Smithsonian
Marine Station Fort Pierce

Exploring Seagrass Ecosystems

Distance Learning Module

Grades 3-8

Activity Packet

Smithsonian Marine Ecosystems Exhibit Word Search: Seagrass

S A I S L O Z T S Z E D B M A
N N Q L B Y Q F U P V R R Z E
U I A F Z E S J N C H P A T R
T T X P P D K M L B N K C D O
R Y U N P T T A I O J I K S B
I O K R U I L I G X V K I H I
E C X W T R N D H F H Q S H C
N X T Y N L S G T I Z W H X Z
T N U Y G F E E S S N W V H O
S K A C K E E G R H Z V K D N
V X L I R P N T R Y R K D H E
Q W G Z T Y M I F A I I P K D
Y T A M U L L E T T S Q M Q H
Z Y E Q O D B I V Z A S W P C
X F J M A N A T E E G R A S S

Snapping Shrimp
Nursery
Nutrients
Turtle Grass
Mullet
Brackish
Manatee Grass
Oxygen
Boxfish
Sunlight
Aerobic Zone
Algae

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Smithsonian Marine Ecosystems Exhibit
Word Search: Seagrass

Just like finding animals in an actual seagrass bed, finding words in this word search will be a little tricky! See if you can search and find all the words!

Snapping Shrimp: A small species of burrowing shrimp. When they open and close their specialized claws, it sounds like a human's snap!

Nursery: Many juvenile fish and invertebrates utilize this habitat as they grow. Seagrass provides complex protection from predators and many food sources.

Turtle Grass: A thick bladed species of seagrass that is the preferred snack of Green Sea Turtles! Seagrasses are related to land plants.

Nutrients: Many nutrients are important for seagrass habitats. The two most important are Nitrogen and Phosphorous.

Mullet: An herbivorous fish that you can often see jumping or swimming in schools near the surface of the water in tidal estuaries.

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Brackish: Brackish water is a combination of both fresh water from rivers and salt water from the ocean. When these bodies of water meet and mix, we call it an estuary.

Manatee Grass: A thin, and round bladed species of seagrass. Manatees can often be found grazing on this species.

Oxygen: Did you know that as a byproduct of photosynthesis, seagrass is a huge producer of the oxygen we breath?

Boxfish: These unique box-shaped fish are one of the juvenile species you can find in the seagrass beds.

Sunlight: Sunlight is required for photosynthesis, the process where plants convert sunlight to food.

Aerobic Zone: Depth to which oxygen diffuses down into the substrate. This zone varies in size and depth depending on the habitat.

Algae: Unlike seagrasses, algae lack true roots, stems, or leaves. An important food source for many species living in seagrass beds.

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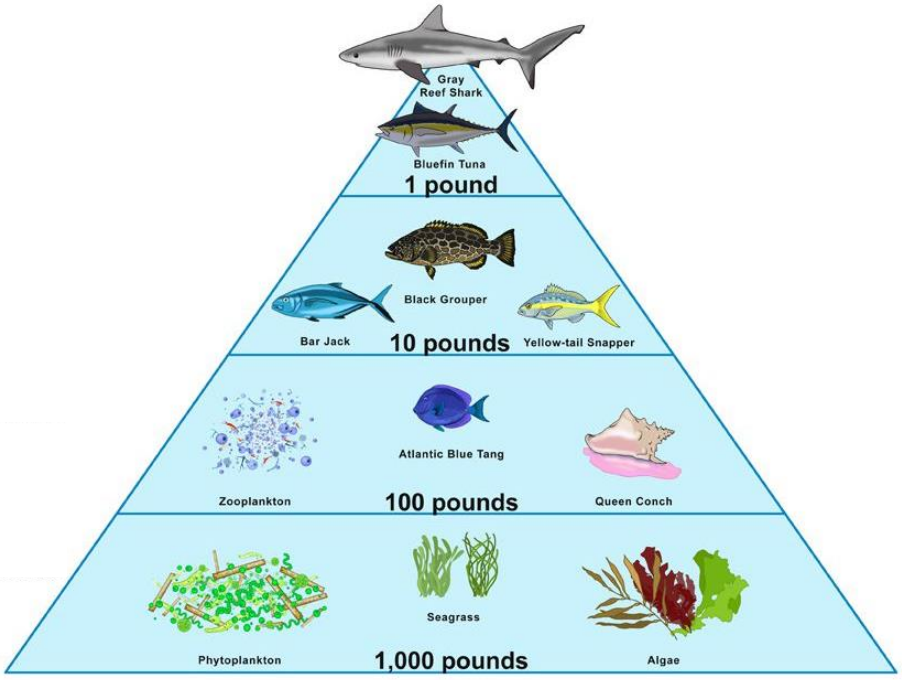
Seagrass Food Web Activity

Tertiary Consumers LEVEL 4

Secondary Consumers LEVEL 3

Primary Consumers LEVEL 2

Producers LEVEL 1



ENERGY

Producers = plants or "plant like" organisms that make energy from sunlight

Consumer = animals who must eat plants or other animals for energy

It takes 1,000 pounds of producers to create 1 pound of a top consumer. That's a LOT of plants!

Learning Objectives: Explore energy flow in food webs; from the sun all the way up to apex predators. Food webs are complex; many consumers are dynamic and opportunistic feeders, discover the different items consumers eat in seagrass habitats.

Instructions: Who eats what? Print out the food web pictures and cut into individual squares. Using the pictures, map out how you think a food web of seagrass habitats would be organized.

Use yarn, pens, sticks or whatever you have at home, to create links to demonstrate the flow of energy.

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Food Web Activity

SUNLIGHT

MANATEE

AMPHIPODS

TIGER SHARK

HUMANS

BROWN PELICAN

SEAGRASS

SPINY LOBSTER

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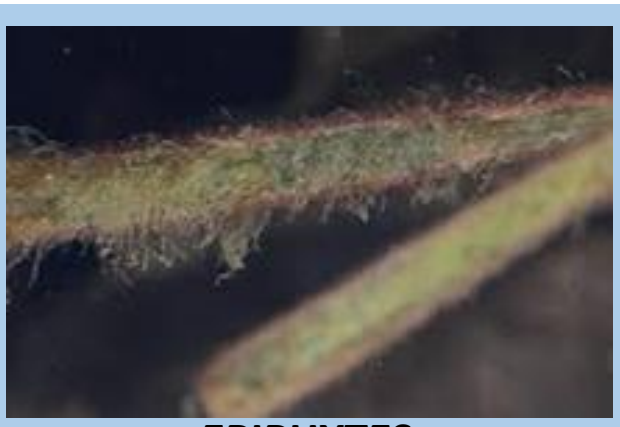
Food Web Activity

LOGGERHEAD SEA TURTLE

JUVENILE RED DRUM

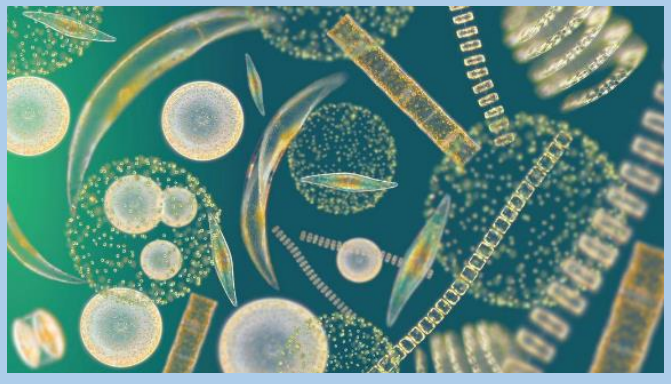
MULLET



EPIPHYTES

QUEEN CONCH

SEA URCHIN



PHYTOPLANKTON

HERMIT CRAB

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WRAP UP

Seagrass Food Web Activity

- This answer key does not include every single possible connection of energy flow. In nature, many organisms are “opportunistic” feeders, meaning they eat what is available. A tiger shark may eat a sea turtle one day and a pelican later in the week!
- It’s important to remember that the food webs are incredibly complex, dynamic, and changing structures. If one component goes missing or is in abundance, it can change the whole dynamic of the food web structure.
- Pressures to seagrass food webs include; overfishing, seagrass die-offs, algal blooms, and poor water quality. These pressures can cause the seagrass food web to become unbalanced.

Send us a photo of your activity to smseducation@si.edu or share with us on social media @SmithsonianSMS by using #myseagrassfoodweb

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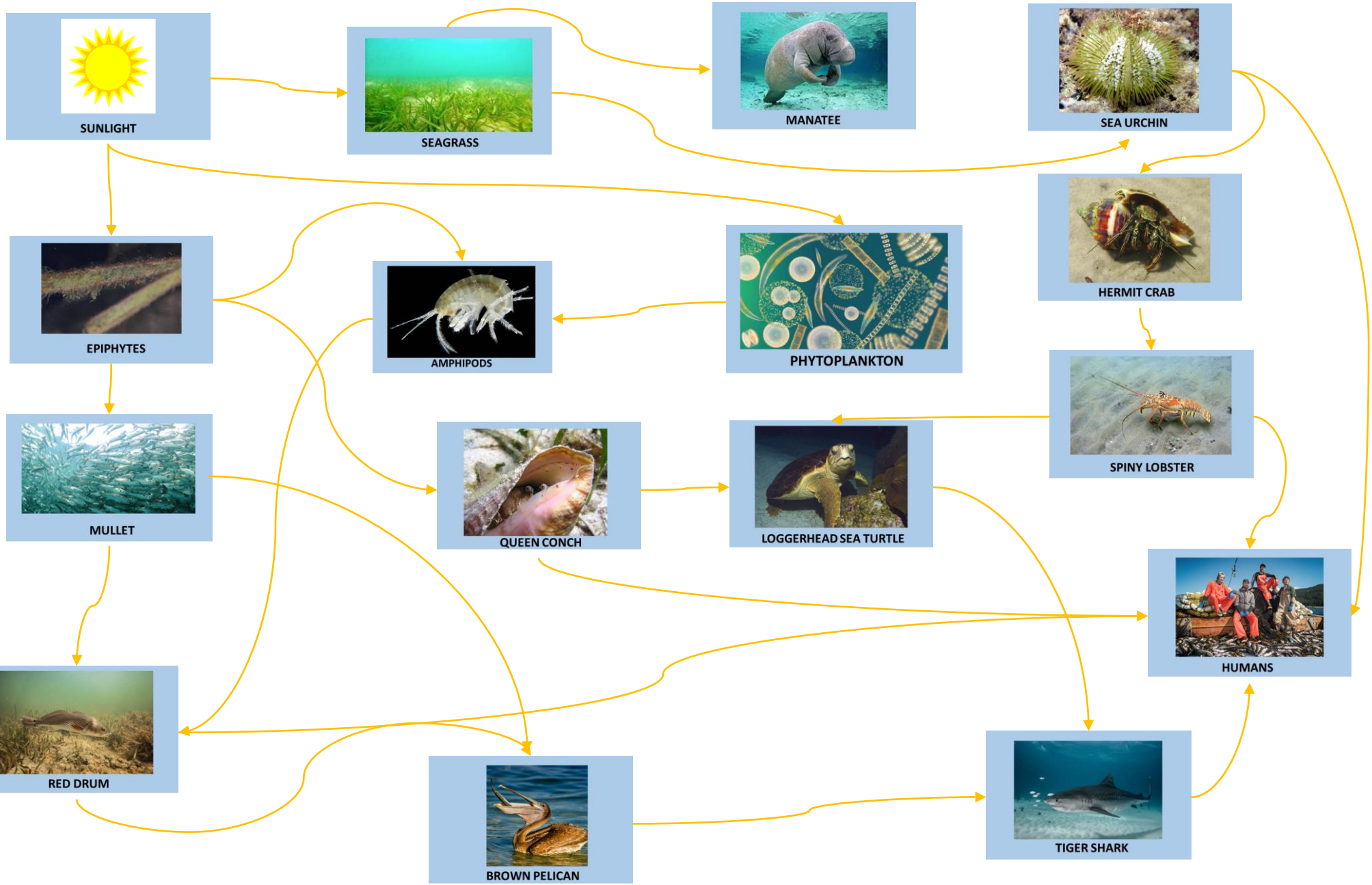
Seagrass Food Web Activity Answer Key



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Seagrass Monitoring Activity

Background: Florida seagrass habitats are valuable marine resources. Seagrasses grow in thick meadows in the Indian River Lagoon and provide an important nursery habitat for many species, are important for nutrient cycling, sediment stabilization, and for storing carbon.

Learning Objectives: In this activity you will learn how and why scientists monitor seagrass habitats and track percentage cover overtime. You will virtually use a seagrass quadrat to measure percentage cover of seagrass.

Scientists use “quadrats” or square meters, sometimes divided into 10x10 smaller squares, to calculate the percentage cover of an area of seagrass.

Why calculate percent cover? Calculating percentage cover helps scientists and policymakers understand population density and overall health of seagrass meadows. Seagrass densities fluctuate over time because of environmental and human stressors, like boat propeller scarring, algal blooms and others. Mapping and monitoring efforts help local and regional governments manage and protect critical seagrass habitats.

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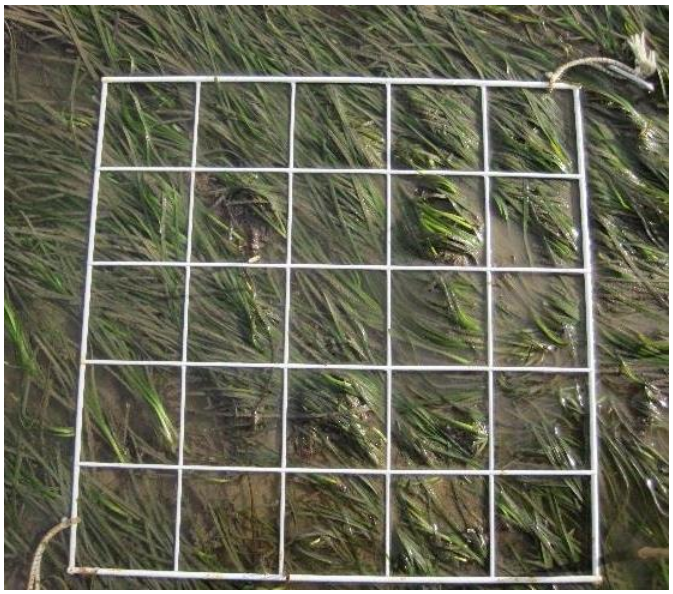
Monitoring Activity

Examples of quadrats placed on abundant (100% cover) seagrass meadows.



Instructions: Using the "quadrats" on the following page you will measure and calculate percentage cover of seagrass species abundance. Each quadrat is made of 10x10 squares, therefore each square equals 1%. You will add up the squares containing seagrass and that will give you percentage cover for each species.

As you learned in the Seagrass Module, there are 7 species of seagrass in the IRL. We will focus on 2 in this activity, *Thalassia testudinum* and *Halodule wrightii*. Measure the percentage of each seagrass species (*Thalassia* and *Halodule*), then add them together to find the total percentage cover.

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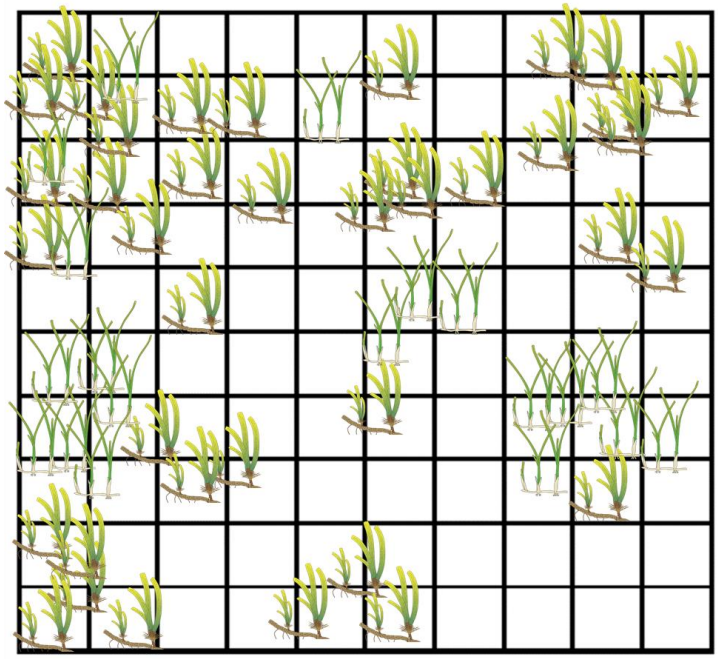
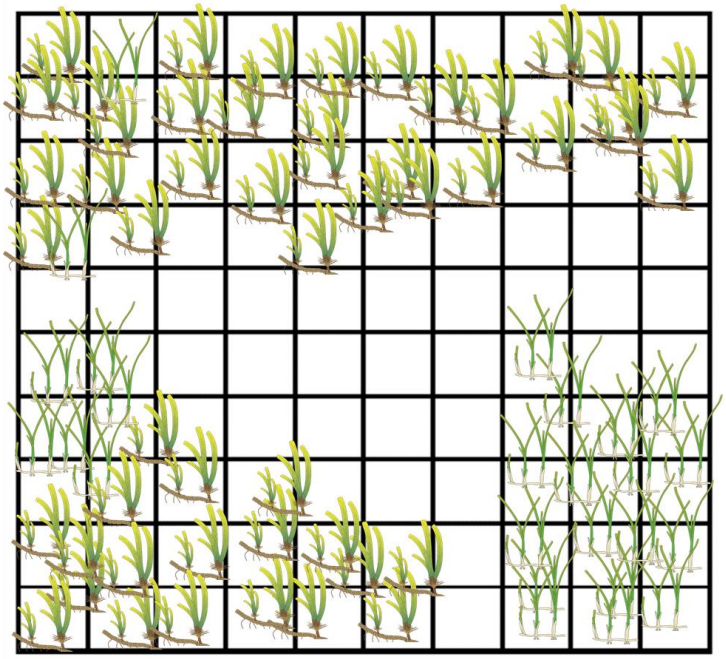
Monitoring Activity

Now it's Your Turn:

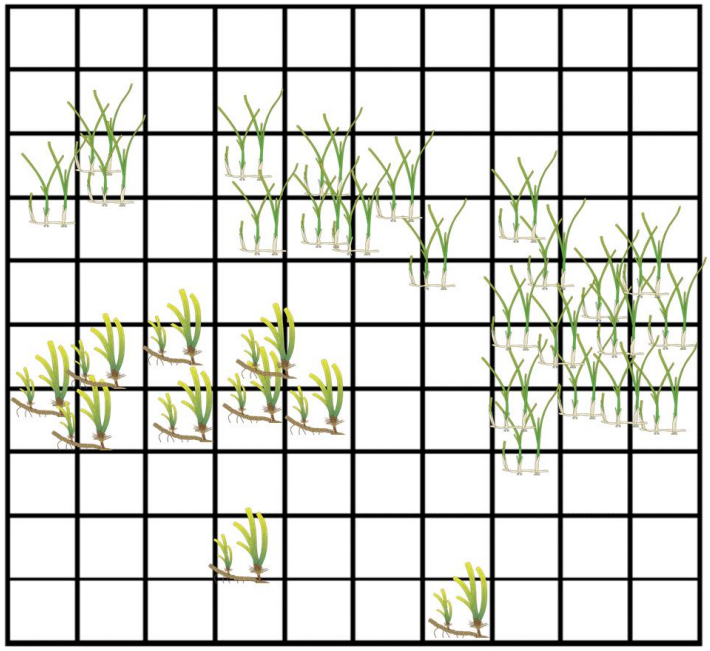
KEY — *Thalassia* — *Halodule*



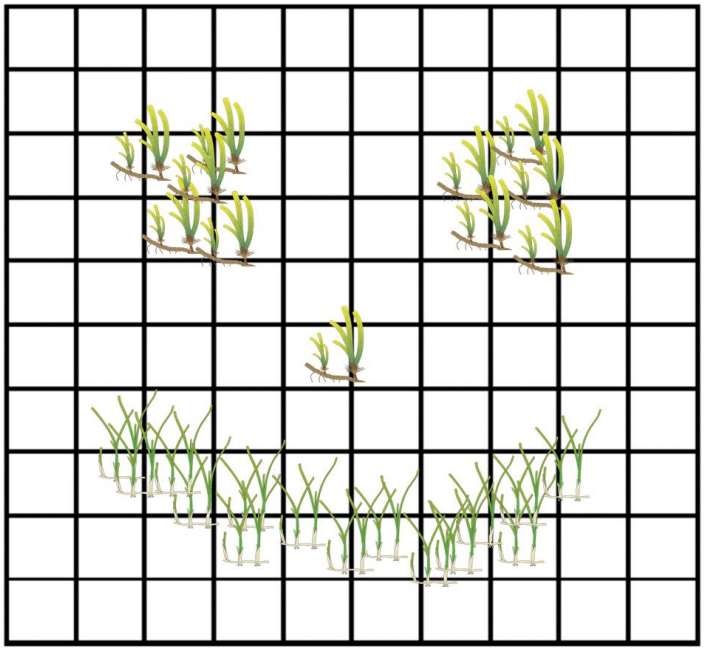
1. % *Thalassia* = _____
   % *Halodule* = _____
   Total = _____



2. % *Thalassia* = _____
   % *Halodule* = _____
   Total = _____



4. % *Thalassia* = _____
   % *Halodule* = _____
   Total = _____



3. % *Thalassia* = _____
   % *Halodule* = _____
   Total = _____

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Seagrass Monitoring Activity

Thinking Questions & Wrap Up:

- Seagrass grows in meadows of varying coverage in the Indian River Lagoon. Why do you think there might be more *Thalassia* in quadrat 2 than quadrat 3?
- Seagrasses are subject to stressors that reduce their coverage: including algal blooms, poor water quality, boat propeller scarring, and increased herbivory. All these factors can change seagrass abundance over time. Why is it important to manage or protect seagrass meadows?
- If you were to monitor these same quadrats a year from now, how do you think they would look?
- Unfortunately, many studies show a decline in seagrasses globally. Why do you think that is?

If you have any questions or need help with this activity, please contact us at smseducation@si.edu or reach out to us on social media @SmithsonianSMS

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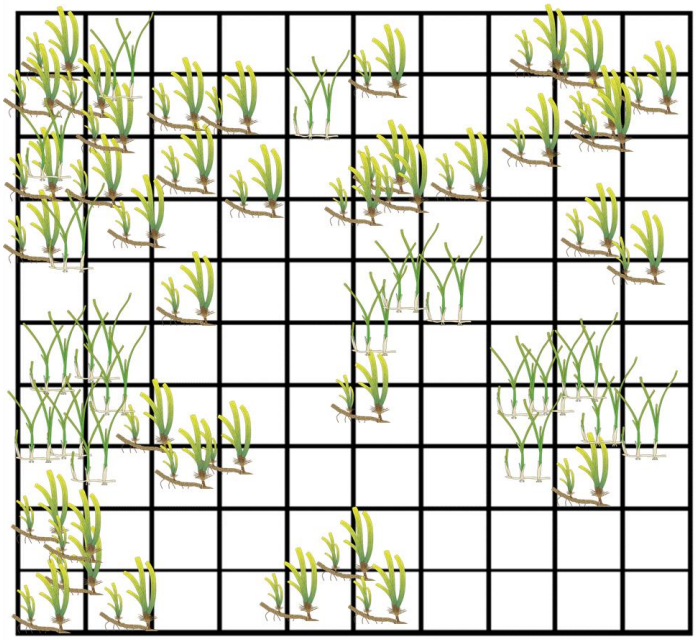
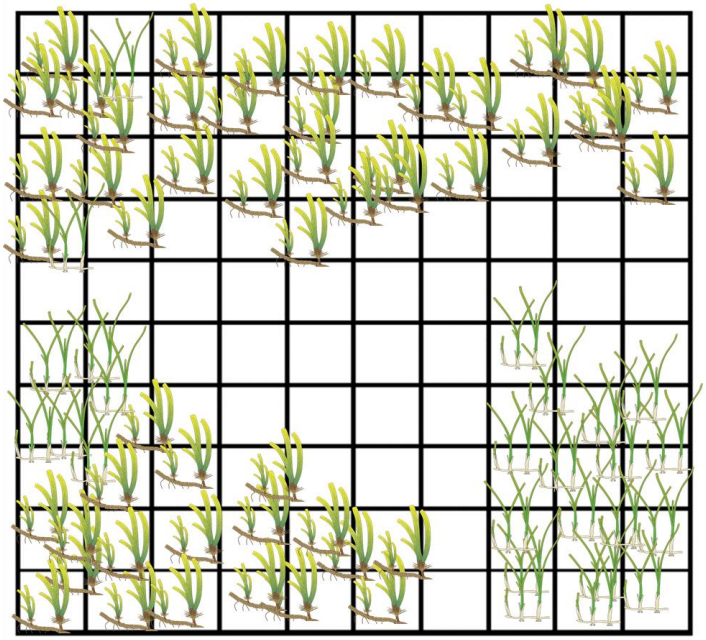
Monitoring Activity

ANSWER KEY

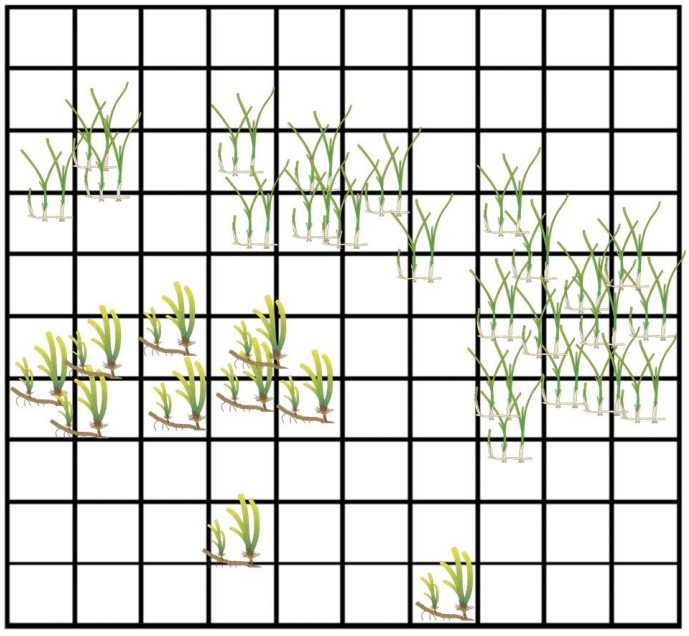
KEY — *Thalassia* — *Halodule*



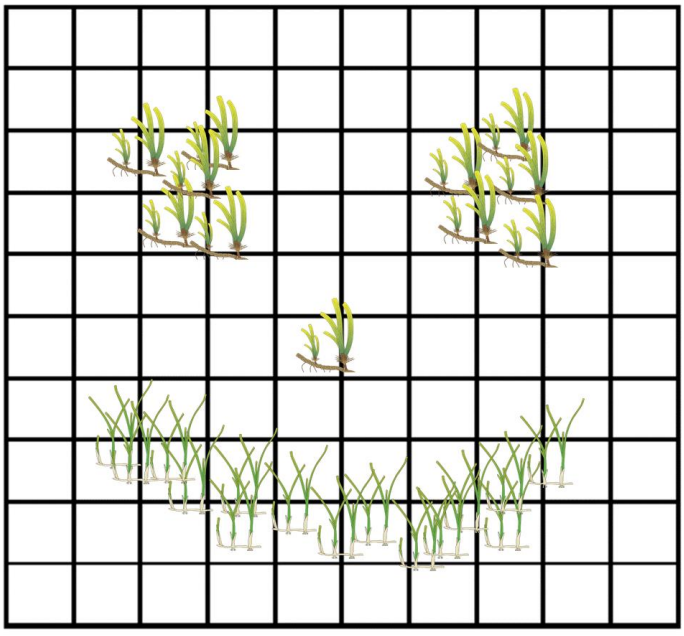
1. % *Thalassia* = **50%**
   % *Halodule* = **20%**
   Total = **70%**



2. % *Thalassia* = **60%**
   % *Halodule* = **20%**
   Total = **80%**



4. % *Thalassia* = **20%**
   % *Halodule* = **20%**
   Total = **40%**



3. % *Thalassia* = **10%**
   % *Halodule* = **20%**
   Total = **30%**