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Environmental Update



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Do you want to become a Master Gardener Volunteer?

The Onslow County Center of the North Carolina Cooperative Extension is offering a Master Gardener Volunteer class starting January 22. The Master Gardener Volunteer Program is a joint endeavor of the North Carolina Cooperative Extension Service and volunteers who wish to learn how to be better gardeners and help other gardeners by sharing their knowledge. The program is designed to recruit and train volunteers to help meet the educational needs of the citizens of Onslow County.



Class participants learn about a wide variety of gardening subjects including vegetables, fruits, lawn grasses, shrubs, flowers, and trees. The training focuses on developing diagnostic skills for insects and diseases of plants. Classes are also given on landscaping for water quality, soils, composting, propagation, wildlife control and much, much more!

Master Gardeners receive 40 hours of training and after graduation they provide 40 hours of volunteer work in the community. Master Gardeners are involved in a range of community projects including: answering homeowner inquires at the Extension Office and Farmer's Market, mailing out information bulletins to homeowners, conducting plant clinics, working with school children on special horticultural projects, talking to garden clubs, working on community beautification projects, and developing the new Discovery Gardens of Onslow.

The 2014 Master Gardener course will begin January 22 and ends March 31. Classes normally will be taught Monday and Wednesday mornings from 9:00 am until noon. Cost for the course is \$100, which includes a comprehensive Master Gardener manual.

Persons interested in receiving an application for the 2014 course should call the North Carolina Cooperative Extension - Onslow County Center at (910) 455-5873 and request an application. Class size is limited.

Coastal wetlands ...

Coastal wetlands are a vital part of our aquatic ecosystems. They provide several important functions, include nursery habitat for young fish and shellfish species, water filtration, and shore-line protection. Because of their importance, they have been the subject of numerous studies and protective legislation. The activities of humans are not the only threat to their existence.

Page 23 of a new report on the status of US wetlands, by Dahl and Stedman, stated that “*Salt-water inundation of freshwater wetlands and some uplands... resulted in the conversion of an estimated 7,800 acres of freshwater wetland and 1,940 acres of upland to become saltwater wetlands. However, there was also an estimated loss of 7,360 acres of estuarine saltmarsh in the coastal watersheds of the Atlantic. The majority of the losses in estuarine marsh area were attributed to erosion and/or inundation related to increases in sea level...*” (T. E. Dahl and S. M. Stedman. 2013. [Status and Trends of Wetlands in the Coastal Watersheds of the Conterminous United States, 2004 to 2009](#). US Department of the Interior, Fish and Wildlife Service and National Oceanic and Atmospheric Administration, National Marine Fisheries Service. 46 p.). In effect, coastal wetlands are being squeezed by development on one side and the encroaching ocean on the other. The result is that freshwater wetlands are getting salty, and saltwater wetlands are becoming open water.

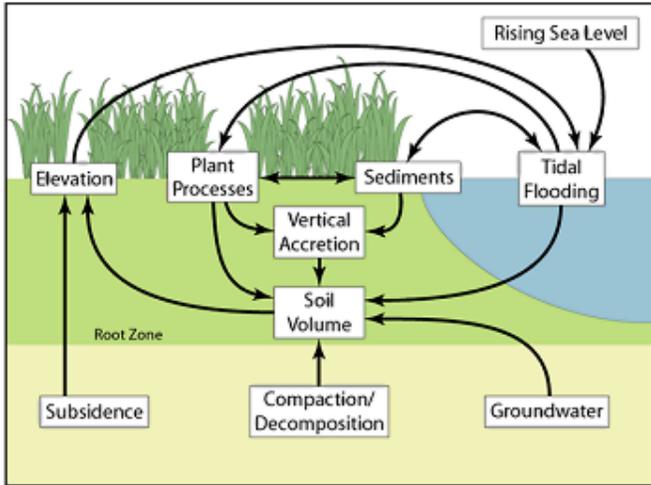
The NC rules define coastal wetlands as “any salt marsh or other marsh subject to regular or occasional flooding by tides, including wind tides, provided this does not include hurricane or tropical storm tides”(15A NCAC 07H .0205). These include wetlands along our coastal rivers subject to tidal influence. Regulations exist regarding alterations to these wetlands, including mowing or cutting coastal wetland vegetation by either mechanical or manual methods. The rules regarding alteration of coastal wetlands further state that:

1) *Alteration of coastal wetlands is exempt from the permit requirements of the Coastal Area*

Management Act (CAMA) when conducted in accordance with the following criteria:

- a. *Coastal wetlands may be mowed or cut to a height of no less than two feet, as measured from the coastal wetland substrate, at any time and at any frequency throughout the year;*
 - b. *Coastal wetlands may be mowed or cut to a height of no less than six inches, as measured from the coastal wetland substrate, once between each December 1 and March 31;*
 - c. *Alteration of the substrate is not allowed;*
 - d. *All cuttings/clippings shall remain in place as they fall;*
 - e. *Coastal wetlands may be mowed or cut to a height of no less than six inches, as measured from the coastal wetland substrate, to create an access path four feet wide or less on waterfront lots without a pier access; and*
 - f. *Coastal wetlands may be mowed or cut by utility companies as necessary to maintain utility easements.*
- 2) *Coastal wetland alteration not meeting the exemption criteria of this Rule requires a CAMA permit. CAMA permit applications for coastal wetland alterations are subject to review by the NC Wildlife Commission, NC Division of Marine Fisheries, US Fish and Wildlife Service, and National Marine Fisheries Service in order to determine whether or not the proposed activity will have an adverse impact on the habitat or fisheries resources.*

Limiting mowing or other alteration to coastal wetlands has other benefits besides those to habitat and fisheries. A recent research study through the Defense Coastal Estuarine Research Program (DCERP) at Camp Lejeune showed that marsh vegetation trapped sediment at roughly the same rate as sea level rise was occurring, thereby keeping the land-water interface at the same elevation. When sediment deposition doesn't keep pace with sea level rise and erosion, the marsh collapses.



Salt marsh response to sea-level rise depends on sediment and plant biomass. Image source: https://dcerp.rti.org/Portals/0/CoastalWetland/CW1_marshes%20and%20SLR.png

A new project is underway to improve predictive computer models and adaptive management strategies. Additional information about this and other projects is available at the DCERP website:

<https://dcerp.rti.org/DCERPPublicSite/EcosystemModules/CoastalWetlands/tabid/137/Default.aspx>

There is also a DCERP Marsh Equilibrium Model (includes a “for more information” link where you can run your own model scenarios):

<https://dcerp.rti.org/Portals/0/ModelFS/MEM3v4.pdf>

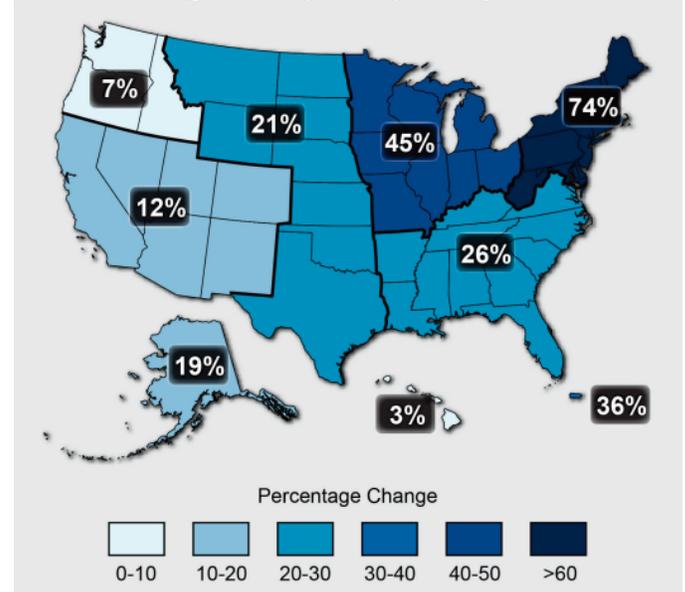
Climate change & impacts ...

Numerous studies have been conducted that ask people what they think of “climate change”. Is it occurring? If yes, is it from natural events, human activities, or a combination of both? Is climate change something that we should be concerned about or take steps to address?

Climate is long-term changes or trends in our weather, whereas *weather* is what occurs on a day-to-day basis. The vast majority of scientists are convinced that the planet’s climate has changed during the past century. The next few graphs show some of their observations of what has happened, and thoughts on what will happen by the end of this century.

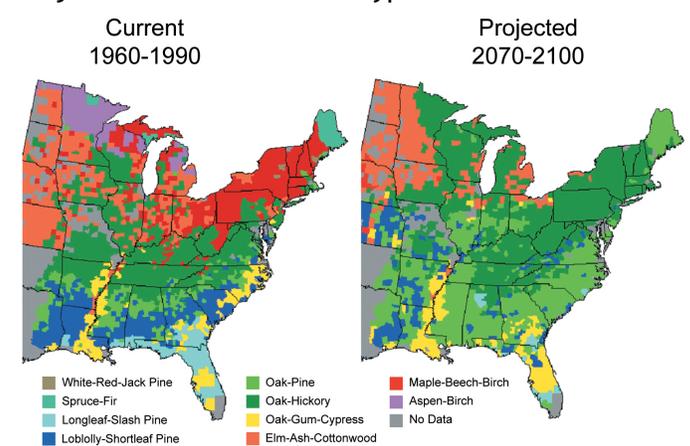
The graph below shows that during the past 50 years, our heaviest rainfall events have gotten heavier. This can have effects on flooding, erosion, and steps taken to mitigate impacts.

Percent Change in Very Heavy Precipitation



The map shows percent increases in the amount of precipitation falling in very heavy events (defined as the heaviest 1% of all daily events) from 1958 to 2011 for each region. There are clear trends toward a greater amount of very heavy precipitation for the nation as a whole, and particularly in the Northeast and Midwest. Figure source: updated from Karl et al. *Global Climate Change Impacts in the United States*, 2009 with data from NCDC.

Projected Shifts in Forest Types



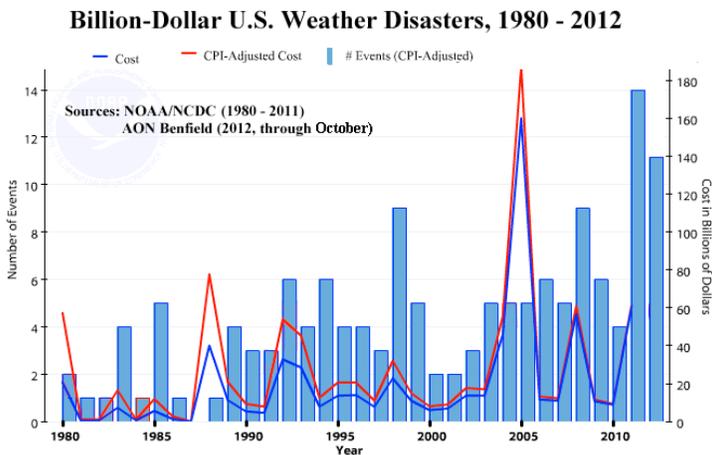
NAST²¹⁹

The maps show current and projected forest types. Major changes are projected for many regions. For example, in the Northeast, under a mid-range warming scenario, the currently dominant maple-beech-birch forest type is projected to be completely displaced by other forest types in a warmer fu-

ture. Figure source: US Global Change Research Program. *Global Climate Change Impacts in the United States*. p. 81.

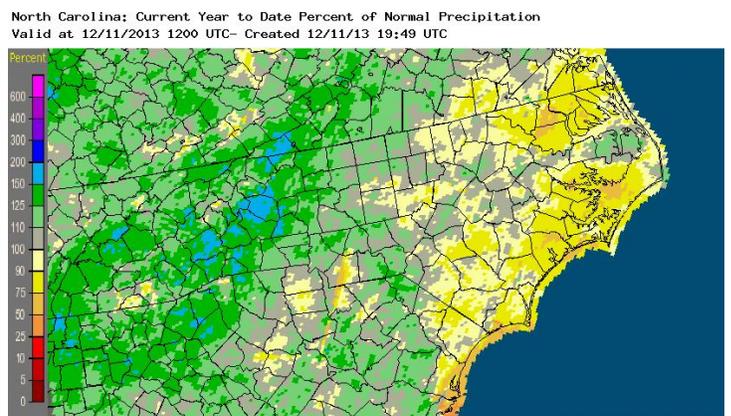
Shifts in tree species are projected to occur due to changes in temperature ranges. Insects and disease also shift in their ranges, and have already caused damage to millions of acres of US forests. This makes it easier for invasive species to move into an area. More information about the impacts of climate change on forests can be found at: <http://www.epa.gov/climatechange/impacts-adaptation/forests.html>

The next graph shows the number of billion dollar storm damage events that occurred in the US since 1980. This is significant, because of the prediction that climate change will cause an increase in severe weather events. The outcome may include increased insurance costs and changes to both building codes and road construction.



How wet was 2013? ...

We've had dry years, and we've had wet years. So, how did 2013 stack up? Well, rather like an inchworm bunching up and stretching out, our rainfall was similar. There were several weeks this year where it seemed that the rain just wouldn't quit; other times were much drier. The graph below shows the rainfall for 2013 through Dec. 11th. The end result: on average, eastern NC received a normal to slightly below normal rainfall amount for the year. The situation was much wetter in the mountains.



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<http://onslow.ces.ncsu.edu/content/Envedarchive>

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