ADAPTING TO CLIMATE CHANGE ON THE ALBEMARLE PENINSULA

Duke Energy – Improving the Environment

In 2008, Duke Energy partnered with The Nature Conservancy to study effects of rising sea levels on North Carolina's Albemarle Peninsula. Duke Energy's $1 million contribution will help fund research on ways to slow the saltwater intrusion and protect existing natural areas.

The Albemarle region's rich mosaic of forests, dunes, wetlands, rivers and sounds provides an extraordinarily productive natural system. It is part of the largest closed lagoon in the world, and part of the second largest and healthiest estuary in the eastern United States. Yet, the region could face potentially devastating environmental and economic consequences if it is not prepared for rising sea levels.

Vulnerable ecosystems – with thriving natural communities much like the low, flat Albemarle Peninsula – are being altered by saltwater intrusion, shoreline erosion and a decay of peat soils. These effects, partially attributed to climate change, lead some scientific models to predict that up to 1 million acres will be under water in the next 100 years. Climate change could also result in an altered species distribution, a higher incidence of invasive species, and changes in fire patterns.

Albemarle Climate Change Adaptation Project

The Albemarle Climate Change Project is working to help ensure coastal communities remain vibrant while facing their inevitable alteration by climate change. The project has a four-fold mission:

- Reduce future shoreline erosion
- Restore the hydrology of the natural land
- Manage ecosystem transition
- Research the carbon feasibility of the region's peat soils

The Albemarle Peninsula is located on the coast of North Carolina, just below the Outer Banks.

Scott Lanier, Deputy Refuge Manager at the Alligator River National Wildlife Refuge, and Duke Energy's John Stowell stand by the 400 tons of marl to be used in constructing an oyster reef.

The Nature Conservancy
Protecting nature. Preserving life.™

Duke Energy, The Nature Conservancy, U.S. Fish and Wildlife Services and local universities have begun various testing in support of the project's four-fold mission.

1 Reduce shoreline erosion

As the Albemarle Peninsula's landmass gradually erodes, a receding shoreline is inevitable. However, this process can be slowed with natural buffers. By constructing a shoreline oyster reef, the wave energy from accelerated sea level rise may be reduced. Blocks of limestone and nettled bags of shells were submerged in mid-2010 to construct a 400-ton oyster reef. There are many additional environmental benefits of oyster reefs, including improved estuarine water quality – due to their filtering ability – and restored fisheries habitat.

2 Restore hydrology

Sea levels continue to rise and existing channels in the area are slowly filling with salt water. These channels were originally built for agricultural purposes more than 100 years ago. Now, these channels act as inland waterways, transporting salt water to the inland peat soils. Water control structures with flashboard risers and tide gates are being installed to prevent saltwater intrusion of these inland waterways and rehydrate the peat soils. These structures will also provide necessary data for developing new scientific models that will improve the health of the ecosystem.

3 Manage ecosystem transition

Planting vegetation that can withstand high levels of salinity in these floodplains is an effective method for preventing additional land erosion, a growing challenge of rising sea levels. Experimental tree planting is underway to monitor the growth and survival of different plant species on the Albemarle Peninsula.

Approximately 60 acres are devoted to the experimental planting of over 20,000 trees. These seedlings include bald cypress, black gum and pond pine species. These salt-tolerant hardwoods have been planted in different plots with variables such as competing species and saltwater intrusion taken into account.

4 Research carbon storage potential

With a carbon-constrained future in mind, Duke Energy strives to learn more about the carbon-sequestration potential of peat soils. Carbon is a greenhouse gas, one of the known sources of atmospheric climate change; storing it prevents the gas from building up in the atmosphere. The research will establish a baseline for understanding the carbon storage potential for peat soil conservation and monitor the effects of management tactics on carbon sequestration. Already, a comprehensive literature review was conducted with partnering universities and more experimentation is planned.

Looking toward a more sustainable future

Duke Energy strives to help the natural communities of the Albemarle Peninsula stand tall against rising sea levels and coastal erosion. The lessons we learn may be applied on a much larger scale as coastal communities worldwide become vulnerable to the same impacts of climate change. Specific takeaways from this project will help with future conservation practices and coastal remediation. By addressing climate change and moving toward a more sustainable future, we hope to give future natural communities the opportunity to thrive.

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