Klong Beach and Ao Kham, Trang

Researcher

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Associate Professor Dr. Mullica Jaroensutasinee

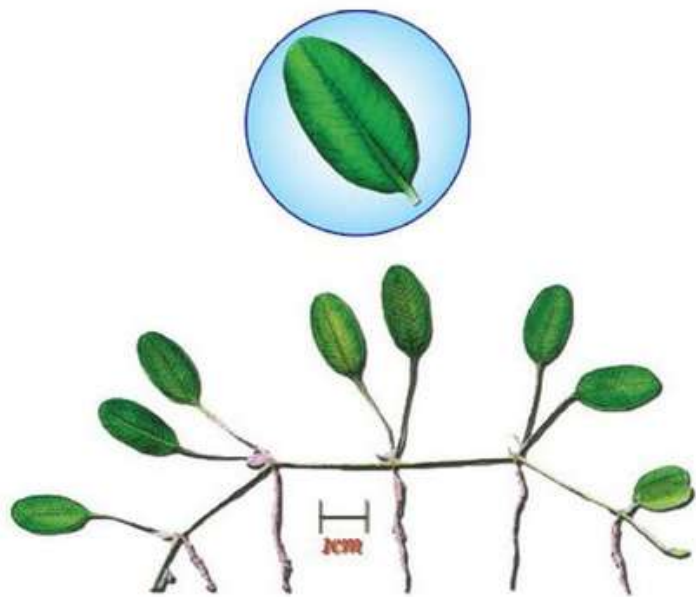
Adviser

Mrs. Patchara Pongmanawut

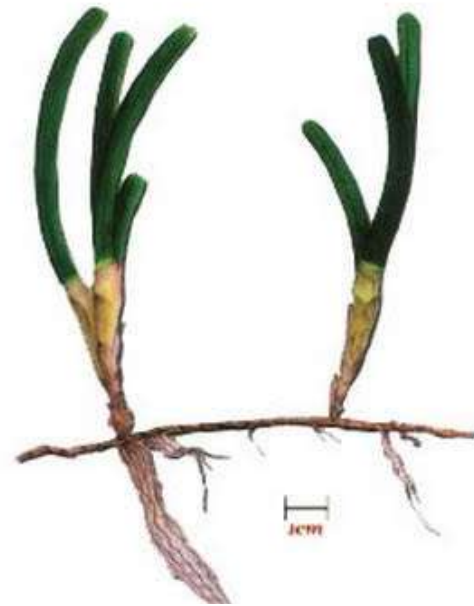
Mrs. Sirikwan Nuphutti



Introduction



Halophila major



Cymodocea rotundata



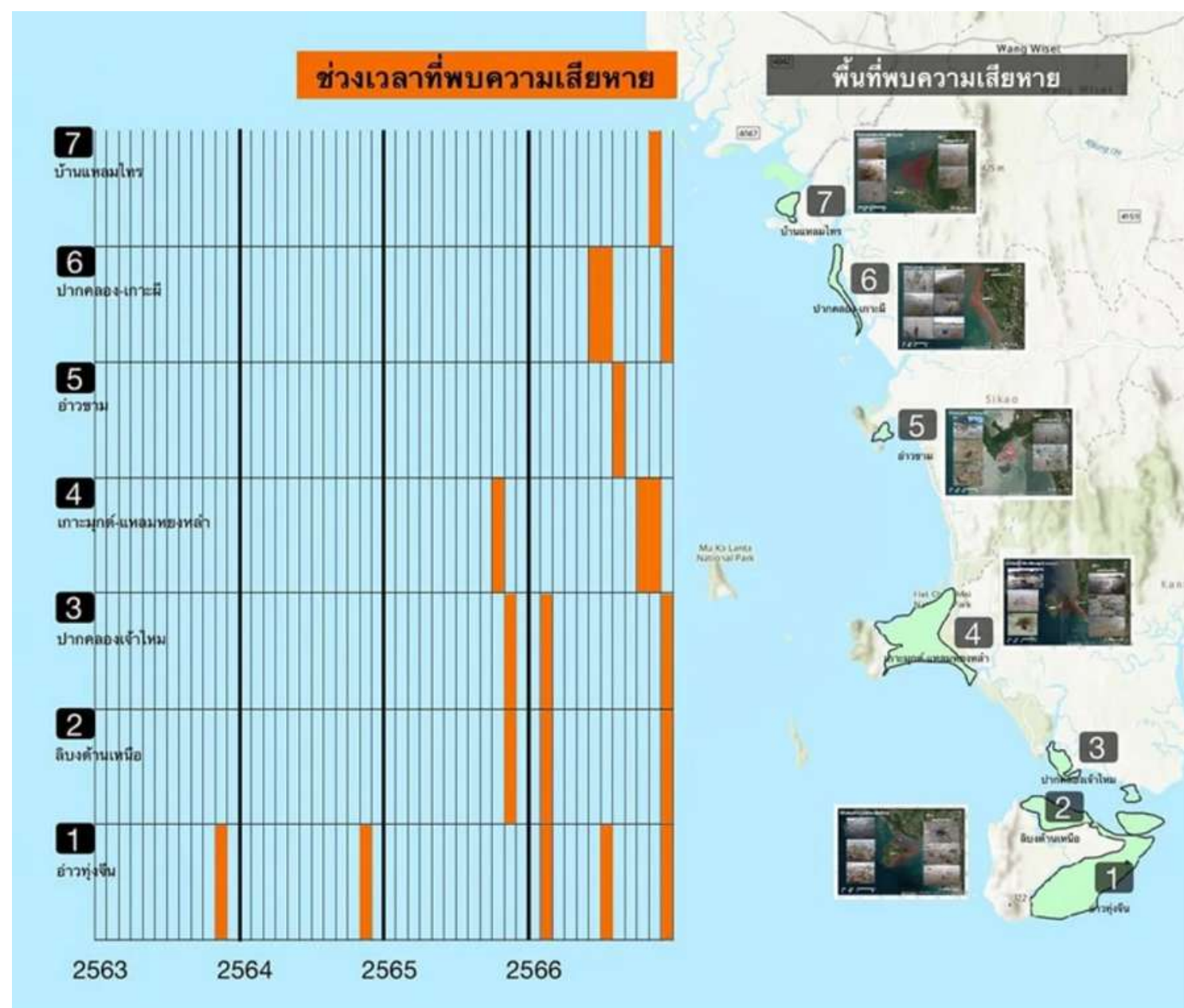
Enhalus acoroides

Seagrass



Seagrass carbon storage

Introduction



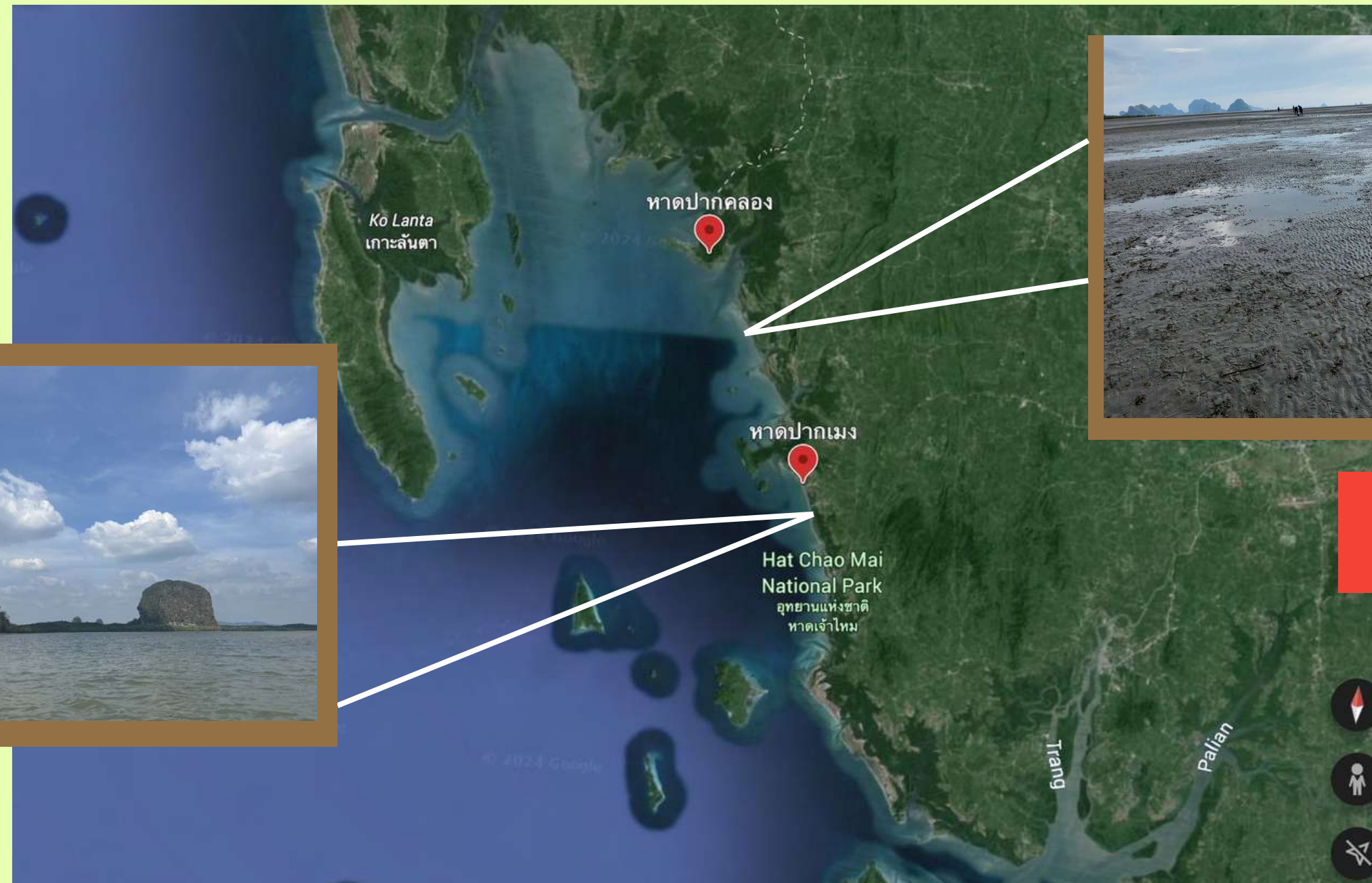
ธรณ์ อารังนาวาสวัสดิ์, 2567

seagrass got damage and greatly increase

objective

- 1 To compare the carbon storage of seagrass in the Pak Khlong Beach area. and the area of Ao Kham, Pak Meng Beach
- 2 To study soil quality that affects carbon storage in seagrass.
- 3 To study the carbon storage ability of each type of seagrass including *Enhalus acoroides*, *Halophi major*, and *Cymodocea rotundata*
- 4 To compare the above-ground and underground seagrass carbon storage abilities.
- 5 To compare the carbon sequestration capacity of single-species and aggregated seagrass habitats.

Study site



Ao Kham

Lat7.5020
Lon99.3012

Pak Klong

Lat7.6244
Lon99.2611

Operation step

1



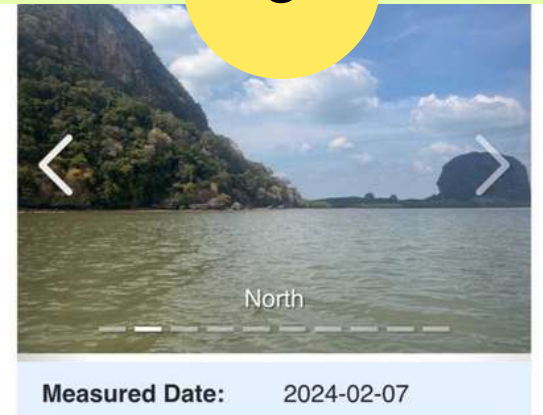
Surveyed the area and collected samples of seagrass and sediment.

2



Soil quality analysis

3



Do Land Cover using GLOBE

4



Analyze the quantity
Store carbon in the soil

5



Analyze the quantity
Carbon storage in seagrass

6



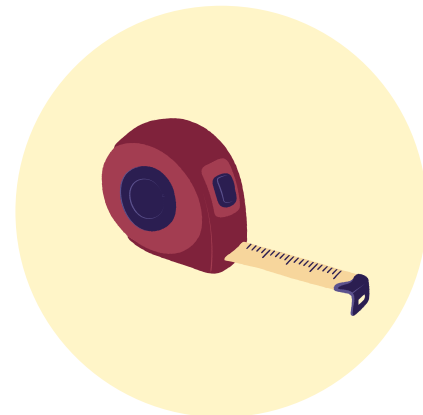
data analysis

Materials and Equipments

collecting samples



Quadrat



Tape measure

carbon storage



hot air oven



muffle furnace



digital scale

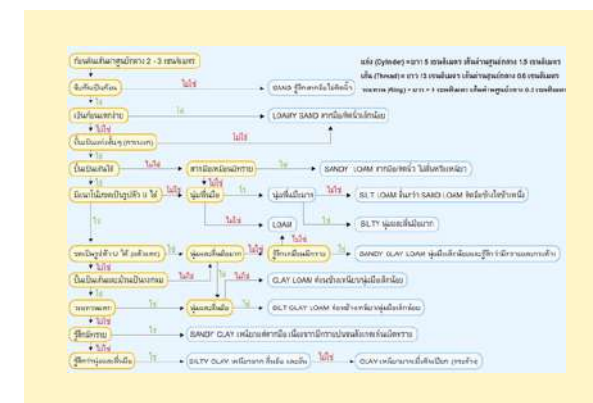
soil observation



universal indicator
paper



soil NPK test kit

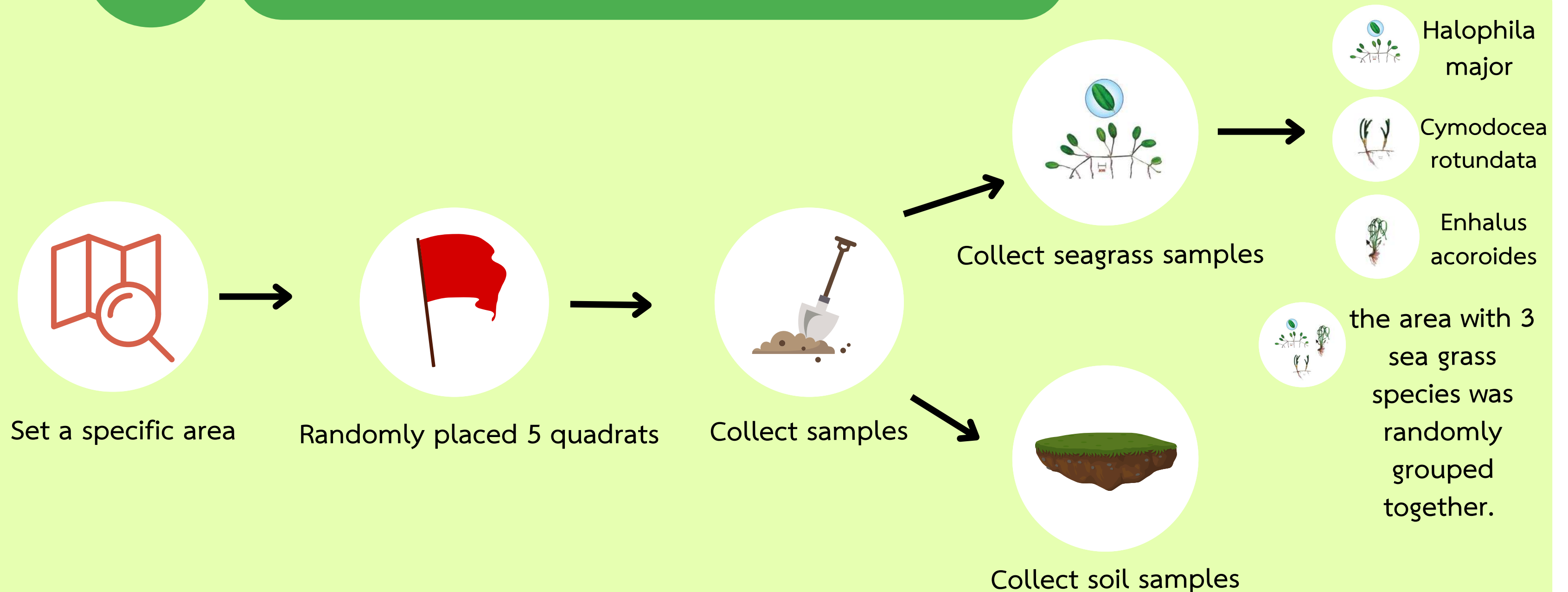


field inspection guide for
soil characteristic

Methods

1

Collection of seagrass and soil samples



1

Collection of seagrass samples

Methods



Placing a specific area

- Measure the distance from a coastline that rises 150 meters above sea level to an area with seaweed.
- The study area is set to be 100x100 meters.

1

Collection of seagrass samples



Methods

placing specific random quadrats in areas with 50–75% dense seagrass, divided into 4 groups, with Group 1–3 types randomly separated according to the type of sea grass, including *Enhalus acoroides*, *Halophila major*, and *Cymodocea rotundata*. As for the fourth group, the area with 3 sea grass species was randomly grouped together.

1

Collection of seagrass samples

All seagrass samples were collected in the quadrat for all 4 seagrass species.



Enhalus acoroides



Halophila major



Cymodocea rotundata



the area with 3 sea grass species
was randomly grouped together.

1

Collection of soil samples

Methods



- Soil samples were collected according to the GLOBE method by digging approximately 30 cm from the soil surface in every quadrat, amounting to 400 grams.

Methods

2

Soil quality analysis

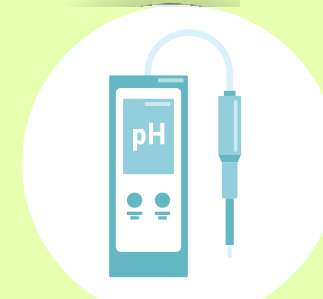
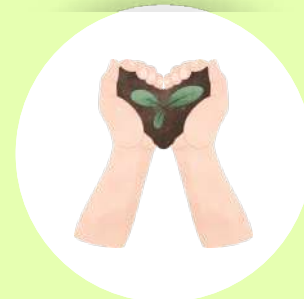


N P K test



test soil characteristics

by Field inspection guide for soil characteristic
according to GLOBE method (Soil Protocol)



pH test



3

Save data to GLOBE data base

Methods

Land Cover



Measured Date: 2024-02-07

Organization Name: Princess Chulabhorn Science High School Trang

Site ID: 338140

Site Name: 47NNJ332292

Latitude: 7.501501

Longitude: 99.300917

Elevation: 0m

Muddy: true

Leaves On Trees: true

Feature 1 Extra Data: ((compassData.heading: 326, compassData.horizon: 12))

Feature 2 Extra Data: ((compassData.heading: 61, compassData.horizon: 7))

Feature 3 Extra Data: ((compassData.heading: 269, compassData.horizon: 7))

Feature 4 Extra Data: ((compassData.heading: 31, compassData.horizon: 10))

Data Source: GLOBE Observer App

Field Notes: (none)

GLOBE Teams: GLOBE PCSHSTrang

Land Cover



Measured Date: 2024-02-07

Organization Name: Princess Chulabhorn Science High School Trang

Site ID: 338141

Site Name: 47NNJ304405

Latitude: 7.603733

Longitude: 99.275603

Elevation: 0m

Measured At: 2024-02-07T08:09:00

Measurement: 7.604

Site ID: 338141

Site Name: 47NNJ304405

Latitude: 7.603733

Longitude: 99.275603

Elevation: 0m

Measured At: 2024-02-07T08:09:00

Measurement Latitude: 7.604

Measurement Longitude: 99.2765

Location Method: automatic

Location Accuracy M: 6

Standing Water: true

Muddy: true

Leaves On Trees: true

Data Source: GLOBE Observer App

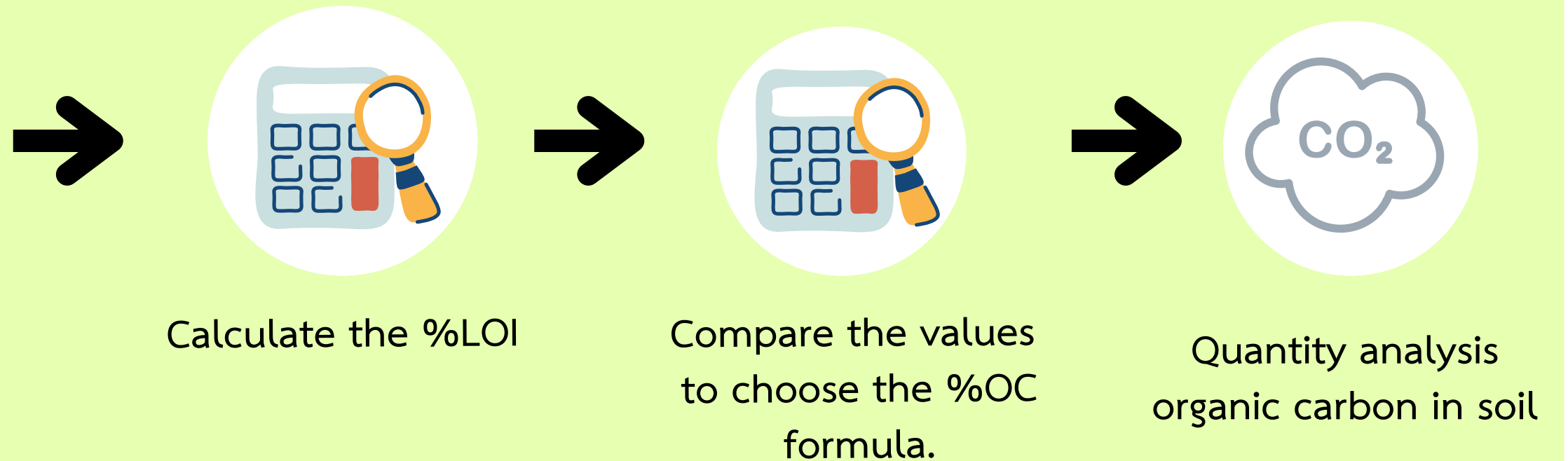
Field Notes:

4

Analyze the amount of carbon storage in the soil



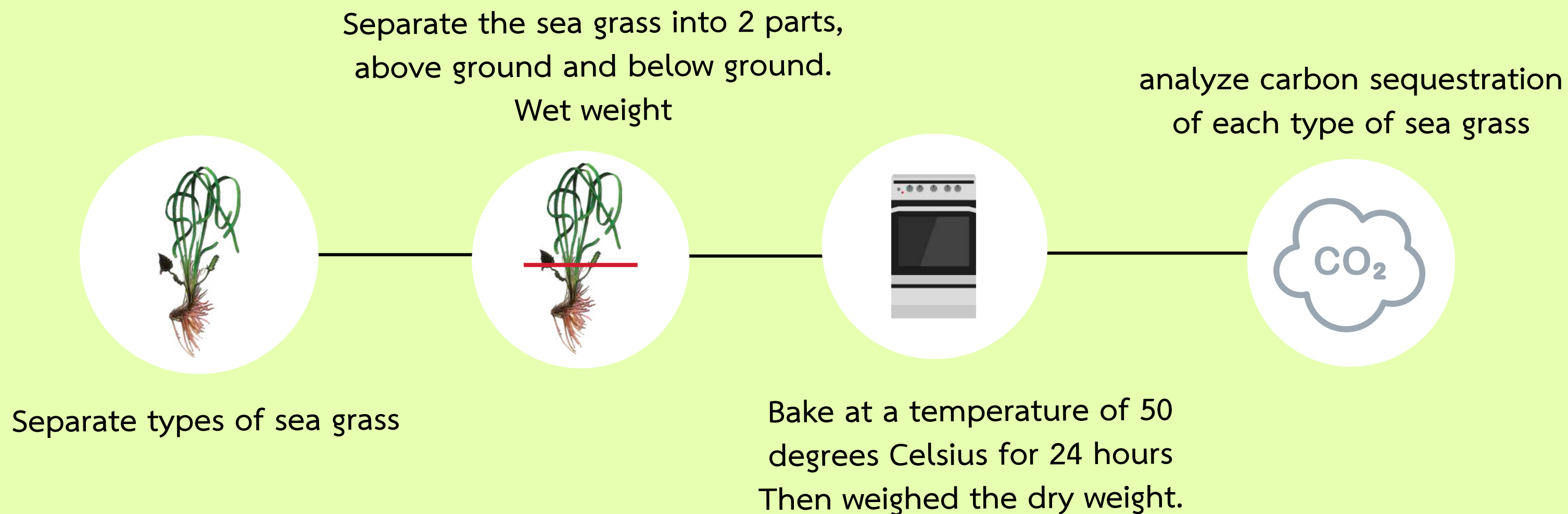
Take 100 grams of baked clay,
Burned at a temperature of 450 degrees Celsius for
4 hours, left to cool and weighed after burning.



5

Analyze the amount of carbon storage in seagrass

Methods



5

Analyze the amount of carbon storage in seagrass

Methods



Separate sea grass into above ground and underground parts and weigh before drying.



Take seagrass to dry at a temperature of 50 degrees Celsius for 24 hours



Weigh the seagrass after drying. to analyze and quantify carbon storage in seagrass

6

Formula for calculating the amount of carbon storage in soil and seagrass

1

calculated %Loss on Ignition(%LOI).

$$\%LOI = \frac{(\text{Mass before combustion} - \text{Mass after combustion})}{\text{Mass before combustion}} \times 100$$

2

Calculated Organic carbon(%OC) from analyze organic matter content(%LOI) can be done in two cases as follow:

Formular 2: $\%OC = -0.21 + 0.40(\%LOI)$ If $\%LOI < 0.20$

Formular 3: $\%OC = -0.33 + 0.43 (\%LOI)$ If $\%LOI > 0.20$

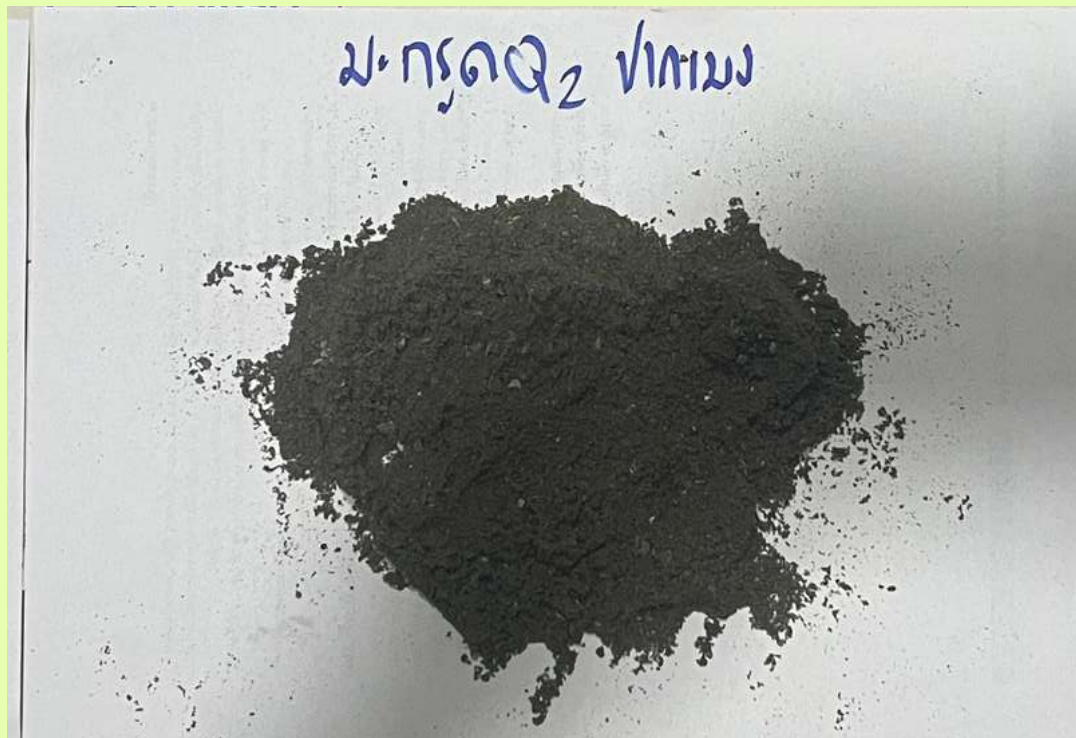
3

Calculated carbon storage in seagrass

$$\text{Carbon Storage in seagrass (MgC/ha)} = \frac{\%OC \times \text{Dried weigh of seagrass in area (Mg)}}{\text{Area of seagrass (ha)}}$$

Results

Part 1 : Soil quality



Ao Kham
Loamy sandy soil



Pak Klong Beach
Loamy sandy soil

Part 1 : Soil quality

Results

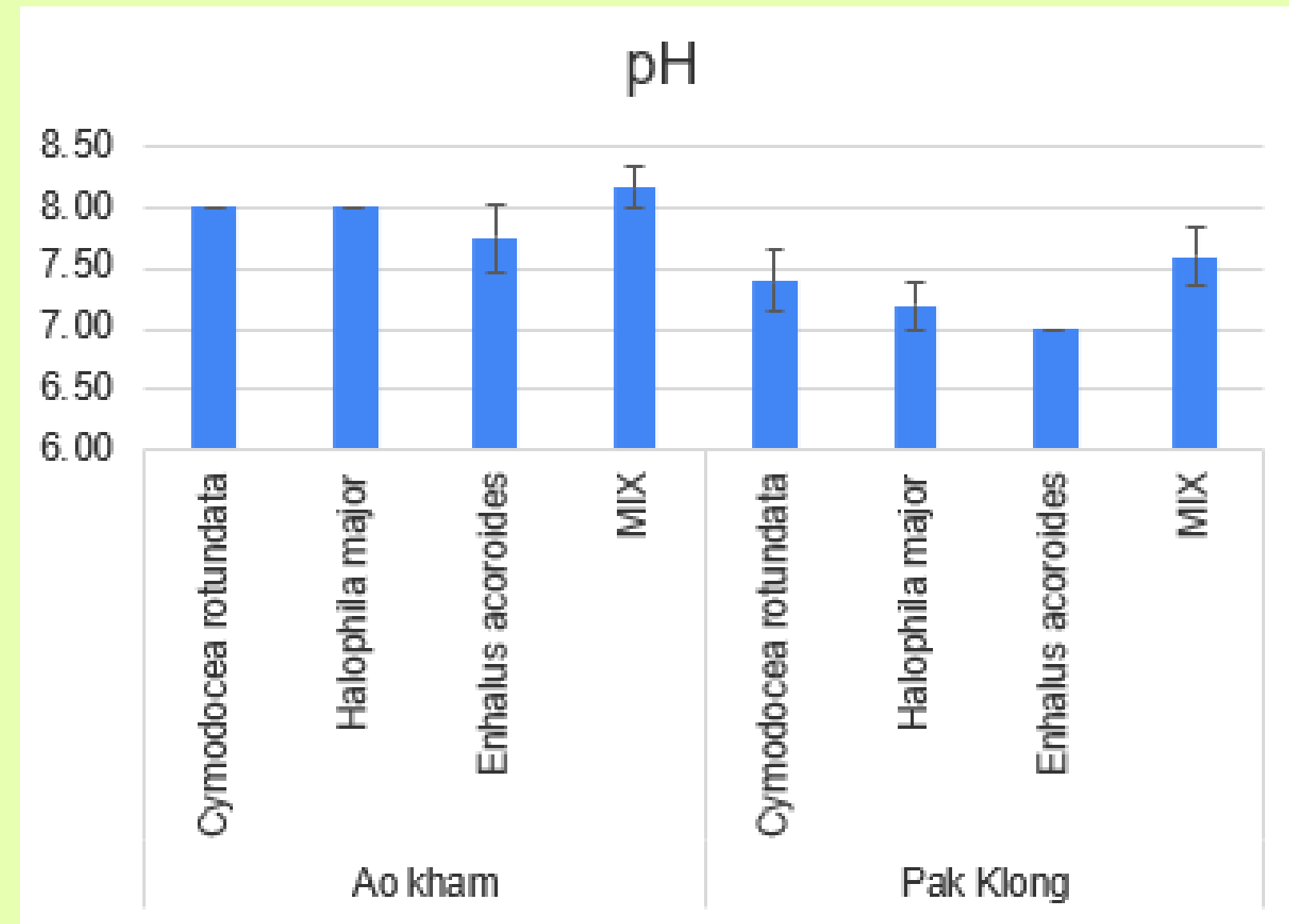


Chart 1: Shows a bar chart that showing pH comparisons. of each type of sea grass in Pak Klong Beach and Ao Kham, Trang

Part 1 : Soil quality

Results

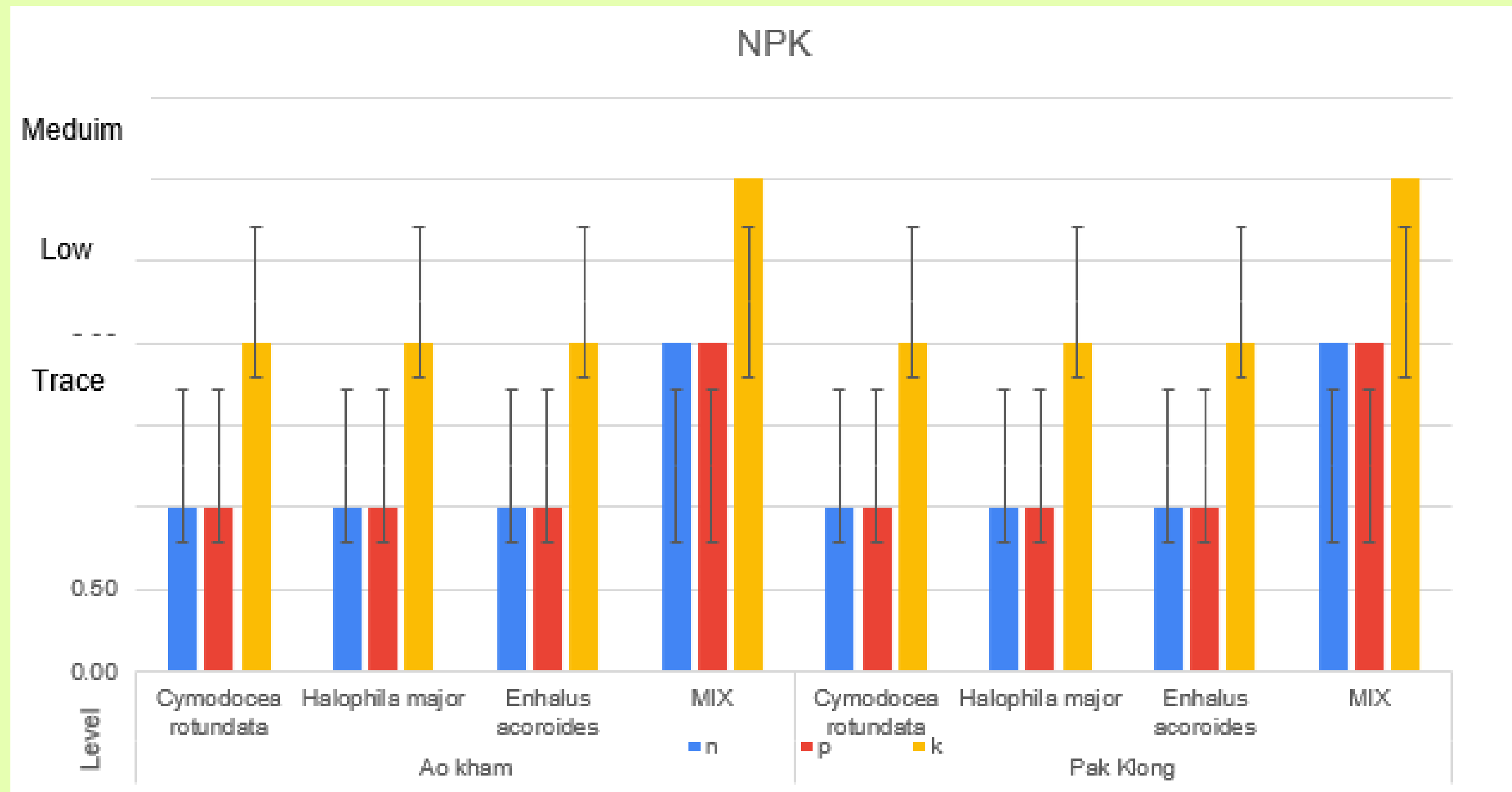


Chart 2: Shows a bar chart that showing N P K comparisons.
of each type of sea grass in Pak Klong Beach and Ao Kham, Trang

Part 1 : Soil quality

Results

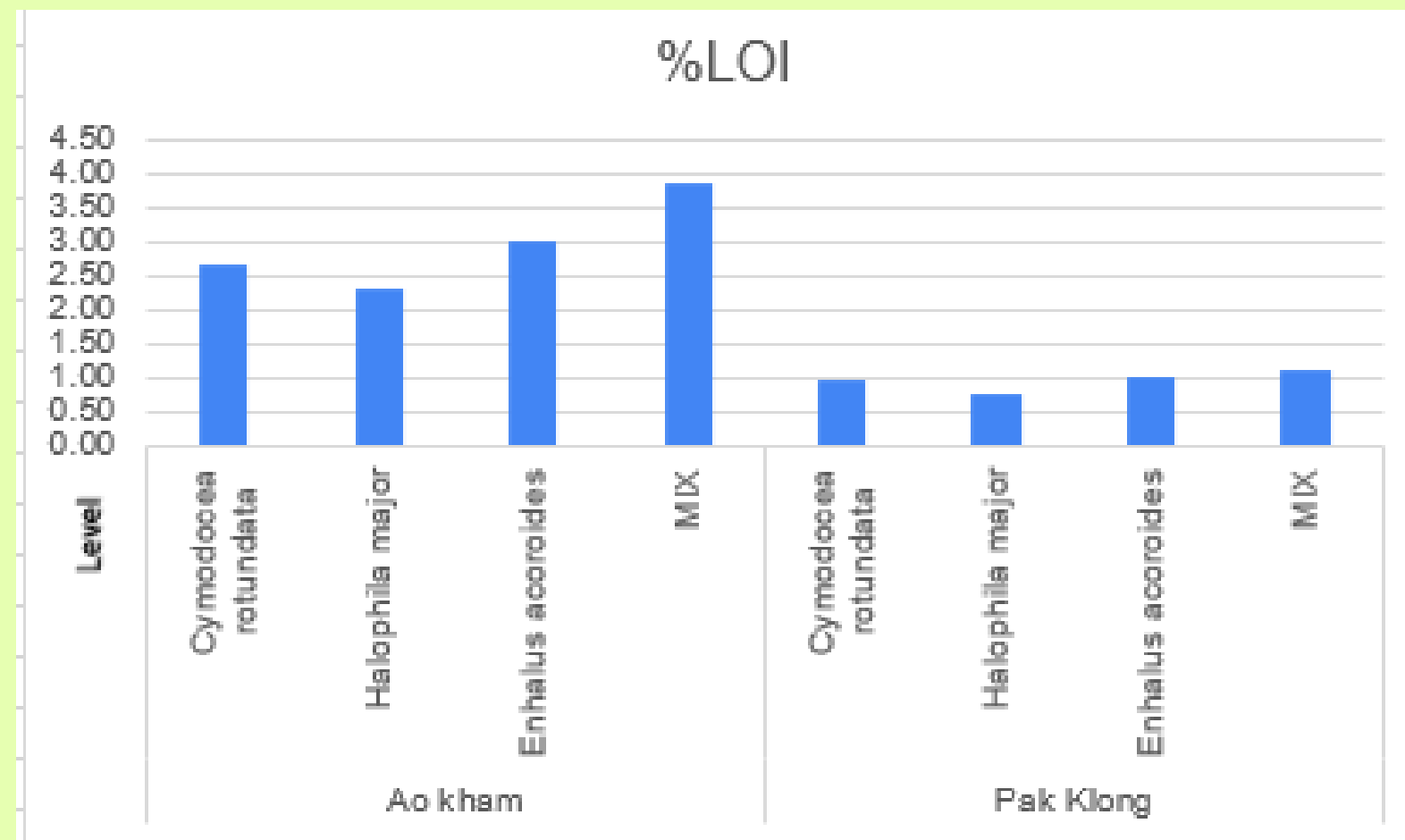


Chart 3: Shows a bar chart that showing %LOI comparisons of each type of sea grass in Pak Klong Beach and Ao Kham, Trang

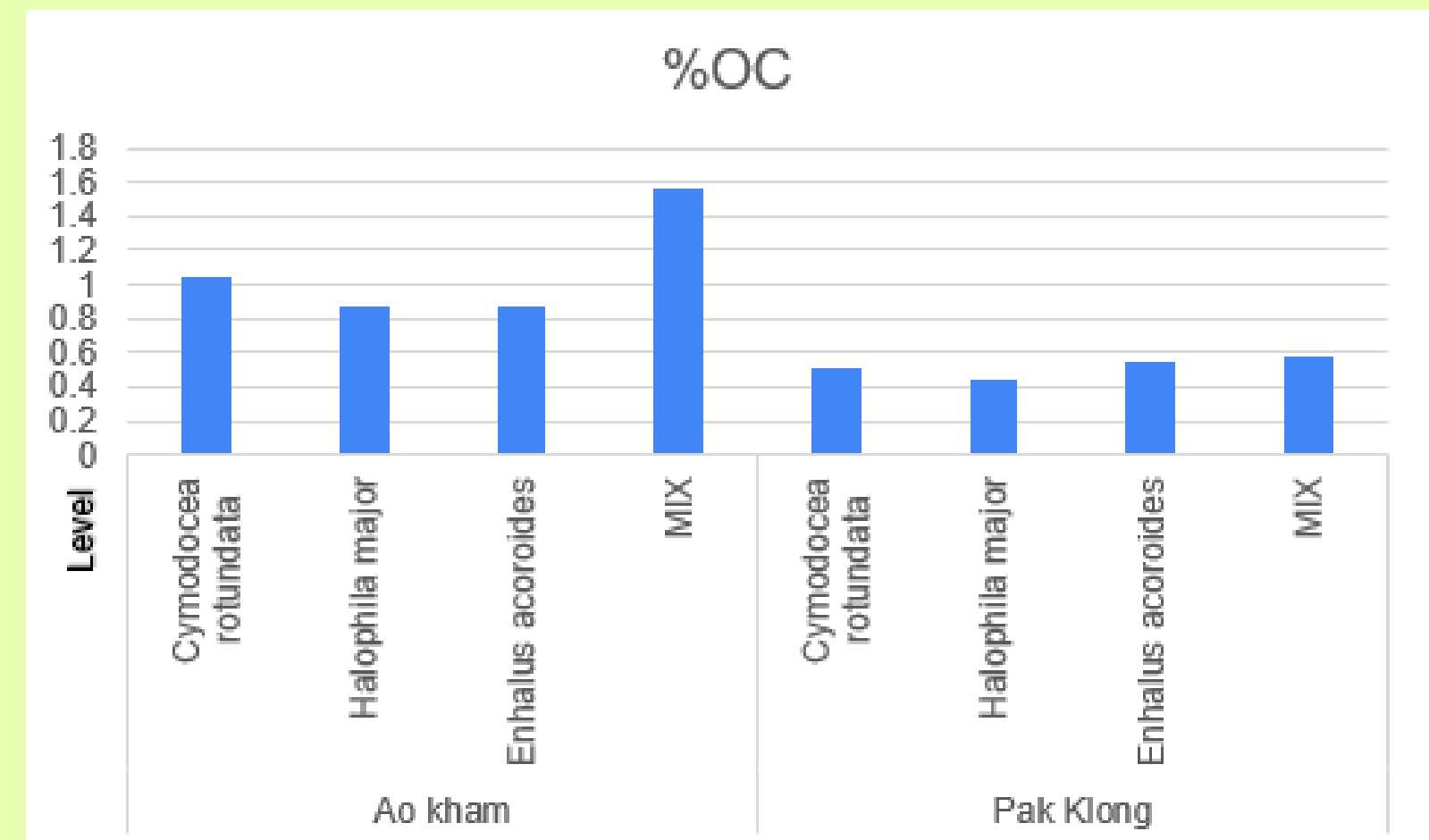


Chart 4: Shows a bar chart that showing %OC comparisons of each type of sea grass in Pak Klong Beach and Ao Kham, Trang

Part 2 : Quantity of carbon storage

Results

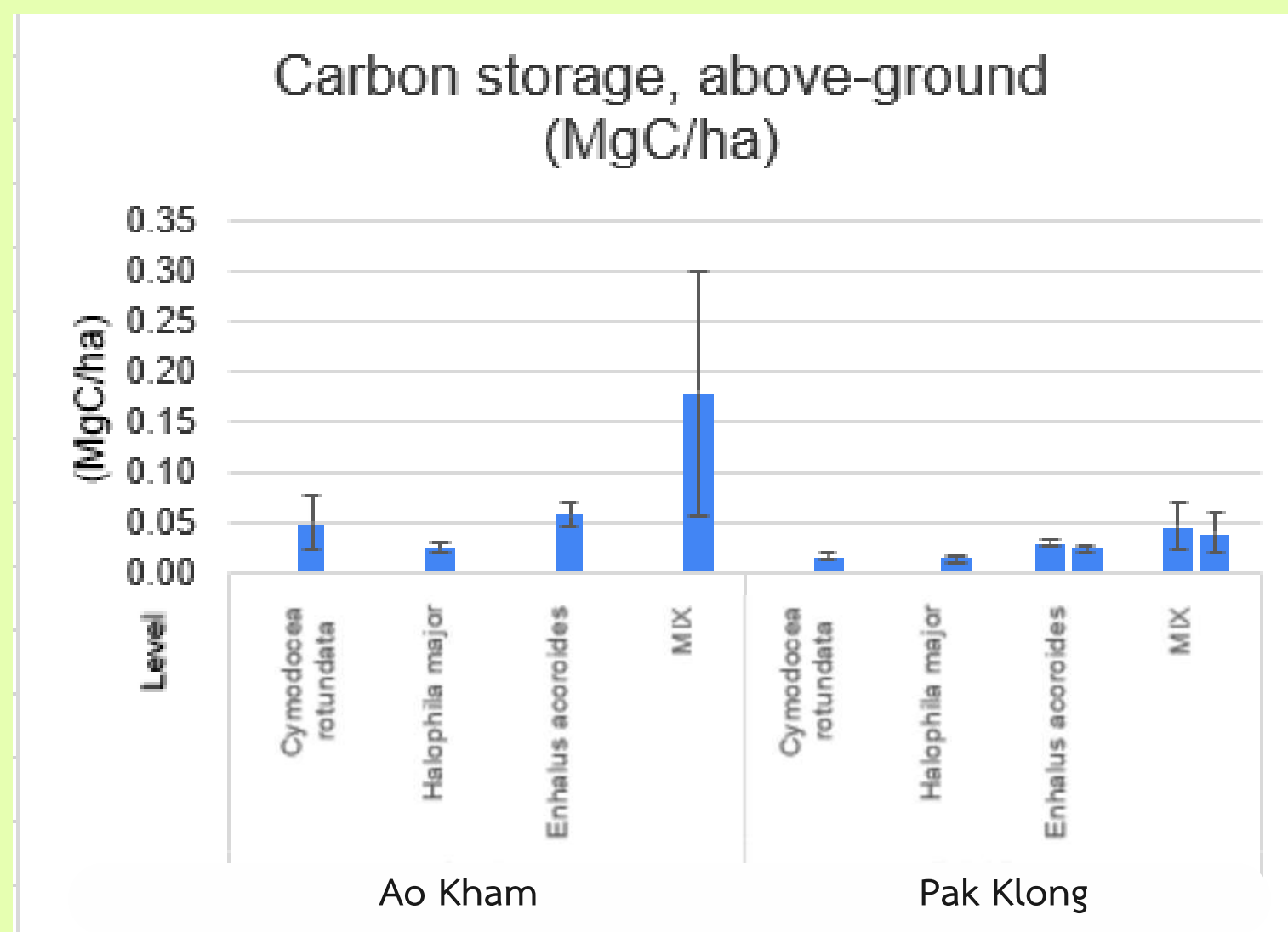


Chart 5

Carbon accumulates in aboveground seagrass

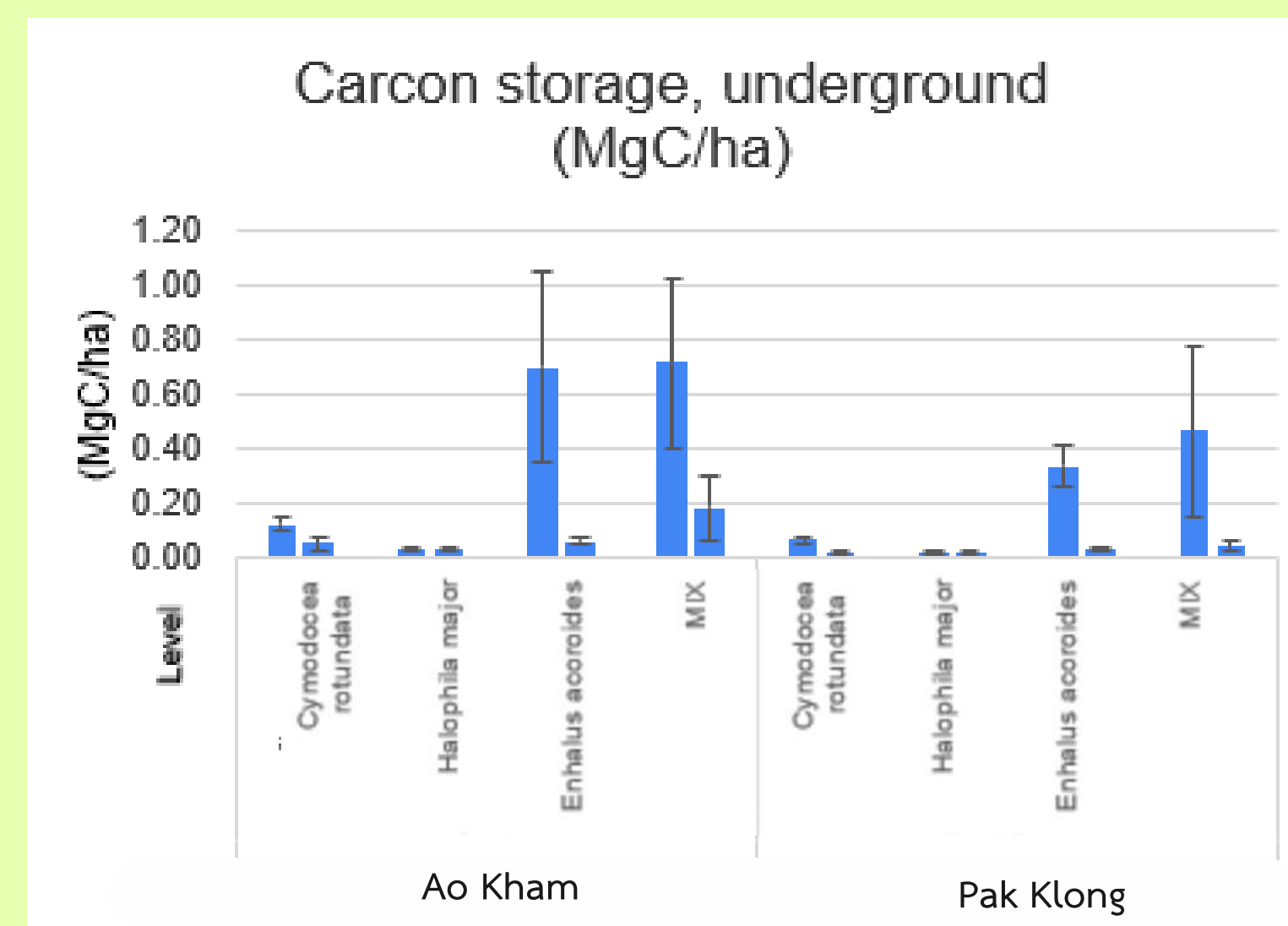


Chart 6

Carbon accumulates in underground seagrass.

Part 2 : Quantity of carbon storage

Results

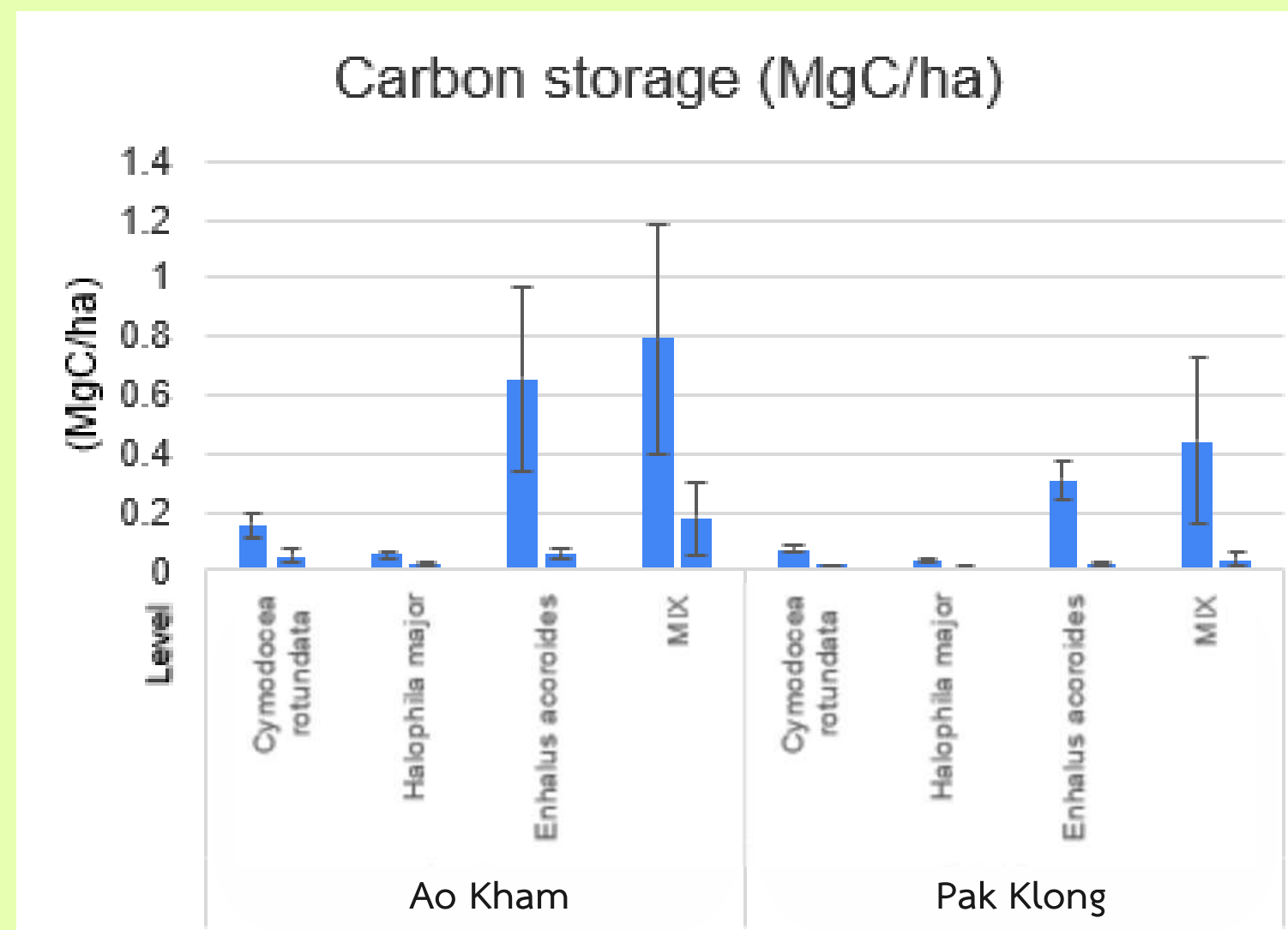
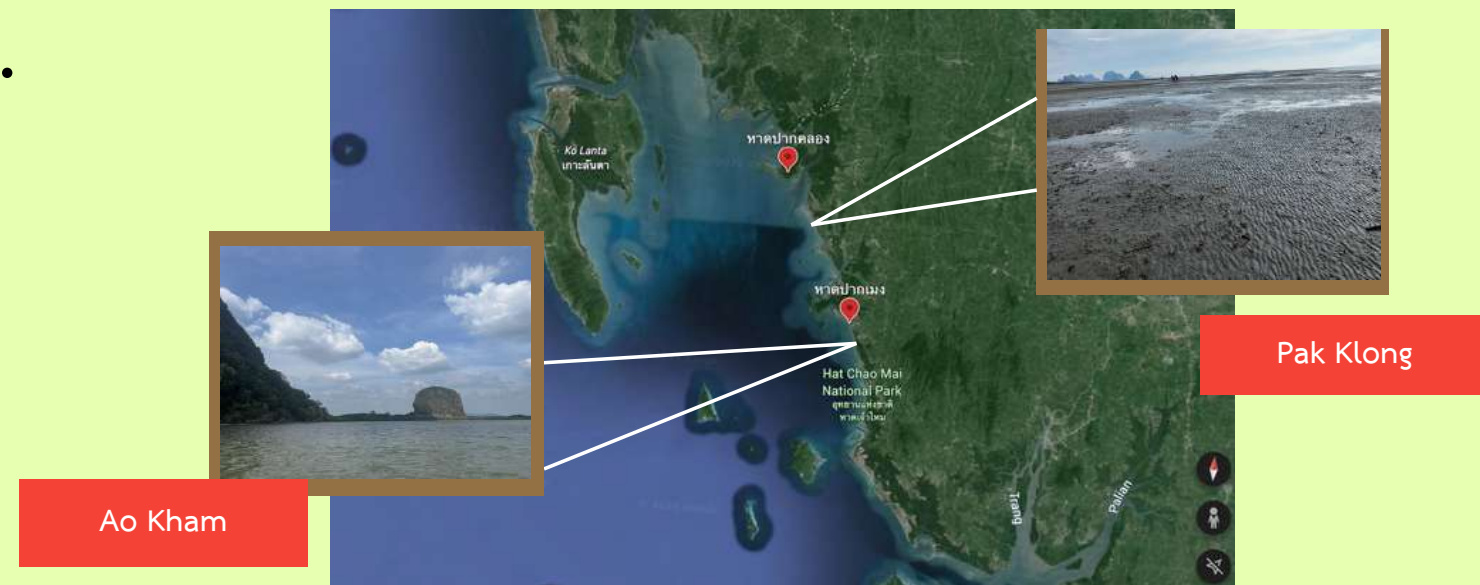


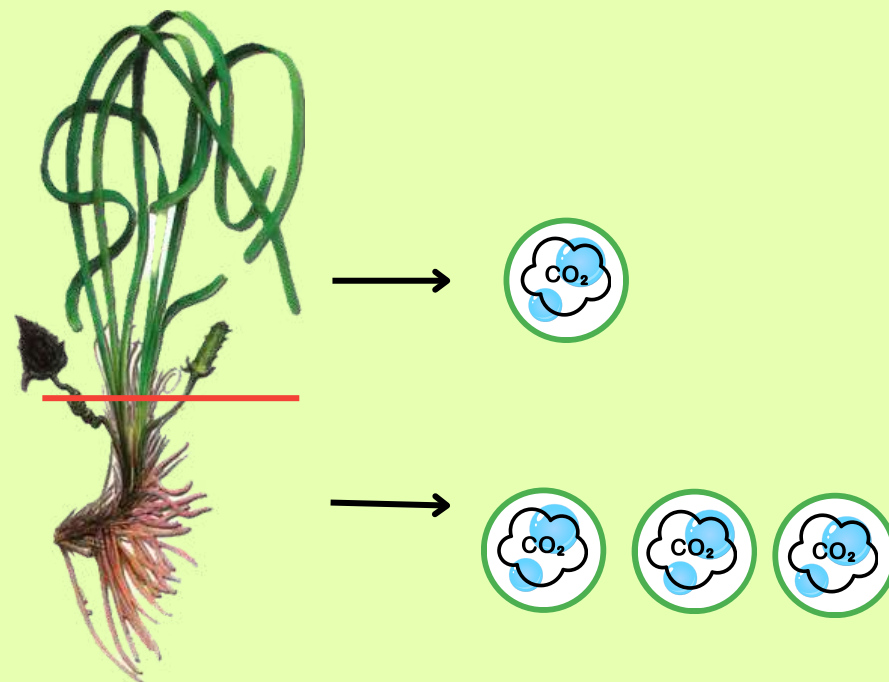
Chart 7 Shows a bar chart that showing the amount of carbon storage that both part collected comparisons in Pak Klong Beach and Ao Kham, Trang

Conclusion and discussion

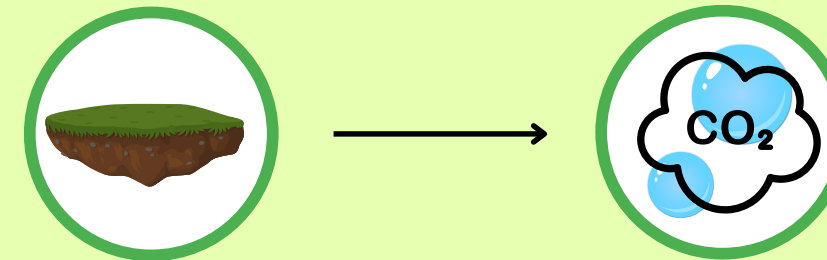
1.



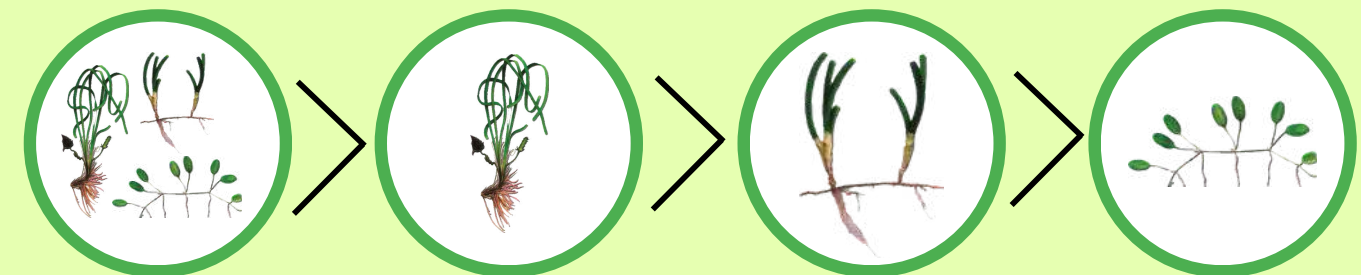
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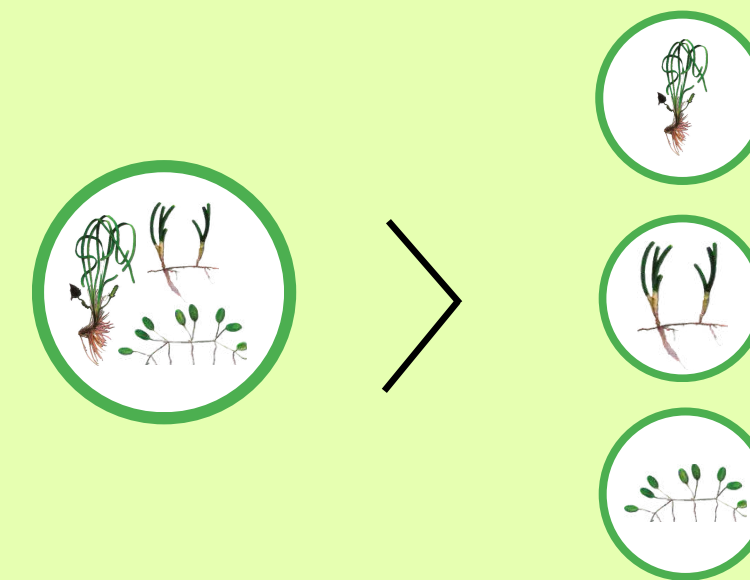
3.



4.



5.





Acknowledgments



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Sikao Trang



Walailak University



Director and teachers of
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High School Trang

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Thank you