

WETLAND ELEVATION MONITORING

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MARTHA'S VINEYARD COASTAL CONFERENCE

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IMPORTANCE OF SALTMARSHES

- SALTMARSHES ARE BELIEVED TO BE THE MOST PRODUCTIVE HABITAT ON EARTH.
- LOCALLY, THE MARSHES SUPPORT VARIOUS LIFE STAGES OF COMMERCIALY AND RECREATIONALLY VALUABLE FISH AND SHELLFISH, AS WELL AS NUMEROUS WILDLIFE SPECIES.
- KEY COMPONENT OF FLOOD CONTROL AND THE NITROGEN CYCLE

THE VULNERABILITY

- SALT MARSHES ARE IN TROUBLE WITH RESPECT TO CLIMATE CHANGE.
 - RISING SEA LEVELS HAVE THE POTENTIAL TO DROWN THE MARSHES
 - MAINLY BECAUSE ADJACENT DEVELOPMENT HAS LIMITED THE AVAILABILITY OF UPLAND OPEN SPACE FOR LANDWARD MIGRATION.
 - NOT MUCH SEDIMENT INPUT FROM STREAMS, THAT IS HELPFUL ELSEWHERE.
 - OTHER THREATS:
 - ACIDIFICATION
 - LOSS OF FREEZE-REQUISITE SPECIES LIKE CRANBERRIES
 - UNKNOWNNS

SEA LEVEL RISE FARM POND FOR EXAMPLE



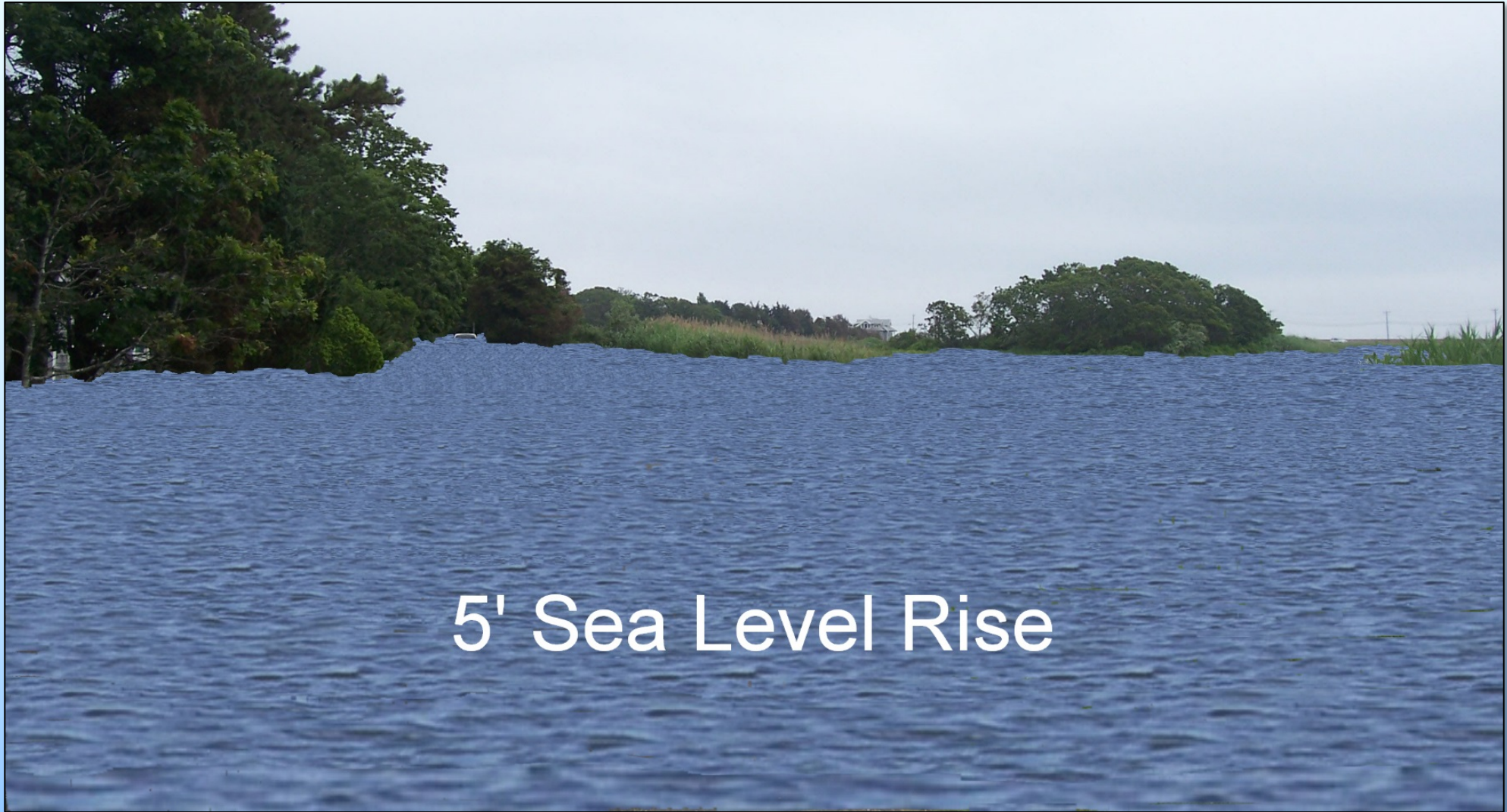
Farm Pond, Oak Bluffs

FARM POND ~ 2050



1.5' Sea Level Rise

FARM POND ~ 2100



5' Sea Level Rise

FARM POND

Legend

Wetlands (1:12,000)

IT_VALDESC

- SHALLOW MARSH MEADOW OR FEN
- DEEP MARSH
- SALT MARSH
- TIDAL FLAT

Sea Level Rise

including Mean High High Water Offset

- $\leq 1.5\text{ft}$
- $>1.5\text{ft}$ to 5.0ft
- Conserved Land

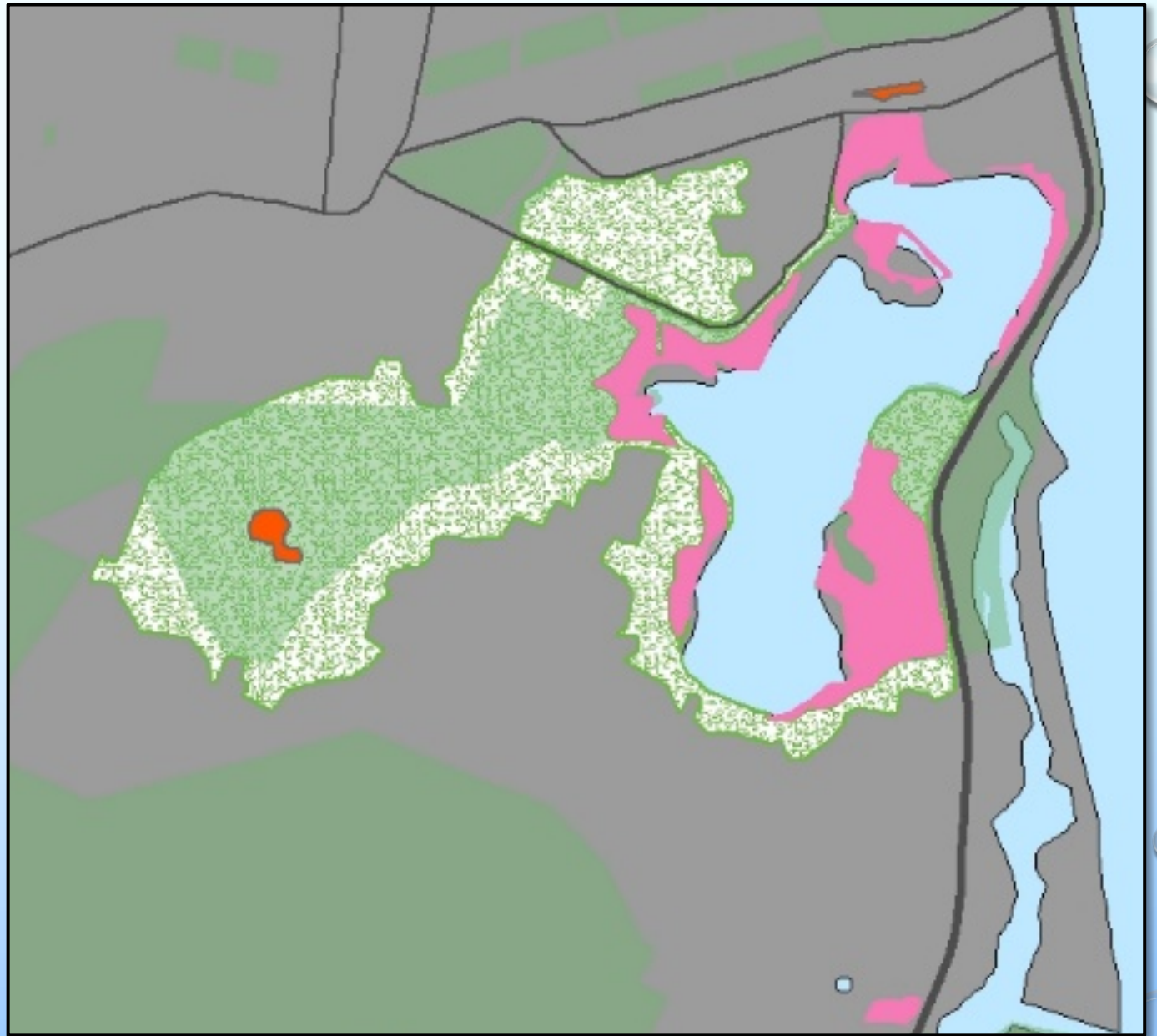
Priority Areas

- Undeveloped Upland Buffer

Main Roads Network

CLASS

- Primary Road
- Secondary Road



FARM POND AFTER SLR 5FT

Legend

Wetlands (1:12,000)

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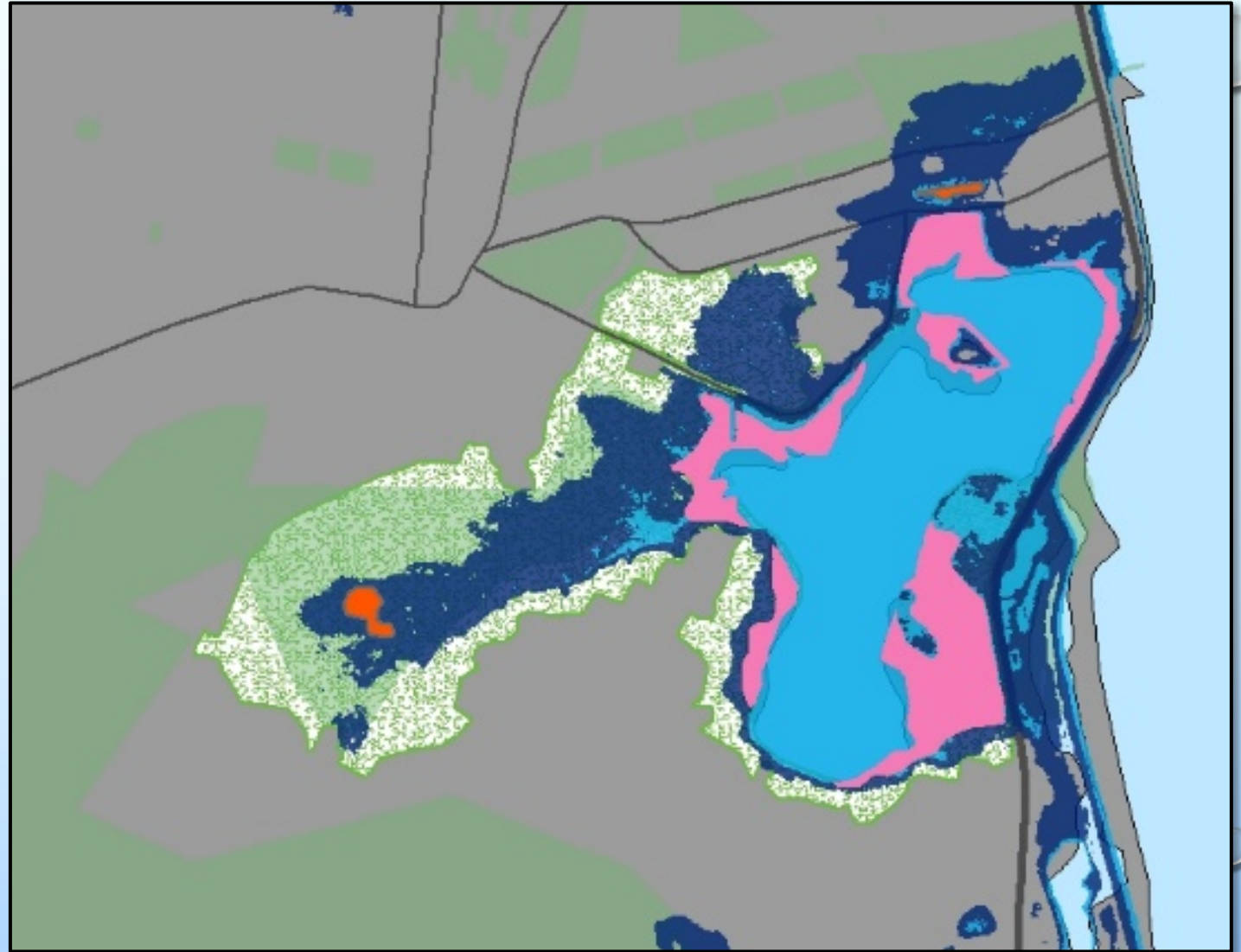
Priority Areas

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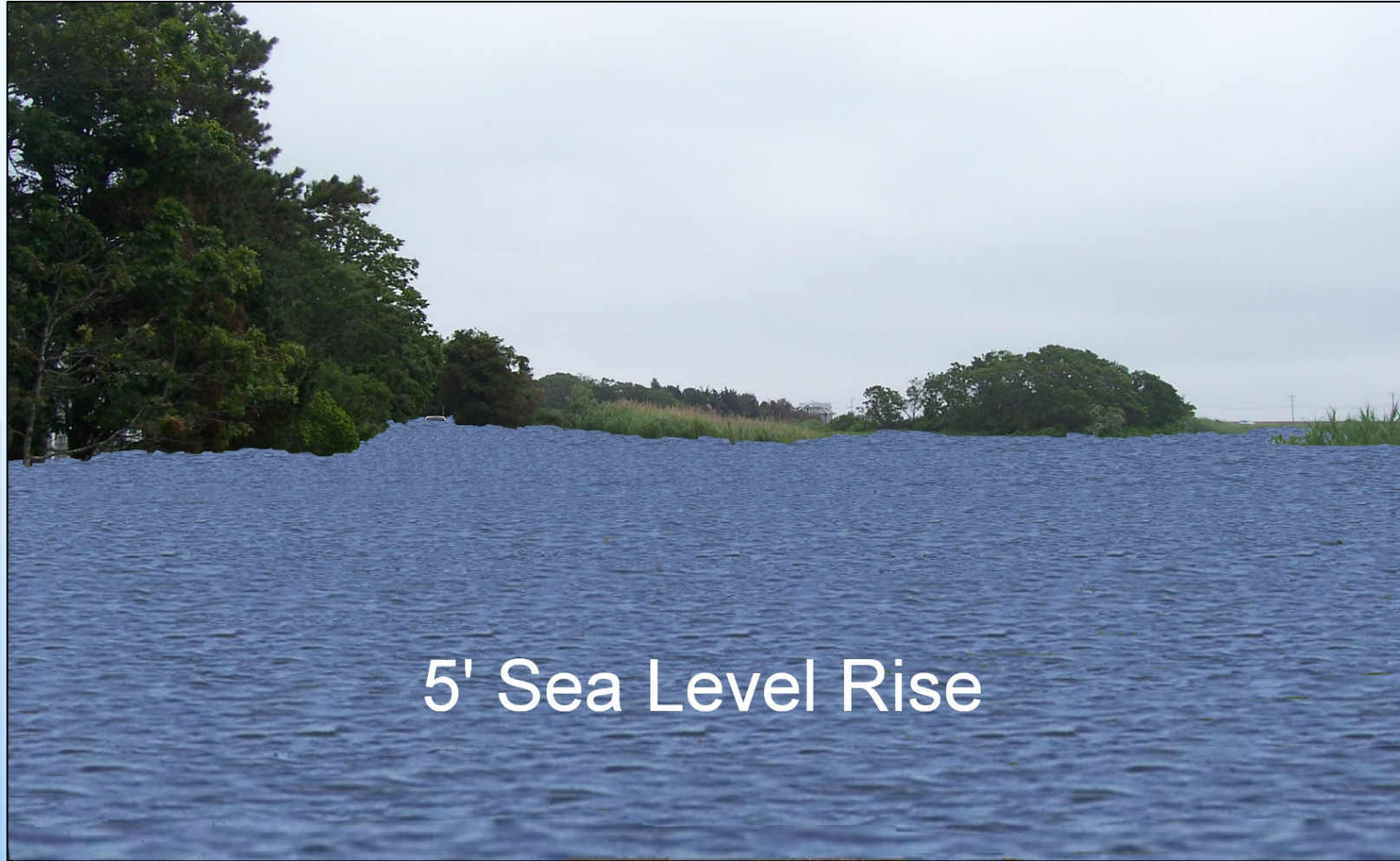
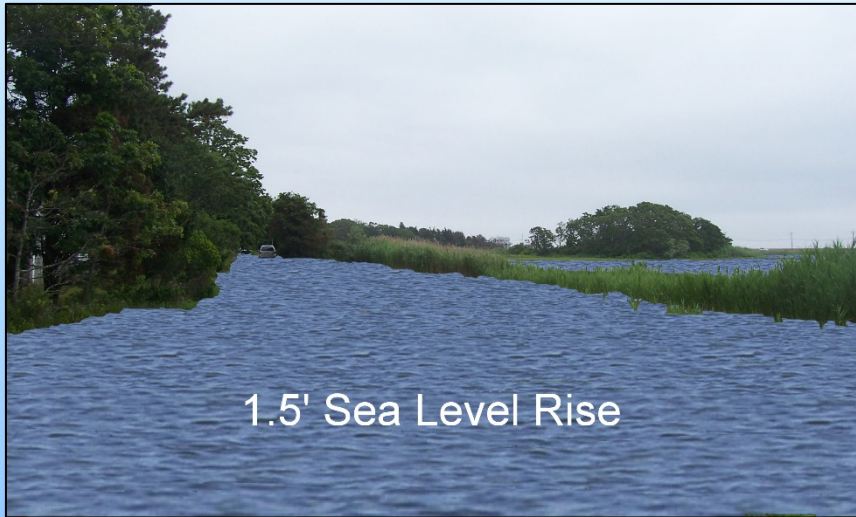
Main Roads Network

CLASS

- Primary Road
- Secondary Road



WHAT IS THE PROGNOSIS FOR THE MARSH?




SENGEKONTACKET POND




Legend


Priority Areas


 Undeveloped Upland Buffer


Wetlands (1:12,000)

IT_VALDESC

 SHALLOW MARSH MEADOW OR FEN


 DEEP MARSH


 SALT MARSH


 TIDAL FLAT

Main Roads Network

CLASS

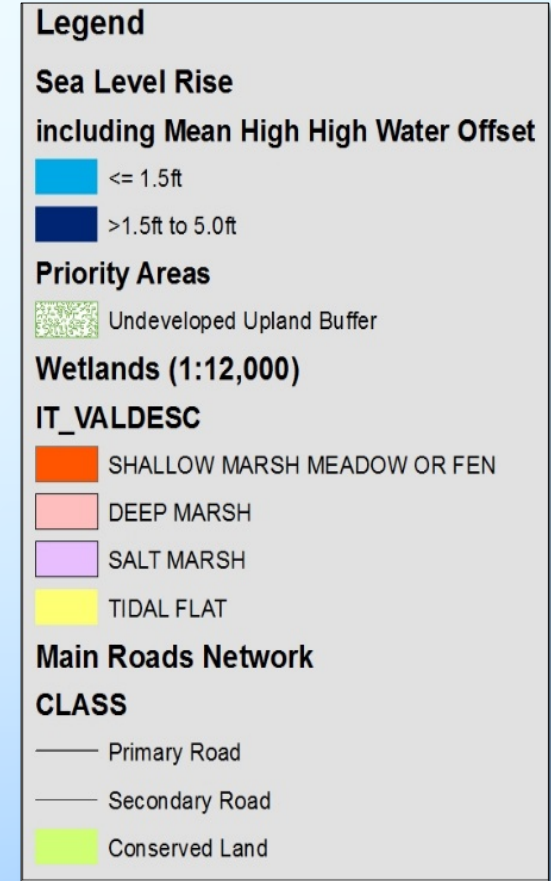
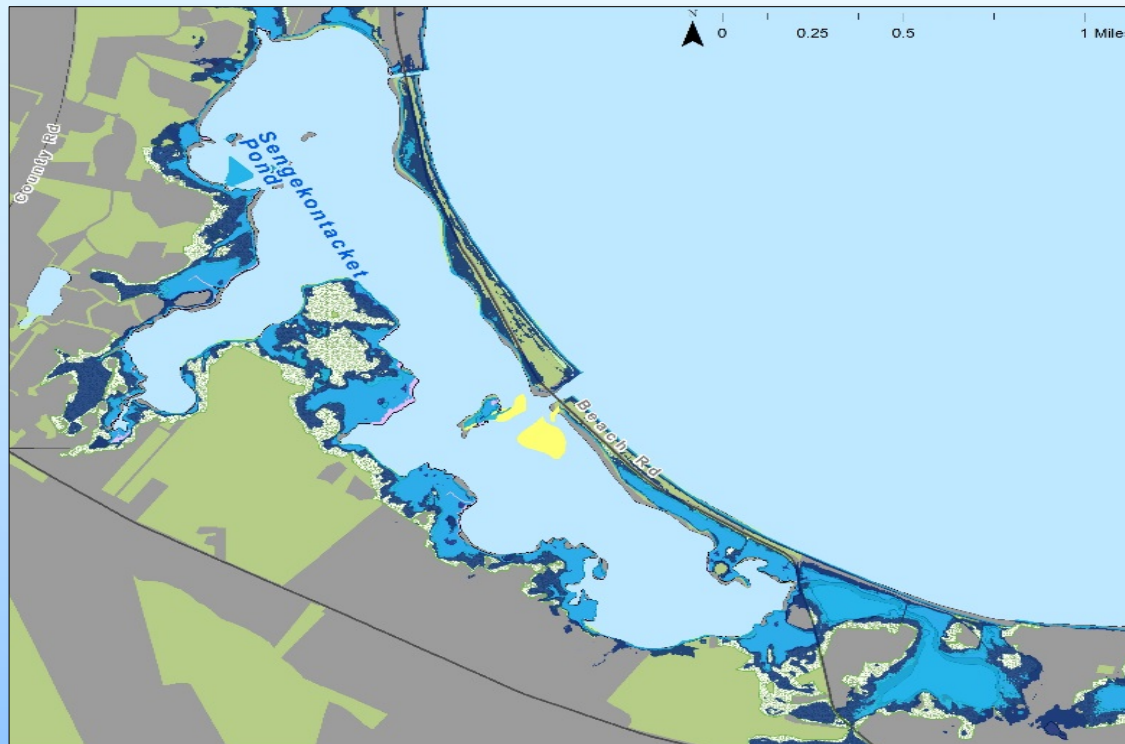
 Primary Road

 Secondary Road

 Conserved Land

AFTER SEA LEVEL RISE ~ 2100

- BELOW, AFTER 1.5 FEET OF SEA RISE, SOME WETLANDS WILL BE COVERED
- WHICH IS INDICATED BY THE LIGHT BLUE
- AFTER 5 FEET OF SEA LEVEL RISE THE PRESENT WETLANDS WILL BE COMPLETELY COVERED WHICH IS REPRESENTED BY DARK BLUE

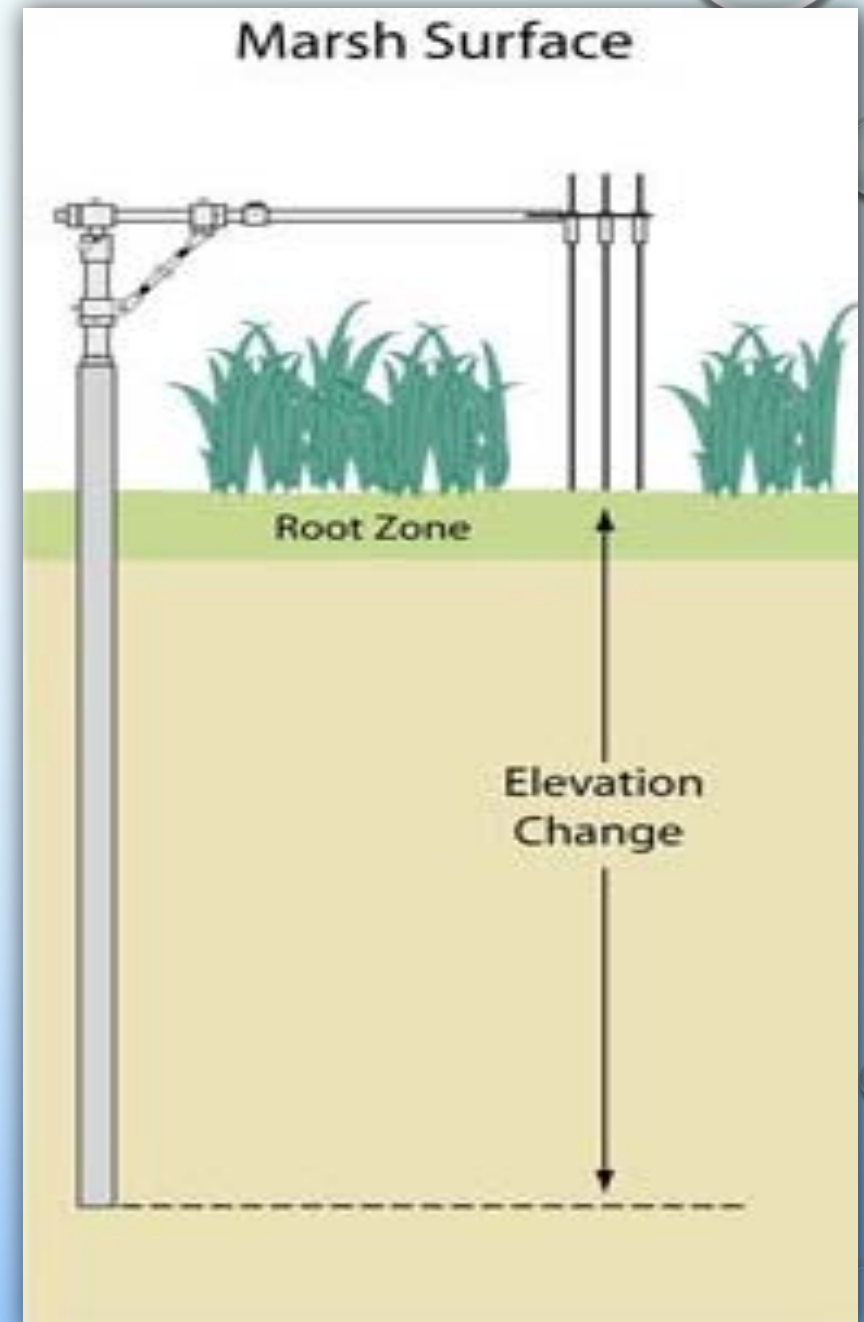


WETLANDS ELEVATION MONITORING

- MARSHES WITHOUT CAPACITY FOR UPLAND MIGRATION WILL LIKELY DROWN.
- MARSHES WITH ROOM FOR LANDWARD MIGRATION NEED PROTECTION FROM DEVELOPMENT OF THOSE LANDS.
- THE ROD-SET SYSTEM MEASURES THE MINUTE ELEVATION CHANGES WITHIN SALTMARSHES TO COMPARE THE EFFECTS OF DEPOSITION AND SEA LEVEL RISE ON ELEVATION. HOW IS THE MARSH FARING WITH RESPECT TO SEA LEVEL RISE?

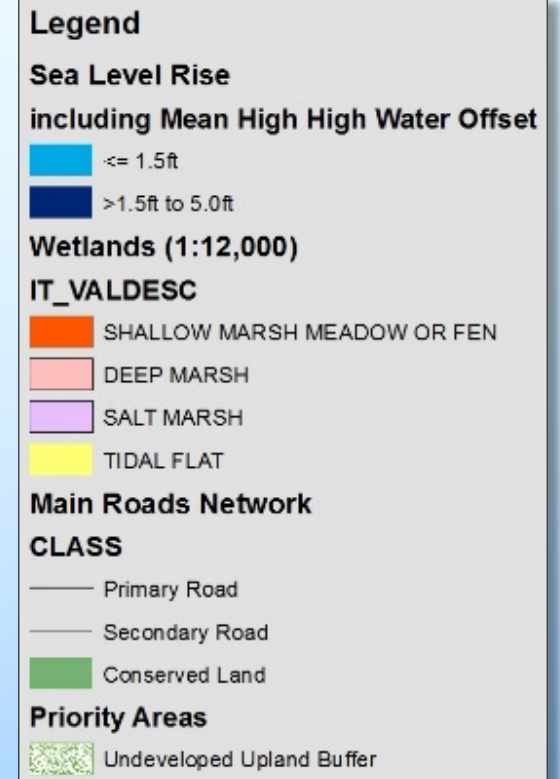
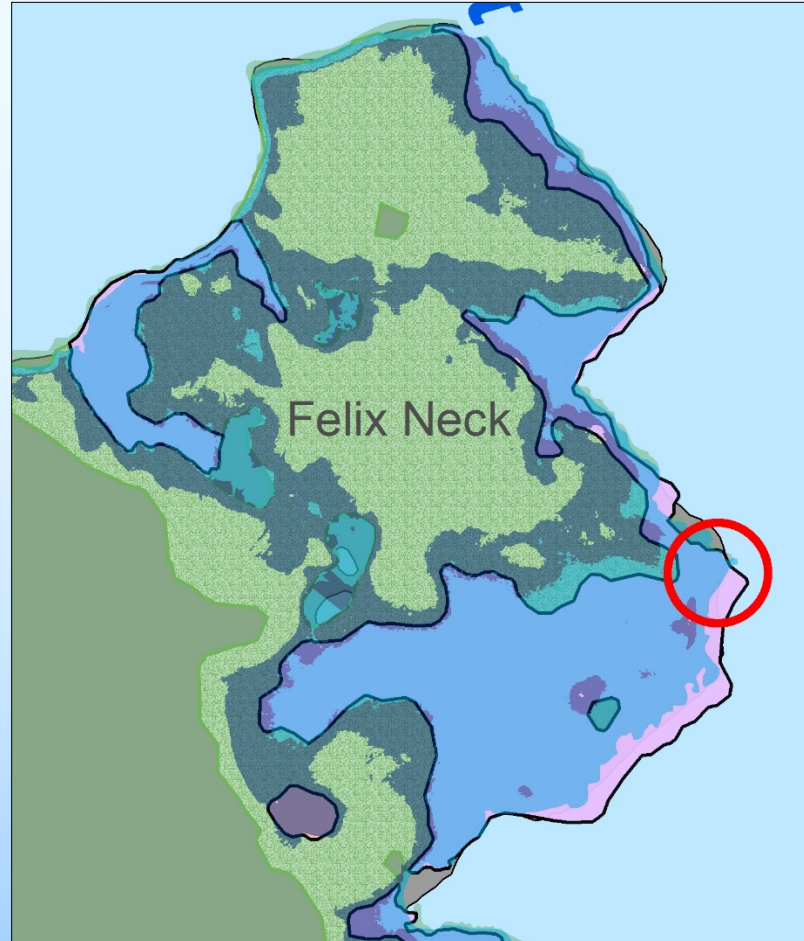
THE SYSTEM

- THE SET PROVIDES A CONSTANT REFERENCE PLANE FROM WHICH THE DISTANCE TO THE SEDIMENT SURFACE CAN BE MEASURED BY MEANS OF PINS LOWERED TO THE SEDIMENT SURFACE.
- REPEATED MEASUREMENTS OF ELEVATION CAN BE MADE WITH HIGH PRECISION BECAUSE THE ORIENTATION OF THE TABLE IN SPACE REMAINS FIXED FOR EACH SAMPLING.



FIRST INSTALLATION ON MV

THE SITE OF THE FIRST
INSTALLATION ON MV IS
WITHIN THE FELIX NECK
WILDLIFE SANCTUARY AND IS
INDICATED BY THE RED CIRCLE.

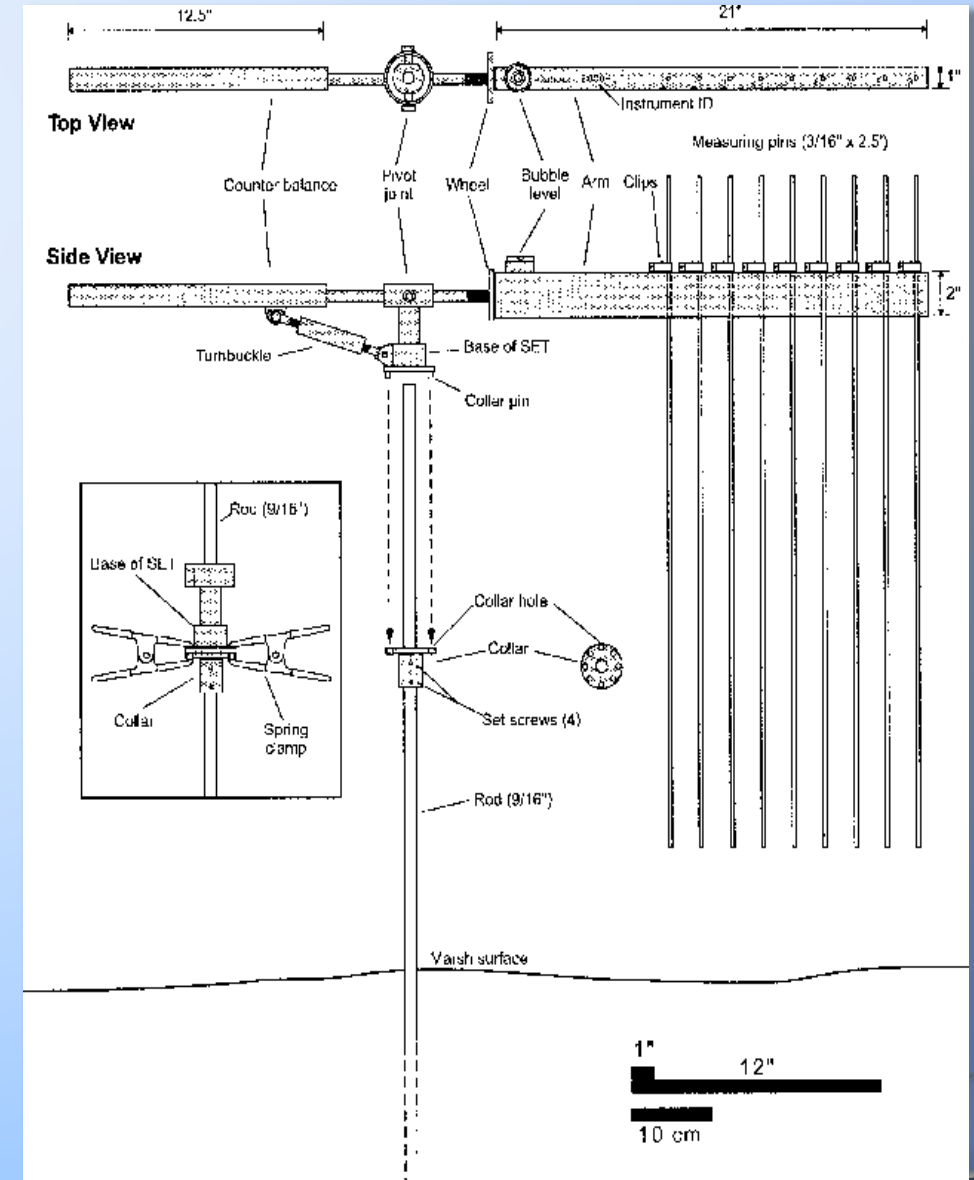


SPONSORS/PARTNERS (WITH A LITTLE HELP FROM OUR FRIENDS)

- FRIENDS OF SENGEKONTACKET: SPONSORED THE CONSTRUCTION MATERIALS.
- MASS AUDUBON/FELIX NECK WILDLIFE SANCTUARY HOSTED THE SITE ON ITS PROPERTY.
- EDEY FOUNDATION FUNDED PURCHASE OF THE R-SET ARMATURE TO BE USED ISLAND-WIDE.
- WAQUOIT BAY NATIONAL ESTUARINE RESEARCH RESERVE (WBNERR) PROVIDED EQUIPMENT LOAN AND PRICELESS ADVICE.

THE SYSTEM

A ROD-SET SYSTEM IS BE USED TO MEASURE THE PRECISE CHANGE IN ELEVATION WITHIN THE SALT MARSHES.



INSTALLATION

A SYSTEM OF TEMPORARY PLATFORMS WAS USED TO MITIGATE THE IMPACTS ON THE MARSH.
RODS WERE INSERTED TO A DEPTH OF 40 FEET.



INSTALLATION

A RECEIVER AND CAP WERE INSTALLED.



AFTER INSTALLATION AT FELIX NECK



MEASUREMENT

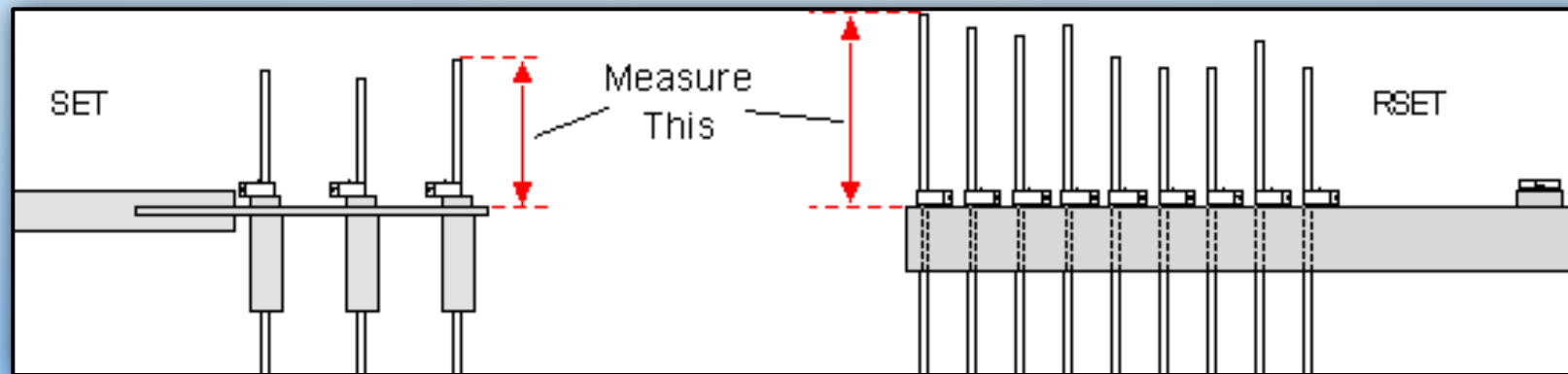
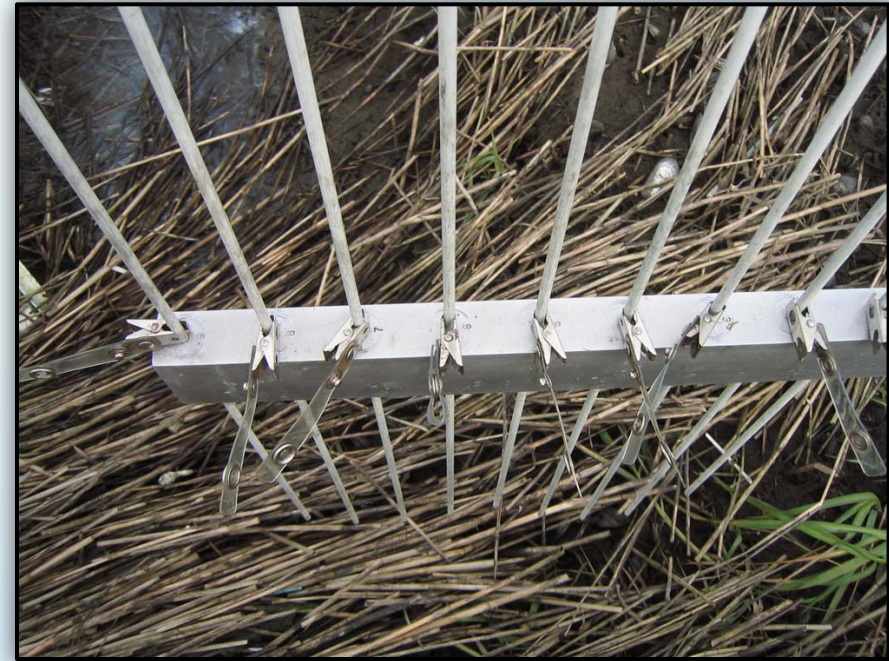
PLACE THE ARMATURE INSTRUMENT ON THE RECEIVER AND ATTACH THE PINS.



MEASUREMENT

LOWERING THE PINS TO THE SURFACE OF THE MARSH IS THE NEXT STEP.

NEXT IS MEASUREMENT OF THE HEIGHT OF THE PIN ABOVE THE ARMATURE.



MEASUREMENT AT FELIX NECK IN DECEMBER



NEXT?

Legend

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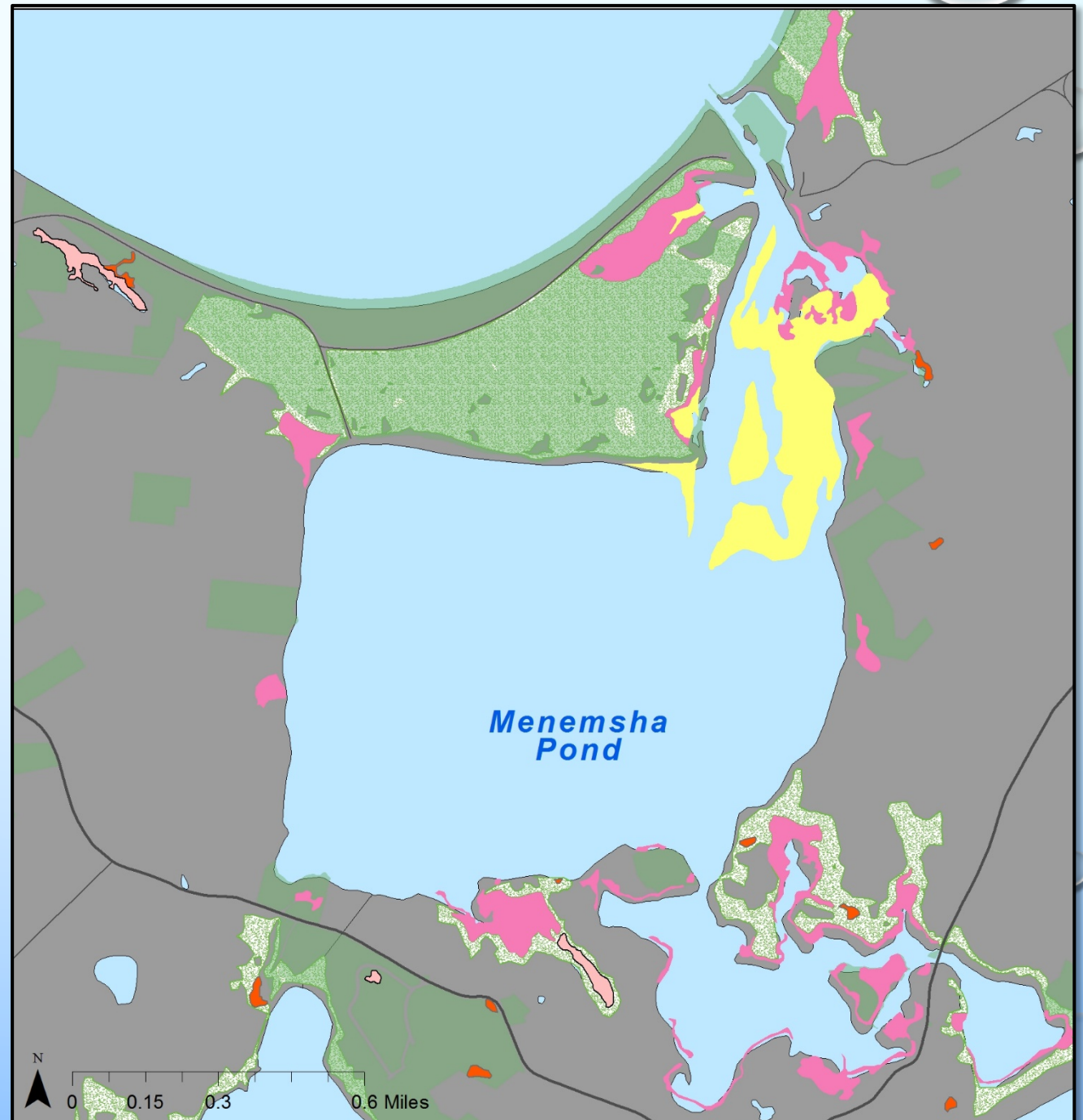
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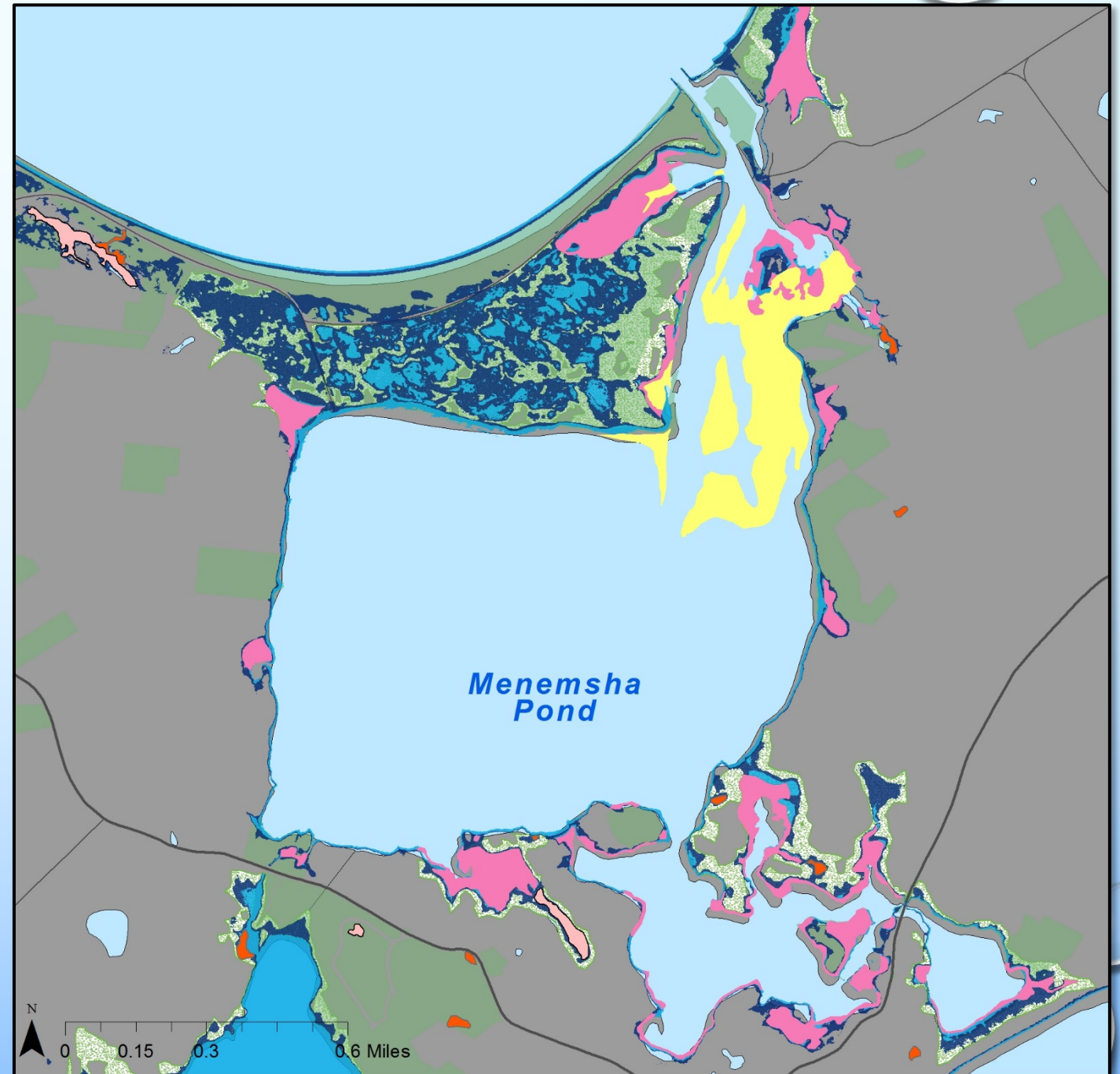
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THE END

THIS IS NOT OUR END. THIS IS THE MARSH AT WBNERR, DEVOTED TO RESEARCH. PERMANENT WALKWAYS MINIMIZE IMPACTS OF LOTS OF FOOT TRAFFIC.

SENSITIVITY TO VISUAL IMPACTS MEANT DEVISING TEMPORARY WALKWAYS AND PLATFORMS.

