

FROM RIVERS TO SOUNDS IN THE BERTIE WATER CRESCENT

AN EARTH & ENVIRONMENTAL SCIENCE PROGRAM THAT FOLLOWS THE WATER

WORKSHOP 4: HUMAN TIME & GEOLOGIC TIME

Cashie River Center: 8:00 am to 3:00 pm

NORTH CAROLINA LAND OF WATER (NC LOW) & A TIME FOR SCIENCE (ATFS)

www.nclandofwater.org & www.atimeforscience.org

AGENDA:

8:00-8:30: Review of previous workshops with a K-W-L chart.

Your Place in North Carolina, Coastal Plain, and Bertie County--dots where we have been

Lidar maps of "Bertie Water Crescent" and "Bertie Peninsula"

The Water Cycle: Water, water everywhere and its drainage systems

From "Rivers to Sounds": Bertie County's "5 Water Hubs"

The Rock Cycle: Elements, minerals, rocks & soils and NC Geology

8:30-9:00: Human Time and Earth Time

Directional Time: a straight line with a beginning to an end (birth to death)

Animals, plants; earth, sun, & universe

Cyclical Time: endlessly repetitive and predictable

Night-day: caused by rotation of earth on its axis

Seasons: caused by rotation of earth around sun

Astronomical tides: caused by rotation of moon around earth

Calendars: years (365 ¼ days/yr = leap year),

Equinoxes (sun over equator = day-night; Mar 21/Sep 21)

Solstices (winter = sun farthest S; summer = sun farthest N; Dec 21/June 21)

9:00-10:00: Time exercises and climate change

Tree calendars: time from years to centuries

Ice calendars: time from years to a million years

10:00-10:10: Break

10:10-11:30: Geologic time: from today back-words for 4.6 billion years

Formation of NC Appalachian, Piedmont, and Atlantic Ocean

Erosion of Appalachian Mountains, river transport, deposition of Coastal Plain-Continental

Margin provinces

Thinking Diagram for climate change and Bertie County

11:30-12:00: Lunch Break (supplied) and Description of Field Trip

12:00-2:30: Meet at the van with warm clothes and hiking shoes/boots

FIELD TRIP: ROANOKE RIVER

Main Concepts

1. Rivers and Estuaries
2. Brown Water Trunk Rivers & Black-Water Tributary Streams
3. Climate Change:
 - a. Changing Climate: Meandering, Braided, and Incised Rivers
 - b. Sea Level Rise and Storm Dynamics
 - c. Human Dams: Lakes, Power, and Floods
4. Eco-Systems: Floodplains, Shorelines, & Ravines, & Terraces
5. Sediment Erosion and Deposition: Inorganic & Organic
6. Upland Terraces: Old Sea Levels and Their Ecosystems
7. Land Uses: Forestry, Agriculture, Hunting, Fishing, & Boating

SCIENCE CLASSROOM ACTIVITIES

FIELD TRIP SCAVENGER HUNT

Find the following items and either sample it or photograph it for your classes

1. Shrimp burrows
2. A natural spring
3. A fossil coral
4. High tide beach
5. A slump block
6. A braided river
7. An ironstone boulder
8. An eroding shoreline
9. Deposit of heavy minerals
10. An iron hardpan

VOCABULARY BINGO

1. Beach
Sediment accumulation between water body and land
2. Braid plain
Floodplain of a multi-channel river in an arid environment
3. Topography
Land surface geometry above water level
4. Lidar
Technique for measuring land surface elevation
5. Estuary
Water body where river water mixes with ocean water
6. Cross-section
Surface profile and underlying character of a vertical section of the earth

7. Mean sea level
Average level of the present ocean surface
8. Trace fossil
Indirect evidence of a former organism
9. Watershed
Area contained within a drainage basin
10. Continental Margin
Submarine province adjacent to the subaerial Coastal Plain Province
11. Interstream divide
High land area between two drainage valleys
12. Hydrologic cycle
Continuum of water movement within our planet's surface
13. Drainage basin
A land basin that contains an integrated system of streams
14. Terrace
Land surface formed by previous river or ocean levels during different climate conditions
15. Shoreline
Line between any water body and adjacent upland
16. Shore zone
Land area routinely covered by the moving shoreline
17. Trunk river
Largest or primary river within a drainage basin
18. Black-water stream
Tributary streams that drain upland swamps
19. Fall line
Line of intersection between old crystalline Piedmont rocks and young marine sediments of Coastal Plain rocks
20. Coastal plain
Marine sediment province adjacent to Atlantic Ocean