

# Chapter 6

## Water Quality Stressors and Sources of Impairment in the Chowan River Basin

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### 6.1 Stressor and Source Identification

Human activities can negatively impact surface water quality, even when the activity is far removed from the waterbody. The many types of pollution generated by human activities may seem insignificant when viewed separately, but when taken as a whole can result in significant stress to the aquatic ecosystem. Water quality stressors are identified when impacts have been noted to biological (fish and benthic) communities or water quality standards have been violated. Stressors apply to one or more use support categories and may be identified for Impaired, as well as Supporting waters with noted impacts.

For specific discussion of stressors and sources of the Impaired or waters with Noted Impacts, refer to the subbasin chapters. More information regarding aquatic life, recreation, fish consumption and shellfish harvesting stressors and sources can be found in Chapter 3 of the *Supplemental Guide to North Carolina's Basinwide Planning: Support Document for Basinwide Water Quality Plans* <http://www.ncwaterquality.org/basinwide/SupplementalGuide.htm>.

#### 6.1.1 Stressors

Identifying stressors is challenging because direct measurements of the stressor may be difficult or prohibitively expensive. DWQ staff use field observations from sample sites, special studies and data from ambient monitoring stations, as well as information from other agencies and the public to identify stressors and their potential sources. It is important to identify stressors and potential sources of stressors so that water quality programs can target limited resources to address the stressor.

Stressors to recreational use include pathogenic indicators such as fecal coliform bacteria, *escheria coli* (*E. coli*), and *enterococci*. In the fish consumption category, mercury and dioxin are the noted stressors. Other substances may also result in the issuance of a fish consumption advisory or advice by the NC Division of Health and Human Services (NCDHHS).

Most stressors to the biological community are a complex grouping of many different stressors that individually may not degrade water quality or aquatic habitat, but together can severely impact aquatic life. Sources of stressors are most often associated with land use in a watershed, as well as the quality and quantity of any treated wastewater that may be entering a stream. During naturally severe conditions such as droughts or floods, any individual stressor, or group of stressors, may have more severe impacts to aquatic life than during normal climatic conditions. The most common source of stressors is from altered hydrology.

In the fish consumption category dioxin is a stressor resulting in the Impairment of waters in Albemarle Sound to the mouths of the Chowan and Roanoke Rivers. Dioxins are the byproducts of industrial processes and are formed during the chlorine bleaching process at pulp and paper mills. The current dioxin advisory was issued by the Department of Health and Human Services in 2001. The advisory is for the consumption of catfish and carp in the Albemarle Sound from

Bull Bay to Harvey Point; West to the mouth of the Roanoke River and to the mouth of the Chowan River to the U.S. Highway 17 Bridge (Perquimans, Chowan, Bertie, Washington, and Tyrrell Counties). Women of childbearing age and children should not eat any catfish or carp from this area until further notice. All other persons should eat no more than one meal per month of catfish and carp from this area. For more information on this advisory please visit the DHHS website <http://www.epi.state.nc.us/epi/fish/>.

### **6.1.2 Sources**

Pollutants fall into two general categories: point sources and nonpoint sources. DWQ identifies the source of a stressor, point or nonpoint, as specifically as possible depending on the amount of information available in a watershed. Most often the source is based on the predominant land use in a watershed. Many point sources were removed from the Chowan River due to the NSW management strategy with the conversion of municipal wastewater treatment plants to land application. Stressors sources identified in the Chowan River basin during this assessment period include agriculture and runoff from WWTP land application sites. In addition to these sources, many impacts originate from unknown sources.