Land, Water and Wealth

This session will highlight the connections between land use and water quality, and make connections with basic economic principles.

Summary

North Carolina has a beautiful coast and is attractive to visitors from around the country. As a result, tourists generated over $2.3 billion in direct expenditures in 2006 in our coastal counties (NC Department of Commerce). Our coasts are also becoming more populated with year round residents. Between 1990 and 2000, the twenty CAMA counties experienced a 19 percent increase in population. New Hanover County led with 51% growth, while Brunswick, Pender, Currituck and Dare, saw 43, 42, 32 and 31 percent growth, respectively. This unprecedented growth continued through 2005, with 3 counties having growth rates over 20% between 2000 and 2005; and 5 counties with 10% or greater growth. The coastal counties also "lost" 140,000 acres of cropland and 489,000 acres of woodland from 1982 to 2002 (Conservation Trust for North Carolina). According to the forecasts, our high growth rates are expected to continue, with the coastal county population expected to approach 1.2 million in 2030 – a 43 percent increase from 2000.[1]

During our recent population boom, the state also witnessed declines in coastal water quality, including nutrient loading and associated eutrophication, anoxia (water with no oxygen), hypoxia (water with low oxygen), harmful algae blooms (HABS) and fish kills; toxic contamination and bacterial contamination with associated closed recreational beaches and shellfish beds. There are over 2.1 million acres of coastal waters in North Carolina, and approximately 365,000 acres are closed to shellfish harvest. About 40,000 to 50,000 acres are closed temporarily after heavy rainfall flushes stormwater runoff and associated bacteria and contaminants into waterways. According to the Division of Water Quality, over 1,000 acres of Outstanding Resource Waters were closed to shellfishing between 1990 and 2006 (Tom Reeder, August 28, 2006). We are also experiencing problems with erosion and habitat quality in many of our streams and creeks and along our estuarine shoreline.

Population and tourism increases are accompanied by development. Development results in water quality and habitat degradation when: 1) the land surface is altered such that it creates changes in the "natural" flow of water from the property, and 2) the developed land is accompanied by activities that generate polluted runoff. The attached factsheet from the California NEMO Partnership provides helpful explanations of these changes, which generally occur at relatively small scales but cumulatively have significant impacts. A variety of studies have shown that once impervious cover in a watershed exceeds 10% of the area, streams and rivers become degraded.

Many local communities are recognizing that their current land management strategies will neither protect their aquatic resources nor provide long term stability for their economies. These communities are finding creative ways to minimize the impacts of growth on water resources by improving their planning efforts, developing watershed protection plans; revising development ordinances; implementing local programs for stormwater management, erosion control, on-site wastewater management, and tree protection; and implementing innovative practices on their own property.

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[1] NC Coastal Federation 2006 State of the Coast Report 18 pages
http://www.nccoast.org/publication/socreports/2006/index_html

Increasingly, developers are taking steps to plan, design and develop in a more sustainable manner, as they strive to be environmental stewards and meet market and social demands. They recognize the economic benefits sustainable development can deliver to their businesses and the community. For example, developers of a 270-unit apartment complex in Aberdeen North Carolina saved $275,000 by eliminating curb and gutter and installing bioretention areas and grassy swales (ECONorthwest). A study from Maryland documented increased sales values of 10-15% per lot for those adjacent to forest and buffers (Chesapeake Bay Program). The National Homebuilders Association notes clustering homes on a large piece of property rather than requiring large lots can reduce the costs of clearing, grading and installing erosion control practices, and reduce the capital cost by 10-33% by reducing infrastructure needs (National Association of Homebuilders). Similarly, clustering homes was shown to be an effective approach to designing an affordable housing project in Kannapolis, North Carolina, saving $13,000 per lot over the original design (Conservation Fund).

We are finding that maintaining clean water and functioning wetlands is much less expensive than having to clean or restore these resources. Stream restoration costs can range from $100 to $1000 per linear foot. Small channels in rural settings that only involve bank stabilization and buffer planting would be on the lower end of this cost scale, while large urban streams that involve a lot of utilities and excavation would be on the higher end. Restoration projects, whether for streams or wetlands, are also not guaranteed to restore all the original qualities and benefits of the stream.

Strategies and Tools

There are various avenues for local governments to improve strategies for addressing water quality impacts from development. The following basic principles of hydrology can help guide a community's efforts at the county or watershed level, a development site, or on an individual lot.

Basic Principles of Maintaining Natural Hydrology

- Preserve and protect continuous areas of absorbent and vegetated areas
- Preserve and protect critical ecological areas such as wetlands, floodplains, and riparian areas
- Minimize overall land disturbance and additions of impervious surface
- Capture, treat and infiltrate runoff generated from impervious surfaces
- Identify key areas in need of restoration where significant measurable goals can be obtained (i.e. improving critical coastal habitats, water quality, etc.)

Presenters

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