NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY DIVISION OF ENERGY, MINERALS AND LAND RESOURCES

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Introduction

The Atlantic Coastal Plain of eastern North Carolina (Fig. 1) is poorly understood from scientific, stratigraphic, and mapping perspectives. It is mantled primar by Pliocene and Pleistocene deposits that have map extents, allostratigraphy, and relationships to global sea level cycles that are mostly undefined. Outcrops are rare. and the new subsurface data necessary to define units and map this region is expensive. Except for recent STATEMAP (SM) deliverables, detailed geologic maps at was conducted by one NCGS staff Geologist and two temporary STATEMAP-funded positions [one Temporary Geologist I (11-month 1:24,000-scale for the Coastal Plain do not exist. The current geologic map (NCGS, 1985) does not show surficial units for the Coastal Plain, it shows underlying sub- appointment) and one part-time driller (320 hours per year). New data to support this mapping is shown in the Table below; Also crops (Fig. 1A). In recent SM areas (FY10-18), the Pliocene Yorktown Formation is supposedly the principal subcrop (NCGS, 1985); this unit is affiliated with a shown are two cross sections that are work in progress. regional-scale shallow confining unit. Detailed mapping (FY10-18) shows that the Yorktown (Fig. 1A) is thin, absent, or misidentified. Isotopic age dates suggest that basal, clastic carbonate beds that define the base of the Plio-Pleistocene, correlate with the Chowan River Formation, rather than the Yorktown. If this is the case the Yorktown is essentially absent in this area of the NC Coastal Plain. The post-Chowan River section includes several early Pleistocene units in ramp or interfluve settings; younger terraces and alluvium occur in incised valleys.

Location and Geologic Setting

The Coastal Plain, a relict, Plio-Pleistocene landscape (Fig. 1B), consists of a series of progressively younger scarps, or paleoshorelines, and intervening terraces that step down in elevation and age towards the coast (Fig. 2) and into river basins (Fig. 3). This is stairstep topography. Seven river basins dissect the Coastal Plain so that its low-relief, flat, eastward-dipping marine terraces (ramps) are separated by incised valleys with terraced borders. Over the past 5 Ma, glacio-eustatic changes in sea level drove the transgressive-regressive (T-R) cycles that sculpted this landscape. Fluvial, estuarine and marine deposits occur in the incised valleys. The stratigraphy in valley fills differs from that of the ramp or interfluve (Farrell and others, 2003), and forms the "alluvial aquifer system" (Tesoriero and others, 2005).

The Surry Scarp, a Pleistocene paleoshoreline complex, trends north through Fountain quad (Figs. 1, 4A). Regional-scale conceptual models (Mixon and others, 1989; Winker and Howard, 1977; Oaks and DuBar, 1974; Daniels and others, 1966) and NCGS SM data suggest that the Surry shoreline is the highstand position for the main early Pleistocene T-R cyclic event. Stratigraphic relationships near the scarp are complex and include several early Pleistocene units; each contains similar repeating facies, and fossils are rare. In Virginia (Mixon and others, 1989) these are the Moorings Unit and the Bacons Castle, Windsor, and Charles City Formations (Fig. 5). In NC and VA, these correlative units occur within the shoreline complex, and both landward and seaward of it. These are not lithologically distinct bodies of rock that are easily mappable; these are allo-units that are mapped by establishing bounding surfaces, their terminations, and the geologic facies above them. Our goal is to describe facies and establish units in a sequence stratigraphic context, and to determine the stratigraphy's relationship to surficial landforms. Sequence stratigraphy emphasizes facies relationships and stratal architecture within a chronological framework (Catuneanu and others, 2009).

Strategy for Performing the Investigation

Geologic mapping in the NC Coastal Plain requires a non-traditional method, called three-dimensional (3D) subsurface mapping (see Newell and Dejong, 2010; and Hughes, 2010), to define and map surficial geologic units. This method combines a geomorphic interpretation of the relict Quaternary landscape with targeted subsurface analysis along profiles that transect geomorphic features. It is useful because the NC Coastal Plain is notorious for its low relief, few outcrops, lack of defined units and type sections, recurring facies, colluvium on side slopes, and extensive wetlands cover, even on uplands: bedrock mapping methods do not apply.

To produce the map, landforms were interpreted from the highest resolution Light Detecting and Ranging (LiDAR) elevation data (20 cm). LiDAR tiles, as floating point ASCI files were downloaded from the Floodplain Mapping Program's website (www.ncfloodmaps.com). These were transformed from ASCI files to raster grids, mosaiced into 10 X 10 rasters, and reprojected as State Plane Nad 1983 meters. Hillshade, slope, and contour lines (1.0, 0.5, and 0.25 meters) were constructed from the raster grids. Orthoimagery (2012, 2010) from the NCONEMAP was used in conjunction with elevation grid color ramps, contour lines, hillshade and slope to interpret landforms. Farrell and others (2003) summarize the method of comprehensive landscape analysis. A series of landform elements was interpreted and digitized starting with the Holocene depositional system and working backward in time into older landscapes. Key transects cross cutting the Surry paleoshoreline and other features were chosen for subsurface analysis. Geologic cores were acquired in plastic tubes with the Geoprobe drill rig. These are 1.5-inch diameter continuous cores (discrete sampling method) collected in 4-foot increments. Cores were logged using the methods of Farrell and others (2012, 2013). High-resolution photos of cores were compiled as photomosaics for archiving. Allostratigraphic units were defined on cross sections, and extrapolated regionally using geomorphic map. Data locations were collected using GPS.

Geomorphic and Stratigraphic Description of Four Quadrangle Region (Figure 4)

The southeast quadrant of Falkland is situated east of the Surry Palaeoshoreline Complex, mostly at elevations below 26 m, in a stratigraphically complex area east of the boundary between the "Sunderland Terrace" (see Fig. 2) and the "Wicomico Terrace". This geomorphically complex area includes a variety of relict coastal landforms and associated facies along its length. Associated features include barrier islands, beach and shoreface, beach ridge accretion plains, longshore bars, spits, embayed areas, lagoons, tidal channels, etc. (see Farrell et al., 2003). Near the Surry shoreline complex, four, surficial, early Pleistocene units occur beneath upland, predominantly marine flats: in adjacent Virginia, these are called the Bacons Castle Formation, Moorings Unit (informal), and the Windsor and Charles City Forma-

tions. All four units are Early Pleistocene in age (Mixon et al., 1989), becoming successively younger in age towards the east. These may be conformable as indicated by stratigraphic details observable in core and outcrop. All four units potentially include similar, repeating facies. The current study includes marine interfluve units associated with correlatives of the Windsor and Charles City Formations, and a number of terraces in the local incised drainages. The map deliverable shows two units, tentatively called Q wm (Windsor Formation, marine) and Q lzm (Lizzie Formation, marine; terraces are numbered in sequence. The nomenclature utilized here is considered draft only.

In the four quad area, coastal landforms are preserved geomorphically between elevations of 26 and 34 meters. The toe of the Surry paleoshoreface is at about 28 m; the main highstand elevation that explains most of the geomorphic features associated with the Surry Scarp is at about 30 m. Other landforms and surficial stratigraphy indicate slightly higher sea levels (34-35 m) associated with the shoreline complex. Two units are associated with the shoreline complex itself (28-34+ m): the Windsor Formation and the Moorings unit. The Moorings unit is locally associated with barrier island facies. The Windsor outcrops surfically, east of the 30 m contour. It is notched and overlain by the Lizzie Formation near the 26 m contour. This particular geomorphic boundary occurs in the current map area. The sea level maximum associated with the flooding event that formed the Surry paleoshoreline complex was likely at about 34 – 35 m, with a shoreline complex and embayed coast between 34 and 28 m. A second near-occupation of the same shoreline formed the shoreline features at about 26 m in the current map area, the boundary between "Windsor" and "Lizzie" Formations. Valleys incised into the marine Windsor (Q wm) and Lizzie (Q lzm) units include a group of Pleistocene terraces that step down from 26 to 8 m in Falkland quadrangle.

Overview of Geomorphology and Stratigraphy in Falkland Quadrangle, Southeast Quadrant The project deliverable is a PDF of the northeast quadrant of Falkland Quadrangle (1/4 quadrangle). This new map area is immediately north of Falkland SE (STATEMAP FY 17), northeast of Falkland SW (STATEMAP FY 16), Fountain (STATEMAP FY 13, 14, 15), north of Farmville (STATEMAP FY 10 and 12), and northeast of Walstonburg (STATEMAP FY 11 and 12) Quadrangles. Mapping

Falkland Quadrangle (1/4): Significant findings from the mapping include:

- Geomorphic analysis reveals that the map area occurs east of the Plio-Pleistocene Surry Paleoshoreline complex (shore elevation ~ 30 m MSL) at elevations less than about 26 m. Interfluves range in elevation from ~ 26 m (northeast) to 24 m (southeast). Interfluves are separated by incised drainages which have a series of terraces that step down from 24 m to 5 m. The bottom of drainages includes a Holocene wetland flat at 5 to 17 m, that gradually rises in elevation in an upstream direction, burying Pleistocene terraces.
- A significant shore parallel feature occurs at ~26 to 27 m, immediately west of the study area (see Farrell and Thornton, 2017). This elevation may correspond to a stratigraphic contact that separates a sand-rich shoreface unit (west) from falling-stage, finer-grained, highly variable deposits to the east. Tentatively this may be a "formation boundary", i.e. separating correlative Moorings from Windsor units. It may separate normal from forced regressive deposits.
- In the current quadrant, forced regressive deposits include a series of continuously-deposited, Early Pleistocene terrace-defined units that step down in elevation from 26 to 20 m, at intervals of 1 to 2 m. Geomorphic contacts between these 'marine terraces' are subtle; locally these transition into and cannot be separated from incised valley deposits. In these cases, the "incised valley" starts to lose its incised geomorphic character, becoming more depositional in character. This is especially characteristic at elevations of 25 to 22 m.
- The landscape in this area is very difficult to interpret geomorphically because of the existance of Carolina Bays. These bays likely formed as blow-outs of beach ridges. Map patterns for remobilized sands (from blowouts) indicate elongate, shoreline-parallel ridges, separated by deflation deflation surfaces, and lower-lying flats. Terrace boundaries are difficult to identify because of the blowouts. Sinkholes with springs or lakes occur within some of the blowout areas of the Carolina Bays.
- A separate problem with mapping terraces using high resolution Lidar is separating depositional terraces from erosional terraces. This is because the slope break is used to separate terraces. In many cases, a slope break may simply represent an erosional surface during sea level fall. • The Quaternary section is ~ 40 to 64+ ft (12 - 20 m) thick. Refusal depth ranged from 12-53.8 ft (3.7 – 16.4 m). Refusal was caused by encountering semi-consolidated substrate (Paleogene or Cretaceous), collapse of loose shells, sands and gravels into corehole, closing of hole by thixotropic marine units, and cemented zones and large impenetrable shells.



HOLE_ID	DATE_DRILLED	GEO_IN_FIELD	QUAD	COUNTY	NORTHING_M	EASTING_M	LAT_DD	LONG_DD	DEPTH_FT	DEPTH_M	ELEVATION_FT	ELEVATION_M	CORING_METHOD	DRILLERS
PIERCE-03	9/26/2018	K.Farrell, E.Thornton	Falkland	Pitt	215229.7160	741424.7530	35.681490	-77.543589	23.65	7.21	82.22	25.06	Geoprobe Discrete Sampling	D. Foyles
PIERCE-04	10/16/2018	K.Farrell, E.Thornton	Falkland	Pitt	214473.6590	740875.6090	35.674748	-77.549777	52.00	15.85	82.15	25.04	Geoprobe Discrete Sampling	D. Foyles
PIERCE-05	11/20/2018	K.Farrell, E.Thornton	Falkland	Pitt	212767.5120	744004.4590	35.658954	-77.515499	47.80	14.57	72.54	22.11	Geoprobe Discrete Sampling	D. Foyles
PIERCE-06	11/27/2018	K.Farrell, E.Thornton	Falkland	Pitt	212903.3930	744090.7620	35.660167	-77.514524	50.00	15.24	81.89	24.96	Geoprobe Discrete Sampling	D. Foyles
PIERCE-07	12/13/2018	K.Farrell, E.Thornton	Falkland	Pitt	213083.8920	743518.7320	35.661187	-77.520811	40.10	12.22	70.44	21.47	Geoprobe Discrete Sampling	D. Foyles
PIERCE-08	12/18/2018	K.Farrell, E.Thornton	Falkland	Pitt	214807.1800	740454.0220	35.677810	-77.554380	46.50	14.17	87.89	26.79	Geoprobe Discrete Sampling	D. Foyles
SUGGS-01	1/16/2019	K.Farrell, E.Thornton	Falkland	Pitt	214767.5590	739442.9800	35.677584	-77.565555	51.00	15.54	85.96	26.20	Geoprobe Discrete Sampling	D. Foyles
SUGGS-02	1/17/2019	K.Farrell, E.Thornton	Falkland	Pitt	215227.6880	740155.7160	35.681639	-77.557608	51.00	15.54	85.86	26.17	Geoprobe Discrete Sampling	D. Foyles
							Total F	ootage	362.05	110.35				
Table 2. Locatio	ns of new cores	collected in the Northeast Qua	adrant of	Falkland Q	Quadrangle fo	r STATEMA	P FY18 da	ta delivera	bles.					
HOLE_ID	DATE_DRILLED	GEO_IN_FIELD	QUAD	COUNTY	NORTHING_M	EASTING_M	LAT_DD	LONG_DD	DEPTH_FT	DEPTH_M	ELEVATION_FT	ELEVATION_M	CORING_METHOD	DRILLER
CLARK-01	2/6/2019	K.Farrell, E.Thornton	Falkland	Pitt	222307.0050	744571.0330	35.744854	-77.507658	12.40	3.78	31.59	9.63	Geoprobe Discrete Sampling	D. Foyles
CLARK-02	2/6/2019	K.Farrell, E.Thornton	Falkland	Pitt	222132.0620	743932.7860	35.743363	-77.514743	13.50	4.11	38.32	11.68	Geoprobe Discrete Sampling	D. Foyles
CLARK-03	2/6/2019	K.Farrell, E.Thornton	Falkland	Pitt	222609.4110	744979.7970	35.747524	-77.503089	15.10	4.60	36.94	11.26	Geoprobe Discrete Sampling	D. Foyles
CLARK-04	2/6/2019	K.Farrell, E.Thornton	Falkland	Pitt	222602.7430	744965.3520	35.747466	-77.503250	12.00	3.66	37.63	11.47	Geoprobe Discrete Sampling	D. Foyles
DEAN-01	2/14/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	220605.0030	744443.6850	35.729532	-77.509349	20.60	6.28	31.82	9.70	Geoprobe Discrete Sampling	D. Foyles
DEAN-02	2/14/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	220536.6080	744370.6590	35.728925	-77.510167	13.50	4.11	20.44	6.23	Geoprobe Discrete Sampling	D. Foyles
DEAN-03	2/14/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	221046.1960	744773.9250	35.733463	-77.505625	17.60	5.36	33.33	10.16	Geoprobe Discrete Sampling	D. Foyles
DEAN-04	2/15/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	220774.4300	744486.3140	35.731053	-77.508850	17.30	5.27	27.95	8.52	Geoprobe Discrete Sampling	D. Foyles
DEAN-05	2/15/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	221217.0820	745023.1540	35.734969	-77.502842	14.35	4.37	31.27	9.53	Geoprobe Discrete Sampling	D. Foyles
DEAN-06	2/15/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	221007.9090	743322.7890	35.733314	-77.521672	30.80	9.39	26.87	8.19	Geoprobe Discrete Sampling	D. Foyles
DEAN-07	3/1/2019	E.Thornton, J.Chapman	Falkland	Pitt	221420.5600	744110.1640	35.736927	-77.512900	17.80	5.43	34.74	10.59	Geoprobe Discrete Sampling	D. Foyles
DEAN-08	3/1/2019	E.Thornton, J.Chapman	Falkland	Pitt	221641.7530	744575.8320	35.738858	-77.507716	23.10	7.04	38.71	11.80	Geoprobe Discrete Sampling	D. Foyles
DEAN-09	3/6/2019	K.Farrell, E.Thornton	Falkland	Pitt	221939.5500	745209.3270	35.741455	-77.500663	16.00	4.88	36.06	10.99	Geoprobe Discrete Sampling	D. Foyles
DEAN-10	3/7/2019	K.Farrell, E.Thornton	Falkland	Pitt	221289.7850	743887.9250	35.735778	-77.515379	19.40	5.91	27.40	8.35	Geoprobe Discrete Sampling	D. Foyles
SCOTT-01	3/7/2019	K.Farrell, E.Thornton	Falkland	Pitt	221219.0090	743646.5180	35.735173	-77.518059	18.50	5.64	22.60	6.89	Geoprobe Discrete Sampling	D. Foyles
DEAN-11	3/7/2019	K.Farrell, E.Thornton	Falkland	Pitt	221795.9200	744903.1860	35.740203	-77.504072	23.10	7.04	35.60	10.85	Geoprobe Discrete Sampling	D. Foyles
DEAN-12	3/8/2019	K.Farrell, E.Thornton	Falkland	Pitt	221265.4410	743758.3390	35.735576	-77.516814	20.60	6.28	20.14	6.14	Geoprobe Discrete Sampling	D. Foyles
DEAN-13	3/8/2019	K.Farrell, E.Thornton	Falkland	Pitt	221348.1490	744071.1030	35.736280	-77.513344	15.20	4.63	24.08	7.34	Geoprobe Discrete Sampling	D. Foyles
PORIES-01	4/3/2019	K.Farrell, E.Thornton	Falkland	Pitt	222612.8370	743240.8820	35.747789	-77.522313	18.40	5.61	23.20	7.07	Geoprobe Discrete Sampling	D. Foyles
PORIES-02	4/3/2019	K.Farrell, E.Thornton	Falkland	Pitt	222515.8010	742962.5390	35.746952	-77.525406	6 16.90	5.15	29.89	9.11	Geoprobe Discrete Sampling	D. Foyles
WHICHARD-01	4/10/2019	K.Farrell, E.Thornton	Falkland	Pitt	218492.5540	742426.8590	35.710764	-77.531986	31.10	9.48	68.11	20.76	Geoprobe Discrete Sampling	D. Foyles
PORIES-03	4/11/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	222458.5320	742173.1080	35.746541	-77.534143	17.70	5.39	33.40	10.18	Geoprobe Discrete Sampling	D. Foyles
PORIES-04	4/11/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	222484.0580	742550.4370	35.746721	-77.529968	17.20	5.24	31.56	9.62	Geoprobe Discrete Sampling	D. Foyles
PORIES-05	4/17/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	222233.0800	742019.6350	35.744530	-77.535877	35.80	10.91	67.72	20.64	Geoprobe Discrete Sampling	D. Foyles
PORIES-05a	4/17/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	222287.3200	742016.7250	35.745019	-77.535900	35.80	10.91	68.83	20.98	Geoprobe Discrete Sampling	D. Foyles
PORIES-06	4/17/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	222385.6060	741976.1890	35.745910	-77.536332	27.00	8.23	55.58	16.94	Geoprobe Discrete Sampling	D. Foyles
WOOTEN HEIRS-01	4/18/2019	K.Farrell, E.Thornton	Falkland	Edgecombe	221955.5070	740291.1420	35.742257	-77.555030	34.40	10.49	68.08	20.75	Geoprobe Discrete Sampling	D. Foyles
WOOTEN HEIRS-02	4/24/2019	K.Farrell, E.Thornton	Falkland	Edgecombe	222366.0840	740546.9570	35.745923	-77.552136	48.10	14.66	85.17	25.96	Geoprobe Discrete Sampling	D. Foyles
WOOTEN HEIRS-03	4/25/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Pitt	221399.0300	740409.7040	35.737226	-77.553809	42.40	12.92	81.00	24.69	Geoprobe Discrete Sampling	D. Foyles
WOOTEN HEIRS-04	4/25/2019	K.Farrell, E.Thornton, J.Chapman	Falkland	Edgecombe	221736.8370	740213.5810	35.740296	-77.555923	30.90	9.42	68.60	20.91	Geoprobe Discrete Sampling	D. Fovles
WHICHARD-02	5/8/2019	K.Farrell, E.Thornton	Falkland	Pitt	218457.2540	743428.0770	35.710312	-77.520928	52.80	16.09	81.27	24.77	Geoprobe Discrete Sampling	D. Fovles
WOOTEN-WM-01	5/9/2019	K.Farrell, E.Thornton	Falkland	Pitt	218568.2910	744168.9990	35.711213	-77.512722	53.80	16.40	73.33	22,35	Geoprobe Discrete Sampling	D. Fovles
WHICHARD-03	5/23/2019	E.Thornton, J.Chapman, W.Blocher	Falkland	Pitt	217103.0250	742773,4080	35 698194	-77.528384	41 35	12 60	81 89	22.00	Geoprobe Discrete Sampling	D. Fovles
WHICHARD-04	5/29/2019	E.Thornton, J.Chapman, W.Blocher	Falkland	Pitt	216049,2540	743,714,516	35.688571	-77.518160	38.50	11.73	68.34	20.83	Geoprobe Discrete Sampling	D. Fovles
WHICHARD-05	6/6/2019	K Farrell F Thornton	Falkland	Pitt	215790 5790	744501 4980	35 686133	-77 509500	28 75	8 76	Δ7 <i>ΛΛ</i>	14 /6	Geoprobe Discrete Sampling	
	0/0/2010				210100.0100		00.000100		20.75	0.70		17.40		D. T Oyles

K.Farrell, E.Thornton Falkland Pitt 222363.5390 741590.4590 35.745763 -77.540600 42.40 12.92

Total Footage 1009.15 307.59

Disclaimer: This Open-File Map is preliminary. It has been reviewed internally for conformity
with the North Carolina Geological Survey editorial standards. Further revisions or corrections
to this preliminary map may occur.

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GEOLOGIC MAP WITH GEOMORPHIC LANDSCAPE ELEMENTS OF THE FALKLAND 7.5 MINUTE QUADRANGLE, NORTHEAST QUADRANT, NORTH CAROLINA

Geology mapped from July 2018 to June 2019. Landscape analysis, map preparation, digital cartography and editing by Kathleen M. Farrell.

5.14 Geoprobe Discrete Sampling D. Foyles

74.70 22.77 Geoprobe Discrete Sampling D. Foyles









IVIIIes



NORTH CAROLINA GEOLOGICAL SURVEY Legend for Geologic Map Units - Geomorphic Landscape Elements OPEN FILE REPORT 2019-08 Stream Channel **Man-Made Excavation - Pond or Lagoon, Mining Operations.** Man-Made Earthenware Structures - such as Spoil Piles from Mining and Dredging, Dams, Causeways through Wetlands. H wf--Wetland Flat (Holocene): Wetland flat at base of incised valleys; commonly with anastomosed channel network activated during flood stage, or a single main channel, which is commonly trenched and straightened by human activity; may exhibit lacustrine conditions. Basal quartz sand fines up into organic-rich sand and mud. Deposits are typically less than 3 m thick. Flat is typically flanked by colluvium, alluvial fan, and partly buried channel belts. It is partly incised into pre-existing deposits, and may be separated in stepwise fashion from other active wetland flats. Upstream, the flat narrows and is replaced by channel deposits or undifferentiated Quaternary alluvium. Typical facies include: muddy and sandy peat, gravelly sand and other facies. H wf2--Wetland Flat 2 (Holocene - reactivated Pleistocene flat): Wetland flat that merges with the Hwf in upstream reaches of incised valleys. In some cases, H wf2 is separated vertically by a step-like feature from H wf. An incised channel may connect the two wetland flats. In other cases, the two flats gradually merge in upstream reaches. H wf2 is dryer than H wf; it may be continuous with a set of valley fill terraces. Not systematically mapped on this quadrant yet. **H** sc H sc--Side valley colluvium and bar forms within channels. H s--Sinkhole (Holocene): Incipient ovate depression that is commonly incised into surrounding landscape; may occur in conjunction with depressions in centers of Carolina Bays

H pb H pb--Point bar deposits (probably Holocene) that are part of lower Otter Creek drainage.

Undifferentiated Quaternary Deposits:

and colluvium on side slopes.

Qt0

Qt1

Q lzm3

Ours Q urs: Undifferentiated remobilized sands that usually on interfluve flats such as the 24-26 m marine terraces.

Untifferentiated Pleistocene Depositional Systems including Valley Fill and Falling Stage Deposits:

Qt100 Qt100 Pleistocene Stream Terrace in Tar River incised valley - 4-6 m.

Qt200 Pleistocene Stream Terrace in Tar River incised valley - 10-12 m.

Qal Undifferentiated Quaternary Alluvium - currently active landscape. Includes the Holocene material in side valleys and on alluvial fans

Qt0 Pleistocene Stream Terrace @ 8-9 m on Falkland SE, not occurring upstream on Falkland SW.

Qt1 Pleistocene Stream Terrace @ 19-20 m on Falkland SW. Very distinct flat terrace mapped downstream to 11 m on Falkland SE. May be Middle Pleistocene.

Qt2 Pleistocene Stream Terrace @ 20-21 m on Falkland SW. Principally a colluvial deposit affiliated with Qt1. Mapped downstream to 13 m on Falkland SE. Locally widens into flat terrace.

3-10 Qt3-10 Pleistocene Stream Terrace @ 22-23 m on Falkland SW where it occurs as an upstream valley fill colluvial deposit. Downstream on Falkland SE, it broadens and flattens into a fully developed terrace at 20 m.

Qt3-20 Qt3-20 Pleistocene Stream Terrace @ 19 m on Falkland SE where it occurs as an upstream valley fill colluvial deposit.

Downstream on Falkland SE, it broadens and flattens into a fully developed terrace at 20 m. Qt3 Pleistocene Stream Terrace @ 22-23 m on Falkland SW where it occurs as an upstream valley fill colluvial deposit.

Downstream on Falkland SE, it broadens and flattens into a fully developed terrace at 20 m. Qt4 Pleistocene Stream Terrace @ 23-24 m on Falkland SW where it occurs as upstream valley fill colluvium associated with falling stage.

Downstream on Falkland SE, it forms broad flat areas at 21-23 m, and is associated with deflation surfaces of Carolina Bays.

Qt5 Qt5 Pleistocene Stream Terrace @ 24-25 m on Falkland SW. This unit is similar to and may correlate with Qt4, but is located in updip areas. It was not identified in Falkland SE.

Qt6 vf Qt6 Pleistocene Valley Terrace @ 25-26.5 m; merges with marine terrace equivalent that is seaward (east) of ~26 m shoreline (Q lzm). Mapped upstream on Falkland SW; does not occur in downstream areas of Falkland SE.

Early Pleistocene Units - Marine Ramps on Interfluves:

Q lzm: Informal Lizzie Formation, downstepping, marine interfluve deposits; occur beneath marine flats east of 26 m shoreline, mapped downdip to 23 m.

of the Little Contentnea Creek Watershed, Neuse River Basin, North Carolina. Carolina Geological Society

Gibbard, P.L., Head, M.J., Walker, M.J.C., and the Subcommission on Quaternary Stratigraphy, 2010, Formal ratification of the Quaternary System/Period and the Pleistocene Series/Epoch with a base at 2.58

Annual Field Trip Guidebook.

Ma, Journal of Quaternary Science, v. 25, p. 96-102.

Q lzm3: Marine terrace that occurs @ ~23-24 m.

Q lzm2: Marine terrace that occurs @ ~24-25 m, merging gradually (elevation-wise) with lzm1.

Q lzm1: Marine terrace that extends from 26.5 meters to 24.5 m. Boundary between lzm1 and lzm2/3 is ~24.5 m.



