Acknowledgements

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Front Cover photograph: A North Carolina application of the University of Georgia UGA EASY (Evaporation-based Accumulator for Sprinkler-enhanced Yield) Pan Irrigation Scheduler can provide in-field monitoring of crop water needs in humid areas for a fraction of the management time and cost associated with other irrigation scheduling methods (Cooperative Extension Service/The University of Georgia College of Agricultural and Environmental Sciences, "UGA EASY Pan Irrigation Scheduler", D.L. Thomas, K.A. Harrison, J.E. Hook, and T.W. Whitley, Bulletin 1201, January, 2002). See page 48 (Irrigation Scheduling) for further information on this device. Photograph by Andy Smith.

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Comments Welcome and Updates: Contact the North Carolina Natural Resources Conservation Service (NRCS) at any one of the field offices located throughout the state, or the state office in Raleigh, with suggestions or comments in regards to this document. It may be updated periodically, and all comments and suggestions are welcome.

Chapter 1 (NEH 652.0106) North Carolina NRCS Irrigation Guide Supplement - Introduction

1a - General Information for North Carolina

The North Carolina supplement to the Natural Resources Conservation Service (NRCS) National Engineering Handbook (NEH) Part 652, Irrigation Guide, has been adapted from the original 1976 NRCS North Carolina Irrigation Guide. The material was developed to assist North Carolina NRCS field personnel and others working with North Carolina irrigators to provide general planning, design, and management guidance on various methods of irrigation commonly used in the State.

The NRCS in North Carolina has a long history of assisting the agriculture community with resource issues, which include the planning, design and operation of irrigation systems. North Carolina is a state with abundant resources that should be maintained and enhanced to ensure they will be available for future generations to come. This document will attempt to provide a holistic approach which considers all benefits as well as the associated impacts, while maximizing the utilization of resources without causing any degradation. “Leave it better than you found it”.

Conservation of water and nutrient resources is a prominent issue in the forefront of today’s irrigation designer. Conservation makes dollars and sense for the long-term operation and maintenance of an irrigation system. The irrigation system should allow for efficient application quantities and quality of water, with a minimum of waste, and have a good cost/benefit ratio. An additional benefit from an irrigation system should be a more consistent crop output of higher quality. Land resources, soil fertility, and water quality should not be negatively impacted by a properly designed irrigation system.

North Carolina has six unique physiographic regions, as shown in Figure NC1-1. Each of the regions will have their own specific challenges to the design and operation of an irrigation system. Those regions are the Mountains (Blue Ridge), Piedmont, Sandhills, Inner Coastal Plains, Outer Coastal Plains and Coastal (Barrier) Islands. Each of these regions have resource issues that should be considered in the design of an irrigation system. Groundwater quality and quantity, surficial aquifers, nutrient sensitive watersheds, coastal sound areas, and impacts to fisheries or shellfish beds must all be considered, as well as any other resource issues not specifically discussed here.

State and local laws/guidelines must be addressed by any irrigation system designer, and are not generally covered in this document. Check with state and local government representatives to insure compliance with any associated regulations/requirements. This NRCS North Carolina supplement is not intended to stand completely on its own, and is intended to be used as a supplement to the NRCS NEH Part 652, Irrigation Guide. Some important points from the NRCS NEH Part 652, Irrigation Guide, will be reiterated in this supplement, but the irrigation designer should use both in an irrigation system design.

The North Carolina Irrigation Guide Supplement contains information and experience about soils, climate, water supplies, crops, cultural practices, and farming conditions in North Carolina. These factors can be used to improve the planning and design of an irrigation system

located in this state. Adjoining states were consulted during this revision process to allow for as much consistency with these states as possible.

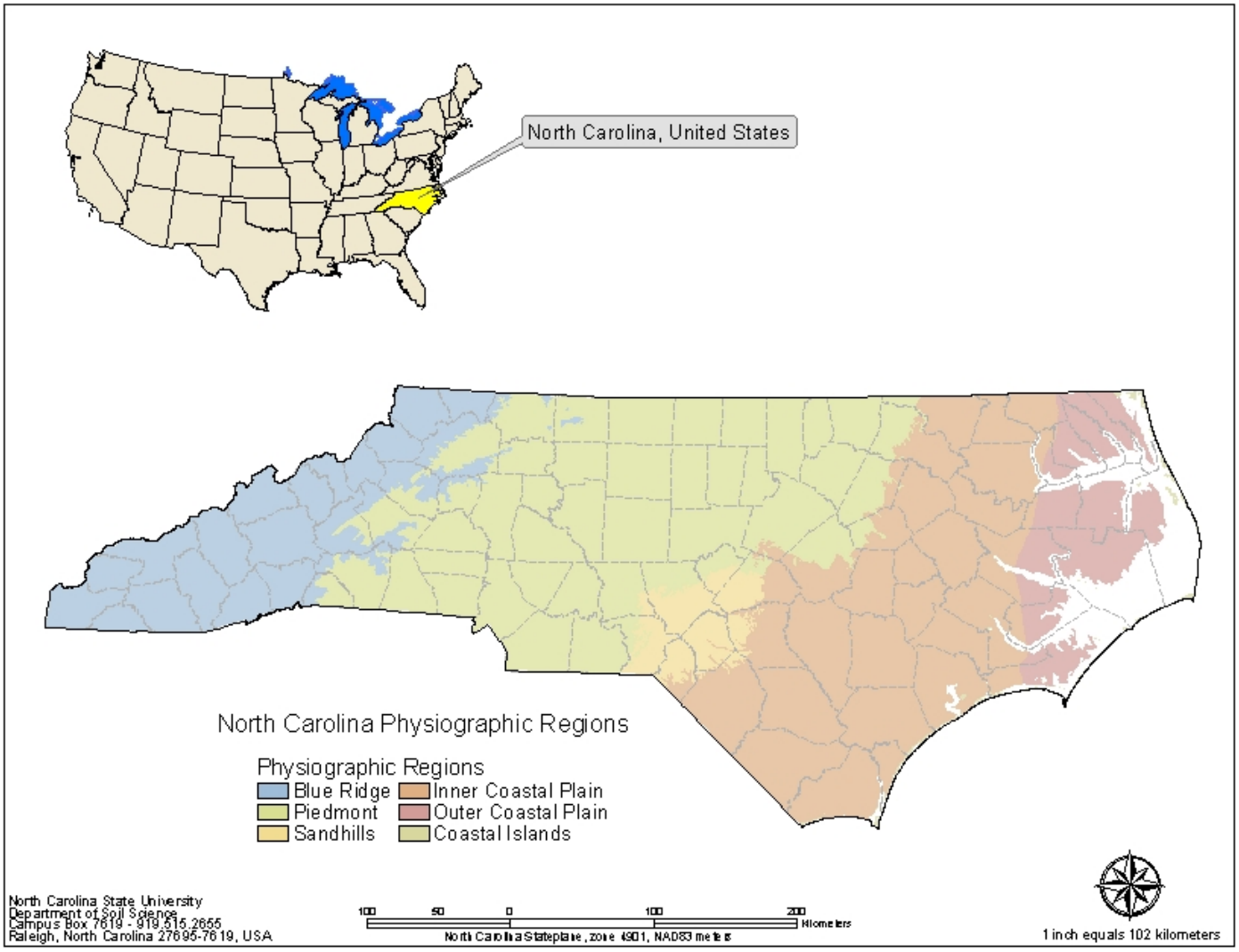

Figure NC1-1: Physiographic Regions of North Carolina.

In general, the climate of North Carolina is affected by latitude, variations in elevation, proximity to the ocean, and location with respect to principle path of storms. The ocean generally provides a moderating effect for the land adjacent to it, but the influences do not extend very far inland due to the predominantly west-to-east wind currents. North Carolina lies between 33.5 and 37 degrees north latitude, with an average annual temperature variation of about 2° F from south to north. The state varies in elevation from sea level at the coast to 6684 feet at Mount Mitchell, the highest peak in the eastern United States. The average annual temperature decreases by about 3.5^{o} F for each 1000 feet increase in elevation, for a range of about 20 degrees from the coast to the higher mountains. (“Climate of North Carolina Research Stations”, Agricultural Experiment Station, North Carolina State Univ. at Raleigh, Bulletin #433, July 1967)