WATER RESOURCES RESEARCH INTERESTS

IN THE

SENIOR COLLEGES AND UNIVERSITIES

OF

NORTH CAROLINA

An

Institute Report

April 1, 1967

The work upon which this report is based was supported in part by funds provided by the United States Department of the Interior, Office of Water Resources Research, as authorized under the Water Resources Research Act of 1964.

Agreement Number - 14-01-0001-978 FY 1967

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WATER RESOURCES RESEARCH INSTITUTE

UNIVERSITY OF NORTH CAROLINA

C O N T E N T S

WATER RESOURCES RESEARCH INTERESTS

IN THE

SENIOR COLLEGES AND UNIVERSITIES OF NORTH CAROLINA

The Water Resources Research Institute has prepared three basic reports to guide the development of its research program. These include reports on the State's water resources problems and research needs, water resources research interests in the senior colleges and universities of North Carolina, and an inventory of water resources research projects currently underway throughout the State.

The first report on "Water Resources Problems and Research Needs of North Carolina" was published on March 1 as Report No. 2 in the Institute's numbered report series.

This report on "Water Resources Research Interests in the Senior Colleges and Universities of North Carolina" was first released on August 15, 1966, as "Appendix A - Research Plan". Since the supply has long been exhausted and a number of changes have occurred, it has been updated and is being reissued as WRRI Report No. 3. A closely associated report on "Active Water Resources Research Projects in North Carolina" has also been updated and will be reissued as WRRI Report No. 4.

Many of the scientist listed in this report, while presently devoting their full attention to non-water related research, have indicated sufficient interest in water resources to suggest their possible involvement in this field. This represents a reservoir of potential research capability which can be drawn upon as circumstances permit. The research interests of faculty members of the senior colleges and universities of North Carolina are summarized on the following page.

Summary of Research Interests

Senior Colleges and Universities of North Carolina

University	Faculty Members: Reporting Water-Related Research Interest	Faculty Members: Currently Involved in Water-Related Research
Consolidated University of North Carolina		
North Carolina State University at Raleigh	92	53
University of North Carolina at Chapel Hill	43	33
University of North Carolina at Charlotte	2	2
University of North Carolina at Greensboro	1	1
Duke University	19	16
East Carolina College	9	4
Guilford College	1	1
North Carolina College at Durham	1	0
Total	168	110

CONSOLIDATED UNIVERSITY OF NORTH CAROLINA

NORTH CAROLINA STATE UNIVERSITY AT RALEIGH

UNIVERSITY OF NORTH CAROLINA AT CHAPEL HILL

UNIVERSITY OF NORTH CAROLINA AT CHARLOTTE

UNIVERSITY OF NORTH CAROLINA AT GREENSBORO

Consolidated University of North Carolina - N. C. State University at Raleigh

School	Department	Name	Water Related Research Interest
Ag. and Life Sc.	Animal Science	Dr. Albert J. Clawson	Disposal of swine wastes
"	Botany	*Dr. Ernest O. Beal	Taxonomy, ecology, and evolution of aquatic plants particularly in relation to selection by various factors of the habitat
"	"	*Dr. Arthur W. Cooper	Coastal ecology, salt marshes, forest ecology
"	"	*Dr. Larry A. Whitford	Floristics and ecology of fresh water algae
"	Crop Science	Dr. Douglas S. Chamblee	Moisture levels and plant management systems for optimal water efficiency and growth of forage species and the relative importance of moisture as a factor limiting establishment, growth and adaptation of major forage species
"	"	Dr. Frederick T. Corbin	Influence of herbicides on growth of aquatic microorganisms, detoxication mechanisms enabling microorganisms to detoxify herbicides, and persistence of herbicides in reservoirs and lake bottom soils
"	"	*Dr. William B. Gilbert	Water management for turf grasses and turf establishment and maintenance along highways
"	"	Dr. H. Douglas Gross	Water management for hay, pasture, and ensilage crops
"	"	*Dr. Glenn C. Klingman	Growth of crops in stubble mulch or sod-mulch planting as a means for control of soil erosion
"	"	Dr. R. C. Long	Relationships between water use and plant metabolism
"	"	*Dr. Donald L. Thompson	Drought resistance in corn and surface irrigation

School	Department	Name	Water Related Research Interest
Ag. and Life Sc.	Crop Science	Dr. Jerome B. Weber	The chemistry of the soil and fate and biological availability of applied organic compounds, especially herbicides
"	Economics	Dr. Edward W. Erickson	General
"	"	Prof. Cleon Harrell	Benefit-cost analysis and economics of recreation
"	"	Dr. Dale M. Hoover	Analysis of effects of irrigation on land values and aggregate output, and relationship between crowding and quality as related to demand for recreation
"	Entomology	Dr. Richard C. Axtell	Biology and control of Diptera associated with man including flies & gnats breeding in water and waste treatment plants, midges and gnats of impounded waters, and mosquitoes associated with drainage systems
"	"	Dr. Walter C. Dauterman	Structure-activity relationship of organophosphate insecticides
"	"	*Dr. Frank E. Guthrie	Mechanisms of pesticide toxicity
"	"	Dr. Robert L. Raab	Faunistic studies of aquatic insects in North Carolina
"	"	*Dr. Thomas J. Sheets	Water quality as affected by agricultural land runoff with emphasis on pesticides
"	Plant Pathology	*Dr. Ellis B. Cowling	Enzymatic degradation of lignin by microorganisms and development of useful products from pulp and paper wastes
"	Soil Science	*Dr. S. W. Buol	Relationship of soil and water

School	Department	Name	Water Related Research Interest
Ag. and Life Sc.	Soil Science	*Dr. J. Fulton Lutz	Water conservation, storage and movement in soils, availability to plants, contamination by herbicides, pesticides, etc.
"	"	*Dr. Charles B. McCants	Infiltration, percolation, leaching of mineral elements and soil moisture regimes
"	"	*Mr. Charles D. Sopher	Interactions between rainfall distribution and plant growth
"	"	*Dr. W. G. Woltz	Infiltration, percolation, leaching of mineral elements and soil moisture regimes
"	"	*Dr. William W. Woodhouse, Jr.	Effect of vegetation on water movement in and over soils, water losses, stabilization against erosion and water use by plants
"	Zoology	*Dr. Thomas A. Gaucher	Marine invertebrates
"	"	*Dr. William W. Hassler (Director Hatteras Laboratory)	Life history studies and population dynamics of marine and estuarine fishes
"	"	*Dr. F. Eugene Hester (Leader Coop. Fisheries Unit)	Fishery and waterfowl biology
"	"	*Dr. John E. Hobbie	General limnology, hetertrophy in fresh and marine waters, new methods of studying heterotrophy
"	"	*Dr. Donald B. Horton (Director, Pamlico Marine Laboratory)	Marine and estuarine ecology

School	Department	Name	Water Related Research Interest
Note: The following members of the professional staff, Radiobiological Laboratory, Bureau of Commercial Fisheries, Fish and Wildlife Service, Department of the Interior, Beaufort, N. C. hold adjunct appointments on the Department of Zoology Faculty:			
		*Dr. Theodore R. Rice	Marine and estuarine ecology
		*Dr. Claire L. Schelske	
		*Dr. Richard B. Williams	
		*Dr. Douglas B. Wolfe	
		*Dr. Joseph W. Angelovic	
		*Dr. Thomas W. Duke	
Engineering and Ag. and Life Sc.	Biological & Agricultural Engineering	*Dr. George J. Kriz	Moisture movement through porous media in the saturated and unsaturated states
"	"	*Mr. Ronald E. Sneed	Water requirements of plants and water quality as related to home water systems
"	"	*Dr. Cliff R. Willey	Water movement in soil, drainage, and water use
"	"	*Dr. Ralph E. Williamson	Drainage requirements of plants
"	"	*Dr. Edward H. Wiser	Hydrology
Engineering	Chemical Engineering	Dr. David B. Marsland	Desalination, industrial water pollution, and waste-water reuse
"	Civil Engineering	*Dr. Michael Amein	Stream flow, river basin planning, rainfall runoff, and wave motion
"	"	*Dr. William S. Galler	Application of systems analysis to water problems
"	"	*Dr. A. I. Kashef	Flow toward wells, seepage through dams, drainage problems, soil mechanics, and ground water hydrology

School	Department	Name	Water Related Research Interest
Engineering	Civil Engineering	*Dr. Jay Langfelder	Coastal erosion
"	"	*Prof. Charles Smallwood, Jr.	Water supply & pollution control
"	Engineering Research	Mr. W. T. McDaniel (Chief Engineer Minerals Research Laboratory)	Utilization of mining and ore processing wastes as useful products
"	"	*Miss Frances M. Richardson	Removal of radioactive contaminants from water
"	Mechanical Engineering	Prof. Jesse S. Doolittle	Saline water conversion, particularly in the field of thermodynamics and heat transfer
"	"	Dr. M. Necati Ozisik	Heat and mass transfer problems, diffusion problems related to removal of aerosols or particulates from fluid streams and research associated with the effectiveness of heat exchanges in association with saline water conversion
"	Mineral Industries	*Dr. C. J. Leith	Physical characteristics of present and future water-bearing geologic units
"	"	*Dr. John M. Parker, III	Occurrence of ground water in metamorphic and igneous rocks
"	"	*Dr. Charles W. Welby	Ground water occurrence and management and legal and economic aspects of ground water use
"	Nuclear Engineering	Dr. Martin A. Welt	Desalination, process water, water reuse
Forestry	Forest Management	*Dr. T. Ewald Maki (Department Head)	Forest influences (humus type-infiltration interrelationships); stand density & composition--evapotranspiration and production

School	Department	Name	Water Related Research Interest
Forestry	Hardwood Research Program	*Prof. R. L. McElwee	Influence of changing water regimes resulting from alteration of natural water cycles on reproduction, development, growth and harvesting of bottomland hardwood timber
"	Recreation and Park Admin.	Prof. Thomas I. Hines (Head-Department)	Human and economic values related to recreational use of water resources
"	"	Dr. Robert E. Sternloff	Programming of water resources for recreational use
"	"	Prof. Charles C. Stott	Water-based recreation facilities
"	"	Mr. Roger Warren	Maintenance and operation practices in water-based recreation areas
"	Wood Science & Technology	*Dr. Wyn Brown	Biological degradation of lignin
"	"	*Dr. Eric L. Ellwood (Head-Department)	Processing and manufacturing of pulp and paper and the physics and chemistry of wood utilization
"	"	Prof. R. G. Hitchings	Influence of pulp-making processes on mill effluents as related to waste treatment
"	"	Dr. Alfred J. Stamm	Pulp mill and chemical plant effluents and processing with less water
Liberal Arts	Politics	*Dr. William J. Block	Rural zoning-including flood-plain zoning
Physical Sci. & Applied Math.	Chemistry	*Dr. Lawrence H. Bowen	Behavior of water-soluble organic and organometallic compounds in aqueous solution
"	"	*Dr. Forrest C. Hentz, Jr.	Solubility equilibria of metal oxides and corresponding metal perchlorates

School	Department	Name	Water Related Research Interest
Physical Sci. & Applied Math.	Experimental Statistics	Dr. R. L. Anderson	Statistics and economic application
"	"	Dr. R. J. Hader	Statistical theory and methodology as related to industry and engineering applications
"	"	Dr. H. K. Hamann	Statistical theory and methodology as related to biological applications
"	"	*Dr. Don W. Hayne	Sampling, aquatic biology, pollution biology, and fishery biology
"	"	Dr. A. H. E. Grandage	Statistical theory and methodology as related to industry and engineering applications
"	"	Mr. Ray R. Lassiter	Quantitative ecology, biostatistics, computerizing biological problems (especially simulation), and fisheries
"	"	Dr. H. L. Lucas, Jr.	Mathematical description, mathematical modeling, and experimental design for dynamic systems with biological components
"	"	Mr. A. R. Manson	Model building for spread of pollution, design of experiments for monitoring pollution levels, and related areas
"	"	*Dr. Robert E. Mason	Quantitative ecology, biostatistics, and adaptation of biological problems to the computer
"	"	Dr. F. E. McVay	Statistics and economic application

School	Department	Name	Water Related Research Interest
Physical Sci. & Applied Math.	Experimental Statistics	Dr. David D. Mason	Design and analysis of experiments and surveys relating to the effect of soil characteristics, topography, and management to the hydrology of an area
"	"	Dr. R. J. Monroe	Statistical consultant in estuarine biology research and to bacteriologists engaged in water pollution studies
"	"	*Dr. L. A. Nelson	Design and analysis of experiments and surveys relating to the effect of soil characteristics, topography, and management factors on the hydrology of an area
"	"	*Dr. C. H. Proctor	Sample design and analysis to survey recreation activities and resources
"	"	Dr. Charles Quesenberry	Application of non-parametrics theory to water resources problems
"	"	Dr. R. G. D. Steel	Statistical theory and methodology as related to biological applications
"	"	*Mr. David W. Turner	Statistics as applied to fisheries problems
"	"	Dr. H. R. van der Vaart	Mathematical models for representing physical and biological processes
"	"	Dr. J. A. Warren	Statistical theory and methodology as related to biological applications
"	"	Dr. O. Wesler	Mathematical models for representing physical and biological processes
Textiles	Textile Chemistry	*Dr. H. Y. Jennings	Recovery of warp sizes

School	Department	Name	Water Related Research Interest
Weather Bureau-ESSA	State Climatologist	*Mr. Albert V. Hardy	Relationships of precipitation, temperature, evaporation, evapotranspiration, soil moisture and soil temperature to agricultural and industrial production, human health and welfare

Consolidated University of North Carolina - University of North Carolina at Chapel Hill

School	Department	Name	Water Related Research Interest
Arts and Sciences	Botany	Dr. C. Ritchie Bell	Variation and evolution in certain aquatic and marsh or bog plants
"	"	Dr. Aris Domnas	Salt water adaptation in fungi with respect to enzymes and proteins
"	"	*Dr. Max H. Hommersand	Metabolism, respiration, and photosynthesis of algae
"	"	*Dr. William J. Koch	Aquatic fungi in all aspects
"	"	*Dr. J. Frank McCormick	Marine and fresh water ecology, particularly pollution, algae and fungi studies
"	"	*Dr. Clyde J. Umphlett	Aquatic fungi, ecology of fresh water flagellated forms, and aquatic fungus parasites of mosquito larvae
"	Chemistry	*Dr. Royce W. Murray	Basic research on adsorption of metal ions and complexes at metal surfaces
"	"	Dr. Charles N. Reilley	Electrochemical determination of dissolved oxygen
"	"	*Dr. Henry C. Thomas	Adsorption and motion of ions on and through soil minerals
"	Geology	*Dr. Roy Ingram	Sediments in inshore waters along the Atlantic coastline
"	"	*Dr. Daniel A. Textoris	Solution of mineral matter, precipitation in sedimentary rocks and influence on permeability and porosity
"	Zoology	*Dr. Charles E. Jenner	Invertebrate zoology and aquatic ecology

School	Department	Name	Water Related Research Interest
Arts and Sciences	Zoology	*Dr. Howard T. Odum	Ecological networks, tropical and disturbed systems
"	"	*Dr. Allen E. Stiven	Population systems including aquatic
Graduate	City & Regional Planning	*Dr. Maynard M. Hufschmidt	Water resources planning, policy and administration, and system analysis techniques
"	"	*Mr. Hugh W. Knox	Impact of economic development on water resources
"	Curriculum in Recreation Administration	Dr. H. Douglas Sessoms	Outdoor recreation patterns, relationship of socioeconomic characteristics to leisure use, and motivating factors in outdoor recreation participation
Institute of Marine Sciences	------	*Dr. A. F. Chestnut (Director-Institute)	Marine and estuarine ecology
"		*Dr. Earl E. Deubler, Jr.	Systematics and ecology of fishes
"		*Dr. William E. Fahy	Ecology of marine and brackish water fishes. Experimental study of influence of environmental factors on skeleton of developing marine fishes
"		*Dr. Jan J. Kohlmeyer	Marine fungi
"		*Prof. Hugh J. Porter	Marine and estuarine mollusca
"		*Dr. Austin B. Williams	Systematics and ecology of Decapod Crustacea
"		*Dr. William J. Woods	Hydrography and plankton of western Pamlico Sound, and productivity-nutrient cycles in Bogue Sound

School	Department	Name	Water Related Research Interest
Institute of Government		*Prof. Milton S. Heath, Jr.	Water resources law and administration, legislation, and municipal government
"		*Prof. Warren J. Wicker	Public control and provision of water and sewerage services, with emphasis on governmental organization, management, finance, and intergovernmental relations
Institute for Research in Social Science	Center for Urban and Regional Studies	*Dr. Edward J. Kaiser	Impact of water and sewerage policies on urban development
"	"	*Prof. Shirley F. Weiss	Water as a key factor in urban and regional land use, misuse, and reuse
Public Health	Environmental Sciences and Engineering	*Dr. J. Donald Johnson	Chlorination, disinfection, fluoridation, flotation tertiary treatment processes, and estuarine pollution
"	"	*Dr. Edward J. Kuenzler	Nutrient cycling, ecology of phytoplankton, and estuarine ecology
"	"	*Dr. James C. Lamb, III	Water and waste treatment processes, stream pollution, and water resources economics
"	"	*Dr. Robert A. Mah	Microbiology of anaerobic sludge fermentation
"	"	*Dr. Daniel A. Okun (Head Department)	Water supply and pollution control for developing countries
"	"	*Dr. Charles R. O'Melia	Water supply and waste water treatment
"	"	*Dr. Jabbar K. Sherwani	Systems analysis approach to water resource, hydrology, and economics of water quality management

School	Department	Name	Water Related Research Interest
Public Health	Environmental Sciences and Engineering	*Dr. Fred McJunkin	Water supply and pollution control
"	"	Dr. S. J. Weidenkopf	Inactivation of viruses in water
"	"	*Dr. Charles M. Weiss	Aquatic ecology, effects of pollution on the aquatic environment, water resources and water quality, and detection and assessment of organic constituents in water
"	Biostatistics	Dr. Elizabeth J. Coulter	Demography, economic factors in health, vital statistic studies of environment in relation to long-term illness
"	"	Dr. R. C. Elston	Statistical methods in bioassay
"	"	Dr. James E. Grizzle	Consultation with research workers on design of experiments and analysis of data
"	"	Dr. P. A. Lachenbruch	Simulation and data analysis
"	"	Dr. Dana Quade	Statistical inference, especially non-parametric

Consolidated University of North Carolina - University of North Carolina at Charlotte

School	Department	Name	Water Related Research Interest
_____	Chemistry	*Dr. James R. Kuppers	Diffusion of water through organic and inorganic membranes with applications to the reverse osmosis process for reclaiming saline water
_____	Mechanical Engineering	*Dr. Fred J. Dunkerley	Water treatment for commercial boilers as related to boiler scale formation and other boiler tube corrosion phenomena

Consolidated University of North Carolina - University of North Carolina at Greensboro

School	Department	Name	Water Related Research Interest
_____	Chemistry	*Dr. Henry L. Anderson, II	Thermodynamics of aqueous electrolyte solutions

*Currently active in field of water resources research

DUKE UNIVERSITY

Duke University

School	Department	Name	Water Related Research Interest
Graduate School of Arts and Sciences	Botany	*Dr. T. W. Johnson, Jr.	Aquatic fungi: marine, estuarine, and fresh water
"	"	*Dr. Paul J. Kramer	Effects of water stress on plant growth and plant processes
"	"	*Dr. Richard B. Searles	Biology of algae, particularly the benthic marine algae
"	Civil Engineering	*Dr. Edward H. Bryan	Water pollution, waste water characterization, water quality, and waste water treatment
"	Economics & Business Administration	Dr. Thomas H. Naylor	Econometric, computer simulation and operations research
"	"	Dr. Wallace Reed	Development of urban systems and regional planning
"	"	*Dr. William H. Wallace	Regional economic impact of water resource development
"	Political Science	Dr. Richard H. Leach	Intergovernmental relations in water development, regulation and use
"	Zoology--Marine Laboratory	*Dr. C. G. Bookhout (Director-Marine Laboratory)	Rearing estuarine and oceanic invertebrates in relation to environmental factors and planktonic studies of estuarine and oceanic crustacea

School	Department	Name	Water Related Research Interest
Graduate School of Arts and Sciences	Zoology--Marine Laboratory	*Dr. John D. Costlow, Jr.	Environmental effects on crustacean development and endocrine mechanisms of crustacean development
"	"	*Dr. I. E. Gray	Community studies of the continental shelf and estuaries of North Carolina
"	"	*Dr. Daniel A. Livingston	Development of lakes as ecological systems, mud-water reactions in lakes, and geochemistry of the hydrosphere
"	"	*Dr. Robert J. Menzies (Director-Oceanographic Program)	Marine biology
"	"	*Dr. Unnsteinn Stefansson	Chemical oceanography - particularly nutrients and water masses analyses
"	"	*Dr. F. John Vernberg	Physiological ecology of marine animals
"	"	*Dr. W. B. Vernberg	Host-parasite physiological relationships and invertebrate physiology
Forestry	_____	*Dr. Kenneth R. Knoerr	Forest hydrology - particularly the relationship between the energy balance and vegetation work use
"	_____	*Dr. Charles W. Ralston	Effects of forest land use practices on water quality
"	_____	*Dr. Frank W. Woods	Water movement in ecosystems and uptake and movement through plants

*Currently active in field of water resources research

EAST CAROLINA COLLEGE

East Carolina College

School	Department	Name	Water Resources Research Interest
Arts & Sciences	Biology	*Mr. Francis P. Belcik	Parasitic copepods, especially on marine invertebrates
"	"	*Dr. Vincent J. Bellis	Algal ecology and algae as indicators of pollution
"	"	*Dr. J. G. Boyette	Animal ecology, including aquatic and amphibious forms
"	"	*Dr. Edward P. Ryan	Ecological biology of aquatic invertebrates
"	"	Dr. Edgar F. Stillwell	Ion uptake in fishes
"	Geology	Dr. C. Q. Brown	Sediment transport and Geochemistry
"	"	Dr. Jean Lowry	Ground water
"	Geography	Dr. Daniel Stillwell	Recreation use of Water Resources and Biogeography
"	"	Prof. Richard Stephenson	Hydrologic Parameters Affecting Stream Discharges

*Currently active in field of water resources research

GUILFORD COLLEGE

Guilford College

School	Department	Name	Water Related Research Interest
———	Biology	*Dr. Robert R. Bryden	Limnology of ponds and streams

*Currently active in field of water resources research

NORTH CAROLINA COLLEGE AT DURHAM

North Carolina College at Durham

School	Department	Name	Water Related Research Interest
Arts & Sciences	Geography	Dr. Theodore R. Speigner (Head - Department)	Small watershed legislation