Water Service Areas WSA, May 2023 - NC Department of Transportation

Geodatabase Feature Class

Tags Water Service Areas, WSA, Water Provider, Water Service Provider, Water Service Area Boundaries Planning, Public Water Supply Water Sources, NCDEQ – Division of Water Resources (DWR), Transportation, NCDOT, Environment, Location, North Carolina, ATLAS

Summary

An assessment of existing data at the outset of project ATLAS identified a need for accurate and current municipal and other providers' water service areas for use in NCDOT – Community Studies' (CS) indirect and cumulative effects analysis.
This water service area dataset is comprised of water service area boundary polygons and is derived from Division of Water Resources's (DWR) existing draft 2019 water service area data. DWR has ultimate interest in and jurisdiction over any water service area data and this dataset developed for ATLAS is exclusively for NCDOT use until a more current and comprehensive dataset, currently funded and in the initial stages, can be completed by DWR.
The development of this water service area (WSA) dataset is related to a similar effort to develop a wastewater service area (WWSA) dataset from existing base data and data obtained through outreach to sewer service providers, which was finalized in September 2021.

Description

The Water Service Area WSA dataset is a statewide polygon layer comprised of water service area boundary polygons and is derived from Division of Water Resources's (DWR) existing draft 2019 water service area data for the state of North Carolina.

This data layer will aid and inform indirect and cumulative effects analysis as a data input into the CS quantitative screening tools, along with values assigned to other factors known to influence land use decisions. These tools are included in Indirect and Cumulative Effects Screening Reports (SICE) and Land Use Scenario Assessments (LUSA) completed for STIP projects as part of the NEPA project development process. These reports assess the potential for change in land use as a result of transportation projects and other public and private actions. Integral to this analysis is determining where water service is available, which when present, increases the potential for denser development and change in land use effects. This analysis aids in eventual project permitting. As is the case for all data layers developed/obtained for direct and indirect and cumulative impact analysis, accuracy is important, however the WSA layer is not supposed to function as a detailed inventory of sewer system assets such as those for disciplines focused on utilities.

Credits

The ATLAS EAU within NCDOT was tasked to create this dataset.
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.

Datasets developed under Project ATLAS 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.

Extent

West -84.132484
East -75.419229
North 36.595716
South 33.740941

Scale Range

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

Topics and Keywords

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

Content type Downloadable Data

Export to FGDC CSDGM XML format as Resource Description No

Theme keywords Water Service Areas, WSA, Water Provider, Water Service Provider, Water Service Area Boundaries Planning, Public Water Supply Water Sources, NCDEQ – Division of Water Resources (DWR), Transportation, NCDOT, Environment, Location, North Carolina, ATLAS

Thesaurus

Title User
Creation date 2023-04-01 00:00:00
Publication date 2023-05-15 00:00:00

Place keywords North Carolina

Thesaurus

Title User
Creation date 2023-04-01 00:00:00
Publication date 2023-05-15 00:00:00

Citation

Title Water Service Areas WSA, May 2023 - NC Department of Transportation

Creation date 2023-04-01 00:00:00

Publication date 2023-05-15 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 919-707-6146

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

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 - originator

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

Contact information

Phone

Voice 919-707-6146

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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

Contact information

Phone

Voice 919-707-6146

Address

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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 10.8.1.14362

Credits

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

Extents

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 2023-04-01 00:00:00
Ending date 2023-04-01 00:00:00

Extent
Geographic extent
Bounding rectangle
Extent type Extent used for searching
West longitude -84.132484
East longitude -75.419229
North latitude 36.595716
South latitude 33.740941
Extent contains the resource Yes

Extent in the item's coordinate system
westBL 491682.656492
eastBL 3051823.369534
southBL 34409.243056
northBL 1035781.931908
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 919-707-6146
Address
Type physical
Delivery point 4101 Capital Boulevard
City Raleigh
Administrative area NC
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Resource Maintenance

Resource maintenance

Update frequency
annually

Scope of the updates
dataset

Other maintenance requirements

Maintenance of this dataset is handled by the EAU. Support and maintenance of the enterprise spatial database where this data resides is handled by NCDIT's Transportation GIS Unit.

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
919-707-6146

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

9:00am – 5:00pm Monday - Friday

Contact instructions

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Resource Constraints

Legal constraints

Limitations of use

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Security constraints

Classification
unclassified

Limitations of use
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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 3048.0060960121928
ZOrigin -100000
ZScale 10000
MOrigin -100000
MScale 10000
XYTolerance 0.0032808333333333331
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 WaterServiceArea
Object type composite
Object count 4611

ArcGIS Feature Class Properties

Feature class name WaterServiceArea
Feature type Simple
Geometry type Polygon
Has topology FALSE
Feature count 4611
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

'Draft' service area polygons that were developed during the initial phase underwent internal consistency checks and QA/QC procedures prior to 1st draft submittal. The draft water service area layer compiled by RK&K was submitted as part of a geodatabase to NCDOT for review utilizing the data reviewer tool in two (2) rounds; 1st draft submittal and 2nd draft submittal. The draft submittal date was determined by NCDOT in coordination with RK&K.

A 1st draft of the merged layer underwent an internal RK&K QA/QC and was provided to NCDOT GIS Unit, Community Studies and EAU on 4/13/23. The next steps and anticipated estimated dates are as follows:

• GIS Unit internal QA/QC utilizing the data reviewer tool
• RK&K 1st draft revisions, internal QA/QC and 2nd draft submittal – 6/1/2023
• GIS Unit internal QA/QC utilizing the data reviewer tool; 2nd Draft
• Coordination meeting between NCDOT GIS Unit, Community Studies, EAU and RK&K – 6/15/2023
• RK&K 2nd draft revisions, internal QA/QC and 3rd draft submittal 7/15/2023

QC checks of the data involved the following processes:

Esri Data Reviewer was used by ATLAS internal staff to generate an error log of the invalid geometry, holes, gaps, slivers, and overlap. A manual review, and correction if needed, of each error was performed.

The status of each error was tracked in the CORRECTIONSTATUS attribute of the error log, and attributed with the following values:

• Corrected – The error was considered valid, and measures were taken to correct geometry.
• Validated holes – Holes within coverage areas were determined to be valid, representing an absence of wastewater service.
• Validated overlap – These overlapping coverage areas were determined to be valid.

To make this determination the following processes were applied:

A. Hole validation – Each of the sewer service areas updated for the WWSA data layer were vetted manually for geometric integrity. The goal was to determine whether gaps in coverage, or 'holes' within the shape of the service area were legit and reflected an absence of provided services. Gaps were filled in where

appropriate.
B. Assessment of overlap legitimacy – In many cases, the service areas provided by adjacent providers contained areas of overlap. The primary causes of the overlap were true overlapping coverage from public and private providers and cases where provider entities have current and future services areas. Remaining overlap should be considered legitimate.
C. Slivers, gaps, and unclean boundaries – Due to sewer service providers supplying service areas independent of one another, there were a considerable number of small gaps, or slight overlaps in coverage.

The following rules and tools were applied to address these errors:
• Boundary priority – Service areas with an attribute Status = Final, were given priority over service areas with Status = Original. The Original data, or data brought forward from the 1997 and 2004 data layers was modified to fit the geometry of the Final service areas.
• Boundary coincidence – In cases where two or more adjacent service areas have Final status, both boundaries had forced coincidence to a best fit boundary.
• Boundary disagreement – In cases where two or more adjacent service areas have Final status, and the overlap between is too great to be able to determine a best fit, the boundaries were left as-is. For these cases, the overlap conflict would need to be resolved by the service providers themselves, which is beyond the scope for the current phase of this WSA dataset.
• Boundary Cleaning Tools – The primary tool used to make adjacent boundaries coincident was the Align Feature editing tool, which allows a best fit line to be traced and then snaps all vertices from polygons within a specific tolerance to this best fit line.

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

Lineage

Lineage statement

The initial step in the development of this dataset entailed RK&K contacting DWR in November 2021 to inquire about existing water service area data and any efforts to regularly update the dataset. A meeting between NCDOT, DWR, and RK&K was held in December 2021 to discuss ATLAS data needs and DWR's existing 2019 water service area data, which was provided as the initial data source. A scope of work was approved in September 2022.
The water service area layer for ATLAS was developed utilizing the existing 2019 draft layer, 'PWS_NC_2019_Duke', that was compiled with a collaboration between NCDENR and Duke University. This layer was considered the most recent and accurate water service area dataset, with the source of the geometry coming from the individual municipality or entity.

Process step

Description

The steps to improve this dataset were focused on coincidence of geometry, and overall geometric integrity. Deficiencies in the service area polygon geometry were identified such as holes, slivers, and overlaps. Areas of

data overlaps, data gaps and instances of multi-part features were edited manually and through automated GIS tools. Each service area was analyzed to determine where holes or gaps in service area coverage were purposeful and should be kept, or if these anomalies were most likely left over from previous geoprocessing activities and needed to be cleaned.
Once the revisions and data cleaning are complete, the modified or published date is tracked with the EditDate attribute field, which is set to 4/1/2023.

Process contact - originator

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

Contact's position Environmental Program Consultant

Contact information

Phone

Voice 919-707-6146

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

9:00am – 5:00pm Monday - Friday

Contact instructions

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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 919-707-6146

Address

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Delivery point 4101 Capital Boulevard

City Raleigh

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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 919-707-6146

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

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9:00am – 5:00pm Monday - Friday

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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 919-707-6146

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

9:00am – 5:00pm Monday - Friday

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Distribution format

Name File Geodatabase Feature Class

Version 10.5

Fields

Details for object WaterServiceArea

Type Feature Class

Row count 4611

Definition

Water Service Area boundaries in the state of North Carolina

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 SystmName

Alias SystemName
Data type String
Width 254
Precision 0
Scale 0

Field description
Name of the system

Description source
NCDOT

Field PWSID

Alias PWSID
Data type String
Width 254
Precision 0
Scale 0

Field description
Unique Identifier, retained from source data

Description source
NCDOT

Field GlobalID

Alias GlobalID
Data type String
Width 38
Precision 0
Scale 0
Field description
ID retained from source data

Description source
NCDOT

Field CreationDate

Alias CreationDa
Data type Date
Width 8
Precision 0
Scale 0
Field description
Original creation date

Description source
NCDOT

Field Creator

Alias Creator
Data type String
Width 128
Precision 0
Scale 0
Field description
Original creator

Description source
NCDOT

Field EditDate

Alias EditDate
Data type Date
Width 8
Precision 0
Scale 0
Field description

Edit date, reflects end of updates by RK&K

Description source
NCDOT

Field Editor

Alias Editor
Data type String
Width 128
Precision 0
Scale 0
Field description
Entity completing latest edits from EditDate field

Description source
NCDOT

Field DataLastUp

Alias DataLastUp
Data type Date
Width 8
Precision 0
Scale 0
Field description
Date the data was last updated

Description source
NCDOT

Field Label

Alias Label
Data type String
Width 254
Precision 0
Scale 0
Field description
Cartographic friendly version of the SystmName field.

Description source
NCDOT

Field Shape_Length

Alias Shape_Length
Data type Double

Width 8
Precision 0
Scale 0

Field description
Length of feature in internal units.

Description source
Esri

Description of values
Positive real numbers that are automatically generated.

Field Shape_Area

Alias Shape_Area
Data type Double
Width 8
Precision 0
Scale 0

Field description
Area of feature in internal units squared.

Description source
Esri

Description of values
Positive real numbers that are automatically generated.

Field OrigID

Alias OriginalID
Data type Integer
Width 4
Precision 0
Scale 0

Field description
ID from the original water service data source

Description 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 2023-09-27

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 14:39:39
Last modified in ArcGIS for the item 2023-09-27 14:37:36
Automatic updates
Have been performed Yes
Last update 2023-09-27 14:37:36

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 919-707-6146
Address
Type physical
Delivery point 4101 Capital Boulevard
City Raleigh
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Metadata Maintenance

Maintenance

Update frequency as needed
Other maintenance requirements
Maintenance of this dataset is handled by the EAU. Support and maintenance of the enterprise spatial database

where this data resides is handled by NCDIT's Transportation GIS Unit.

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 919-707-6146

Address

Type

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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