KITTERY MAINE!

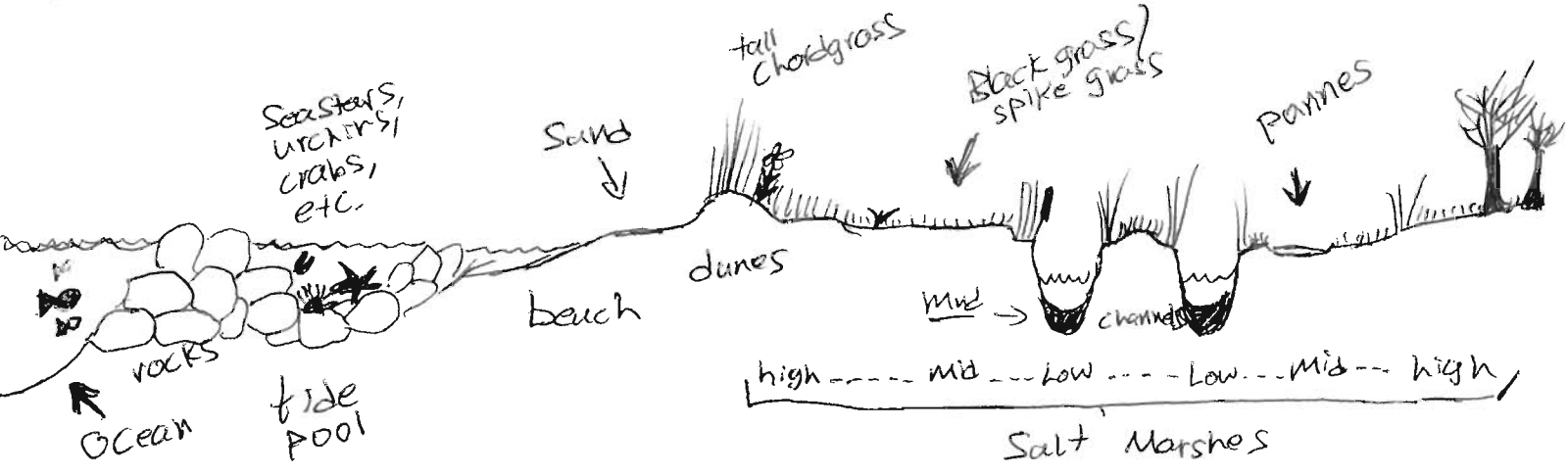
8 AM - 3 PM

Are you ready for one crazy-fun trip? Good, because we are off to Kittery, Maine. Unlike most people in the area, we won't be shopping but rather exploring and learning about wetlands. The times are odd so that we can be at low tide at the beach. That is the trick about tide pools: you have to be there at the right point of the tide to see them. Sort of like magic. After a quick lesson on some new plants in the area, we'll jump into the channels of mud. When we are sufficiently dirty, we will be head over to the beach to wash off, eat lunch, and explore tidepools.

Tripslip #7 - July 12th 2005 -- With Questions Call Jeff: (857) 205 4723

Equipment - Old Sneakers (No boots or Sandals)
- old clothes that will get very very muddy!
- wear a bathing suit under your clothes
- Big Lunch - Lots of Water - Bug Spray
- Sun Screen - An old towel - First Kit - Warm Layer
- change of clothes for bus-ride back - 3 large trash bags

Coastal/salt marsh zonation



Field Guide Sheet For Southeastern New England Marine Environments

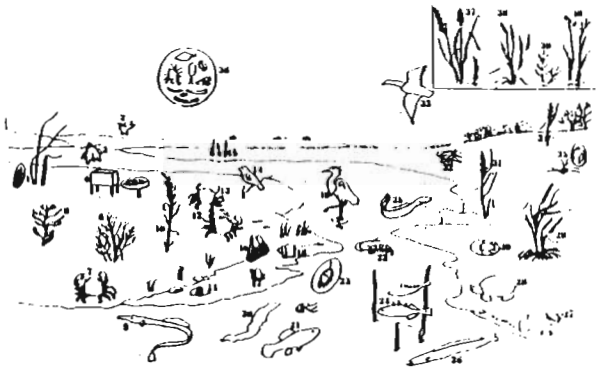
Salt Marsh

Sponsored by:
National Marine Education Association
Northeast Marine Education Council
Massachusetts Marine Educators

Cape Cod Sea Camps &
Cooperative Extension Service,
University of Massachusetts
United States Department of Agriculture and
County Extension Services Cooperating

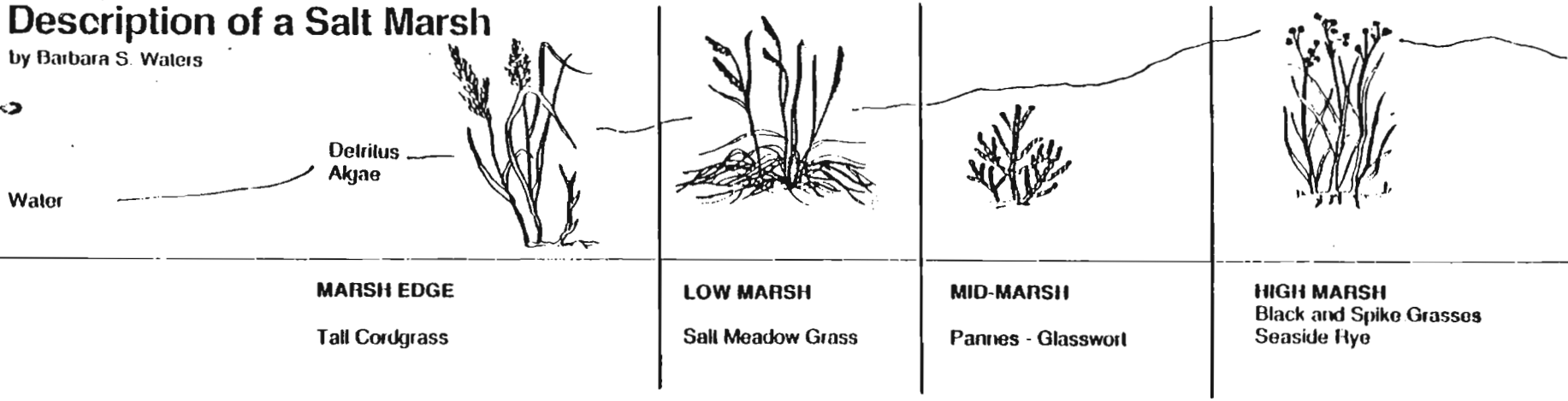
Salt Marsh

1. Marsh Bulrush *(Scirpus)*
2. Black Duck *(Nyroca)*
3. Greenhead Fly *(Tabanus)*
4. Boxes put out in marshes to trap Greenhead Flies
5. Larval form of the Greenhead
6. Glasswort *(Salicornia)*
7. Marsh Crab *(Sesarma)*
8. Sea Lavender *(Limonium)*
9. Pipe Fish *(Sygnathus)*
10. Spike Grass *(Distichlis)*
11. Rock Barnacles *(Balanus)*
12. Male Fiddler Crab *(Uca)*
13. Female Fiddler Crab *(Uca)*
14. Red Winged Black Bird *(Agelaius)*
15. Cat-tail *(Typha)*
16. Ribbed Mussels *(Modiolus)*
17. Marsh Periwinkle *(L.saxatilis)*
18. Mud Snail *(Nassarius)*
19. Great Blue Heron *(Florida)*
20. Sea Lettuce *(Ulva)*
21. Killifish *(Fundulus)*
22. Glass Shrimp *(Palaemonetes)*
23. Isopods *(Idotea)*
24. Sticklebacks *(Gasterosteus)*
25. American Eel *(Anguilla)*
26. Sand Launce *(Ammodytes)*
27. Raccoon *(Procyon)*
28. Diamondback Terrapin *(Malaclemys)*
29. Salt Meadow Grass *(Spartina patens)*
30. Marsh Mite *(order Acari)*
31. Cordgrass *(Spartina alterniflora)*
32. Cricket *(Acheta/Gryllus)*
33. Canada Goose *(Branta)*
34. Panic Grass *(Panicum)*
35. Coffee Bean Snail *(Melampus)*
36. Assortment of plankton so plentiful and vital to the salt marsh ecosystems.
37. Cordgrass *(S.alterniflora)*
38. Salt Meadow Grass *(S.patens)*
39. Glasswort *(Salicornia)*
40. Black Grass or Rush *(Juncus)*



Description of a Salt Marsh

by Barbara S. Waters



Salt marshes border the salt water bays, and are flooded on high tide at some period during a twenty-four hour cycle. They are dominated by grasses of the genus *Spartina*. **Cordgrass** *(Spartina alterniflora)* is a sturdy grass, one of a group of salt-tolerant plants. It cannot survive underwater as eel grass, but it grows well with a salt-water bath twice each day. It sends out underground stems and new clumps of **Cordgrass** grow from these. The grass blades slow down the water movement so that the sediment in the water drops and the **Cordgrass** grows higher. Eventually it will form a peat bed many feet thick. **Spike Grass**, grows alongside Salt-Meadow Grass. It can be recognized by its shorter leaves. **Black Grass** takes its stand near the landward edges of the marsh. Where the marsh surface develops shallow depressions, known as pannes, water sometimes collects at the highest tides. In these pannes and along the salt-rimmed borders of the marsh the **Glassworts** grow beside the **Sea Lavender**. Colonial people and wild food lovers pick these stubby, fleshy **Glassworts**.

Looking out over a marsh for the first time you may not be able to tell each kind of grass from one another. Two clues to identification includes knowing where the grass is located in relation to amount of time it stays in the water and color. At the water's edge, the cordgrass forms a dark-green border, up to six feet tall in favorable conditions. The salt-meadow grass and nearby spike grass are one to two feet high and form a lighter green carpet. By late summer the salt-meadow grasses have bent at their bases to form flattened cowlicks.

The black grass rims the landward side of the marsh with red-brown patches. In bare patches and at the high dry edges, the short glasswort is easy to see. In fall it turns bright red, while the sea lavender is purple.

After this first survey, you are ready for a closer look between the grasses. Here the primitive algae grow, providing the basic nutrients for many animals. They grow in flat green mats or float up and down the creeks. Down between the grasses are dozens of the **Coffee Bean Marsh Snail** which feed on the algae mats and decaying vegetation. At high tide these snails climb to the top of the marsh grass out of reach of the water, and they move back down as the water recedes. It is a pulmonate snail and must breath air *(having lungs rather than gills)*. When up on the grass blades the Coffee Bean Snail is often eaten by birds. It is a squat, egg shaped snail, translucent brown and about 1/2" long.

Many holes the size of a fat finger puncture the marsh. Beside most of the holes are neat balls of sand and mud. These holes are dug by the **Fiddler Crab.** On a hot summer's day, the **Fiddler Crabs** scurry frantically when you approach trying to find their holes. At low tide, the crabs leave their holes by the hundreds to drink and feed at the water's edge. The name fiddle comes from the enlarged claw of the male crab, which it carries in front of its body like a musical instrument.

Near the water the marsh drops off to form an eroded peat bank providing homes for a number of burrowing clams and crabs. The box crab or **Marsh Crab**, makes a hole here about two inches in width[illegible] little piles of mud around the hole which [illegible]ds to a network of tunnels that can be traced to the water. This Marsh Crab is shaped like a box and it is bigger than the fiddler. When caught it will play possum, keeping the legs extended and rigid. When returned to the ground, it will suddenly come to life and dart away.

Every salt marsh has colonies of **Ribbed Mussels** which are often covered with **Barnacles**. These mussels are good to eat, if the marsh is clean.

The most unwelcome creature on the marsh, as far as man is concerned, is the **Greenhead Fly**. The female fly lays its eggs on grass stems in mid-summer. These females seek blood of warmblooded animals to develop their eggs. The eggs hatch into inch-long maggots, which winter in the mud at the base of the plants, feeding on insects, worms, snails and other greenhead larvae. Usually the following summer they emerge as the dreaded fly. They in turn provide a bumper meal in late July for the swallows, and many other birds as well.

The green and blue boxes out on the marsh are our way to try to capture these pests before they bite. The female fly *(only one who bites)* is attracted to warm, dark places. Once in the box she cannot find her way out.

As many as sixty different kinds of fish have been found to live most of their lives in the marsh creeks. The young of many of our most popular fish begin their lives here such as flounder, mullet and menhaden. Larger fish such as striped bass, tuna and swordfish feed in turn on these marsh raised fish.

KITTERY IDENTIFICATIONS

Low Marsh- Area closest to the channel
Mid-Marsh
High-Marsh- Area farthest from the channel (and *not* near the shore of the ocean)
Goldenrod- (solidago) Large yellow-flowered plant found in the high marsh
Black Grass- (juncus jeradi) looks dark in color, found in mid-marsh, and sometimes high-marsh
Spike Grass- (juncus trifitus) has three spikes, found in mid-marsh
Salt Marsh Grass- (spartina patens) soft, found in mid-marsh
Cord Grass- (spartina alternaflora) found in low-marsh along the banks of the channels
Sedges- (cyperales) has 3 edges, sharp, found in the mid-marsh
Pannes- bare areas in the midst of grasses, look crusty and cracked on the top
Glasswort- salty plant used by the colonists as seasoning. Found in pannes, very succulent, filled with water

"Sedges have edges, reeds and rushes are round, and grasses are flat."

Fiddler Crabs- the ones that run sideways. Females have one big claw, males are both small
Hermit Crabs- the ones that live in shells
-Other ones are probably Box Crabs, but look them up.

TIDE POOLS

Periwinkles- snails with small black shells.
Starfish- If you don't know what these guys are already, you're in trouble
Sea Aneomes- They attach to rocks and have lots of wavy arms
---Use the books for anything else!

CLASSIFICATION

King = Kingdom --- Animal
Phillip = Phylum ---Chordata
Came = Class ---Mammalia
Over = Order ---Primata
From = Family ---Hominidae
Germany = Genus ---Homo
Smiling = Species ---sapiens

EXAMPLE USING HUMANS

**********Linneaus uses "Genus, species" for his binomial nomenclature classification system.

ZONATION, TIDES, AND OTHER STUFF

--**Zonation:** look at the different grasses within the marsh, but also at a larger scale. Tidal zone-marsh zone--deep water zone—etc
--**Tides**: Go over why they exist and how they affect the tidepools, and then how they affect the salt marshes. They are slightly different in terms of amount of water and extreme conditions
--You may want to talk a little about Wetlands and why they are important.

KITTERY, MAINE.

TRIPSLIP #6 - JULY 9th 2004

QUESTIONS? call Jonathan (617-645-1379)

TIME: 7:45AM - 3PM
bus leaves at 8AM, be on time!

GET READY FOR A WILD AND CRAZY TRIP! WE'RE OFF TO KITTERY, ME! NOT TO GO SHOPPING AT THE OUTLETS; BUT RATHER, TO LEARN ABOUT ITS WONDERFUL WETLANDS! WHY THE WIERD TIMES. YOU ASK? WE WANT BE AT THE CHANNELS AND TIDEPOOLS AROUND LOW TIDE, WHICH IS AT 11:41AM. WE'LL START OFF LEARNING 'BOUT SEDGES, RUSHES/REEDS, & GRASSES BEFORE JUMPING INTO THE CHANNELS (MUD CHANNELS) TO EXPLORE THIS INTERESTING ENVIRONMENT. BE PREPARED TO GET REALLY DIRTY/MUDDY! IT'S A LOT OF FUN! NEXT WE'LL WASH OFF AT THE BEACH, EAT LUNCH, AND EXPLORE THE TIDEPOOLS! GET EXCITED!

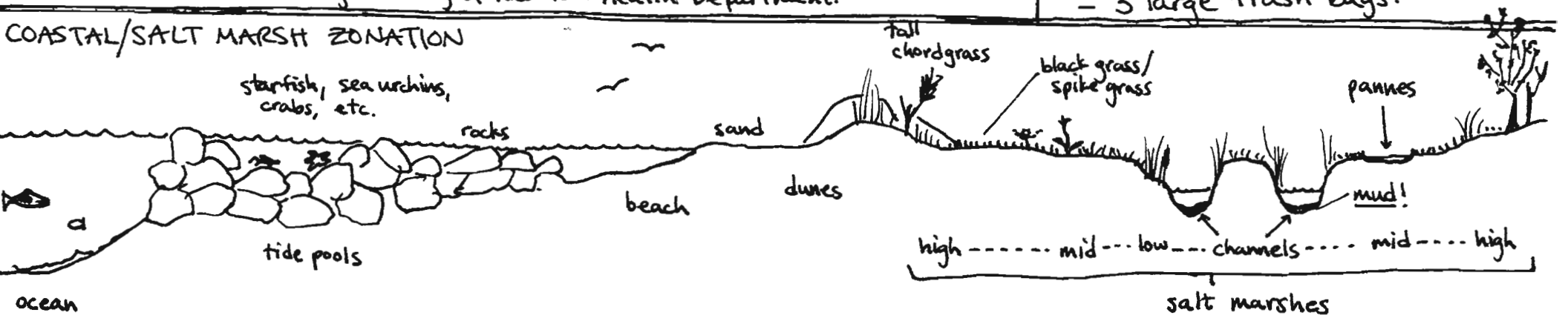
EQUIPMENT:

- Old Sneakers (no boots or sandals)!
- Old clothes that will get very, very muddy.
- Wear a bathing suit (under clothes)
- BIG LUNCH
- Lots of H_2O
- Bugspray
- Sunscreen
- An old towel
- Field Kit
- Warm Layer
- Change of Clothes for bus ride
- 3 large trash bags.

IN CASE OF EMERGENCY: the nearest Hospital is: York Hospital (1-877-363-4321)

This program must comply with the regulations of the Massachusetts Department of Health and be licensed by the city of Newton Health Department.

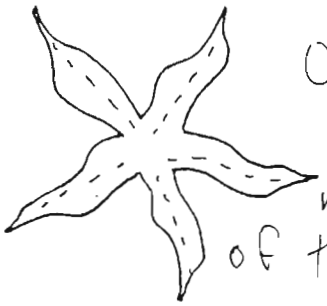
COASTAL/SALT MARSH ZONATION



Kittery maine

Tripslip #7
July 9th 1999
Dan Thomases
(527-2763)

TIME 10AM - 6PM



Off we head to where the fresh waters of the streams meet with the salty tides of the ocean. Made of mud and sand, the Salt marshes are the homes to a wide variety of Shelled animals. Out in the tide pools live another group of shelled creatures. And what do people collect on the beach? SHELLS!! Why do all these organism live in Self made hard casings?

Pam the Clam

Equipment:
- Old Sneakers *
NO BOOTS TODAY
- Bathing Suit (under your clothes)
- Wear *-clothing you don't mind getting very muddy.
- Big Lunch
- Field Kit / Day Pack (lined w/a Garbage bag)
- lots of H_2O
- a Towel
- a Change of clothes (for the ride back)
- a sweater or sweatshirt

So where are we going? That's right were going to Kittery. It will be a chance to explore the different environments or Zones which exist along a sea shore. What kinds of wildlife do you expect to see in a tidepool? a salt marsh? the high marsh grasses and vernal pools? Would you expect to see tall hard wood trees? bears? and deer? what about racoons? or ferns? Well... Why not? what would you expect to see. Try to make a list of the different spots we stop at & compare what wildlife you find in Various places.

TRIPSLIP #6
JULY 10, 2000

MEET @ BROWN

KITTERY MAINE

QUESTIONS?? CALL JENNY (969-2776)

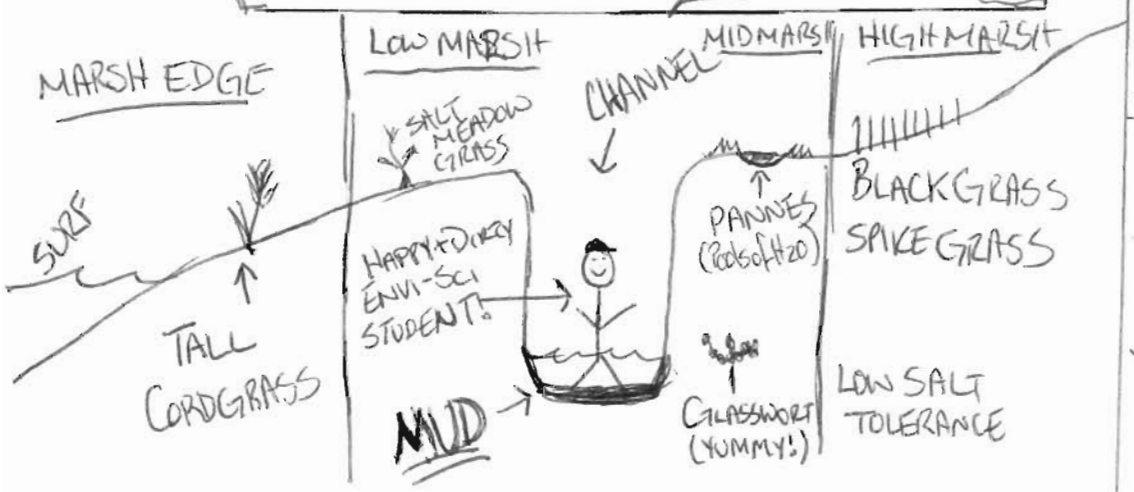
9AM-5PM

EQUIPMENT

- A SENSE OF ADVENTURE
- OLD SNEAKERS (NO BOOTS OR SANDALS)
- OLD CLOTHES THAT WILL GET VERY MUDDY
- WEAR A BATHING SUIT (UNDER CLOTHES)
- BIG LUNCH
- LOTS OF H_2O
- BUG SPRAY
- SUNSCREEN
- OLD TOWEL
- FIELD KIT
- WARM LAYER
- CHANGE OF CLOTHES FOR BUS RIDE HOME

YIPPEE SKIPPY! TODAY WE'RE OFF TO KITTERY, MAINE! NO, WE ARE NOT GOING SHOPPING, BUT RATHER EXPLORING THE REALLY COOL SALT MARSH UP THERE. WE ARE ALL GOING TO GET VERY MUDDY SO WEAR CLOTHES THAT YOU DON'T CARE TOO MUCH ABOUT. AFTER KICKIN' IT IN THE SALT MARSH WE'RE GOING TO HEAD OUT TO THE TIDEPOOLS TO POKE AROUND. GET READY TO GET DIRTY!

SALT MARSH ZONATION



STARFISH

MARSH ZONATION – DIFFERENT PLANTS GROW/DIFFERENT ANIMALS LIVE IN "ZONES" – KINDA LIKE A "NEIGHBORHOOD"

QUESTIONS TO PONDER

- WHY ARE SALT MARSHES IMPORTANT ECOSYSTEMS?
- WHAT KINDS OF ANIMALS WILL WE FIND IN A SALT MARSH?
- WHY ARE SALT MARSHES IMPORTANT FOR HUMAN SURVIVAL?

KITTERY

MA-ZW

estuaries

salt marsh

tidepools

Date: Friday, July 13 2001 Tripslip #7

Time: 8:30am - 4pm Meet @ Brown Middle School

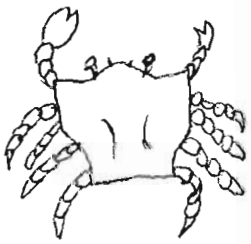
QUESTIONS? Call Jeff (332-3617)

EQUIPMENT ☆☆☆ this is very important!

- OLD sneakers that you don't mind getting completely muddy (NO boots or sandals, they should fit your feet!)
- OLD clothes that will get very muddy
- Wear a bathing suit (under your clothes)
- BIG LUNCH and lots of water
- Bug Spray ☆
- Old towel
- Warm layer
- Sunscreen
- Field kit
- Change of clothes for the bus ride back

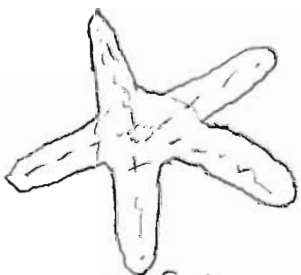
We're off to discover the salt marshes and tidepools of Kittery Beach in Maine. In the salt marshes, we'll be traveling through the estuaries of the marsh. An estuary is where fresh water from the land mixes with the salt water from the ocean. It is very MUDDY in the estuaries, so get ready. What could be better than spending a Friday soaked in mud? After lunch, we'll investigate the nearby tidepools. Then, back to Newton for a relaxing weekend.

Some things we'll see...

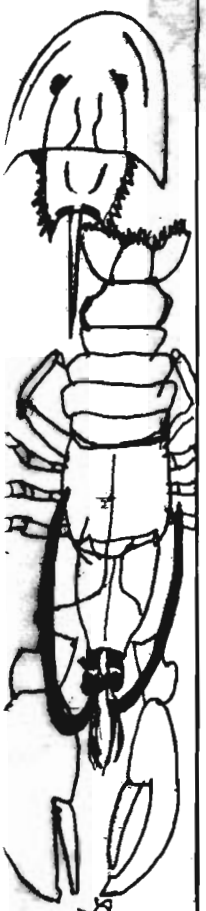


Fiddler Crab

Cordgrass



Starfish



Tripslip #5: **Salt Marshes and Tidepools** TIMES:
Monday, July 8, 1991 at
Questions?: 964-5857 **Kittery, Maine** 10:30-
527-2763 6:00pm

Meet & Pickup @ Newton South don't be late!

Equipment: Field Kit (except don't wear your boots), Old Sneakers and Clothes (that you don't mind destroying), Extra shoes, socks, and clothes (for the ride home), Towel, Bathing Suit, Suntan Glop, Insect Repellent.
Optional Equipment: Hat, Food to snack on.

READ THIS TRIPSLIP!

Get excited everybody, because Monday is our first bus trip! O.K., so if the idea itself of riding on a bus isn't exactly titillating, well just wait to you see the beaches and marshes of **SEA POINT** in Kittery, Maine. Once we get to our destination, we will spend the day investigating the salt marsh and tidepool environments, and find some time to swim in the chilly Atlantic Ocean. We will get there just before dead low tide so the marshes and tidepools will be exposed and hopefully, full of fun creatures to look at and learn about. It should be a down and dirty, wet and wild, not to mention wacky eco-adventure!

Grist for the Mill: Some things to think about over the weekend!

Salt Marshes:-Are the most food productive land ecosystems. Salt Marshes are the breeding place for many of the fish and crustaceans that we eat.

-For that matter, what the heck is a crustacean; or a mollusk; what about an echinoderm; and what is an arthropod; a gastropod?

-Looking at a salt marsh you will see many different kinds of grasses. See if by the end of the day you can tell the difference between the Black Grass (Juncus Jerardi), Saltmeadow Grass (Spartina Pateas), Cord Grass (Spartina Alterniflora), Saltmarsh Bullrush (Scirpus Robustus), and Reed or Fen-grass (Phragmites Communis).

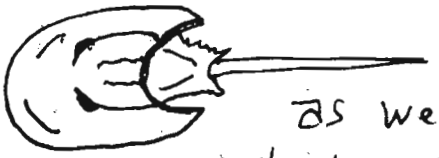
-More important than identifying grasses, what can they tell one about the marsh? A hint: think about ZONATION; think about "limiting factors."

Tidepools:-There is zonation here too. For example think about why the barnacles live in only one section of a rocky shore. Are there limiting factors here too?

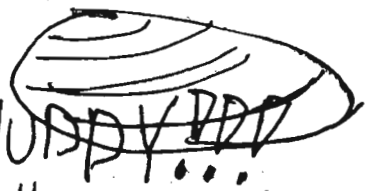
-Seaweed is actually called algae. Not only try to find as many different kinds as you can, but how many different adaptations you can find. Especially note Rockweed (fucus) and Irish Moss (Chondrus).

-The tidepools are an ideal place to understand how we classify all organisms. Try to get every plant and animal you find to fit into this system: kingdom phylum class order family genus species or remember "King Phillip Came Over From Germany Smiling

Our first stop will be the salt marshes.



Be sure to dig on the Zonation as we walk from the beach to the Chanels. What is Zonation? Zonation is the slight changes in environment vegetation & wild life between regions. What kinds of things would you expect to see growing or inhabiting sandy areas? muddy areas? salty areas? Be Prepared to Get MUDDY!!!



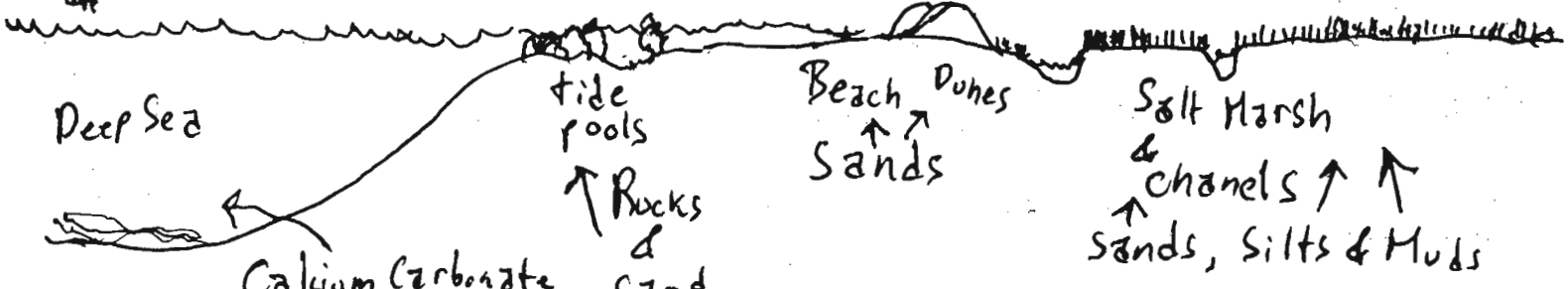
We will then cruise over to the beach to rinse off eat some lunch & look at some shells. What kinds of beasts do you think lived in these shells? What kind of mode of transport do you think they used to get around? Are they all happy as clams?

Lastly we will check out the biota of the tide pools. Starfish, mussels, barnacles sea urchins, sea weed, sea anemones

"WHAT A FAB-O DAY!!"

Experience Environment, it's Better than Books.

↓ From looking at this diagram what kinds of rocks do you think would form over time? ↓



KITTERY MAINE

Date: Friday, July 11th, 199

TIME: 9AM – 4PM

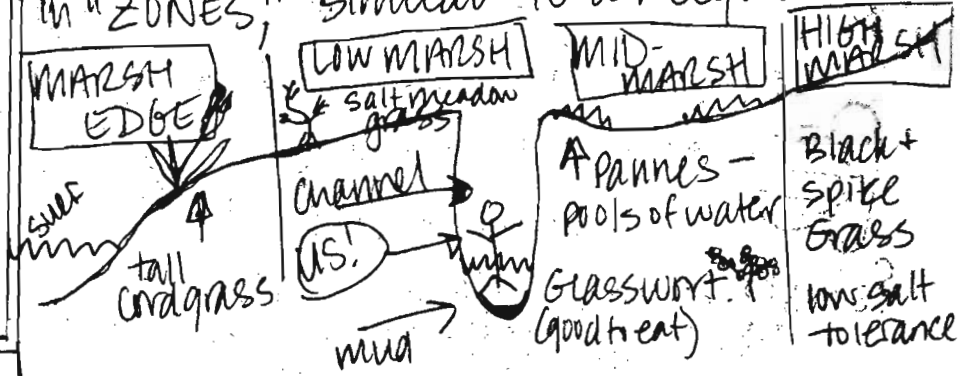
TRIPSLIP # 8 ?s Jenny 469-2776

EQUIPMENT:

1. OLD SNEAKERS (no sandals)
2. old clothes that CAN (and will get very muddy)
3. BIG LUNCH
4. LOTS OF WATER
5. Bug spray
6. Field Kit (but NO BOOKS)
7. Suntan lotion
8. Bathing suit (wear it)
9. Old towel
10. Sweatshirt/warm layer (it may get cold)
11. A change of clothes (for bus ride home!)

Today, we'll have a great, oh-so-wet, time exploring the salt marsh and tidepool ecosystems of Kittery! We'll get down and dirty as we first walk across the high marsh, mid marsh, and then plunge into the channels.

These names are examples of MARSH ZONATION → different plants grow / different animals live in "ZONES," similar to a "neighborhood."



Why are salt marshes important ecosystems? Why are they essential for the survival of humans? What kinds of plants + animals can we expect to see in the marsh? What will we learn today? (enough questions?) →

We'll be talking about ZONATION, CLASSIFICATION, MARINE ECOLOGY, AND WETLANDS!

Tidepools, left behind at low tide, are home to many animals. We'll explore those too – pick up periwinkles, snails, rinse off our mud, and have fun!

periwinkles
black grass
cordgrass
barnacles
goldenrod
glasswort
SOME PLANTS + ANIMALS
hermit crabs
greenhead flies

starfish
mussels
fiddler crabs

KITTERY IDENTIFICATIONS

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Mid-Marsh
High-Marsh- Area farthest from the channel (and *not* near the shore of the ocean)
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Glasswort- salty plant used by the colonists as seasoning. Found in pannes, very succulent, filled with water

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Hermit Crabs- the ones that live in shells
-Other ones are probably Box Crabs, but look them up.

TIDE POOLS

Periwinkles- snails with small black shells.
Starfish- If you don't know what these guys are already, you're in trouble
Sea Aneomes- They attach to rocks and have lots of wavy arms
---*Use the books for anything else!*

CLASSIFICATION

King = Kingdom --- Animal
Phillip = Phylum ---Chordata
Came = Class ---Mammalia
Over = Order ---Primata
From = Family ---Hominidae
Germany = Genus ---Homo
Smiling = Species ---sapiens

EXAMPLE USING HUMANS

**********Linneaus uses "Genus, species" for his binomial nomenclature classification system.

ZONATION, TIDES, AND OTHER STUFF

--**Zonation:** look at the different grasses within the marsh, but also at a larger scale. Tidal zone-marsh zone--deep water zone—etc
--**Tides**: Go over why they exist and how they affect the tidepools, and then how they affect the salt marshes. They are slightly different in terms of amount of water and extreme conditions
--You may want to talk a little about Wetlands and why they are important.

GOALS FOR SALT MARSH TRIP

1. Understanding the origin and nature of the marsh and its development.

2. Cognizance of environmental factors operating here. How is the effect of environmental factors discerned? Distribution.

3. The idea of dominance in plant communities. What is dominance? How extreme is it in this habitat?

4. To learn the names of a few common marsh plants and animals.

5. Recognition of the ecophene as a phenomenon.

6. The importance of the salt marsh as an ecosystem.

7. Evidences of man's effects: mosquito ditches, fill, hay straddles, duck blinds, garbage dumps, dikes, housing.

Trip #5 7/11/75
Ann 527-4687
Time: 2:30 PM - 9:30 PM
Low Tide: 8:00 PM
Site: Kittery, Me.
salt marsh
tide pools

group:

Wear: sneakers (minus the socks), a bathing suit under your regular clothes, and a hat.
Bring: your complete pack (minus rockhammer), a raincoat, extra shoes/sandles, socks, anti-sunburn lotion, a towel. Supper (no visits to a MacDonalds), a full canteen, and an extra bev-

Cont. 2
erage.

Readings: Seashores pp. 10-11, 14-15 and skim Basic Ecology: pp. 170 177.

Objectives:
1) Study life in a salt marsh.

2) Observe life in a tide pool.

3) Conduct a zonation study of a beach and a tidal marsh.

4) Appreciate the worth of a tidal marsh community

5) Have some Fun.

3
Grist for the Mill:
How can this "desolate" land be of any use to Nature, to Man?
How can marsh reeds live in salt water; what adaptions have been made?
What danger to these lands can you foresee?
What type of beach is Kittery?
Where are organisms found; what adaptions have they made?
what does the beach zonation indicate?

With your knowledge of pH and poH, how do you interpret "natural" shampoo commercials?

Unusual things to do:

Sit by a tide pool for

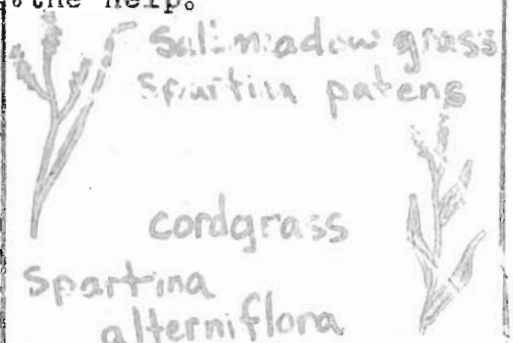
4
5 minutes or so and make a mental mote of everything that you see, hear, feel, and smell (taste is omitted since I do not expect you to eat a tide pool).
Find a depression on a rock that has barnacles - even a plain rock with barnacles will do, pour sea water over them to simulate a tide change; when their tentacles come out, observe them feeding.

Tidal Marsh Communities

The salt marsh is a valuable area. Fish enter the channels to feed and to spawn. The marsh gives nutrients to the sea in the form of plant material. According to studies

5
one acre of East Coast marsh contributes 9 tons of plant materials to the sea each year. This is amazing if you consider that an acre af a wheat field yields only 1.5 tons of plant materials.
Not everyone realized the worth of a salt marsh. People have drained and/or filled these areas in order der to put the land to a "good use": more beach front cottages. This change upset the marine food web. Commercial fishing declined because ther were fewer fish, the fish population declined due to a decrease in the food supply and a lack of safe areas for the fish to reproduce.
The decline of the fish-

6
ing industry was partly responsible for the investigations into the role of the salt marsh. Connetiecut and other states have passed laws to preserve the tidal marsh communities. The San Fransisco Bay Marine Research Center is currently testing ways of reclaiming abused salt marshes. Hopefully their findings will be put to use in the areas that need the help.



Tripslip #5:
Monday, July 8, 1991
Questions?: 964-5857
527-2763

Salt Marshes and Tidepools of Kittery, Maine

TIMES: 10:30-6:00pm

Meet & Pickup @ Newton South don't be late!

Equipment: Field Kit (except don't wear your boots), Old Sneakers and Clothes (that you don't mind destroying), Extra shoes, socks, and clothes (for the ride home), Towel, Bathing Suit, Suntan Glop, Insect Repellent.
Optional Equipment: Hat, Food to snack on.

READ THIS TRIPSLIP!

Get excited everybody, because Monday is our first bus trip! O.K., so if the idea itself of riding on a bus isn't exactly titillating, well just wait to you see the beaches and marshes of **SEA POINT** in Kittery, Maine. Once we get to our destination, we will spend the day investigating the salt marsh and tidepool environments, and find some time to swim in the chilly Atlantic Ocean. We will get there just before dead low tide so the marshes and tidepools will be exposed and hopefully, full of fun creatures to look at and learn about. It should be a down and dirty, wet and wild, not to mention wacky eco-adventure!

Grist for the Mill: Some things to think about over the weekend!

Salt Marshes:-Are the most food productive land ecosystems. Salt Marshes are the breeding place for many of the fish and crustaceans that we eat.

-For that matter, what the heck is a crustacean; or a mollusk; what about an echinoderm; and what is an arthropod; a gastropod?

-Looking at a salt marsh you will see many different kinds of grasses. See if by the end of the day you can tell the difference between the Black Grass (Juncus Jerardi), Saltmeadow Grass (Spartina Patens), Cord Grass (Spartina Alterniflora), Saltmarsh Bullrush (Scirpus Robustus), and Reed or Fen-grass (Phragmites Commonis).

-More important than identifying grasses, what can they tell one about the marsh? A hint: think about ZONATION; think about "limiting factors."

Tidepools:-There is zonation here too. For example think about why the barnacles live in only one section of a rocky shore. Are there limiting factors here too?

-Seaweed is actually called algae. Not only try to find as many different kinds as you can, but how many different adaptations you can find. Especially note Rockweed (fucus) and Irish Moss (Chondrus).

-The tidepools are an ideal place to understand how we classify all organisms. Try to get every plant and animal you find to fit into this system: kingdom phylum class order family genus species or remember "King Phillip Came Over From Germany Smiling

Crustaceans, Horseshoe Crabs, Insects — ARTHROPODS
Barnacles, Copepods, Arachnids
Sea Anemone, Hydras, Comb Jelly — COELENTERATES
Coral, Jellyfish, Sea Fans

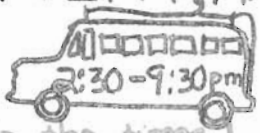
Squids & Octopi, Bivalves, Tusk Shells, Gastropods, Chitons — MOLLUSKS
Sea Cucumbers, Starfish, Sea Urchins, Brittle Stars, Crinoids — ECHINODERMS

duck these pennies are hot!

READ YOUR TRIP SLIPS

Trip slip #5 July 11

KITTERY, MAINE



note the times!

bring Supper, wear sneakers, a bathing suit under your clothes, bring a towel, sun tan glop, sunglasses, a hat, & a seashore book

Your leader is Isie Marcus (332-2948)

We'll investigate the rocky seacoast and a salt marsh. Dead low tide is at approx. 8pm, we'll go out over the rocks & examine the tidal pools trapped in the depressions in the rocks

Plants can grow only where enough light penetrates, mostly in the SURFACE ZONE

The temp. of the surface water varies only about 10°F each season. The salt content is fairly steady (about 3½%)

All of the animals in the tide pools have special devices for hanging onto the rocks as the waves crash against them.

②

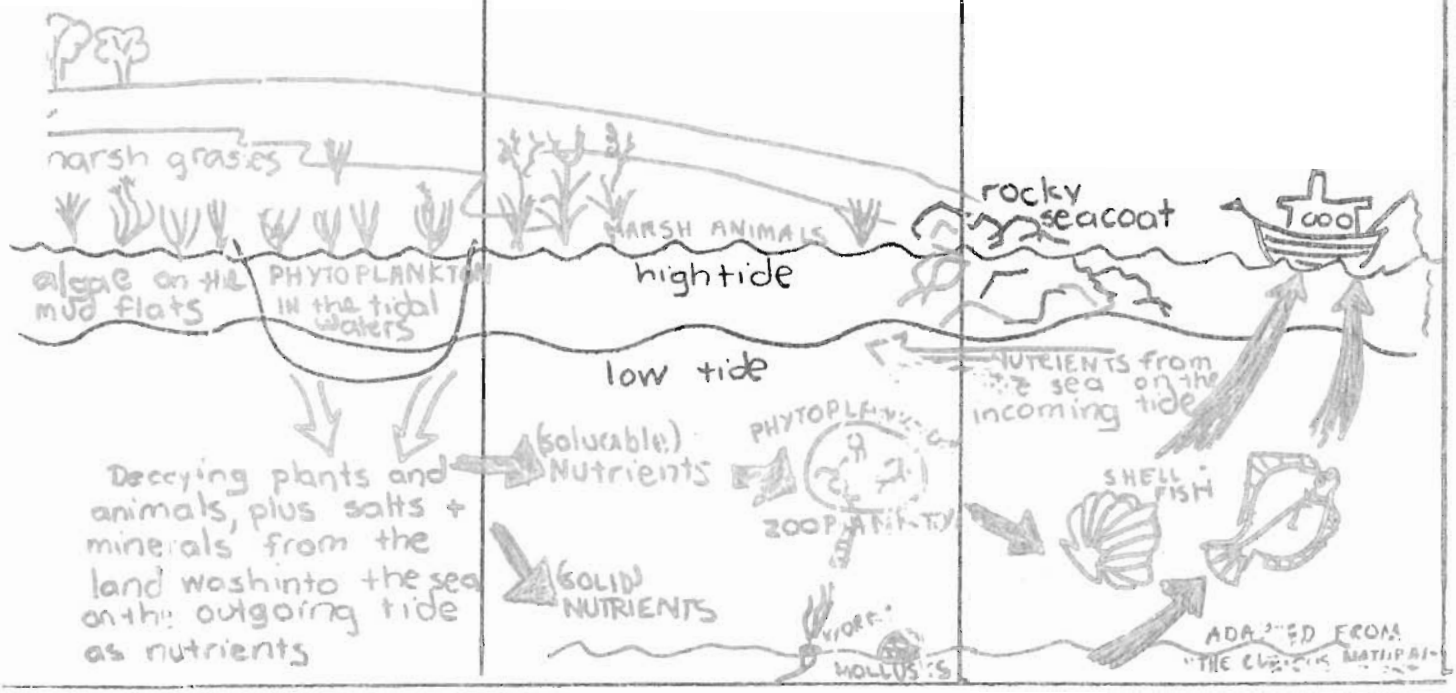
SALT MARSHES produce more food than any other land! Estuaries and salt marshes are the nurseries for many of the crustaceans & fish that we eat.

The nutrients produced in the salt marsh, such as grasses, algae, + plankton, are used in the food web by worms, mollusks, and fish.

This cycle takes hundreds of years to develop! If we use salt marshes as dumps, we destroy the whole food chain!

③

SALT MARSHES



Trip Slip # 5

Friday July 12, '74

Lois Marcus (332-2948)

Kittery, Maine

sea coast & salt marsh

bright and early, be at NSHS by 6 am we will return to NSHS at 2pm Bring a lunch, your gear, a map of New England, wear sneakers, a hat small towel, bathing suit under clothes sun tan goop, sunglasses

*This is a very rocky stretch of seashore. It takes about 1½ hrs. to get there by bus. Dead low tide occurs at 10:24 am so we'll get to go out over the rocks & examine the tidal pools for starfish, sea anemones, occasionally even lobsters.

The rocks are very sharp, at low tide the barnacles are exposed + they're razor like, so don't slip.

Life in the open ocean is planktonic, or drifting. Life along the shore or tidal zone has to be fabulously sturdy. It is subject to temp. extremes, covering & uncovering by tides, decrease of salinity by rainfall, lack of food when the tide is out, damage when the tide rushes in, hot sun, hungry birds, etc. That's why the barnacles are such tough creatures. They're impossible to get off the rocks!

Tides are a twice a day water level change caused by gravitational force on the water by moon & sun. When the sun & moon are arranged so that their gravitational forces are pulling togather, there are more extreme tides.

→ There is 2½x more ocean than land!

→ Chapter 8 in Basic Ecology should be read, pgs. 170-177

Pray for Sunshine

3

benthic division = all bottom living communities

pelagic division - mass of H_2O in which plants + animals float or swim.

littoral benthic zone - from high tide to the edge of the continental shelf.

deep sea benthic zone - from edge of con. shelf to the depths.

Some more zones to be aware of. Don't memorize

littorina zone - sprayed at high tide

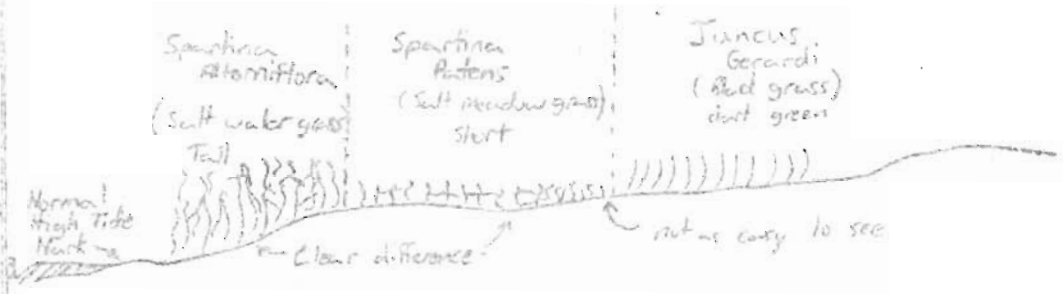
balanoid zone - covered & uncovered

subtidal algal - below low water mark.

Kittery

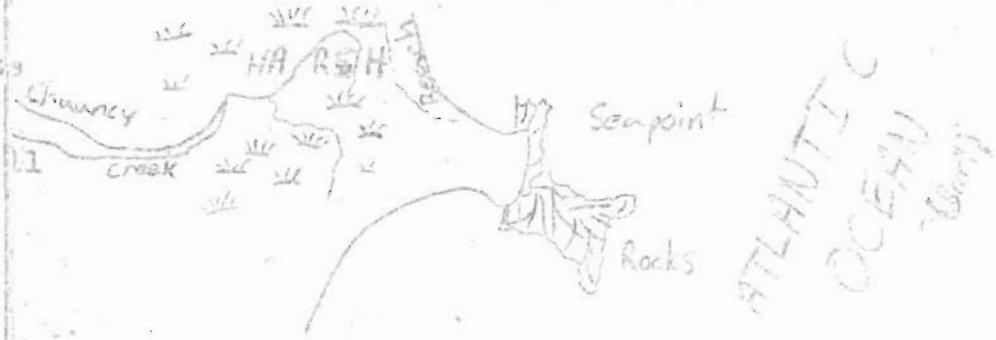
Supplement

Today we'll visit two main areas; the Salt Marsh
the Sea point Rocky coast. These two are right
to eachother but the plant and animal life found
ch differ tremendously. The rocky sea point is
ed to the pounding of the ocean while the salt
is gently bathed by the tides which drain and
it through Chauncy Creek. Obviously the plants
nimals living in these very different niches are
very different forms.
salt marsh produces tremendous quantities of
and nutrients which support life in the marsh
almost more importantly, also support the plants
nimals of the open ocean. Food produced by
in the water and in the mud of the marsh as
s by the grasses and other surface plants you'll
ding at today. When these plants and algae
they are decomposed by the bacteria and fungi
in the soil. Here's where the unique feature
e salt marsh comes in. As you've probably
ed, as decomposition takes place in a fresh-
marsh succession continues and grasses are
ly pushed out and replaced by shrubs and trees.
lt water tides flowing in and out of costal
es prevents this from happening. First by
the soil too salty for most woody plants
econdly by carrying excess nutrients and
ed material out to sea. Thus the salt marsh is
ely stable ecosystem. Out at sea the excess
ents feed the plankton and algae which in turn
ort the higher animals including the fish we
Who would think that a salt marsh could be so
ortant?
en you're in the marsh look for Zonation.
ain species of plants have become adapted to the
specific conditions that exist at different
ls in the marsh.



ZONATION!

Also look for saltwort of sea cucumber which grows in evaporation flats where the ground is very salty. (so is saltwrt - not surprisingly)



The same tide dependent zonation is even more easily seen on the rocky coast. Here plants and animals must contend with being exposed alternately to the air and sun and then later being completely submerged in (cold!) water. So the seaweeds, such as Fucus (rockweed), which live on rocks near the high water mark have tough leathery skins which help them resist dehydration during the long hours of exposure to the sun. Further down, near the low tide mark, more delicate algae such as Sea Lettyce take over. Animal life follows the same pattern. Barnicles and mussels are most abundant on the upper rocks while starfish and other animals which need more water live in tide pools closer to the low water mark. All the plants and animals have some method of anchoring themselves to the rocks to pre-

Kittery

Maine Seacoast

Times:
Leader: Thea Brandsen 527-1195
Equipment:
- Field kit
- Lunch
- Water
- 2 pair of sneakers
  - NO BOOTS
  (one pair will get wet)
- Shorts
- towel(s)
- Bathing suit (under clothes)
- BUG STUFF

(1)

We will be starting out the day in the salt marsh. We will try to identify the different types of grass:
- spartina patens
- spartina alterniflora
- Juncus gerardi

go in the mud, look at the mosquitoes and have a great time breaking out the mosquito repellant. Then we will hit the tide pools at about 11:15 where we will find (hopefully) ——→

(4)

Brimmed Hat

What to look for:

different zones - tidal and marsh

changes in:
- amount of water
- salinity of water

Adaptation:
- found in
- Anchoring / attaching
- Floating
- opening & closing
- profile and shape
- movement
- nourishment
- reproduction

(2)

mean that these animals and plants have found a solution for survival

How do they adapt?

What can you look for?

The periwinkle is an animal with one foot that stays to rocks using suction. tidal / marsh zones

(Periwinkle) (3)

(sea pickle)

Sea pickle grows in the salt marsh. It is salty on the inside to protect itself from the high salt levels surrounding it.

Barnacles
mussels
clams
periwinkles
starfish
brittle star
blood star
urchin
anemoneas
lobsters
crabs

(seaweed)

(5)

lobsters
hermit crabs

The contrast in the different zones and how the animals and plants adapt is so interesting and puzzling.

It is an environment that has its similarities with that of, say, Diamond Woods. Look for them.

Try reading
Tidal marshes of Connecticut (From the leaders room)

(6)

TRIP #5 July 12, 1974
FRIDAY

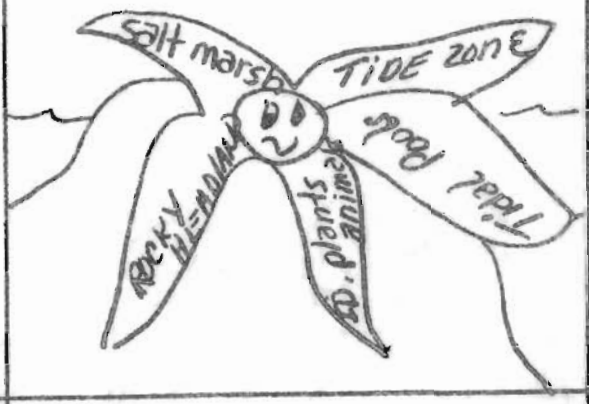
To. Kittery, Maine
BUS 6 A.M - 2 P.M
low tide 10:24 A.M

Floyd's Group

EQUIPMENT

① BLUEFISH
② BASIC PACK
③ Bathing Suit (wear under your clothes)
④ old sneakers (for wading) as well as hiking boots
⑤ extra socks
⑥ Read in Basic Ecology pgs. 95-97 + 170-177
⑦ sunglasses

Objectives We'll see



Questions to answer:

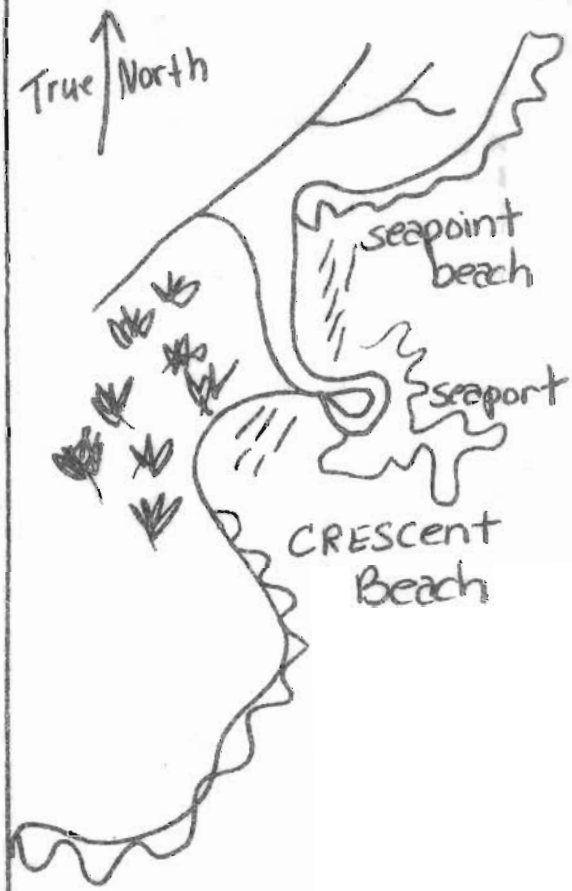
① What is a tidal pool?
② What purpose does it serve?
③ Why is the living population of the tide zone so dense?
④ Why must these living things function in both water and air?
⑤ What is a salt marsh?

discovery

Let's see if we can locate some rockweed.

Why do you think it has air bladder?

Floyds group



1

DATE: JULY 11, 1975

SITE: KITTERY MAINE
coast and salt marsh

LEADER: STU ROTHMAN
439-3638

TIME: 2:30 - 9:30

BRING: supper, field kit, wear sneakers, towel, drink, book on seashore life

no collecting here!

2

we will see cold water marine environment, salt water-tidal marsh, tide pools, rocky and sandy shore

Objectives:

1) Visit a truly classic rocky headland environment reasonably untouched by man.

2) learn to identify animal and plant life

3

3) Visit a beautiful salt marsh, probably the most essential part of the ocean biome and to discover its function

4) Examine harshness concept

5) see the effect of the tides on a sandy beach

6) Note the special values found for PH, and density

4

QUESTIONS:

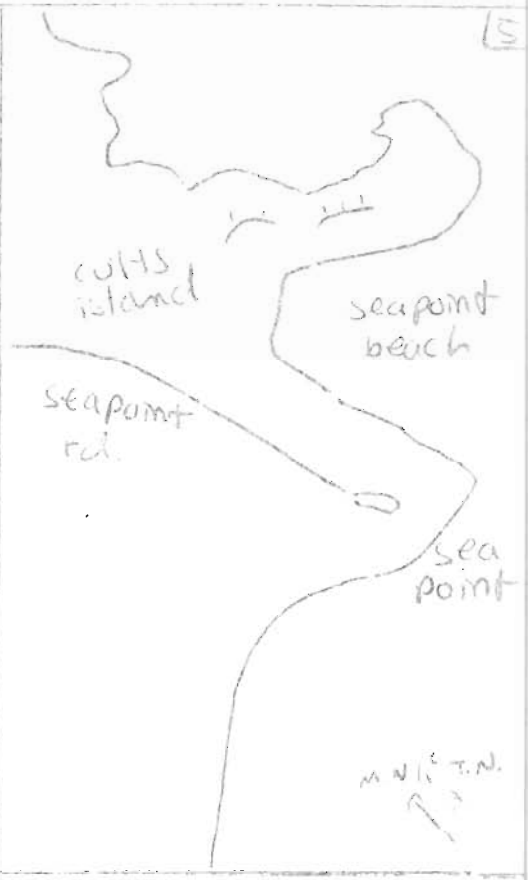
1) What is a tidepool? Why does it form, what purpose does it serve?

2) List all the functions of the rocks in the rocky headland you can think of?

3) What is a salt marsh? what is its function in the ocean biome?

4) What purpose do the canals serve?

5



1

Trip Slip ## #5
July 11, 1975
230pm-930pm
Howie 332-5976
site: Seapoint
Kittery, Maine
NOTE TIME This is to take advantage of the low tide, which will ## occur ## late in the day.

General Instructions:
Bring: a hearty supper complete pack minus rockhammer, hat, Seashore text (optional), towel, dry socks and extra footwear(to be left on the bus for afterwards)
Wear: sneakers without socks, bathing suit under regular clothes.

2

At Kittery We will:
--examine the importance of a saltmarsh in the ocean food web (a saltmarsh is one of the most productive and naturally fertile areas in the world)
--examine the mini-ecosystems present in the tidepools trapped in depressions in the rocks.

The shore and saltmarsh at Kittery comprise a relatively unspoiled area in our modern day world. No collecting will be allowed.

3

Questions##:
1 what kinds of adaptations are necessary for the plants and animals in the tideplisa? on the rocks? in the marsh?
2what are the various ways in which the tidepool creatures attach themselves to the rocks?
3 can you visually see the ecotones(borders between ecological communities)at this site?
4 what is the purpose of the channels in the marsh?
5 why is the saltmarsh vitally important to virtually all marine life?

4

Suggested Reading:
National Geographic
June 1972
-article on salt marshes

(1)

DATE: July 11, 1975

SITE: KITTERY, MAINE
coast and salt marsh

LEADER: STU ROTHMAN
969-3638

TIME: 2:30 - 9:30

BRING: supper, field kit, wear sneakers, towel, drink, book on seashore life

no collecting here!

(2)

We will see cold water marine environment, salt water-tidal marsh, tide pools, rocky and sandy shore

Objectives:

1) Visit a truly classic rocky headland environment reasonably untouched by man.

2) learn to identify animal and plant life

(3)

3) Visit a beautiful salt marsh, probably the most essential part of the ocean biome and to discover its function

4) Examine harshness concept

5) see the effect of the tides on a sandy beach

6) Note the special values found for PH, and density

(4)

QUESTIONS

1) What is a tide pool? Why does it form, what purpose does it serve?

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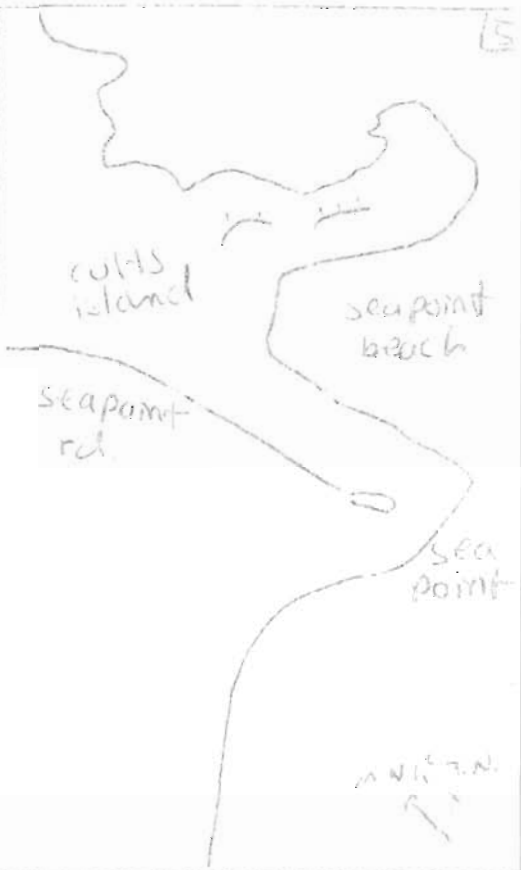
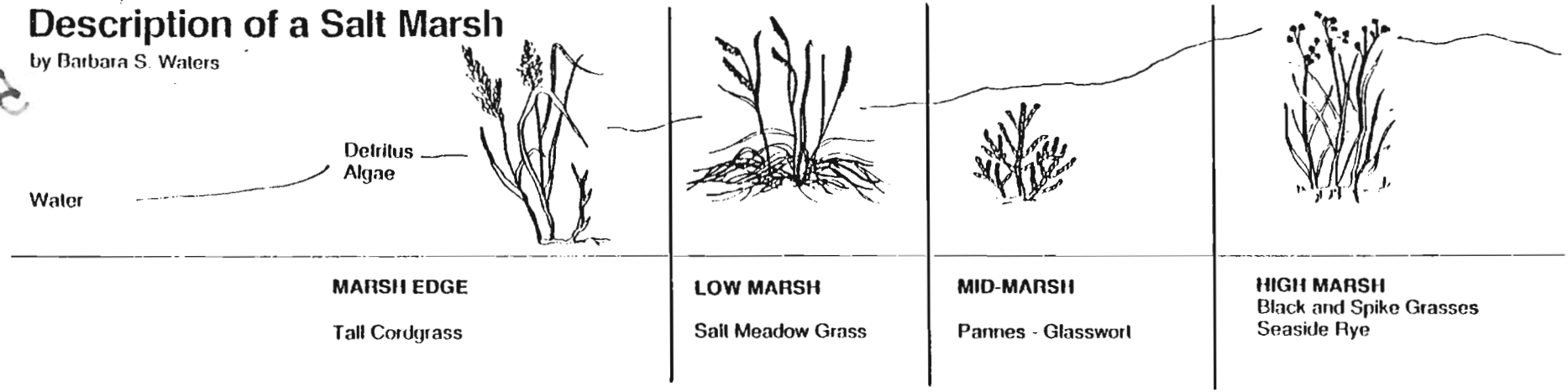
(5)



Description of a Salt Marsh

by Barbara S. Waters



Salt marshes border the salt water bays, and are flooded on high tide at some period during a twenty-four hour cycle. They are dominated by grasses of the genus *Spartina*. **Cordgrass** *(Spartina alterniflora)* is a sturdy grass, one of a group of salt-tolerant plants. It cannot survive underwater as eel grass, but it grows well with a salt-water bath twice each day. It sends out underground stems and new clumps of **Cordgrass** grow from these. The grass blades slow down the water movement so that the sediment in the water drops and the **Cordgrass** grows higher. Eventually it will form a peat bed many feet thick. **Spike Grass**, grows alongside Salt-Meadow Grass. It can be recognized by its shorter leaves. **Black Grass** takes its stand near the landward edges of the marsh. Where the marsh surface develops shallow depressions, known as pannes, water sometimes collects at the highest tides. In these pannes and along the salt-rimmed borders of the marsh the **Glassworts** grow beside the **Sea Lavender**. Colonial people and wild food lovers pick these stubby, fleshy **Glassworts**.

Looking out over a marsh for the first time you may not be able to tell each kind of grass from one another. Two clues to identification includes knowing where the grass is located in relation to amount of time it stays in the water and color. At the water's edge, the cordgrass forms a dark-green border, up to six feet tall in favorable conditions. The salt-meadow grass and nearby spike grass are one to two feet high and form a lighter green carpet. By late summer the salt-meadow grasses have bent at their bases to form flattened cowlicks.

The black grass rims the landward side of the marsh with red-brown patches. In bare patches and at the high dry edges, the short glasswort is easy to see. In fall it turns bright red, while the sea lavender is purple.

After this first survey, you are ready for a closer look between the grasses. Here the primitive algae grow, providing the basic nutrients for many animals. They grow in flat green mats or float up and down the creeks. Down between the grasses are dozens of the **Coffee Bean Marsh Snail** which feed on the algae mats and decaying vegetation. At high tide these snails climb to the top of the marsh grass out of reach of the water, and they move back down as the water recedes. It is a pulmonate snail and must breath air *(having lungs rather than gills)*. When up on the grass blades the Coffee Bean Snail is often eaten by birds. It is a squat, egg shaped snail, translucent brown and about 1/2" long.

Many holes the size of a fat finger puncture the marsh. Beside most of the holes are neat balls of sand and mud. These holes are dug by the **Fiddler Crab.** On a hot summer's day, the **Fiddler Crabs** scurry frantically when you approach trying to find their holes. At low tide, the crabs leave their holes by the hundreds to drink and feed at the water's edge. The name fiddle comes from the enlarged claw of the male crab, which it carries in front of its body like a musical instrument.

Near the water the marsh drops off to form an eroded peat bank providing homes for a number of burrowing clams and crabs. The box crab or **Marsh Crab**, makes a hole here about two inches in width with little piles of mud around the hole which leads to a network of tunnels that can be traced to the water. This Marsh Crab is shaped like a box and it is bigger than the fiddler. When caught it will play possum, keeping the legs extended and rigid. When returned to the ground, it will suddenly come to life and dart away.

Every salt marsh has colonies of **Ribbed Mussels** which are often covered with **Barnacles**. These mussels are good to eat, if the marsh is clean.

The most unwelcome creature on the marsh, as far as man is concerned, is the **Greenhead Fly**. The female fly lays its eggs on grass stems in mid-summer. These females seek blood of warmblooded animals to develop their eggs. The eggs hatch into inch-long maggots, which winter in the mud at the base of the plants, feeding on insects, worms, snails and other greenhead larvae. Usually the following summer they emerge as the dreaded fly. They in turn provide a bumper meal in late July for the swallows, and many other birds as well.

The green and blue boxes out on the marsh are our way to try to capture these pests before they bite. The female fly *(only one who bites)* is attracted to warm, dark places. Once in the box she cannot find her way out.

As many as sixty different kinds of fish have been found to live most of their lives in the marsh creeks. The young of many of our most popular fish begin their lives here such as flounder, mullet and menhaden. Larger fish such as striped bass, tuna and swordfish feed in turn on these marsh raised fish.

Kittery Identifications

- Low marsh = area closest to the channel
- Mid marsh
- High Marsh = area farthest from channel (and <u>not</u> near the shore of the ocean).
- Goldenrod = (solidago) Large yellow-flowered plant found in the high marsh.
- Black Grass = (juncus jerardi) looks dark in color, found in mid marsh, and sometimes high marsh.
- spike grass = (juncus trifitus) has 3 spikes
- salt marsh grass = (spartina patens) soft } mid marsh plants
- Cordgrass = (spartina alternaflora) found in the low marsh along the banks of the channel
- sedges = (cyperales) has 3 edges, sharp - found mid marsh
- Pannes = bare areas in the midst of the grasses.
- Glasswort = salty plant used by Colonists as seasoning. found in the pannes - very succulent (filled w/ H_2O)

"Sedges have edges, grasses are flat, reeds + rushes are round"

- fiddler crabs = the ones that run sideways. Females have one big claw - males are both small.
- hermit crabs = the ones that live in shells.
- other, larger crabs are probably Box Crabs, but look them up.
- periwinkles = snails w/ small black shells.

continued...

TIDEPOOLS!

trouble!

- Sea anemones = I don't know how common these are. They attach to rocks + have lots of wavy arms, or a big wavy hairpiece, almost.

Use The Books For Anything Else.

CLASSIFICATION!

King = Kingdom → Animal
Phillip = Phyllum → Chordata
Came = Class → Mammalia
Over = Order → Primata
From = Family → Hominidae
Germany = Genus → Homo
Smiling = Species → Sapiens

example using humans

*Linneaus uses "Genus, species" for his binomial Nomenclature classification system.

ZONATION, TIDES, + OTHER STUFF!

- Zonation = look at within the different grasses within the marsh, but also at a larger scale → tidal zone, marsh zone, deep water zone, etc.
- Tides = Go over why they exist and how they affect the tidepools, and then how they affect the saltmarshes. They are slightly different in terms amount of water + extreme conditions.
- You may want to also talk a little about Wetlands and why they are important.

TRIP SLIP #5

KITTERY MAINE

Date: Tuesday July 7

TIMES: 9am to 4pm

EQUIPMENT:

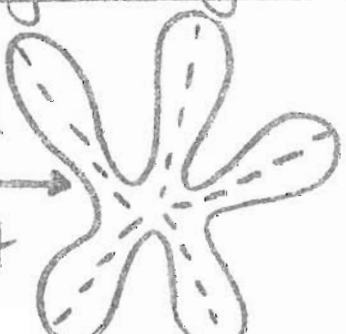
1) OLD sneakers (no sandals)
2) Old clothes that can (and will get very muddy)
3) LUNCH (a big one)
4) WATER (lots)
5) Bug Spray
6) Field kit (but NO BOOTS)
7) Suntan lotion
8) Bathing suit (wear it)
9) Old towel
10) Sweatshirt (it may get cold)
11) A change of clothes (for the bus ride home)

Ever wonder what happens when the salty oceans mix with inland fresh water? Ever felt like walking, falling and crawling in the mud? Ever wanted to hold a crab, a periwinkle or a starfish? If you answered yes to any of these questions then Kittery is the trip for you!! On tuesday we are going to visit an oceanside salt marsh and also explore some nearby tidepools. The main topics we will be discussing are: ZONATION, CLASSIFICATION, MARINE ECOLOGY, and WETLANDS.

Do you know what an ecosystem is? Why is the marine ecosystem important to us? If someone wanted to use a saltmarsh as a trash dump, should we care? How does this ecosystem affect other systems around it? Are there any similarities between a forest in Newton and a saltmarsh in Maine? How is that for 21 questions? On this trip I encourage you to get your feet wet, your hands muddy, and to keep your eyes open! (And ask about King Phillip)

SOME PLANTS + ANIMALS:

periwinkles
blackgrass
barnacles
goldenrod
starfish
glasswort



hermit crabs
greenhead flies
cordgrass
mosquitos
jellyfish
mussels
fiddler crabs

Tripslip #5:
Monday, July 8, 1991
Questions?: 964-5857
527-2763

Salt Marshes and Tidepools of Kittery, Maine

TIMES: 10:30-6:00pm

Meet & Pickup @ Newton South — don't be late!

Equipment: Field Kit (except don't wear your boots), Old Sneakers and Clothes (that you don't mind destroying), Extra shoes, socks, and clothes (for the ride home), Towel, Bathing Suit, Suntan Glop, Insect Repellent.
Optional Equipment: Hat, Food to snack on.

Get excited everybody, because Monday is our first bus trip! O.K., so if the idea itself of riding on a bus isn't exactly titillating, well just wait to you see the beaches and marshes of **SEA POINT** in Kittery, Maine. Once we get to our destination, we will spend the day investigating the salt marsh and tidepool environments, and find some time to swim in the chilly Atlantic Ocean. We will get there just before dead low tide so the marshes and tidepools will be exposed and hopefully, full of fun creatures to look at and learn about. It should be a down and dirty, wet and wild, not to mention wacky eco-adventure!

Grist for the Mill: Some things to think about over the weekend!

Salt Marshes:-Are the most food productive land ecosystems. Salt Marshes are the breeding place for many of the fish and crustaceans that we eat.

-For that matter, what the heck is a crustacean; or a mollusk; what about an echinoderm; and what is an arthropod; a gastropod?

-Looking at a salt marsh you will see many different kinds of grasses. See if by the end of the day you can tell the difference between the Black Grass (Juncus Jerardi), Saltmeadow Grass (Spartina Patens), Cord Grass (Spartina Alterniflora), Saltmarsh Bullrush (Scirpus Robustus), and Reed or Fen-grass (Phragmites Commonis).

-More important than identifying grasses, what can they tell one about the marsh? A hint: think about ZONATION; think about "limiting factors."

Tidepools:-There is zonation here too. For example think about why the barnacles live in only one section of a rocky shore. Are there limiting factors here too?

-Seaweed is actually called algae. Not only try to find as many different kinds as you can, but how many different adaptations you can find. Especially note Rockweed (fucus) and Irish Moss (Chondrus).

-The tidepools are an ideal place to understand how we classify all organisms. Try to get every plant and animal you find to fit into this system: kingdom phylum class order family genus species or remember "King Phillip Came Over From Germany Smiling

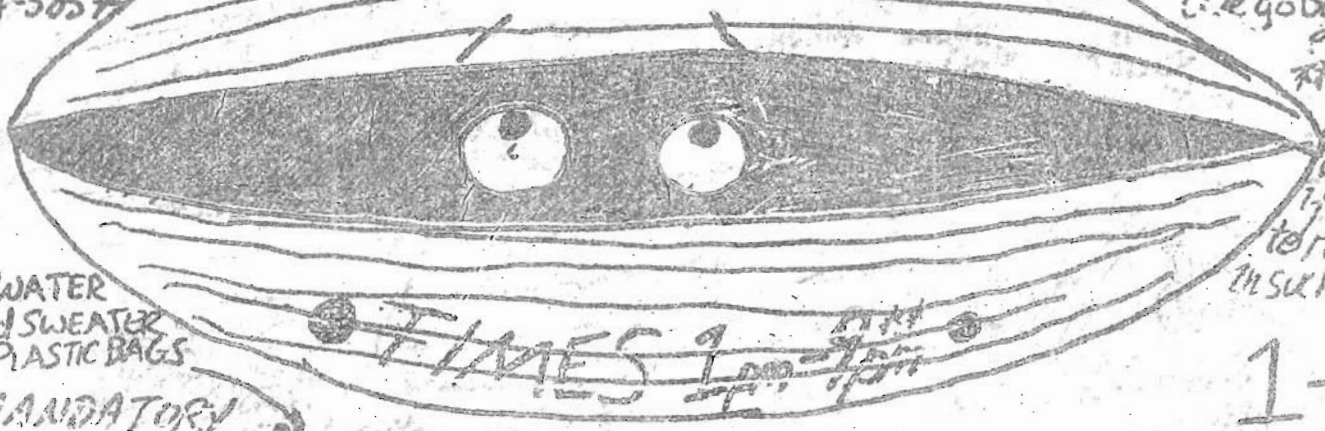
arthropod Crustacean

TRIPSLIP #4

JULY 6, 1990

Cole Stanton
964-5857

KITTERY!



MEETING PLACE: NEWTON SOUTH PARKING LOT
i.e. go by school bu

** We may return ear and will pa if so, attempt to reach parent in such a situation

1-9

① WATER and SWEATER & PLASTIC BAGS

MANDATORY EQUIPMENT: DINNER, OLD CLOTHES YOU WILL NEVER WEAR AGAIN, OLD SNEAKE YOU WILL NEVER WEAR AGAIN, INSECT REPELLENT, SUNBLOCK, TOWEL, HAT BATHING SUIT, * NO JEWELRY, WATCHES, etc., FIELD KIT, ** NO BOOTS **

OPTIONAL EQUIPMENT: CHANGE OF CLOTHES (NOTE: THERE ARE NO FACILIT. BUT YOU CAN CHANGE IN THE WOODS IF YOU WISH) SHOES for ride home

---

NOTE THE SPECIAL DATES AND TIMES ON THIS TRIP!

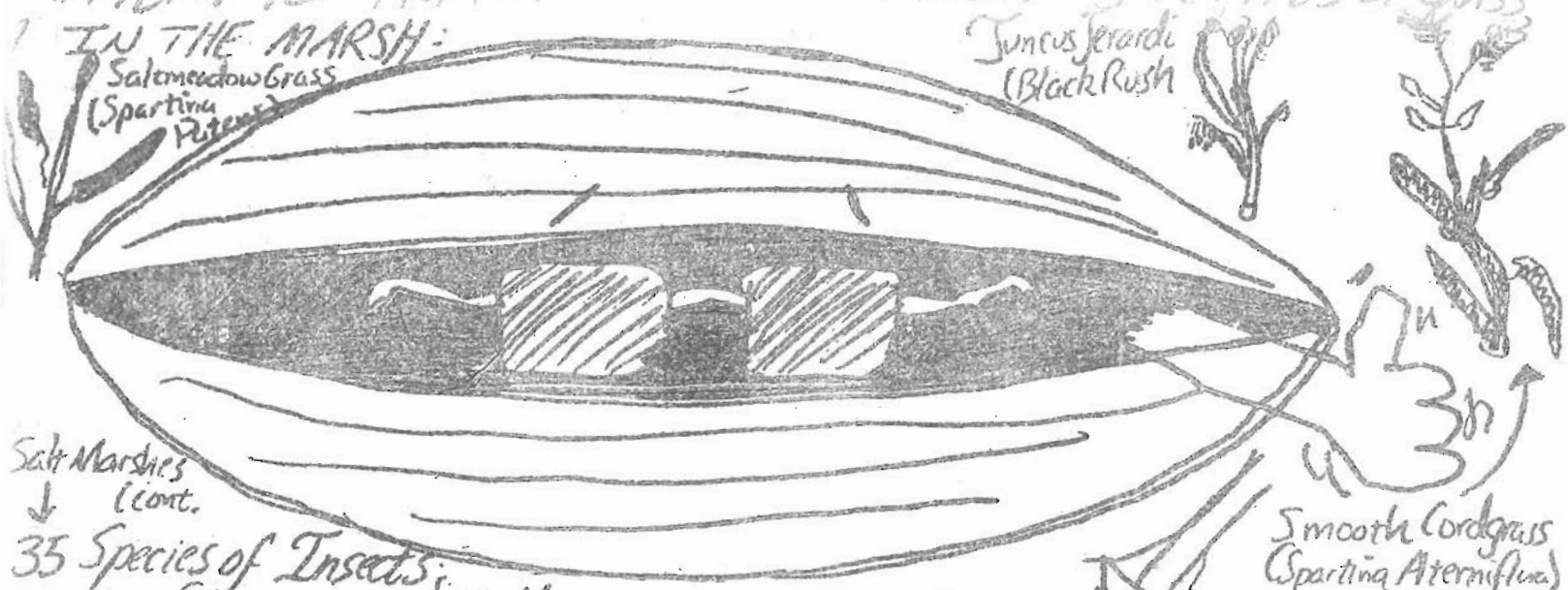
We are going to Kittery Maine's Sea Point to explore the beach, tidepool and salt marsh environments. To do this we need the dead low tide which will be at about 2:32pm. Eat your lunch before coming to South. This will be a wild, wacky, and awfully wet occassion.

First we will explore the grassy flats, tidal pannes (pools left behind in the marsh at high tide), and muddy channels of the salt marsh. The salt marsh is one of the most beautiful and misunderstood environments in the world. It is more than mud and grass. The healthy salt marsh can support at least:

100 Species of Birds; Sparrows to eagles
20 Species of Mammals; Mice to Men
25 Species of Fish; Mummichugs to Stripers
10 Species of Mollusks: Mussels to Snails

ATTERY '90: TRY TO FIND THE THE THREE MAJOR TYPES OF GRASS

IN THE MARSH:



Salt Marshes (cont.

35 Species of Insects; from mosquitoes to Mantises

50 Species of Plants; from cattails to cordgrass

10 Species of Amphibians; from toads to treefrogs

10 Species of Crustacea; from shrimps to crabs

→ The salt marsh is an important spawning ground for game fish, a breeding spot for water birds, animals and shellfish. It is also a beautiful part of our seacoast.

Unfortunately half of what we had 50 years ago is gone and all will be gone by 2000 if we don't act vigorously. Many people unfortunately think the salt marsh is space for a dump, an industrial plant, a place to be developed into real estate, or a source of insects to be drained. And too many people don't know that only a pound of insecticide, a quart of detergent or a crankcase full of motor oil can turn the whole thing into nothing but a big grey sewer!

When in the marsh remember the rules for identifying grasses - SEDGES HAVE EDGES
GRASSES ARE FLAT
RUSHES ARE ROUND

After the salt marshes we will head for the beaches for a swim, a rinse, and a spin in the FREEZING cold ocean. Then we will hit the tide-pools. These are areas where we will find animals and plants left behind at high tide's departure.

FOR EXAMPLE:

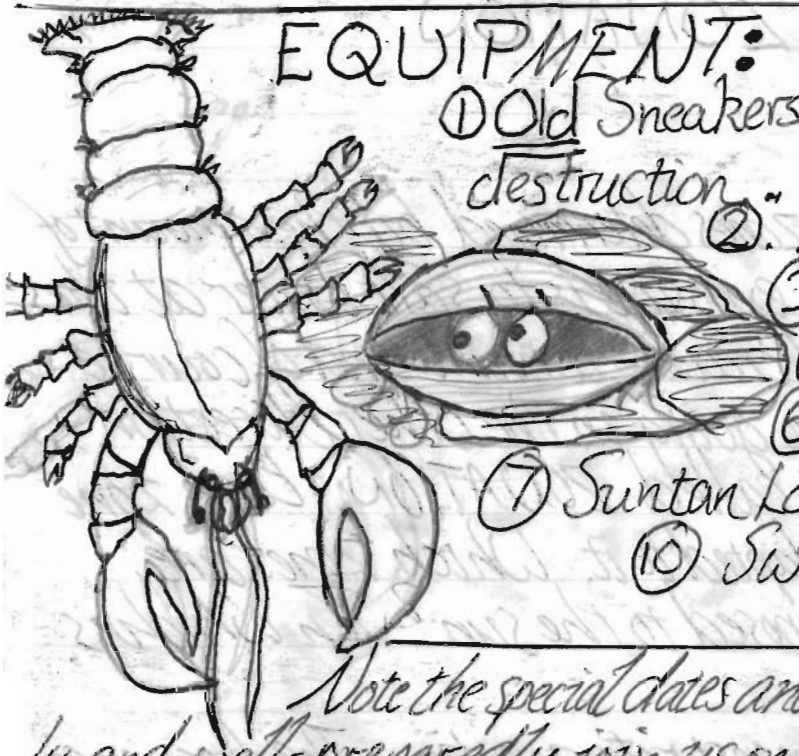
Rockweed - a (fucus) a brown seaweed
Star fish (Echinoderms)
Sea Urchins (Echinoderms
Sea Anemones (Coelentrates
Limpets (Mollusks, Univalves)
Quahogs & Clams (Mollusks, Bivalves)
Lobsters (Arthropods, Crustaceans)
Crabs (Arthropods, Crustaceans)
Spiders (Arthropods, Arachnids)

Jestwicki

TRIPSLIP #5
July 11, 1989
Cole Stanton (964-5857)
TIMES:** 8am-4pm
Meet at Newton South

KITTERY MAINE

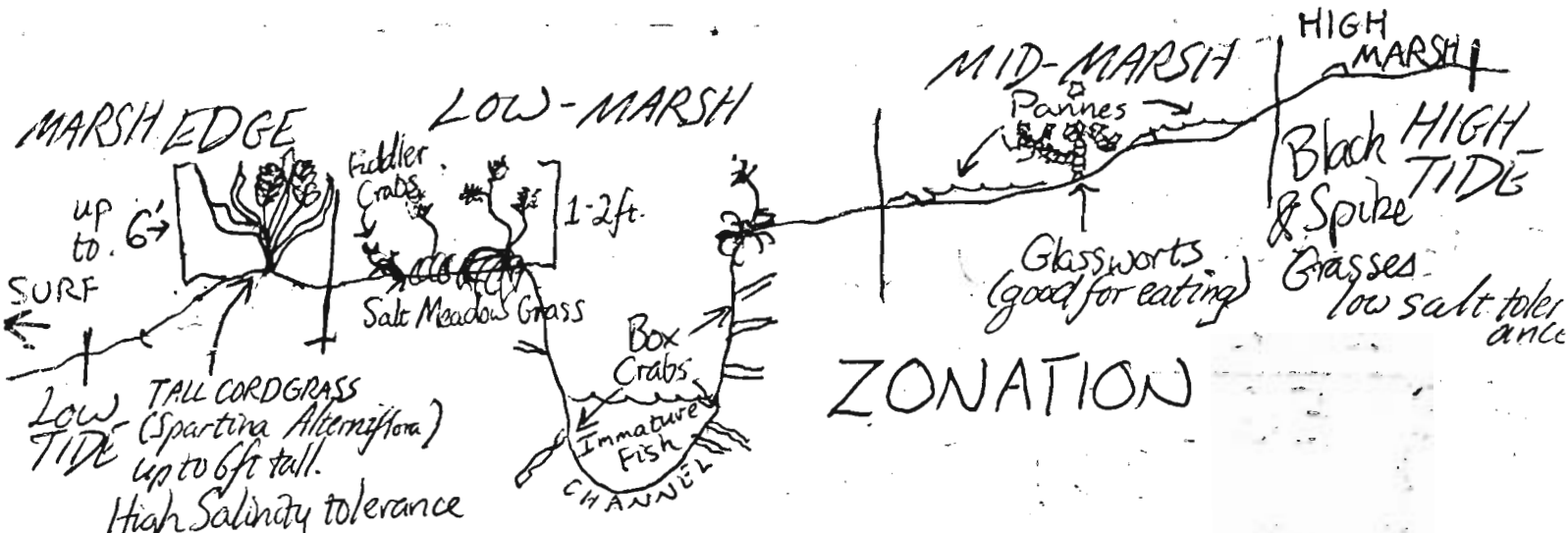
SALT MARSHES & TIDEPOOLS



EQUIPMENT:

① Old Sneakers & Clothing with an appetite for destruction - No boots today!
② LUNCH
③ BUG repellent
④ Field Kit ⑤ Water
⑥ Bathing Suit (under your clothes, there is no place to change)
⑦ Suntan Lotion ⑧ Towel ⑨ Hat
⑩ Sweater or Sweatshirt

Note the special dates and times so you make sure you promptly and well-preparedly join us on our expedition to a salt marsh and seashore environment. This is a wild, special, and on-so wet occasion. A salt marsh borders a (guess what?) salt water body and is flooded at least twice per day by the tides. Traditionally it has been viewed by the ignorant at best as a source of salt meadow hay and at worst as a dump for rubbish or as a mosquito ground to be treated. Only recently have these biomes been appreciated as an important breeding ground for fishes, waterfowl, crustacea, and their prey, and as scenic parts of our planet which form a valuable buffer to pollution and surf. We have also only recently understood that it takes but a pound of insecticide, or a quart of laundry bleach, or a crankcase of motor oil to turn this environment into a sewer.



The salt marsh is divided into zones determined by the amount of exposure each area recieves. This exposure is to salt water at the marsh edge to the high tide line in decreasing amount and of course exposure to terrestrial rain and sun going in the other direction. A division of an environment is called ZONATION. Each zone is inhabited by the species best adapted to it. Which zones are most salty? Which most often exposed to the sun? In which is salt most variable?

Tidepools and Beaches also demonstrate zonation. The frequency at which the tide reaches certain pannes (areas of water marooned by the receding tide) determines what species can survive there. The most marine life (like fish) must live where there is a constant replenishment of seawater. Snails and Crabs can live higher in more isolated pools.

Species: Cordgrass, Black Rush, Salt Meadow Hay, Glasswort (Why so many grasses?) Spike Grass, Coffee Bean Snail, Box Crab, Ribbed Mussel, Barnacle, Fiddler Crab, Greenhead Fly, Geraldo Rivera? Lobster, Martina Navratilova, Spartina Alterniflora, Sea Urchin & Sea Cucumber

REMEMBER: There is Swimming at the end of the day to clean off. But we will get muddy, EVERYONE WILL GET INTO THE MARSH & INTO THE MUD!

KITTERY MAINE

questions?
Jennifer McKenna
332-7724

TIDE POOLS & SALT MARSHES

times 11:00am to 6:00pm please be on time!!!
meet in the N.S.H.S. parking lot.

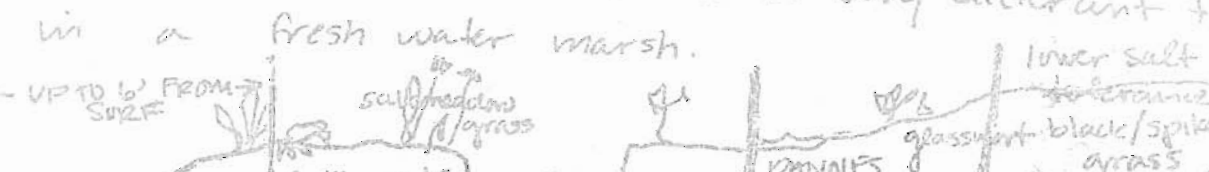
EQUIPMENT:
- old sneakers and clothing (things that can be ruined)
- A LARGE LUNCH
- BATHINGSUIT/TOWEL/SUNBLOCK/HAT
- Sweater or Sweatshirt and clean clothes for the ride home.
- and your fieldkit

* wear your bathingsuit.

What happens if a starfish losses a leg? 2 things can happen.

STOP #1 THE SALT MARSH & CHANNELS

you should all now understand the formation of a marsh as part of a sequence. the zonation in a salt marsh is very differant than in a fresh water marsh.



SALT WATER MARSH ZONATION

unlike fresh water the salt adds an extra condition that plants & animals must adapt themselves to. plants that grow in the high marsh have a lower tolerance to salt than the plants in the low marsh. the grass will form "contour lines" in various wetness

STOP #2 THE TIDE POOLS

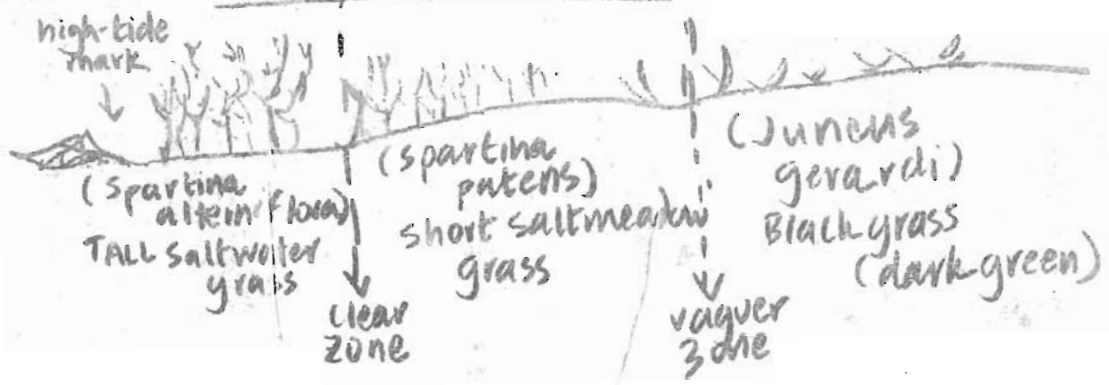
we will venture out to the tide pools after lunch here while cleaning of all the mud. you will see many forms of life. each animal has a different method of getting food transportation and survival.
- how do barnacles eat?
- what happens when a hermit crab gets to big for his shell?
- how do starfish, periwinkles and sea urchines move around?

through looking and touching try to answer these questions.

KITTERY p. 2

WHAT LOVELY CHANNEL MUCK!

SALT-MARSH ZONATION

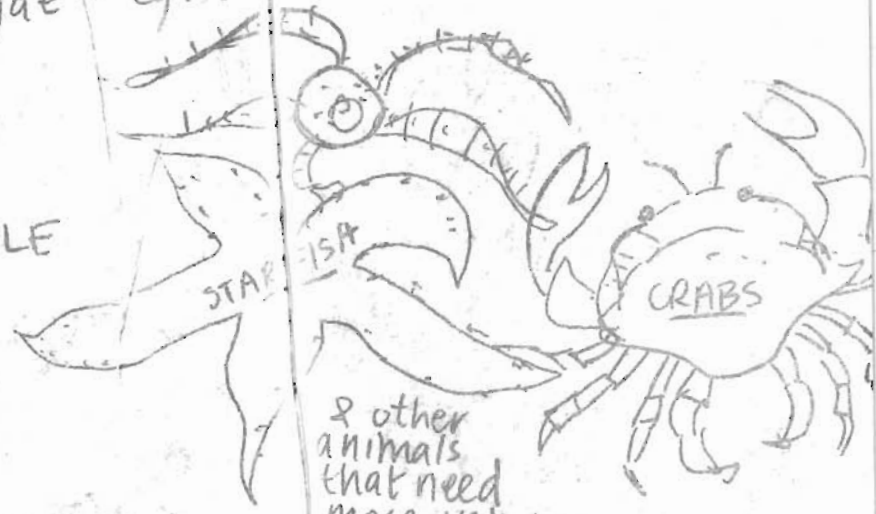


II TIDEPOOL ZONATION is even easier to see. Plants & animals on the rocky coast are exposed alternately to sun and air, then submersion in (cold!) ocean water. The seaweeds, eg. Fucus, or rockweed (the stuff you'll fall all over) have tough & leathery skins to resist dehydration (something we humans have to think about too) during the sun & air exposure hours. △. Down near the low-tide mark, there is more delicate algae - eg: sea lettuce.

FURTHER

BARNACLES & MUSSELS are more resiliant, & live on the upper rocks.

WHILE



& other animals that need more water will live in lower tide pools.

WHAT CAN YOU FIND IN THE TIDEPOOLS

& why do you think it lives that far from/near to the sea? It is amazing just how many things can live at different levels of salt / wave exposure. Imagined such a salt-forced bath - so regularly! & long live limpets.

KITTERY! MAINE

FRIDAY 8 JULY 1988

HOWDY CIMPETS!

Just a few notes before we take off to much about channels & splash in the pools..

TIME WILL BE POSTED

BRING field kit, lunch, water
2 pairs sneakers (1 will get wet!), shorts, towel, bathing suit (wear)
bug stuff, SUNTAN LOTION (screen, that is)
hat w/ brim, NOTEBOOKS & PENCILS

GROUP: test kits, TIDAL MARSHES, seashores, dipnet; vigor, verve & immense CURIOUSITY!

I SALT MARSH

REEDS & RUSHES are ROUND
SEDGES have EDGES
& GRASSES are FLAT

WHY DO YOU THINK MARSHLAND IS SUCH A SPECIES-RICH AREA?

WHO MIGHT EAT THESE?
WHO MIGHT EAT WHO EATS THESE?

Salt marsh, unlike freshwater marshland, is not succeeded by encroaching shrubs & trees. This is due to the tidal salt water flowing in & out each day - making the soil too salty for most woody plants & carrying excess decayed material & nutrients out to sea.

Fri. July 11, 1975
Day 5 Erica's gang
2:30 PM - 9:30 PM
Sea Point - Kittery, Maine
Note special start + end times. This is because the low tide we want is at 8 pm.
bring:
supper + extra water
kit
hiking boots
sneakers + extra socks
bathing suit + towel
sunglasses
hat
books: SEASHORES

(1)

What lives in the tide zone?
How do various creatures adapt to the tides?
How do you get the salt out of your hair + clothes?
How can weather affect the life in the tide zone?

(3)

NATIONAL GEOGRAPHIC
June 1972
We will see:
a salt marsh
the tide zone
tidal pools
a rocky headland
ME.
We will try to identify all the salty things (wet and dry) that we find in the area
questions:
What + why is a tide pool?
What + why is a salt marsh?

(2)

Trip: Kittery!

Me. Seacoast

Monday July 8th

Bus leaves → 7AM → 7PM

Group:

Leader: Sarah Beasley
332-2932

Equipment:

- Old sneakers (and clothes)
- lunch
- bug repellant
- rain jacket and extra sweater
- long pants (if cold)
- water bottle (filled)
- containers for bringing back samples of stuff
- test kits / guide books

sea anemone

*We may be wading thru water and mud so a pron dress won't be appropriate!

Important ⇒ Meet behind West New Police Station at 6 or 6:30AM = DON be late = bus leave at 7AM SHARP

This area we are visiting is a rocky seashore. At the time of day, we'll be there, the tide will be low or "out", formi tide pools on the shoreline. Many interest organisms live and breed in these tidepool like crabs, starfish, water bugs and ma other things. We will be discussing how the share their environment. Also, the salt ma "canals" are fun to walk through. VERY fu things live there which you may find st to you when you get out. The salt marsh life story is an interesting one and if you have any questions ask Thea. (has her Ph.D in Marine Biology.) & → thea

KITTERY
Maine Seacoast

Times: 7:00–2:00

LEAVE FROM NEWTON POLICE STATION

Equipment: Field Kit
Lunch
water
2 pairs of sneakers (one will be destroyed)
bathing suit-under Clothes
towel(s)
sun tan lotion
swimmers hat
rain gear

NO BOOTS →

BUG STUFF
- for maggies

At Kittery, we will be exploring two basic areas: the salt marsh and the tidepools. Both of these areas are important part of the marine environment. Many countries depend on marine related industries such as food supplies for the food web!

Periwinkle

The periwinkle is an animal with one foot that stays to rocks using suction. It is found in marsh zones.

SOME things to look for:

Different zones:
- tidal
- marsh

Adaptations found in:
- clinging
- floating
- opening: shape
- movement
- nourishment
- reproduction

ALL of these things mean that these animals + plants have found a Solution for Survival!

How do they adapt? What can you look for?

WE will be studying the zones in the salt marsh. There we will be seeing producers + consumers as well as in the tidal pools.

You should see the three Baltic (basic) kinds of grasses and what they grow spawning patterns spawning alternations

What?

The contrast in the different zones allows us to discover why things grow where they do so...

hypothesize!

Then we will hit the tidepools which qualify as separate ecosystems where organisms survive exposure to sunlight + crashing of waves

For our next adventure, we go to...

Tripslip #4

KITTERY, ME.

you may ask, what is kittery?- well read on!

Thursday July 7th times: 1:30 PM - 8 PM

very important! let your parents know so they know when to pick you up.

ve will meet at Newton South
and will be dropped back off at South
by the bus!

if you have questions call Leeann @ 527-2763

hat to bring: Field kit, lunch, water (already filled water bottles)
ug stuff, sun screen, notebook, pencils, 2 pairs
t sneakers (one you don't care about, clothes that you
on't mind getting very dirty, bathing suit, towel,
nd a CHANGE of clean clothes to put on
The end of the day, bring a garbage bag also
that you can put your dirty clothes + sneakers
at the end of the day.

---

at to expect to do and see at Kittery:

we hop on a bus and drive 1 1/2 hrs. to
ne, 2nd we explore the kittery wet lands and
sles seeing all different kinds of grasses and
s, 3rd we explore the tide pools

WHAT IS A WETLANDS ENVIRONMENT

Why aren't we going until 1:30 in the afternoon? well in order to explore both the marsh + tide pools it must be low tide and low tide on Thursday isn't until around 3 sometime

this is a star-fish

What eats a star fish? what does a star fish eat?

WHAT EFFECTS THE TIDES?

Just like all the places we see the tide pools and marshes are well balanced Communities of life - there is a food web and a delicate balance of nature!

What happens when something interrupts these delicate environments? what would interupt or make an environment upset or unstable?

In the marsh we'll see many different kinds of grasses and insects - what eats these things?

If we are lucky we may be able to see a lobster in the tide pools, we have before!

saltmarsh bulrush