

# **FROM RIVERS TO SOUNDS IN THE BERTIE WATER CRESCENT**

## **AN EARTH & ENVIRONMENTAL SCIENCE PROGRAM THAT FOLLOWS THE WATER**

**WORKSHOP 4: FEBRUARY 28 and March 1, 2019  
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](http://www.nclandofwater.org) & [www.atimeforscience.org](http://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

Feb 28: Do field trip of Cashie River drainage system: from Hoggards Mill Run to Sans

Souci Ferry.

March 1: Travel to Bertie County's "Tall Glass of Water" and do field exercises from upland

Talbot Terrace and drainage system to Albemarle beach

2:30-3:00: Return to the Cashie River Center and wrap up

## **FIELD TRIP: BERTIE COUNTY'S "TALL GLASS OF WATER"**

### **Main Concepts**

1. Rivers and Estuaries
2. Shorelines: Erosion and Deposition
3. Upland Terraces: Old Sea Levels, Incised Channels, and Their Ecosystems
4. Future Land Uses: Environmental Education, Recreation, and Eco-Tourism

### **WORKSHOP #1 HANDOUTS**

1. Agenda and Info (front and back)
2. Map of Appalachians, Piedmont, & Coastal Plain Provinces
3. 3-D Cross-Section of Surface Topography NC
4. Map of Coastal Plain & Continental Margin Provinces
5. Bertie Peninsula Plain Lidar Map: Where do You Live? What are the Water Bodies?
6. Bertie Peninsula Lidar Map with Towns & Roads: Now Where do You Live?
7. Coastal Plain Shorelines: Product of Climate and Sea Level Changes
8. Drainage Basins NE NC: Product of Riverine Processes
9. Bertie Water Crescent: Lidar Topography and Cross Sections of Surface Topography
10. Earth's Water Cycle
11. Bertie Peninsula Water Hubs

### **WORKSHOP #2 HANDOUTS**

1. Agenda and Info (front and back)
2. Roanoke-Chowan River drainage basins
3. Bertie Co. Lidar with highways and towns--but no named water bodies or hubs
4. Cashie River Lidar map and topographic river profile
5. Close up of Windsor Lidar with no streets
6. Close up of Windsor Lidar with streets
7. Roanoke River water gauges—normal
8. Roanoke River water gauges—flood
9. Storm surge teeter-totter diagram—Albemarle Sound
10. Flood maps of Windsor
11. Sea-level rise maps of Cashie River

### **WORKSHOP #3 HANDOUTS**

- 1 & 2. Agenda
- 3 & 4. Simple Rock Cycle and Process Cross-Section
- 5 & 6. North Carolina Geologic Map and Major Rock Types
- 7 & 8. North Carolina Rock and Mineral Resources
- 9 & 10. Field Trip: Bertie County's "Tall Glass of Water"
- 11 & 12. Field Trip Maps of Bertie County's "Tall Glass of Water"

## **WORKSHOP OBJECTIVES:**

1. Develop a sense of your place in both space and time
2. Cultivate an understanding of
  - a) The local and regional landscape and waterscape,
  - b) The dynamics that drive change within the region, and
  - c) How these forces dictate human response and vice versa.
3. Produce ideas for your individual lesson plans that fit into the overall curricula.

## **BERTIE-WINDSOR SCIENCE TEACHER WORKSHOPS**

All of the science teacher workshops will utilize the fundamental concepts of earth and environmental science to focus on the basic concepts associated with “What’s In Your Backyard”?

1. The workshops and field trips will focus on the character and dynamics of the incredible natural resource system of the Bertie-Windsor region and Atlantic Coastal Plain Province. It will also include the influence these resource dynamics have on the development of the human culture.
2. The program leaders will build the workshops and field trips around the six basic concepts in science to integrate the natural resources and cultural histories of the local to regional environments. Use of the big concept approach to science will provide teachers with a critical understanding of the interactive and interdependent nature of **earth systems**, as well as providing a critical framework for presenting specific components and processes required by the NC Essential Standards and EOG Science test.
  - a) Earth’s cycles: water, rock, & chemical
  - b) Energy to do work: sun, fossil fuels, & natural hazards
  - c) Time: human and geologic
  - d) Earth’s tectonism: changing landscapes & ecosystems
  - e) Economic resources: elements, minerals, rocks, & soils
  - f) Human dynamics: cultural history & environmental change
3. Leaders for the Bertie-Windsor Science Teacher Education Program:
  - Dr. Stan Riggs: NC LOW Leader and Regional Earth and Environmental Science Expert
  - Ms. Maria McDaniel: Education and Program Director for “A Time for Science” ATFS.
  - Ms. Dorothea Ames: Earth Science Educator for NC LOW
  - Ms. Karen Clough: Program Coordinator for NC LOW
4. The Six Big Concepts of Earth and Environmental Science
  - Earth’s Cycles: Water, Rock, and Chemical
  - Energy to do Work: Sun, Fossil Fuels, and Natural Hazards
  - Time: Human and Geologic
  - Earth’s Tectonism: Changing Landscapes and Seascapes
  - Economic Resources: Elements, Minerals, Rocks, and Soils
  - Human Dynamics: Cultural History and Environmental Change

