Brandt Island Cove Runnel Site

Table of Contents

FACT SHEET

Site: Brandt Island Cove, Town of Mattapoisett, Plymouth County

Ownership and Protection of Marsh: Mattapoisett Land Trust, Protected Open Space

Ownership and Protection Adjacent Parcels: Mattapoisett Land Trust, Town of Mattapoisett, Protected Open Space

Access: Park side of road, walk down a low grade embankment to enter marsh.

Elevation: 1.78 ± 0.20 ft NAVD88

MHW: 1.85 ft NAVD88

Existing drainage considerations: The marsh is on the tidally restricted side of a road, connected through a culvert (photo). The culvert does not appear to be a problem (undersized). Ditches were unvegetated and draining well. There may be some freshwater runoff from the road.

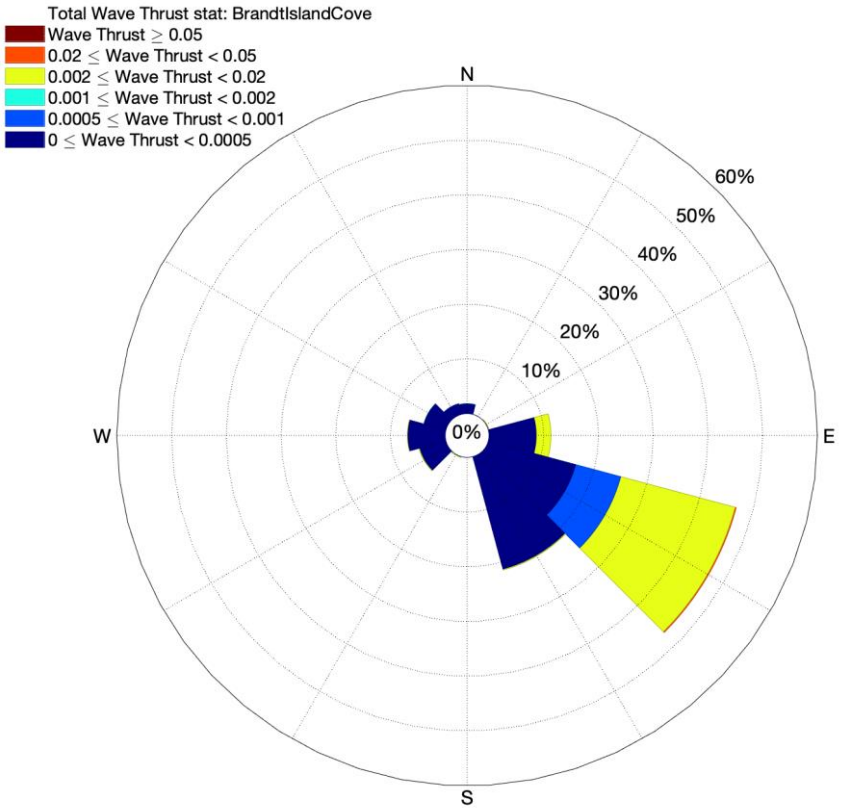
Peat condition: Peat firmness was patchy, becoming softer along the western side of the marsh where there was greater percent cover of standing water. Toward the culvert peat was firmer.

Close to existing salt marsh monitoring transects (BBC and BBNEP)?: Yes

Wind wave exposure: Low to moderate wave thrust from the southeast

Proposal: Impoundments in the northwest corner of the marsh appear to have been present for some time. However, it appears this subsidence is spreading, with standing water beneath vegetation, and small patches of die-back, extending eastward. Along the edge of the embankment, the northern edge of the marsh, softer areas and small patches of die-back are present, possibly influenced by runoff from the road.

We propose to place one runnel at this site to address the northwest corner. The forested area west of the marsh is protected open space. A runnel here may facilitate marsh migration.


Total Wave Thrust stat: BrandtIslandCove
Wave Thrust ≥ 0.05
0.02 ≤ Wave Thrust < 0.05
0.002 ≤ Wave Thrust < 0.02
0.001 ≤ Wave Thrust < 0.002
0.0005 ≤ Wave Thrust < 0.001
0 ≤ Wave Thrust < 0.0005
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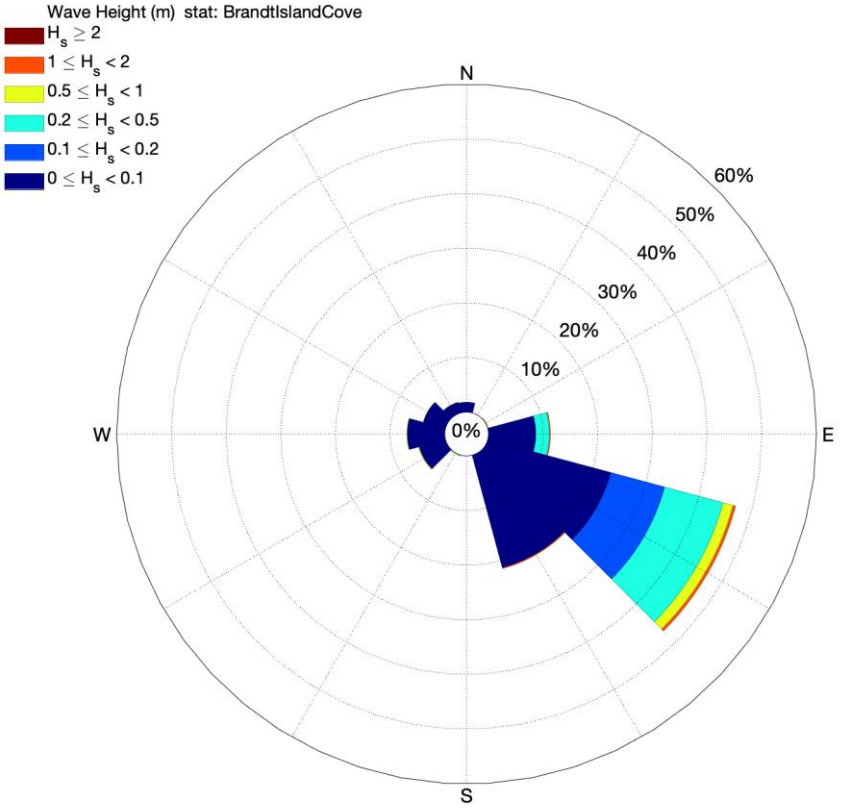
W
10%
20%
30%
40%
50%
60%
0%


Wave Height (m) stat: BrandtIslandCove
$H_s \geq 2$
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
N
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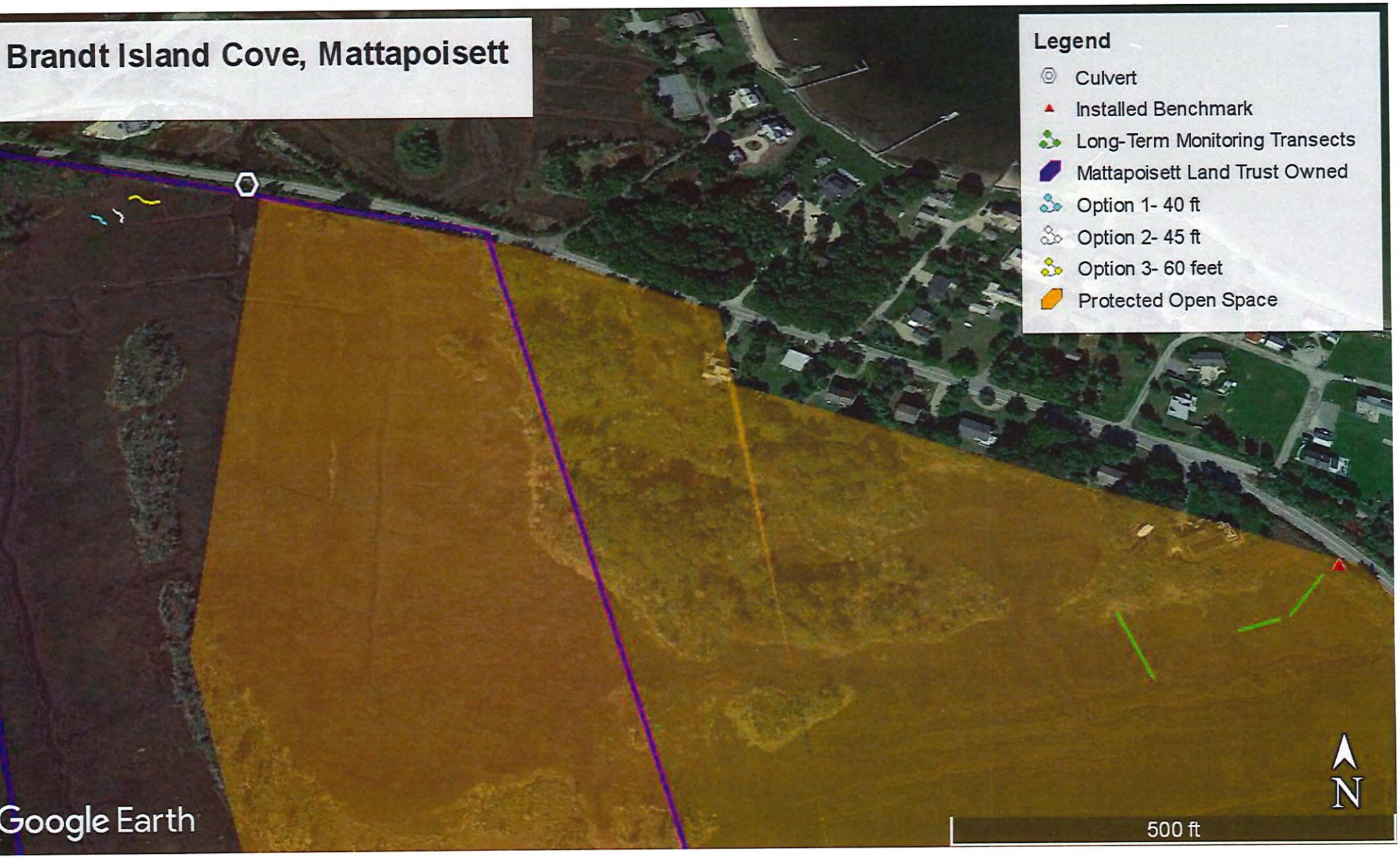
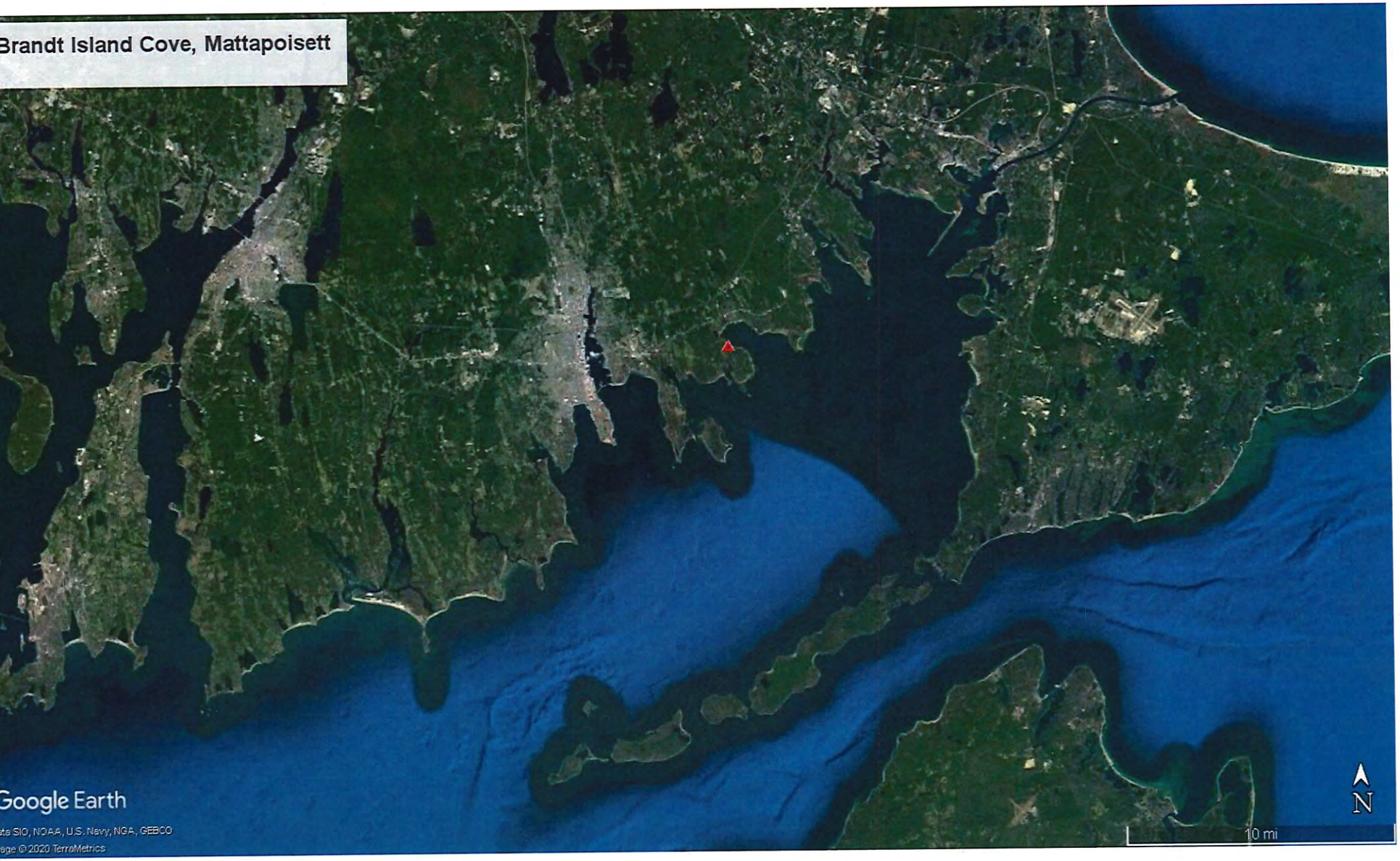
20%
30%
40%
50%
60%
0%


Brandt Island Cove, Mattapoisett
Legend
Culvert
Installed Benchmark
Long-Term Monitoring Transects
Mattapoisett Land Trust Owned
Option 1- 40 ft
Option 2- 45 ft
Option 3- 60 feet
Protected Open Space
N
500 ft
Google Earth


Brandt Island Cove, Mattapoisett
Google Earth
ata SIO, NOAA, U.S. Navy, NGA, GEBCO
ge © 2020 TerraMetrics
10 mi
N


Brandt Island Cove, Mattapoisett
Randall Rock
Barstow Rock
Snow Rock
Sunken Ledge
Gallatin Rock
Gravelly Rock
Mattapoisett Ledge
Brant Island Cove
Brant Island
Google Earth
© 2020 Google
N
1 mi


Brandt Island Cove, Mattapoisett, Oct 2018
Legend
Culvert
Option 1- 40 ft
Option 2- 45 ft
Option 3- 60 feet
Parking
P
N
80 ft
Google Earth


Brandt Island Cove, Mattapoisett, Apr 2017
Legend
Culvert
Option 1- 40 ft
Option 2- 45 ft
Option 3- 60 feet
Parking
P
N
80 ft
Google Earth


Brandt Island Cove, Mattapoisett, Mar 2012
Legend
Culvert
Option 1- 40 ft
Option 2- 45 ft
Option 3- 60 feet
Parking
P
N
80 ft
Google Earth


Brandt Island Cove, Mattapoisett, Dec 2001
Legend
Culvert
Option 1- 40 ft
Option 2- 45 ft
Option 3- 60 feet
Parking
P
N
80 ft
Google Earth

Field photographs from January/February 2020, within 3 hours of low tide.

Brandt Island Cove, Mattapoisett, Initial Conditions, 2011

2/26/2020, 2:49:35 PM

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sn_ylw-pushpin0

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Brandt Island Cove, Mattapoisett, 2.3 ft. SLR (2100)

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0 0.04 0.09 0.18 km

Brandt Island Cove, Mattapoisett, 4.5 ft. SLR (2100)

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0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Massachusetts Office of Coastal Zone Management | 251 Causeway Street

Web AppBuilder for ArcGIS

SITE EVALUATION

- Is this marsh suitable for a runnel adaptation project? _____
- Why or why not?

  _____

  _____

  _____

  _____
- Which runnel option(s) do you think is/are best (none is an acceptable answer!)? ____
- Do you agree with the placement, length, and direction of the runnel(s)?_____
- Why or why not? Describe suggested changes you would make (feel free to draw!)

  _____

  _____

  _____

  _____
- Would additional adaptation actions have to be taken at this site for a runnel project to successfully improve drainage, allow revegetation, and maintain elevation (e.g. ditch maintenance, culvert replacement, sediment placement)? _____
- If not, why? And if additional actions would be necessary, which ones and why?

  _____

  _____

  _____

  _____
- Do you have any thoughts on how a runnel at this site should be dug (by hand, low-pressure excavator), and/or whether a deeper-narrower, or shallower-wider runnel would be more suitable here? Should a sill be left?

  _____

  _____

  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**

Briarwood Beach Runnel Site

Table of Contents

FACT SHEET

Site: Briarwood Beach, Town of Wareham, Plymouth County

Ownership and Protection of Marsh: Town of Wareham, Protected Open Space

Ownership and Protection Adjacent Parcels: Beach on western coast of peninsula is protected open space and town owned, otherwise private and not protected.

Access: Drive to the end of Madison St., turn left on the sand/gravel drive and park at the gate. To cross ditches easily need to walk to the southwest tip of the peninsula near the electrical pole, then turn back north and walk to the southeast lobe of the peninsula.

Elevation: 2.21 ± 0.11 ft NAVD88

MHW: 1.82 ft NAVD88

Existing drainage considerations: There is a high hummock of vegetation in the ditch draining the eastern side of the marsh. It was not clear if it was draining well (photo and map). A high ridge of ditch spoils along the southern side of the ditch is likely blocking drainage. It was vegetated with *Iva*. Sand eroding from the beach on the western coast washes around to the southern tip, and also is deposited on the marsh surface on the southwest lobe of marsh.

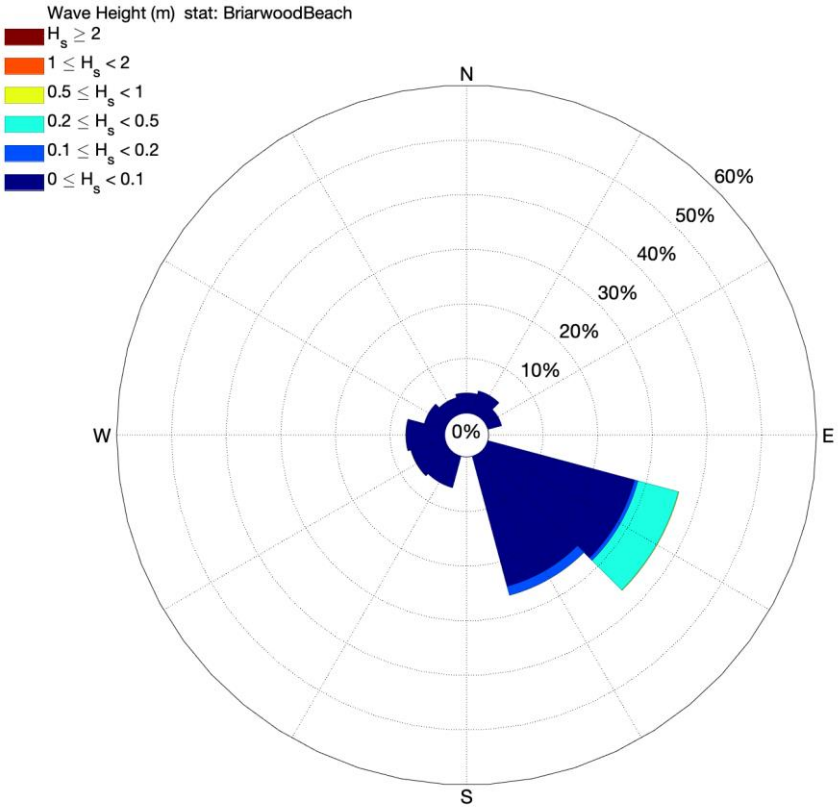
Peat condition: Peat on the northwest portion of the marsh was very soft and difficult to traverse. The southwest, central, and eastern portions were firm other than slightly softer peat in areas of die-back. Die-back appears recent, with many areas still vegetated.

Close to existing salt marsh monitoring transects (BBC and BBNEP)?: No

Wind wave exposure: Relatively low, with highest waves and greatest wave thrust from the southeast (see wind rose figures)

Proposal: Degradation of the platform on the eastern side is more recent, and less severe than the western side. The western side is very muddy, and much greater percent cover of bare sediment. On the eastern side it appears that small runnels through the ditch spoils would help drainage. Consider ending runnel east of the higher vegetation in the ditch. Alternatively, flow may be high enough for adequate flow through the ditch.

Three potential runnels are shown (lengths in legend), one ending seaward of the potential clog, and two shorter runnels landward of the potential clog. To connect the pools to the ditch below the clog that runnel would have to be longer.


Wave Height (m) stat: BriarwoodBeach
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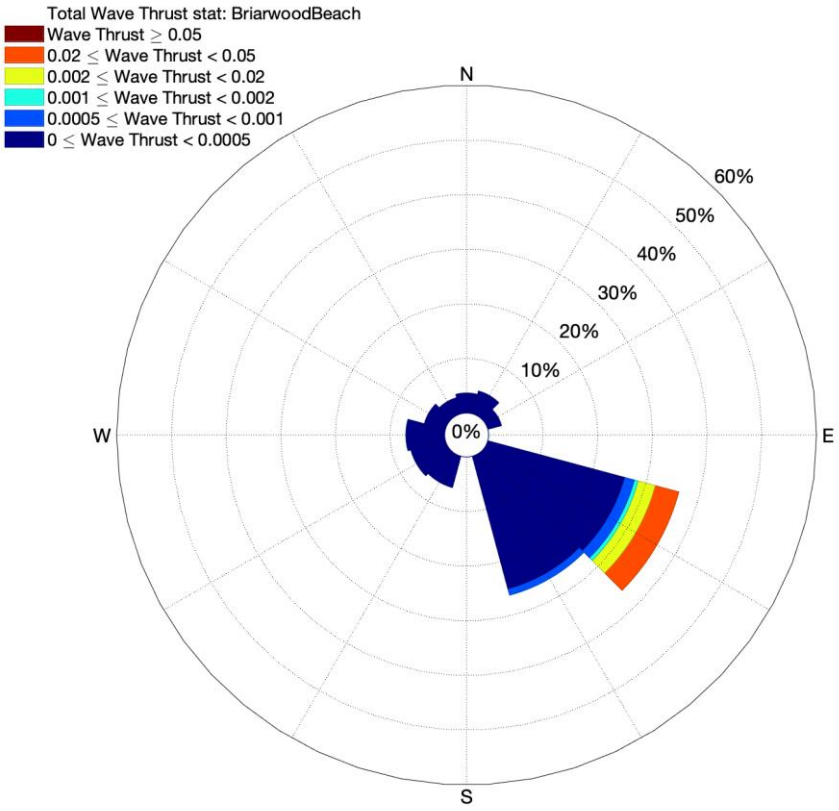
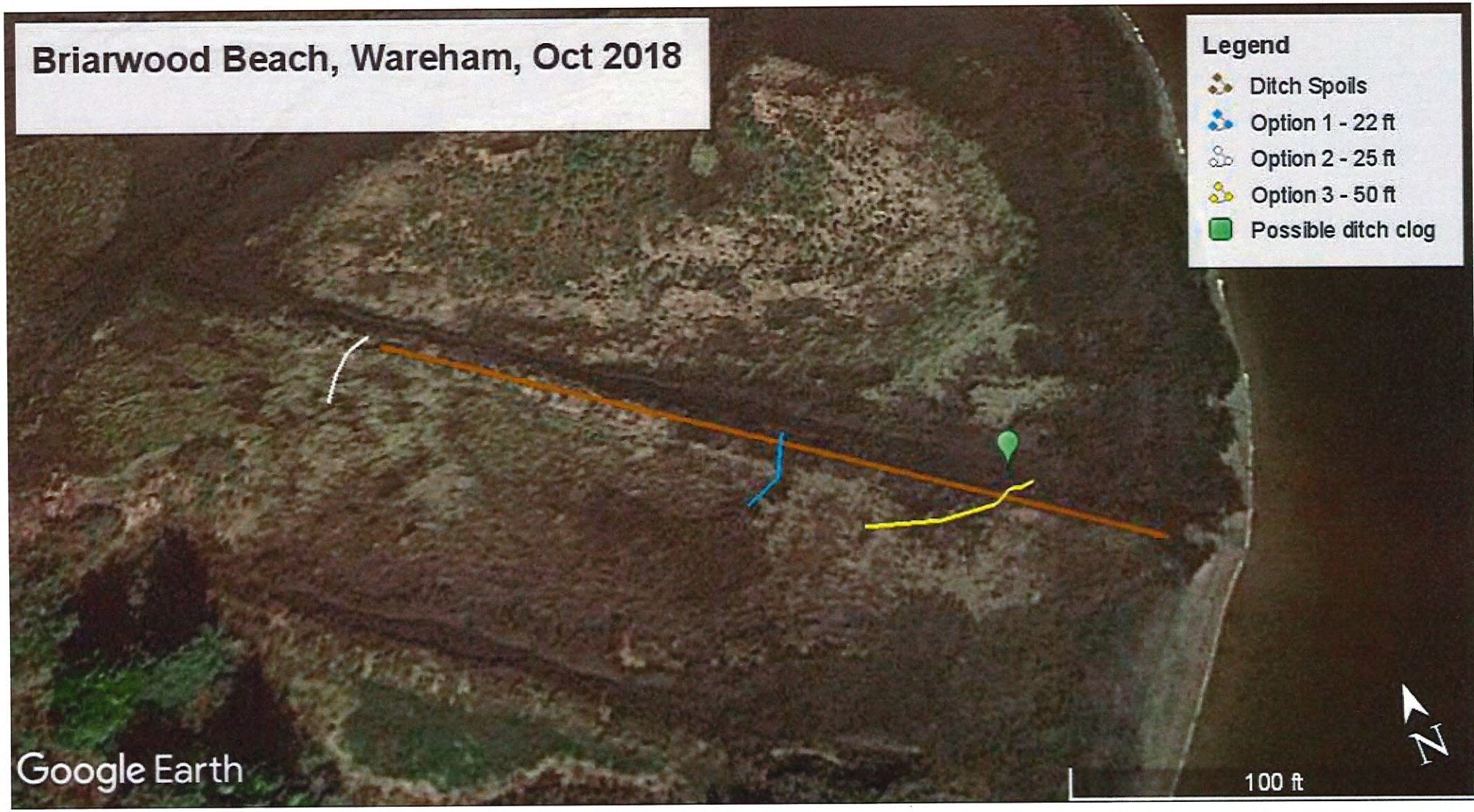
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
N
E
S
W
60%
50%
40%
30%
20%
10%
0%

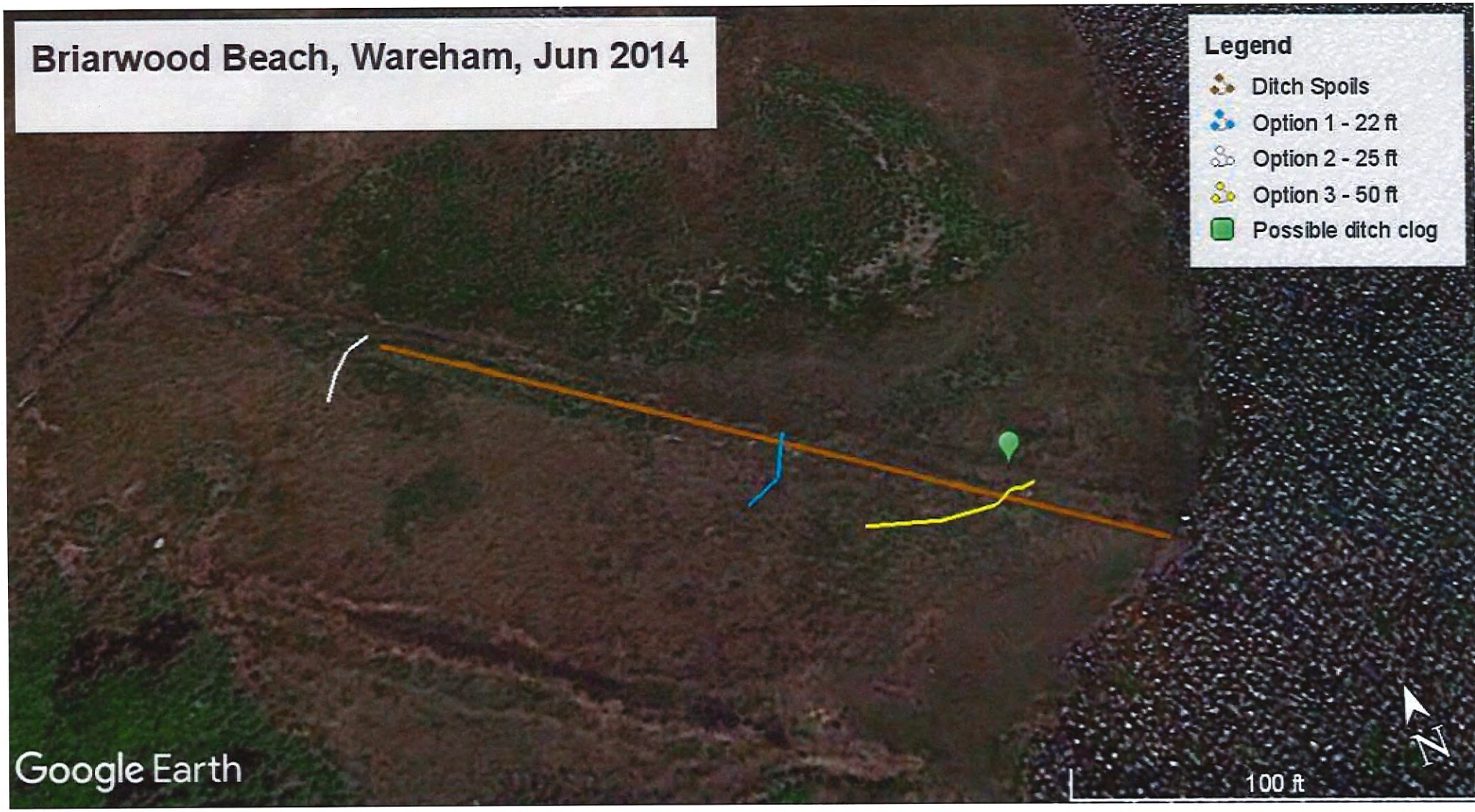

Total Wave Thrust stat: BriarwoodBeach
Wave Thrust ≥ 0.05
$0.02 \leq$ Wave Thrust < 0.05
$0.002 \leq$ Wave Thrust < 0.02
$0.001 \leq$ Wave Thrust < 0.002
$0.0005 \leq$ Wave Thrust < 0.001
$0 \leq$ Wave Thrust < 0.0005
N
E
S
W
60%
50%
40%
30%
20%
10%
0%

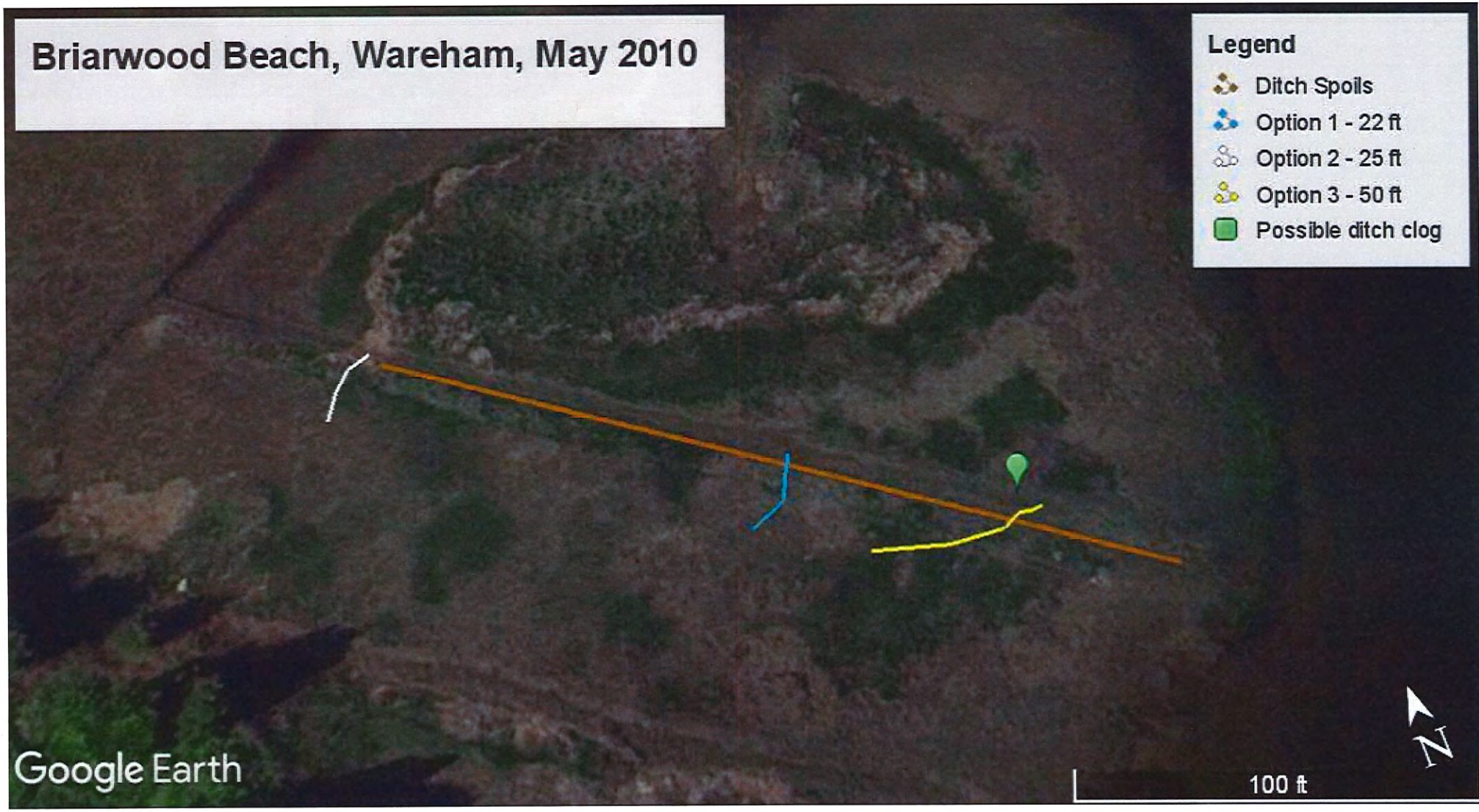

Briarwood Beach, Wareham
Legend
Ditch Spoils
Option 1 - 22 ft
Option 2 - 25 ft
Option 3 - 50 ft
Parking
Possible ditch clog
Protected Open Space/ Town of Wareham Owned
P
Google Earth
700 ft
N


Briarwood Beach, Wareham
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image Landsat / Copernicus
Image © 2020 TerraMetrics
N
10 mi


Briarwood Beach, Wareham
Weweantic
Cedar Island
Marks Cove
Woods Point
Google Earth
© 2020 Google
N
3000 ft

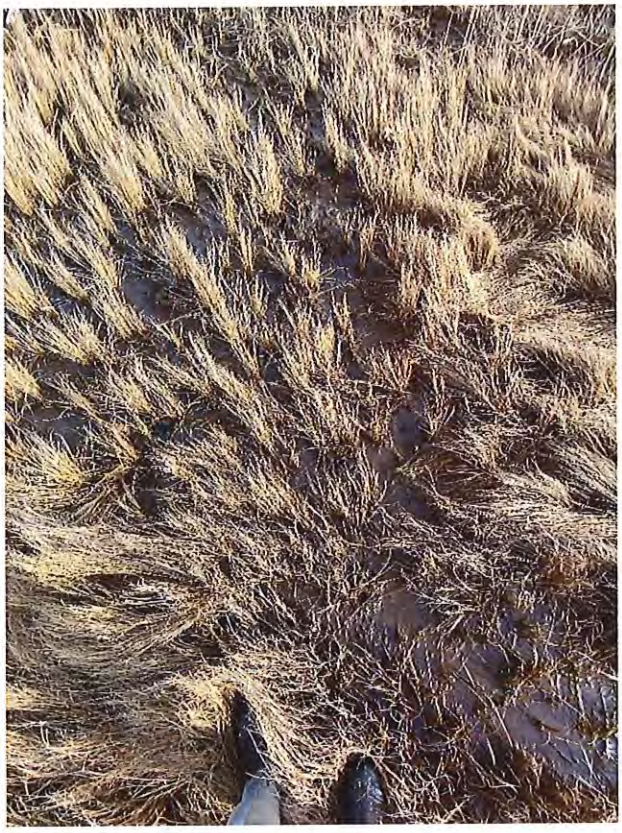

Briarwood Beach, Wareham, Oct 2018
Legend
Ditch Spoils
Option 1 - 22 ft
Option 2 - 25 ft
Option 3 - 50 ft
Possible ditch clog
Google Earth
100 ft
N


Briarwood Beach, Wareham, Jun 2014
Legend
Ditch Spoils
Option 1 - 22 ft
Option 2 - 25 ft
Option 3 - 50 ft
Possible ditch clog
Google Earth
100 ft
N


Briarwood Beach, Wareham, May 2010
Legend
Ditch Spoils
Option 1 - 22 ft
Option 2 - 25 ft
Option 3 - 50 ft
Possible ditch clog
Google Earth
100 ft
N


Briarwood Beach, Wareham, Apr 2005
Legend
Ditch Spoils
Option 1 - 22 ft
Option 2 - 25 ft
Option 3 - 50 ft
Possible ditch clog
Google Earth
100 ft
N

Field photographs from January/February 2020, within 3 hours of low tide.



Briarwood Beach, Wareham, Initial Conditions, 2011

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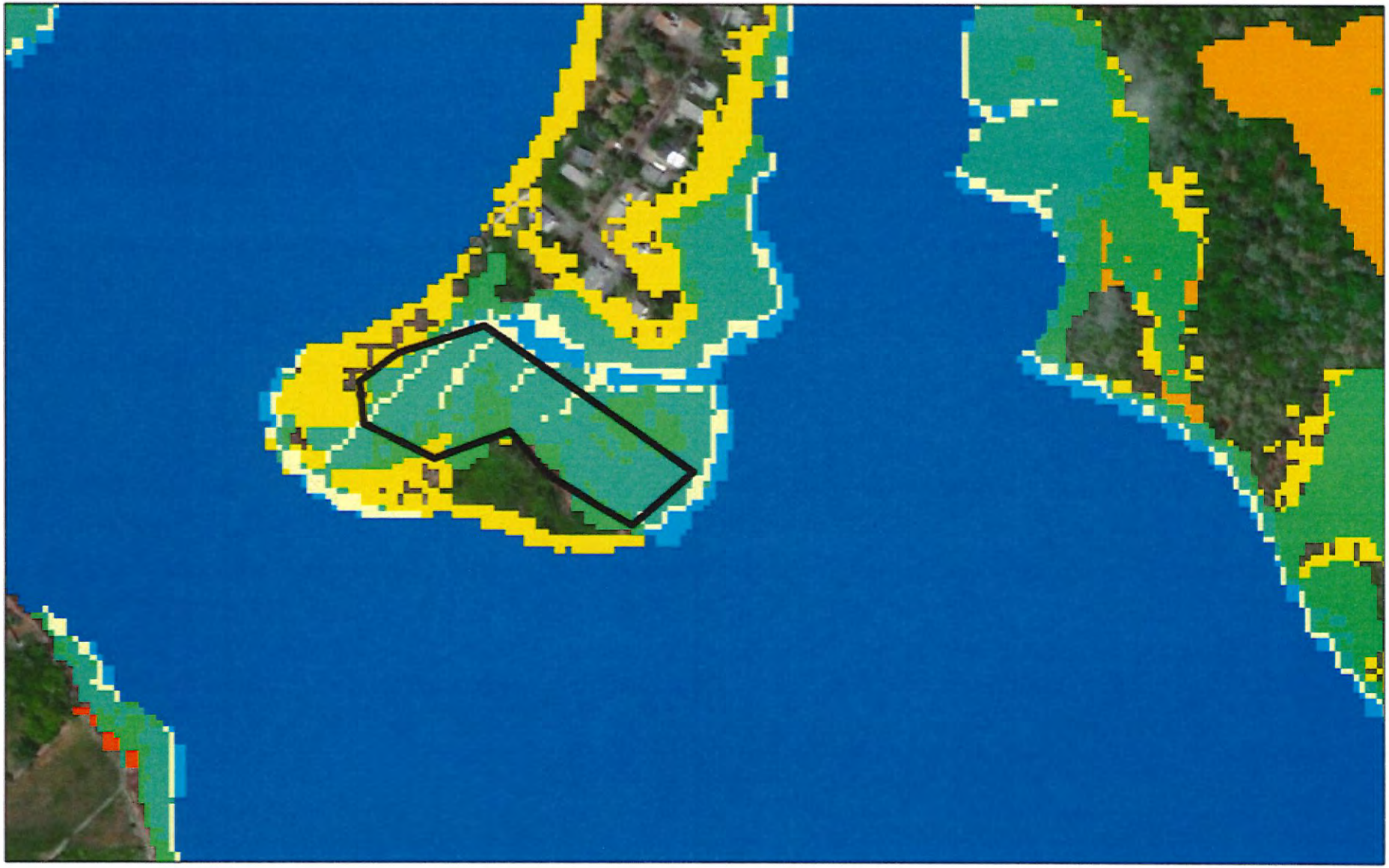
0 0.04 0.09 0.18 km

Briarwood Beach, Wareham, 2.3 ft. SLR (2100)



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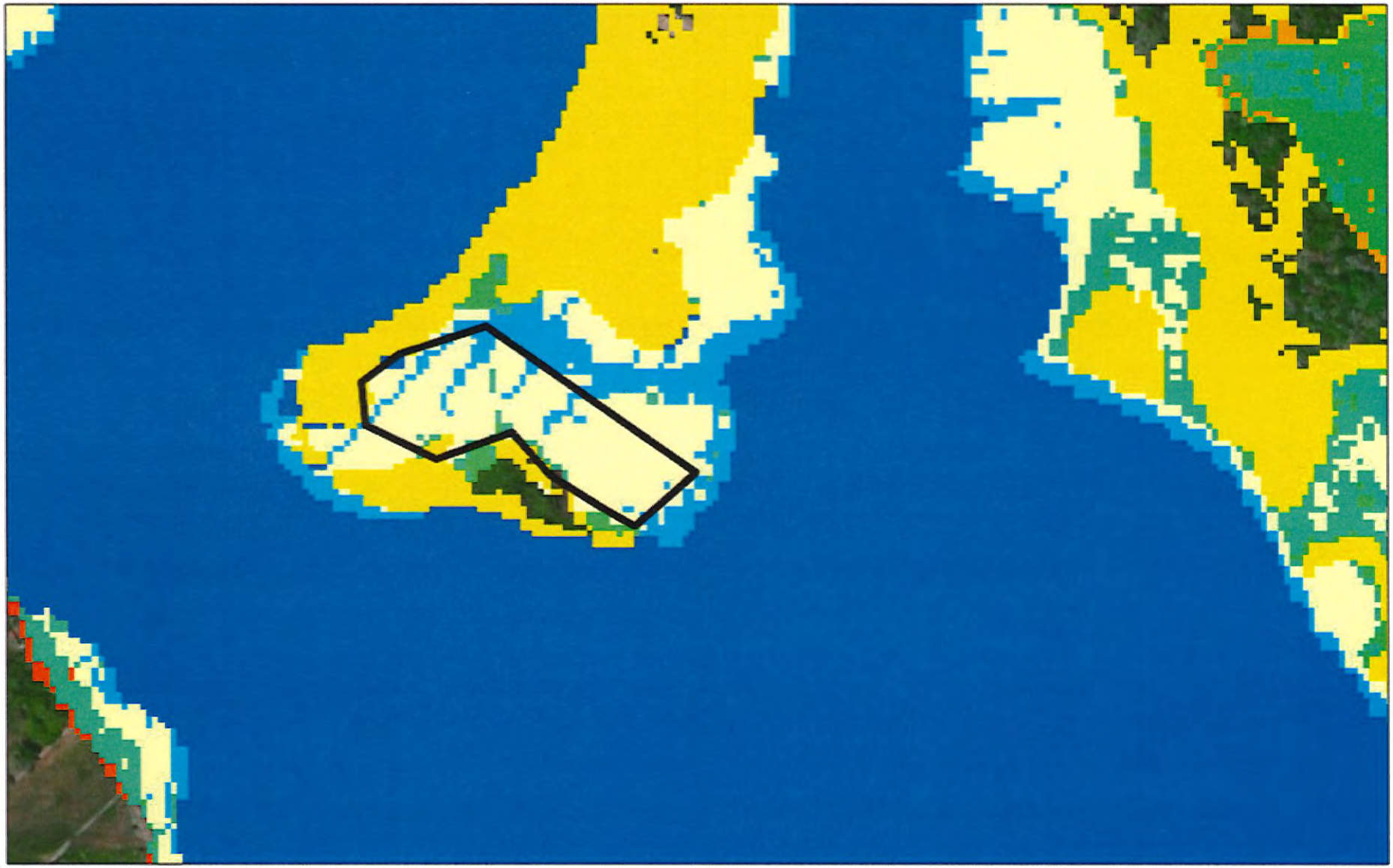
0 0.04 0.09 0.18 km

Briarwood Beach, Wareham, 4.5 ft. SLR (2100)



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1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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Web AppBuilder for ArcGIS

SITE EVALUATION

- Is this marsh suitable for a runnel adaptation project? _____
- Why or why not?

  _____

  _____

  _____

  _____
- Which runnel option(s) do you think is/are best (none is an acceptable answer!)? ____
- Do you agree with the placement, length, and direction of the runnel(s)?_____
- Why or why not? Describe suggested changes you would make (feel free to draw!)

  _____

  _____

  _____

  _____
- Would additional adaptation actions have to be taken at this site for a runnel project to successfully improve drainage, allow revegetation, and maintain elevation (e.g. ditch maintenance, culvert replacement, sediment placement)? _____
- If not, why? And if additional actions would be necessary, which ones and why?

  _____

  _____

  _____

  _____
- Do you have any thoughts on how a runnel at this site should be dug (by hand, low-pressure excavator), and/or whether a deeper-narrower, or shallower-wider runnel would be more suitable here? Should a sill be left?

  _____

  _____

  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**

Cromesett Neck Runnel Site

Table of Contents

FACT SHEET

Site: Cromesett Neck, Town of Wareham, Plymouth County

Ownership and Protection of Marsh: Town of Wareham, Mass Audubon, Protected Open Space

Ownership and Protection Adjacent Parcels: Mass Audubon, Protected Open Space

Access: Park side of road, walk down a moderate grade embankment to enter marsh.

Elevation: 2.03 ± 0.24 ft NAVD88

MHW: 1.80 ft NAVD88

Existing drainage considerations: Freshwater input occurs through a storm drain emptying into the marsh (photo). Additional freshwater runoff from the road may occur. There was a high hummock of vegetation (map) potentially clogging drainage in the ditch seaward of the storm drain. Further examination required.

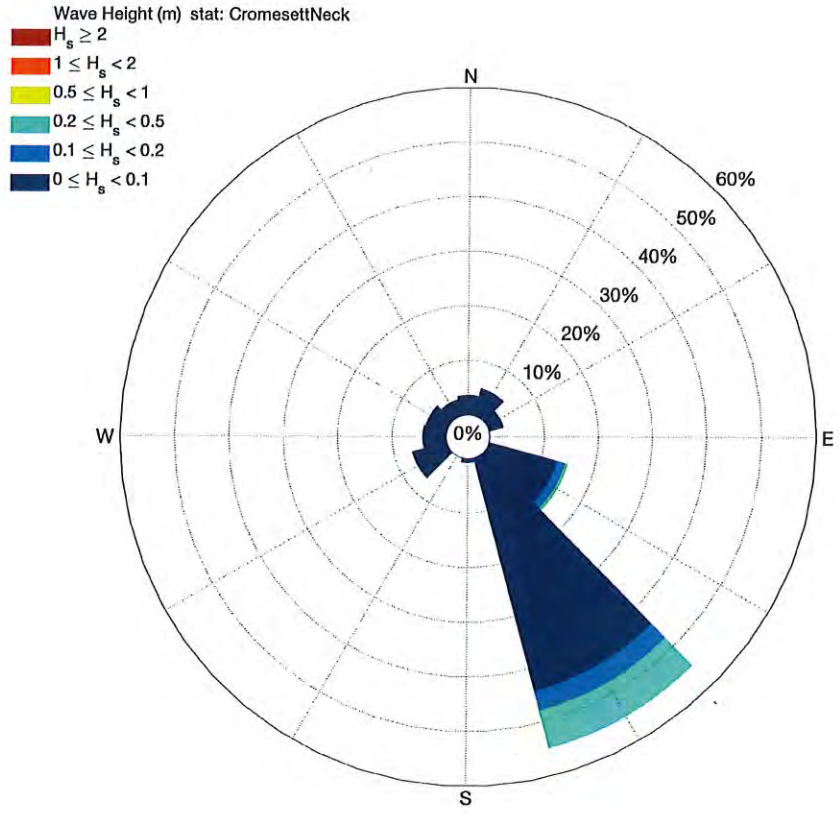
Peat condition: Peat was softer across the platform, especially in areas of die-off and along the ditch perimeters.

Close to existing salt marsh monitoring transects (BBC and BBNEP)?: No

Wind wave exposure: Mostly low with small amount of moderate wave thrust from the south-southeast.

Proposal: The southwest corner of the marsh has a large area of die-off. Along the edge of the ditch separating the Mass Audubon and town-owned properties there are small areas of impounded water, and patches of die-off occur across the Mass Audubon-owned lobe.

We propose to place one runnel at this site to address either the patches along the ditch (map), or to treat the southwest corner that abuts the forest. The forest-edge treatment may facilitate marsh migration. The sites along the ditch would focus on preventing further erosion of the ditch. The Option 2 runnel would intersect the runnel below the possible ditch clog, while the Option 3 runnel would have to be very long, or empty into the ditch landward of the possible clog.


Wave Height (m) stat: CromesettNeck
$H_s \geq 2$
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
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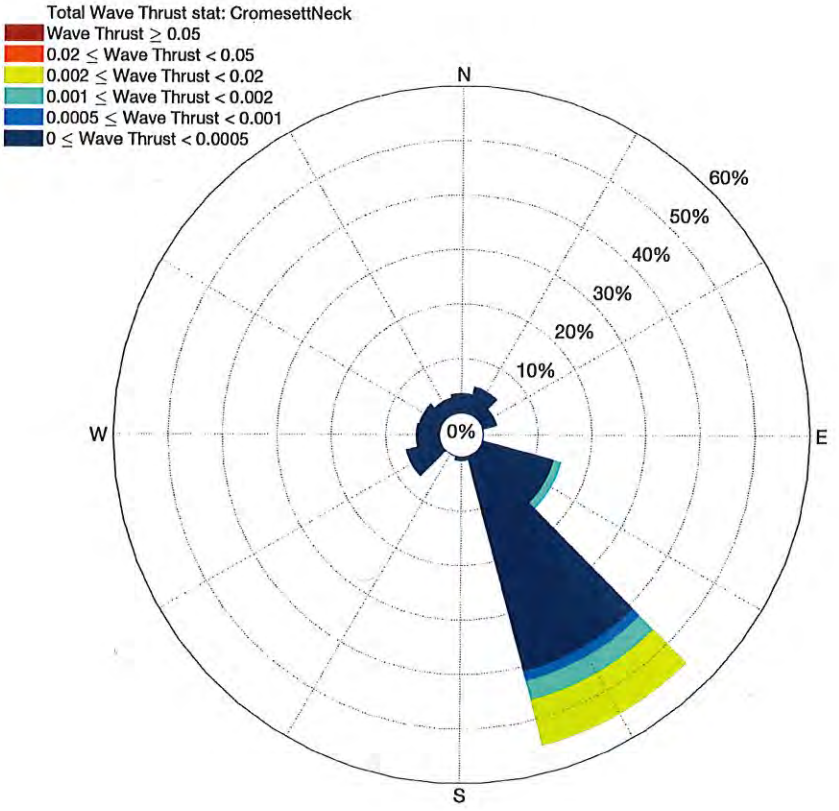
Total Wave Thrust stat: CromesettNeck
Wave Thrust ≥ 0.05
$0.02 \leq$ Wave Thrust < 0.05
$0.002 \leq$ Wave Thrust < 0.02
$0.001 \leq$ Wave Thrust < 0.002
$0.0005 \leq$ Wave Thrust < 0.001
$0 \leq$ Wave Thrust < 0.0005
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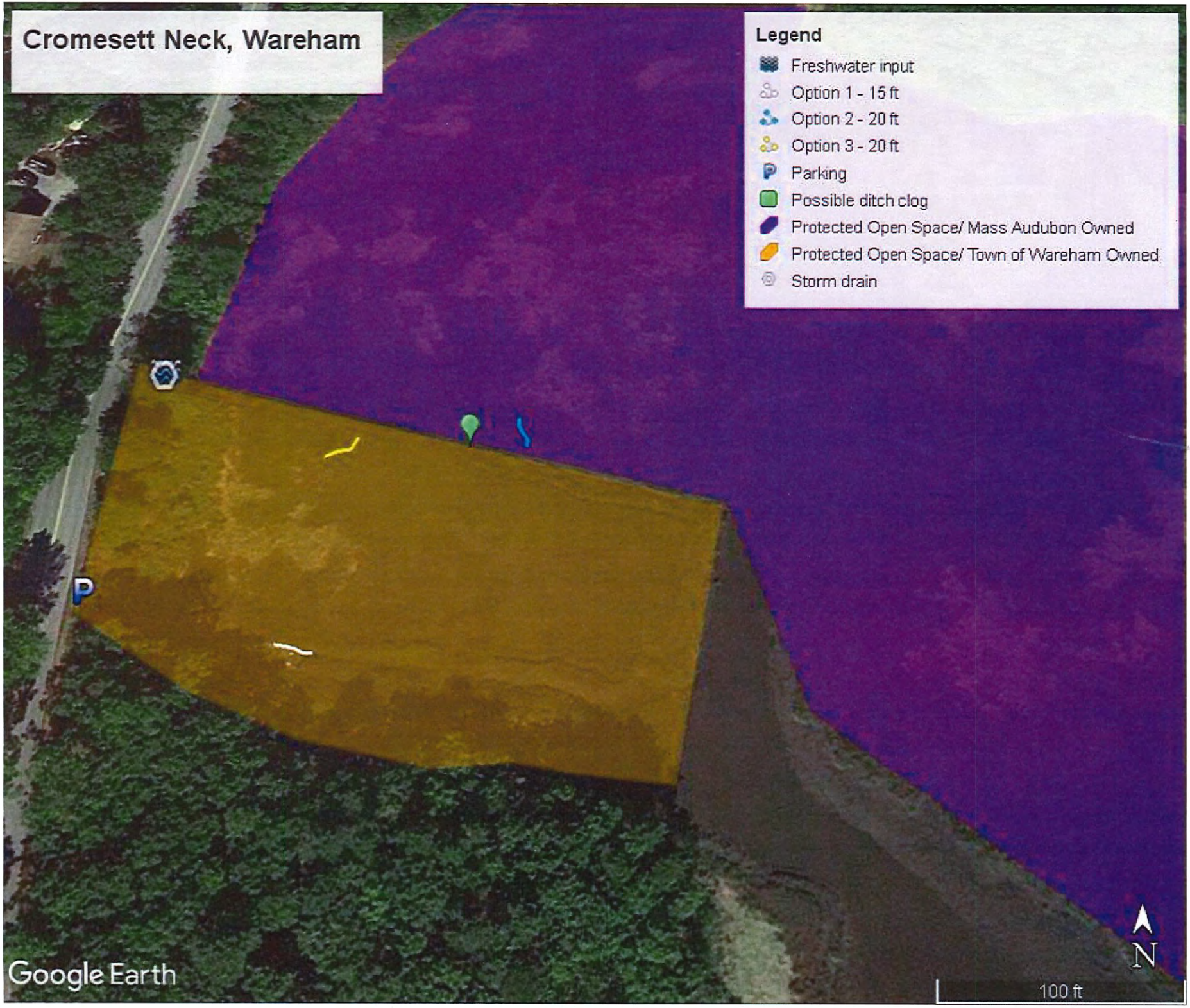
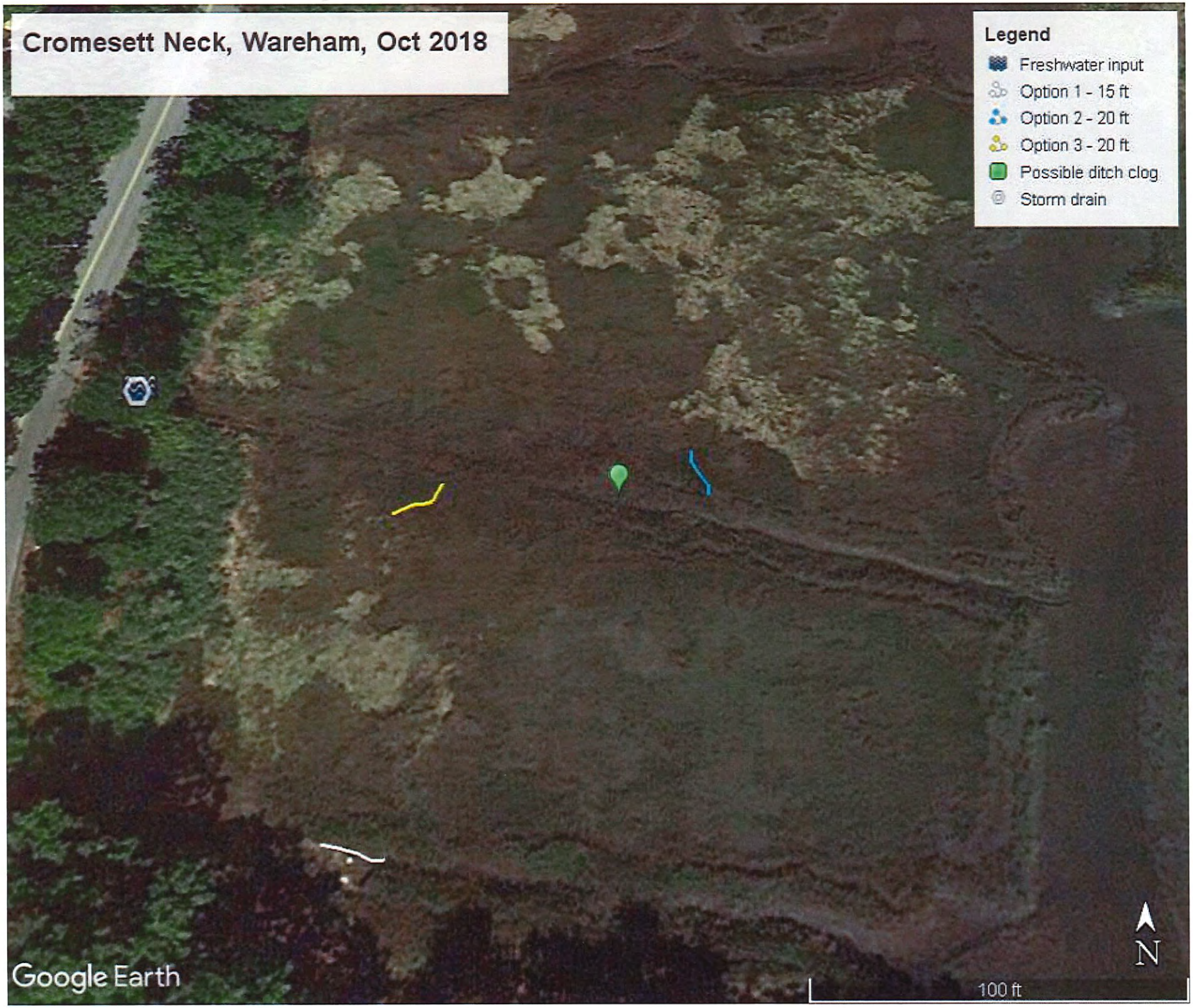
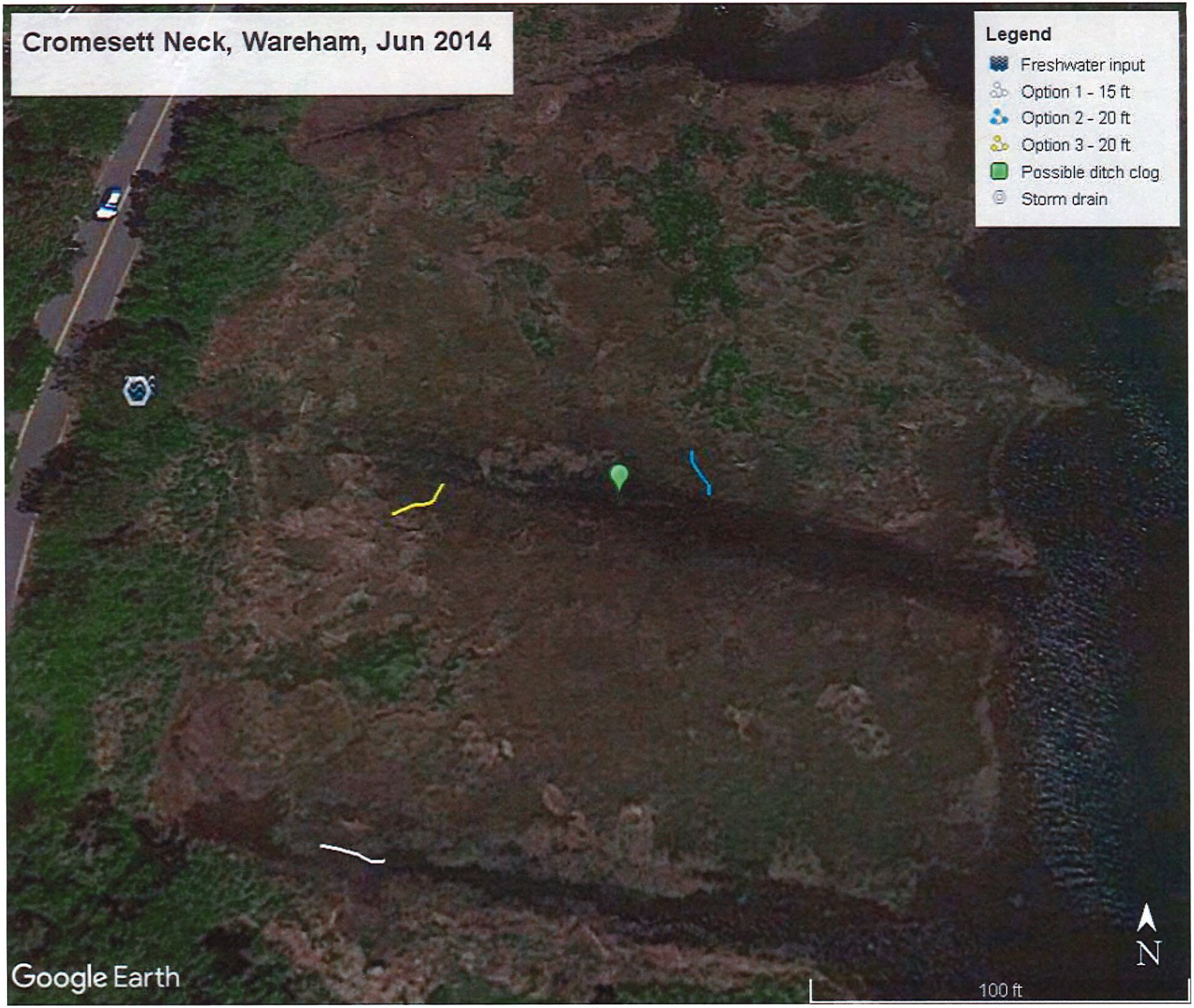

Cromesett Neck, Wareham
Legend
Freshwater input
Option 1 - 15 ft
Option 2 - 20 ft
Option 3 - 20 ft
Parking
Possible ditch clog
Protected Open Space/ Mass Audubon Owned
Protected Open Space/ Town of Wareham Owned
Storm drain
P
N
100 ft
Google Earth

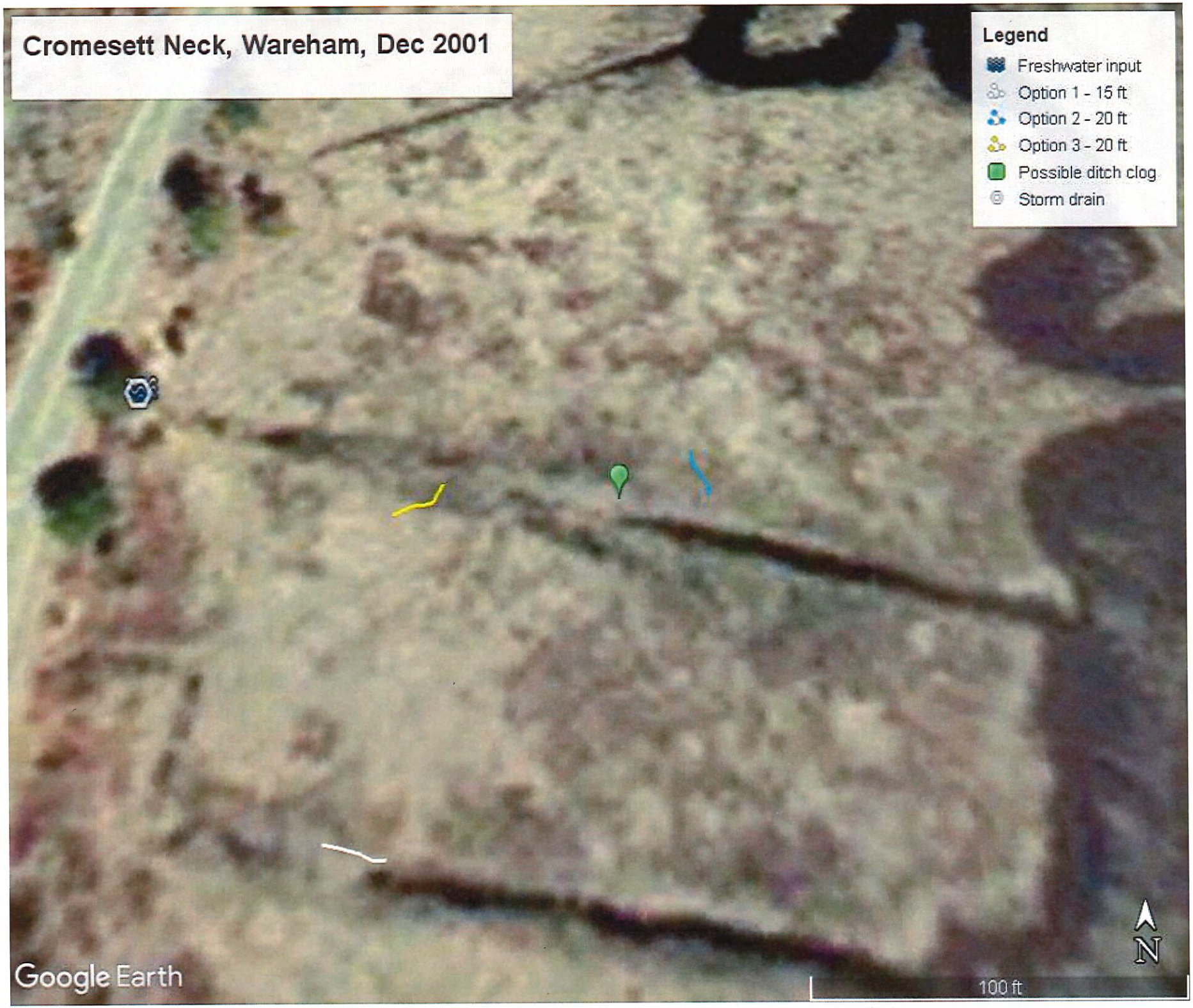

Cromesett Neck, Wareham
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
N
10 mi


Cromesett Neck, Wareham
Cedar Island
Weweantic
Marks Cove
Woods Point
Google Earth
© 2020 Google
N
4000 ft


Cromesett Neck, Wareham, Oct 2018
Legend
Freshwater input
Option 1 - 15 ft
Option 2 - 20 ft
Option 3 - 20 ft
Possible ditch clog
Storm drain
N
Google Earth
100 ft

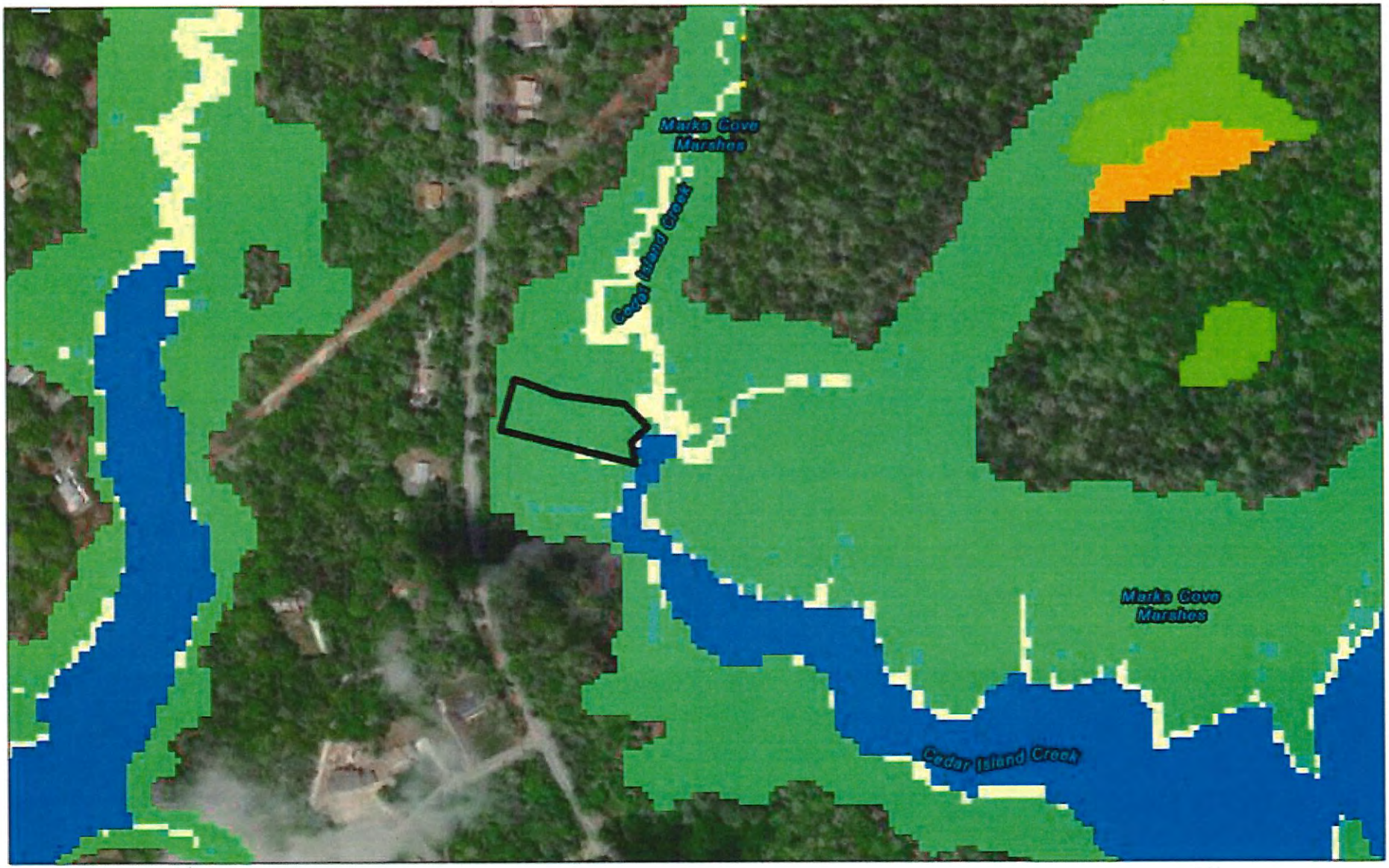

Cromesett Neck, Wareham, Jun 2014
Legend
Freshwater input
Option 1 - 15 ft
Option 2 - 20 ft
Option 3 - 20 ft
Possible ditch clog
Storm drain
N
Google Earth
100 ft


Cromesett Neck, Wareham, May 2010
Legend
Freshwater input
Option 1 - 15 ft
Option 2 - 20 ft
Option 3 - 20 ft
Possible ditch clog
Storm drain
N
Google Earth
100 ft


Cromesett Neck, Wareham, Dec 2001
Legend
Freshwater input
Option 1 - 15 ft
Option 2 - 20 ft
Option 3 - 20 ft
Possible ditch clog
Storm drain
N
Google Earth
100 ft

Field photographs from January/February 2020, within 3 hours of low tide.

Cromesett Neck, Wareham, Initial Conditions, 2011



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1:4,514

0 0.03 0.06 0.11 mi

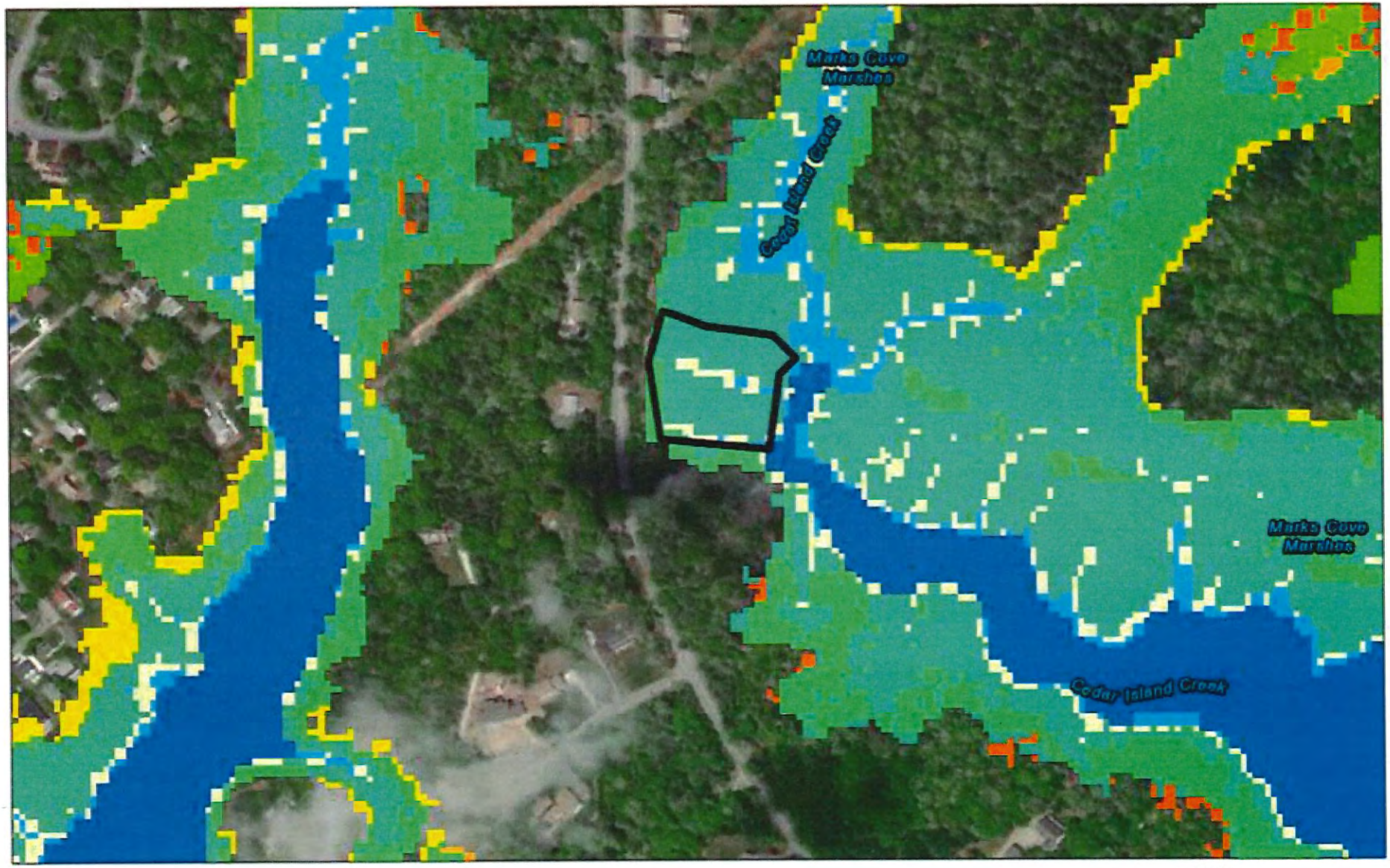
0 0.04 0.09 0.18 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

Web AppBuilder for ArcGIS

USDA FSA | Massachusetts Office of Coastal Zone Management | 251 Causeway Street, Suite 800, Boston, MA 02114-2138 | mass.gov/czm | Massachusetts Office of Coastal Zone Management | 251 Causeway Street, Suite 800, Boston, MA 02114-2138 | mass.gov/

Cromesett Neck, Wareham, 2.3 ft SLR (2100)



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0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

Web AppBuilder for ArcGIS

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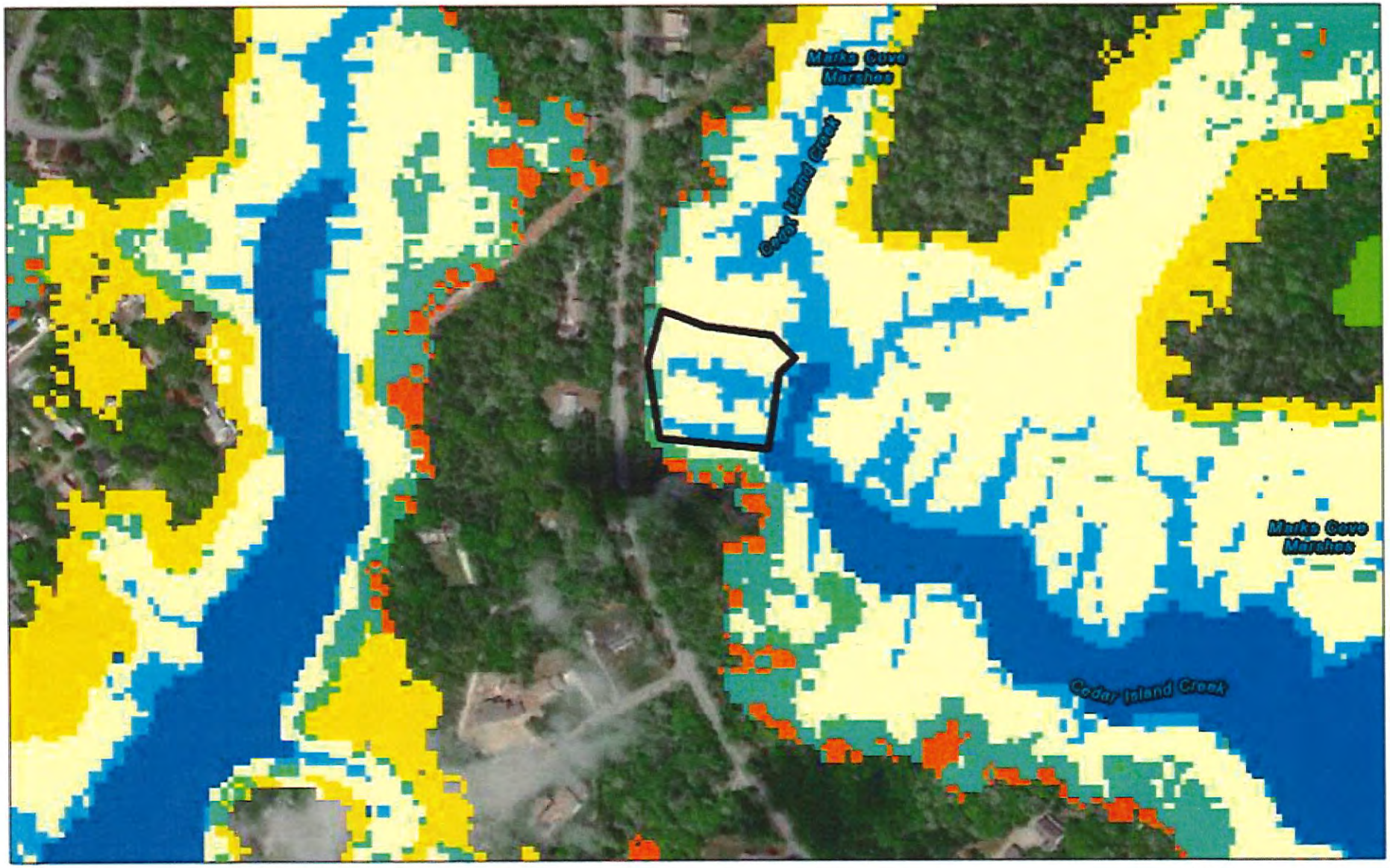
Cromesett Neck, Wareham, 4.5 ft SLR (2100)



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sn_ylw-pushpin20

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0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Massachusetts Office of Coastal Zone Management | 251 Causeway Street

Web AppBuilder for ArcGIS

SITE EVALUATION

- Is this marsh suitable for a runnel adaptation project? _____
- Why or why not?

  _____

  _____

  _____

  _____
- Which runnel option(s) do you think is/are best (none is an acceptable answer!)? ____
- Do you agree with the placement, length, and direction of the runnel(s)?_____
- Why or why not? Describe suggested changes you would make (feel free to draw!)

  _____

  _____

  _____

  _____
- Would additional adaptation actions have to be taken at this site for a runnel project to successfully improve drainage, allow revegetation, and maintain elevation (e.g. ditch maintenance, culvert replacement, sediment placement)? _____
- If not, why? And if additional actions would be necessary, which ones and why?

  _____

  _____

  _____

  _____
- Do you have any thoughts on how a runnel at this site should be dug (by hand, low-pressure excavator), and/or whether a deeper-narrower, or shallower-wider runnel would be more suitable here? Should a sill be left?

  _____

  _____

  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**

Demarest Lloyd Runnel Site

Table of Contents

FACT SHEET

Site: Demarest Lloyd State Park, Town of Dartmouth, Bristol County

Ownership and Protection of Marsh: Dept. Conservation and Recreation, Protected Open Space

Ownership and Protection Adjacent Parcels: Dept. Conservation and Recreation, Protected Open Space

Access: Park in the parking lot and walk down existing path to marsh. Excavator access to the east side of the creek would be possible from this path. The western side of the creek would be more difficult, and would involve the excavator taking the path to its end (map), then traveling around the edge of the marsh off a path.

Elevation: 1.79 ± 0.14 ft NAVD88

MHW: 1.46 ft NAVD88

Existing drainage considerations: Freshwater input runs downslope to the western edge of the marsh from the forest. Pooling at this location was visible. There is a large, 2-pipe culvert system connecting the bay to the marshes beneath the road. In two places there were possible ditch clogs.

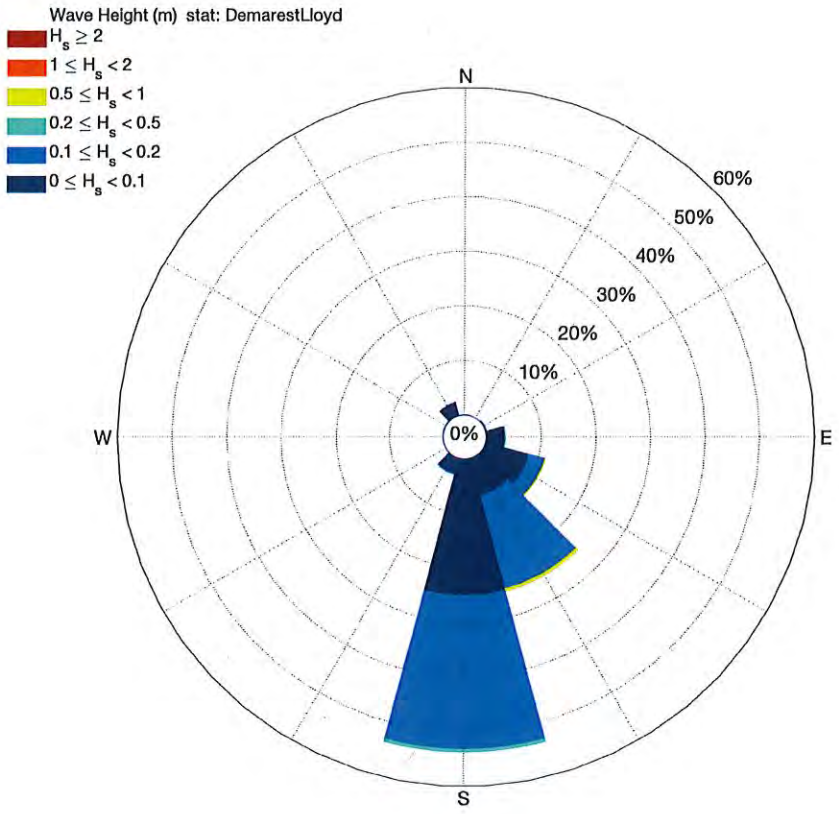
Peat condition: Peat was firm on the eastern side of the creek. On the western side the peat firmness changed with apparent elevation change. The “elevation boundary” on the map delineates a higher elevation, firm area to the north, and lower, softer marsh to the south.

Close to existing salt marsh monitoring transects (BBC and BBNEP)? Yes

Wind wave exposure: Moderate from the south and southeast.

Proposal: Small die-off areas were present on the northern side of the elevation boundary, on the west side of the creek, as well as along the marsh edge on the eastern side of the creek. The area appearing to be at highest risk of degradation, with softest peat and most standing water (though still vegetated) was the marsh south of the elevation boundary on the west side of the creek.

We proposed to put one runnel in one of three locations. Option 1 would treat very mild degradation on the east side of the creek, Option 3 would treat a low-moderate degraded area, and Option 2 would treat the subsiding, softer marsh area with more die-off.


Wave Height (m) stat: DemarestLloyd
$H_s \geq 2$
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
N
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S
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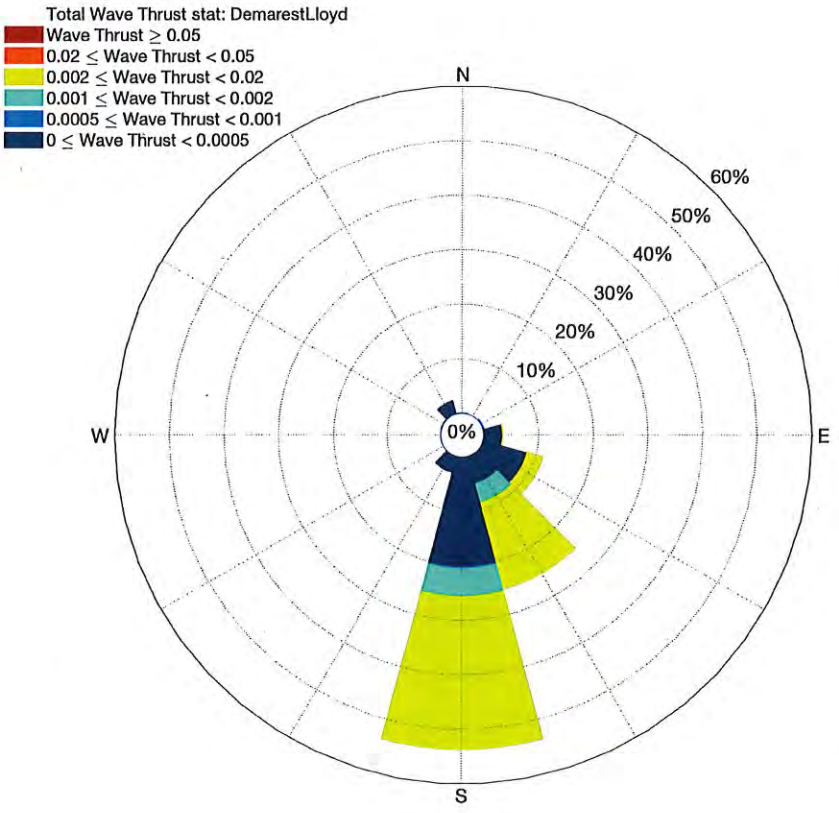
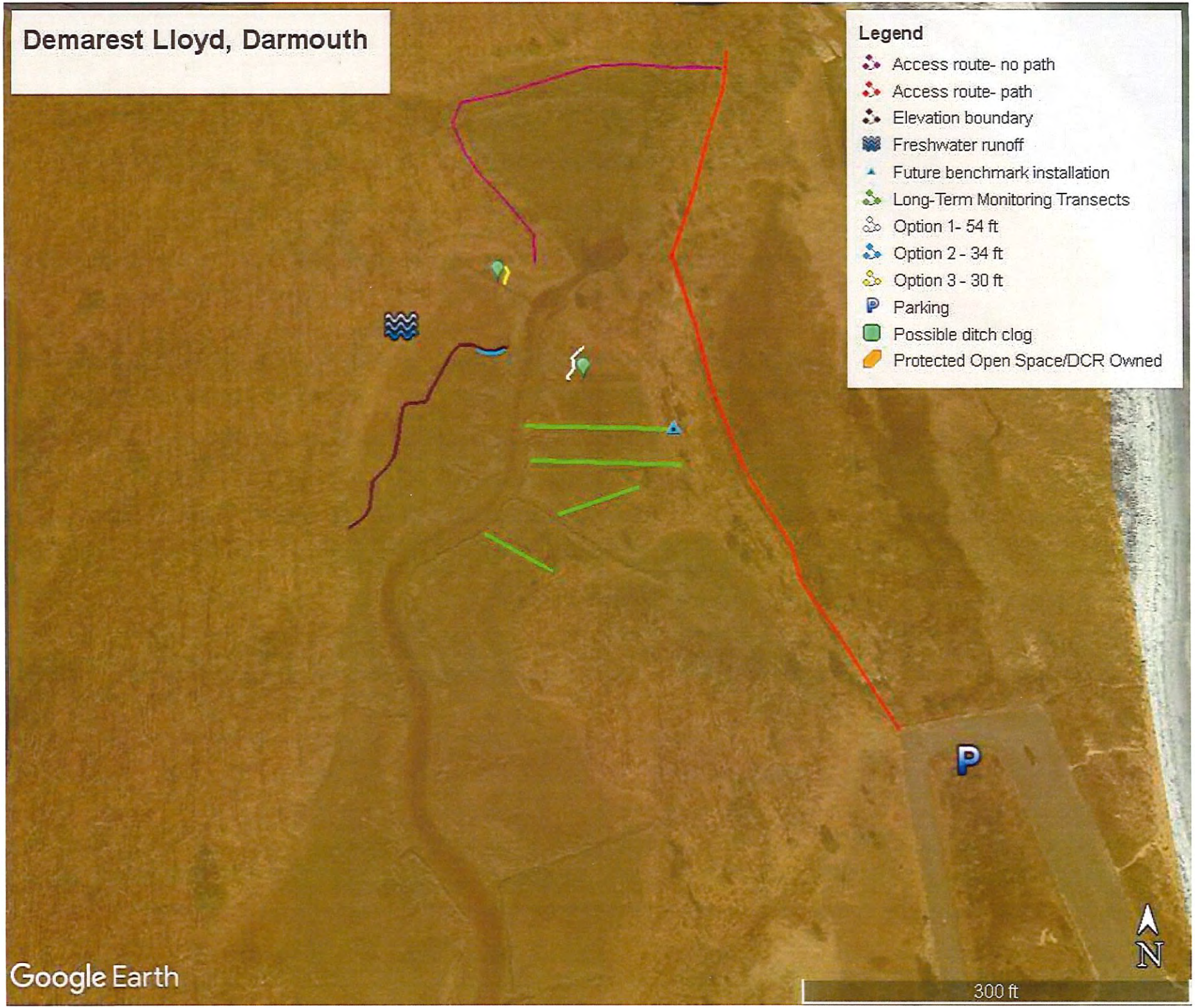
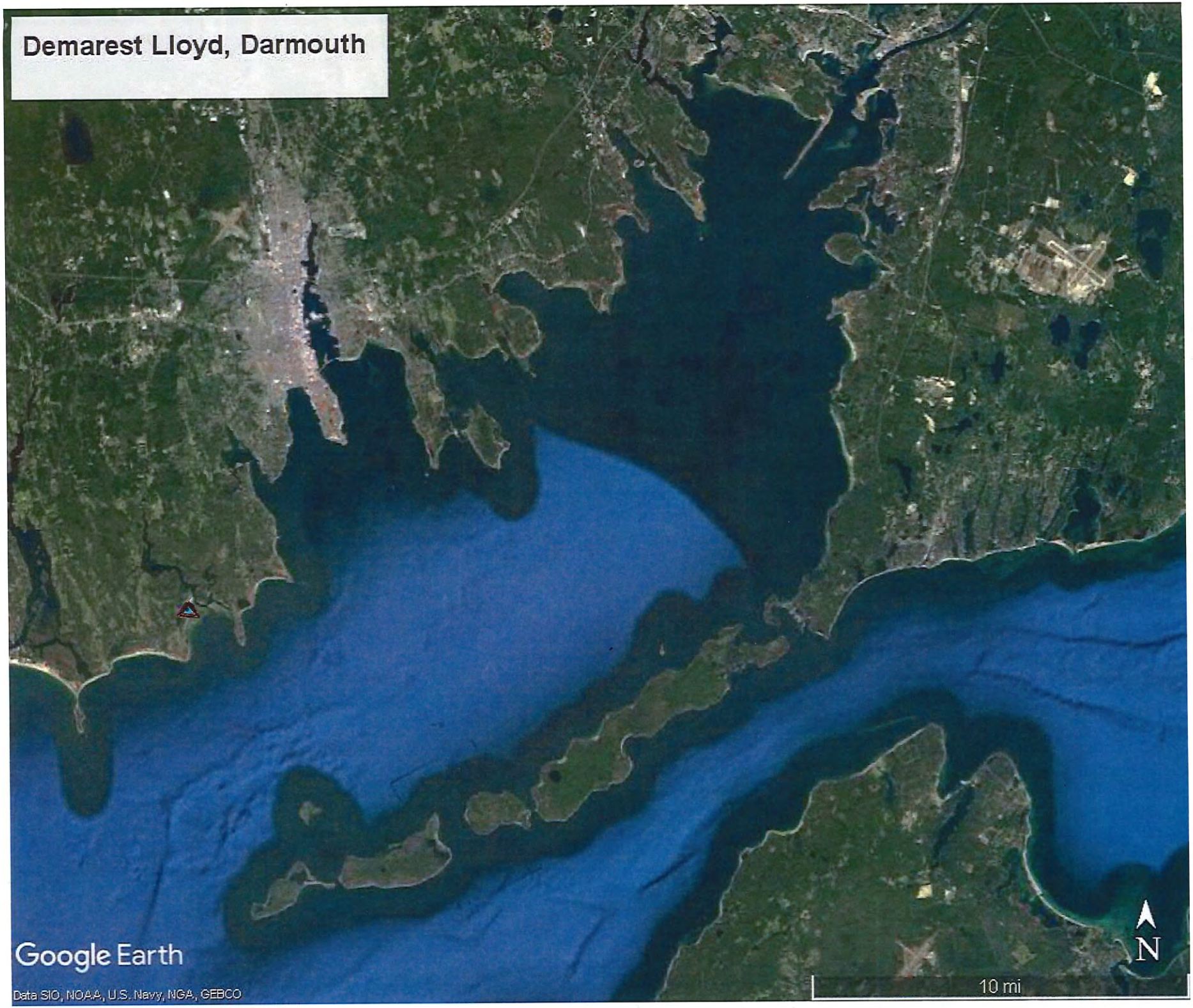
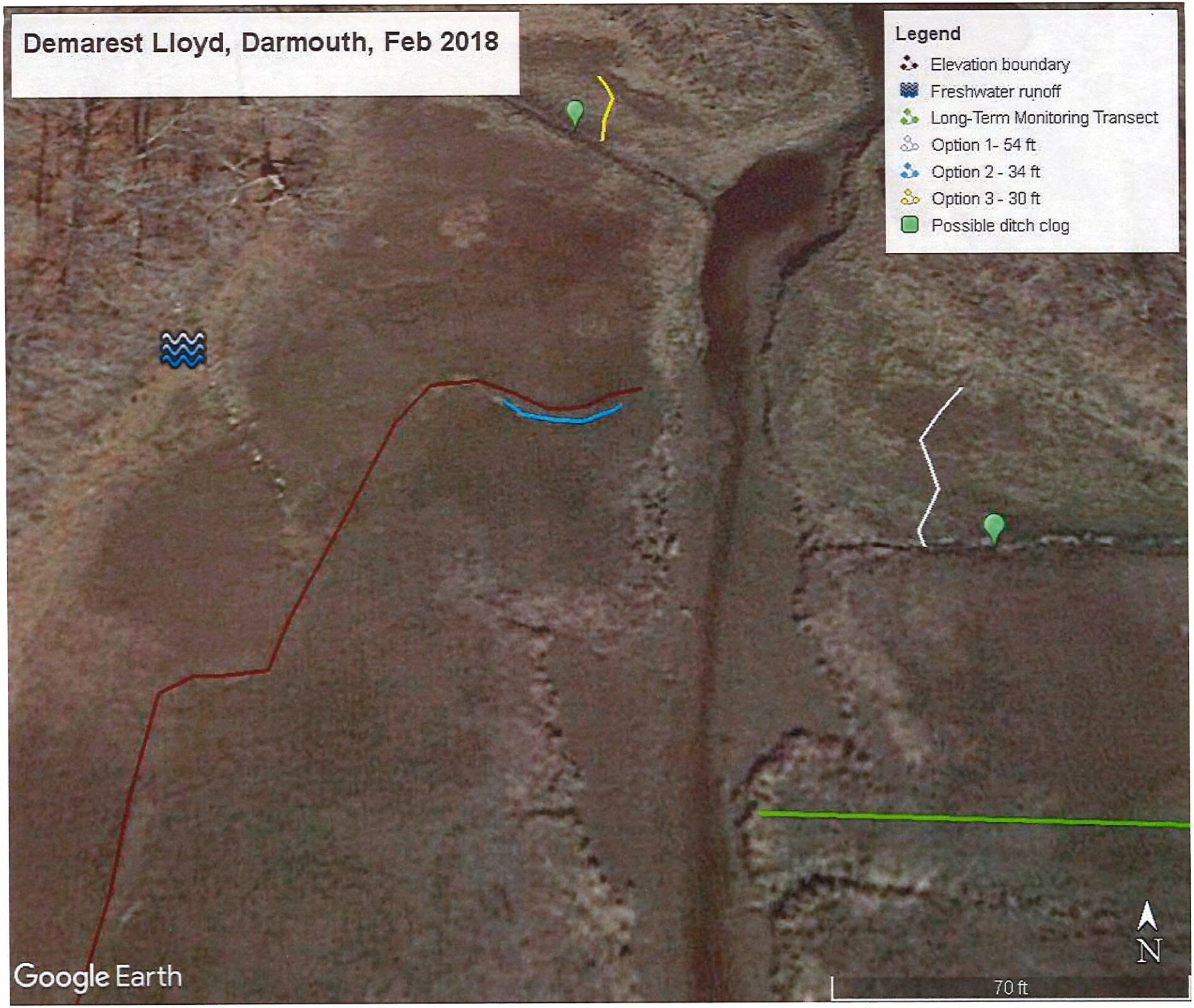
60%
50%
40%
30%
20%
10%
0%

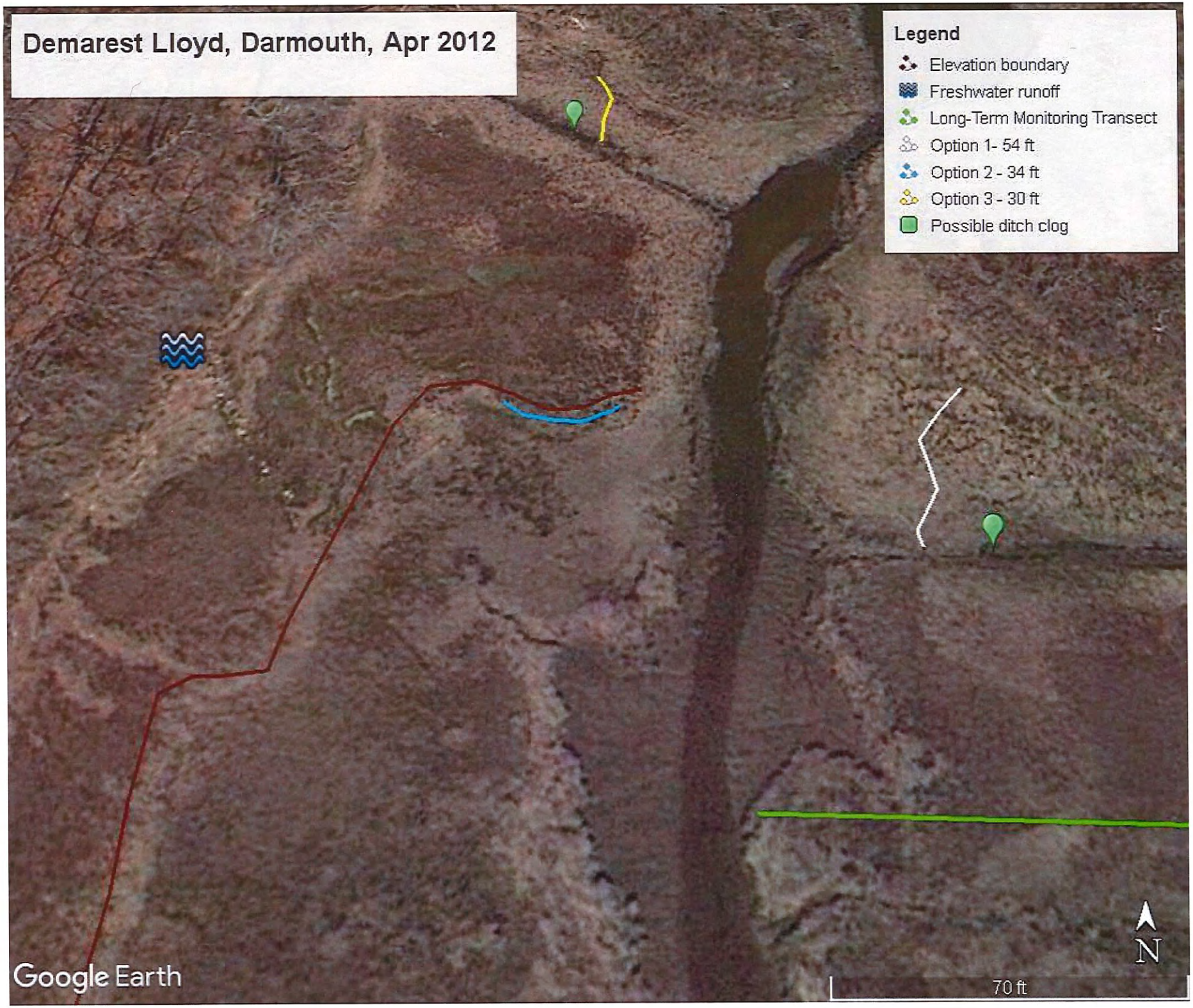

Total Wave Thrust stat: DemarestLloyd
Wave Thrust ≥ 0.05
$0.02 \leq$ Wave Thrust < 0.05
$0.002 \leq$ Wave Thrust < 0.02
$0.001 \leq$ Wave Thrust < 0.002
$0.0005 \leq$ Wave Thrust < 0.001
$0 \leq$ Wave Thrust < 0.0005
N
E
S
W
60%
50%
40%
30%
20%
10%
0%

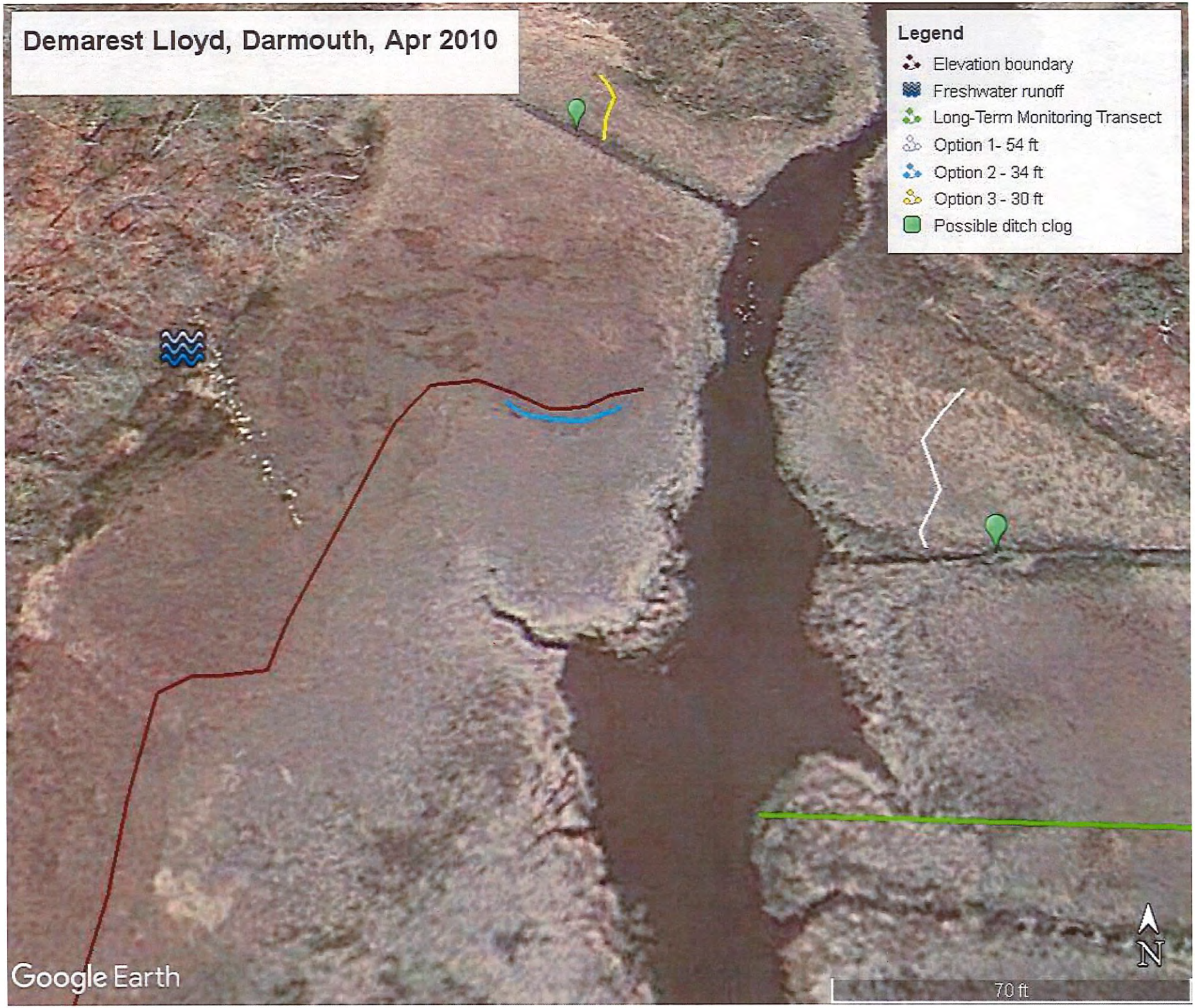

Demarest Lloyd, Darmouth
Legend
Access route- no path
Access route- path
Elevation boundary
Freshwater runoff
Future benchmark installation
Long-Term Monitoring Transects
Option 1- 54 ft
Option 2 - 34 ft
Option 3 - 30 ft
Parking
Possible ditch clog
Protected Open Space/DCR Owned
P
N
Google Earth
300 ft

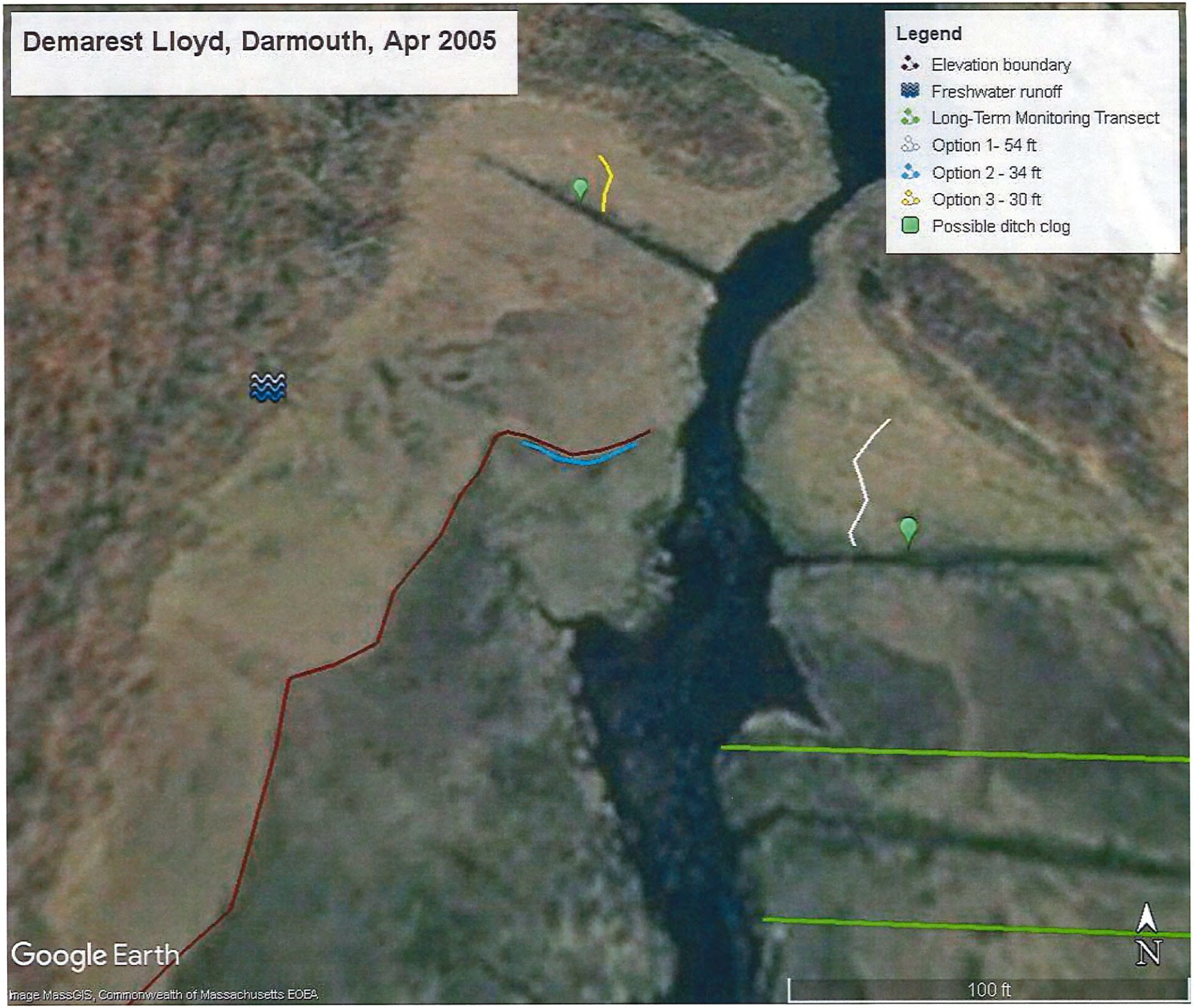

Demarest Lloyd, Darmouth
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
10 mi
N


Demarest Lloyd, Dartmouth
Pelegs Island
Cedar Island
Hunts Rock
Georges Pond
Slocums Ledge
Google Earth
© 2020 Google
Image © 2020 TerraMetrics
N
4000 ft

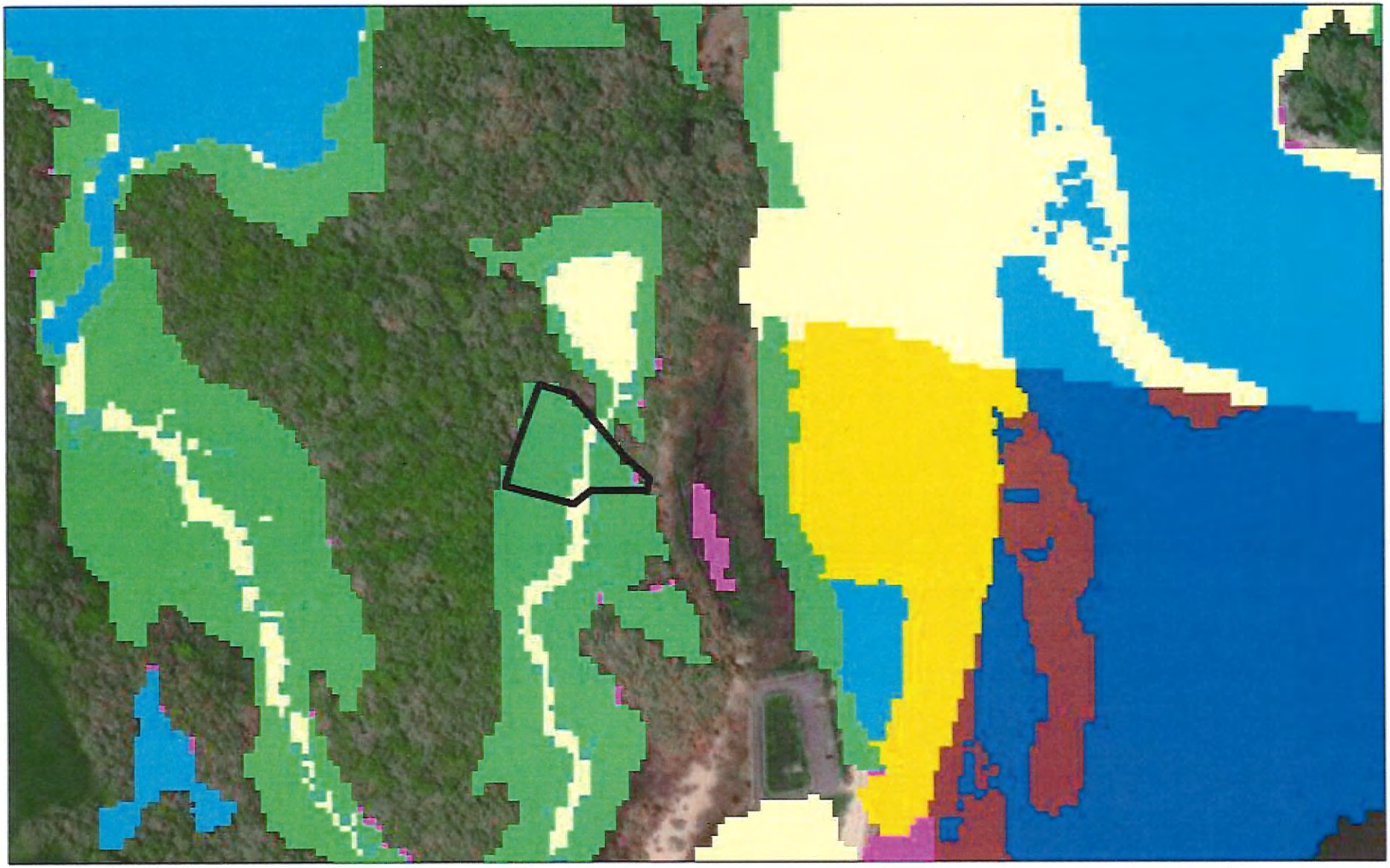

Demarest Lloyd, Darmouth, Feb 2018
Legend
Elevation boundary
Freshwater runoff
Long-Term Monitoring Transect
Option 1- 54 ft
Option 2 - 34 ft
Option 3 - 30 ft
Possible ditch clog
Google Earth
N
70 ft


Demarest Lloyd, Darmouth, Apr 2012
Legend
Elevation boundary
Freshwater runoff
Long-Term Monitoring Transect
Option 1- 54 ft
Option 2 - 34 ft
Option 3 - 30 ft
Possible ditch clog
N
70 ft
Google Earth


Demarest Lloyd, Darmouth, Apr 2010
Legend
Elevation boundary
Freshwater runoff
Long-Term Monitoring Transect
Option 1- 54 ft
Option 2 - 34 ft
Option 3 - 30 ft
Possible ditch clog
Google Earth
N
70 ft


Demarest Lloyd, Darmouth, Apr 2005
Legend
Elevation boundary
Freshwater runoff
Long-Term Monitoring Transect
Option 1- 54 ft
Option 2 - 34 ft
Option 3 - 30 ft
Possible ditch clog
Google Earth
Image MassGIS, Commonwealth of Massachusetts EOEA
N
100 ft

Demarest Lloyd, Dartmouth, Initial Conditions, 2011



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sn_ylw-pushpin

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0 0.03 0.06 0.11 mi

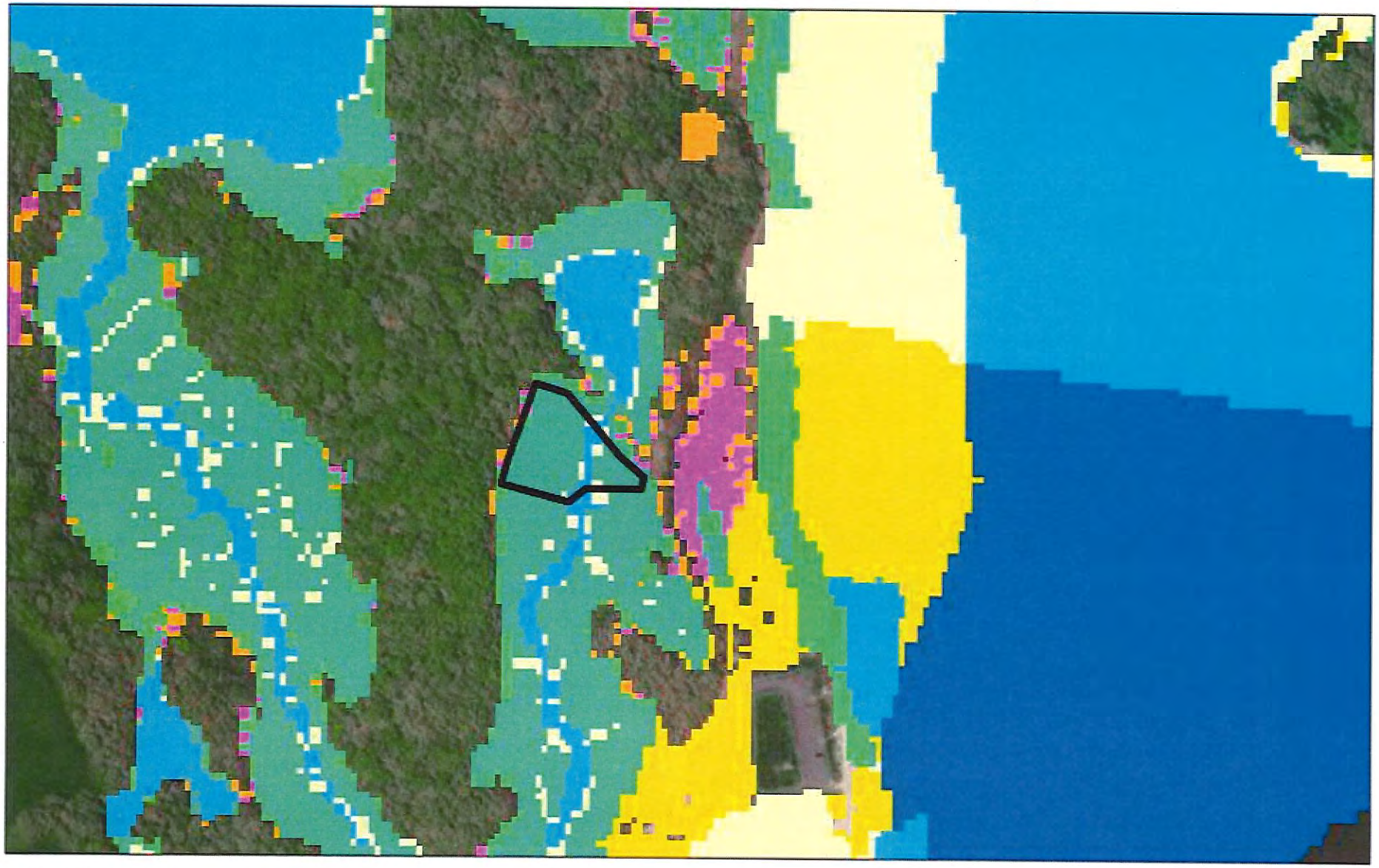
0 0.04 0.09 0.18 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

Web AppBuilder for ArcGIS

USDA FSA | Massachusetts Office of Coastal Zone Management | 251 Causeway Street, Suite 800, Boston, MA 02114-2138 | mass.gov/czm | Massachusetts Office of Coastal Zone Management | 251 Causeway Street, Suite 800, Boston, MA 02114-2138 | mass.gov

Demarest Lloyd, Dartmouth, 2.3 ft. SLR (2100)



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sn_ylw-pushpin

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0 0.04 0.09 0.18 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

Web AppBuilder for ArcGIS

Demarest Lloyd, Dartmouth, 4.5 ft. SLR (2100)

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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Massachusetts Office of Coastal Zone Management | 251 Causeway Street

SITE EVALUATION

- Is this marsh suitable for a runnel adaptation project? _____
- Why or why not?

  _____

  _____

  _____

  _____
- Which runnel option(s) do you think is/are best (none is an acceptable answer!)? ____
- Do you agree with the placement, length, and direction of the runnel(s)?_____
- Why or why not? Describe suggested changes you would make (feel free to draw!)

  _____

  _____

  _____

  _____
- Would additional adaptation actions have to be taken at this site for a runnel project to successfully improve drainage, allow revegetation, and maintain elevation (e.g. ditch maintenance, culvert replacement, sediment placement)? _____
- If not, why? And if additional actions would be necessary, which ones and why?

  _____

  _____

  _____

  _____
- Do you have any thoughts on how a runnel at this site should be dug (by hand, low-pressure excavator), and/or whether a deeper-narrower, or shallower-wider runnel would be more suitable here? Should a sill be left?

  _____

  _____

  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**

Field Family Farm Runnel Site

Table of Contents

FACT SHEET

Site: Field Family Farm, Town of Mattapoisett, Plymouth County

Ownership and Protection of Marsh: Field Family, Protected Open Space by Mattapoisett Land Trust

Ownership and Protection Adjacent Parcels: Town of Mattapoisett, Field Family, Protected Open Space

Access: Park along the road. Walk down a low-grade embankment.

Elevation: 2.0 ± 0.12 ft NAVD88

MHW: 1.87 ft NAVD88

Existing drainage considerations: Area restricted by a culvert that appears undersized. Ditches not clogged.

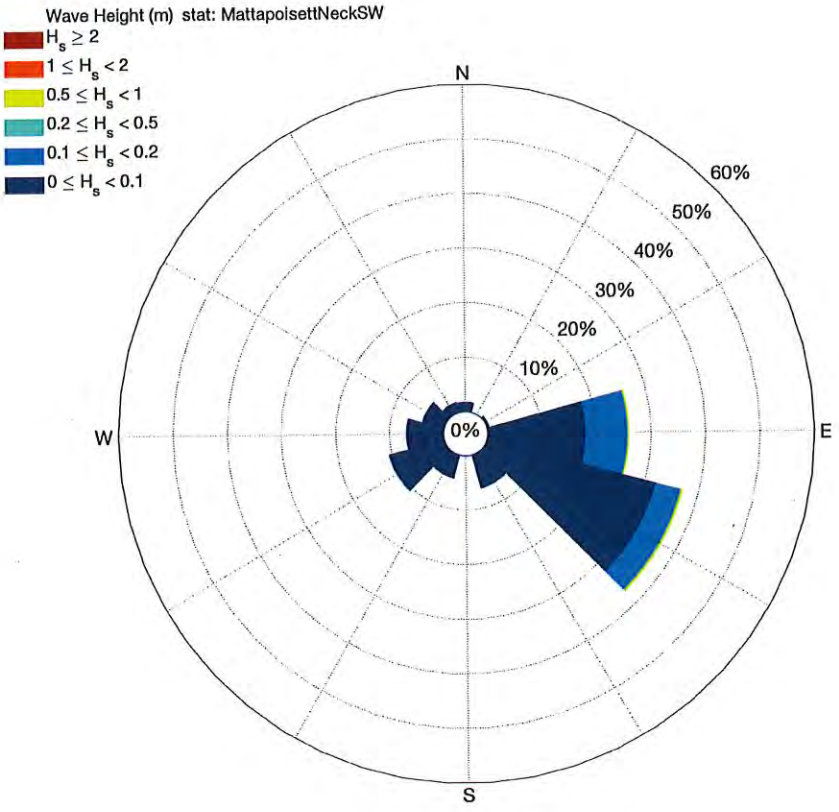
Peat condition: Peat was firmer in the northern areas of the Field Family property, though still soft areas. Peat was very soft further south on the marsh. Firm enough to traverse in some places, but many areas of subsidence were very soft, even while vegetated and without standing water. Extensive standing water and die-back evident in the southeastern lobe of marsh.

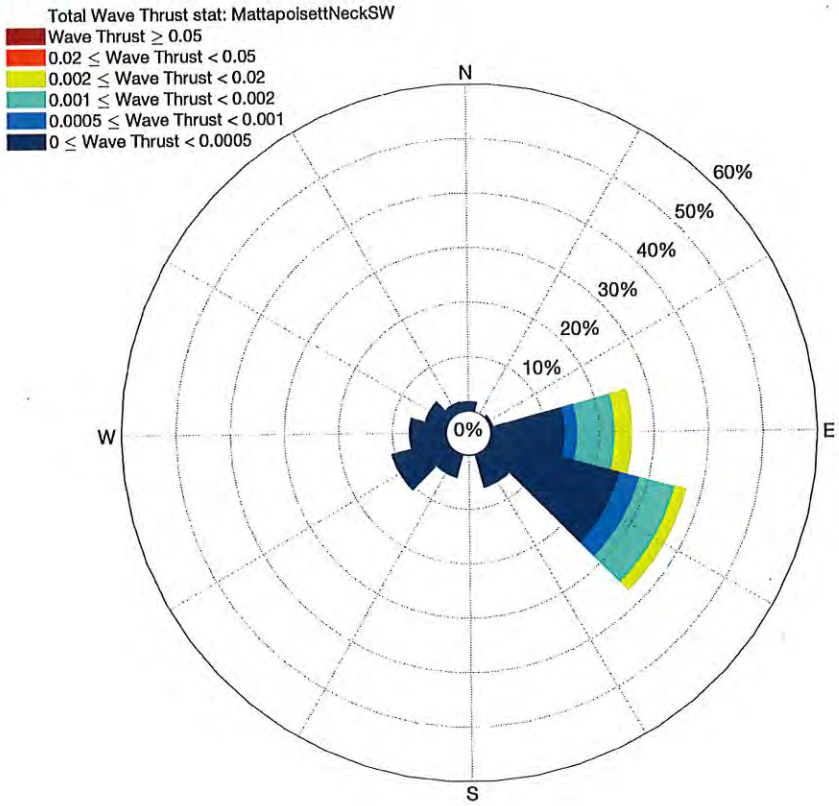
Close to existing salt marsh monitoring transects (BBC and BBNEP)?: Yes

Wind wave exposure: Low from east-southeast. Wave energy not likely directly affecting this marsh area.

Proposal: Marsh platform still mostly vegetated but very soft with evidence of subsidence and pool-creep. Impounded areas in southern lobe were extremely soft, difficult to traverse. Edges of marsh had some dead standing trees.

We proposed to put one runnel in one of four locations. Options 1 and 2 would facilitate marsh migration, and more directly treat the subsiding southeastern lobe. Options 3 and 4 would treat smaller areas of die-back closer to the main ditches.


Wave Height (m) stat: MattapoisettNeckSW
$H_s \geq 2$
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
N
E
S
W
60%
50%
40%
30%
20%
10%
0%


Total Wave Thrust stat: MattapoisettNeckSW
Wave Thrust ≥ 0.05
$0.02 \leq$ Wave Thrust < 0.05
$0.002 \leq$ Wave Thrust < 0.02
$0.001 \leq$ Wave Thrust < 0.002
$0.0005 \leq$ Wave Thrust < 0.001
$0 \leq$ Wave Thrust < 0.0005
N
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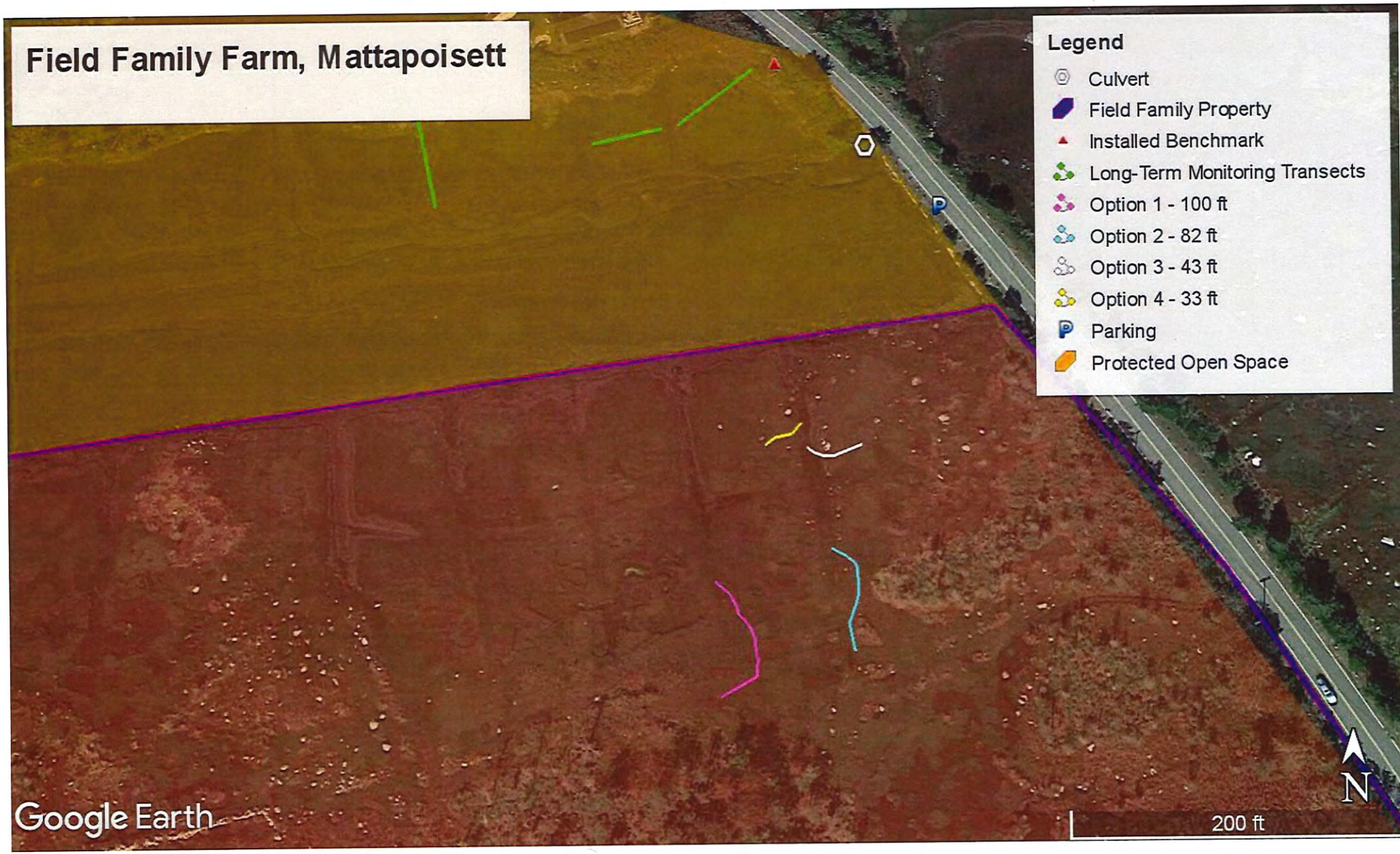
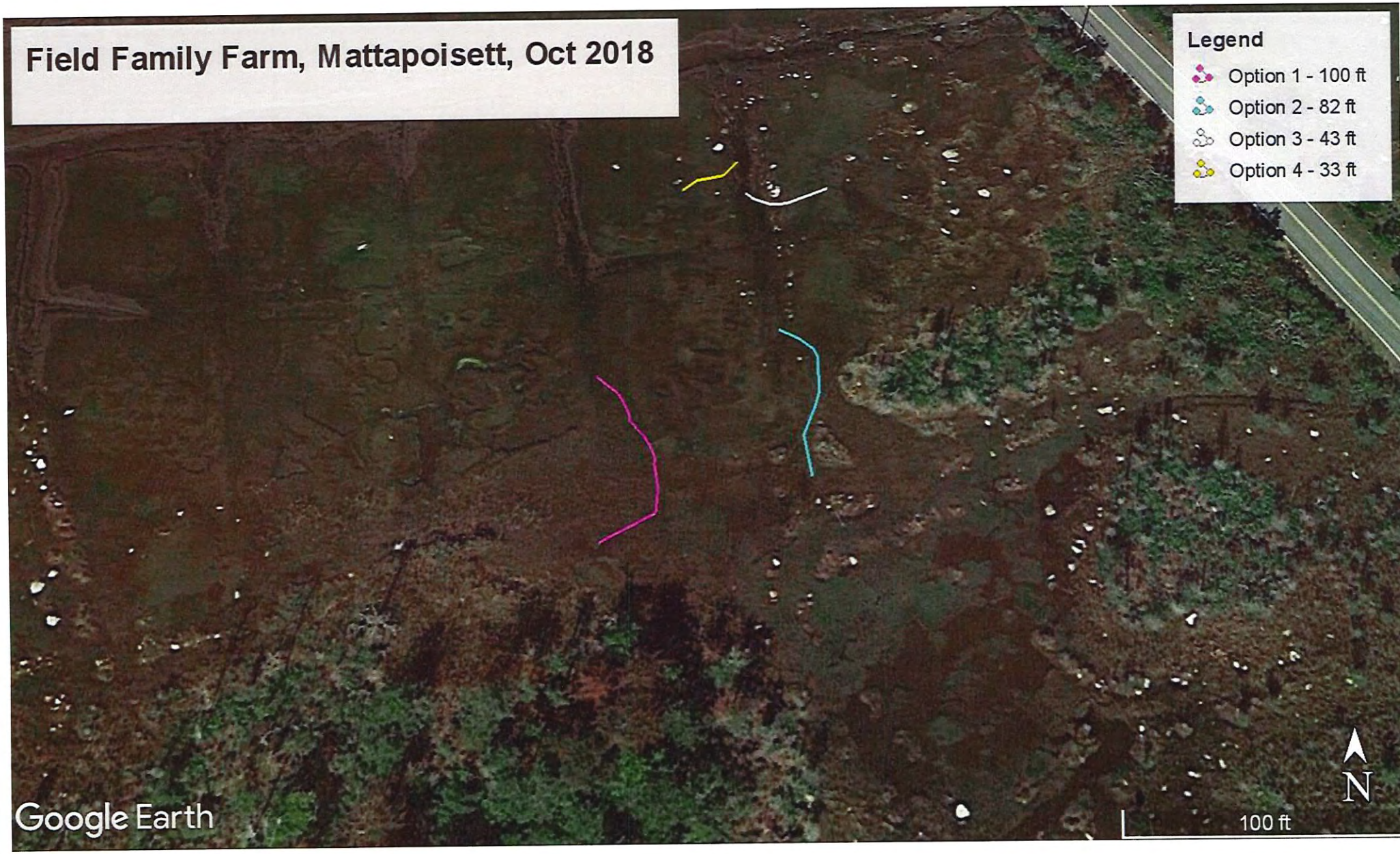
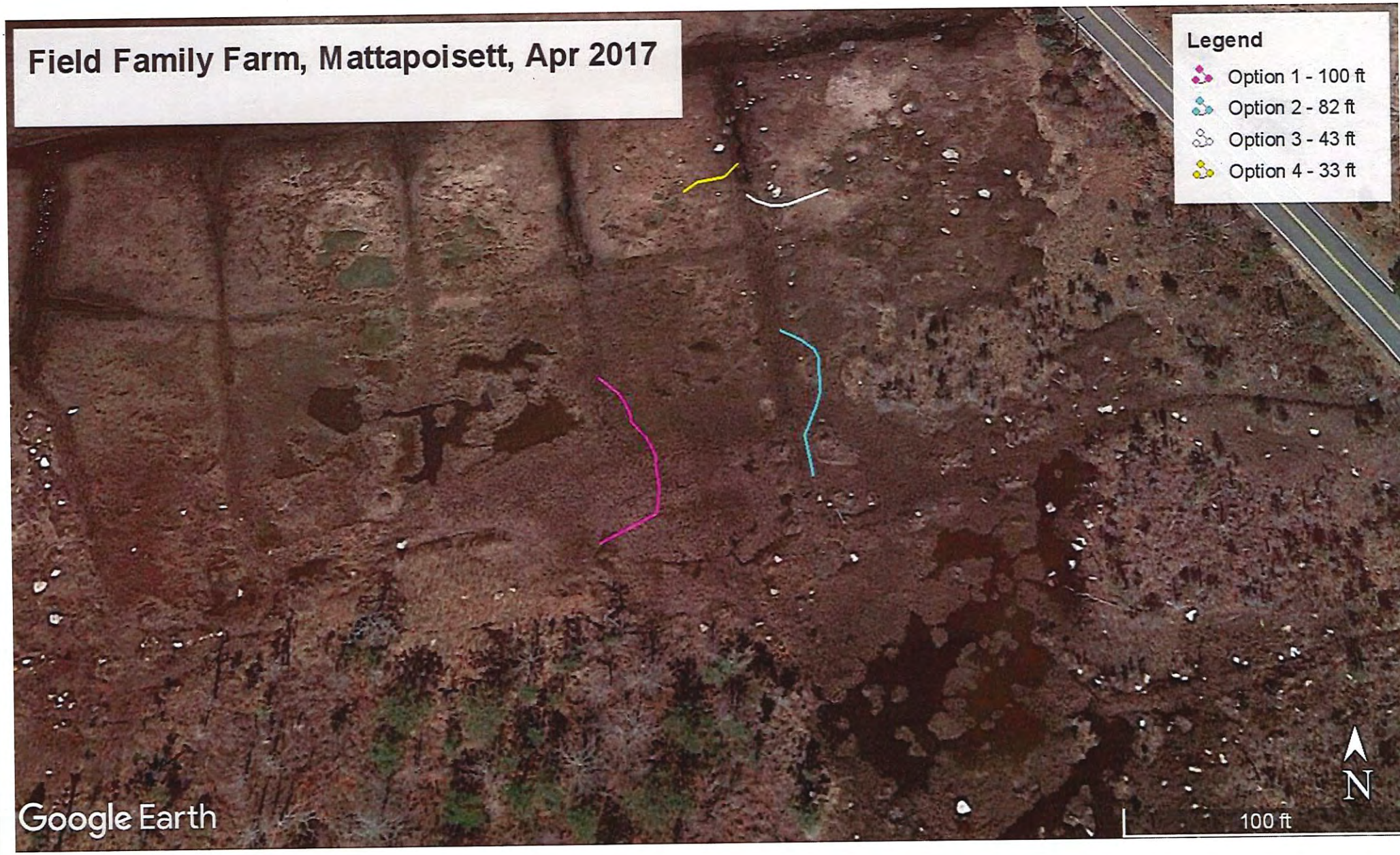
S
W
60%
50%
40%
30%
20%
10%
0%

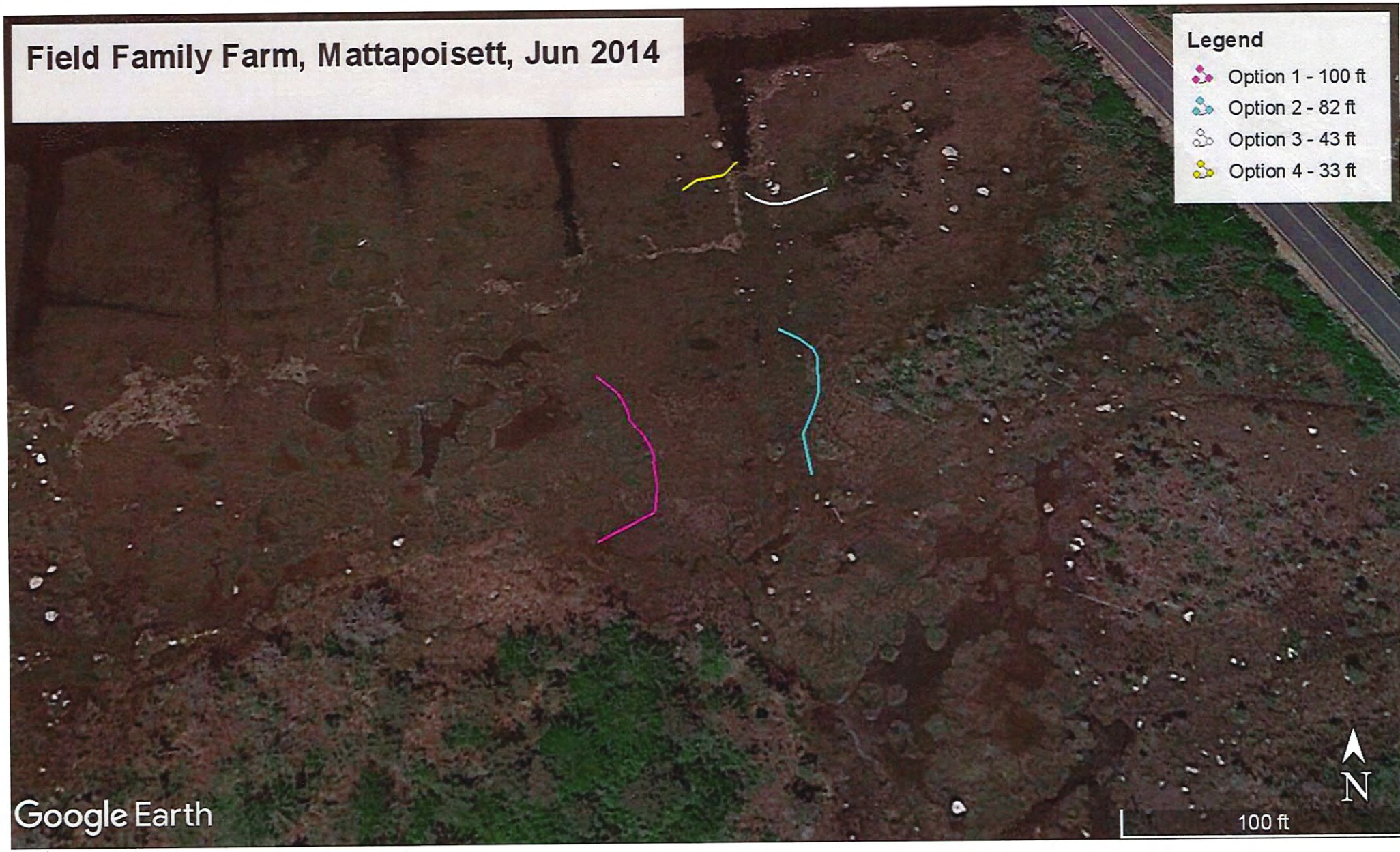

Field Family Farm, Mattapoisett
Legend
Culvert
Field Family Property
Installed Benchmark
Long-Term Monitoring Transects
Option 1 - 100 ft
Option 2 - 82 ft
Option 3 - 43 ft
Option 4 - 33 ft
Parking
Protected Open Space
P
N
200 ft
Google Earth

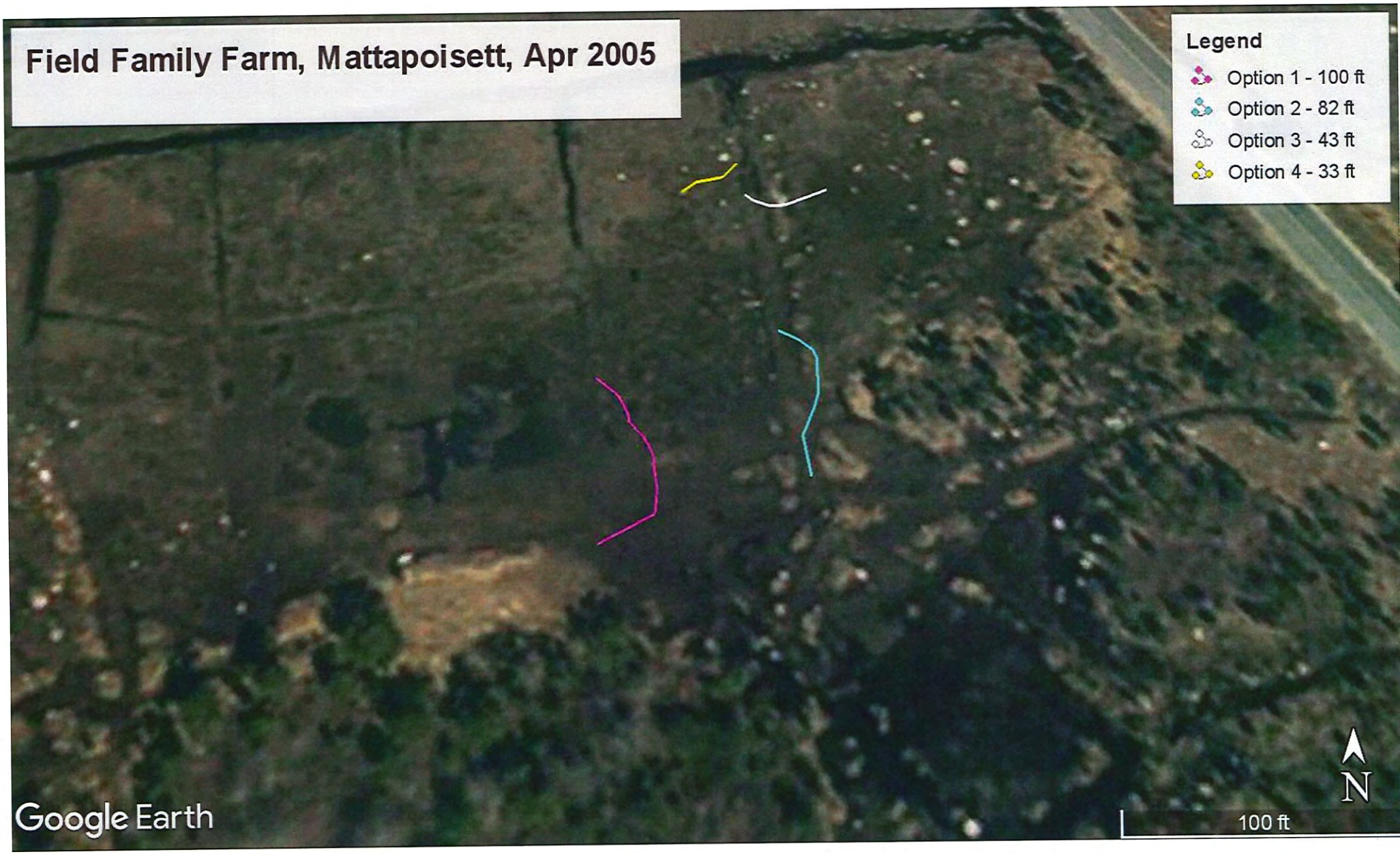

Field Family Farm, Mattapoisett
Google Earth
Image © 2020 TerraMetrics
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
10 mi
N


Field Family Farm, Mattapoisett
Pine Islan
Pin
Randall Rock
Barstow Rock
Snow Rock
Sunken Ledge
Gallatin Rock
Gravelly Rock
Mattapoisett Ledge
Brant Island Cove
Brant Island
Google Earth
© 2020 Google
N
1 mi


Field Family Farm, Mattapoisett, Oct 2018
Legend
Option 1 - 100 ft
Option 2 - 82 ft
Option 3 - 43 ft
Option 4 - 33 ft
Google Earth
N
100 ft

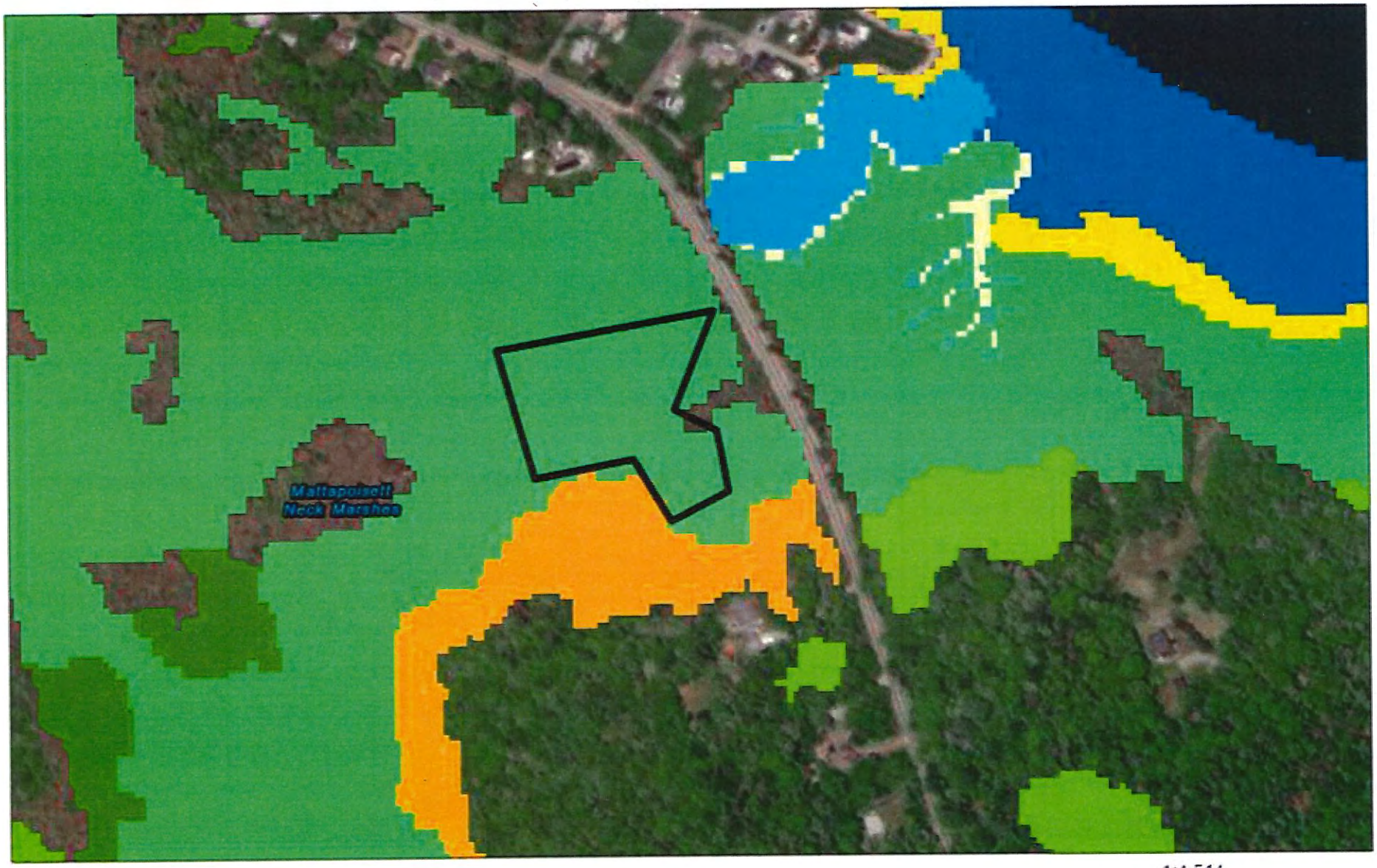

Field Family Farm, Mattapoisett, Apr 2017
Legend
Option 1 - 100 ft
Option 2 - 82 ft
Option 3 - 43 ft
Option 4 - 33 ft
Google Earth
N
100 ft


Field Family Farm, Mattapoisett, Jun 2014
Legend
Option 1 - 100 ft
Option 2 - 82 ft
Option 3 - 43 ft
Option 4 - 33 ft
Google Earth
N
100 ft


Field Family Farm, Mattapoisett, Apr 2005
Legend
Option 1 - 100 ft
Option 2 - 82 ft
Option 3 - 43 ft
Option 4 - 33 ft
N
100 ft
Google Earth

Field photographs from January/February 2020, within 3 hours of low tide.

Field Family Farm, Mattapoisett, Initial Conditions, 2011



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sn_ylw-pushpin

1:4,514

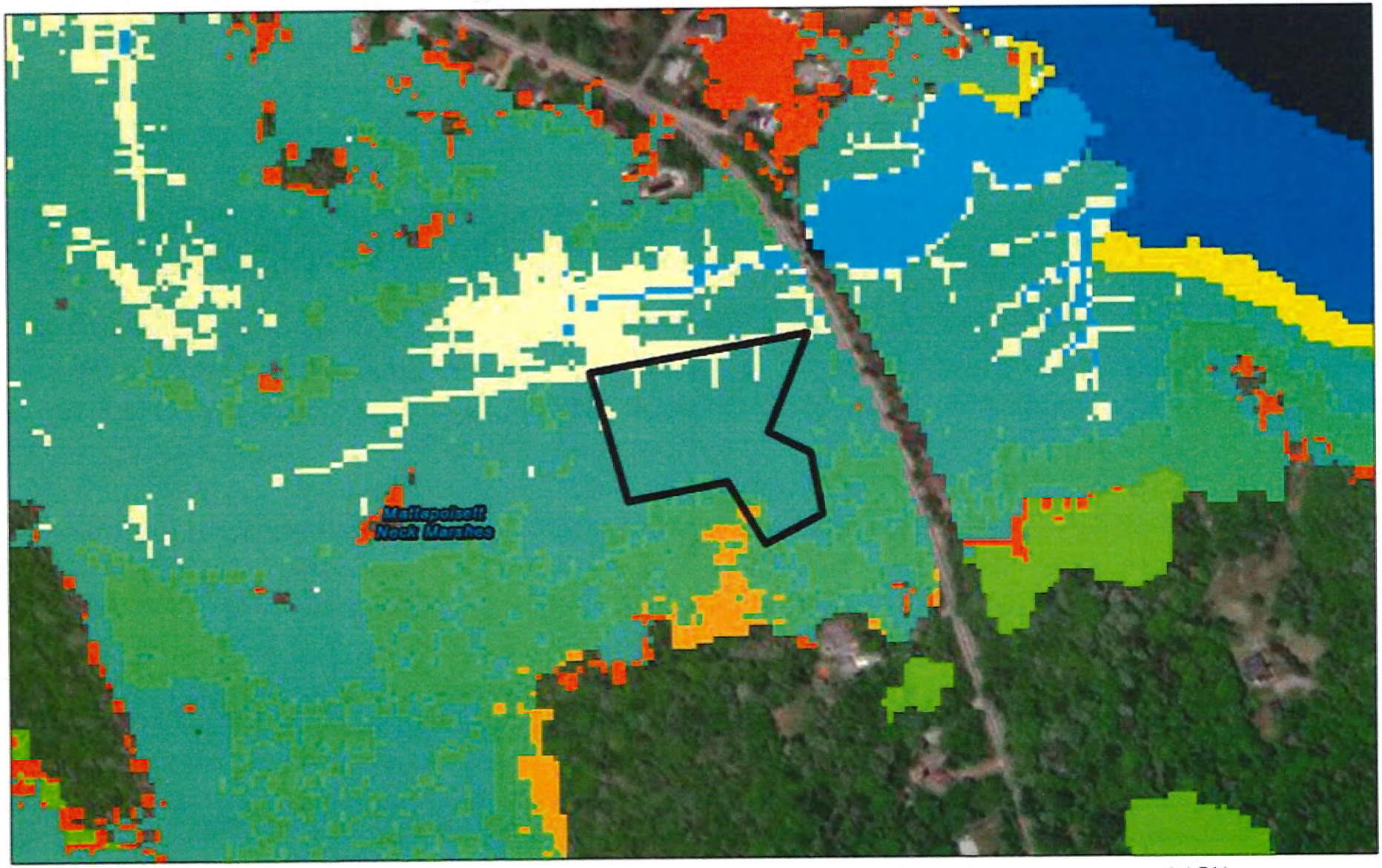
0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

Web AppBuilder for ArcGIS

Field Family Farm, Mattapoisett, 2.3 ft SLR (2100)



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sn_ylw-pushpin

1:4,514

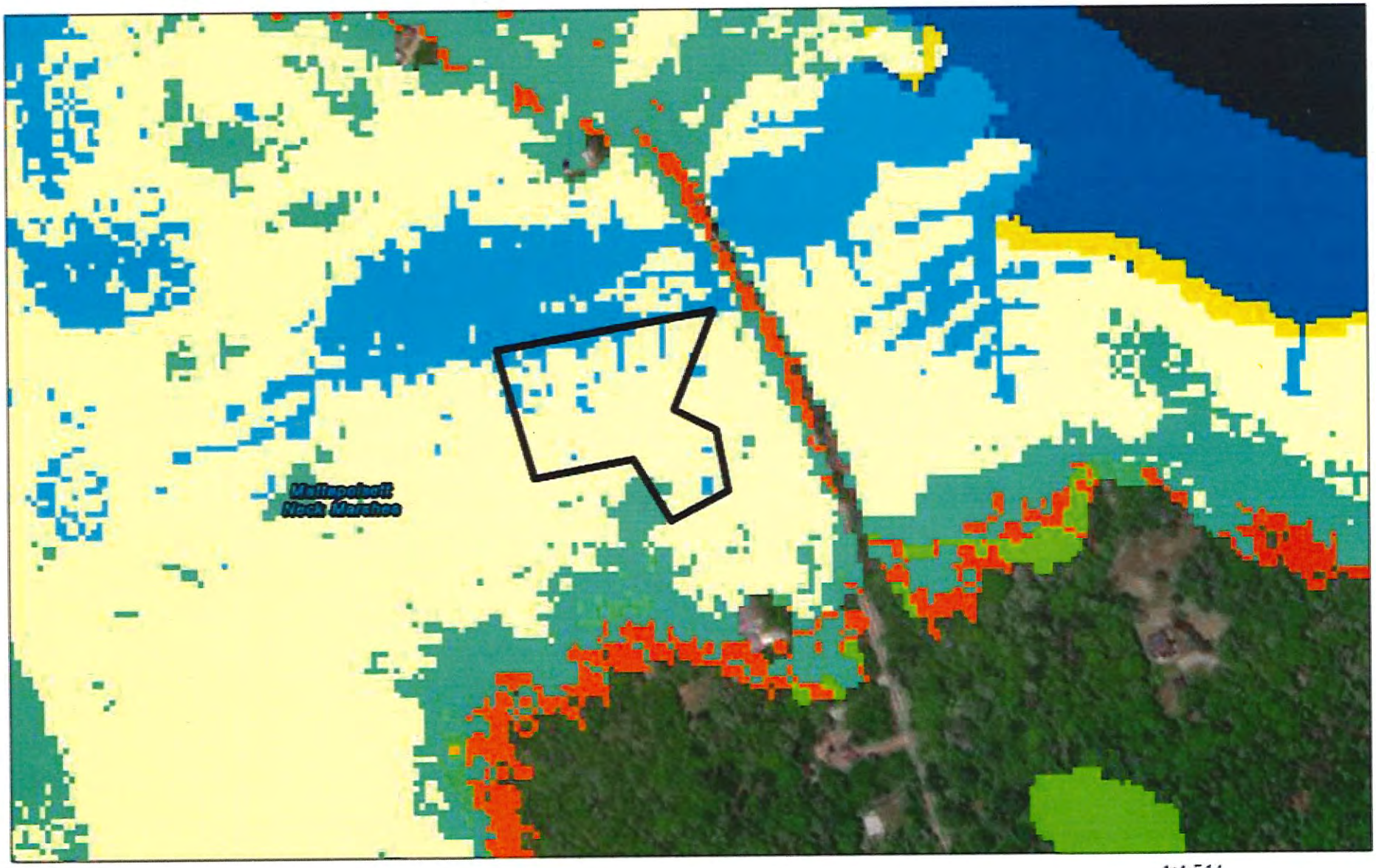
0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

Web AppBuilder for ArcGIS

Field Family Farm, Mattapoisett, 4.5 ft SLR (2100)



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1582742650226r4286467087464334_0

sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Massachusetts Office of Coastal Zone Management | 251 Causeway Street

Web AppBuilder for ArcGIS

SITE EVALUATION

- Is this marsh suitable for a runnel adaptation project? _____
- Why or why not?

  _____

  _____

  _____

  _____
- Which runnel option(s) do you think is/are best (none is an acceptable answer!)? ____
- Do you agree with the placement, length, and direction of the runnel(s)?_____
- Why or why not? Describe suggested changes you would make (feel free to draw!)

  _____

  _____

  _____

  _____
- Would additional adaptation actions have to be taken at this site for a runnel project to successfully improve drainage, allow revegetation, and maintain elevation (e.g. ditch maintenance, culvert replacement, sediment placement)? _____
- If not, why? And if additional actions would be necessary, which ones and why?

  _____

  _____

  _____

  _____
- Do you have any thoughts on how a runnel at this site should be dug (by hand, low-pressure excavator), and/or whether a deeper-narrower, or shallower-wider runnel would be more suitable here? Should a sill be left?

  _____

  _____

  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**

Hammett's Cove Runnel Site

Table of Contents

FACT SHEET

Site: Hammett's Cove, Town of Marion, Plymouth County

Ownership and Protection of Marsh: Sippican Land Trust, Protected Open Space

Ownership and Protection Adjacent Parcels: Town of Marion, Sippican Land Trust, Protected Open Space

Access: Pull-off to park on the south side of the road. To access marsh must climb down a steep rocky embankment.

Elevation: 2.05 ± 0.35 ft NAVD88

MHW: 1.80 ft NAVD88

Existing drainage considerations: Area restricted by a culvert. Ditches not clogged. Freshwater input from road possible.

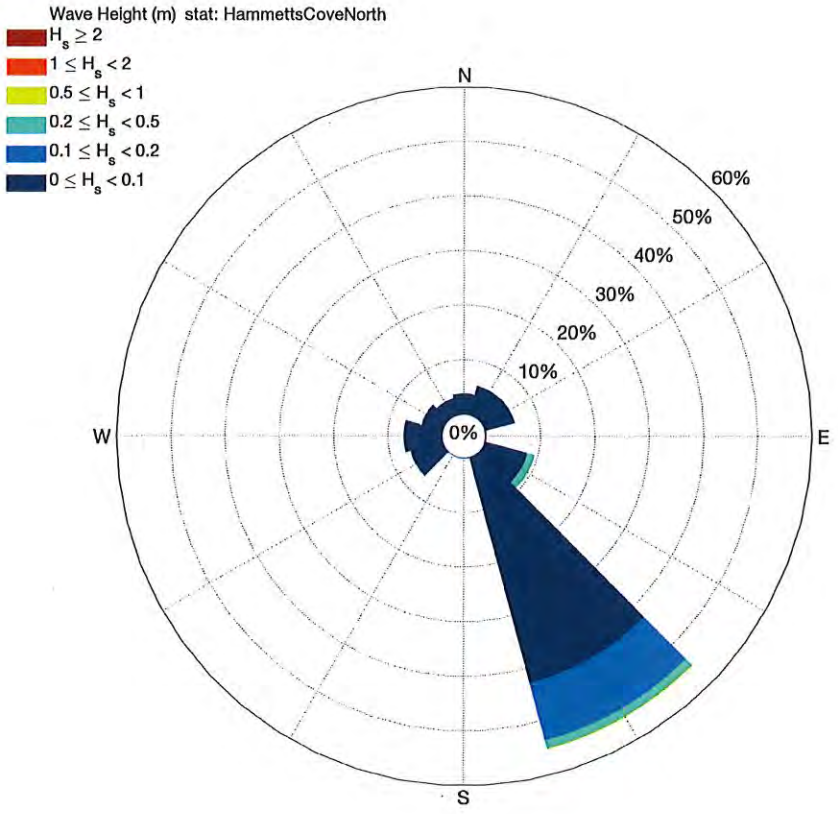
Peat condition: Peat was relatively firm.

Close to existing salt marsh monitoring transects (BBC and BBNEP)?: Yes

Wind wave exposure: Low from south-southeast. Wave energy not likely directly affecting this marsh area.

Proposal: Marsh platform still mostly vegetated, with some areas of die-back. Die-back did not have standing water, and was note very soft.

We propose to treat one of the smaller areas of marsh die-back with a runnel in one of the potential locations indicated on the map. These would be small runnels, intended to facilitate marsh migration into forest area to eastern side of marsh.


Wave Height (m) stat: HammettsCoveNorth
$H_s \geq 2$
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
N
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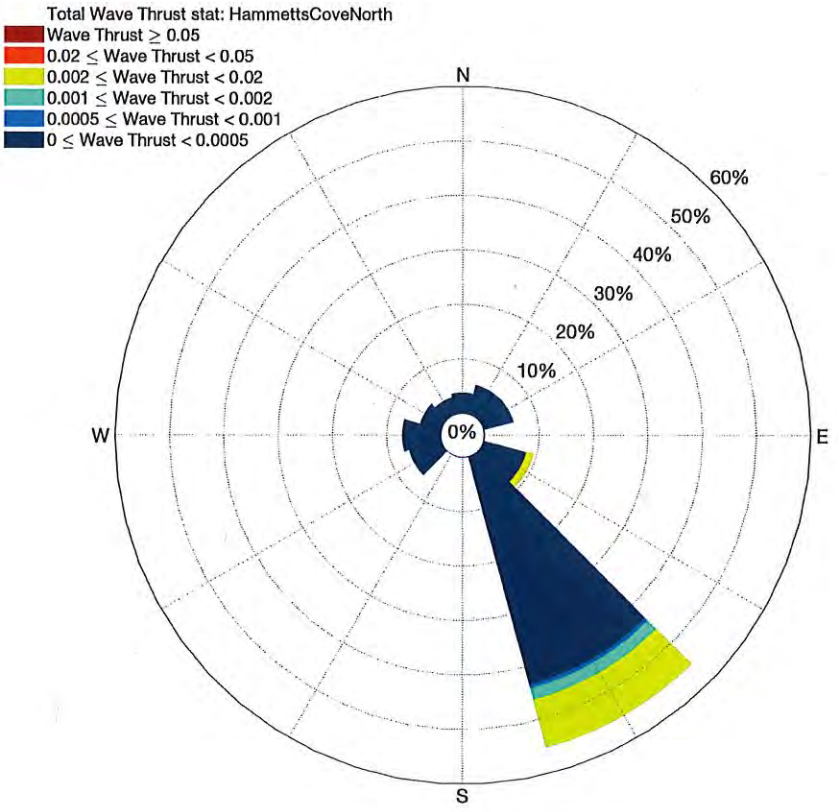
20%
10%
0%


Total Wave Thrust stat: HammettsCoveNorth
Wave Thrust ≥ 0.05
$0.02 \leq$ Wave Thrust < 0.05
$0.002 \leq$ Wave Thrust < 0.02
$0.001 \leq$ Wave Thrust < 0.002
$0.0005 \leq$ Wave Thrust < 0.001
$0 \leq$ Wave Thrust < 0.0005
N
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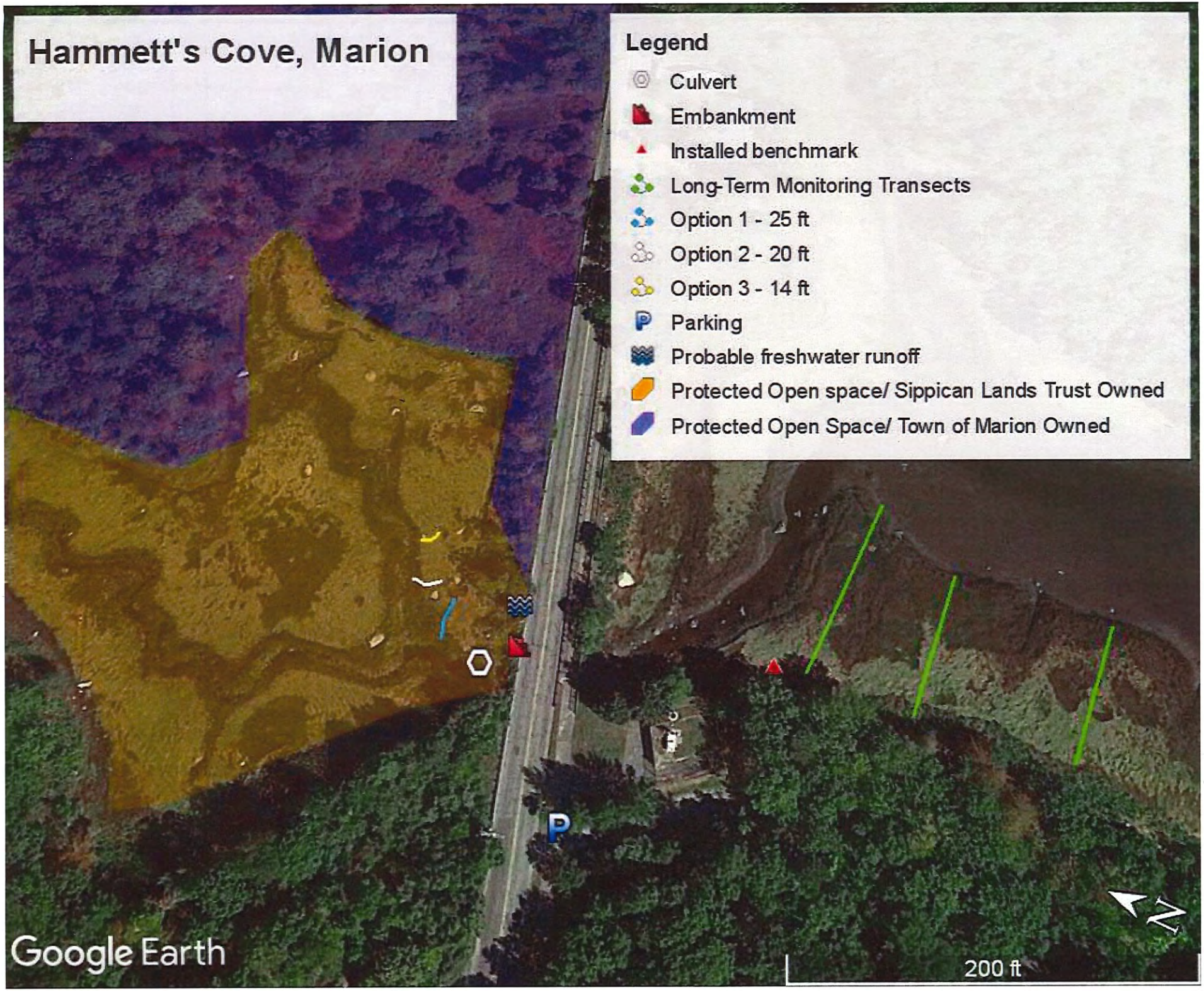
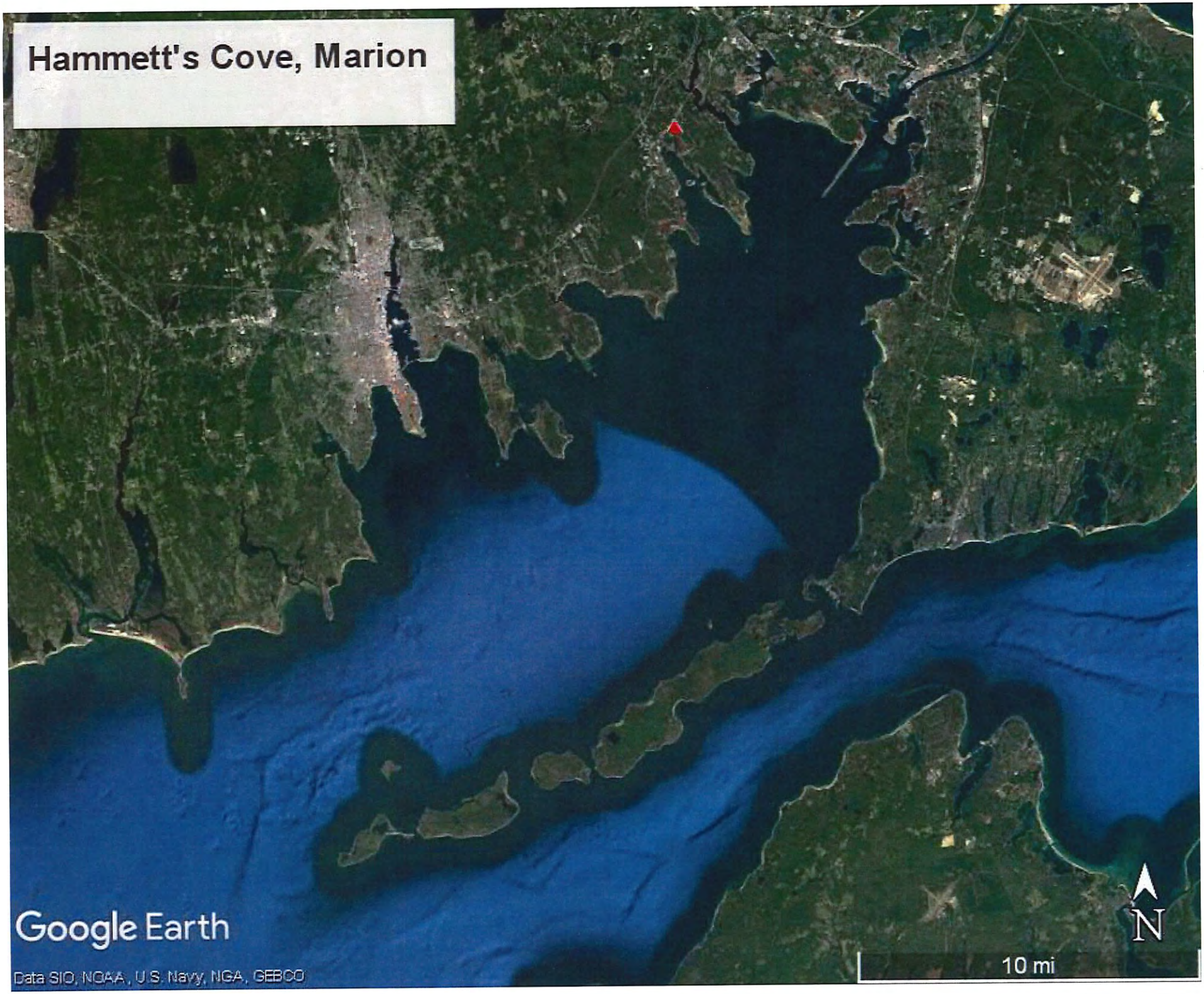
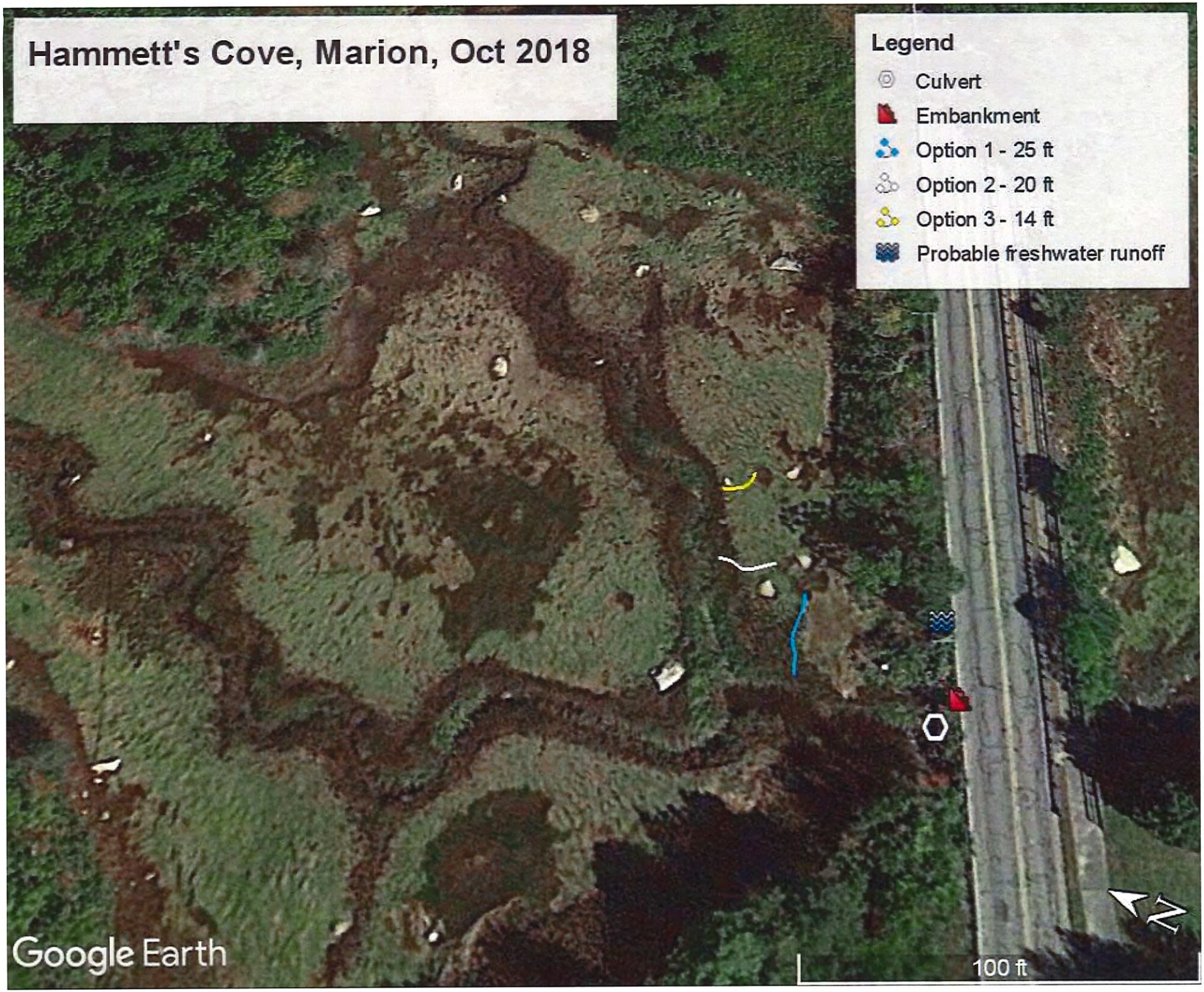
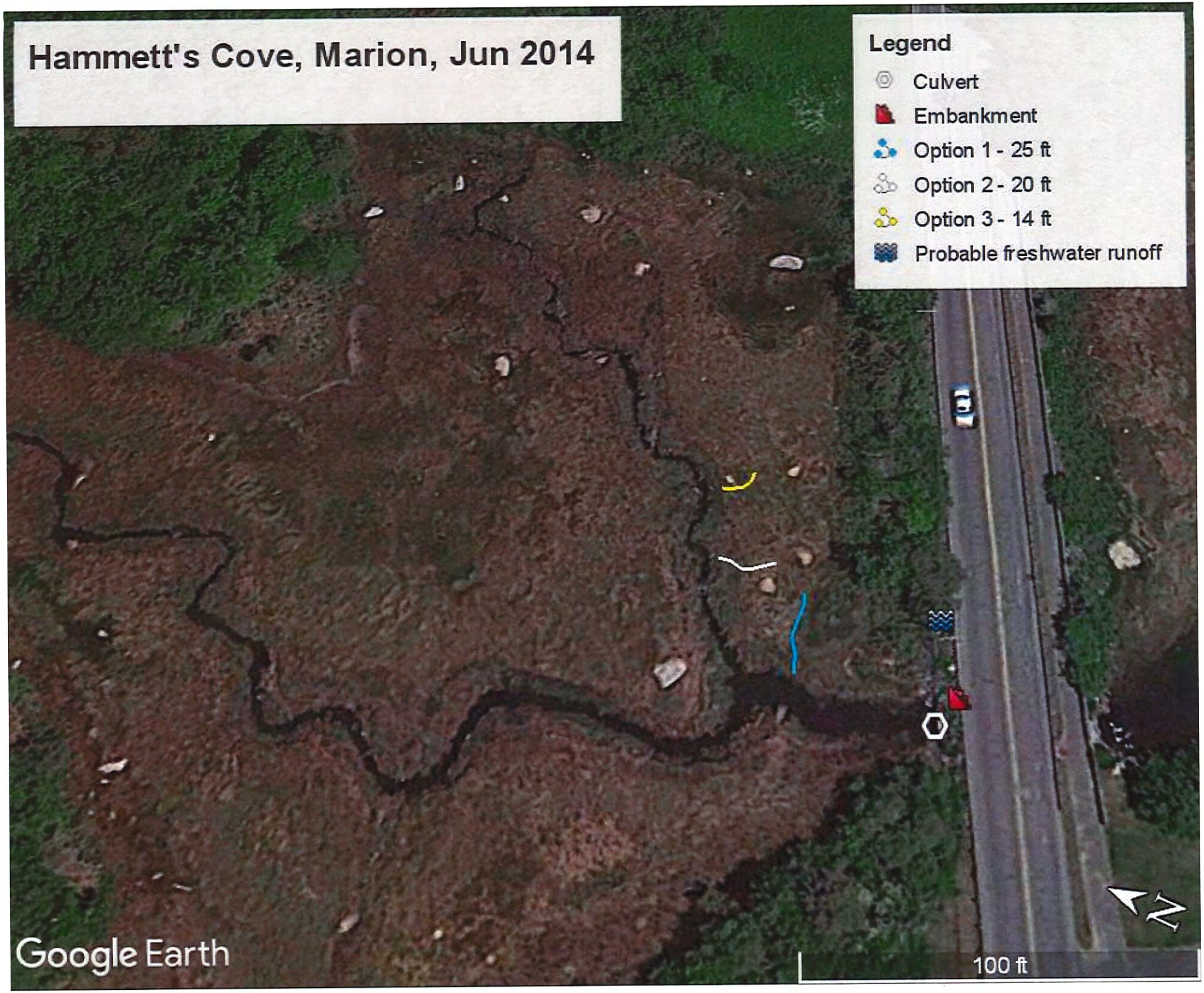
S
W
60%
50%
40%
30%
20%
10%
0%

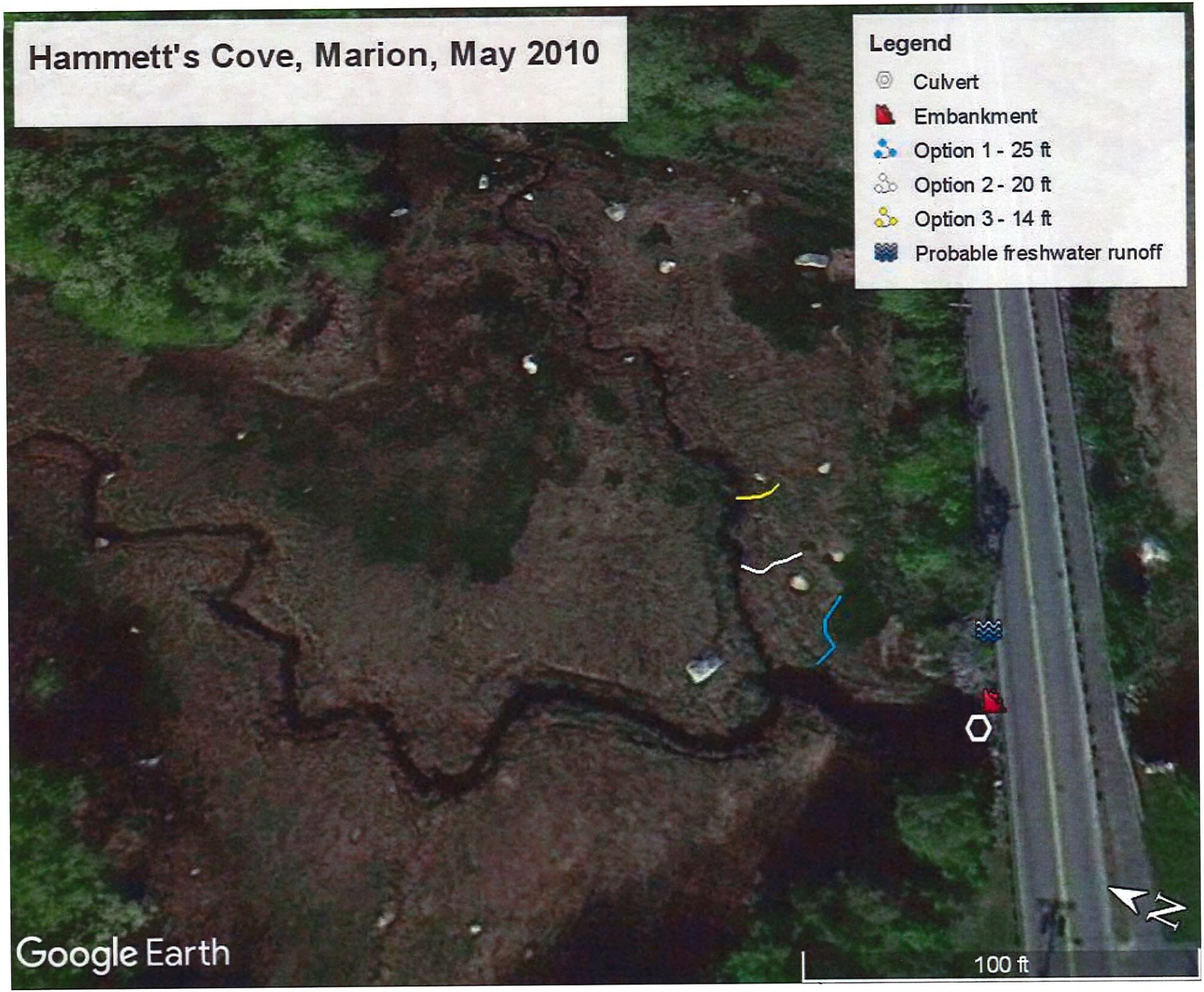

Hammett's Cove, Marion
Legend
Culvert
Embankment
Installed benchmark
Long-Term Monitoring Transects
Option 1 - 25 ft
Option 2 - 20 ft
Option 3 - 14 ft
Parking
Probable freshwater runoff
Protected Open space/ Sippican Lands Trust Owned
Protected Open Space/ Town of Marion Owned
P
P
N
Google Earth
200 ft

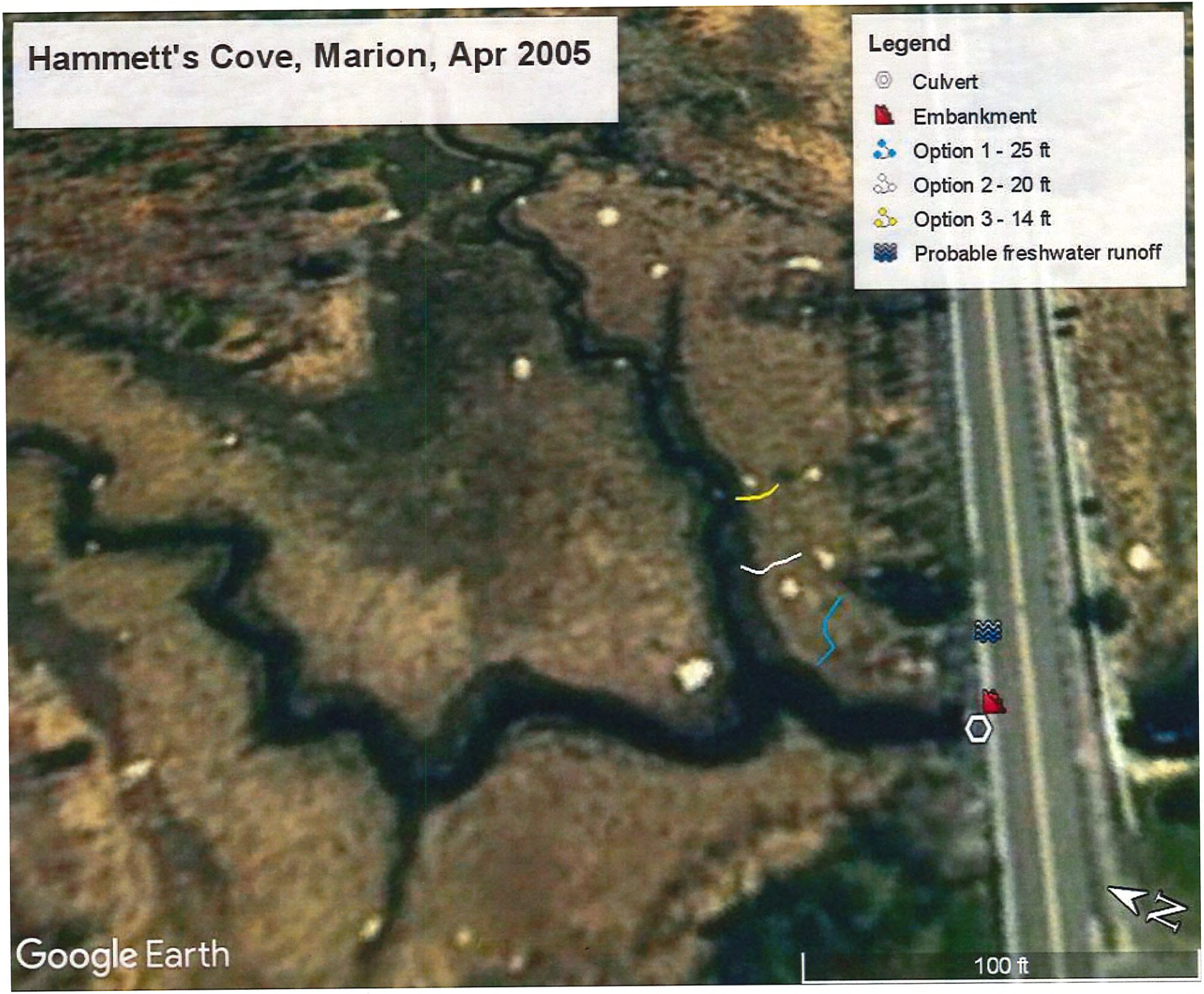

Hammett's Cove, Marion
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
N
10 mi


Hammett's Cove, Marion
Hammett Cove
Gravel Island
Google Earth
© 2020 Google
N
4000 ft


Hammett's Cove, Marion, Oct 2018
Legend
Culvert
Embankment
Option 1 - 25 ft
Option 2 - 20 ft
Option 3 - 14 ft
Probable freshwater runoff
Google Earth
100 ft
N

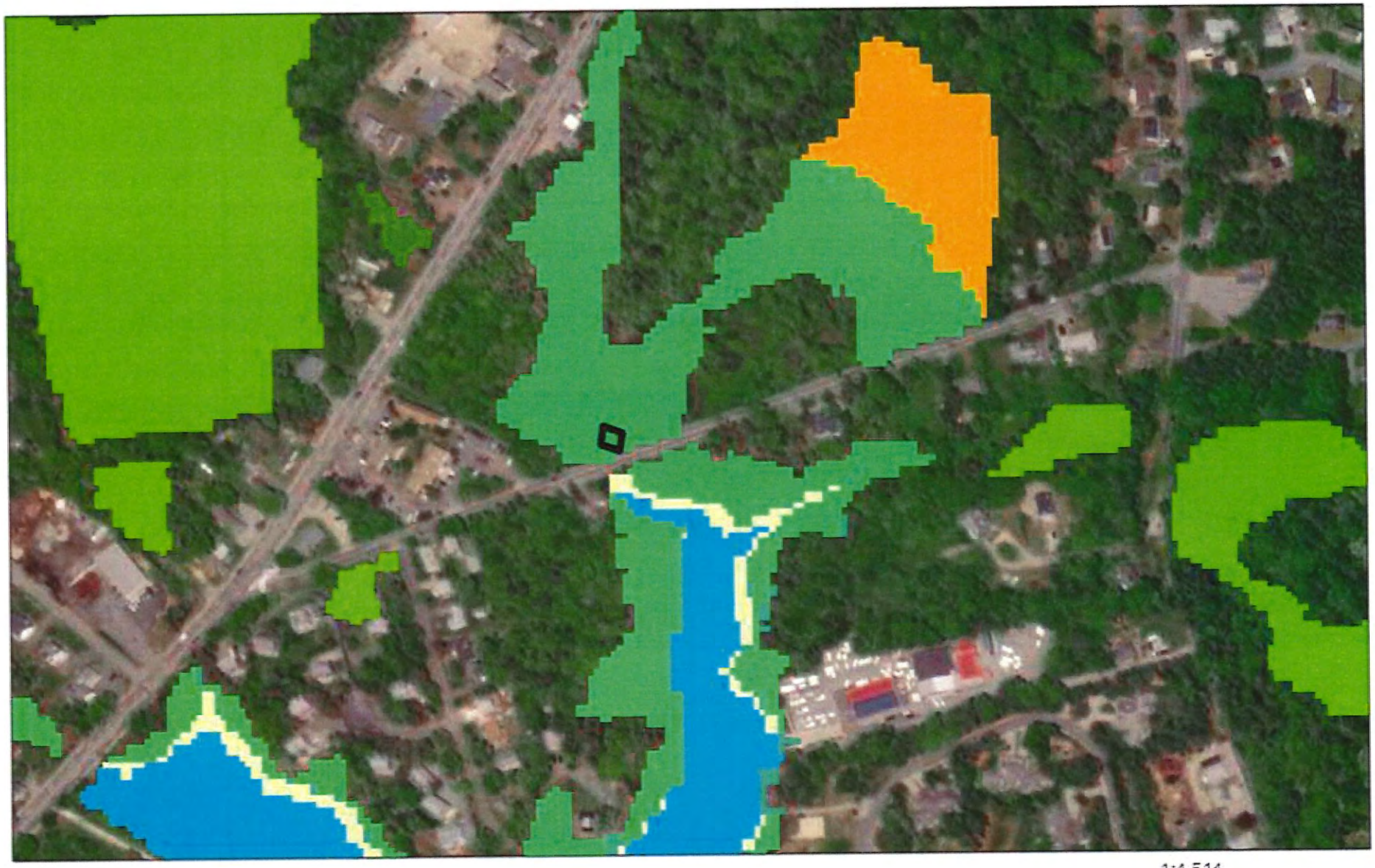

Hammett's Cove, Marion, Jun 2014
Legend
Culvert
Embankment
Option 1 - 25 ft
Option 2 - 20 ft
Option 3 - 14 ft
Probable freshwater runoff
Google Earth
100 ft
N


Hammett's Cove, Marion, May 2010
Legend
Culvert
Embankment
Option 1 - 25 ft
Option 2 - 20 ft
Option 3 - 14 ft
Probable freshwater runoff
Google Earth
100 ft
N


Hammett's Cove, Marion, Apr 2005
Legend
Culvert
Embankment
Option 1 - 25 ft
Option 2 - 20 ft
Option 3 - 14 ft
Probable freshwater runoff
Google Earth
100 ft
N

Field photographs from January/February 2020, within 3 hours of low tide.

Hammetts Cove, Marion, Initial Conditions, 2011



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1582742650226r4286467087464334_0

sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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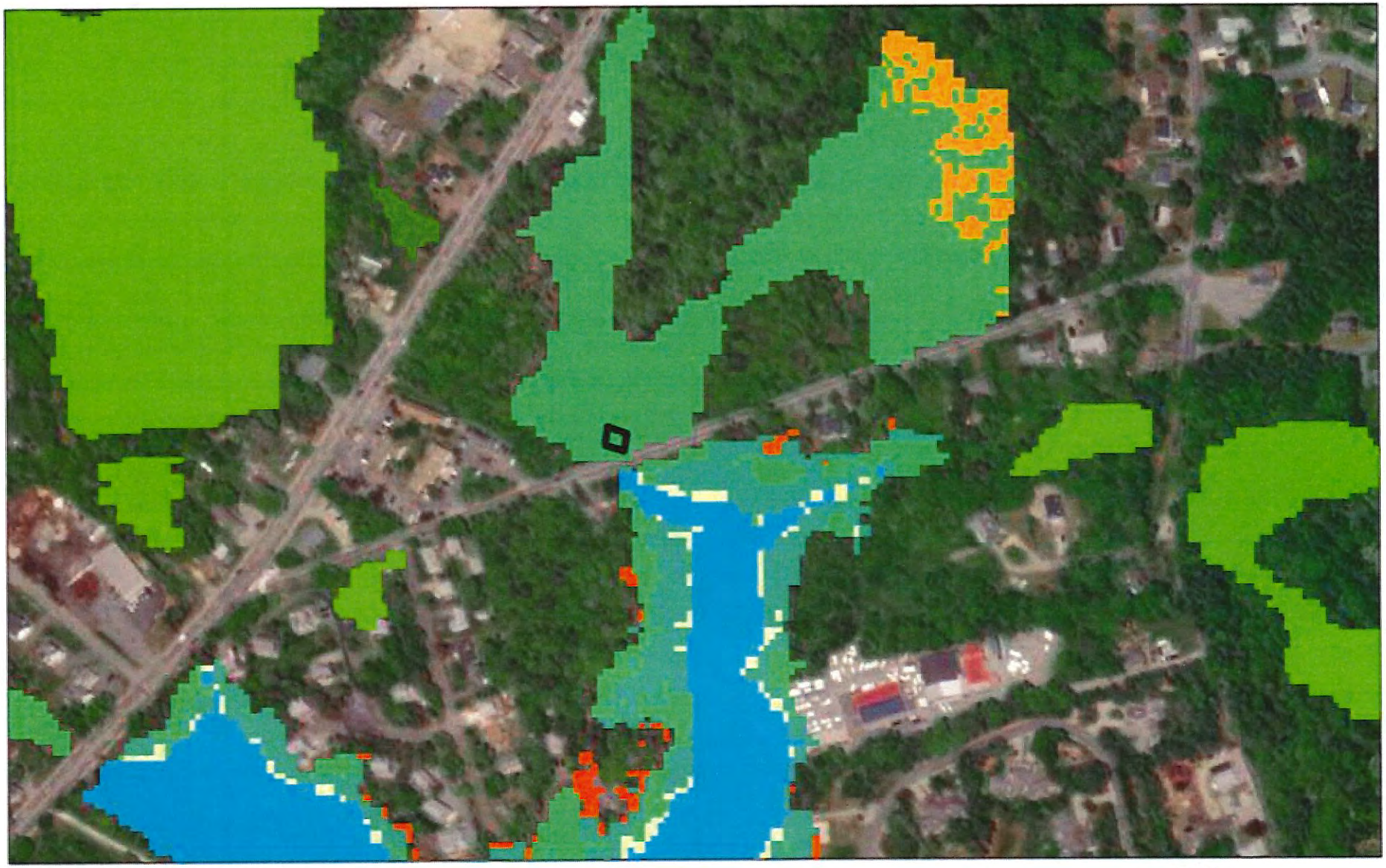
Web AppBuilder for ArcGIS

Hammetts Cove, Marion, 2.3 ft. SLR (2100)



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1:4,514

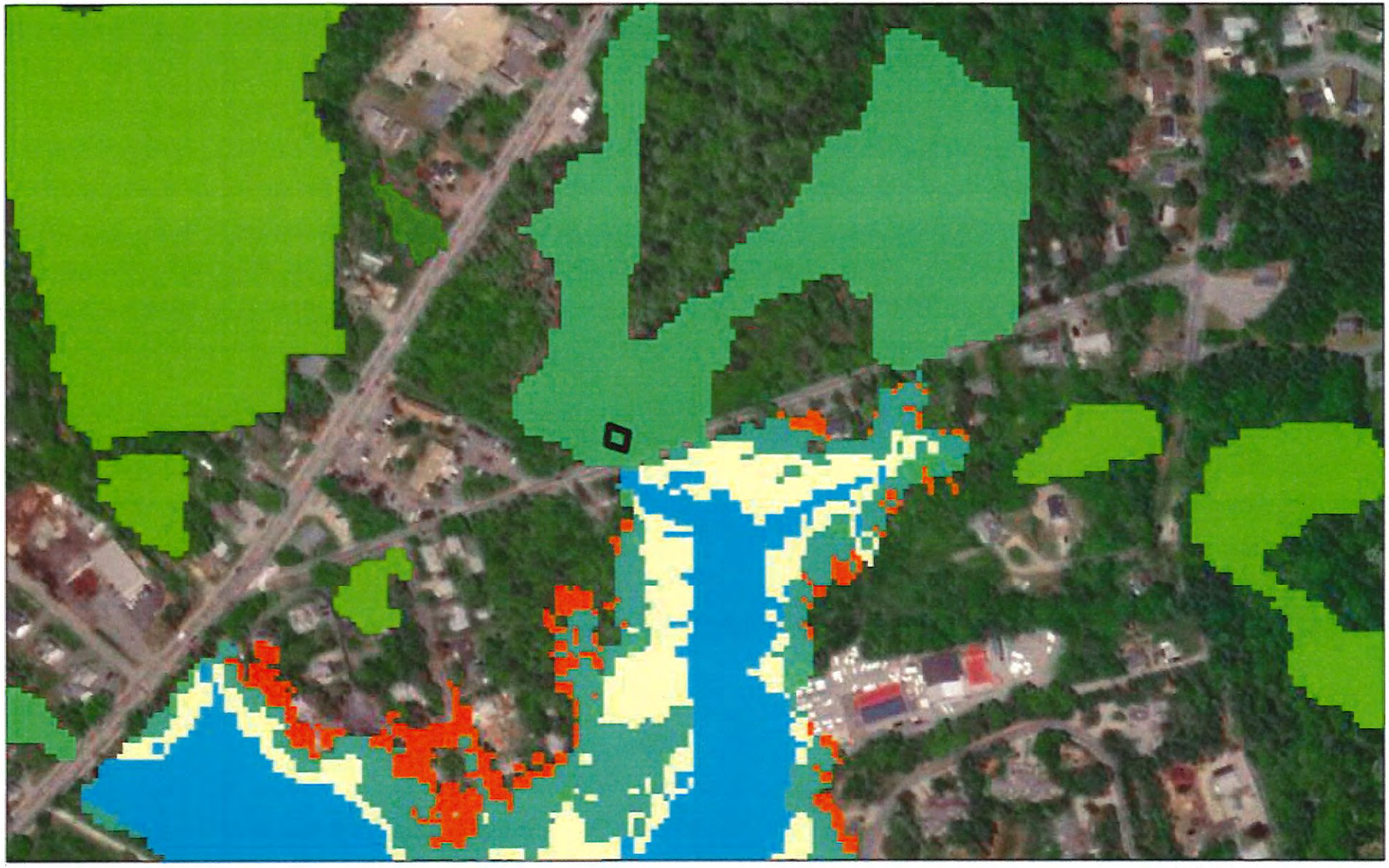
0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

Web AppBuilder for ArcGIS

Hammetts Cove, Marion, 4.5 ft. SLR (2100)



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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Massachusetts Office of Coastal Zone Management | 251 Causeway Street

Web AppBuilder for ArcGIS

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SITE EVALUATION

- Is this marsh suitable for a runnel adaptation project? _____
- Why or why not?

  _____

  _____

  _____

  _____
- Which runnel option(s) do you think is/are best (none is an acceptable answer!)? ____
- Do you agree with the placement, length, and direction of the runnel(s)?_____
- Why or why not? Describe suggested changes you would make (feel free to draw!)

  _____

  _____

  _____

  _____
- Would additional adaptation actions have to be taken at this site for a runnel project to successfully improve drainage, allow revegetation, and maintain elevation (e.g. ditch maintenance, culvert replacement, sediment placement)? _____
- If not, why? And if additional actions would be necessary, which ones and why?

  _____

  _____

  _____

  _____
- Do you have any thoughts on how a runnel at this site should be dug (by hand, low-pressure excavator), and/or whether a deeper-narrower, or shallower-wider runnel would be more suitable here? Should a sill be left?

  _____

  _____

  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**

Little Bay Runnel Site

Table of Contents

FACT SHEET

Site: Little Bay, Town of Fairhaven, Bristol County

Ownership and Protection of Marsh: Town of Fairhaven, Protected Open Space

Ownership and Protection Adjacent Parcels: Town of Fairhaven, Protected Open Space

Access: Park in town owned parking lot. Walk 0.12 miles down bike path (approximately 5 feet wide), then enter marsh from concrete pier. Alternate access may be possible adjacent to the path on ground.

Elevation: 2.29 ± 0.09 ft NAVD88

MHW: 1.85 ft NAVD88

Existing drainage considerations: Ditches appear to be draining (no clogging vegetation). Small elevation ridge (4-6”) along the ditch edge from ditch spoils. No issues with undersized culvert/tidal restriction. No apparent issues with high volume road run-off or other freshwater inputs.

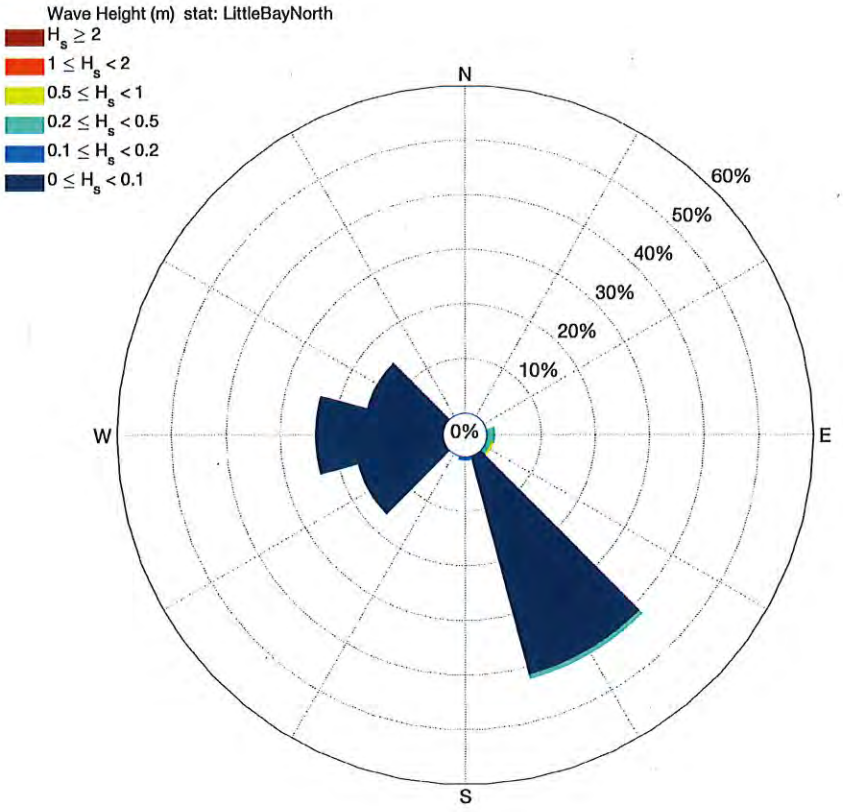
Peat condition: Marsh was firm other than in depressions and die-back areas. Much of the platform appeared firm and healthy.

Close to existing salt marsh monitoring transects (BBC and BBNEP)?: Yes

Wind wave exposure: Very low thrust and wave heights, from the southeast and west (see wind rose figures)

Proposal: Depressions and marsh die-back on multiple lobes of the marsh. Patches vary between no standing water (exposed bare sediment), and standing water of a depth up to 6-8”. Many depressions have ragged edges, appear to be recent die-off. We propose to dig one runnel to treat an area of die-back.

Three potential runnel locations are indicated in blue, white, and yellow. These runnels would be approximately 40 ft, 40 ft, and 25 ft in length. The location of existing long-term marsh monitoring transects are indicated in green, and the red triangle indicates the location of the installed benchmark.


Wave Height (m) stat: LittleBayNorth
$H_s \geq 2$
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
N
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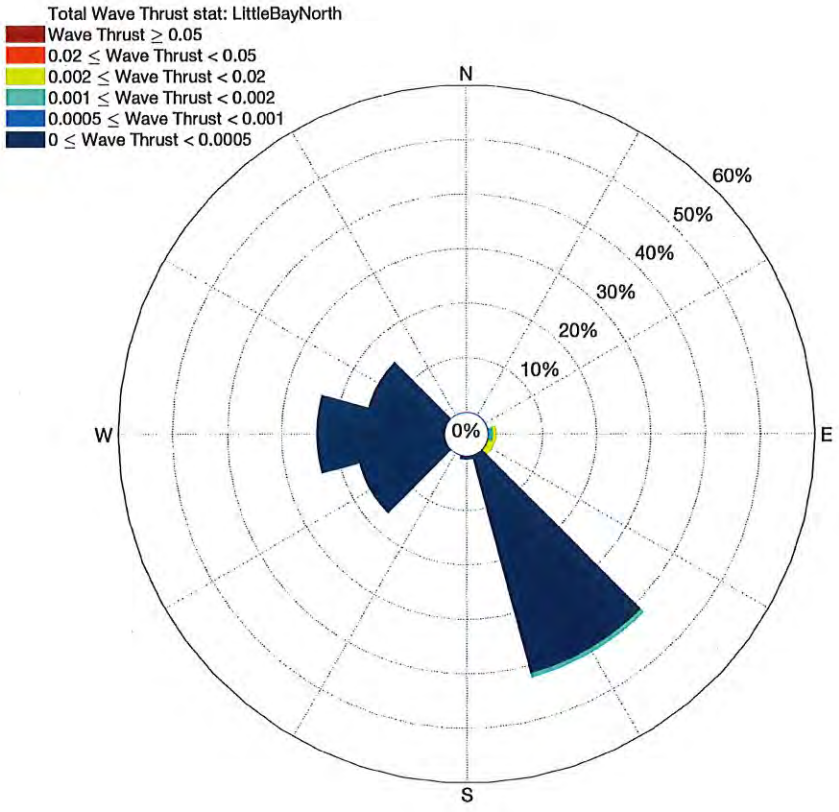
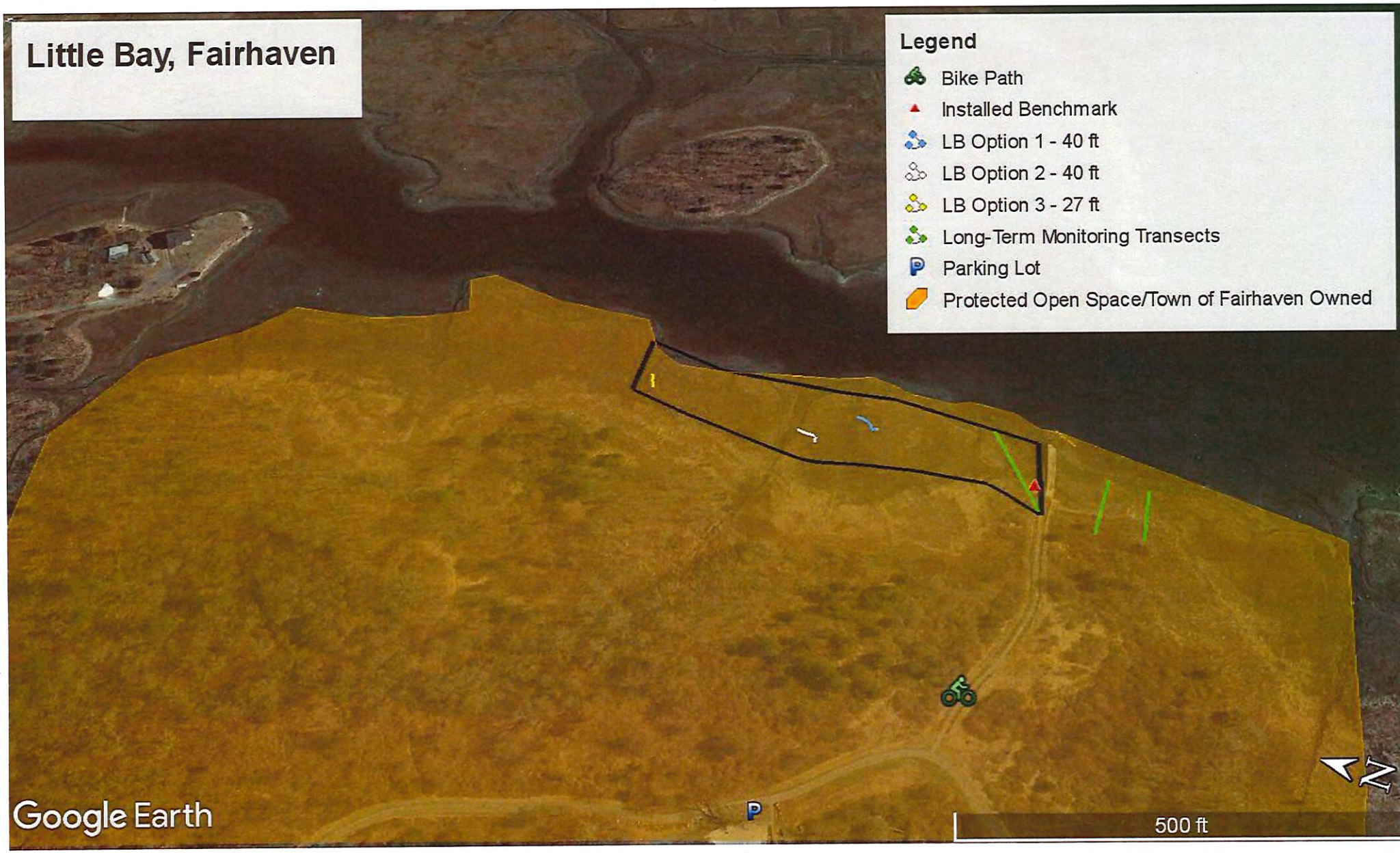
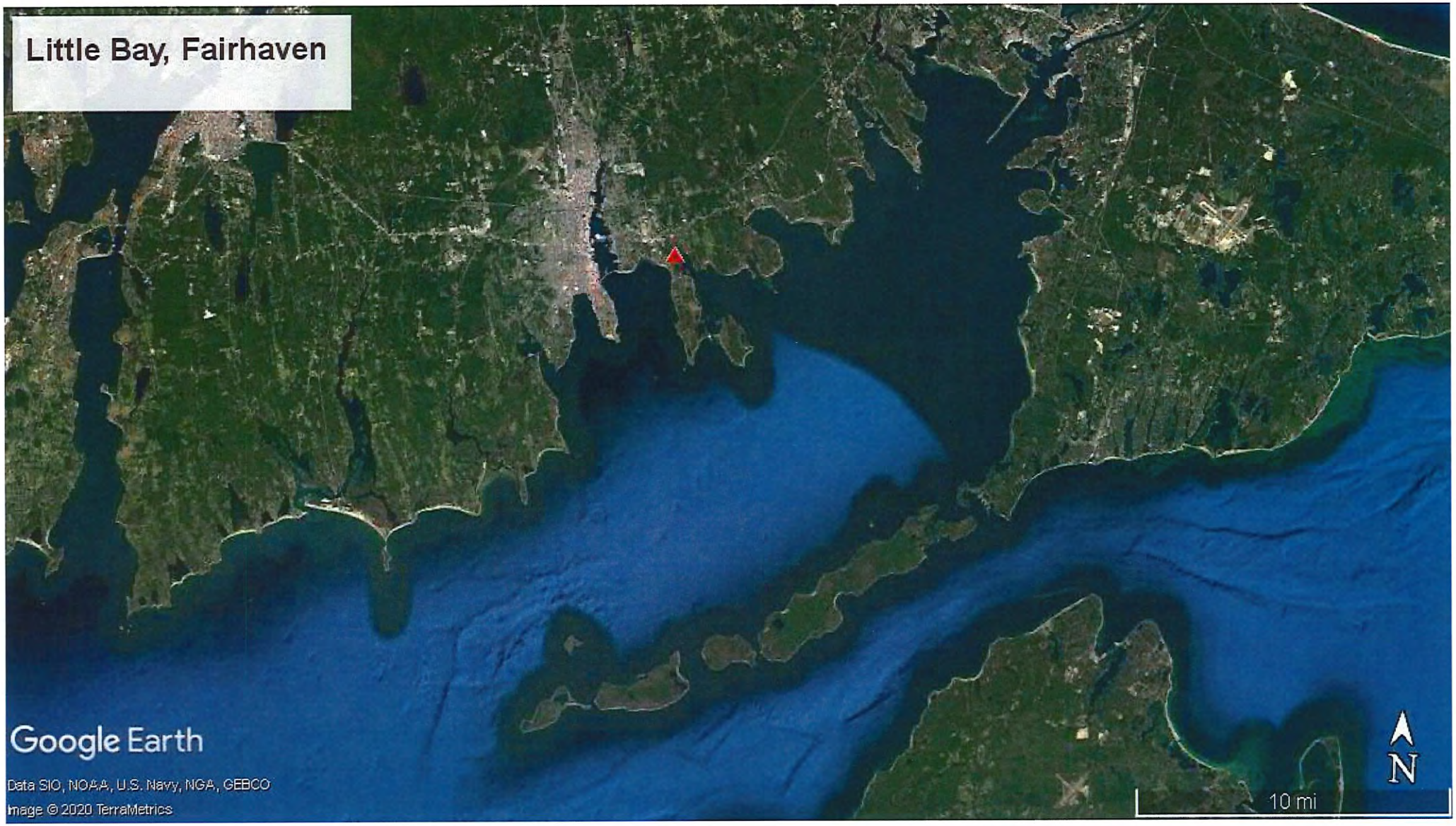
S
W
10%
20%
30%
40%
50%
60%
0%


Total Wave Thrust stat: LittleBayNorth
Wave Thrust ≥ 0.05
$0.02 \leq$ Wave Thrust < 0.05
$0.002 \leq$ Wave Thrust < 0.02
$0.001 \leq$ Wave Thrust < 0.002
$0.0005 \leq$ Wave Thrust < 0.001
$0 \leq$ Wave Thrust < 0.0005
N
E
S
W
10%
20%
30%
40%
50%
60%
0%


Little Bay, Fairhaven
Legend
Bike Path
Installed Benchmark
LB Option 1 - 40 ft
LB Option 2 - 40 ft
LB Option 3 - 27 ft
Long-Term Monitoring Transects
Parking Lot
Protected Open Space/Town of Fairhaven Owned
Google Earth
500 ft
N


Little Bay, Fairhaven
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2020 TerraMetrics
10 mi
N

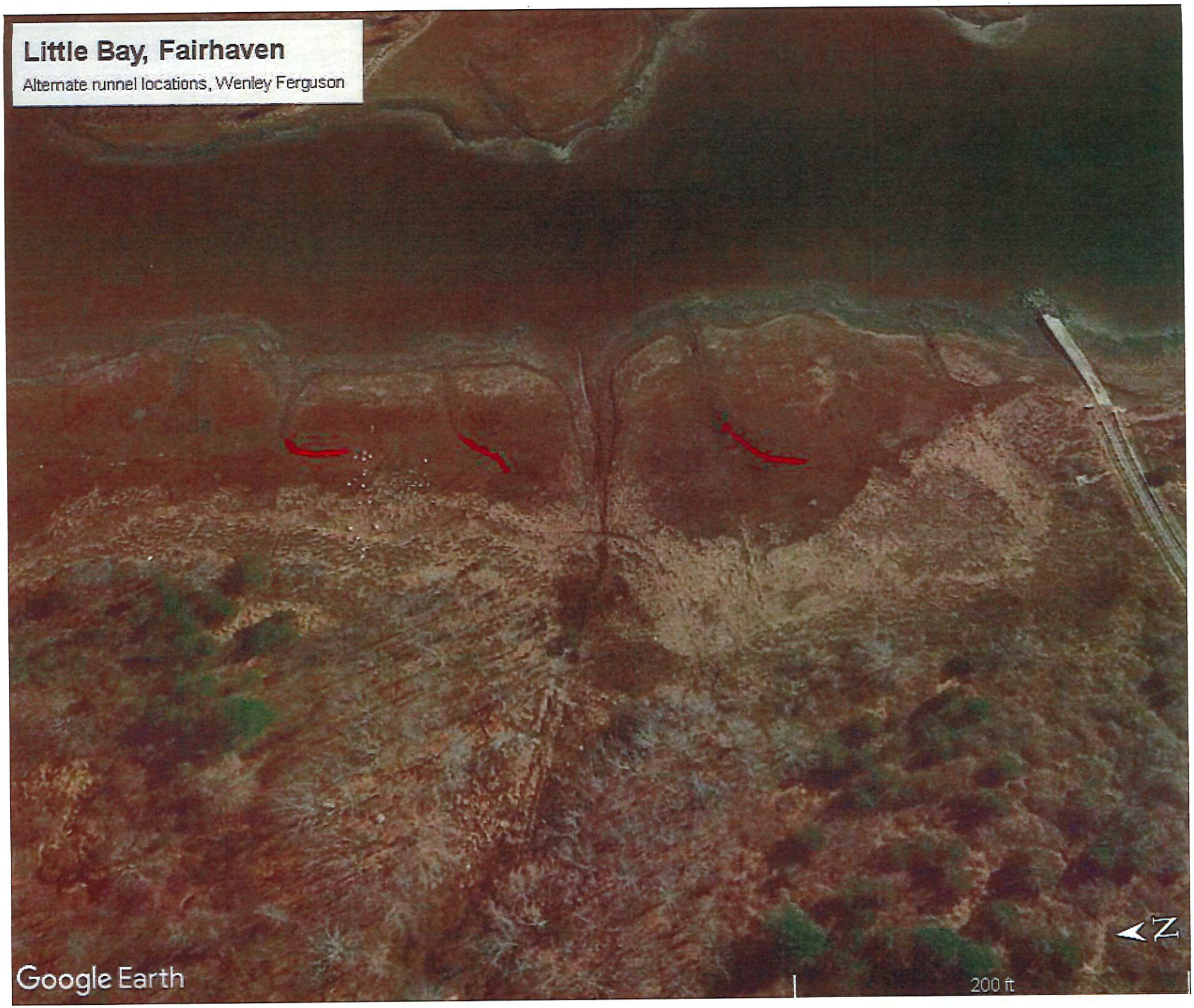

Little Bay, Fairhaven
Little Bay
Shaws Cove
Brant Island Cove
Wards Rock
Brant Island
Pea Island
White Rock
Seal Island
Old Kelick Rock
Nasketucket Bay
West Island
Round Cove
North Cove
Fish Island
Round Island
Google Earth
© 2020 Google
N
1 mi


Little Bay, Fairhaven, Feb 2018
Legend
Installed Benchmark
LB Option 1 - 40 ft
LB Option 2 - 40 ft
LB Option 3 - 27 ft
Long- Term Monitoring Transects
Google Earth
100 ft
N


Little Bay, Fairhaven, Aug 2016
Legend
Installed Benchmark
LB Option 1 - 40 ft
LB Option 2 - 40 ft
LB Option 3 - 27 ft
Long- Term Monitoring Transects
Google Earth
100 ft
N


Little Bay, Fairhaven, Apr 2012
Legend
Installed Benchmark
LB Option 1 - 40 ft
LB Option 2 - 40 ft
LB Option 3 - 27 ft
Long- Term Monitoring Transects
Google Earth
N
100 ft


Little Bay, Fairhaven, Apr 2005
Legend
Installed Benchmark
LB Option 1 - 40 ft
LB Option 2 - 40 ft
LB Option 3 - 27 ft
Long- Term Monitoring Transects
Google Earth
N
100 ft


Little Bay, Fairhaven
Alternate runnel locations, Wenley Ferguson
Google Earth
200 ft
N

Field photographs from January 2020, within 3 hours of low tide.

Little Bay, Fairhaven, Initial Conditions, 2011

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1:4,514

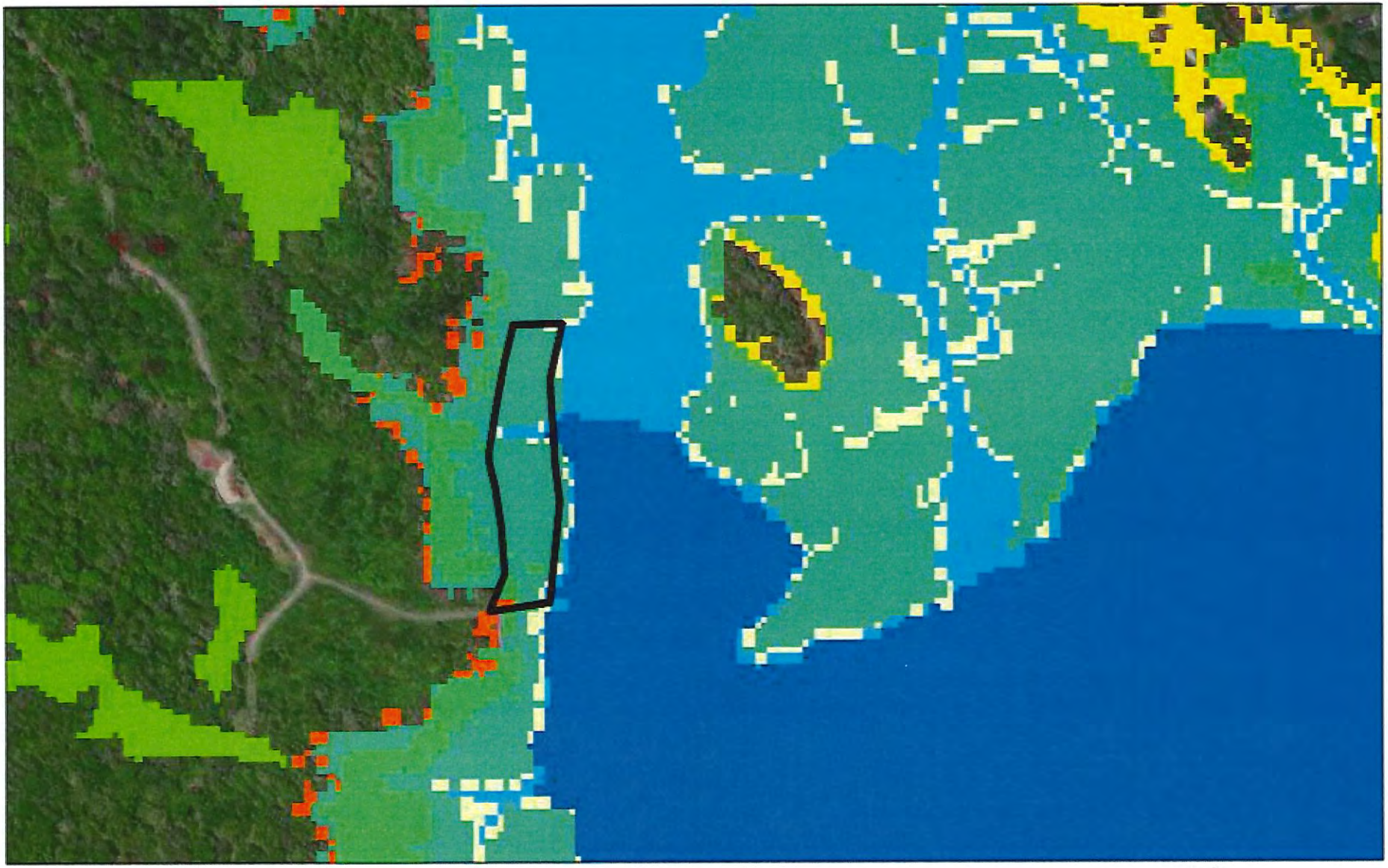
0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

Web AppBuilder for ArcGIS

Little Bay, Fairhaven, 2.3 ft SLR (2100)



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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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Web AppBuilder for ArcGIS

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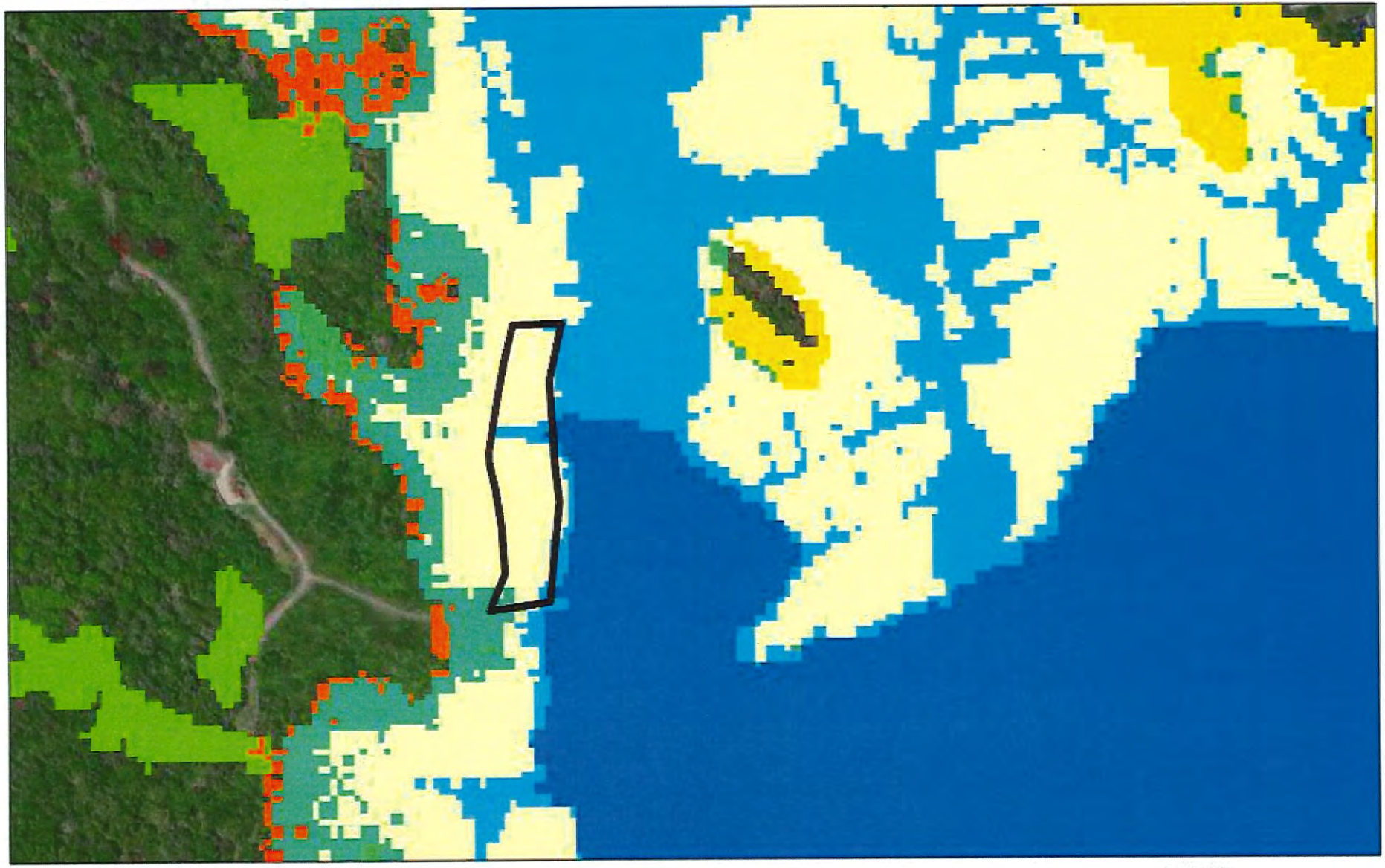
Little Bay, Fairhaven, 4.5 ft SLR (2100)



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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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Web AppBuilder for ArcGIS

SITE EVALUATION

- Is this marsh suitable for a runnel adaptation project? _____
- Why or why not?

  _____

  _____

  _____

  _____
- Which runnel option(s) do you think is/are best (none is an acceptable answer!)? ____
- Do you agree with the placement, length, and direction of the runnel(s)?_____
- Why or why not? Describe suggested changes you would make (feel free to draw!)

  _____

  _____

  _____

  _____
- Would additional adaptation actions have to be taken at this site for a runnel project to successfully improve drainage, allow revegetation, and maintain elevation (e.g. ditch maintenance, culvert replacement, sediment placement)? _____
- If not, why? And if additional actions would be necessary, which ones and why?

  _____

  _____

  _____

  _____
- Do you have any thoughts on how a runnel at this site should be dug (by hand, low-pressure excavator), and/or whether a deeper-narrower, or shallower-wider runnel would be more suitable here? Should a sill be left?

  _____

  _____

  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**

Patuisset Marsh Runnel Site

Table of Contents

FACT SHEET

Site: Patuisset Marsh, Town of Bourne, Barnstable County

Ownership and Protection of Marsh: Town of Bourne, Protected Open Space

Ownership and Protection Adjacent Parcels: Town of Bourne, Protected Open Space to the south, marsh abuts private property and homes.

Access: Parking lot adjacent to beach. Easy walk without embankment from road into marsh.

Elevation: 1.85 ± 0.30 ft NAVD88

MHW: 1.70 ft NAVD88

Existing drainage considerations: Open flushing with Hen Cove. Development restricts upland extent.

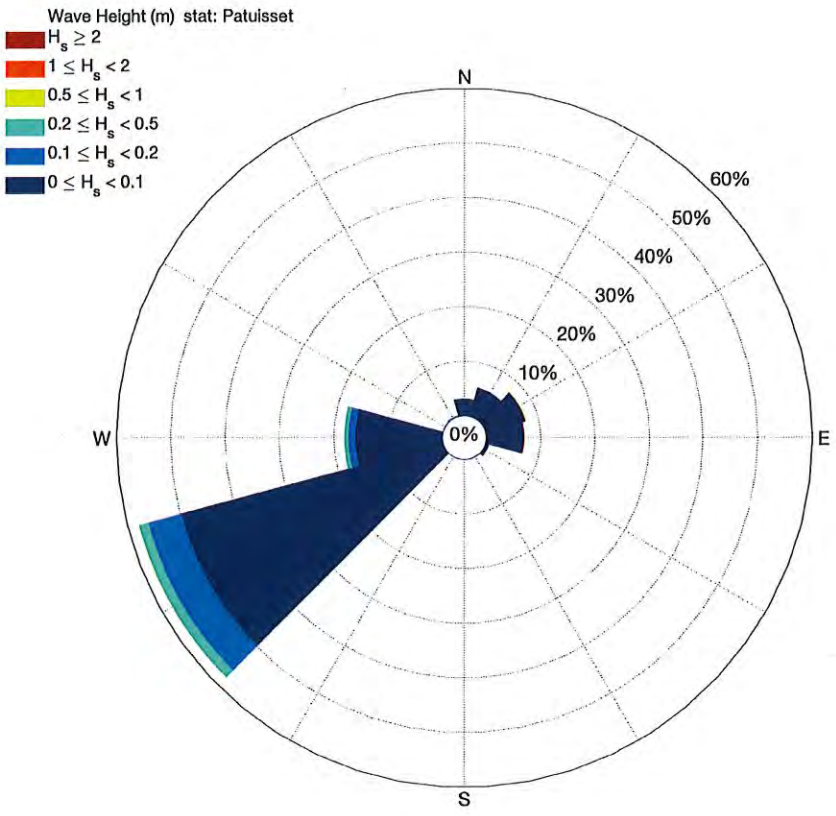
Peat condition: Vegetated peat was firm, but large areas unvegetated.

Close to existing salt marsh monitoring transects (BBC and BBNEP)?: Yes

Wind wave exposure: Low from the southwest and smaller from west.

Proposal: This marsh was highly degraded, with historic ditches eroded into mudflats. Around the perimeter in-tact vegetation and firm peat still present. Areas of die-back were present at the marsh boundary, abutting *Phragmites* stands, and private homes.

We propose to treat these marsh edge die-back areas with one of three runnels. Die-back in these places had lots of evident root mat, and very little standing water.


Wave Height (m) stat: Patuisset
$H_s \geq 2$
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
N
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S
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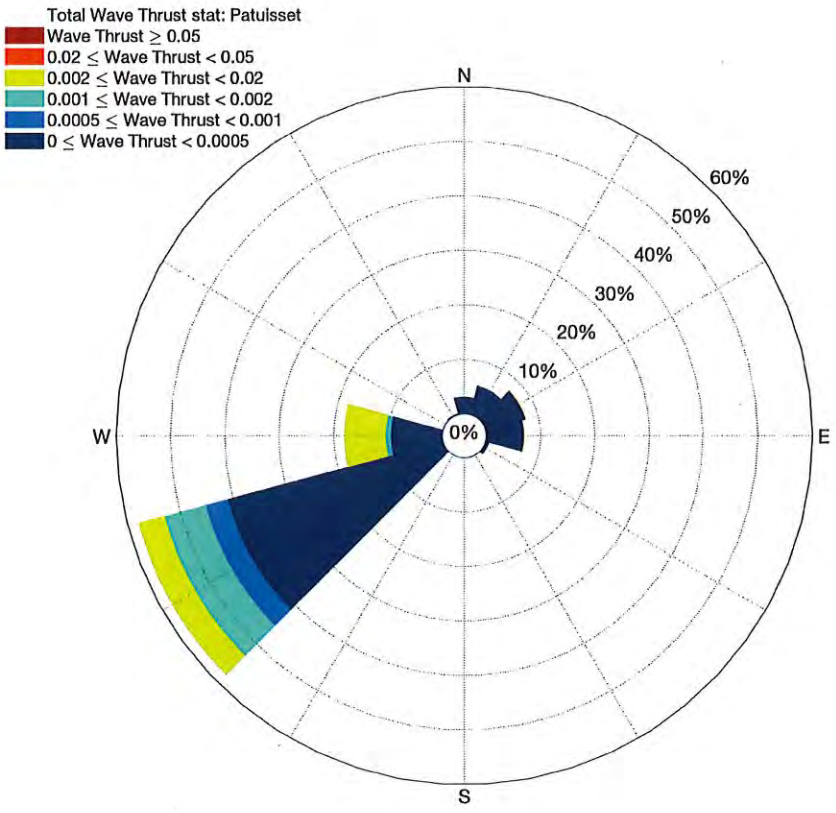
30%
40%
50%
60%


Total Wave Thrust stat: Patuisset
Wave Thrust ≥ 0.05
$0.02 \leq$ Wave Thrust < 0.05
$0.002 \leq$ Wave Thrust < 0.02
$0.001 \leq$ Wave Thrust < 0.002
$0.0005 \leq$ Wave Thrust < 0.001
$0 \leq$ Wave Thrust < 0.0005
N
W
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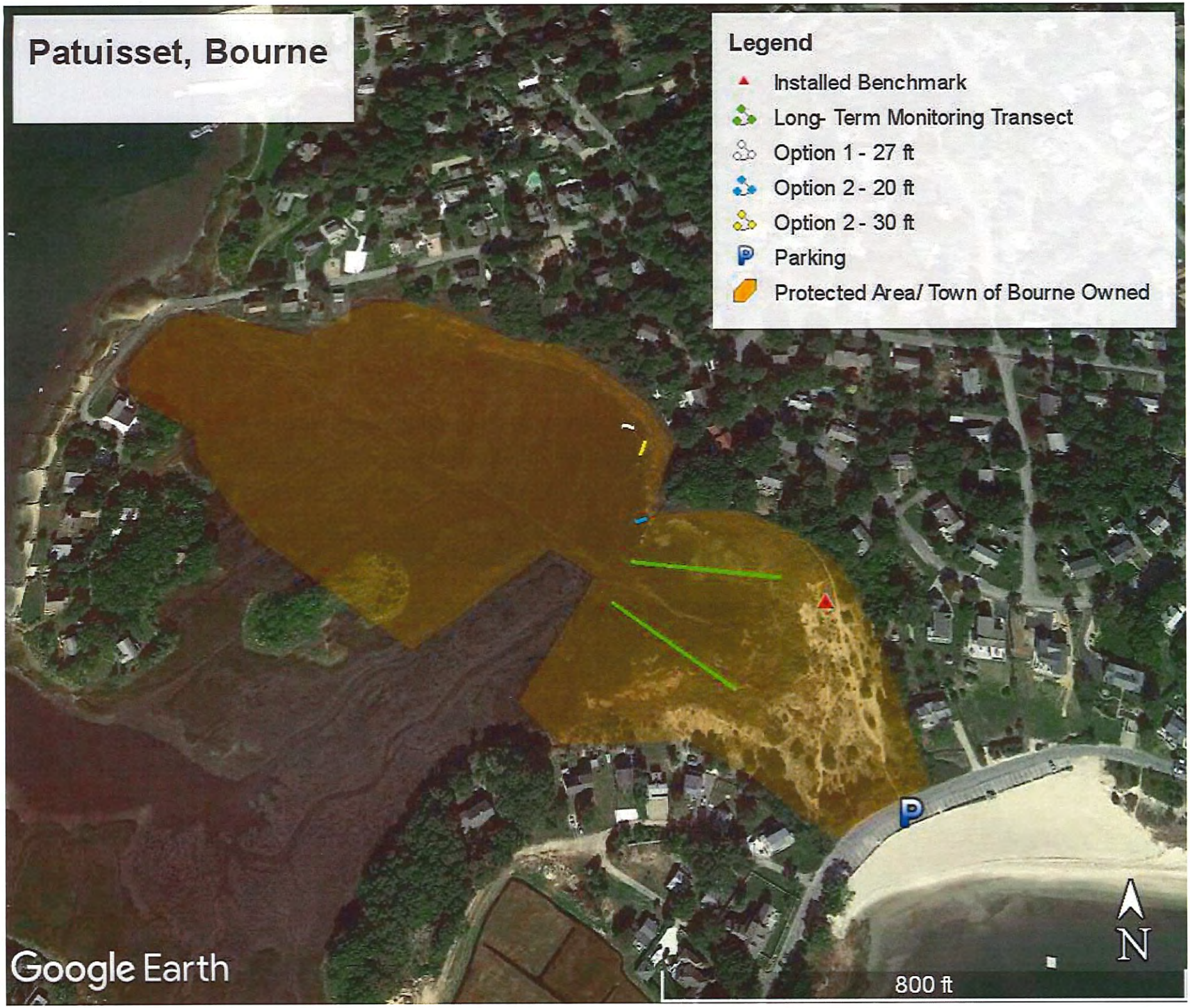
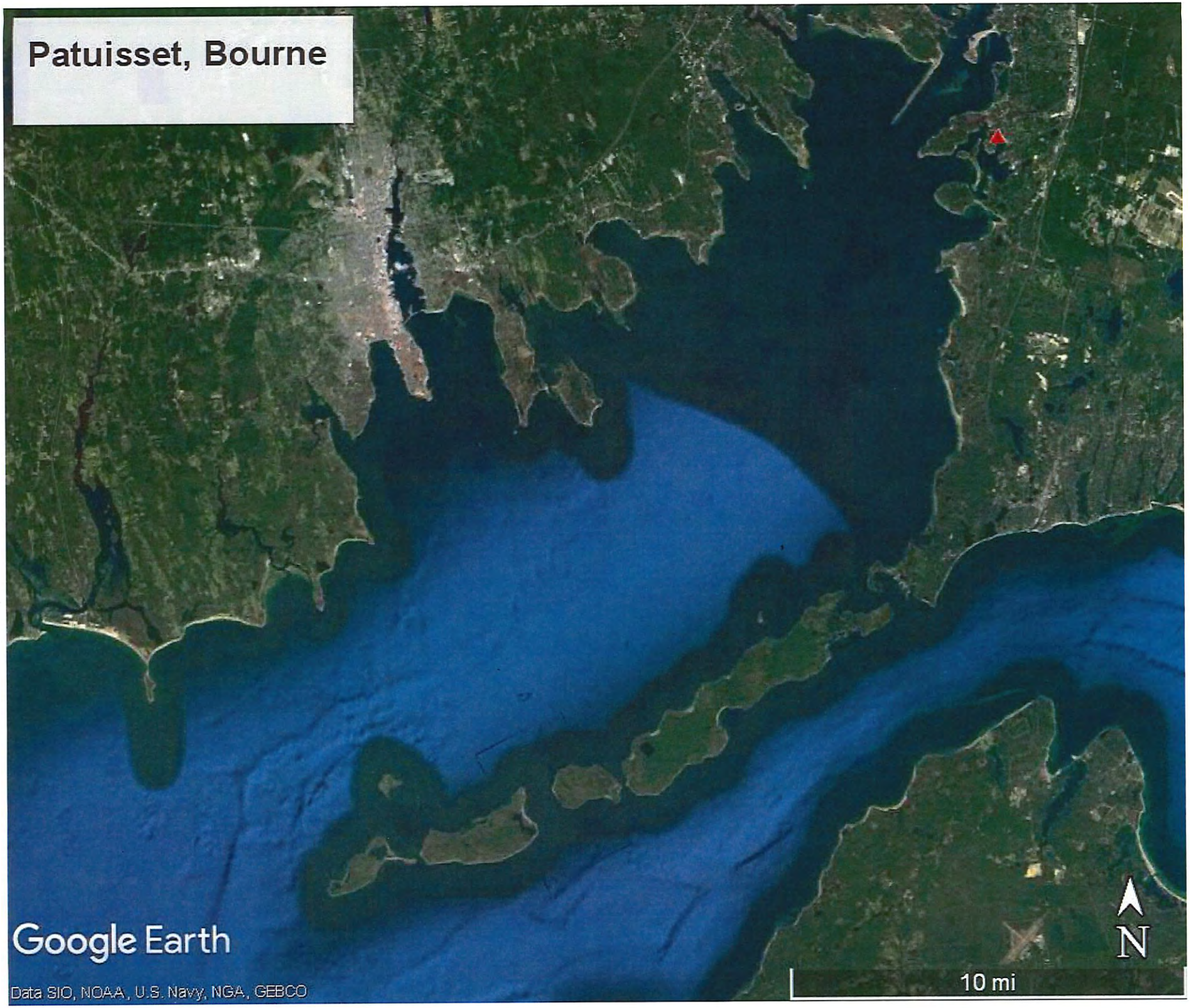
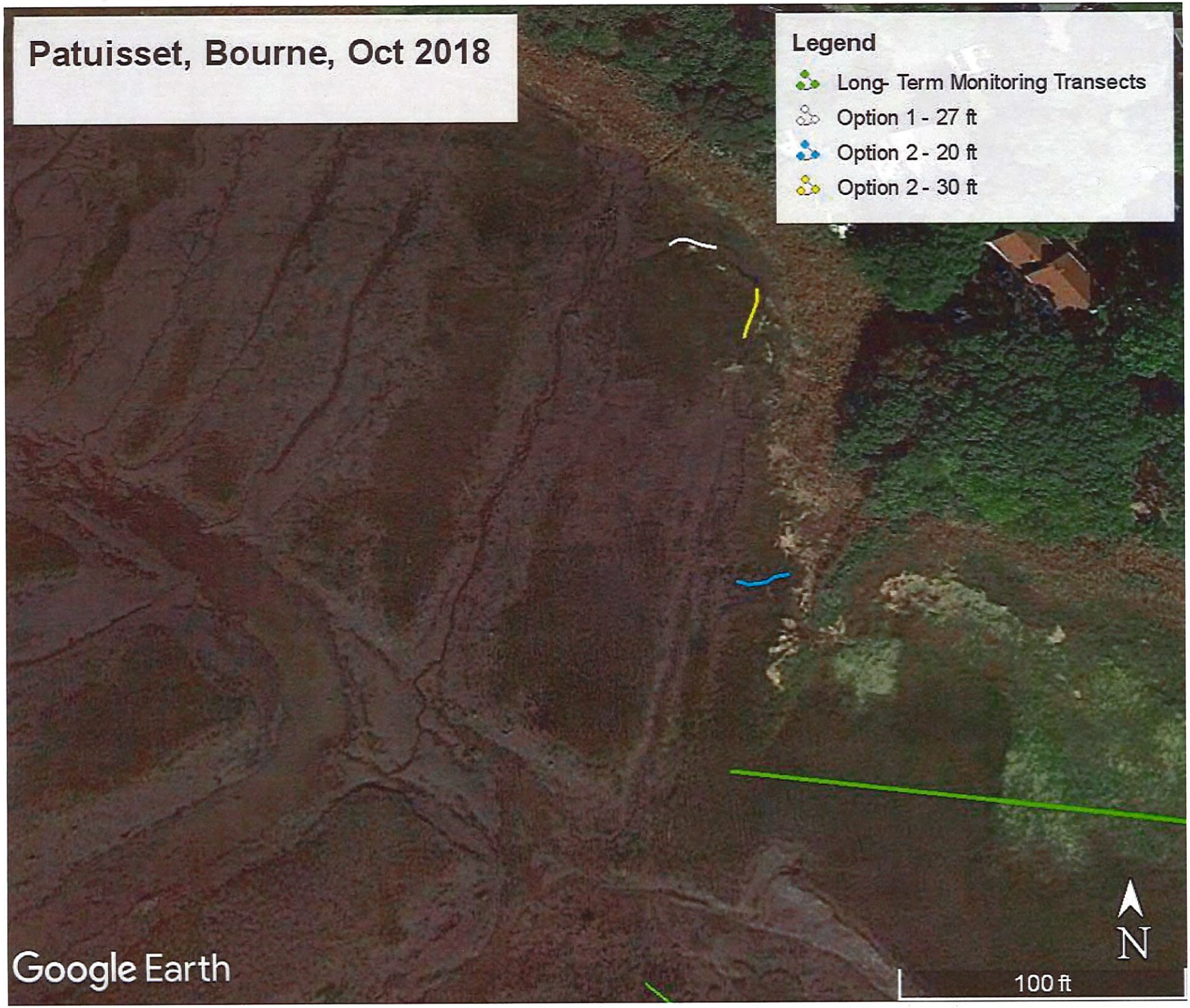
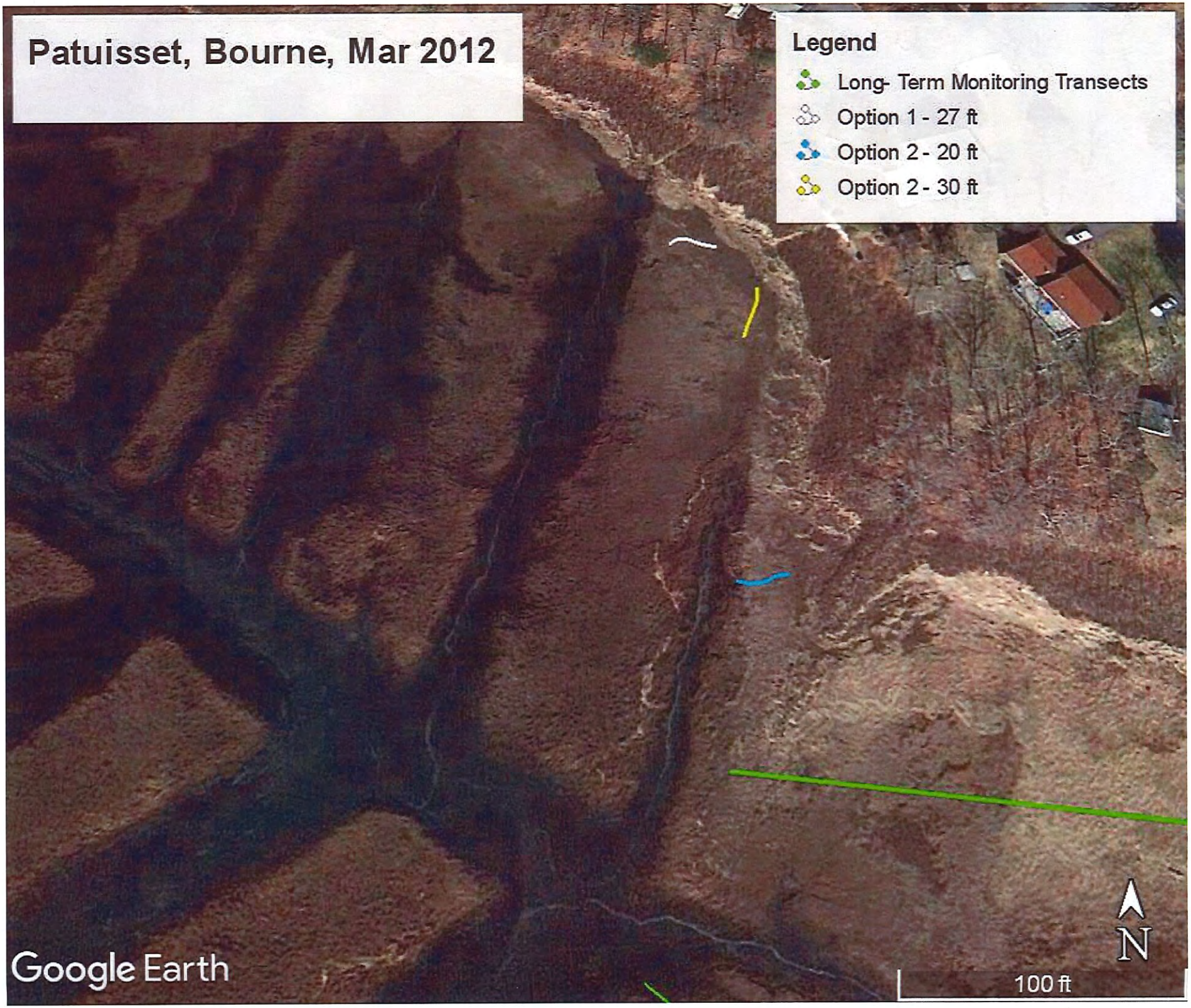
S
0%
10%
20%
30%
40%
50%
60%

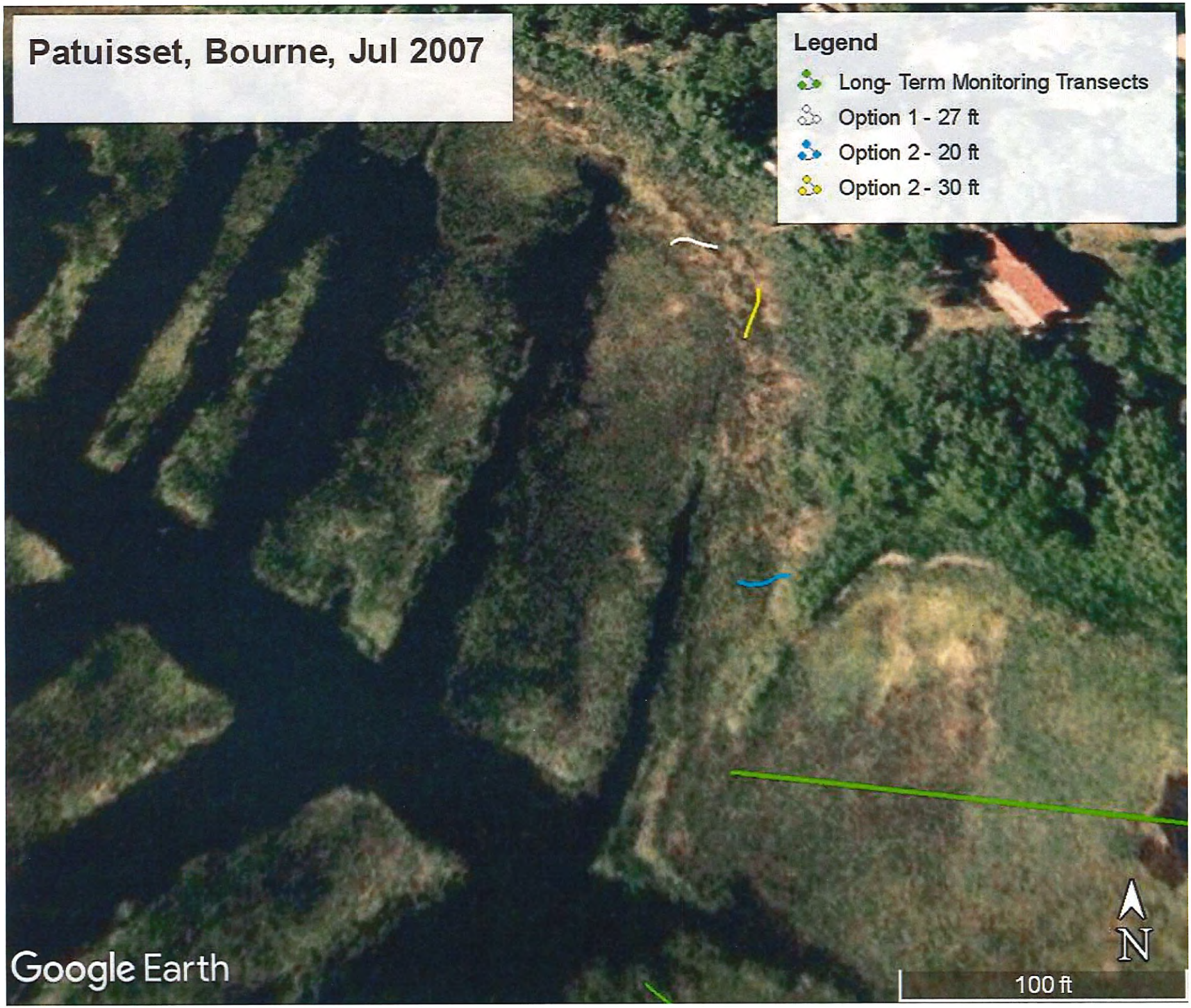

Patuisset, Bourne
Legend
Installed Benchmark
Long- Term Monitoring Transect
Option 1 - 27 ft
Option 2 - 20 ft
Option 2 - 30 ft
Parking
Protected Area/ Town of Bourne Owned
Google Earth
800 ft
N


Patuisset, Bourne
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
N
10 mi


Patuisset, Bourne
Abiels Ledge
Wings Cove
Hen Cove
Bassetts Island
Red Brook Pond
Eustis Rock
The Anchorage
Northwest Cove
Long
Hospital Cove
Cuffs Po
Southwest Ledge
Amrita Island
N
Google Earth
© 2020 Google
Half Tide Rock
1 mi


Patuisset, Bourne, Oct 2018
Legend
Long- Term Monitoring Transects
Option 1 - 27 ft
Option 2 - 20 ft
Option 2 - 30 ft
Google Earth
N
100 ft


Patuisset, Bourne, Mar 2012
Legend
Long- Term Monitoring Transects
Option 1 - 27 ft
Option 2 - 20 ft
Option 2 - 30 ft
N
100 ft
Google Earth


Patuisset, Bourne, Jul 2007
Legend
Long- Term Monitoring Transects
Option 1 - 27 ft
Option 2 - 20 ft
Option 2 - 30 ft
N
Google Earth
100 ft


Patuisset, Bourne, Dec 2001
Legend
Long- Term Monitoring Transects
Option 1 - 27 ft
Option 2 - 20 ft
Option 2 - 30 ft
N
Google Earth
100 ft

Patuisset, Bourne, Initial Conditions, 2011

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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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Web AppBuilder for ArcGIS

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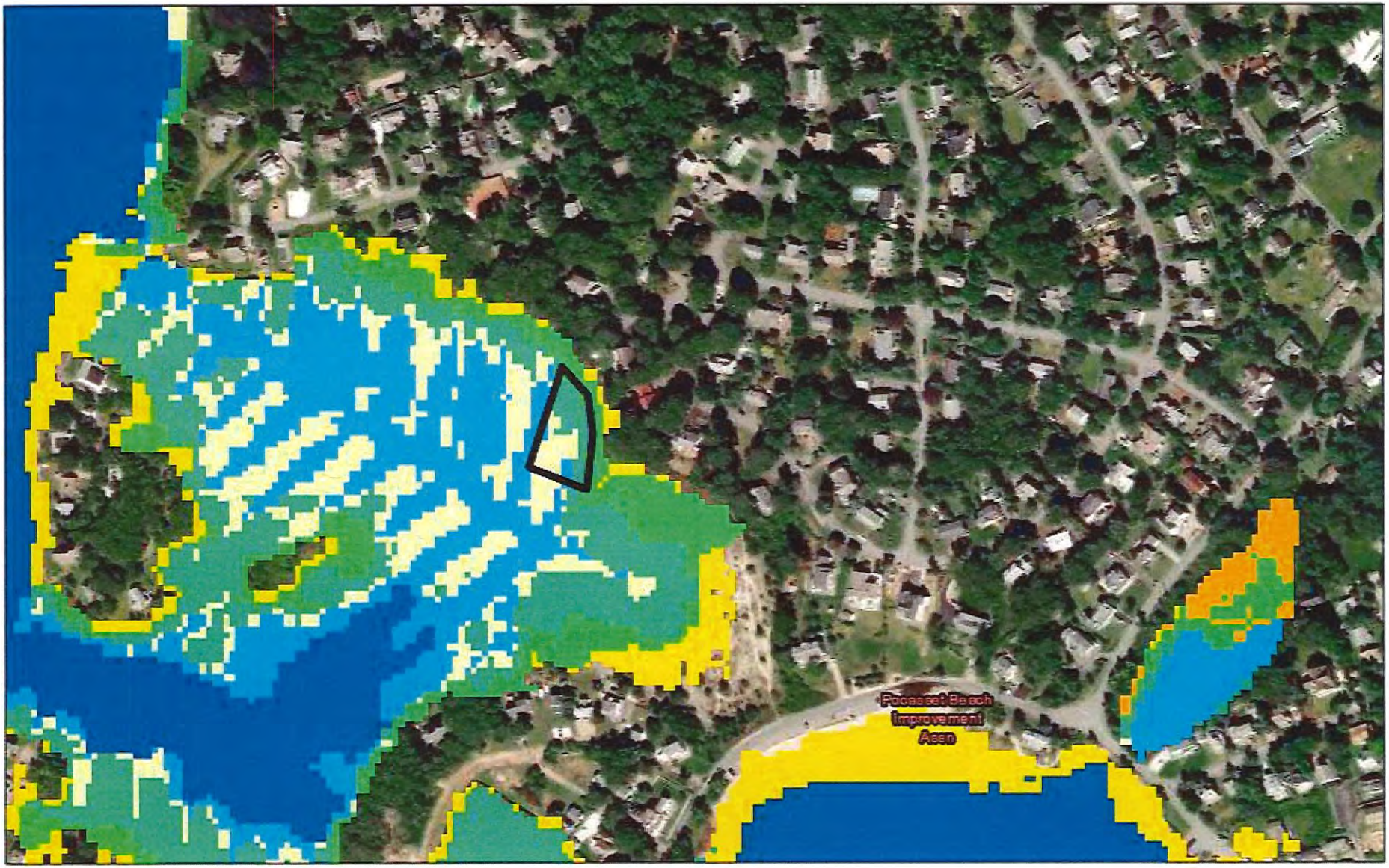
Patuisset, Bourne, 2.3 ft. SLR (2100)



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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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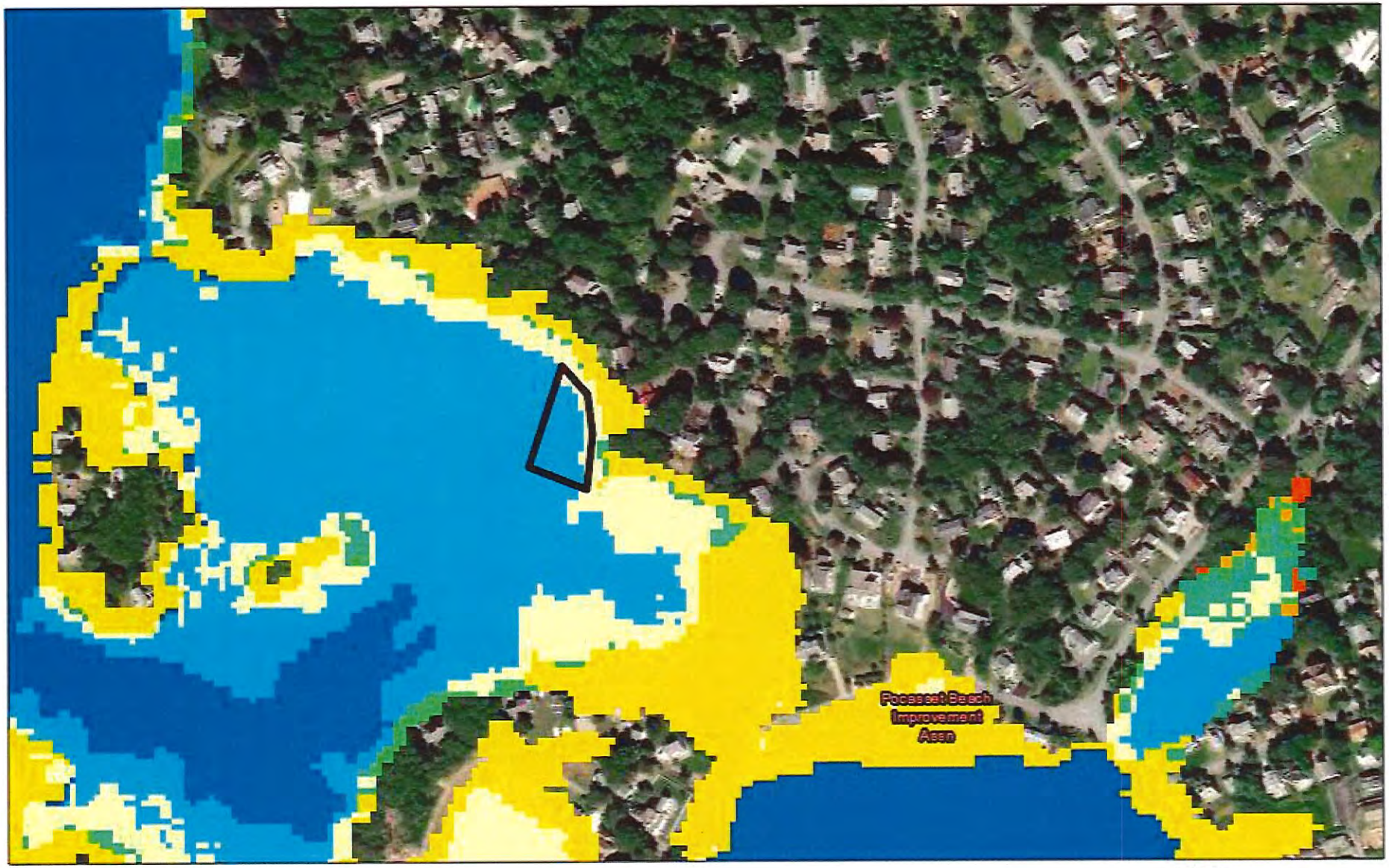
Web AppBuilder for ArcGIS

Patuisset, Bourne, 4.5 ft. SLR (2100)



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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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Web AppBuilder for ArcGIS

SITE EVALUATION

- Is this marsh suitable for a runnel adaptation project? _____
- Why or why not?

  _____

  _____

  _____

  _____
- Which runnel option(s) do you think is/are best (none is an acceptable answer!)? ____
- Do you agree with the placement, length, and direction of the runnel(s)?_____
- Why or why not? Describe suggested changes you would make (feel free to draw!)

  _____

  _____

  _____

  _____
- Would additional adaptation actions have to be taken at this site for a runnel project to successfully improve drainage, allow revegetation, and maintain elevation (e.g. ditch maintenance, culvert replacement, sediment placement)? _____
- If not, why? And if additional actions would be necessary, which ones and why?

  _____

  _____

  _____

  _____
- Do you have any thoughts on how a runnel at this site should be dug (by hand, low-pressure excavator), and/or whether a deeper-narrower, or shallower-wider runnel would be more suitable here? Should a sill be left?

  _____

  _____

  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**

Star of the Sea Runnel Site

Table of Contents

FACT SHEET

Site: Star of Sea, Town of Dartmouth, Bristol County

Ownership and Protection of Marsh: Town of Dartmouth, Protected Open Space

Ownership and Protection Adjacent Parcels: Town of Dartmouth, Dartmouth Natural Resource Trust, Protected Open Space to the south

Access: Park along road, enter marsh by a moderate-grade embankment.

Elevation: 1.55 ± 0.17 ft NAVD88

MHW: 1.77 ft NAVD88

Existing drainage considerations: Restricted by culvert that appeared undersized. Some freshwater input from road and forested perimeter of marsh both possible.

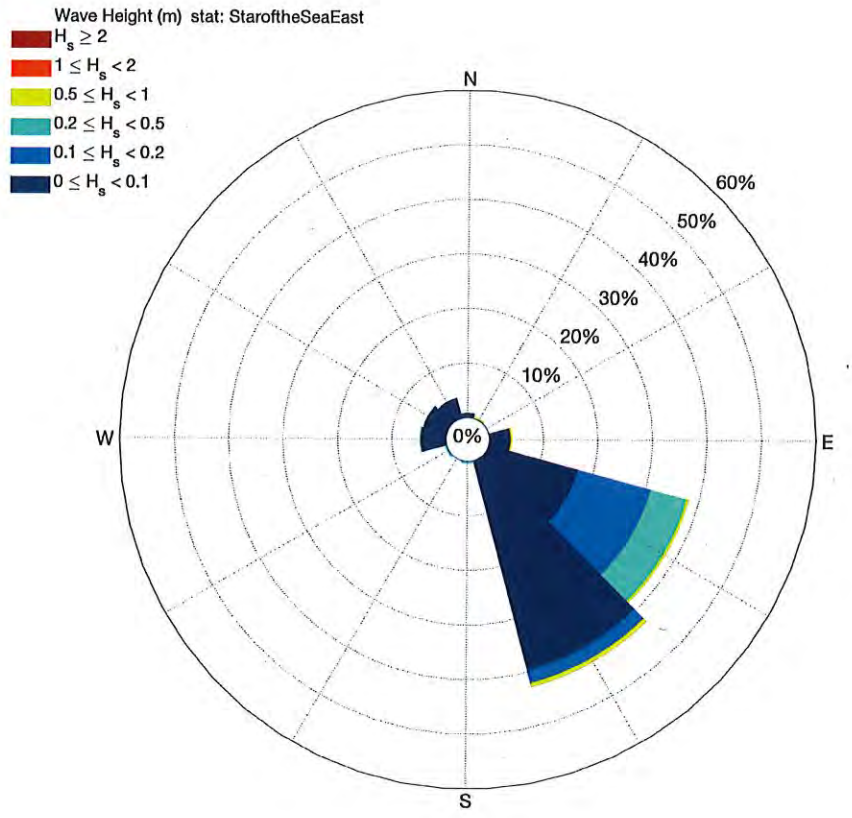
Peat condition: Vegetated peat was moderate in firmness, but large areas unvegetated and large areas of standing water. Around ditches and impoundments peat was very soft.

Close to existing salt marsh monitoring transects (BBC and BBNEP)?: No

Wind wave exposure: Low from the southeast. Given restriction waves likely do not directly impact this marsh.

Proposal: This site has significantly subsided, with large areas of standing water with depth > 12” in places. There is evidence of “ghost forest”, or trees killed from inundation. The ditch on the south side of the marsh was draining, while the ditch on the northern side had a clog.

We propose to install a runnel to help reduce the degree of impoundments along the eastern and southeastern edges of the marsh. We have proposed three locations, all of which would be long runnels to connect to the ditch.


Wave Height (m) stat: StaroftheSeaEast
$H_s \geq 2$
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
N
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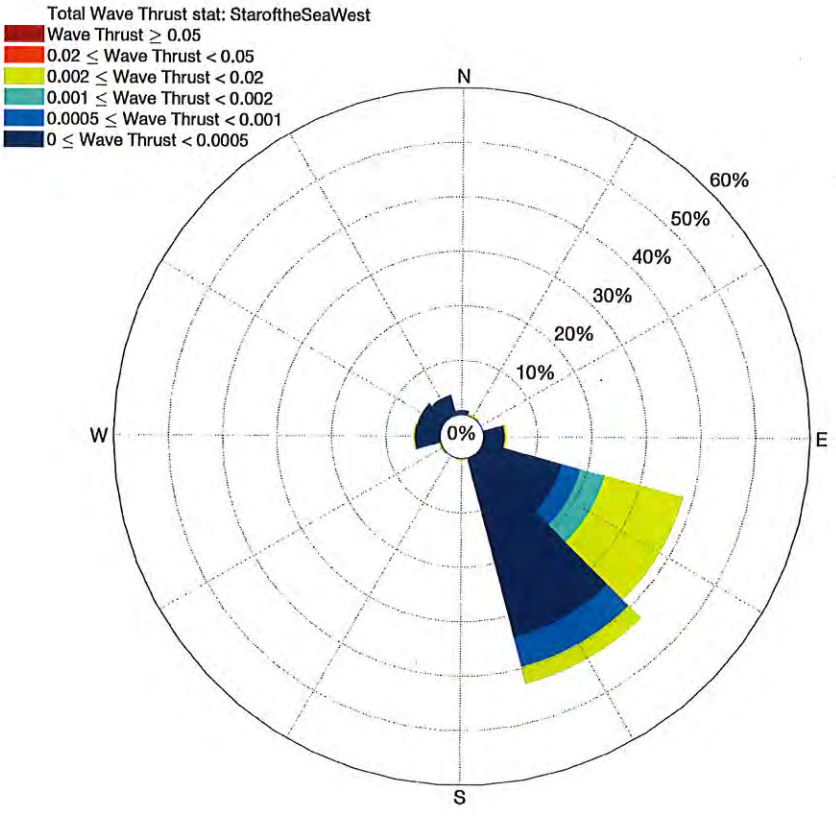
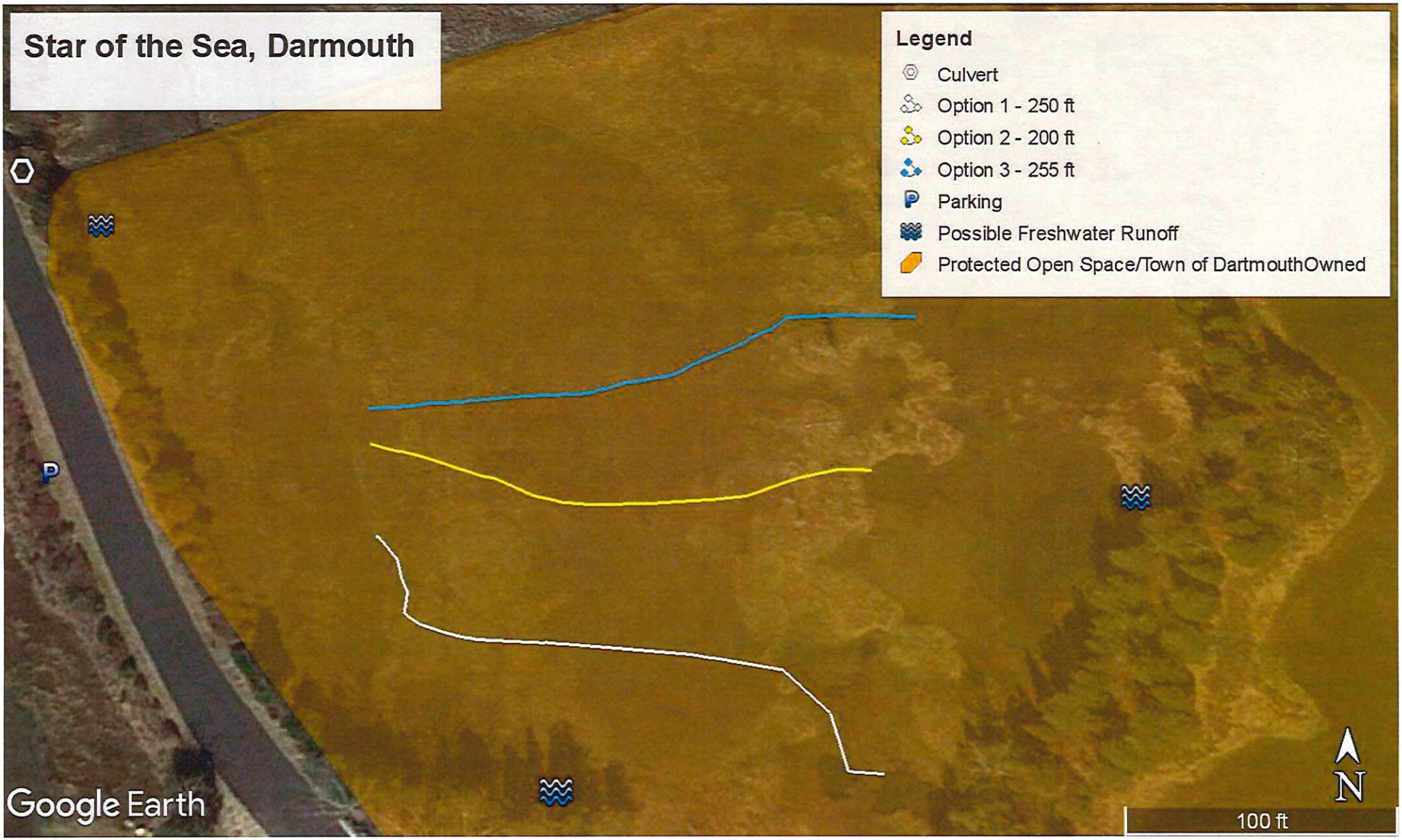
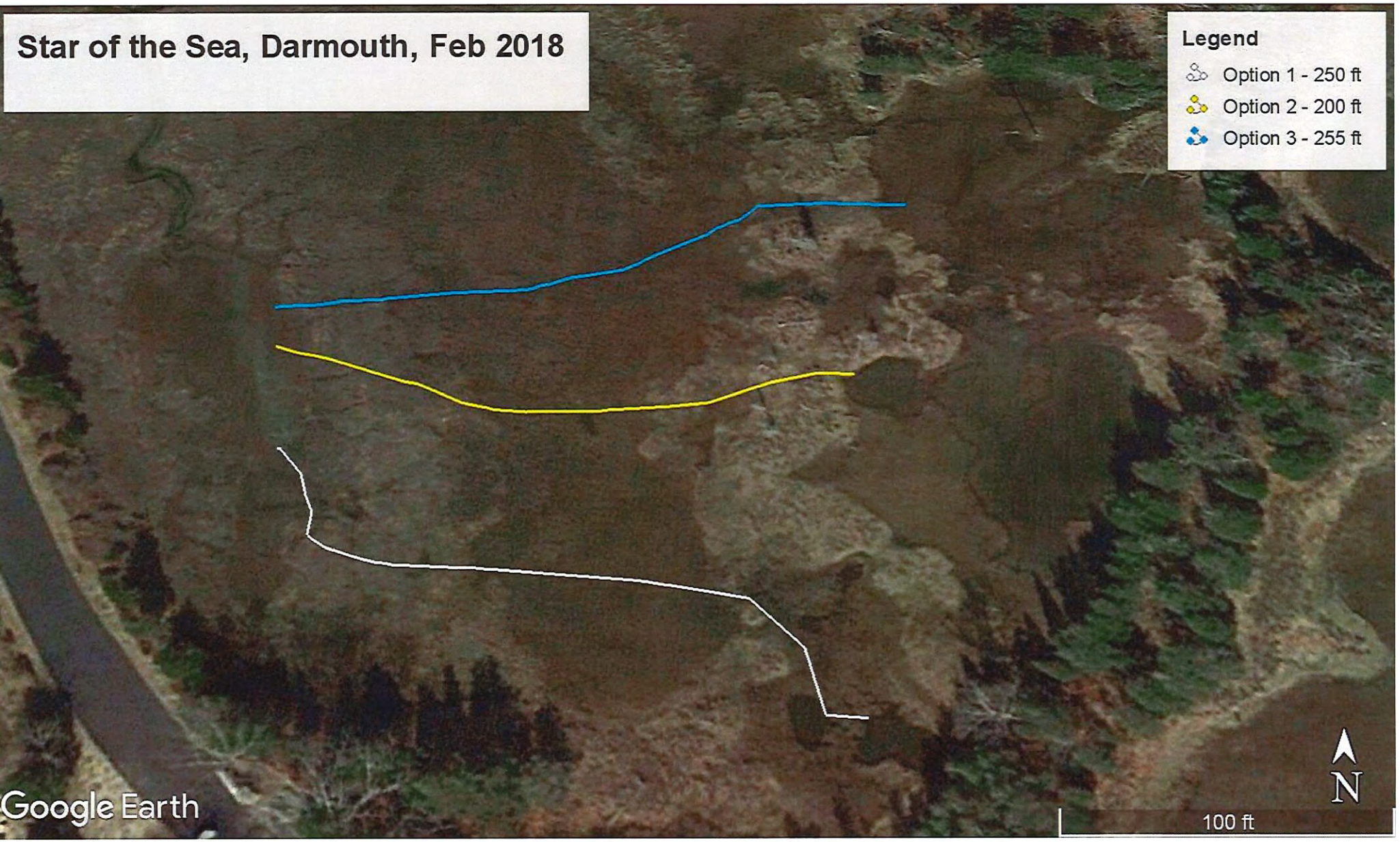
S
W
60%
50%
40%
30%
20%
10%
0%

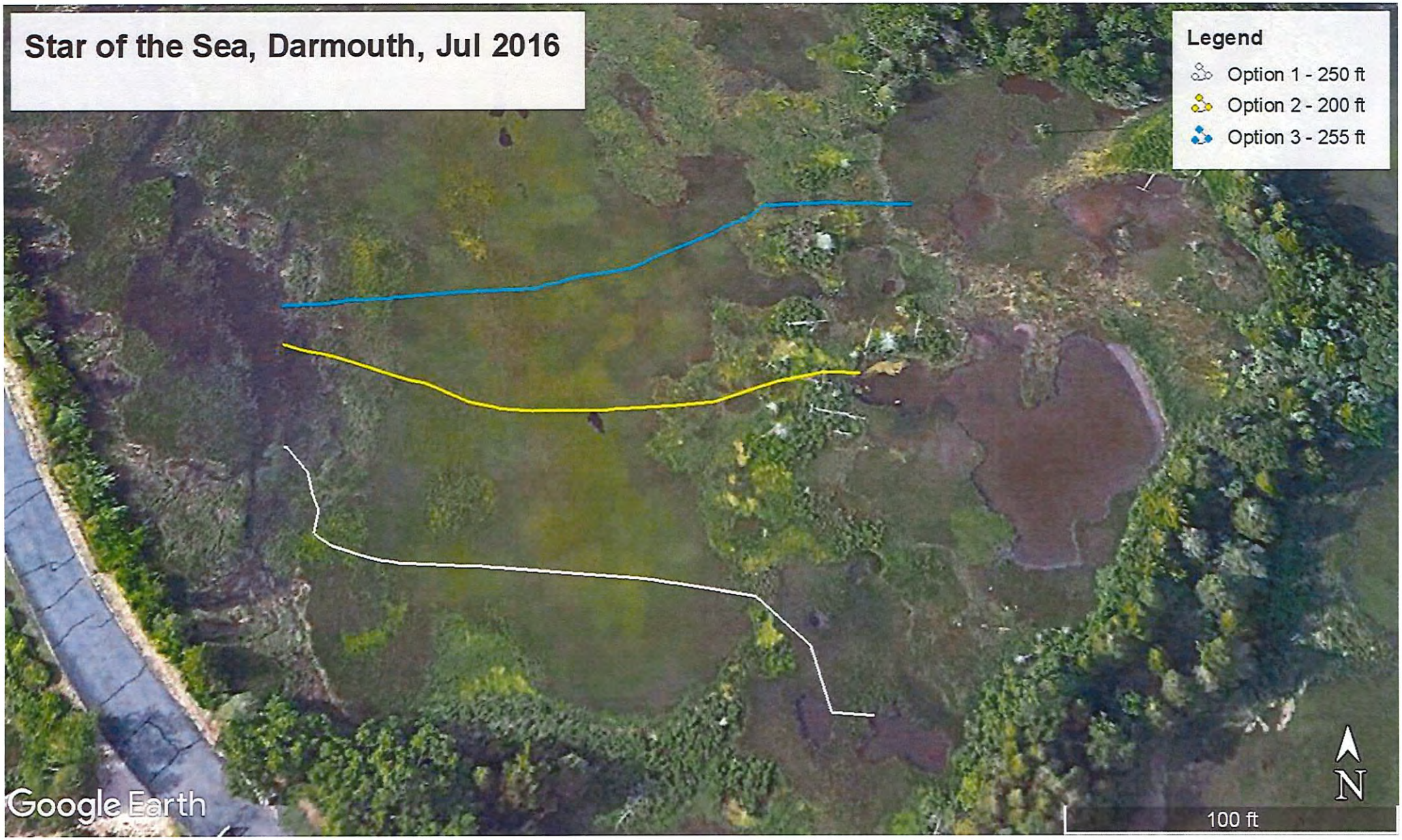

Total Wave Thrust stat: StaroftheSeaWest
Wave Thrust ≥ 0.05
0.02 ≤ Wave Thrust < 0.05
0.002 ≤ Wave Thrust < 0.02
0.001 ≤ Wave Thrust < 0.002
0.0005 ≤ Wave Thrust < 0.001
0 ≤ Wave Thrust < 0.0005
N
E
S
W
60%
50%
40%
30%
20%
10%
0%

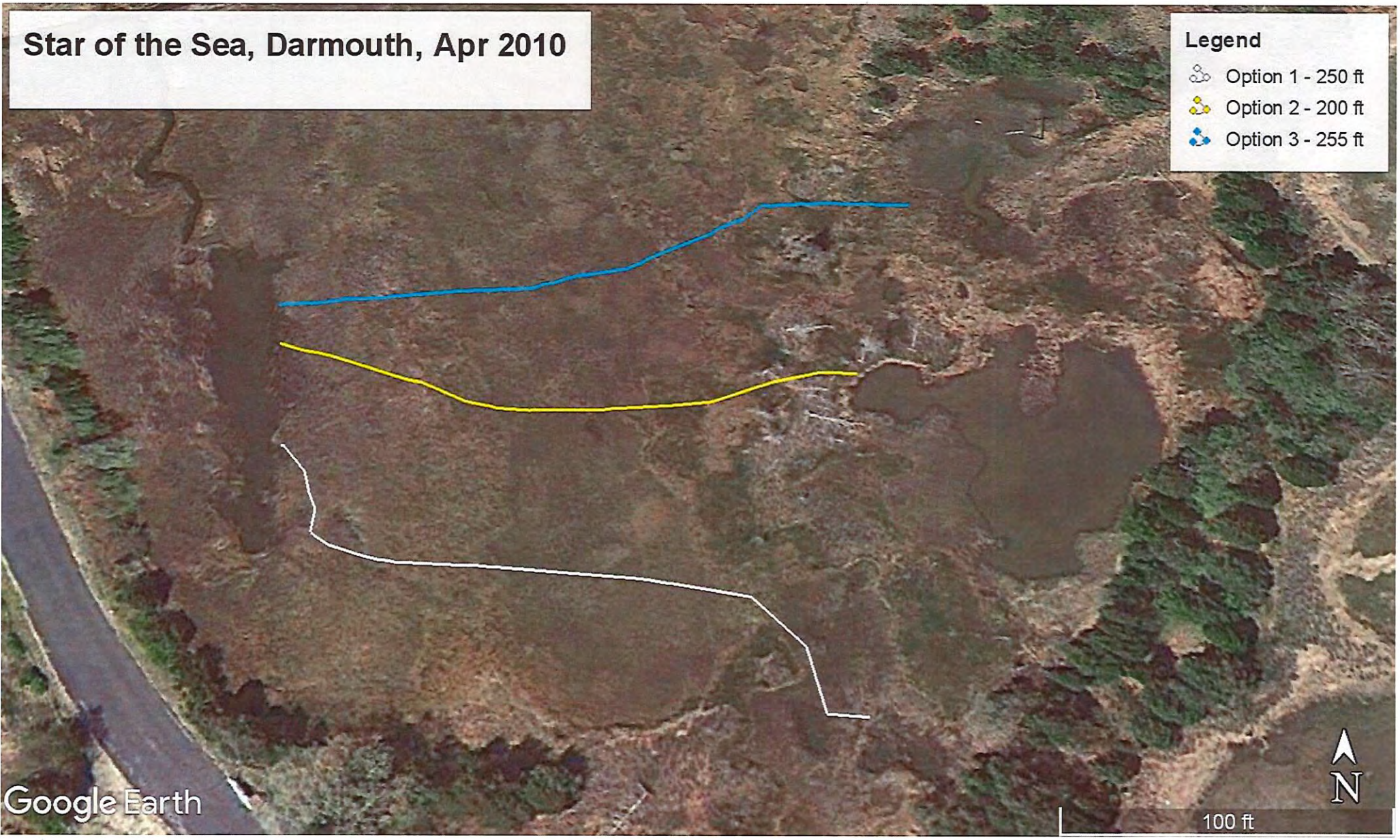

Star of the Sea, Darmouth
Legend
Culvert
Option 1 - 250 ft
Option 2 - 200 ft
Option 3 - 255 ft
Parking
Possible Freshwater Runoff
Protected Open Space/Town of DartmouthOwned
P
Google Earth
N
100 ft

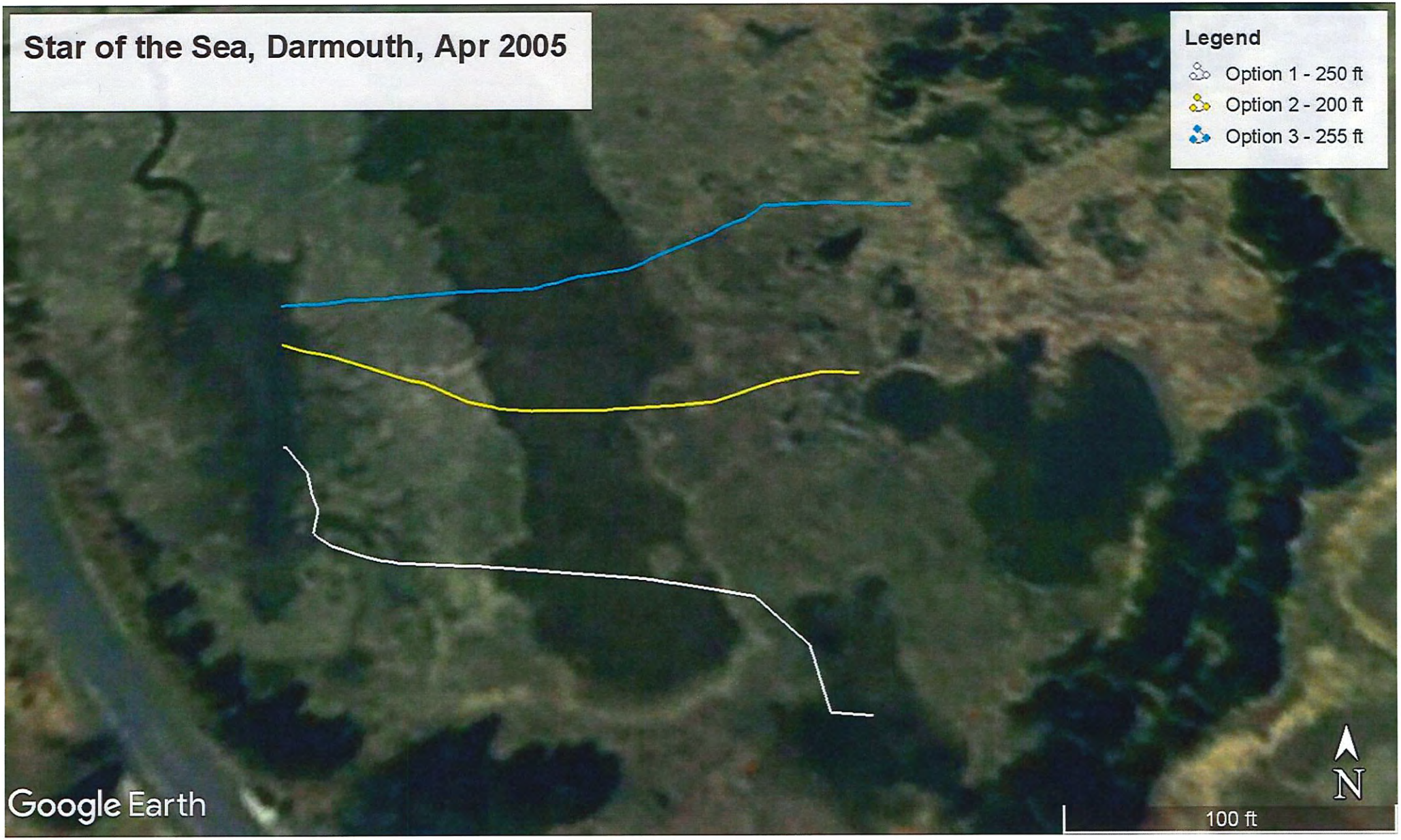

Star of the Sea, Darmouth
Google Earth
Image © 2020 TerraMetrics
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
N
10 mi


Star of the Sea, Dartmouth
Old Bartlemy
South Dartmouth
Little Island
Apponagansett Bay
Dartmouth Rock
Google Earth
© 2020 Google
N
4000 ft


Star of the Sea, Darmouth, Feb 2018
Legend
Option 1 - 250 ft
Option 2 - 200 ft
Option 3 - 255 ft
Google Earth
N
100 ft


Star of the Sea, Darmouth, Jul 2016
Legend
Option 1 - 250 ft
Option 2 - 200 ft
Option 3 - 255 ft
Google Earth
N
100 ft


Star of the Sea, Darmouth, Apr 2010
Legend
Option 1 - 250 ft
Option 2 - 200 ft
Option 3 - 255 ft
Google Earth
N
100 ft


Star of the Sea, Darmouth, Apr 2005
Legend
Option 1 - 250 ft
Option 2 - 200 ft
Option 3 - 255 ft
Google Earth
N
100 ft

Star of the Sea, Dartmouth, Initial Conditions, 2011

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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user

Web AppBuilder for ArcGIS

USDA FSA | Massachusetts Office of Coastal Zone Management | 251 Causeway Street, Suite 800, Boston, MA 02114-2136 | mass.gov/czm | Massachusetts Office of Coastal Zone Management | 251 Causeway Street, Suite 800, Boston, MA 02114-2136 | mass.gov

Star of the Sea, Dartmouth, 2.3 ft. SLR (2100)

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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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Star of the Sea, Dartmouth, 4.5 ft. SLR (2100)

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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Massachusetts Office of Coastal Zone Management | 251 Causeway Street

Web AppBuilder for ArcGIS

SITE EVALUATION

- Is this marsh suitable for a runnel adaptation project? _____
- Why or why not?

  _____

  _____

  _____

  _____
- Which runnel option(s) do you think is/are best (none is an acceptable answer!)? ____
- Do you agree with the placement, length, and direction of the runnel(s)?_____
- Why or why not? Describe suggested changes you would make (feel free to draw!)

  _____

  _____

  _____

  _____
- Would additional adaptation actions have to be taken at this site for a runnel project to successfully improve drainage, allow revegetation, and maintain elevation (e.g. ditch maintenance, culvert replacement, sediment placement)? _____
- If not, why? And if additional actions would be necessary, which ones and why?

  _____

  _____

  _____

  _____
- Do you have any thoughts on how a runnel at this site should be dug (by hand, low-pressure excavator), and/or whether a deeper-narrower, or shallower-wider runnel would be more suitable here? Should a sill be left?

  _____

  _____

  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**

Wing's Neck Runnel Site

Table of Contents

FACT SHEET

Site: Wing's Neck, Town of Bourne, Barnstable County

Ownership and Protection of Marsh: Town of Bourne, Not classified as protected open space

Ownership and Protection Adjacent Parcels: Town of Bourne, some protected open space

Access: Park on the side of road, there is a low grade bank to enter marsh.

Elevation: 1.78 ± 0.11 ft NAVD88

MHW: 1.72 ft NAVD88

Existing drainage considerations: The marsh is on the unrestricted side of an undersized culvert. Ditches appear to be draining (no clogging vegetation). No issues with undersized culvert/tidal restriction. No apparent issues with high volume road run-off or other freshwater inputs.

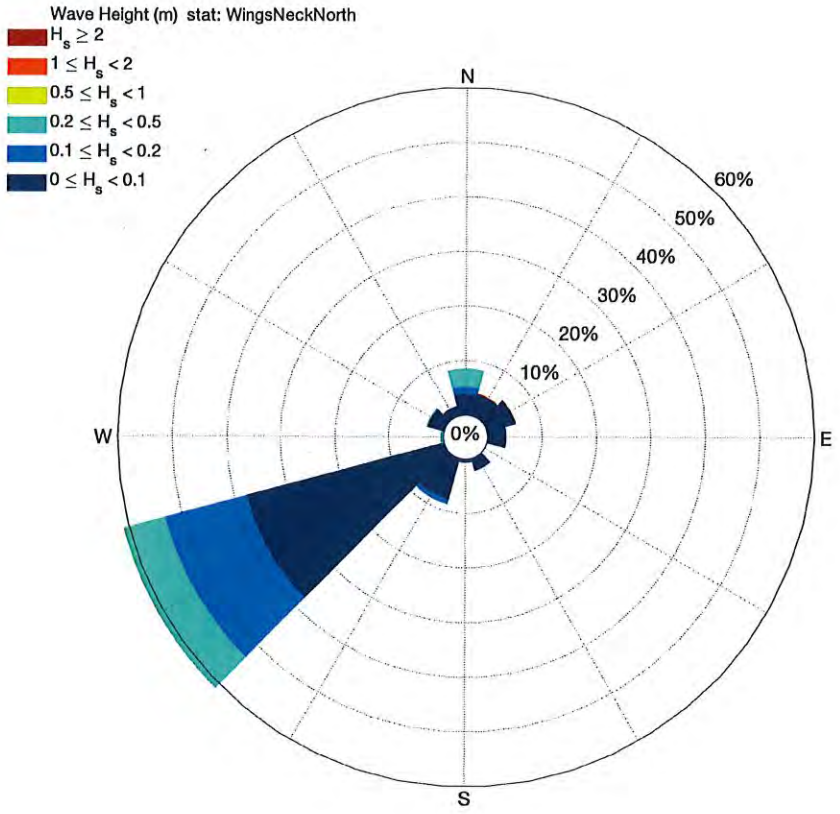
Peat condition: Marsh is muddier, softer, than average peat conditions across marshes.

Close to existing salt marsh monitoring transects (BBC and BBNEP)?: Yes

Wind wave exposure: Low thrust and wave heights, from the southwest (see wind rose figures)

Proposal: Depressions and marsh die-back on multiple lobes of the marsh. Patches vary between no standing water (exposed bare sediment), and standing water of a depth up to 12". Some areas with standing water still appeared to have vegetation, while others were loose mud. Many depressions have ragged edges, appear to be recent die-off. We propose to dig one runnel to treat an area of die-back.

Four potential runnel locations are indicated in blue, white, pink, and yellow, with lengths indicated in the legend. The location of existing long-term marsh monitoring transects are indicated in green, and the red triangle indicates the location of the installed benchmark.


Wave Height (m) stat: WingsNeckNorth
$H_s \geq 2$
$1 \leq H_s < 2$
$0.5 \leq H_s < 1$
$0.2 \leq H_s < 0.5$
$0.1 \leq H_s < 0.2$
$0 \leq H_s < 0.1$
N
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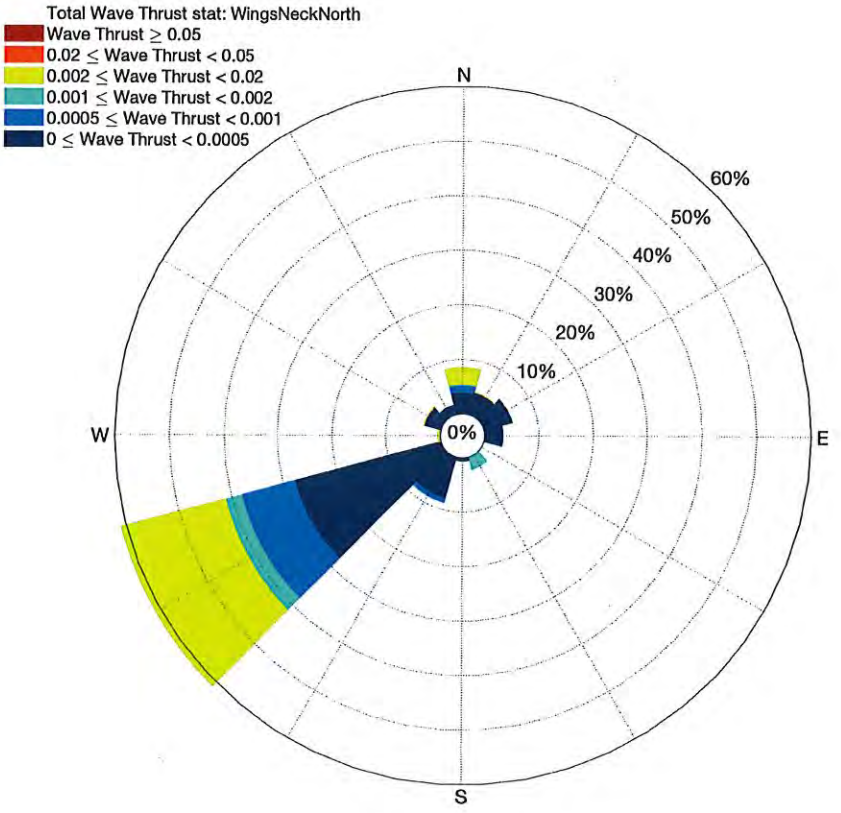
30%
20%
10%
0%


Total Wave Thrust stat: WingsNeckNorth
Wave Thrust ≥ 0.05
0.02 ≤ Wave Thrust < 0.05
0.002 ≤ Wave Thrust < 0.02
0.001 ≤ Wave Thrust < 0.002
0.0005 ≤ Wave Thrust < 0.001
0 ≤ Wave Thrust < 0.0005
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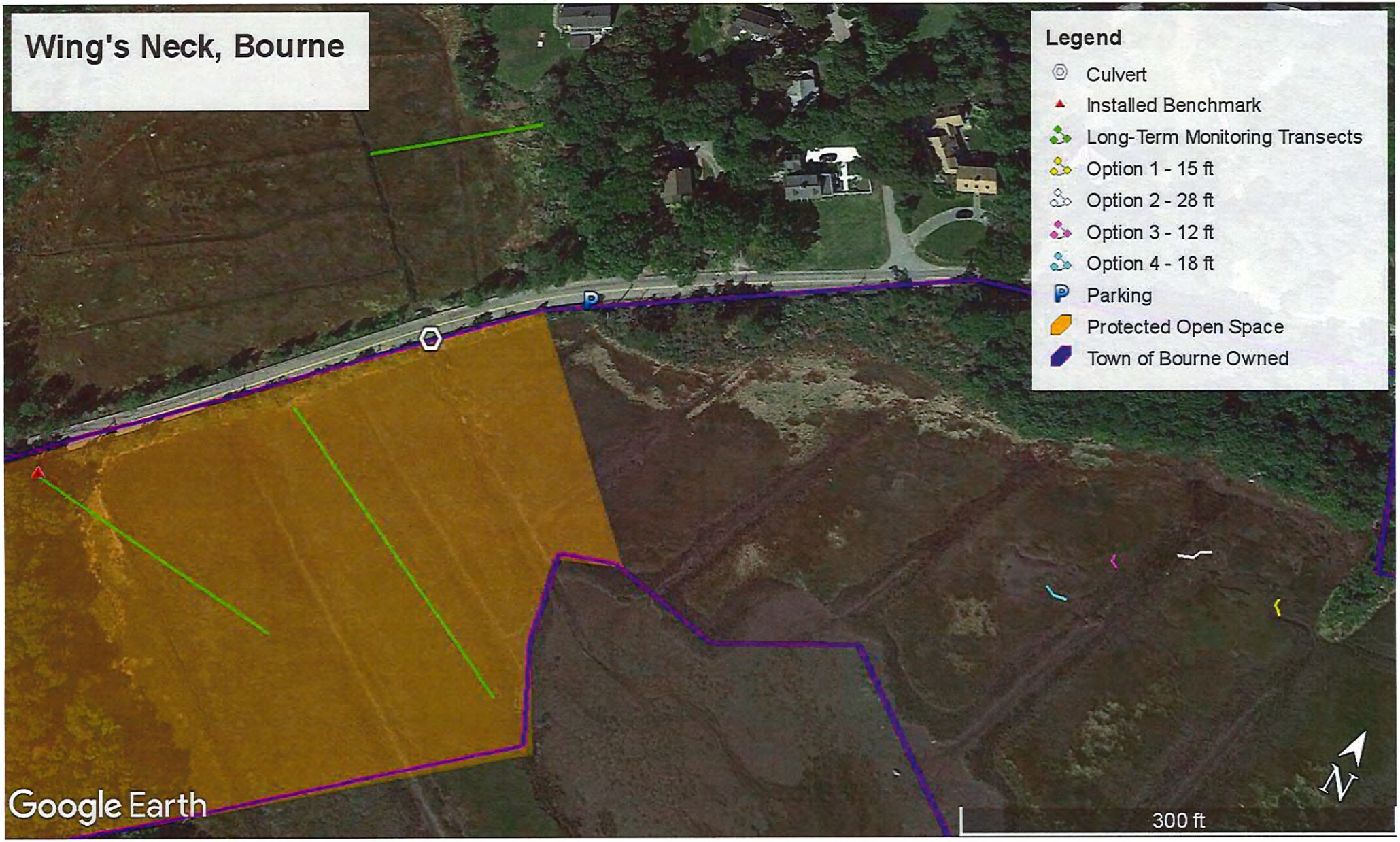
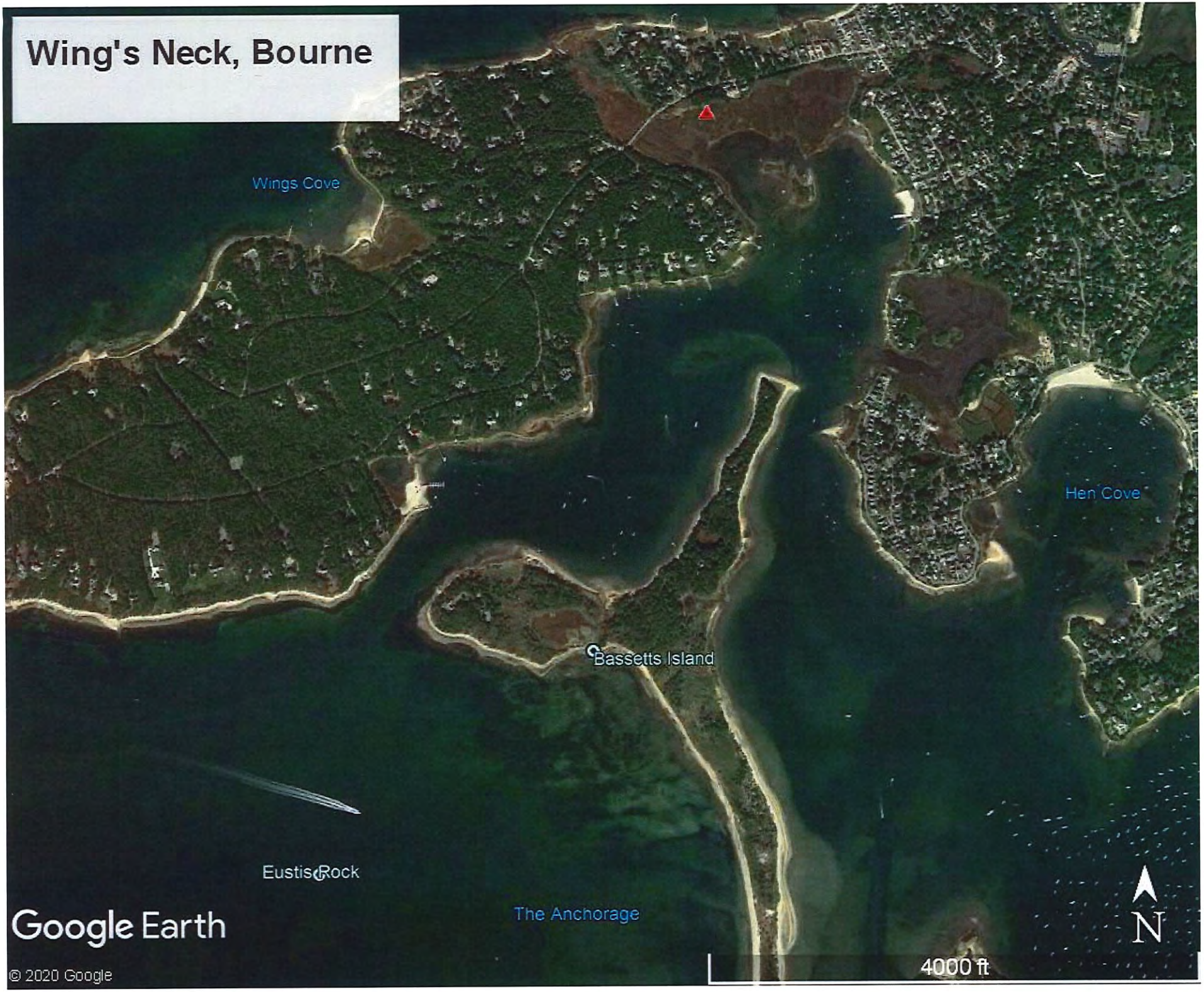
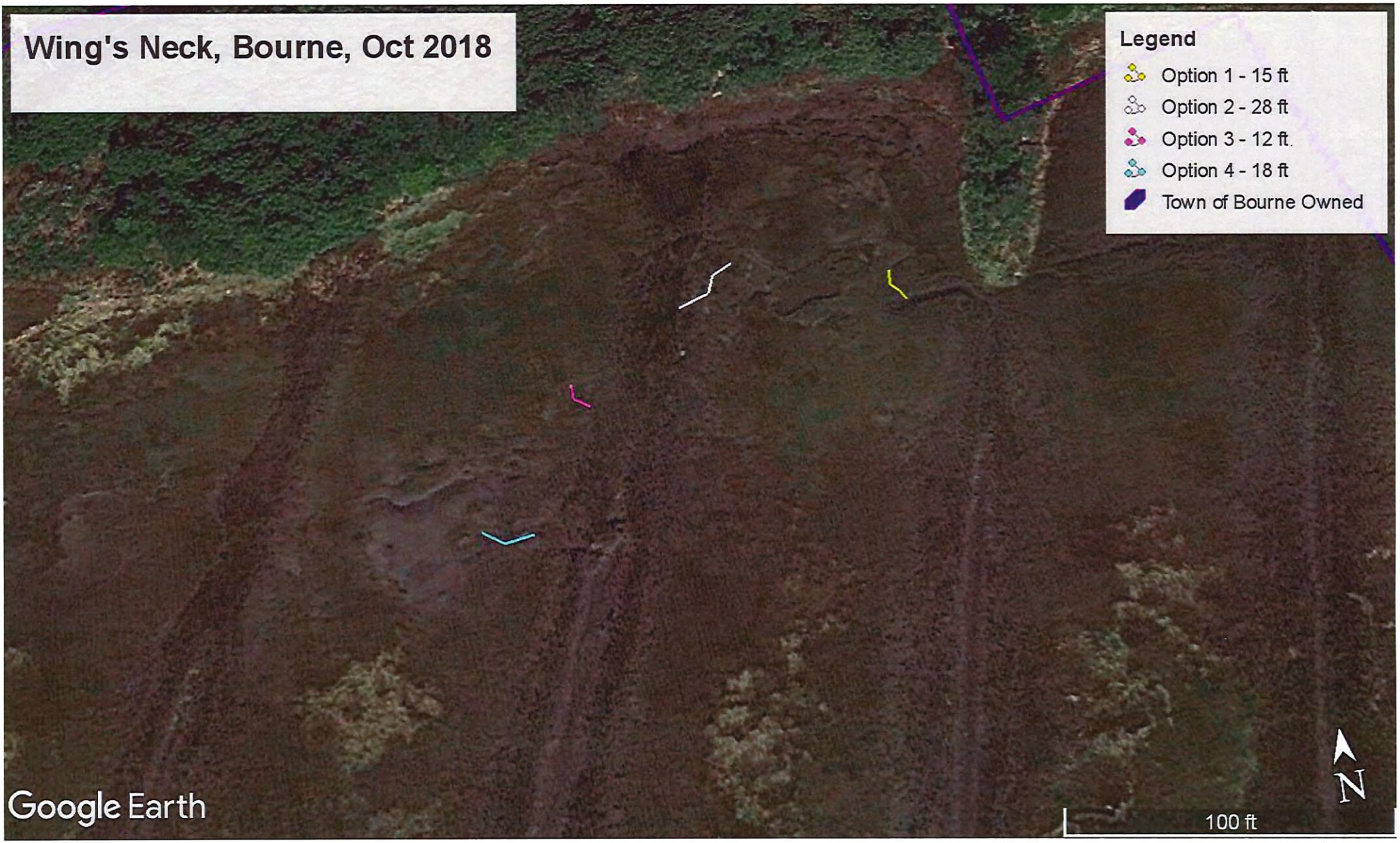
S
60%
50%
40%
30%
20%
10%
0%


Wing's Neck, Bourne
Legend
Culvert
Installed Benchmark
Long-Term Monitoring Transects
Option 1 - 15 ft
Option 2 - 28 ft
Option 3 - 12 ft
Option 4 - 18 ft
Parking
Protected Open Space
Town of Bourne Owned
Google Earth
300 ft
N


Wing's Neck, Bourne
Google Earth
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2020 TerraMetrics
N
10 mi


Wing's Neck, Bourne
Wings Cove
Hen Cove
Bassetts Island
Eustis Rock
The Anchorage
Google Earth
© 2020 Google
N
4000 ft


Wing's Neck, Bourne, Oct 2018
Legend
Option 1 - 15 ft
Option 2 - 28 ft
Option 3 - 12 ft
Option 4 - 18 ft
Town of Bourne Owned
Google Earth
N
100 ft

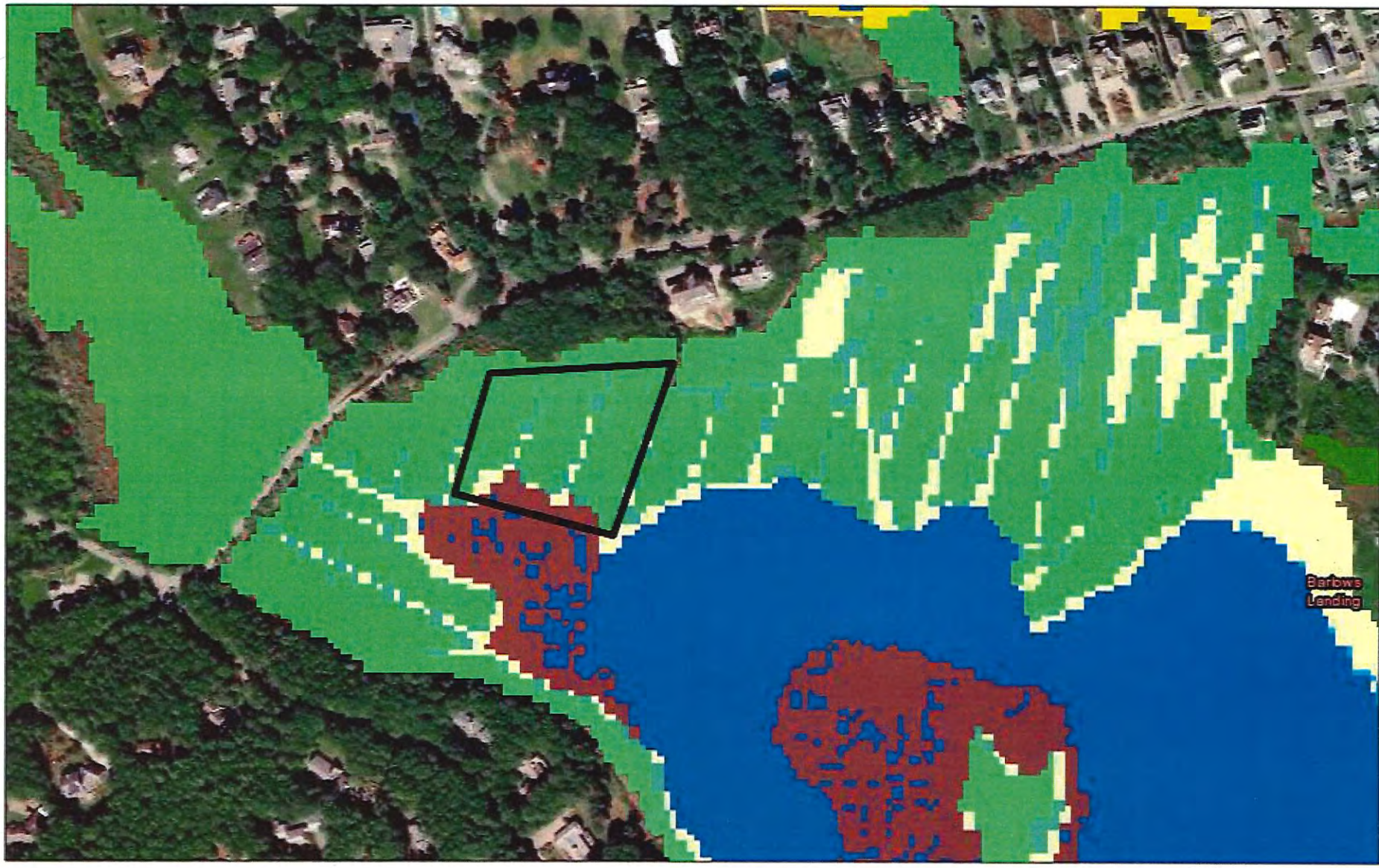

Wing's Neck, Bourne, Apr 2017
Legend
Option 1 - 15 ft
Option 2 - 28 ft
Option 3 - 12 ft
Option 4 - 18 ft
Town of Bourne Owned
Google Earth
N
100 ft


Wing's Neck, Bourne, Mar 2012
Legend
Option 1 - 15 ft
Option 2 - 28 ft
Option 3 - 12 ft
Option 4 - 18 ft
Town of Bourne Owned
Google Earth
N
100 ft


Wing's Neck, Bourne, Apr 2005
Legend
Option 1 - 15 ft
Option 2 - 28 ft
Option 3 - 12 ft
Option 4 - 18 ft
Town of Bourne Owned
Google Earth
N
100 ft

Field photographs from January/February 2020, within 3 hours of low tide.

Wing's Neck, Bourne, Initial Conditions, 2011



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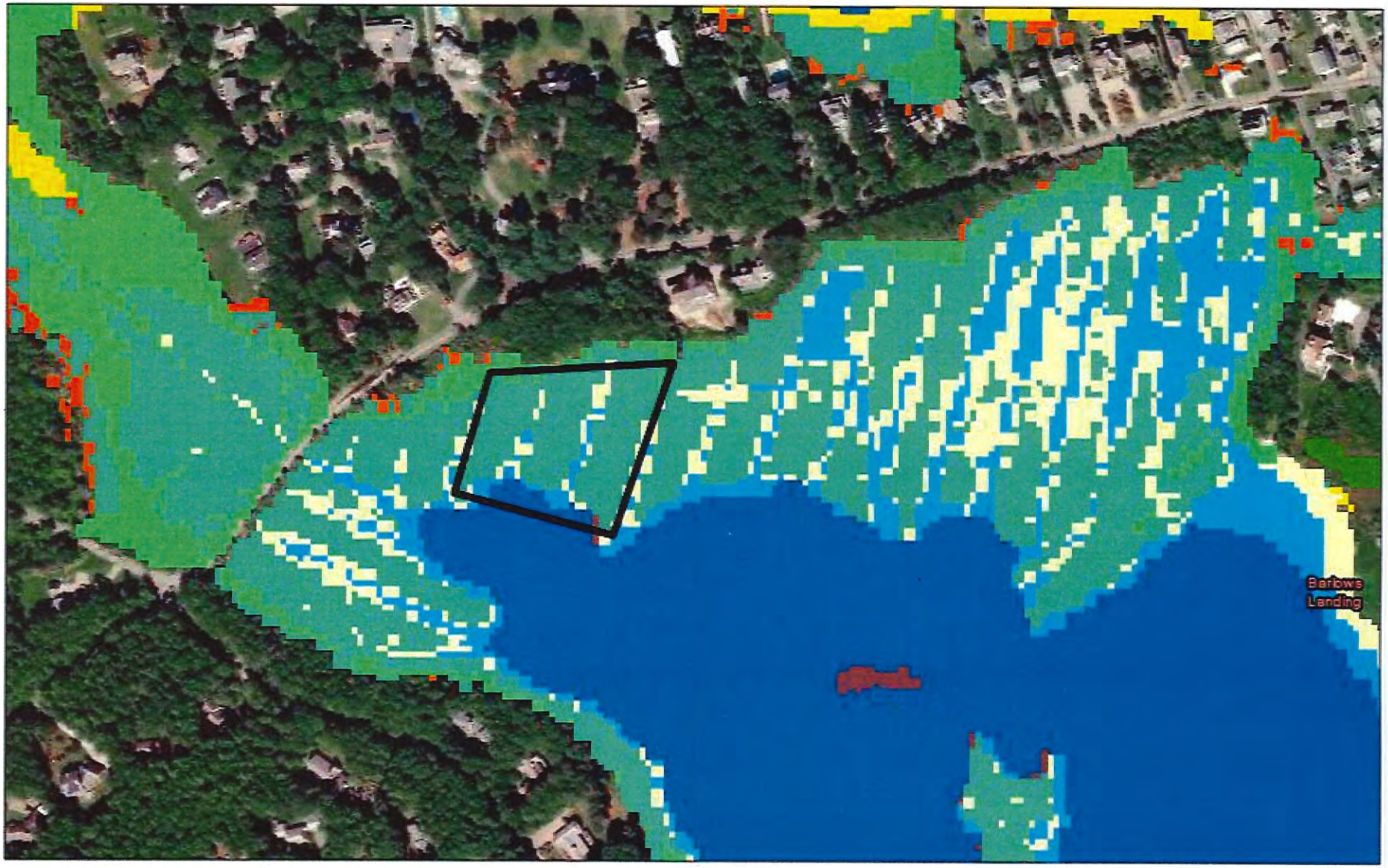
0 0.04 0.09 0.18 km

Wing's Neck, Bourne, 2.3 ft. SLR (2100)



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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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Wing's Neck, Bourne, 4.5 ft. SLR (2100)

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sn_ylw-pushpin

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

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  _____
- Additional comments:

  _____

  _____

- **Suitability Ranking (1-5) _____**