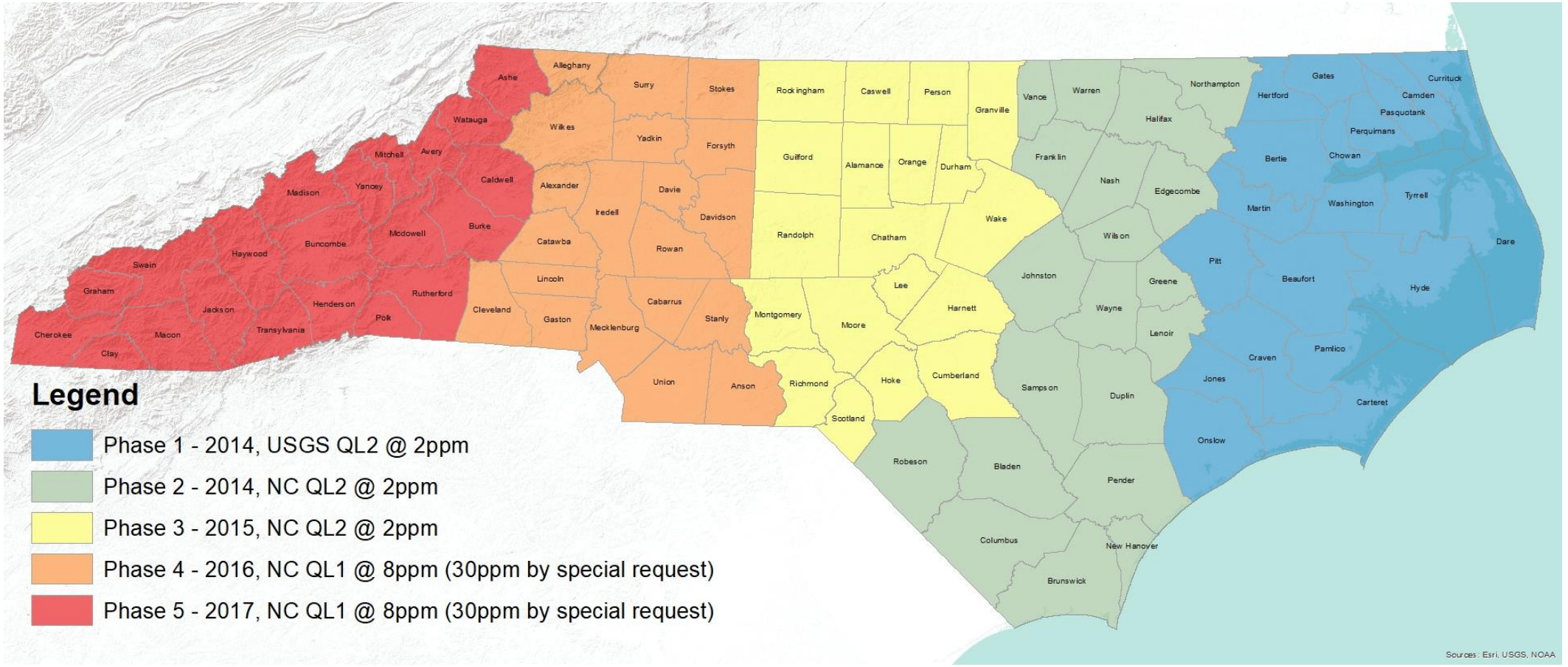
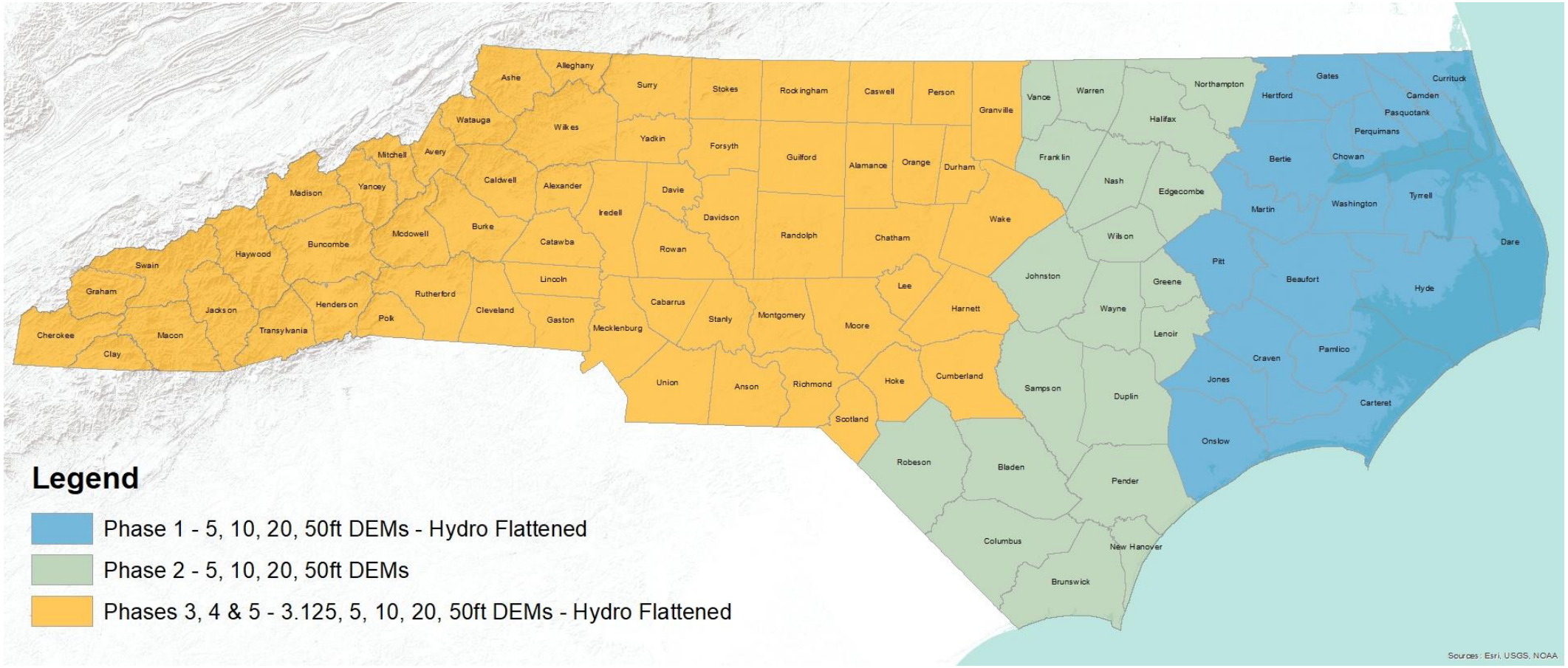
NC LiDAR

LiDAR Phases and Availability



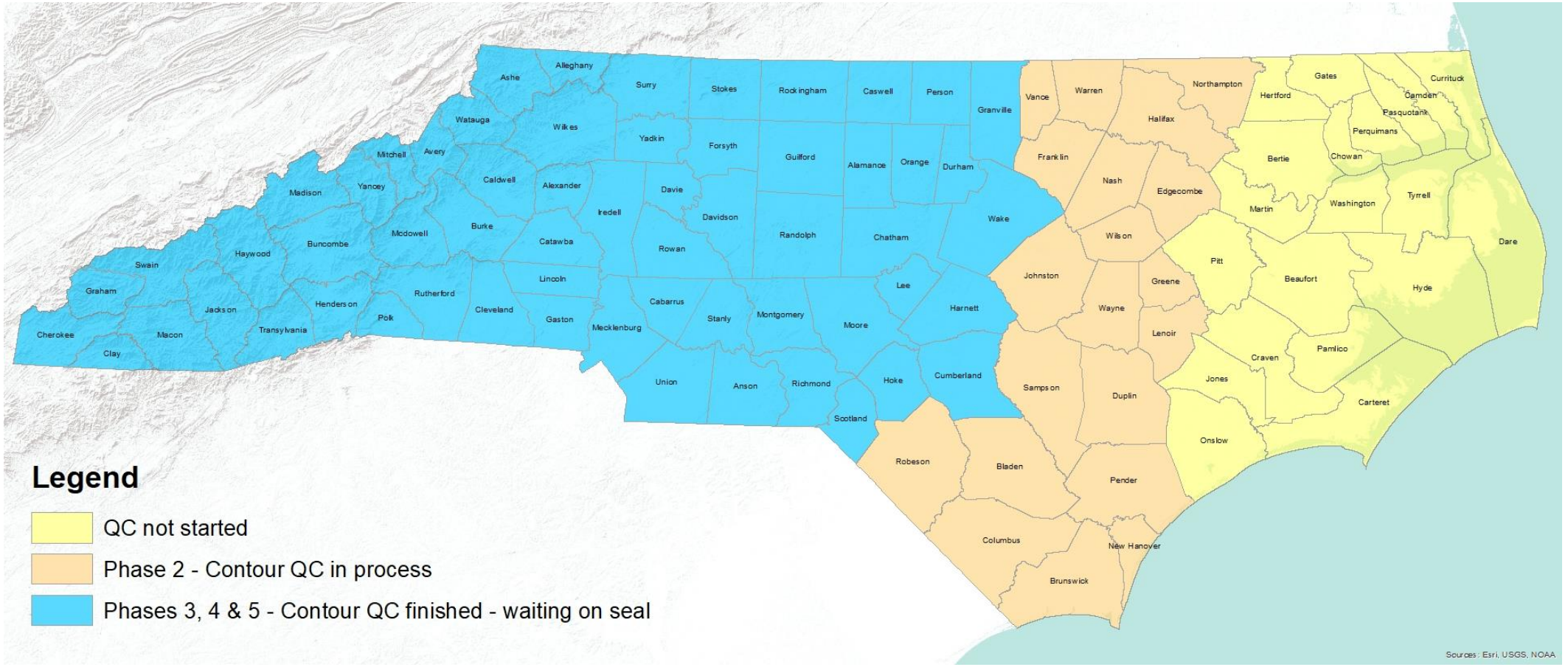
Data available on sdd.nc.gov

DEM Availability

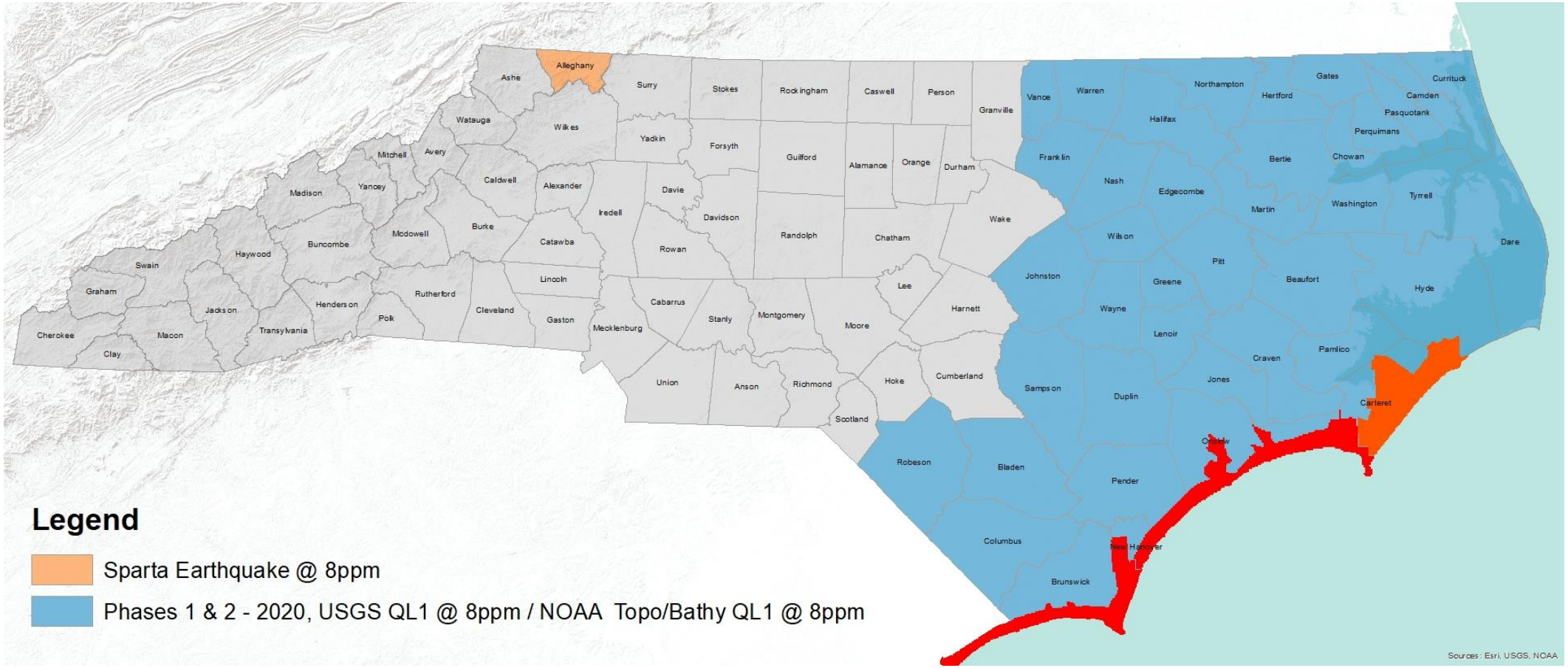


Data available on sdd.nc.gov

New Derived Products – 1ft Contours

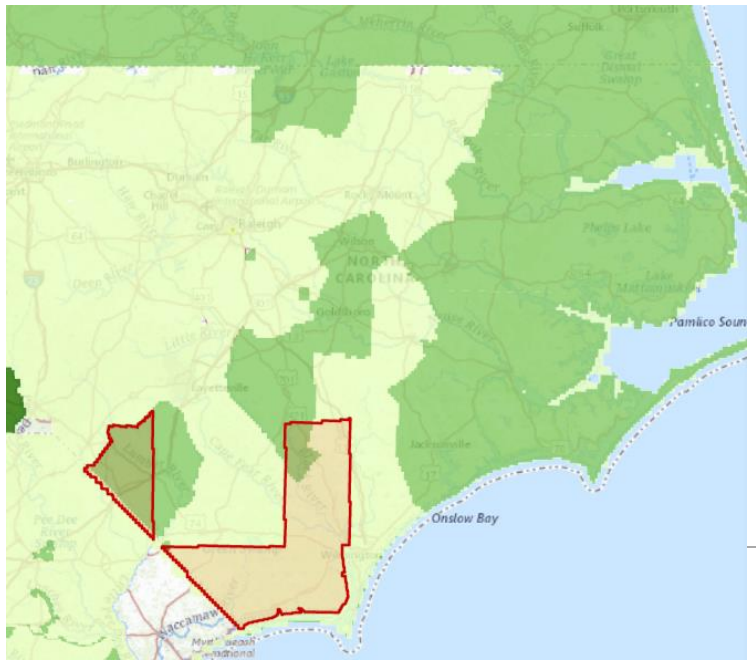


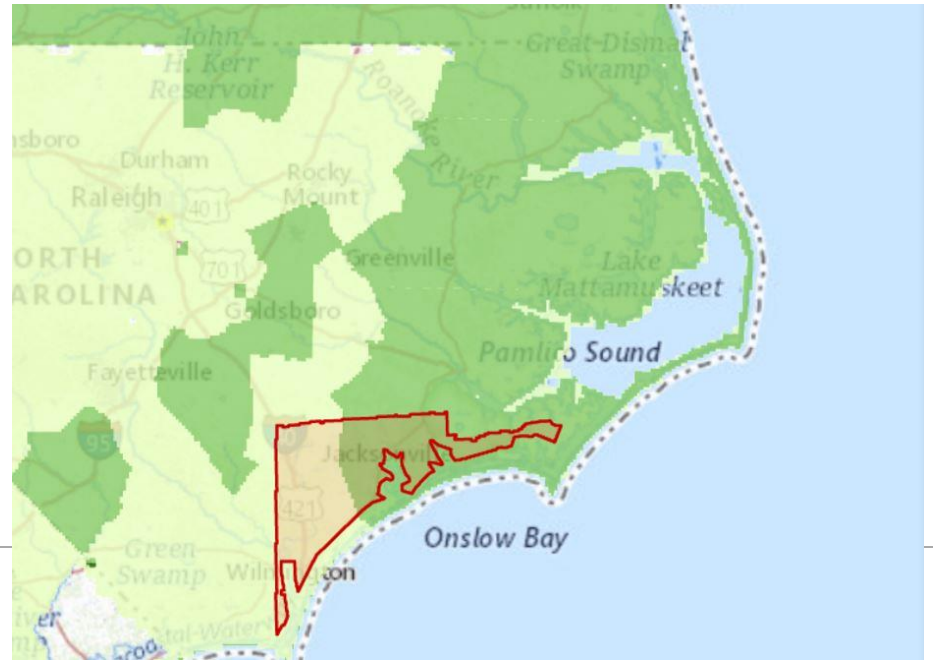
New LiDAR 2020

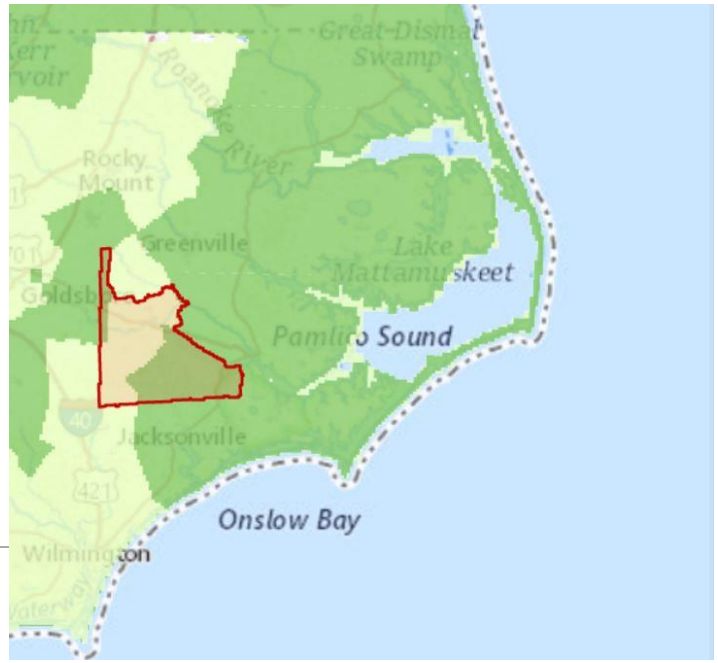


Data available on sdd.nc.gov

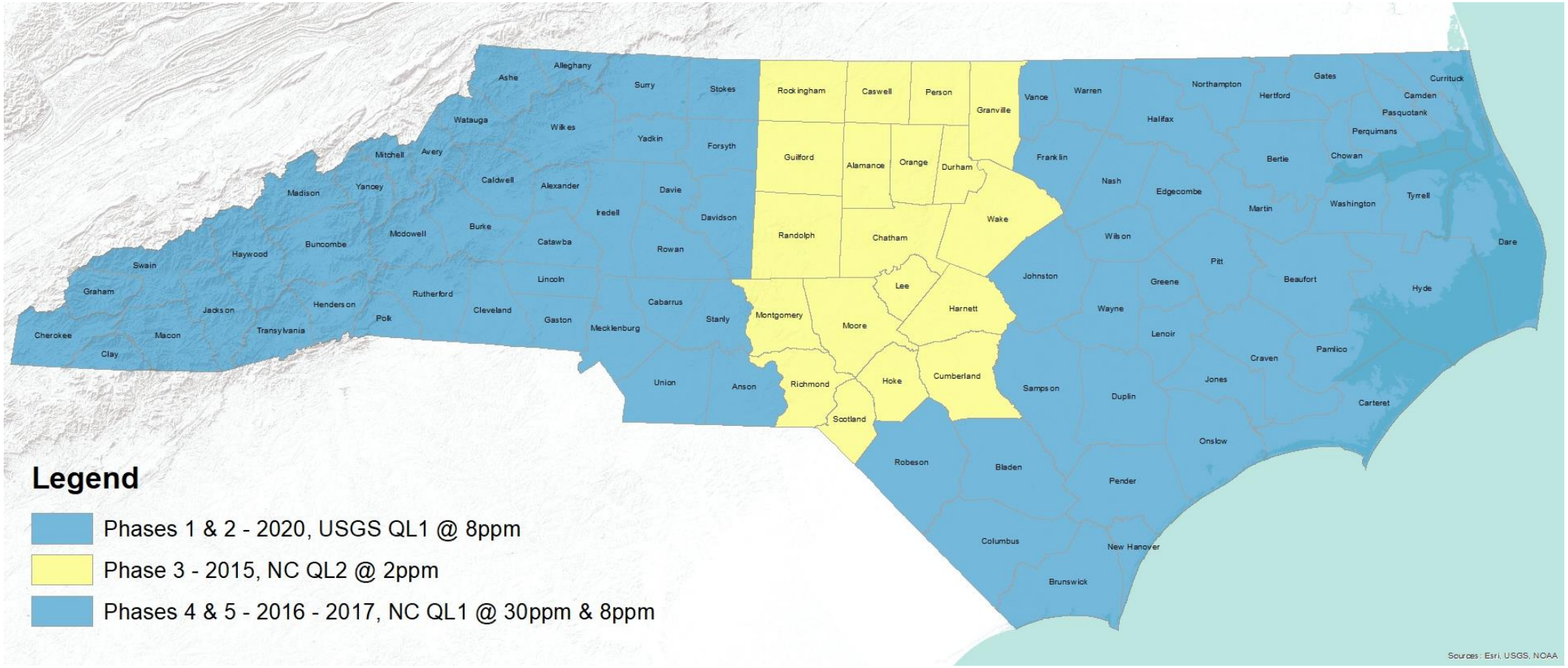
United States Geological Survey (USGS)/National Oceanic and Atmospheric Administration (NOAA) LiDAR Funds



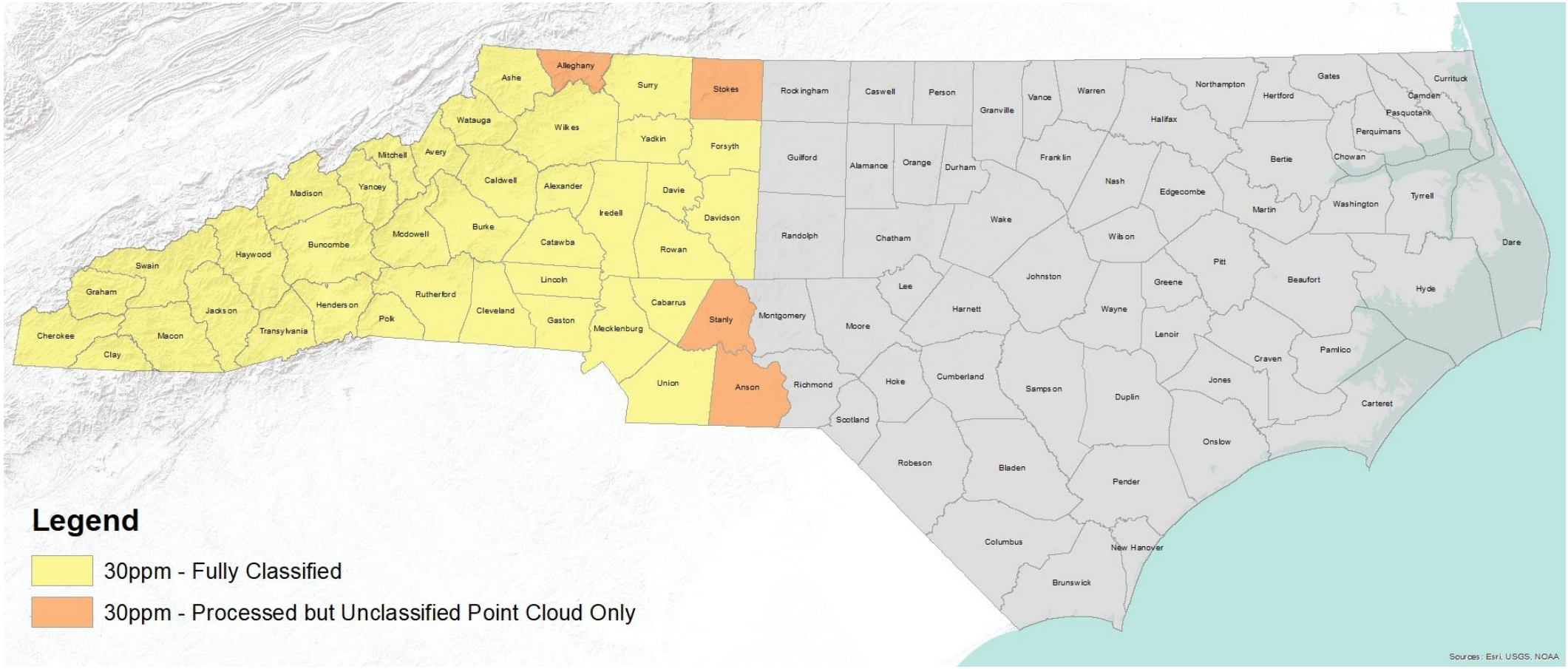




Phase 3 LiDAR



30ppm LiDAR


Alleghany
Ashe
Surry
Stokes
Rockingham
Caswell
Person
Granville
Vance
Warren
Northampton
Hertford
Gates
Currituck
Camden
Pasquotank
Perquimans
Halifax
Watauga
Wilkes
Yadkin
Forsyth
Guilford
Alamance
Orange
Durham
Franklin
Bertie
Chowan
Mitchell
Avery
Yancey
Madison
Caldwell
Alexander
Iredell
Davie
Davidson
Randolph
Chatham
Wake
Nash
Edgecombe
Martin
Washington
Tyrrell
Dare
Burke
Mcdowell
Buncombe
Haywood
Swain
Graham
Jackson
Cherokee
Clay
Macon
Transylvania
Henderson
Polk
Rutherford
Cleveland
Lincoln
Catawba
Gaston
Mecklenburg
Cabarrus
Rowan
Stanly
Montgomery
Moore
Lee
Harnett
Johnston
Wilson
Greene
Pitt
Beaufort
Hyde
Wayne
Lenoir
Craven
Pamlico
Carteret
Jones
Onslow
Duplin
Sampson
Cumberland
Hoke
Scotland
Richmond
Anson
Union
Robeson
Bladen
Pender
Columbus
New Hanover
Brunswick
Legend
30ppm - Fully Classified
30ppm - Processed but Unclassified Point Cloud Only
Sources: Esri, USGS, NOAA

NC Building Footprints

COLLECTION PROCESS

Began by contacting the counties and requesting available existing data.

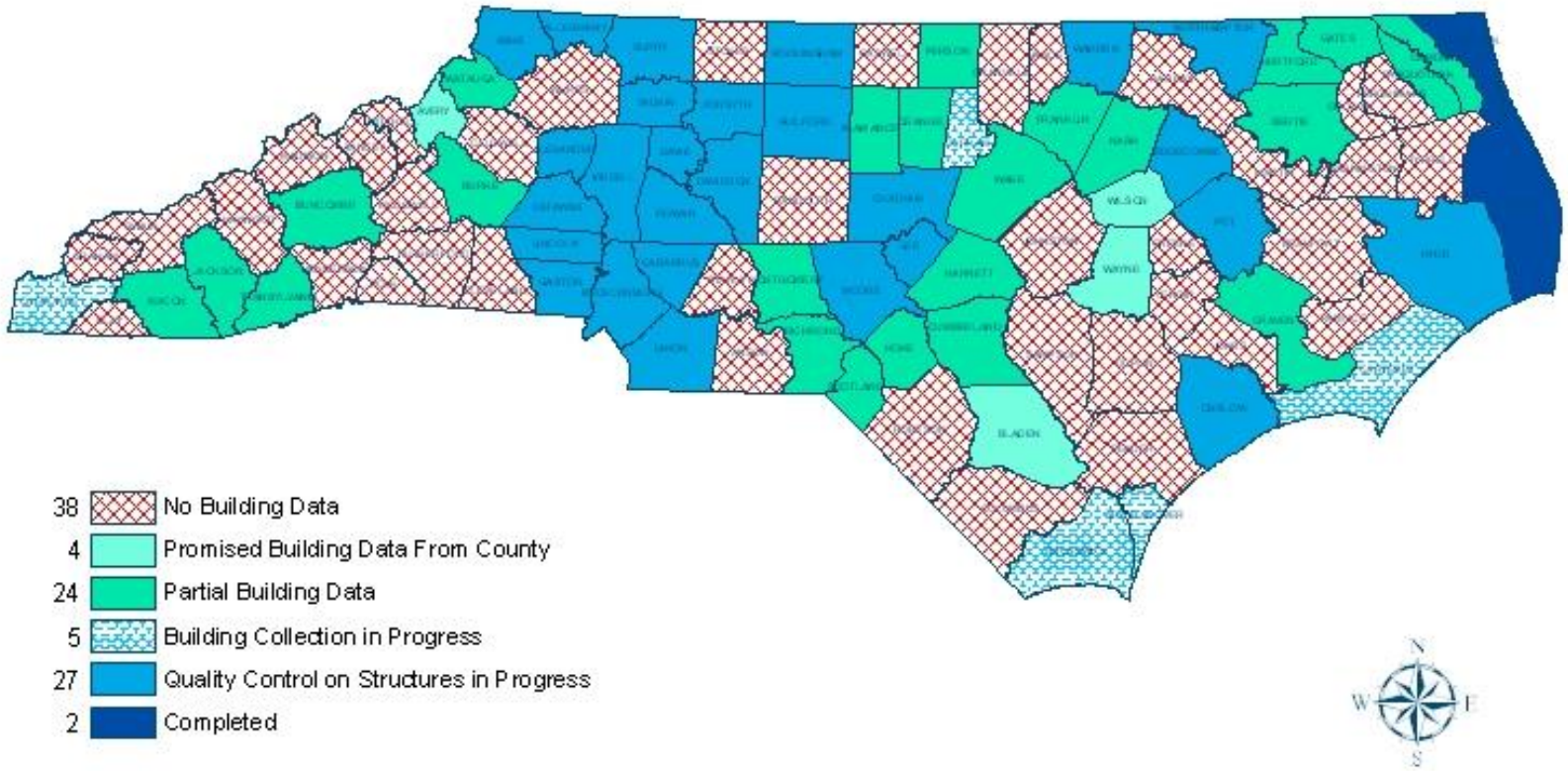
- 49 counties provided building data.
- About half of those were complete datasets.

Additional buildings were collected from best available orthophotography.

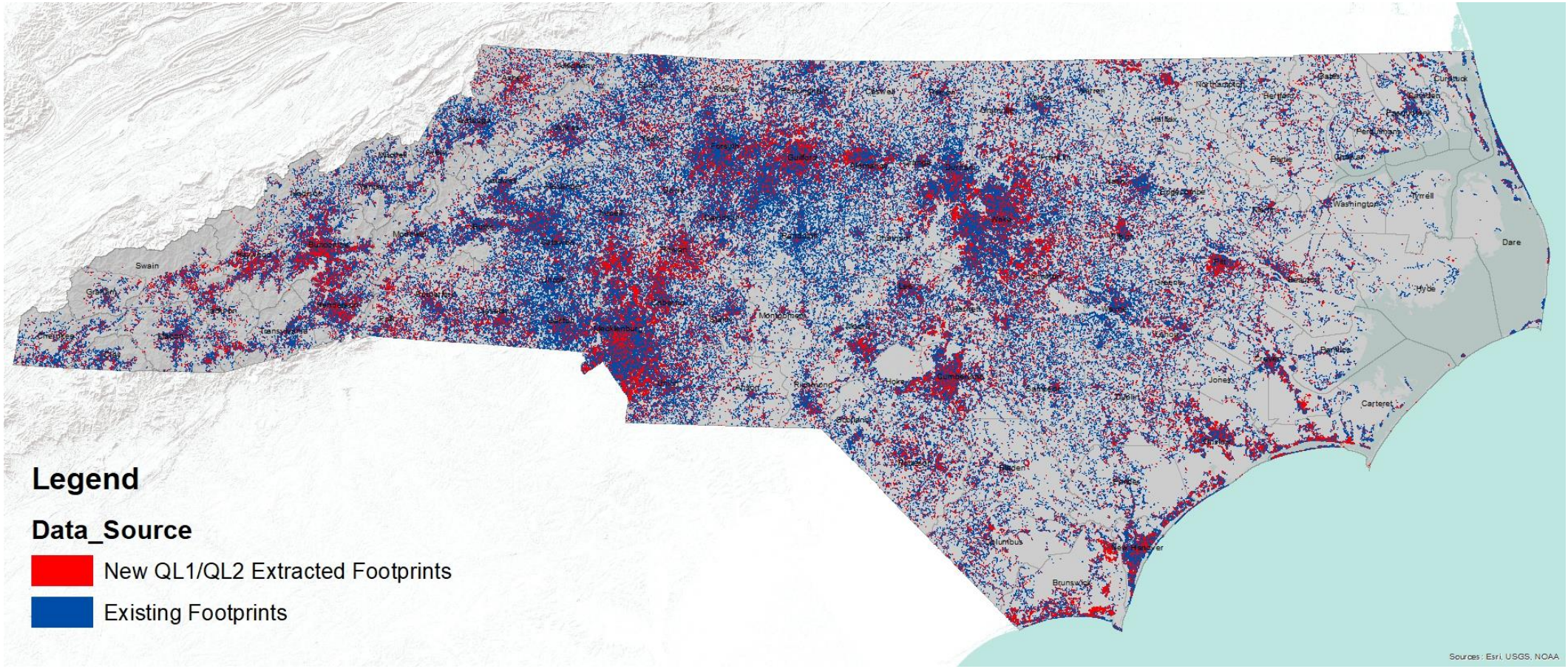
- 4 counties within Phase II Multi-hazard Identification pilot program collected first.
  - Cherokee
  - Durham
  - Edgecombe
  - Onslow
- Buildings were collected coastal counties westward.
- Very few counties benefitted from the 2010 ortho collection

North Carolina Building Footprint Status

September 17, 2008



Building Conflation and RISK Attribution



Flood water surface elevation combined with building footprint used to estimate structure level damages.

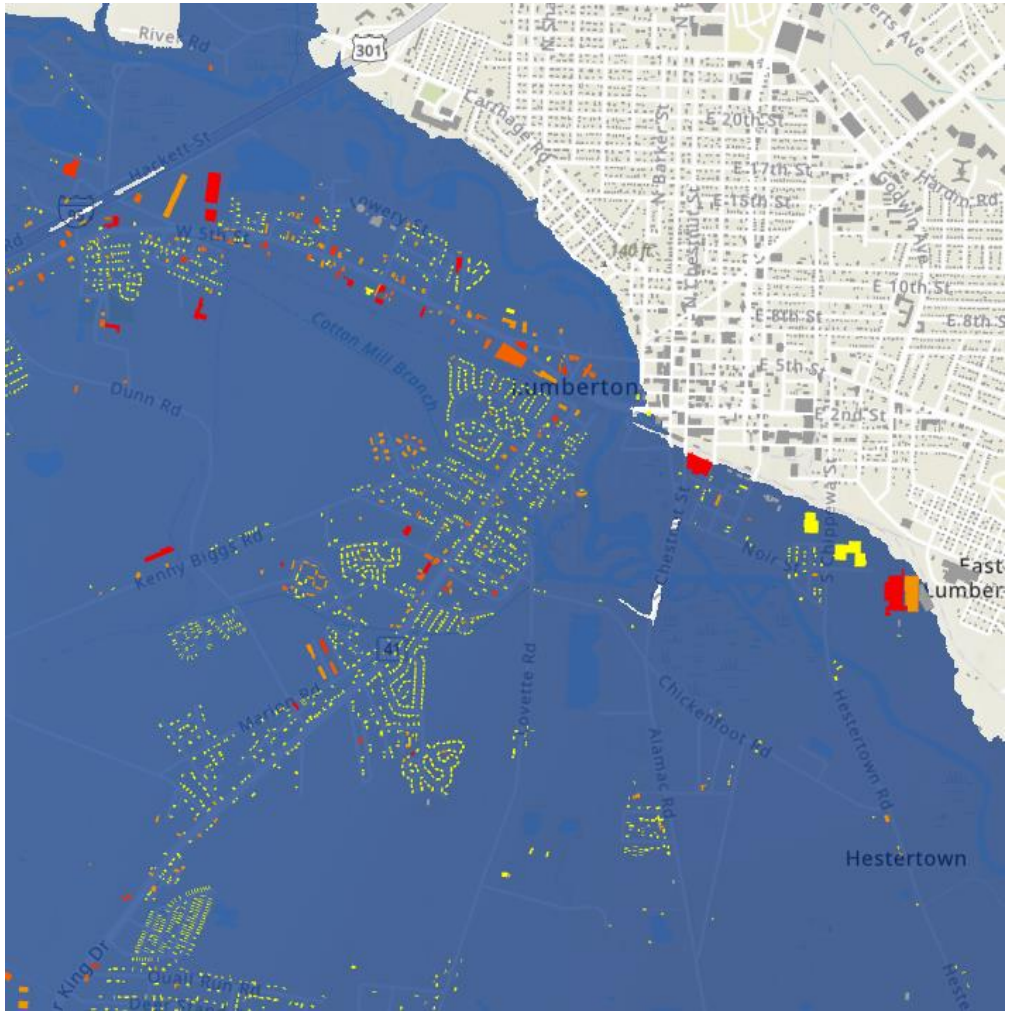
Use FEMA Open Hazus methodology to estimate flood losses at the structure level.

Estimate depth of flooding in the structure

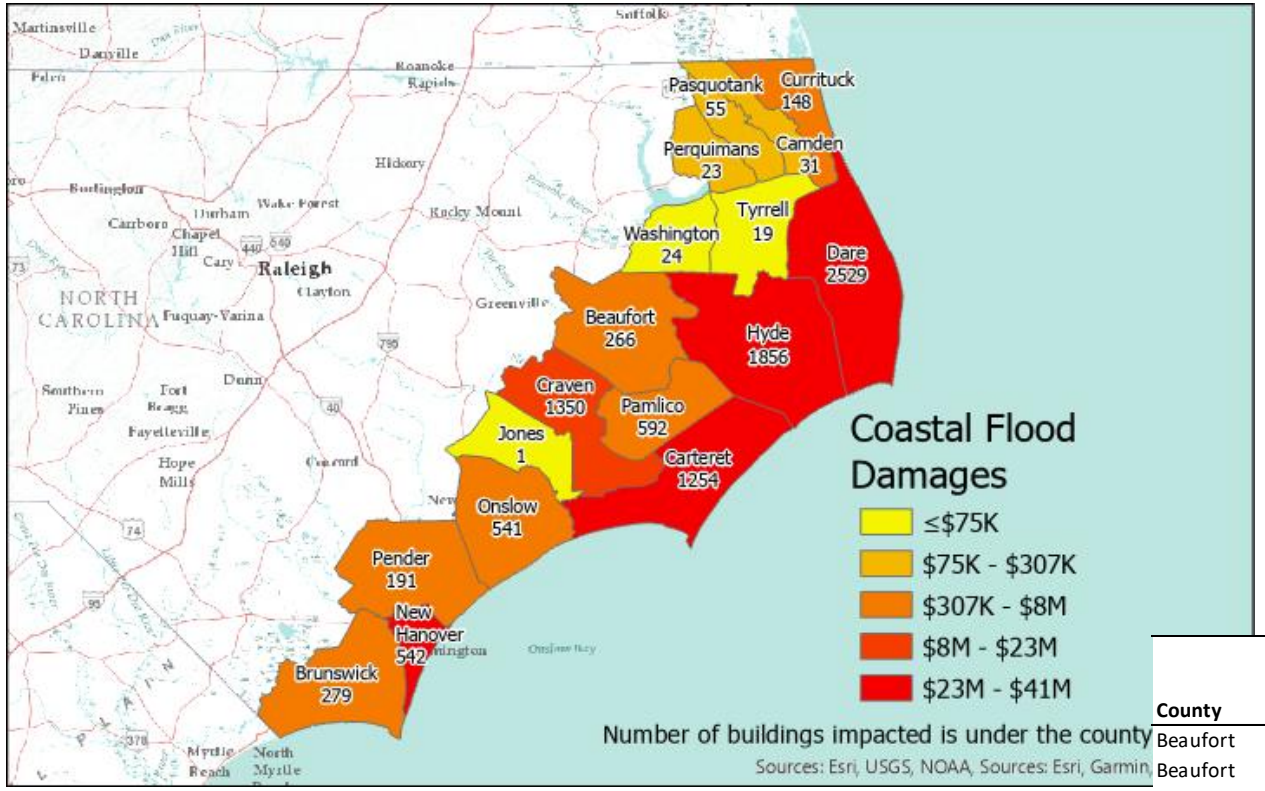
Estimate value of structure, inventory, and content loss using USACE Depth-Damage functions.

Building characteristics and finished floor elevation derived from various survey and conflation methods.

Damages can be aggregated by location (e.g. county) and occupancy type (e.g. residential, non-residential, and public structures)



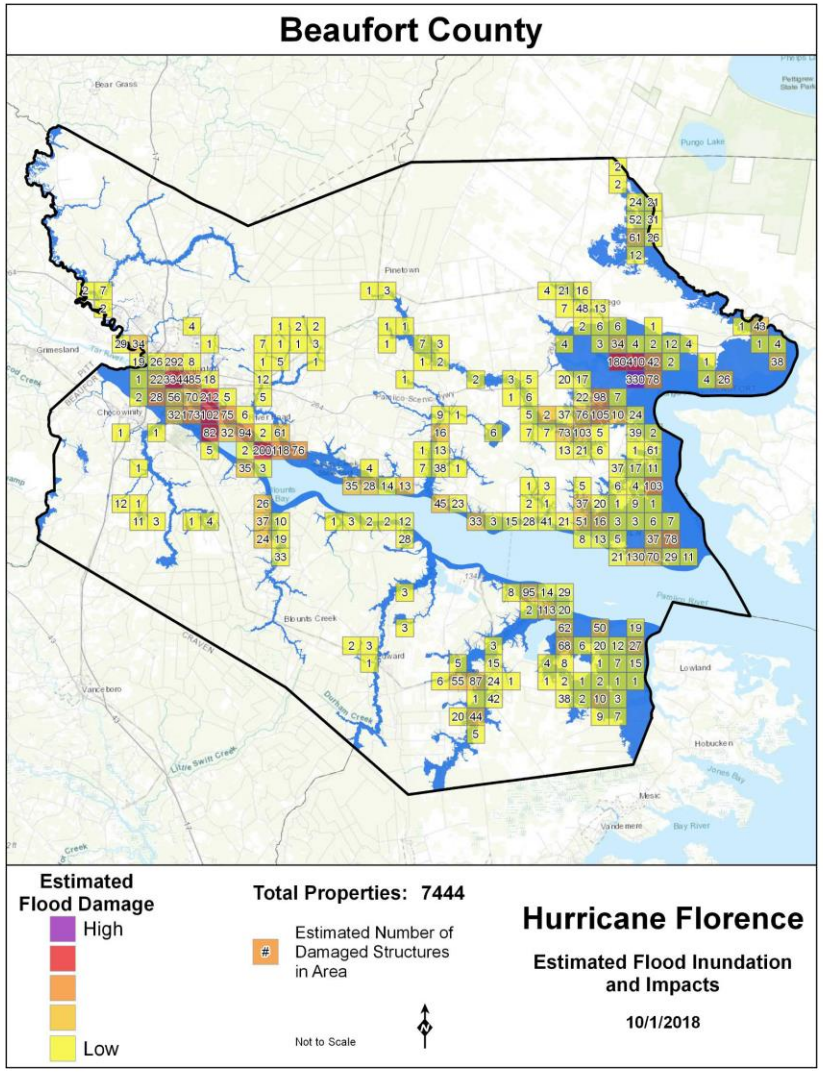
Rapid Impact Assessment Example Summary Results for Hurricane Dorian

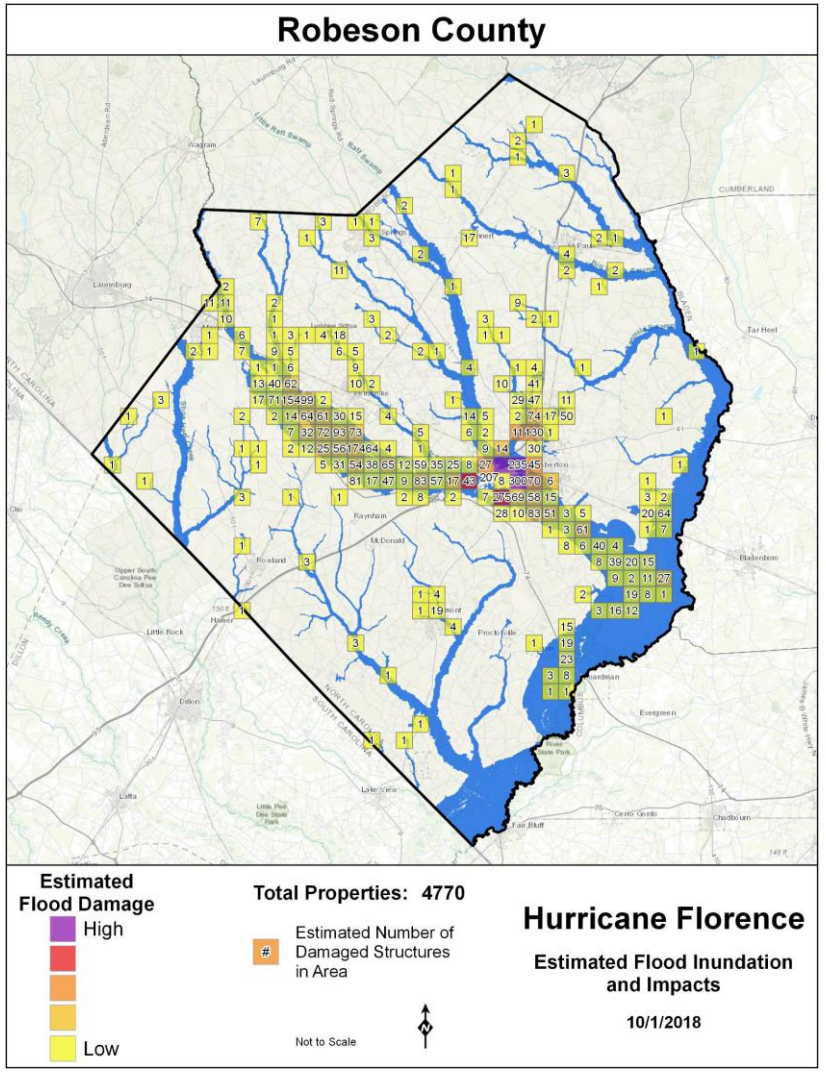


County	All Structure Types Estimated Damages	Buildings	Residential Estimated Damages	Buildings	Non-Residential Estimated Damages	Buildings	Public Estimated Damages	Buildings
New Hanover	$77,901,221	1,849	$44,894,710	1,543	$26,925,157	226	$6,081,354	80
Carteret	$42,175,027	1,653	$39,319,324	1,572	$2,098,455	66	$757,248	15
Dare	$41,539,496	2,581	$28,733,445	2,299	$7,222,094	250	$5,583,957	32
Hyde	$40,436,582	1,864	$33,565,550	1,660	$3,607,338	172	$3,263,694	32
Pender	$26,226,968	1,391	$24,233,147	1,305	$1,928,461	84	$65,359	2
Craven	$26,088,149	1,687	$22,459,021	1,589	$1,450,506	75	$2,178,623	23
Brunswick	$18,181,535	851	$13,623,957	773	$4,403,349	74	$154,229	4
Johnston	$13,007,134	542	$8,749,007	427	$1,972,580	107	$2,285,547	8
Onslow	$12,587,520	1,225	$9,957,156	1,156	$1,234,003	41	$1,396,361	28
Pitt	$12,291,205	744	$7,368,073	548	$4,625,135	184	$297,997	12
Wayne	$11,479,482	741	$7,509,376	667	$3,382,618	65	$587,488	9
Lenoir	$10,822,787	481	$6,177,710	416	$4,120,932	59	$524,145	6
Wilson	$9,512,226	338	$3,872,968	268	$5,119,458	61	$519,800	9
Sampson	$8,225,789	370	$4,004,743	275	$1,036,839	87	$3,184,207	8
Duplin	$7,457,229	424	$4,902,137	321	$2,457,686	98	$97,405	5
Pamlico	$7,198,629	629	$6,154,007	547	$500,106	70	$544,516	12

County	Estimated Depth Range	All Structure Types Estimated Damages	Buildings	Residential Estimated Damages	Buildings	Non-Residential Estimated Damages	Buildings	Public Estimated Damages	Buildings
Beaufort	Substructure	$1,246,662	167	$1,014,246	151	$123,978	14	$108,439	2
Beaufort	0 - 2 ft	$1,293,764	59	$1,155,339	54	$112,851	4	$25,574	1
Beaufort	2 - 4 ft	$2,063,909	40	$2,063,909	40	$0	0	$0	0
Beaufort	4 - 6 ft	$0	0	$0	0	$0	0	$0	0
Beaufort	6+ ft	$0	0	$0	0	$0	0	$0	0
Beaufort	**Subtotal**	**$4,604,335**	**266**	**$4,233,494**	**245**	**$236,828**	**18**	**$134,013**	**3**
Brunswick	Substructure	$1,297,785	103	$1,023,551	91	$247,276	11	$26,958	1
Brunswick	0 - 2 ft	$3,857,568	117	$2,408,735	93	$1,421,702	23	$27,132	1
Brunswick	2 - 4 ft	$1,244,060	43	$946,005	37	$214,843	5	$83,212	1
Brunswick	4 - 6 ft	$534,531	12	$505,017	11	$29,515	1	$0	0
Brunswick	6+ ft	$536,951	4	$259,005	3	$277,945	1	$0	0
Brunswick	**Subtotal**	**$7,470,896**	**279**	**$5,142,313**	**235**	**$2,191,282**	**41**	**$137,301**	**3**

Hotspot maps of estimated damages by counties





DEFICIENCIES IN DATA

There are currently no addresses tied to the structures

Many of the

DEFICIENCIES

There are no addresses tied to the data

LiDAR or image extraction cannot account for all new buildings

- Manual collection / QC is still needed to capture missing or misplaced structures

Most of the property attributes are derive from HAZUS

- If not collected in field (SFHA only), attributes are aggregated from HAZUS Census Block Groups
- Parcel data only provide limited attribute – property card info would be better suited
- Attribute are at least 8 years old

No funds to update

- Estimated to cost about $45,000 per year to update 25 counties with ortho collection
- Original plan was to have counties update their own.

Questions