NCDOT Coastal Inundation Points (Secondary Roadways), March 2022 - NC Department of Transportation

Geodatabase Feature Class

Tags interstates, highways, flooding, transportation, Eastern Seaboard, Atlantic Coast, resiliency, coastal, hurricanes, inundation, rivers, streams, East Coast, Hydraulics, Transportation, NCDOT, Environment, Location, North Carolina, ATLAS

Summary

This dataset was originally created in February 2022 as part of the Project ATLAS initiative at NCDOT to support the Hydraulics Unit with project delivery in the development phase.
This dataset visualizes secondary road flooding potential along the North Carolina coast at various inundation depth levels above 0 ft (NAVD88).

Description

The NCDOT Coastal Inundation Points (Secondary Roadways) dataset is a statewide point layer containing secondary road flooding potential along the North Carolina coast. This is measured for various flood recurrence intervals measured as depth levels above 0 ft.

The layer is used to help understand road elevations in relation to flood events/inundation to help with planning, mitigation and emergency response. It allows ATLAS users to understand road elevations in relation to a project.This data is not meant to represent real-time forecasting or surge modeling.

The dataset comprises points every 50 feet along primary roads.

Points were generated every 50 feet along coastal secondary roads. Each point was assigned a road elevation from a LiDAR-based road elevation dataset provided by NC Emergency Management. Inundation extents were identified by extracting raster cells less than or equal to the desired inundation profile from LiDAR-based high-resolution digital elevation rasters. If a road point fell within the inundation area of a given profile, the water surface elevation was subtracted from the road elevation to determine whether the road flooded and, if so, to what degree. This methodology does not factor in hydraulic connectivity to waterbodies and is not based on mathematical storm surge models. Areas of open water are not included in inundation mapping.

Datasets developed under Project ATLAS do not replace any Hydraulics Unit field work for future projects and may not be used as a replacement for site visits / field surveys by licensed professionals and hence should be used only as a supporting platform for decision making. Use of this dataset for project scoping or screening is merely pre-decisional.

Credits

The Hydraulics Unit within NCDOT was tasked to create this dataset.
Maintenance of this dataset is handled by the Hydraulics Unit. Support and maintenance of the enterprise spatial database where this data resides is handled by NCDIT's Transportation GIS Unit.

Use limitations

The North Carolina Department of Transportation shall not be held liable for any errors in this data. This includes errors of omission, commission, errors concerning the content of the data, and relative and positional accuracy of the data. This data cannot be construed to be a legal document. Primary sources from which this data was compiled must be consulted for verification of information contained in this data.

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Extent

West -78.747503
East -75.419564
North 36.588580
South 33.798467

Scale Range

Maximum (zoomed in) 1:5,000
Minimum (zoomed out) 1:625,000

Topics and Keywords

Themes or categories of the resource Boundaries, Inland Waters, Location, Transportation, Environment

Content type Downloadable Data

Theme keywords interstates, highways, flooding, transportation, Eastern Seaboard, Atlantic Coast, resiliency, coastal, hurricanes, inundation, rivers, streams, East Coast, Hydraulics, Transportation, NCDOT, Environment, Location, North Carolina, ATLAS

Thesaurus

Title User
Creation date 2022-02-08 00:00:00
Publication date 2022-03-31 00:00:00

Place keywords North Carolina

Thesaurus

Title User
Creation date 2022-02-08 00:00:00
Publication date 2022-03-31 00:00:00

Citation

Title NCDOT Coastal Inundation Points (Secondary Roadways), March 2022 - NC Department of Transportation

Creation date 2022-02-08 00:00:00

Publication date 2022-03-31 00:00:00

Presentation formats digital map

Citation Contacts

Responsible party - point of contact

Organization's name North Carolina Department of Transportation - EAU Mitigation and Modeling Unit
Contact's position Environmental Program Consultant

Contact information

Phone

Voice 919-707-6136

Address

Delivery point 4101 Capital Boulevard
City Raleigh
Administrative area NC
Postal code 27604
Country US
e-mail address ATLAS@ncdot.gov

Hours of service

9:00am – 5:00pm Monday - Friday

Contact instructions

Please send an email with any issues, questions or comments regarding the ATLAS Data Search Tool, ATLAS Screening Tool or ATLAS Workbench. If it is an immediate need, please call the contact number or indicate as such in the subject line in an email.

Responsible party - resource provider

Organization's name North Carolina Department of Transportation - EAU Mitigation and Modeling Unit
Contact's position Environmental Program Consultant

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Responsible party - originator

Organization's name North Carolina Department of Transportation - Hydraulics Unit
Contact's position State Hydraulics Engineer
Contact information

Phone
Voice 919-707-6700
Address
Delivery point 1000 Birch Ridge Drive
City Raleigh
Administrative area NC
Postal code 27610
Country US
e-mail address ATLAS@ncdot.gov
Hours of service
9:00am – 5:00pm Monday - Friday

Resource Details

Dataset languages English (UNITED STATES)
Dataset character set utf8 - 8 bit UCS Transfer Format

Status completed
Spatial representation type vector

Processing environment Version 6.2 (Build 9200) ; Esri ArcGIS 10.5.1.7333

Credits

The Hydraulics Unit within NCDOT was tasked to create this dataset.
Maintenance of this dataset is handled by the Hydraulics Unit. Support and maintenance of the enterprise spatial database where this data resides is handled by NCDIT's Transportation GIS Unit.

Extents

Extent

Geographic extent
Bounding rectangle
West longitude -84.330352
East longitude -75.419514
South latitude 33.744722
North latitude 36.589925
Extent contains the resource Yes

Extent

Description

Data collection is complete.

Geographic extent
Bounding rectangle
West longitude -84.125201
East longitude -75.426058
South latitude 33.829738
North latitude 36.556356
Extent contains the resource Yes
Temporal extent
Beginning date 2022-02-08 00:00:00
Ending date 2022-02-08 00:00:00

Extent
Geographic extent
Bounding rectangle
Extent type Extent used for searching
West longitude -78.747503
East longitude -75.419564
North latitude 36.588580
South latitude 33.798467
Extent contains the resource Yes

Extent in the item's coordinate system
westBL 2076680.131192
eastBL 3051815.071893
southBL 35984.006800
northBL 1033284.308142
exTypeCode Yes

Resource Points of Contact

Point of contact - point of contact

Organization's name North Carolina Department of Transportation - EAU Mitigation and Modeling Unit
Contact's position Environmental Program Consultant
Contact information
Phone
Voice 919-707-6136
Address
Delivery point 4101 Capital Boulevard
City Raleigh
Administrative area NC
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Resource Maintenance

Resource maintenance

Update frequency

as needed

Scope of the updates

dataset

Other maintenance requirements

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Maintenance contact - point of contact

Organization's name

North Carolina Department of Transportation - EAU Mitigation and Modeling Unit

Contact's position

Environmental Program Consultant

Contact information

Phone

Voice 919-707-6136

Address

Type

Delivery point 4101 Capital Boulevard

City Raleigh

Administrative area NC

Postal code 27604

Country US

e-mail address ATLAS@ncdot.gov

Hours of service

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Contact instructions

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Resource Constraints

Legal constraints

Limitations of use

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data was compiled must be consulted for verification of information contained in this data.

Security constraints

Classification
unclassified

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Constraints

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Spatial Reference

ArcGIS coordinate system

Type Projected
Geographic coordinate reference GCS_North_American_1983
Projection NAD_1983_StatePlane_North_Carolina_FIPS_3200_Feet

Coordinate reference details

ProjectedCoordinateSystem

WKID 102719
XOrigin -121841900
YOrigin -93659000
XYScale 18939.39393939394
ZOrigin -100000
ZScale 10000
MOrigin -100000
MScale 10000
XYTolerance 0.00052800000000000004
ZTolerance 0.001
MTolerance 0.001
HighPrecision true
LatestWKID 2264

WKT
PROJCS["NAD_1983_StatePlane_North_Carolina_FIPS_3200_Feet",GEOGCS["GCS_North_American_1983",DATUM["
79.0],PARAMETER["Standard_Parallel_1",34.33333333333334],PARAMETER["Standard_Parallel_2",36.16666666666

Reference system identifier

Value 2264
Codespace EPSG
Version 6.12(9.0.0)

Spatial Data Properties

Vector

Level of topology for this dataset geometry only

Geometric objects

Feature class name CoastalInundationPointsSecondaries
Object type point
Object count 15571963

ArcGIS Feature Class Properties

Feature class name CoastalInundationPointsSecondaries
Feature type Simple
Geometry type Point
Has topology FALSE
Feature count 15571963
Spatial index TRUE
Linear referencing FALSE

Data Quality

Scope of quality information

Resource level dataset

Data quality report - Completeness omission

Data quality measure reference

Measure description

After processing, the dataset is checked for drawing display and number of records and file sizes compared with source materials.

Conformance test results

Test passed Yes
Result explanation
Pass

Product specification

Title NCDOT Geospatial Data Specifications
Creation date 2021-12-15 00:00:00
Publication date 2022-01-28 00:00:00

Data quality report - Conceptual consistency

Data quality measure reference

Measure description

The dataset is converted to file geodatabase (FGDB) format using tools in ArcGIS. The geometry is checked, and if needed repaired.

Conformance test results

Test passed Yes
Result explanation
Pass

Product specification

Title NCDOT Geospatial Data Specifications
Creation date 2021-12-15 00:00:00
Publication date 2022-01-28 00:00:00

Data quality report - Quantitative attribute accuracy

Data quality measure reference

Measure description

A contractor created the layer using numerous manual and automated checks as well as QA/QC of the layers used in creation and the final product by NCDOT personnel. The original layers had gone through the normal process from NC Emergency Management to assure quality.

Quality evaluation procedure

Evaluation method

Pass

Conformance test results

Test passed Yes
Result explanation
Pass

Product specification

Title NCDOT Geospatial Data Specifications
Creation date 2022-02-08 00:00:00
Publication date 2022-03-31 00:00:00

Lineage

Lineage statement

Points were generated every 50 feet along secondary roads.

Each point was assigned a road elevation from a LiDAR-based road elevation dataset provided by NC Emergency Management.
If a road point fell within the greatest floodplain extent (100-yr or 500-yr), the water surface elevation was subtracted from the road elevation to determine whether the road flooded and, if so, to what degree.
Bridges, overpasses, and areas of open water are not included in this dataset.
Roads that were analyzed but did not have inundation impacts are not included in this dataset.
Analysis is based on NCDOT's 2021 Q2 road network and 2014-2018 LiDAR.

Process step

Description

Data was reviewed in ESRI's Data Reviewer tool to verify geometry. No legitimate errors were found.

Process contact - point of contact

Organization's name North Carolina Department of Transportation - EAU Mitigation and Modeling Unit

Contact's position Environmental Program Consultant

Contact information

Phone

Voice 919-707-6136

Address

Delivery point 4101 Capital Boulevard

City Raleigh

Administrative area NC

Postal code 27604

Country US

e-mail address ATLAS@ncdot.gov

Hours of service

9:00am – 5:00pm Monday - Friday

Contact instructions

Please send an email with any issues, questions or comments regarding the ATLAS Data Search Tool, ATLAS Screening Tool or ATLAS Workbench. If it is an immediate need, please call the contact number or indicate as such in the subject line in an email.

Process step

Description

Geodatabase was forwarded on to the GIS Unit for publishing as part of data for project ATLAS.

Process contact - point of contact

Organization's name North Carolina Department of Transportation - EAU Mitigation and Modeling Unit

Contact's position Environmental Program Consultant

Contact information

Phone

Voice 919-707-6136

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Distribution

Distributor

Contact information - distributor

Organization's name North Carolina Department of Transportation - EAU Mitigation and Modeling Unit

Contact's position Environmental Program Consultant

Contact information

Phone

Voice 919-707-6136

Address

Delivery point 4101 Capital Boulevard

City Raleigh

Administrative area NC

Postal code 27604

Country US

e-mail address ATLAS@ncdot.gov

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Distribution format

Name File Geodatabase Feature Class

Version 10.5

Fields

Details for object CoastalInundationPointsSecondaries

Type Feature Class
Row count 15571963
Definition
Secondary Road flooding potential along the North Carolina coast

Definition source
NCDOT

Field OBJECTID

Alias OBJECTID
Data type OID
Width 4
Precision 0
Scale 0
Field description
Internal feature number.

Description source
Esri

Description of values
Sequential unique whole numbers that are automatically generated.

Field Shape

Alias Shape
Data type Geometry
Width 0
Precision 0
Scale 0
Field description
Feature geometry.

Description source
Esri

Description of values
Coordinates defining the features.

Field Division

Alias Division
Data type SmallInteger

Width 2
Precision 0
Scale 0
Field description
The NCDOT highway division number.

Description source
NCDOT

Field RouteID

Alias RouteID
Data type String
Width 20
Precision 0
Scale 0
Field description
An 11-digit route identifier, derived from NCDOT's NCRoutes feature class.

Description source
NCDOT

Field RouteClass

Alias RouteClass
Data type String
Width 5
Precision 0
Scale 0
Field description
The route classification, derived from NCDOT's NCRoutes feature class. A value of 1 is an interstate. A value of 2 is a U.S. route. A value of 3 is an NC route. Larger values are secondary routes.

Description source
NCDOT

List of values
Value 1
Description Interstate
Enumerated domain value definition source NCDOT
Value 2
Description US Route
Enumerated domain value definition source NCDOT
Value 3
Description NC Route
Enumerated domain value definition source NCDOT
Value 4

Description Secondary Route
Enumerated domain value definition source NCDOT
Value 5
Description Non-System
Enumerated domain value definition source NCDOT
Value 6
Description Other State Agency Route
Enumerated domain value definition source NCDOT
Value 7
Description Federal Route
Enumerated domain value definition source NCDOT
Value 80
Description Ramp
Enumerated domain value definition source NCDOT

Field RouteName

Alias RouteName
Data type String
Width 20
Precision 0
Scale 0
Field description
The route name, derived from NCDOT's NCRoutes feature class.

Description source
NCDOT

Field County

Alias County
Data type String
Width 20
Precision 0
Scale 0
Field description
The name of the North Carolina county the point is located in.

Description source
NCDOT

Field RoadElev

Alias RoadElevation
Data type Double
Width 8
Precision 0
Scale 0
Field description

The LiDAR-based elevation of the road at the point location.

Description source
NCDOT

Field WSE

Alias WSE
Data type Double
Width 8
Precision 0
Scale 0

Field description
The water surface elevation (WSE) associated with the inundation profile, relative to 0 ft (NAVD88). Units are in NAVD88 feet.

Description source
NCDOT

Field EvacRt

Alias EvacuationRoute
Data type String
Width 5
Precision 0
Scale 0

Field description
Whether the route is an established evacuation route from coastal areas to I-95 inland. Evacuation routes can accommodate heavy traffic volumes and higher speeds.

Description source
NCDOT

List of values
Value Y
Description Yes
Enumerated domain value definition source NCDOT
Value N
Description No
Enumerated domain value definition source NCDOT

Field Depth

Alias Depth
Data type Double
Width 8
Precision 0
Scale 0

Field description

The depth of flooding on top of the road, in feet. If the road elevation is 2 ft and the inundation profile is 5 ft, then the depth of water on the road would be 3 ft.

Description source
NCDOT

Field DepthCat

Alias DepthCat
Data type SmallInteger
Width 2
Precision 0
Scale 0

Field description
Categorizes depth values based on their severity, ranging from 1 to 4. A value of 1 represents minimal flooding, 0.1 to 0.5 ft, which may permit continued use of the road. A value of 2, for 0.5 to 2 ft of flooding, represents severe flooding that would bar passage for most vehicles. A value of 3, for 2 to 5 ft of flooding, denotes roads impassable to all but military and emergency response vehicles. A value of 4 represents heavy flooding, over 5 ft, which renders the road impassable for all vehicles.

Description source
NCDOT

List of values
Value 1
Description Minimal flooding, 0.1 to 0.5 ft of flooding, may permit continued use of the road.
Enumerated domain value definition source NCDOT
Value 2
Description 0.5 to 2 ft of flooding, severe flooding that would bar passage for most vehicles.
Enumerated domain value definition source NCDOT
Value 3
Description 2 to 5 ft of flooding, roads impassable to all but military and emergency response vehicles.
Enumerated domain value definition source NCDOT
Value 4
Description Heavy flooding, over 5 ft, renders the road impassable for all vehicles.
Enumerated domain value definition source NCDOT

Metadata Details

Metadata language English (UNITED STATES)

Metadata character set utf8 - 8 bit UCS Transfer Format

Scope of the data described by the metadata dataset

Scope name dataset

Last update 2022-06-08

ArcGIS metadata properties

Metadata format ArcGIS 1.0
Metadata style ISO 19139 Metadata Implementation Specification
Standard or profile used to edit metadata ISO19139
Created in ArcGIS for the item 2026-08-26 14:34:18
Last modified in ArcGIS for the item 2022-06-08 14:56:02
Automatic updates
Have been performed Yes
Last update 2022-06-08 14:56:02

Metadata Contacts

Metadata contact - point of contact

Organization's name North Carolina Department of Transportation - EAU Mitigation and Modeling Unit
Contact's position Environmental Program Consultant
Contact information

Phone
Voice 919-707-6136
Address
Delivery point 4101 Capital Boulevard
City Raleigh
Administrative area NC
Postal code 27604
Country US
e-mail address ATLAS@ncdot.gov
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Metadata Maintenance

Maintenance

Update frequency as needed
Other maintenance requirements
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Maintenance contact - point of contact

Organization's name North Carolina Department of Transportation - EAU Mitigation and Modeling Unit
Contact's position Environmental Program Consultant

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Metadata Constraints

Security constraints

Classification unclassified
Classification system None

Limitations of use

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Thumbnail and Enclosures

Thumbnail

Thumbnail type

Image file

Enclosure

Enclosure type

File

Description of enclosure original metadata

Original metadata document, which was translated yes

Source metadata format iso19139