Nature Has Solutions
Why Science Matters

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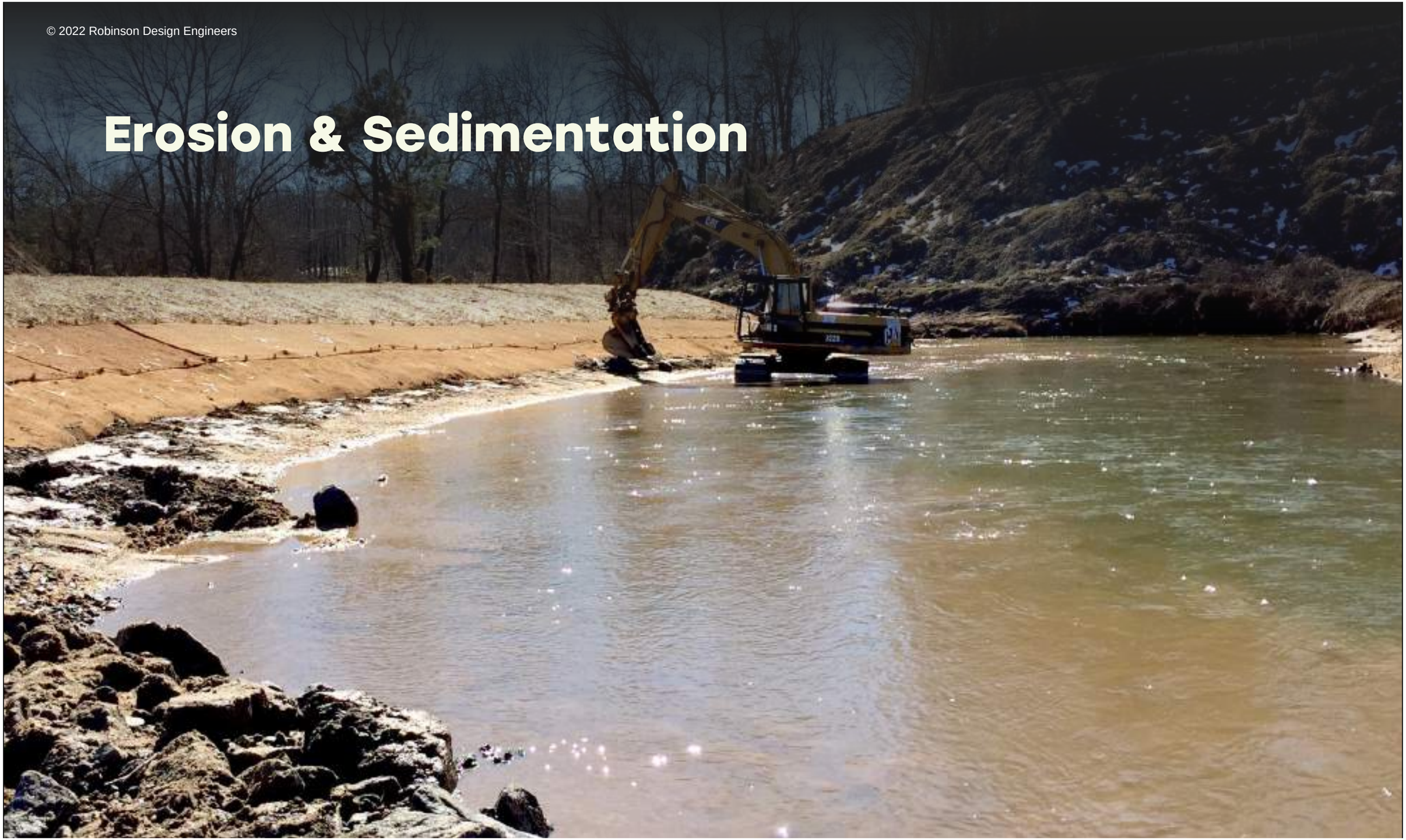
Stormwater

Flooding

Erosion & Sedimentation



Aquatic Ecosystems

Nature-based Solutions

1. Reclaim as much natural function as possible, and

2. Enhance the system’s capacity for self-renewal.

Image credit:
The Nature Conservancy of SC


Image credit:
The Post & Courier

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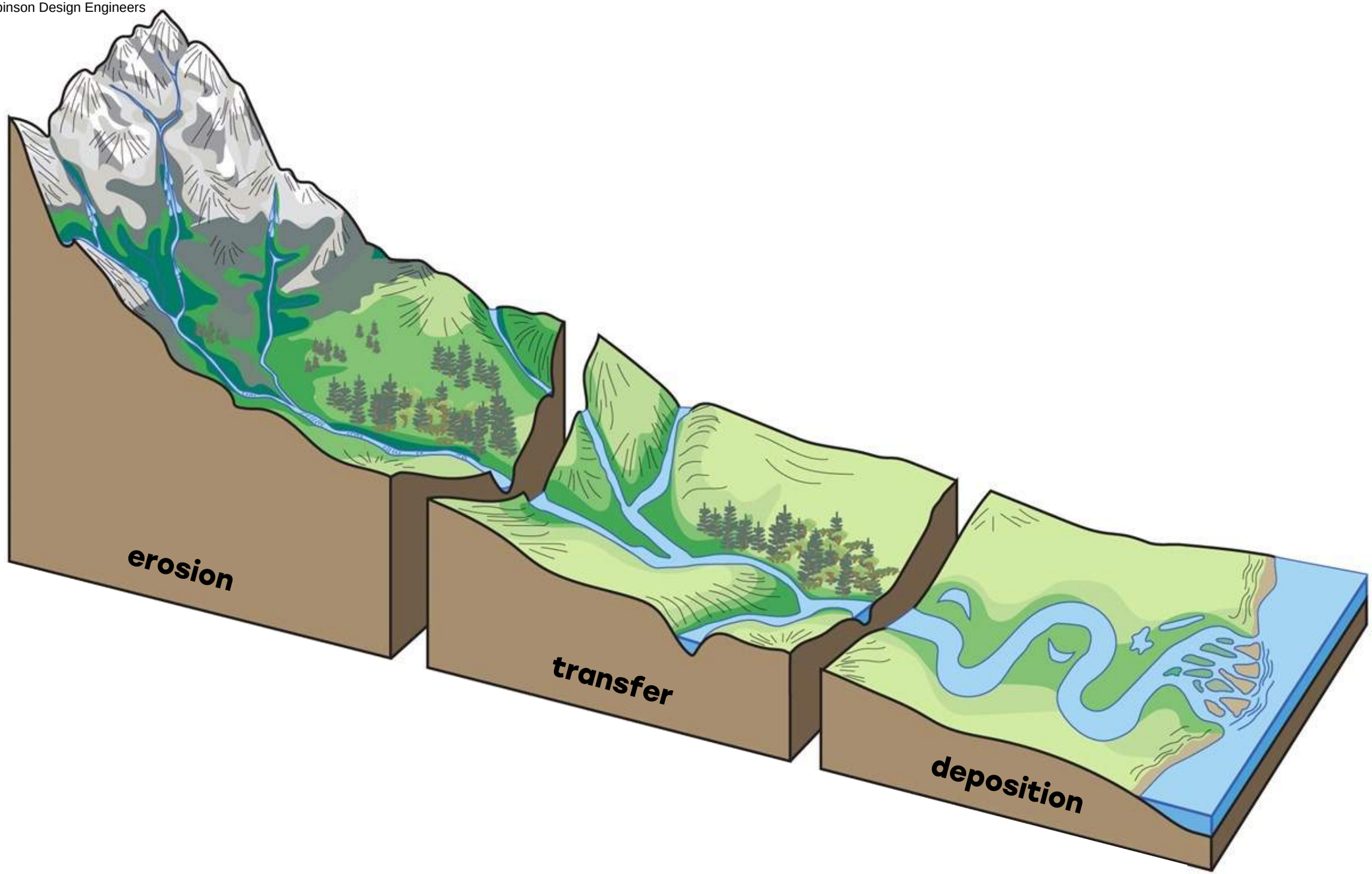
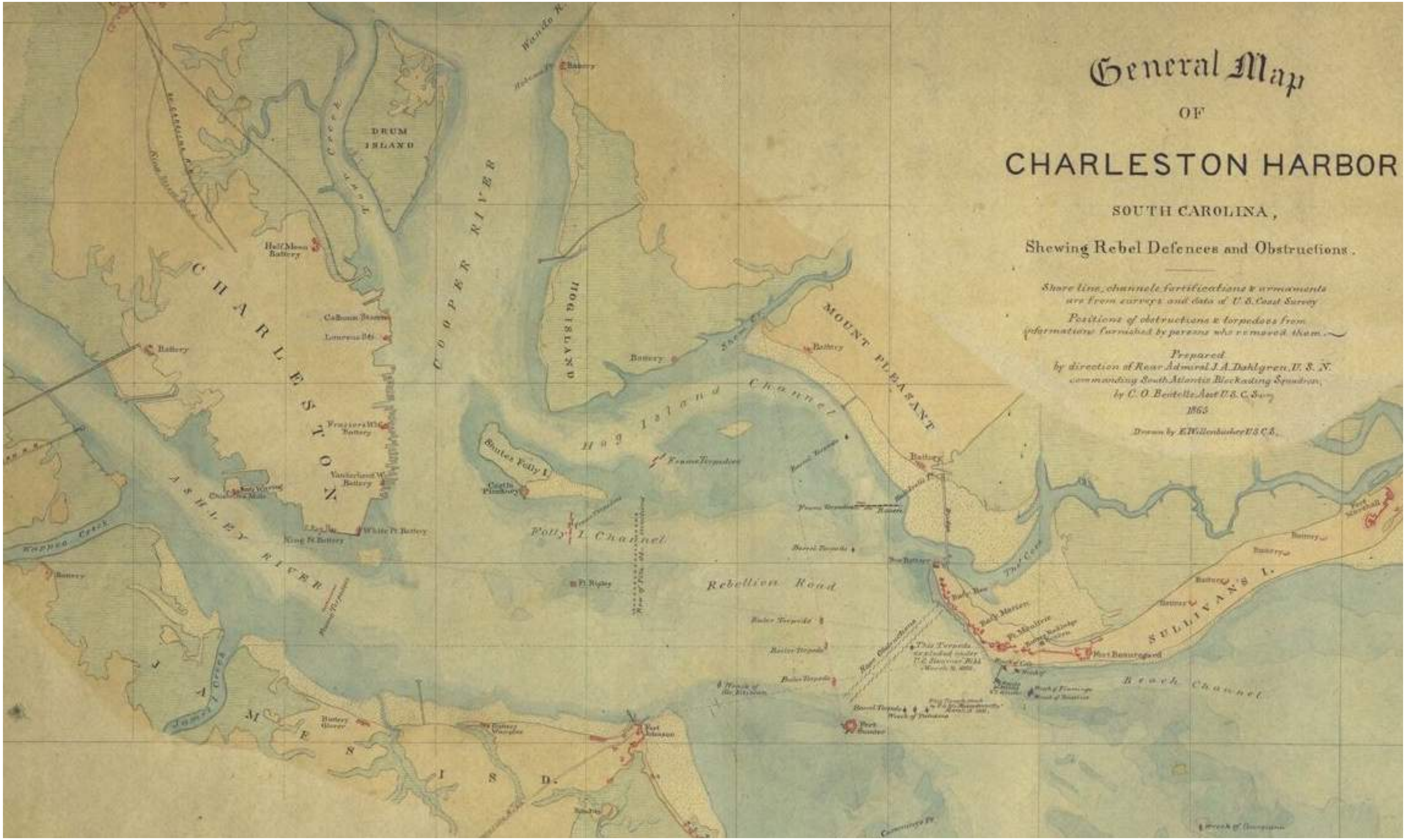
Image Credit: Nolan Williams

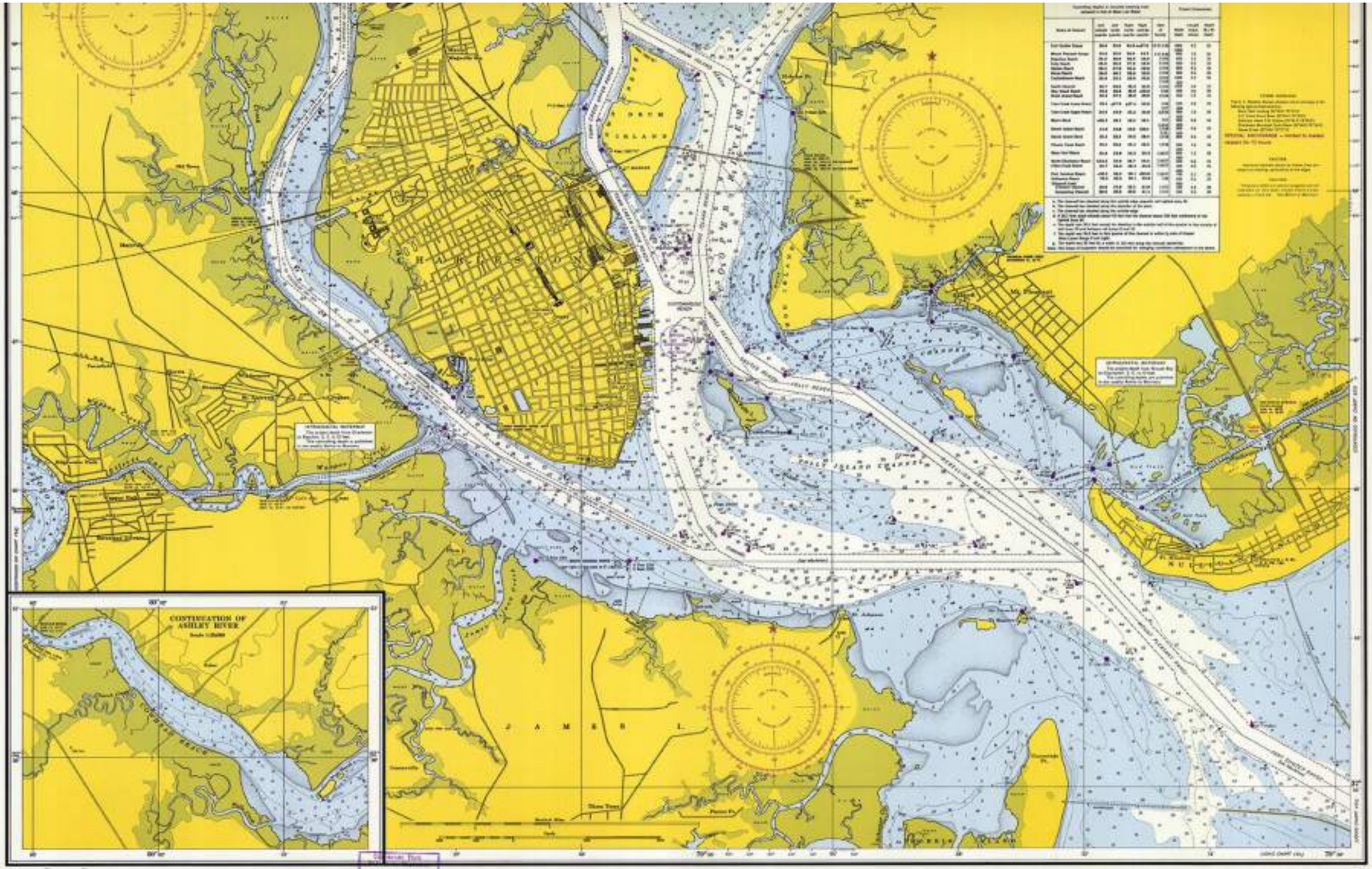


Lake Marion Dam, 1941

Charleston Harbor, present-day


Wando River
Charlestown Neck
Ashley River
Charlestown
Gadsden Creek
Shutes Folly
Hobcaw
Hobcaw Creek
Mount Pleasant
Fort Moultrie
Sullivans Island
North Channel
North Point Head
Upper Middle
Lower Middle
Hamed Creek
Eight Feet Channel

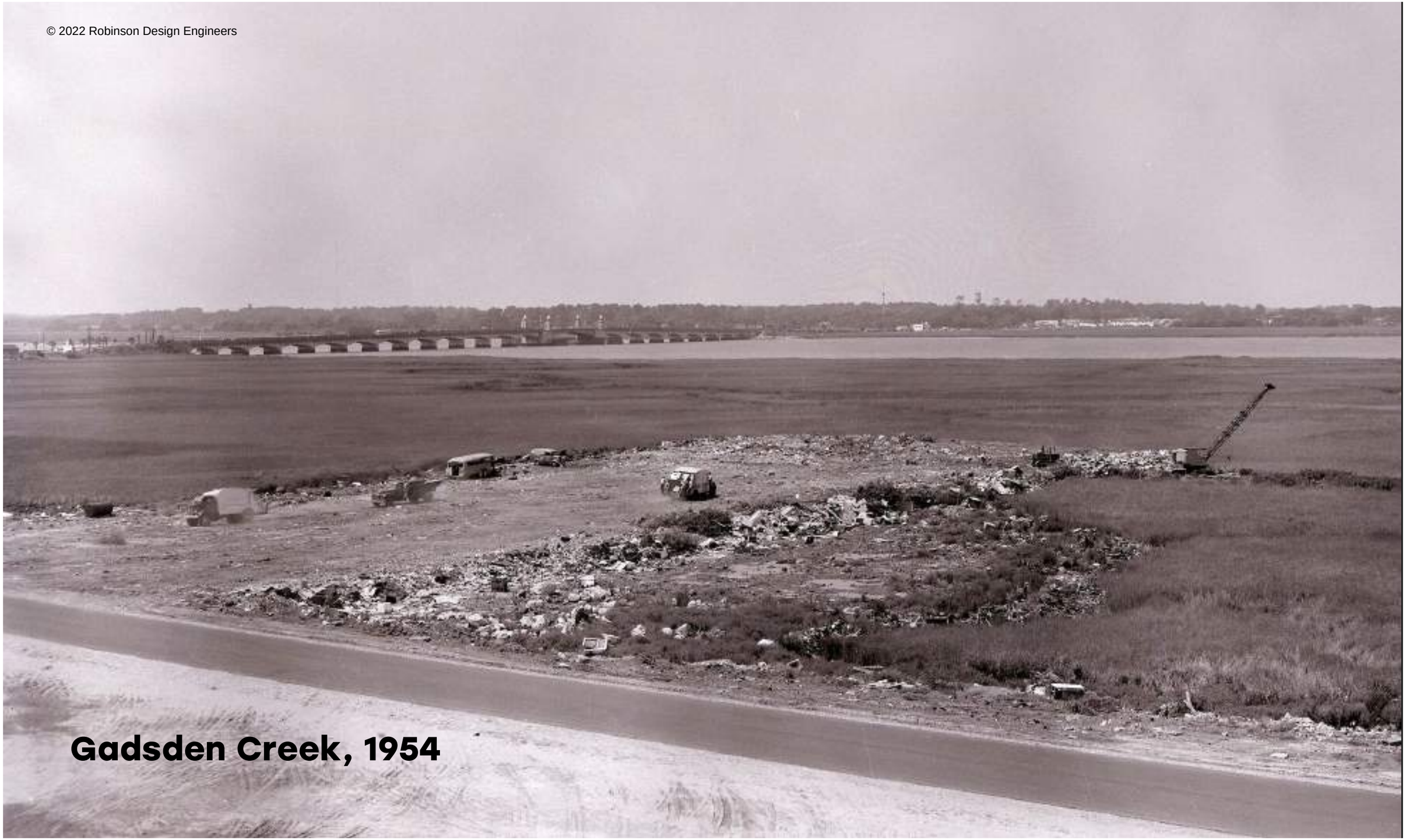

General Map
OF
CHARLESTON HARBOR
SOUTH CAROLINA,
Shewing Rebel Defences and Obstructions.
Shore line, channels fortifications & armaments are from surveys and data of U. S. Coast Survey
Positions of obstructions & torpedoes from information furnished by persons who removed them.
Prepared by direction of Rear Admiral J. A. Dahlgren, U. S. N. commanding South Atlantic Blockading Squadron, by C. O. Boutelle Asst U. S. C. Survey
1865
Drawn by E. Willenbucher U. S. C. S.
DRUM ISLAND
COOPER RIVER
HOG ISLAND
CHARLESTON
MOUNT PLEASANT
Hog Island Channel
Shutes Folly I.
Castle Pinckney
Folly I. Channel
Rebellion Road
ASHLEY RIVER
Wappoo Creek
JAMES ISD.
James I. Creek
Fort Johnson
Fort Sumter
Ft. Ripley
SULLIVAN'S I.
Beach Channel
Ft. Moultrie
Fort Beauregard
Half Moon Battery
White Pt. Battery
Battery



Published at Washington, D.C.
U.S. COAST AND GEODETIC SURVEY
O. Arnold Karo, Director

(Charleston Harbor) C.&G.S. 470

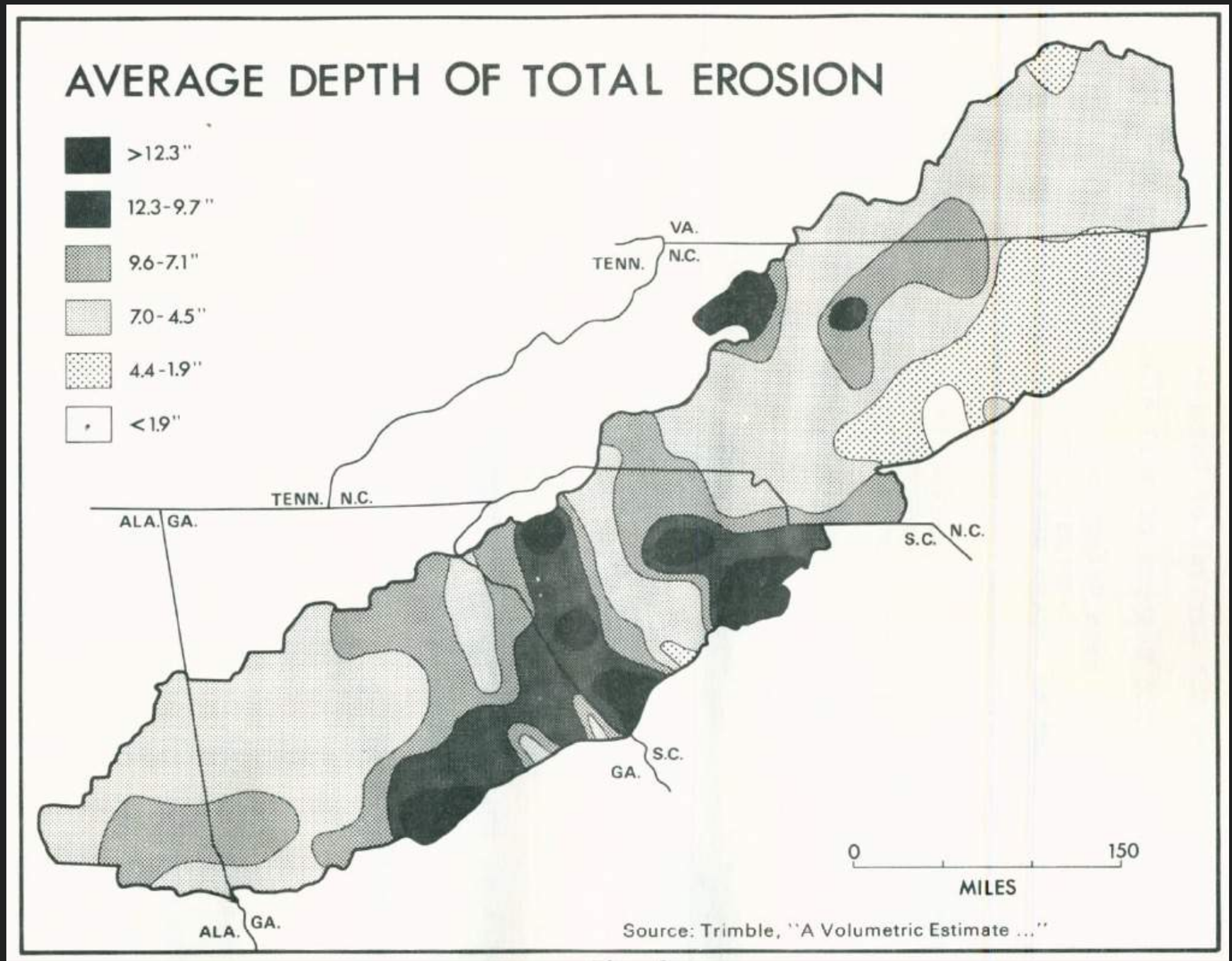

The Nature Conservancy
GIVE
INSPIRE
VOLUNTEER



Gadsden Creek, 1954


Image Credit: Nolan Williams


Greenville
Columbia
Charleston



Trimble, S.W. (1974)

"Man-induced soil erosion on the southern Piedmont, 1700-1970."

Soil Conservation Society of America.

FORESTED VIRGIN LAND DAMAGED BY GULLIES

THAT STARTED IN AN ADJACENT HIGHER-LYING FIELD. SPARTANBURG COUNTY, SOUTH CAROLINA.

Bennett, H.H. and W.R. Chapline (1928)

“Soil Erosion A National Menace."

US Department of Agriculture

RESERVOIR FILLED WITH EROSIONAL DEBRIS

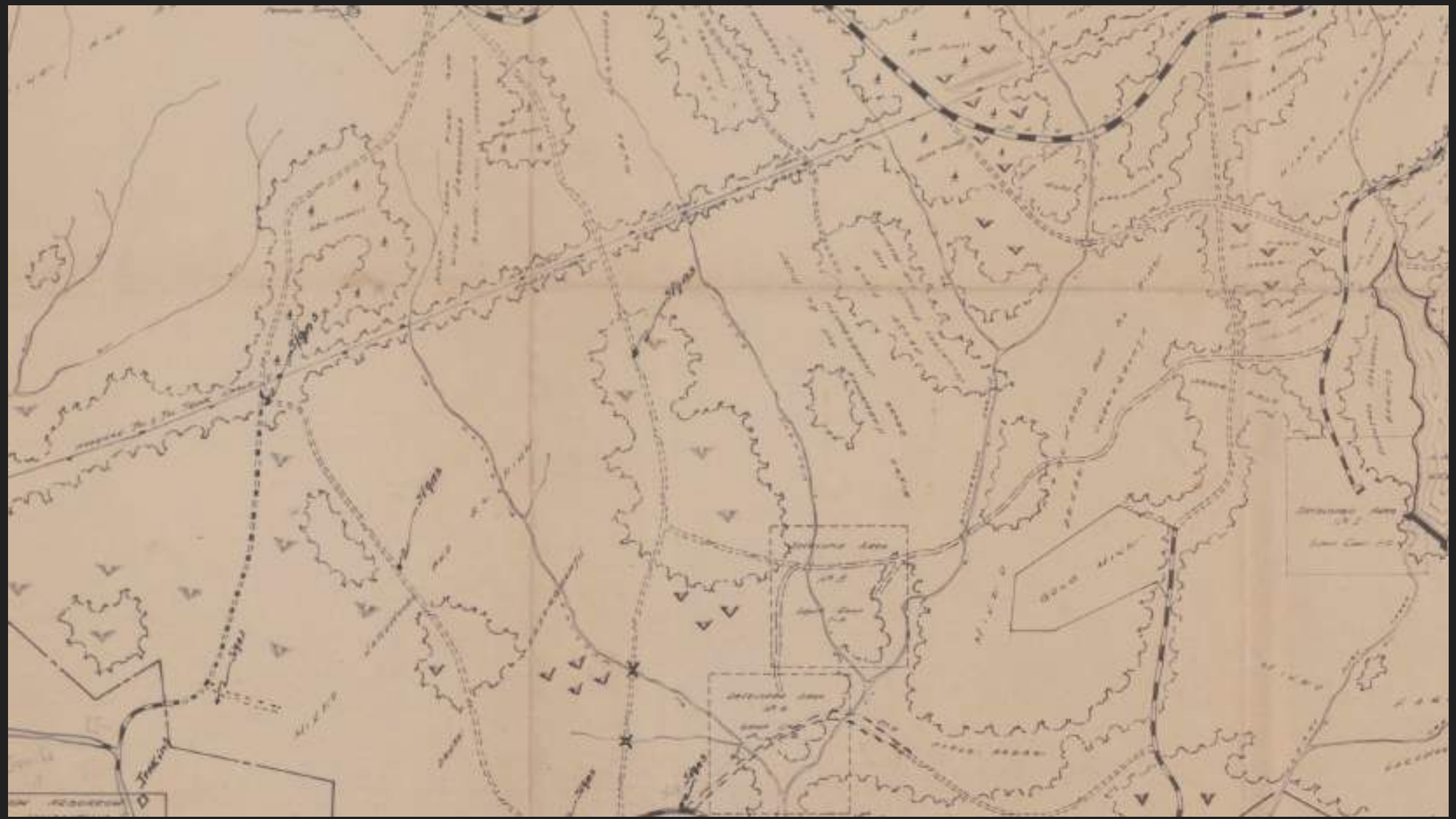
TO THE TOP OF THE DAM (BUT NOT TO THE TOP OF THE FLASHBOARD EXPEDIENT ON TOP OF THI STONE MASONRY FOR MAKING SOME LAST, SHORT-PERIOD USE OF THE COSTLY STRUCTURE). PACOLET RIVER, 7 MILES NORTH OF SPARTANBURG, SOUTH CAROLINA.

Bennett, H.H. and W.R. Chapline (1928)

“Soil Erosion A National Menace."

US Department of Agriculture

Kings Mountain Park, 1937



FIELD PLANTING - TREES

EROSION CONTROL TREATMENT

FIG. 11.—Gully formerly deep with steep banks reclaimed by locust trees and brush dams. Near Martin, Tenn.

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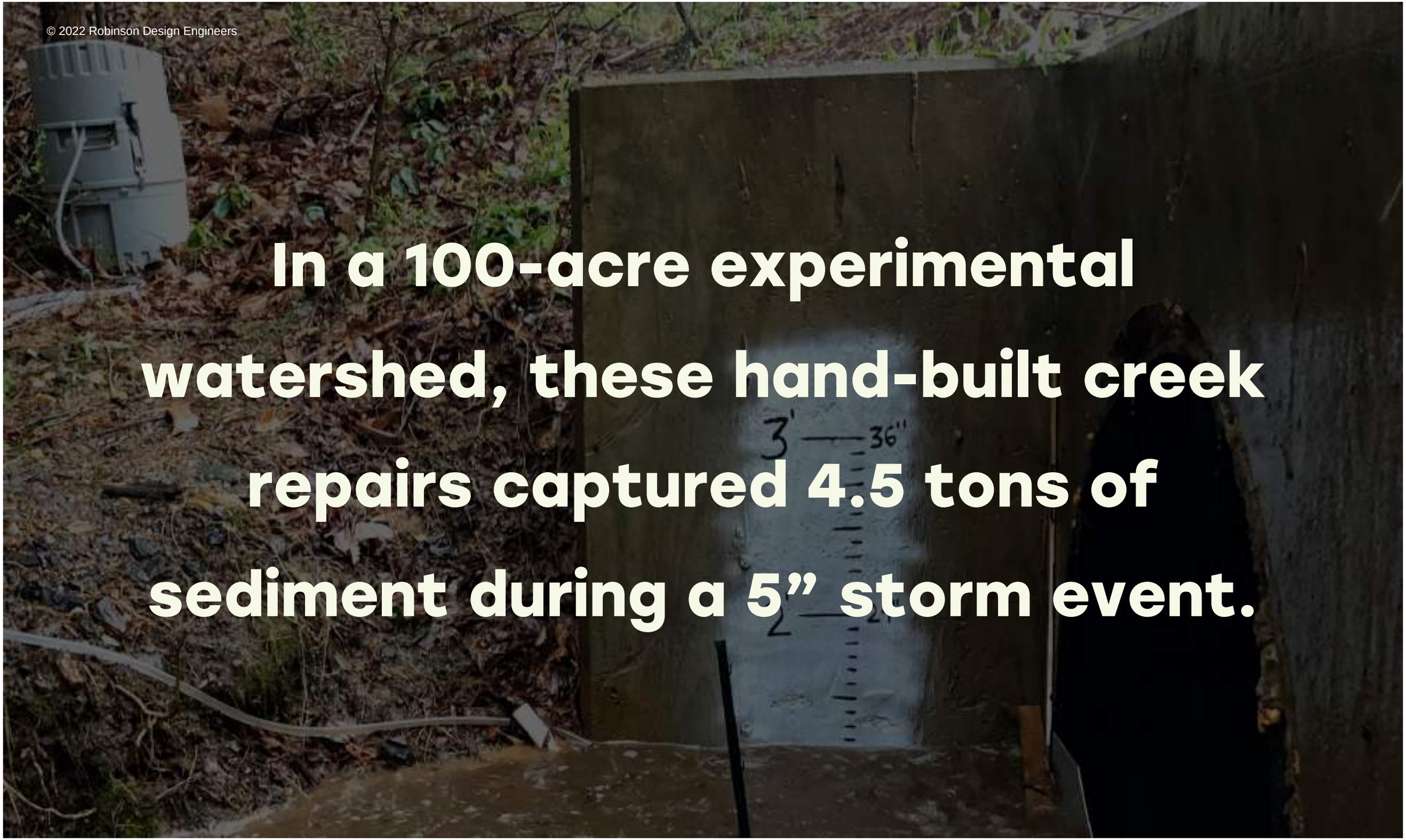
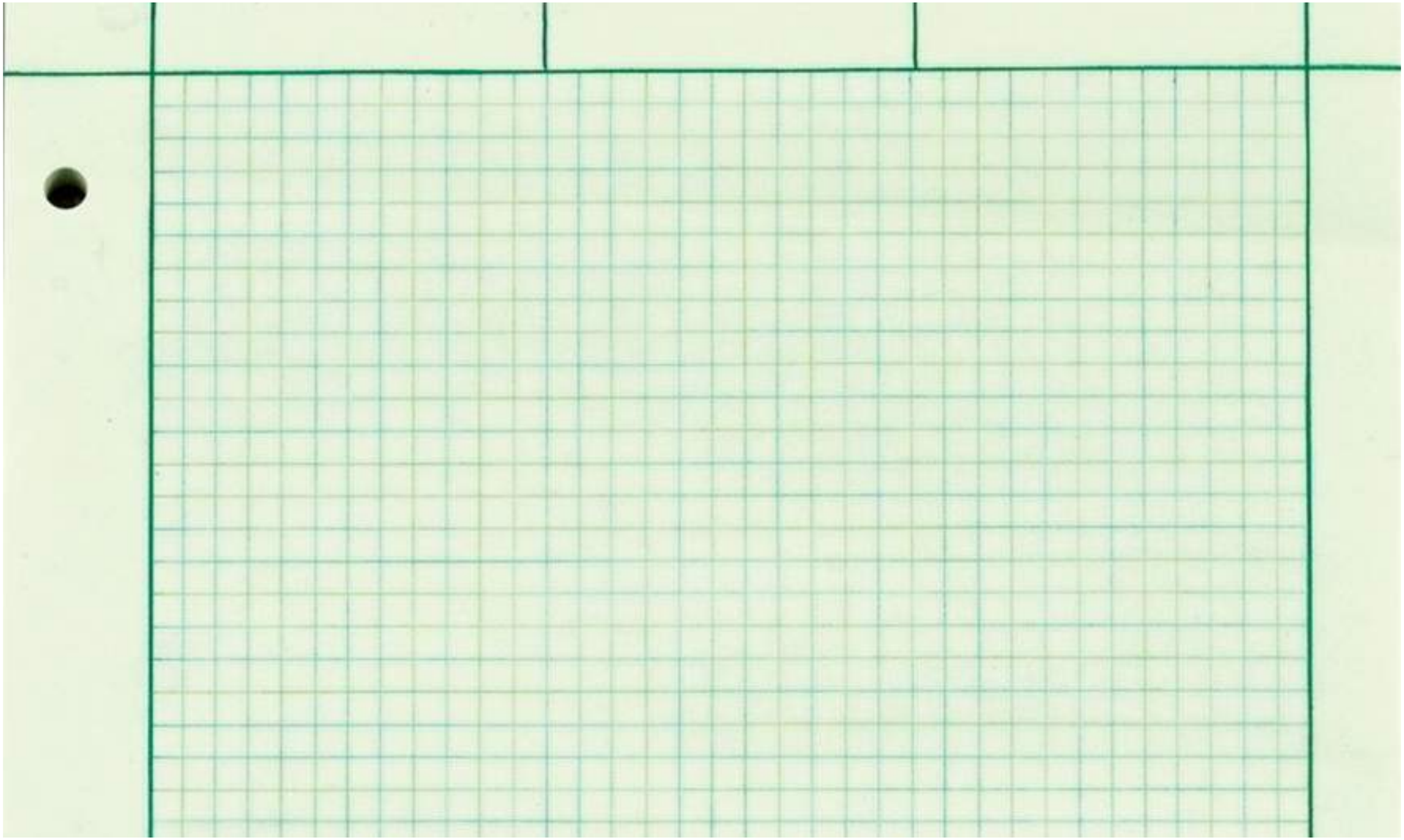
2. Enhance the system’s capacity for self-renewal.

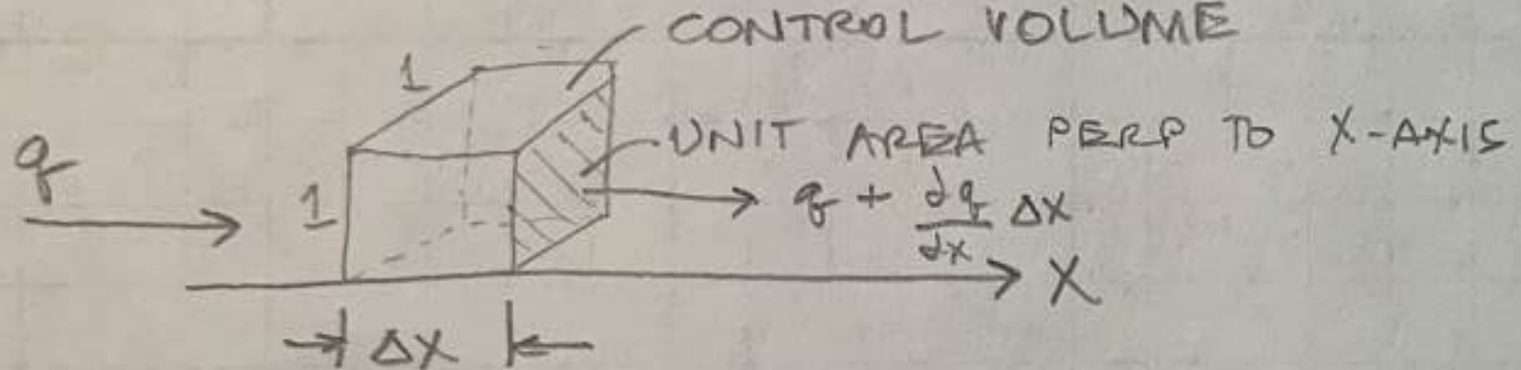


In a 100-acre experimental watershed, these hand-built creek repairs captured 4.5 tons of sediment during a 5” storm event.



$$\vec{q} = -D \nabla c \quad (2.2)$$

CONSIDER A 1D TRANSPORT PROCESS

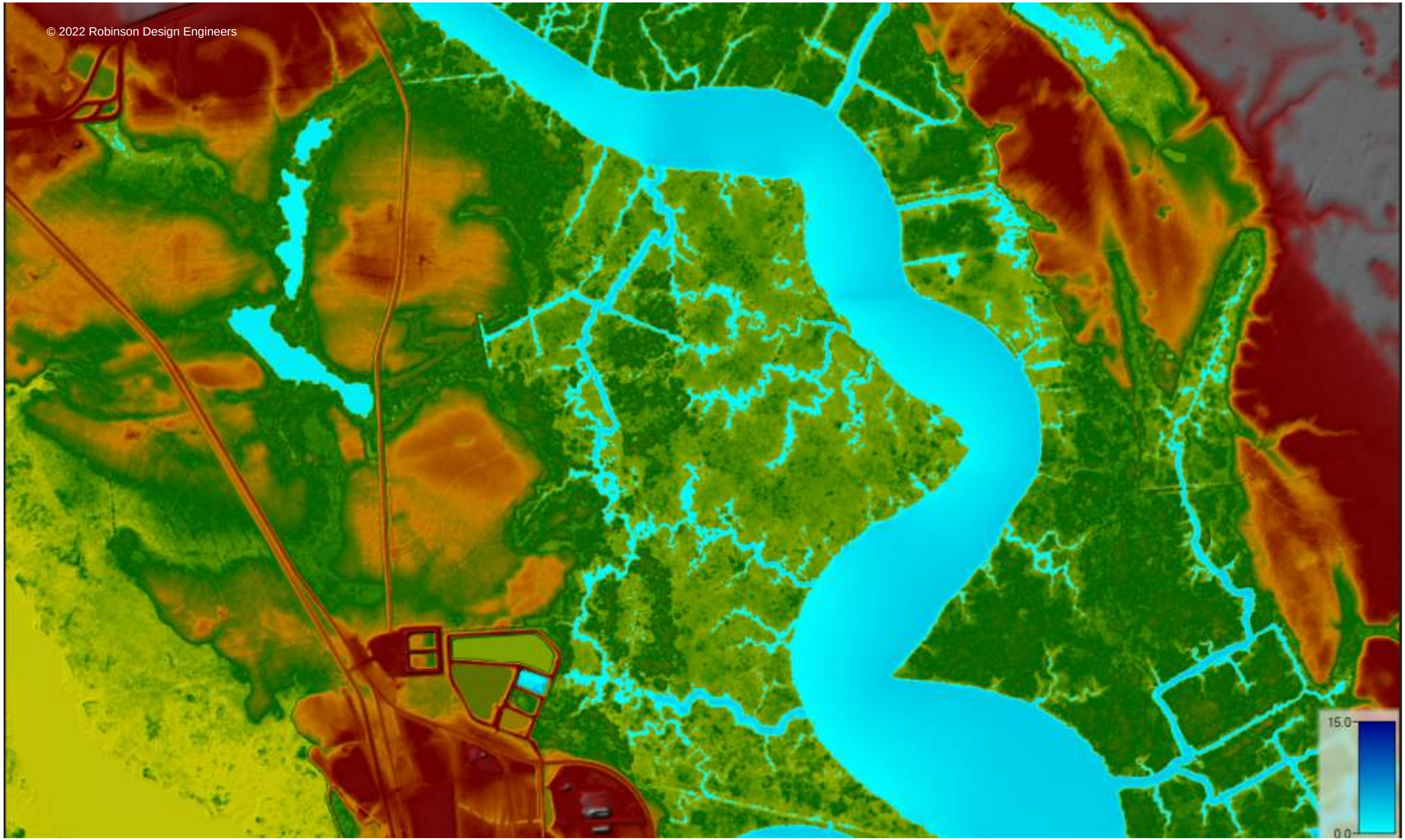


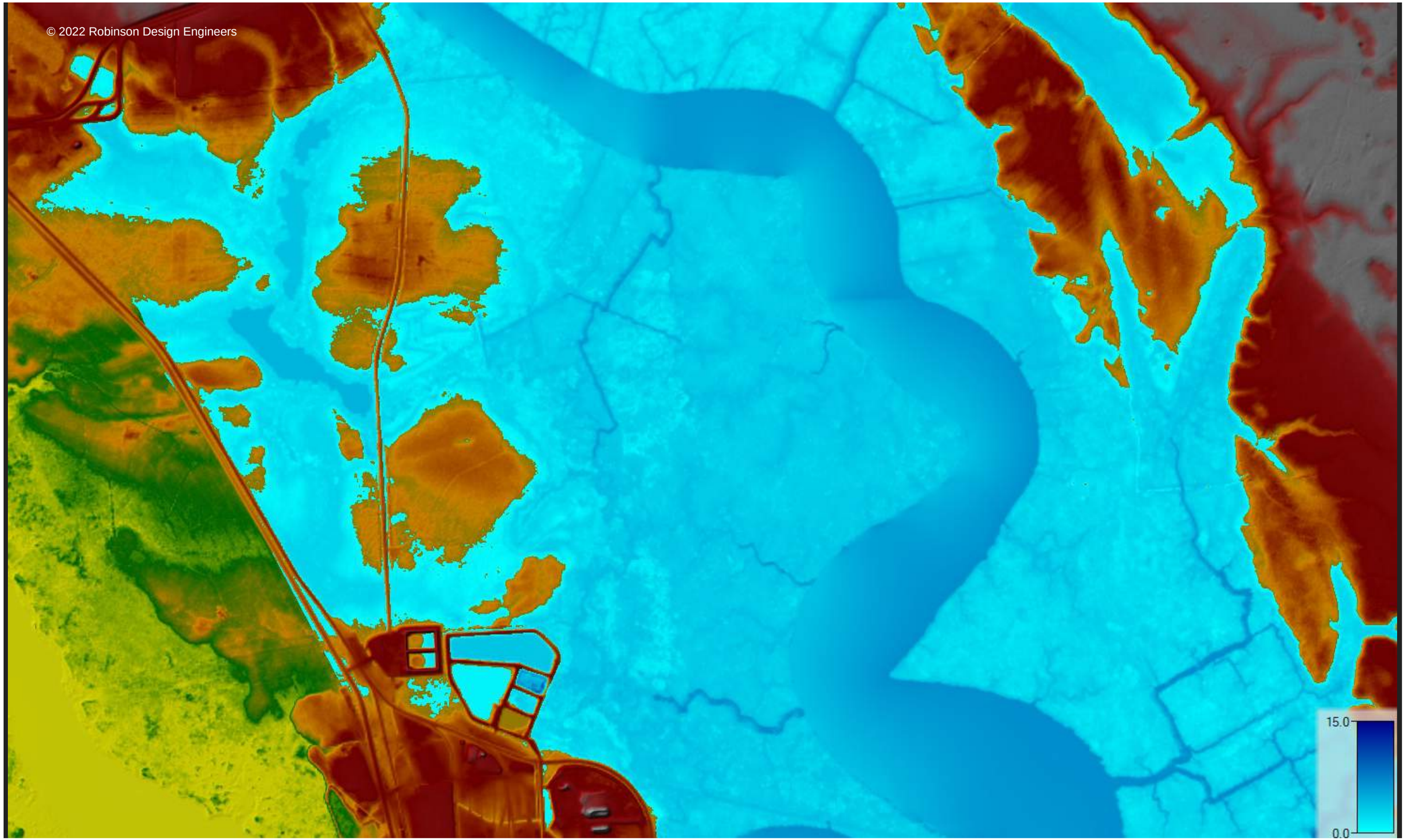
CONCENTRATION ALONG X-AXIS IS $C(x,t)$

MASS OF TRACER IN C.V. $= C \Delta x$

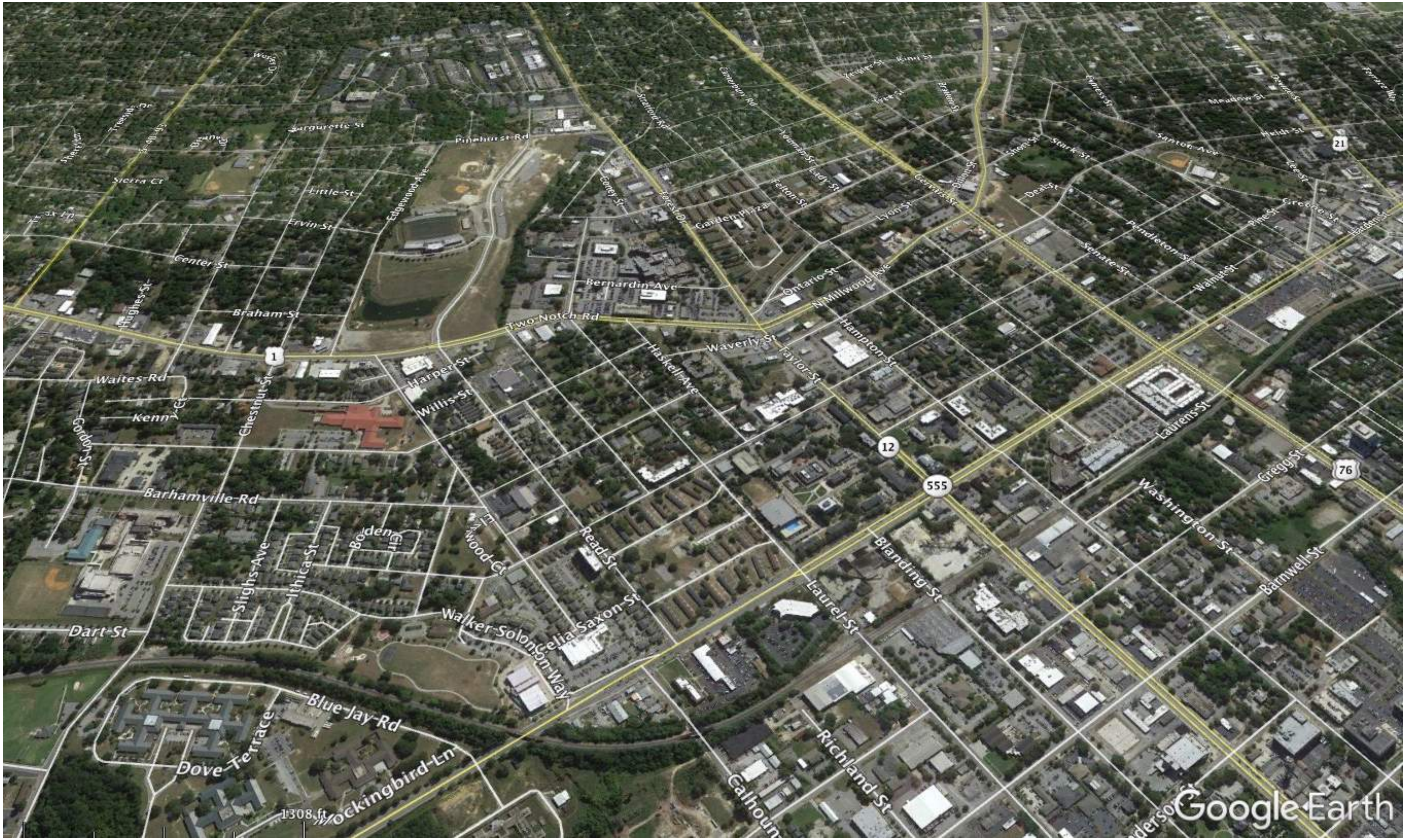
TIME RATE OF CHANGE OF MASS IN CV $= \frac{\partial}{\partial t}(C$

Image credit:
Clemson Cooperative Extension





Columbia, SC



Marguerite St
Pinehurst Rd
Sierra Ct
Little St
Edgewood Ave
Ervin St
Center St
Braham St
Hughes St
Bernardin Ave
Garden Plaza
Felton St
Lady St
Lyon St
Ontario St
N Millwood Ave
Deal St
Stark St
Meadow St
Senate St
Pendleton St
Pine St
Greene St
Walnut St
Two-Notch Rd
1
Waverly St
Hampton St
Taylor St
Haskell Ave
Harper St
Willis St
Waites Rd
Kenny Ct
Chestnut St
Laurens St
12
555
76
21
Gregg St
Barhamville Rd
Washington St
Boden Cir
Read St
Blanding St
Barnwell St
Slighs Ave
Ithica St
Walker-Solomon-Way
Celia Saxon St
Laurel St
Dart St
Blue Jay Rd
Dove Terrace
Mockingbird Ln
Richland St
Calhoun
1308 ft
Google Earth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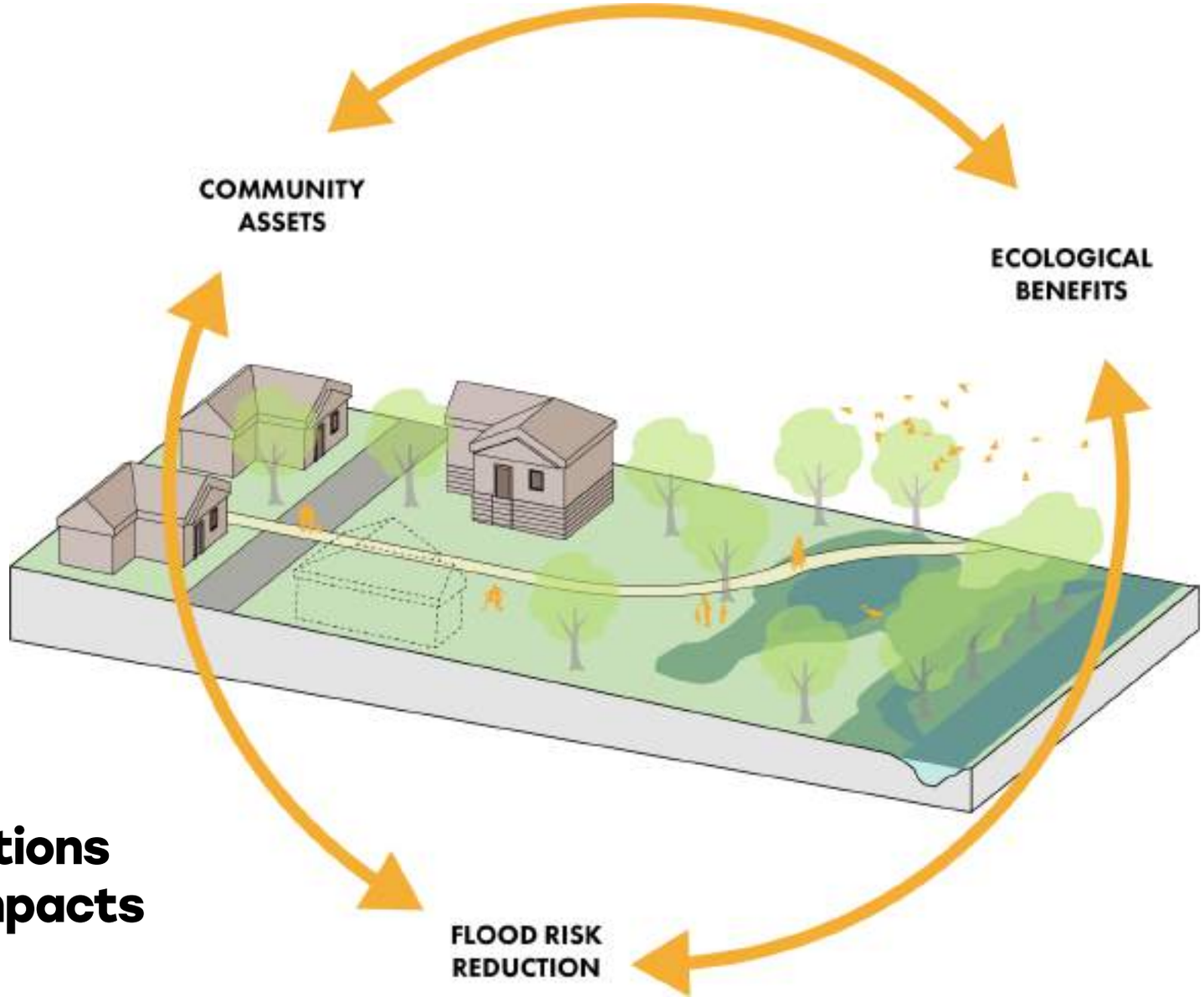
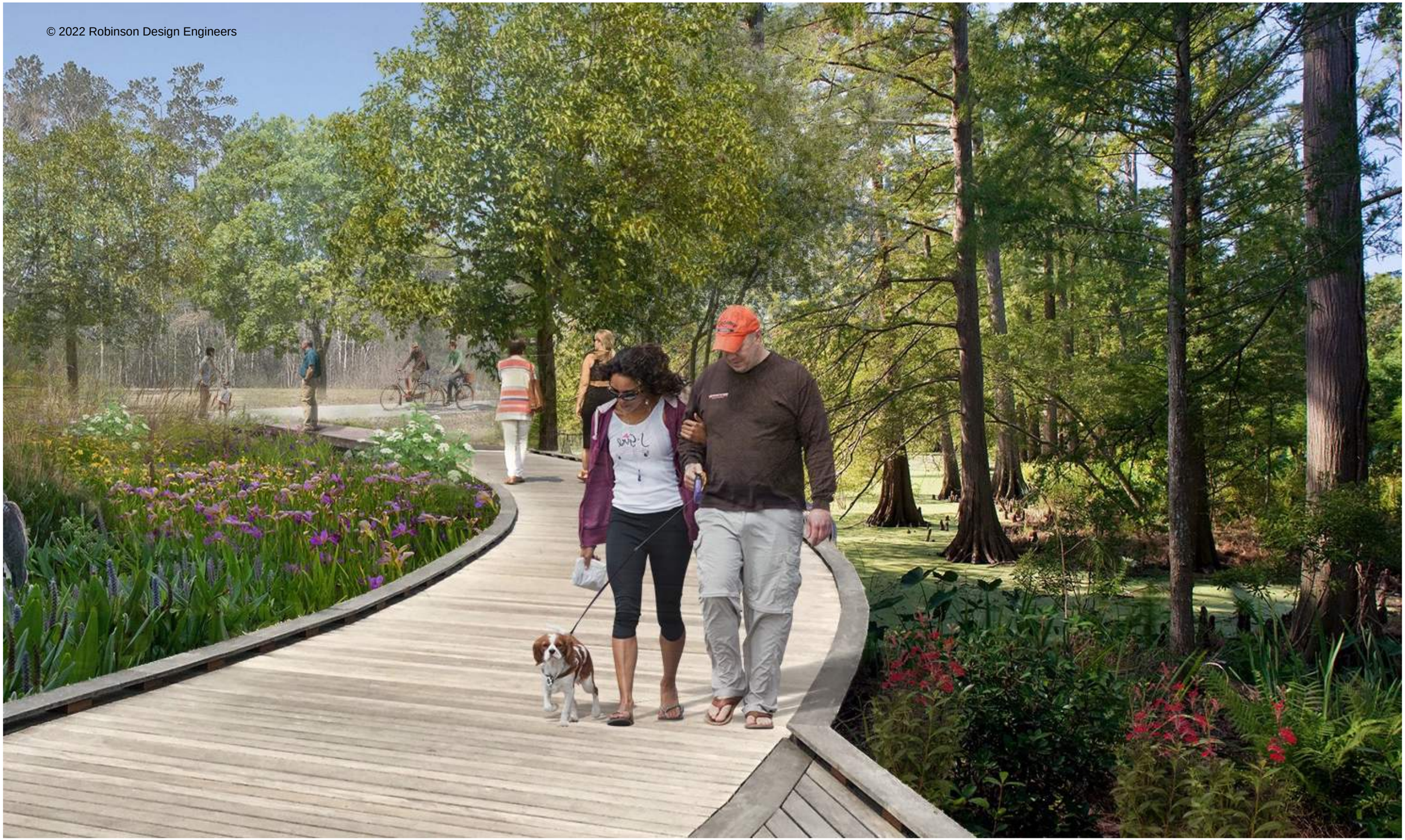
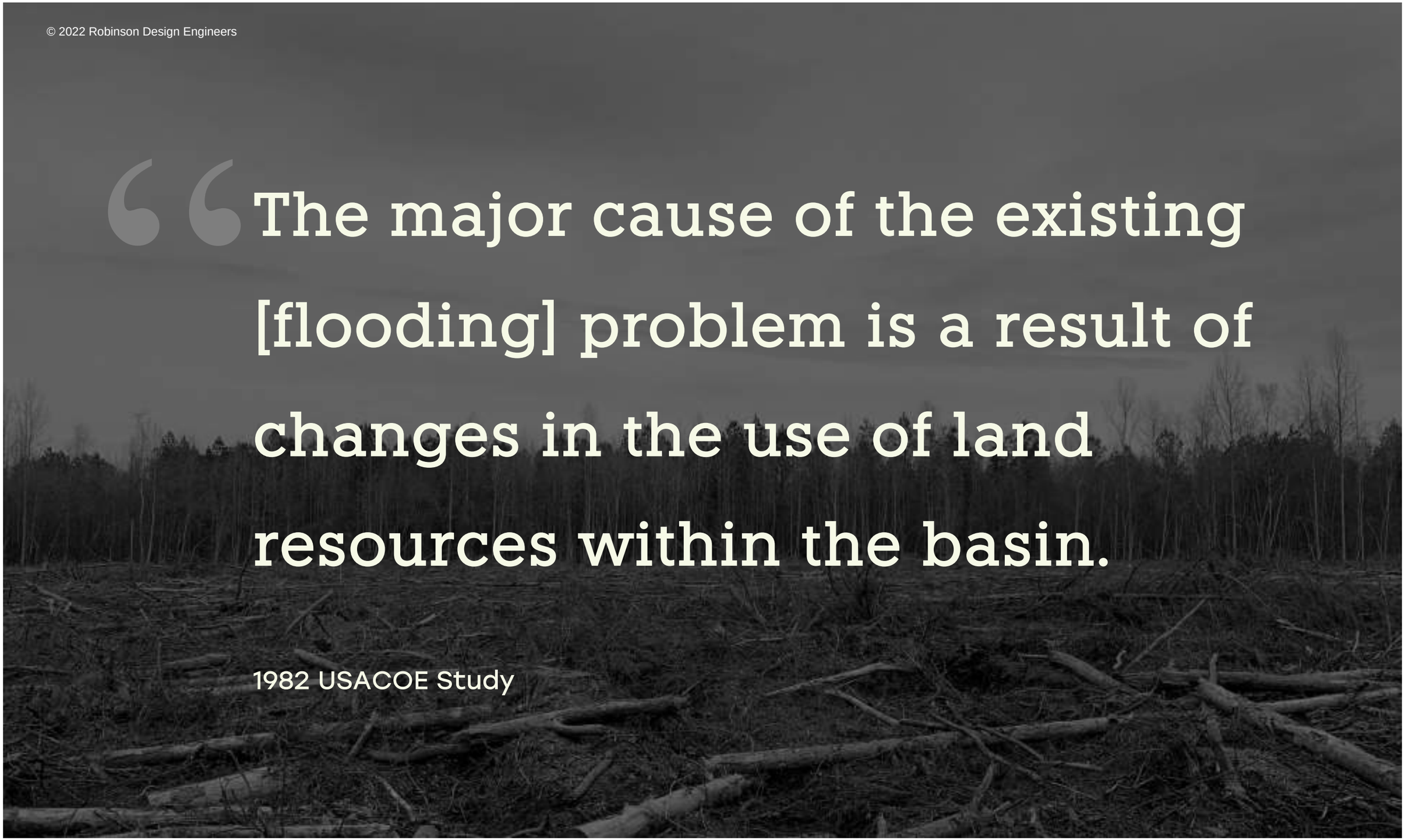
Conway, SC



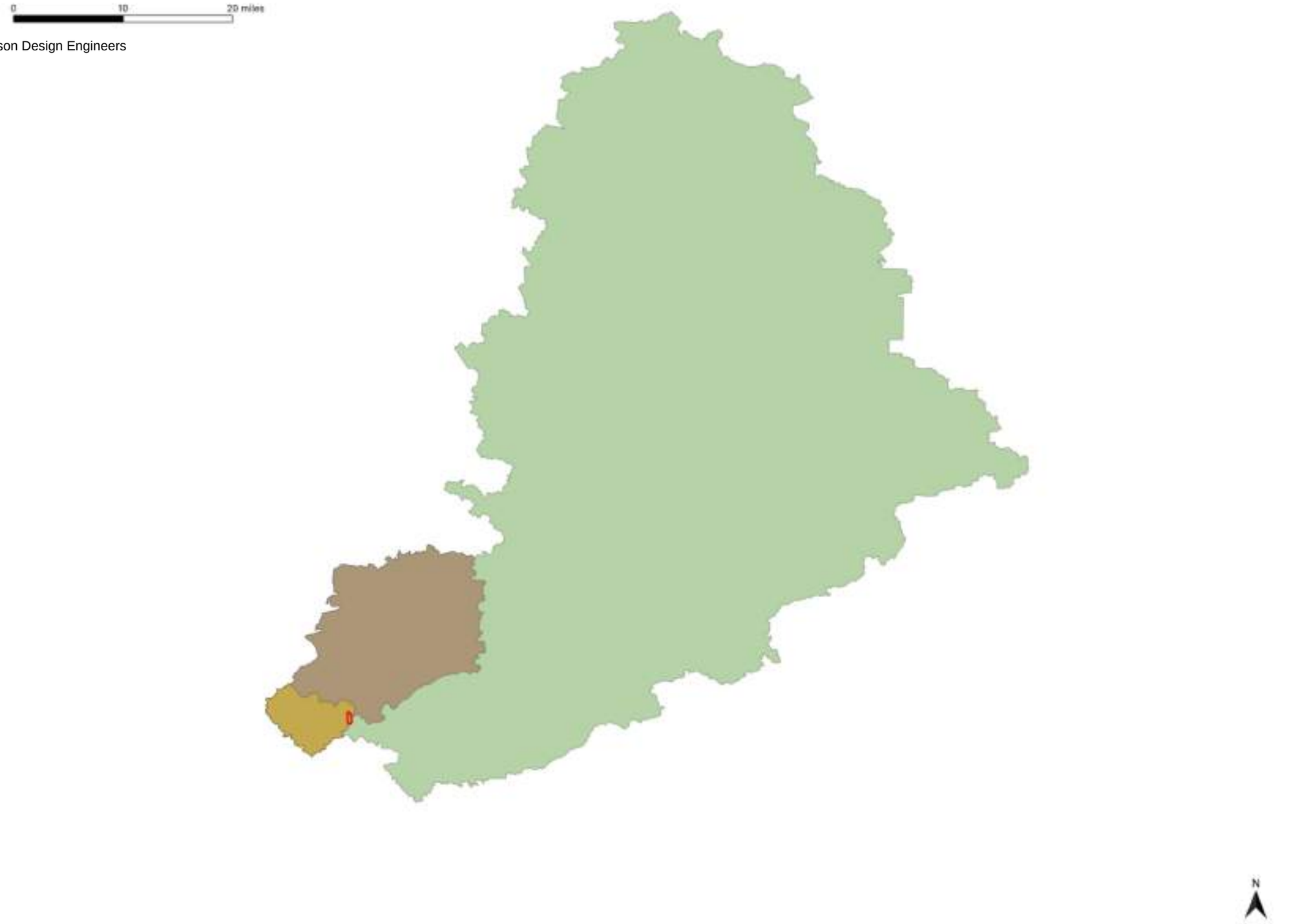
Nature-Based Solutions To Reduce Flood Impacts





> The major cause of the existing [flooding] problem is a result of changes in the use of land resources within the basin.

1982 USACOE Study

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