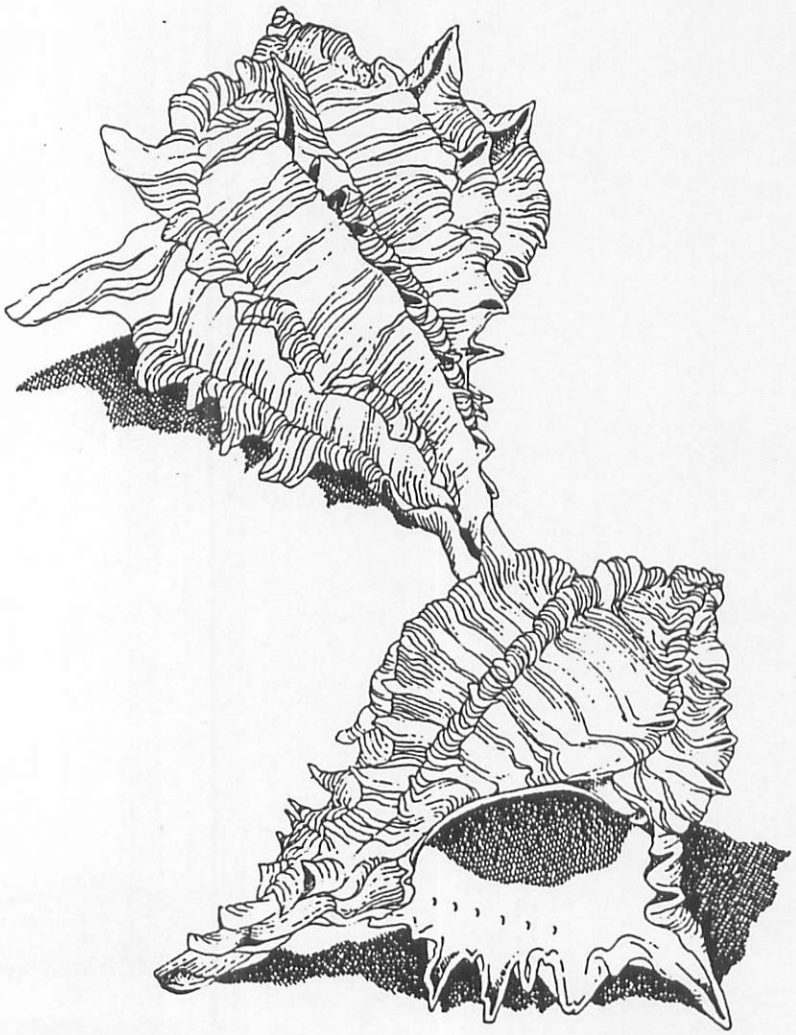
Working Paper
89-2

Noncommercial Invertebrate Species And Associated Environmental Factors Within the Estuarine Complex Of Western Pamlico Sound, North Carolina:

An Information Guide

Donald E. Stearns
Steve W. Ross
John M. Miller



$3.50

UNC Sea Grant College Program
Box 8605
North Carolina State University
Raleigh, N.C. 2769 5

Noncommercial Invertebrate Species and Associated Environmental Factors Within the Estuarine Complex of Western Pamlico Sound, North Carolina:

An Information Guide

Donald E. Stearns
Department of Biology
Rutgers University
Camden, N.J. 08102

Steve W. Ross and John M. Miller
Department of Zoology
North Carolina State University
Raleigh, North Carolina 27695-7617

UNC Sea Grant Publication UNC-WP-89-2

December 1989

$ 3.50

ABSTRACT

Noncommercial invertebrates are important members of the estuarine community, because they comprise the major portion of the diets of most developing fish and shellfish. We compiled and reviewed published information relating to noncommercial invertebrate species in the estuarine system of western Pamlico Sound, North Carolina.

This information guide provides relevant references for 21 general areas and for specific sites within each area. For each reference, information is provided regarding the type of study and the kinds of physical, chemical and biological information obtained.This publication also includes a list of noncommercial invertebrate species and their reported locations within the western Pamlico Sound region. We found that very little data has been collected regarding noncommercial invertebrate distribution or biology in designated, shallow nursery areas of commercially or recreationally valuable species.

Noncommercial invertebrate species are an important food source for developing fish and shellfish, and therefore comprise a major ecological component of nursery areas. For this reason, more research is needed to address how major physical, chemical and biological factors interact to shape the distribution and abundance of the shallow, estuarine biota.

Acknowledgements

We thank the following people for assistance in obtaining references: J. Basnight (Library, N.C. Department of Environment, Health and Natural Resources (formerly Natural Resources and Community Development, Raleigh, N.C.), C. Connelly (Library, Skidaway Institute of Oceanography, Savannah, Ga.), R. Ford (Library, University of Texas Marine Science Institute, Port Aransas, Texas), R. Grundy (Library, University of Texas Marine Science Institute), C.L. Lassiter (Department of Environmental Sciences and Engineering, University of North Carolina, Chapel Hill, N.C.), C. Mallon (Library, Dauphin Island Sea Lab, Dauphin Island, Ala.), A.H. Manooch (Library, National Marine Fisheries Service, Beaufort, N.C.), E. Tew (Water Resources Research Institute, Raleigh, N.C.), T. Turner (Library, Skidaway Institute of Oceanography), J. Williams (Library, Duke University Marine Laboratory, Beaufort, N.C.).

We also thank the following people for reviewing our literature list and providing missing references: M.M. Brinson (Department of Biology, East Carolina University, Greenville, N.C.), G.T. Everett (EHNR, Division of Environmental Management, Raleigh, N.C.), J.H. Hawkins (EHNR, Division of Marine Fisheries, Washington, N.C.), E.J. Kuenzler (Department of Environmental Sciences and Engineering, University of North Carolina), P.F. MacPherson (EHNR, Division of Environmental Management), D.W. Stanley (Institute for Coastal and Marine Resources, ECU), T.L. West (Department of Biology, ECU).

We also thank the following people for manuscript preparation: L.M. Bryant (Dauphin Island Sea Lab), H. Garrett (University of Texas Marine Science Institute).

We appreciate the comments and suggestions of the following manuscript reviewers: B.M. Currin (Department of Zoology, North Carolina State University, Raleigh, N.C.), C.H. Peterson (Institute of Marine Science, University of North Carolina, Morehead City, N.C.), G.W. Thayer (National Marine Fisheries Service, Beaufort, N.C.).

ERRATA SHEET FOR UNC SEA GRANT PUBLICATION UNC-SG-WP-89-2

Stearns, D.E., S.W. Ross and J.M. Miller. 1989. Noncommercial Invertebrate Species and Associated Environmental Factors Within the Estuarine Complex of Western Pamlico Sound, North Carolina: An Information Guide

To aid the reader, post-publication corrections have been listed below:

Table of Contents: Table 3 begins on page 6, not page 16.

Page 11, 2nd reference line: Type B data should read 7 instead of "3,7." 14th reference line: "Juniper Bay" should be deleted. Between reference lines 26 and 27: Spence should read Spencer.

Page 12, 13th reference line: Woodard should read Woodward.

Page 15, 5th reference line: Type C data should read "1-4" instead of "1,2,4." 8th reference line: Simple should read single.

Page 19, 4th reference line: Type C data should read 6 instead of "1,3,5"; 1st reference (#15) 1984b, (#16) 1984a same in references.

Page 21, 29th reference line: Type P data should have no entry instead of "1,6"; type C data should read "1,6" instead of having no entry.

Page 32, 12th reference line: The sampling data should have no entry instead of "July 68-July 69 (seasonally)."

Page 33, 23rd reference line: Type P data should read 6 instead of having no entry.

Page 46, 28th reference line: Type C data should read 7 instead of having no entry.

Page 50, 4th reference line: Type B data should read "6-8" instead of 6.

Page 54, 19th reference line: Type B data should read "6-8" instead of "8,9."

Page 59, 23rd species line (Micrura): Reported areas should read "R,S" instead of having no entry; possible areas should have no entry instead of "R,S."

Page 63, 28th species line (Nebalia): Reported areas should read M instead of having no entry; possible area should have no entry instead of M.

Page 64, 20th species line (Cyathura): Reported areas should read I instead of having no entry; possible areas should have no entry instead of I.

Table of Contents

Introduction

Estuaries are heavily exploited by diverse nektonic species and constitute an important environment for fish and shellfish production. However it is unclear whether many species occurring in estuaries are dependent on brackish-water habitats or whether they use them opportunistically. Also, we have a poor understanding of the physical, chemical and biological mechanisms that influence productivity in these systems. The concept that estuaries are biologically stressful needs clarification, and the idea that relatively few species use estuaries may be overstated, especially for fishes in the Southeastern United States.

Recent research on the nekton of United States estuaries has concentrated on habitat use patterns of larvae and juveniles of certain fishes, shrimps and crabs. These patterns are often so striking that many areas are defined as persistent nursery areas. Despite interannual fluctuations in biota year class strength, these habitats serve as reliable seasonal refugia for many species. Distribution and seasonality of the dominant macrofauna (especially commercially or recreationally valuable species) are well-known in most United States estuaries. However, little is known about the trophic relationships that involve noncommercial and commercial species, mechanisms of recruitment and migration, and faunal relationships to abiotic parameters. These and other factors interact to influence the productivity of estuarine nurseries. Understanding these interactions would allow us to more accurately define the productive areas and predict the effects of natural and man-made disturbances on them.At this time we cannot calculate the value (ecologically or economically) of a unit area of estuarine habitat, and this restriction severely limits our ability to manage estuaries or mitigate damage due to development.

Only about 3 percent of North Carolina's 2.3 million acres of estuaries has been legally designated as primary nursery areas (i.e., prime productive habitats) for early juveniles of commercially important fishes, shrimps and crabs (N.C. Department of Natural Resources and Community Development, Division of Marine Fisheries, 1978). These nursery areas were so designated because large numbers of young-of-the-year animals use them, and the habitats are vulnerable to coastal development activities. Although original designations were biased toward brown shrimp abundance, these shallow creeks and bays are also heavily populated by juvenile blue crab, Atlantic croaker, spot, southern flounder, and Atlantic menhaden. In this report we concentrated our efforts on ecological processes affecting these shallow nursery areas of larval and juvenile nekton.

Many of North Carolina's estuarine nurseries have not been formally defined or regulated. Such areas include open-water, deeper nurseries for fishes like summer flounder, weakfish and kingfish. Beds of submerged aquatic vegetation, which are nurseries to many organisms (e.g., blue crab, pink shrimp, spotted seatrout, gag, pigfish, spot), are legally protected from some disturbances but are not defined or protected as primary nursery habitats. As our understanding of habitat utilization improves, the amount of estuarine acreage that warrants designation as primary nursery habitat should be modified.

North Carolina's estuaries are most heavily used by nekton from March to October. There is considerable habitat overlap among species, but there are two major spatial and temporal groups (Table 1). The offshore, winter-spawned nekton are dominant and attain maximum nursery area abundance in the shallows from March to June. Summer-spawned juveniles have peak nursery occupation generally from June to August and usually in deeper, more open waters.

Estuarine food webs are often complex (De Sylva, 1975). Competition for similar foods may occur or animals may share resources by dividing them in space or time. Alternatively, estuaries, e.g., regions of Pamlico Sound, may have sufficient food to moderate competition or resource sharing between juveniles (Currin et al., 1984). The concept of food limitation requires further study. Although many species feed at lower trophic levels in the food chain throughout life (e.g., spot, menhaden, brown shrimp), some species (e.g. weakfish, the flounders, red drum) shift to higher levels as they grow, eating larger crustaceans or fishes. Small invertebrates, plants or detritus are important foods at some point for nearly all estuarine species.

Few studies describe the spatial and temporal distribution and abundance of the noncommercial, but ecologically important, benthic and planktonic invertebrates. Even fewer studies attempt to associate these invertebrates with abiotic environmental factors or describe their relationships to the larger, better studied animals.Because these invertebrates are trophically important and because data on them is lacking, we summarized the literature on noncommercial

invertebrates in the lagoon/estuarine system of western Pamlico Sound, North Carolina (Figure 1). Our review focused on the western Pamlico Sound system because it is one of the largest estuarine systems in the United States. It also is extremely productive for commercially and recreationally important species.

Pamlico Sound is in reality a lagoon, being relatively poorly connected to the ocean by narrow passes through a system of barrier islands. Although such lagoonal systems worldwide are highly productive, they are also prone to problems of eutrophication (Kapetsky, 1984). Perhaps owing to their relatively long water residence times compared to typical drowned river valley estuaries, algal blooms are common, and anoxic conditions appear in the deeper layers in relatively poorly flushed regions. This review is particularly timely because the U.S. Environmental Protection Agency has recently targeted this system for intensive study.

Areas covered in the comprehensive summary (1886 through 1987) of literature involving noncommercial invertebrates in the western Pamlico Sound estuarine system included designated primary nursery areas as well as adjacent estuarine regions (Figure 1). In addition to citing articles directly relevant to invertebrate biology, we expanded the literature search to include references with physical, chemical or biological information that may be important to the ecology of noncommercial invertebrates within this system.

Table 2 shows the different categories of information included in Table 3. References concerned primarily with fish or commercial invertebrates were not included in Table 3 unless such references also contained extensive physicochemical data. General patterns of seasonality, abundance and distribution of the dominant nekton in this region were reported by Epperly (1984) and Ross, and Epperly (1985). Epperly and Ross (1986) summarized the overall importance of nekton in the Pamlico system. Our literature review of noncommercial invertebrate species complements the more extensive data available for commercial species.

Large lagoons are typically a mosaic of habitats with different local water residence times, depths, substrate types, salinity regimes, etc. Areas in Table 3 were lettered alphabetically from north to south along the coast of western Pamlico Sound (Figure 1). The specific sites within each area were arranged geographically from north to south and upstream to downstream. References that included data obtained in river channels instead of specific creeks or bays were listed under the location label "_____ River proper" (e.g., Upper Pungo River proper). General references of data not associated with a particular location within the area were included at the end of each area's section.

Table 4 lists the noncommercial invertebrates reported from references cited in Table 3. The list may be used to obtain the reported distribution of a particular species within the estuarine system of western Pamlico Sound. By referring to the appropriate areas in Table 3, a researcher may find references that deal not only with the biology of a particular species, but also with its physical, chemical and biological environment at a number of locations. Tables 2 to 4 can thus be used to obtain references pertaining to various combinations of location, species and type of data.

Information on noncommercial invertebrates in the western Pamlico Sound system is sparse, especially for primary nursery areas. Many of the studies were of limited use for evaluating the ecology of these invertebrates because of nonquantitative sampling, lack of species identifications, lack of associating biological data with specific sampling sites or lack of year-round sampling. Studies that avoided such problems (e.g., Chynoweth, 1965; Williams and Deubler, 1968; Tenore, 1970a, 1970b, 1972; West, 1985) were not within designated primary nursery areas. Noncommercial fauna is the foundation of the food web. Improving the basic data base on this resource should lead to a better understanding of how productivity is controlled in Pamlico Sound.

Table 1. Major transient, marine nektonic species using North Carolina's estuarine nurseries. General depth (shallow: ≤ 1.5 m) and salinity zones (oligohaline: 0.5 to 6.0‰ ; mesohaline: 6.0 to 19‰ ; polyhaline: ≥ 19‰) where most juveniles occur are indicated.

Oceanic, Winter-Spawned	Nearshore/Estuarine, Summer-Spawned
Spot (shallow, poly-oligohaline)	Silver perch (deep, misohaline)
Atlantic Croaker (deep and shallow, meso-oligohaline)	Weakfish (deep, mesohaline)
Atlantic Menhaden (deep and shallow, meso-oligohaline)	Spotted seatrout (shallow, meso-polyhaline)
Southern flounder (shallow, meso-oligohaline)	Red drum (shallow, meso-polyhaline)
Summer flounder (deep, meso-polyhaline)	Blue crab (shallow, meso-polyhaline)
Striped mullet (shallow, meso-polyhaline)	
Gag (shallow, polyhaline)	
Pinfish (shallow, polyhaline)	
Pigfish (shallow, polyhaline)	
Brown shrimp (shallow, meso-polyhaline)	
Pink shrimp (shallow, meso-polyhaline)	

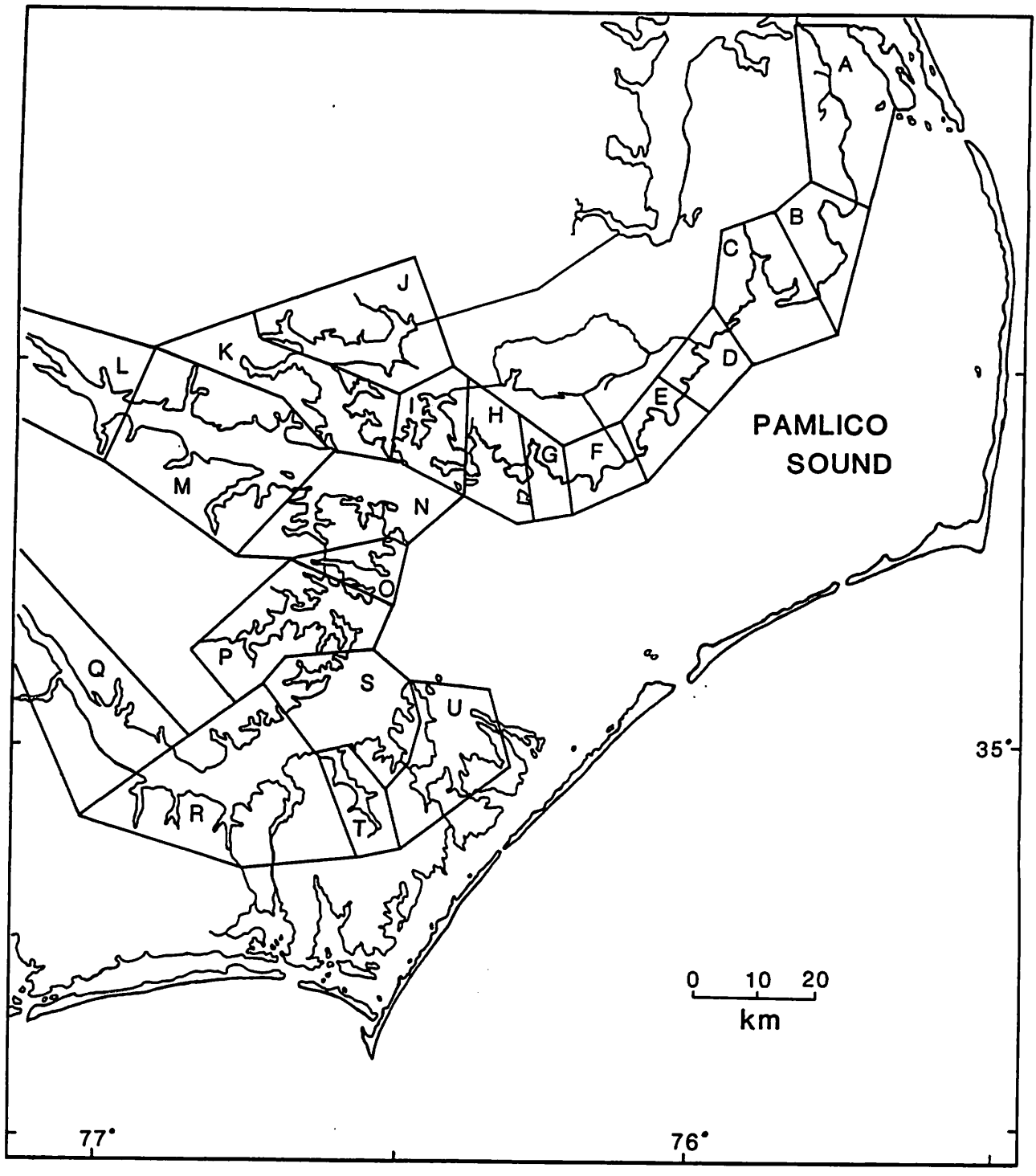


Figure 1. Twenty-one study areas[1] of western Pamlico Sound, N.C.

A. Croatan Sound; B: Stumpy Point and Parched Corn Bays; C: Long Shoal River and Pains Bay; D: Far Creek and Middletown Creek; E: Wysocking Bay; F: Outfall Canal, West Bluff Bay and East Bluff Bay; G: Juniper Bay; H: Swanquarter Bay; I: Rose Bay and Spencer Bay; J: Upper Pungo River; K: Lower Pungo River; L: Upper Pamlico River; M: Middle Pamlico River; N: Lower Pamlico River; O: Big Porpoise, Middle and Jones bays; P: Bay River; Q: Upper Neuse River; R: Middle Neuse River; S: Lower Neuse River; T: South River; U: Long and West bays.

[1] Study area names above are as they appear on U.S. Department of Commerce, NOAA, National Ocean Survey navigation charts.

Table 2. **Codes used in Table 3 to denote the types of data collected during each referenced study in western Pamlico Sound, N.C.**

CODE	DEFINITION
P	Physical Data
1	Width/depth
2	Water flow (advection/dispersion/tides/rates)
3	Wind speed/direction
4	Rainfall
5	Water temperature
6	Salinity/conductivity
7	Light penetration
8	Turbidity
9	Bottom sediments
C	Chemical Data
1	Dissolved gases
2	pH/total alkalinity
3	Nutrients/nutrient fluxes
4	Metals/salts
5	Plant pigments
6	Organic matter/carbon
7	Isotopes
8	Herbicides, pesticides
B	Biological Data
1	Bacteria: ecology/distribution/abundance
2	Bacteria: production/respiration/heterotrophy/uptake kinetics
3	Plants: ecology/distribution/abundance
4	Plants: primary production/plant biomass/uptake kinetics/respiration
5	Benthic invertebrates: growth/biomass
6	Noncommercial invertebrates: ecology/distribution/abundance
7	Commercial invertebrates: ecology/distribution/abundance
8	Fishes: ecology/distribution/abundance
9	Fishes: feeding/growth/production/biomass

Table 3. Annotated reference list for noncommercial invertebrates and studies that include related environmental factors in western Pamlico Sound, N.C. (Areas (A-U of Fig. 1). See Table 2 for a key to types of data.

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
Area A: Croatan Sound						
Broad Creek	Benton 1979	Brackish marsh analysis		1-3,6,8,9	6,7	3,6
Croatan Sound	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Marshall 1951	Hydrography		1,6,9		
	Roelofs and Bumpus 1953	Hydrography		3,6		
	Pickett 1965	Sediment analysis		1,9	6	
	Jarrett 1966	Hydrology		2		
	Magnuson 1967	Hydrology		1		
	Woods 1967	Hydrography	June 63—Dec 66 (monthly)	6		
	Sheets *et al.* 1970	Pesticides	Aug 67 —Sept 68 (monthly)		8	
	Crump 1971	*Rangia cuneata*	Aug 70	1,6,9	6	6
	Hathaway 1971	Cruise data file	1963—1970	5,7,9	3,4,6	
	Porter and Tyler 1972	Mollusk survey				6
	Wright 1972	Benthic macroinvertebrates	1 July — 31 Aug 70	1,5,6,9	2	6,7
	Schwartz 1973	General survey	July 72—June 73 (monthly)	1,5-7,9	1,5,6	3,6-8
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Williams *et al.* 1973	Hydrography		6		
	Katuna and Ingram 1974	Sediment analysis		1,9		
	Riggs and O'Connor 1974	Sediment analysis		9		
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Singer and Knowles 1975	Hydrology and circulation	20 June—2 July 1973; 7 Jan—3 Mar 74	1-3,5,6		
	Skaggs *et al.* 1980	Agriculture and drainage waters	1977—1979 (weekly, biweekly, monthly)	2,5,6,8	1-4	1
Areas A in general	Folger 1972	Review: sediments		9	6	
	Giese *et al.* 1979, 1985	Review: hydrology		1,6,9	6	
Area B: Stumpy Point and Parched Corn Bays						
Stumpy Point Bay	Pickett 1965	Sediment analysis		1,9	6	
	Pickett and Ingram 1969	Sediment analysis		9		
	Schwartz 1973	General survey	July 72—June 73 (monthly)	1,5-7,9	1,5,6	3,6-8
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Singer and Knowles 1975	Hydrology and circulation	20 June—2 July 73; 27 Jan—3 Mar 74	3,5		
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Apr—Oct 82 (monthly)	1,6,9	3,6	7,8
	Pietrafesa *et al.* 1986	Hydrography	1978	2		
Parched Corn Bay	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
Area B in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Skaggs *et al.* 1980	Agriculture and drainage waters	1977—1979 (weekly, biweekly, monthly)	2,5,6,8	1-4	1
	Folger 1972	Review: sediments		9	6	
	Giese *et al.* 1979, 1985	Review: hydrology		1,9	6	
Area C: Long Shoal River and Pains Bay						
Long Shoal River	Pickett 1965	Sediment analysis		1,9	6	
	Pickett and Ingram 1969	Sediment analysis		9		
	Custer and Ingram 1974	Sediment analysis	Summer 72	9		
	Katuna and Ingram 1974	Sediment analysis		1,9		
	Skaggs *et al.* 1980	Agriculture and drainage waters	1977—1979 (weekly, biweekly, monthly)	2,5,6,8	1-4	1
Deep Creek	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Otter Creek	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
Broad Creek	Purvis 1976	Nursery are survey	July 74—June 75 (monthly)	5,6		7,8
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Pains Bay	Roelofs and Bumpus 1953	Hydrographic survey		1-3,5,6		
	Pickett 1965	Sediment analysis		1,9	6	
	Dexter 1967	Haustoriid amphipods				6
	Pickett and Ingram 1969	Sediment analysis		9		
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
	Skaggs *et al.* 1980	Agriculture and drainage waters	1977—1979 (weekly, biweekly, monthly)	2,5,6,8	1-4	1

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Pingleton Shoal Light	Williams *et al.* 1967,1973	Hydrographic survey	1952—1957 (monthly)	5,6		
Area C in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Wilson 1962	Wetlands	Aug 57 — July 59			3
	Folger 1972	Review: sediments		9	6	
	Giese *et al.* 1979, 1985	Review: hydrology		1,9	6	
Area D: Far Creek and Middletown Creek						
Waupopin Creek	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
Far Creek	Williams 1955a	*Ogyrides*		1,6,9		6
	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Benson 1965	Sediment analysis		9		
	Pickett 1965	Sediment analysis		1,9	6	
	Williams *et al.* 1967,1973	Hydrographic survey	1952—1957 (monthly)	5,6		
	Pickett and Ingram 1969	Sediment analysis		9		
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Gibbs Point	Katuna and Ingram 1974	Sediment analysis		1,9		
Middletown Creek	Bayless and Shannon 1965	General survey	12 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Custer and Ingram 1974	Sediment analysis	Summer 72	9		
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
	Ross and Epperly 1985	Community ecology	Apr—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Area D in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Wilson 1962	Wetlands	Aug 57 — July 59			3
	Folger 1972	Review: sediments		9	6	
	Giese *et al.* 1979, 1985	Review: hydrology		1,9	6	
	Pietrafesa *et al.* 1986	Hydrography	Winter 78/79	2		
Area E: Wysocking Bay						
Lone Tree Creek	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
Douglas Bay	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
Mt. Pleasant Bay	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
Wysocking Bay	Grave 1905	Oyster ecology	Oct 1899—Dec 1900	6		3,7
	Williams 1955a	*Ogyrides*		6,9		6
	Pickett 1965	Sediment analysis		1,9	6	
	Dexter 1967	Haustoriid amphipods				6
	Williams et al. 1967,1973	Hydrographic survey	1948—1954 (monthly)	5,6		
	Pickett and Ingram 1969	Sediment analysis		9		
	Sheets *et al.* 1970	Pesticides	Aug 67 — Sept 68 (monthly)		8	
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Ross and Epperly 1985	Community ecology	Apr—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Two miles NE of Gull Rock	Bayless and Shannon 1965	General survey	9 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Area E in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Wilson 1962	Wetlands	Aug 57 — July 59			3
	Folger 1972	Review: sediments		9	6	
	Giese *et al.* 1979, 1985	Review: hydrology		1,9	6	
	Sholar 1980	Salinity analysis	1952-1980	6		
Area F: Outfall Canal, West Bluff Bay and East Bluff Bay						
Outfall Canal	Bayless and Shannon 1965	General survey	28 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
1.25 miles off North Bluff Point	Williams *et al.* 1967, 1973	Hydrographic survey	1948—1951 (monthly)	5,6		
East Bluff Bay	Pickett 1965	Sediment analysis		1,9	6	
	Pickett and Ingram 1969	Sediment analysis		9		
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
	Ross and Epperly 1985	Community ecology	Apr—Oct 81; Mar—Oct 82 (monthly)	6,9	3,6	7,8
Bluff Point	Custer and Ingram 1974	Sediment analysis	Summer 72	9		
	Katuna and Ingram 1974	Sediment analysis		1,9		6
West Bluff Bay	Roelofs 1950	Hydrography	1948—1950	1,5,6		
	Pickett 1965	Sediment analysis		1,9	6	

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Pickett and Ingram 1969	Sediment analysis		9		
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
Area F in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Roelofs 1950	Hydrography	1948—1950	1,5,6		
	Wilson 1962	Wetlands	Aug 57 — July 59			3
	Folger 1972	Review: sediments		9	6	
	Giese *et al.* 1979, 1985	Review: hydrology		1,9	6	
	Sholar 1980	Salinity analysis	1974—1980	6		
Area G: Juniper Bay						
Juniper Bay Point	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
Judge's Quarter Canal	Bayless and Shannon 1965	General survey	12 June 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
Juniper Bay	Pickett 1965	Sediment analysis		1,9	6	
	Pickett and Ingram 1969	Sediment analysis		9		
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
	Pietrafesa 1985	Hydrography	1983—1985	2,5,6		
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82	1,6,9	3,6	7,8
Area G in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Wilson 1962	Wetlands	Aug 57 — July 59			3
	Folger 1972	Review: sediments		9	6	
	Giese *et al.* 1979, 1985	Review: hydrology		1,9	6	
	Sholar 1980	Salinity analysis	1948-1980	6		
Area H: Swanquarter Bay						
Swanquarter Narrows	Grave 1905	Oyster ecology	Oct 1899—Dec 1900	6,9		3,7
	Roelofs 1950	Hydrography	1948—1950	1,5,6		
	Williams *et al.* 1967,1973	Hydrographic survey	1948—1967 (monthly)	5,6		
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
Oyster Creek	Benson 1965	Sediment analysis		9		
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
Caffee Creek	Gerry 1981	Salinity and fish distributions	28 Feb—29 Aug 80	1,6,9	6	8,9
	Grave 1905	Oyster ecology	Oct 1899—Dec 1900	6,9		3,7
	Pickett 1965	Sediment analysis		1,9	6	
	Pickett and Ingram 1969	Sediment analysis		9		
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
	Jones and Sholar 1981	Freshwater discharge study	May 77—Oct 80 (monthly)	2-4, 6		7-9
	Pate and Jones 1981a, b	Freshwater discharge study	1977—1980	1,4,6,9		7
Swanquarter Creek	Gerry 1981	Salinity and fish distributions	28 Feb—29 Aug 80	1,6,9	6	8,9
Swanquarter Bay	Grave 1905	Oyster ecology	Oct 1899—Dec 1900	6,9		7
	Roelofs and Bumpus 1953	Hydrographic survey		1-3,5,6		
	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	14 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Juniper Bay	Pickett 1965	Sediment analysis		1,9	6	
	Pickett and Ingram 1969	Sediment analysis		9		
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6,8
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		7,8
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
	Lovvorn 1987	Diets of canvasback ducks	Dec 82—Feb 83; Dec 83—Feb 84			6
Area H in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Roelofs 1950	Hydrography	1948—1950	1,5,6		
	Wilson 1962	Wetlands	Aug 57 — July 59			3
	Folger 1972	Review: sediments		9	6	
	Giese *et al.* 1979, 1985	Review: hydrology		1,9	6	
	Sholar 1980	Salinity analysis	1948—1976	6		
Area I: Rose Bay and Spence Bay						
Rose Bay Creek	Bayless and Shannon 1965	General survey	11 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Gerry 1981	Salinity and fish	28 Feb—29 Aug 80	1,6,9	6	8,9

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
		distributions				
	Pate and Jones 1981a, b	Freshwater discharge study	1977—1980	1,4,6,9		3,7
Northwest Creek	Gerry 1981	Salinity and fish distributions	28 Feb—29 Aug 80	1,6,9	6	8,9
Tooley Creek	Jones and Sholar 1981	Freshwater discharge study	May 77—Oct 80 (monthly)	2-4, 6		7-9
	Pate and Jones 1981a, b	Freshwater discharge study	1977—1980	1,4,6,9		3,7
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Rose Bay	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	27 July 64 (single sample)	1,2,5-7,9	1,2	6-9
	Sheets *et al.* 1970	Pesticides	Aug 67—Sept 68		8	
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Jones and Sholar 1981	Freshwater discharge study	May 77—Oct 80 (monthly)	2-4, 6		7-9
	Woodard 1981	Fish enclosure studies	June—July 80	1,5,7	1	6,8,9
	Sutherland 1982	Field ecology experiment	1 July—13 Oct 80			6,8
	Currin 1984	Feeding ecology	15 Feb—5 Dec 79 (biweekly, monthly)	5,6	1	6-9
	Currin *et al.* 1984	Fish growth, production		6,9		3,5,6,8,9
	Miller *et al.* 1984	Fish migration	Jan—Oct 79			8
	Pietrafesa 1985	Hydrography	1985	2-7		
	Ross and Epperly 1985	Community ecology	Mar—Oct 81: Apr—Oct 82 (monthly)	1,6,9	3,6	7,8
	Pietrafesa *et al.* 1986	Hydrography		2-7		
	Lovvorn 1989	Diets of canvasback ducks	Dec 82—Feb 83; Dec 83—Feb 84			6
Deep Bay	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		3,6-8
Deep Cove	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		3,6-8
Near Judith Narrows	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Duane 1964	Sediment petrology		1,3,6,9		
Striking Bay	Ross and Epperly 1985	Community ecology	Mar—July, Sept—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
Swan Creek	Jones and Sholar 1981	Freshwater discharge study	May 77—Oct 80 (monthly)	2-4, 6		7-9
	Pate and Jones 1981a, b	Freshwater discharge study	1977—1980	4,6		
Germantown Bay	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		3,6-8
Spencer Bay	Bayless and Shannon 1965	General survey	22 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		3,6-8
Area I in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Roelofs 1950	Hydrography	1948—1950	1,5,6		
	Wilson 1962	Wetlands	Aug 57 — July 59			3
	Sholar 1980	Salinity analysis	1949—1980	6		
Area J: Upper Pungo River						
Near Leechville	McAvoy and Harris 1956	Water chemistry	1954—1955	6	2,4	
	Bayless and Shannon 1965	General survey	3 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Rutman Creek	Bayless and Shannon 1965	General survey	14 July 64 (single sample)	1,2,5-7,9	1,2	6,8,9
Wilkerson Creek	Bayless and Shannon 1965	General survey	14 July 64 (single sample)	1,2,5-7,9	1,2	6-9
Scranton Creek	Bayless and Shannon 1965	General survey	11 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Smith Creek	Bayless and Shannon 1965	General survey	2 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Upper Dowry Creek	Bayless and Shannon 1965	General survey	29 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Lower Dowry Creek	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	19 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Cuckolds Creek	Bayless and Shannon 1965	General survey	29 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Broad Creek	Bayless and Shannon 1965	General survey	17 June 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
	Tarplee *et al.* 1971	Effects of stream channelization	15 July 70 (simple sample)	1,5,9		9
Pantego Creek	McAvoy and Harris 1956	Water chemistry	1954—1955	6	2,4	
	U.S. Geological Survey 1959	Water chemistry	14 Sept 54—1 June 55	6	2,4	
	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	18 June 64 (single sample)	1,2,5-7,9	1,2	6,8,9
			19 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Dreyer 1969	Pollution assimilative capacity		5	1,4	1

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Tarplee *et al.* 1971	Effects of stream channelization	1 July 70 (simple sample)	1,5,9		9
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	2-6	3,6	3,4
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	28 May 85			3
Upper Pungo River proper	Pauszek 1950	Water chemistry	21 Apr, 19 Sept 49	6	2-4	
	U.S. Geological Survey 1959	Water chemistry	14 Sept 54—1 June 55	6	2,4	
	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Duane 1964	Sediment petrology		1,3,6,9		
	Bayless and Shannon 1965	General survey	9 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Grossman 1967	Survey: rhizopods, ostracods	1962	1,7,9		6
	Wilder 1967	General hydrology		6		
	Dreyer 1969	Pollution assimilative capacity		5	1,4	1
	Hobbie *et al.* 1972	Nutrient study	1969—1971 (biweekly)	5,6	1-3,5	
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	2-6	3,6	3,4
	Wilder *et al.* 1978	Hydrology	1910—1960 (monthly)	4		
Area J in general	Wilson 1962	Wetlands	Aug 57 — July 59			3
	Sholar 1980	Salinity analysis	1952—1980	6		
	NOAA National Ocean Service 1985	Review: physical and hydrologic data		1,2,6		
Area K: Lower Pungo River						
Slade Creek	Bayless and Shannon 1965	General survey	2 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	28 May 85			3
Wood Creek	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	28 May 85			3
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
Neal Creek	Davis et al. 1985 (3rd ref)	Submersed macrophytes	28 May 85			3
Pungo Creek	Pauszek 1950	Water chemistry	25 Feb 49	6	2-4	
	McAvoy and Harris 1956	Water chemistry	1954—1955	6	2,4	
	U.S. Geological Survey 1959	Water chemistry	14 Sept 54—1 June 55	6	2,4	
	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	10 June 64 (single sample)	1,2,5-7,9	1,2	6,8,9
			17 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
			19 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Tarplee *et. al* . 1971	Effects of stream	30 June 70 (simple sample)	1,5,9		9
		channelization	1 July 70	1,6,9		9
	Hobbie *et al.* 1972	Nutrient study	1969—1971 (biweekly)	5,6	1-3,5	
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	2-6	3,6	3,4
Jack Creek	Bayless and Shannon 1965	General survey	18 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Jordan Creek	Bayless and Shannon 1965	General survey	13 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	28 May 85			3
Satterthwaite Creek	Bayless and Shannon 1965	General survey	12 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Wright Creek	Bayless and Shannon 1965	General survey	13 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Fortescue Creek	Bayless and Shannon 1965	General survey	2 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Warner Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Pamlico Beach	Benson 1965	Sediment analysis		9		
Lower Pungo River proper	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Allen 1964	Sediment analysis		1,9		
	Duane 1964	Sediment petrology		1,3,6,9		
	Bayless and Shannon 1965	General survey	15 July 64 (single sample)	1,2,5-7,9	1,2	6-9
			29 July 64 (single sample)	1,2,5-7,9	1,2	6-9
	Weiss 1966	Plankton settlement epifauna	Aug 64—Jan 65; Mar—Sept 65		4	3,6
	Grossman 1967	Survey: rhizopods, ostracods	1962	1,7,9		6

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Wilder 1967	General hydrology		6		
	Dreyer 1969	Pollution assimilative capacity		5	1,4	1
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Hobbie *et al.* 1975	Nutrient study	Aug 71 —Aug 72 (biweekly)	6	3,5	3,4
	Marshall 1951	Hydrography		1,9		
	Gray and Winkler 1977	*Rangia cuneata*	Jun—Aug 77	1,9		6
Abel Bay	Bayless and Shannon 1965	General survey	15 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Purvis 1976	Nursery area survey	July 74—June 75 (monthly)	5,6		3,6-8
Area K in general	Wilson 1962	Wetlands	Aug 57—July 59			3
	Sholar 1980	Salinity analysis	1958—1980	6		
	NOAA National Ocean Service 1985	Review: physical and hydrologic data		1,2,6		
	Stanley 1985	Review: oxygen depletion			1	
Area L: Upper Pamlico River						
Herring Run	Rice 1957	Surface water supplies	1950—1955	2		
	Woodward and Thomas 1960	Water chemistry	13 Mar, 28 Aug 58	2,6	2-4	
	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	2,5,8	1,2,4	1
	Chemerys and Phibbs 1962	Water chemistry	19 Feb, 16 Sept 59	2,6	2-4	
Runyon Creek	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	2,5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	17 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Hobbie *et al.* 1972	Nutreint study	1969—1971 (biweekly)	5,6	1-3,5	
Snode Creek	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	2,5,8	1,2,4	1
Chocowinity Creek	Bayless and Shannon 1965	General survey	15 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Chocowinity Bay	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	2,5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	15 June 64 (single sample)	1,2,5-7,9	1,2	6-9

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Dreyer 1969	Pollution assimilative capacity		5	1,4	1
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Gray and Winkler 1977	*Rangia cuneata*	Jun—Aug 77	1,9		6
Hills Creek	Bayless and Shannon 1965	General survey	24 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Broad Creek	Bayless and Shannon 1965	General survey	5 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Gray and Winkler 1977	*Rangia cuneata*	Jun—Aug 77	1,9		6
Upper Goose Creek	Bayless and Shannon 1965	General survey	25 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Gray and Winkler 1977	*Rangia cuneata*	Jun—Aug 77	1,9		6
Blounts Creek	Bayless and Shannon 1965	General survey	16 July 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
			16 June 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
	Gray and Winkler 1977	*Rangia cuneata*	Jun—Aug 77	1,9		6
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	9 May 85, 24 Aug 85			3
Blounts Bay	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Dexter 1967	Haustoriid amphipods				6
	Dobbins 1967	Sediment, water geochemistry	1965	6,9		4,6
	Horton 1967	Water current study	Summer 66	1,2,6		
	Horton *et al.* 1967	Water current study	Summer 67	2,6		
	Peters 1968	Zooplankton ecology	Oct 65—June 67 (monthly)	5-8	1,5,6	6
	Pevear 1968, 1972	Sediment analysis		9		
	Williams and Deubler 1968b	Crustacean macroplankton, ichthyoplankton	1957—1967	5,6		6-8
	Dobbins *et al.* 1970	Water-clay interactions	14—16 Nov 65	6,9	4	
	Hobbie 1970b	Phosphorus levels	Mar 67—Jan 70 (biweekly)	6	3	
	Reid 1970	Meiobenthos	Summer 68	5,6,9	1	5,6
	Tenore 1970a,b, 1972	Macrobenthic ecology	June 68—Sept 69 (biweekly, seasonally)	1,5,6,9	1,6	6
	Copeland and Hobbie 1972	Eutrophication study	1966—1969	2,5,6,9	1,3	3-5
	Edzwald 1972	Coagulation of sediments		9	3	
	Hobbie *et al.* 1972	Nutrient study	1969—1971 (biweekly)	5,6	1-3,5	
	Williams and Bynum 1972	Amphipods	Feb 65—Oct 67 (monthly, semimonthly)			6

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Dean 1973	Ecology of epifauna	Mar 72—Feb 73 monthly, seasonally)	5,6	1	5,6
	Harrison 1973	Phytoplankton nitrate reductase activity	15 Dec 70—14 Apr 71 (biweekly, monthly)	5,6	3,6	3,4
	Harrison 1974	Hydrographic-nutrient study	Aug 71—Aug 72 (biweekly)	2,5,6	1-3,6	
	Harrison and Hobbie 1974	Hydrographic-nutrient study	Aug 71—Aug 72 (biweekly)	2,5,6	3	
	Hobbie 1974b	Nutrient study	Aug 71—Aug 73	5,6	1-3,5	
	Dean and Bellis 1975	Plankton settlement/ epifauna	Mar 72—Feb 73 (monthly)	1,5,6		6
	Harwood 1975	Submersed macrophytes: direct, remote sensing	5—21 Aug 73	1,7		3
	Hobbie *et al.* 1975	Nutrient study	Aug 71—Aug 72 (biweekly)	6	3,5	3,4
	Stephenson *et al.* 1975	Hydrography, water chemistry	Jan—June 75 (biweekly)	5,6	1-3,5	
	Institute for Coastal and Marine Resources (ICMR) 1976	Hydrography, water chemistry	July 75—Oct 76 (biweekly)	5,6	1-3,5	
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Vicars 1976	Aquatic macrophytes: direct, remote sensing	1974—1975	5-8,	3,6	3,4
	Gray and Winkler 1977	*Rangia cuneata*	June—Aug 77	1,9		6
	Hartness 1977	Sediment analysis		1,9	6	
	ICMR 1977	Hydrography, water chemistry	Nov 76—Aug 77 (biweekly)	5,6	1-3,5	
	McClellan and Stanzak 1977	Macrobenthic survey				3,6
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	2-6	3,6	3,4
	Burke 1978	Organic carbon: sources and sinks	1975—1977	5,6	1-7	3,4
	Davis *et al.* 1978	Organic carbon, deoxygenation	Aug 75—July 76 (monthly)	5-7	1,6	
			30 June—1 July 76 (4-h intervals)	5-7	1-3,5	4
			9 June 77 (4-h intervals)	5-7	1-3,5,6	4
			28 July 77 (4-h intervals)	5-7	1-3,5,6	4

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	ICMR 1978	Hydrography, water chemistry	Sept 77— Aug 78 (biweekly)	5,6	1-3,5	
	Reid 1978	Meiobenthos	July 68—July 69 (seasonally)	1,5,6,9	1	5,6
	Kuenzler *et al.* 1979	Phytoplankton/nutrient kinectics	Oct 75—July 77 (monthly)	1,5-7	1,3,5	3,4
	Reed 1979	Aquatic macrophytes	1973—1974 (monthly, bimonthly)	1,5-7	1,3,5	3,4
	ICMR 1980	Hydrography, water chemistry	1979 (biweekly)	5,6	1-3,5	
	ICMR 1981a	Hydrography, water chemistry	1980 (biweekly)	5,6	1-3,5	
	Cabaniss 1982	Benthic nutrient fluxes	Summer 81	5,6	1,3	
	Civils 1982	Macrobenthic ecology	1976—1977 (monthly)	1,5,6,9	1,6	3,6
	ICMR 1982a	Hydrography, water chemistry	1981 (biweekly)	5,6	1-3,5	
	ICMR 1983	Hydrography, water chemistry	1982 (biweekly)	5,6	1-3,5	
	Matson *et al.* 1983 (1st ref)	Biogeochemistry	1981 (monthly)	5,6,9	1,3,4,6,7	
	Matson *et al.* 1983 (2nd ref)	Benthic metabolism	Aug 82		3	
	Chamblee *et al.* 1984	Flouride study	Spring and Summer 77	5,6	2,4	
	Kuenzler *et al.* 1984	Benthic nutrient cycling	Apr 81—July 83 (bimonthly)	5,6,9	1,3,6	
	Stanley 1984a	Phytoplankton	1983 (biweekly)			3
	Stanley 1984b	Hydrography, water chemistry	1983 (biweekly)	5,6	1-3,5	
	Matson and Brinson 1985	Sulfate enrichment study	1981 (monthly)		6	1,3,4
	Stanley and Daniel 1985b	Phytoplankton	1984 (biweekly)			3
	Stanley 1986a	Hydrography, water chemistry	1984 (biweekly)	5,6	1-3,5	
	Stanley 1986b	Hydrography, water chemistry	1985 (biweekly)	5,6	1-3,5	
	Stanley and Daniel 1986	Phytoplankton	1985 (biweekly)			3
	Stanley 1987	Hydrography, water chemistry	1986 (biweekly)	5,6	1-3,5	
Upper Pamlico River proper	Lamar and Joyner 1949	Water chemistry	1946—1947		2-4	
	Pauszek 1950	Water chemistry	9 Sept 49	6	2-4	

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Pauszek and Harris 1951	Water chemistry	1950	2,6	2-4	
	U.S. Geological Survey 1952	Water chemistry	6 Jan 47		2-4	
	U.S. Geological Survey 1954	Water chemistry	9 Sept 49	6	2-4	
	McAvoy and Harris 1956	Water physics, chemistry	1954—55	2,6	2-4	
	McAvoy 1957	Water physics, chemistry	1956	2,6	2-4	
	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	N.C. State`Stream Sanitation Committee 1961	Pollution survey	1958	2,5,8	1,2,4	1
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Allen 1964	Sediment analysis		1,9		
	Duane 1964	Sediment petrology		1,3,6,9		
	U.S. Geological Survey1964	Water chemistry	Oct 61—Sept 62	5,6	2-4	
	Bayless and Shannon 1965	General survey	23 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Woodard and Phibbs 1965	Water chemistry	Oct 62—Sept 63	5,6	2-4	
	Jarrett 1966	Hydrology		2,6		
	Phibbs 1966	Water chemistry	Oct 64—Sept 65	6	2-4	
	Phibbs and Chemerys 1966	Water chemistry	Oct 63—Sept 64	5,6	2-4	
	Dobbins 1967	Sediment, water geochemistry	1965	6,9	4,6	
	Grossman 1967	Survey: rhizopods, ostracods	1961	1,7,9		6
	Magnuson 1967	Hydrology		2,6	4	
	Phibbs 1967	Water quality	1 Oct 65—30 Sept 66	5,6	2-4	
	Wilder 1967	General hydrology		6		
	Johnson and Daugherty 1968	Analyses of fluoride, other salts and metals	1967	1,5,6	2-4	
	Willaims and Deubler 1968a	Crustacean macroplankton, ichthyoplankton	Dec 65—Oct 67 (biweekly)	5,6		6,8
	Dreyer 1969	Pollution assimilative capacity		1,2,5	1,4	1
	Hobbie and Crawford 1969	Bacterial uptake kinetics	28 July, 6 Nov 66			2
	Phibbs 1969	Water chemistry	Oct 66—Sept 67	65,6	2-4	
	Dobbins *et al.* 1970	Water-clay interactions	14—16 Nov 65	6,9	4	
	Hobbie 1970a	Hydrography	1965—1969	5,6	1	

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Sheets *et al.* 1970	Pesticides	1968		8	
	Woodard 1970	Water temperature data	1943—1967	5		
	Park 1971	Mineralogy		9		
	Peters 1971	Planktonic harpacticoids	1966—1968			6
	Edzwald 1972	Coagulation of sediments		9	3	
	Hathaway 1972	Bottom sediments		9		
	Hobbie *et al.* 1972	Nutrient study	1969—1971 (biweekly)	5,6	1-3,5	
	Porter and Tyler 1972	Mollusk survey				6
	Upchurch 1972	Sediment analysis	2 Oct 71; 20—22 July 71		4	
	Williams 1972b	Mysids	1963—1967		6	
	Custer and Ingram 1974	Sediment analysis	Summer 72	9		
	Edzwald *et al.* 1974	Sediment analysis, coagulation kinetics		1,6,9		
	Katuna and Ingram 1974	Sediment analysis		1,9		6
	Upchurch *et al.* 1974	Sediment phosphates and iron		1,6,9	1,3,4	
	Edzwald and O'Melia 1975	Clay distributions		6,9		
	Fox and Bynum 1975	Amphipods				6
	Hobbie *et al.* 1975	Nutrient study	Aug 71—Aug 72 (biweekly)	6	3,5	3,4
	Stephenson *et al.* 1975	Hydrography, water chemistry	Jan—June 75 (biweekly)	5,6	1-3,5	
	Davis and Brinson 1976	Macrophytes	Summer 73—Summer 75		3	3,4
	Institute for Coastal and Marine Resources (ICMR) 1976	Hydrography, water chemistry	July 75—Oct 76 (biweekly)	5,6	1-3,5	
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Zamuda 1976	*Vallisneria americana*	Mar—Nov 75 (bimonthly)	5,6	3,4	3,4
	Burke *et al.* 1977 (1st ref)	Deoxygenation	Summer 76		1	3
	Gray and Winkler 1977	*Rangia cuneata*	June—Aug 77	1,9		6
	Hartness 1977	Sediment analysis		1,9	6	
	ICMR 1977	Hydrography, water chemistry	Nov 76—Aug 77 (biweekly)	5,6	1-3,5	
	Kirby *et al.* 1977	Planktonic respiration	July—Aug 75		1	2,6
	Kornegay and Brinson 1977	Oxygen uptake by sediment communities		1,6		

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	2-6	3,6	3,4
	Burke 1978	Organic carbon: sources and sinks	1975—1977	5,6	1-7	3,4
	Davis *et al.* 1978	water chemistry,	Aug 75—July 76 (monthly)	5-7	1,6	
		primary productivity	Aug 76—July 77 (bimonthly)	5-7	1-3,5,6	3,4
	ICMR 1978	Hydrography, water chemistry	Sept 77— Aug 78 (biweekly)	5,6	1-3,5	
	Stanley 1978	Nitrogen uptake by phytoplankton		6	3,7	4
	Wilder *et al.* 1978	Hydrology		6	4	
	ICMR 1980	Hydrography, water chemistry	1979 (biweekly)	5,6	1-3,5	
	ICMR 1981a	Hydrography, water chemistry	1980 (biweekly)	5,6	1-3,5	
	ICMR 1982a	Hydrography, water chemistry	1981 (biweekly)	5,6	1-3,5	
	Brinson and Matson 1983	Carbon isotope distribution		6	3,6,7	
	ICMR 1983	Hydrography, water chemistry	1982 (biweekly)	5,6	1-3,5	
	Chamblee *et al.* 1984	Flouride study	Spring and Summer 77	5,6	2,4	
	Kuenzler *et al.* 1984	Benthic nutrient cycling	Apr 81—July 83 (bimonthly)	5,6,9	1,3,6	
	Stanley 1984a	Phytoplankton	1983 (biweekly)			3
	Stanley 1984b	Hydrography, water chemistry	1983 (biweekly)	5,6	1-3,5	
	Stanley 1985	Oxygen depletion	1975—1977	5,6	1	
	Stanley and Daniel 1985b	Phytoplankton	1984 (biweekly)			3
	Pietrafesa *et al.* 1986	Hydrography	Summer 78	2		
	Stanley 1986a	Hydrography, water chemistry	1984 (biweekly)	5,6	1-3,5	
	Stanley 1986b	Hydrography, water chemistry	1985 (biweekly)	5,6	1-3,5	
	Stanley and Daniel 1986	Phytoplankton	1985 (biweekly)			3
	Stanley 1987	Hydrography, water chemistry	1986 (biweekly)	5,6	1-3,5	
Area L in general	Wilson 1962	Wetlands	Aug 57—July 59			3

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Copeland *et al.* 1974	Review		1,2,6	1	3,4,6
	Chang 1977	Nutrient modeling			3	
	Giese *et al.* 1979, 1985	Review: hydrology		1,5,6	2-4	
	Lauria and O'Melia 1980	Nutrient model using data from other sources		1,5,6	3	
	Sholar 1980	Salinity analysis	1958—1980	6		
	Copeland *et al.* 1984	Review: estuarine profile		1,2,4-6,9	3,5,6	1-4,6-8
	NOAA Nation Ocean Service 1985	Review: physical and hydrologic data		1,2,6		
	Stanley 1985	Review: oxygen depletion		1,6	1,3	
Area M: Middle Pamlico River						
Mallard Creek	Bayless and Shannon 1965	General survey	25 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Nevil Creek	Bayless and Shannon 1965	General survey	8 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	9 May 85, 11 Aug 85			3
Sparrow Bay	Matson *et al.* 1983 (1st ref)	Biogeochemistry	1981—1982 (monthly)	5,6,9	1,3,4,6,7	2,4
Duck Creek	Bayless and Shannon 1965	General survey	5 June 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
	Gray and Winkler 1977	*Rangia cuneata*	June—Aug 77	1,9		6
Bath Creek	McAvoy and Harris 1956	Water chemistry	1954—55	6	2-4	
	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	17 June 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
			22 June 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
	Benson 1965	Sediment analysis		9		
	Dreyer 1969	Pollution assimilative capacity		5	1,4	1
	Hobbie *et al.* 1972	Nutrient study	1969-1971 (biweekly)	5,6	1-3,5	
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Gray and Winkler 1977	*Rangia cuneata*	June—Aug 77	1,9		6
	Hartness 1977	Sediment analysis		1,9	6	
	Green 1980	Bacteria, *Rangia*	Feb—Apr 79	1-6,8,9	6	1,6
Back Creek	Bayless and Shannon 1965	General survey	22 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Gray and Winkler 1977	*Rangia cuneata*	June—Aug 77	1,9		6
	Green 1980	Bacteria, *Rangia*	Feb—Apr 79	1-6,8,9	6	1,6
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	13 May 85			3
Durham Creek	Pauszek and Harris 1951	Water chemistry	27 May 50	2,6	2-4	
			20 Aug; 28 Sept 50	2,6	2	
	Pauszek 1952	Water physics, chemistry	27 May 50	2,6	2-4	
			25 May 51	2,6	2,4	
			5 June 51	6	2,4	
	Billingsley and Joyner 1953	Water physics, chemistry	27 May 50	2,6	2-4	
			26 Oct 51; 10 Sept 52	2,6	2-4	
	Billingsley and Joyner 1954	Water physics, chemistry	27 May 50	2,6	2-4	
			28 Apr 53; 2 Sept 53	2,6	2,4	
	Harris and Joyner 1955	Water physics, chemistry	2 Sept 53; 18 Feb; 9 Apr 54	2,6	2,4	
	U.S. Geological Survey 1956	Water chemistry	26 Oct 51; 10 Sept 52	2,6	2,4	
	McAvoy 1957	Water physics, chemistry	2 Feb; 19 Sept 56	2,6	2-4	
	U.S. Geological Survey 1957	Water chemistry	28 Apr, 2 Sept 53	2,6	2,4	
	U.S. Geological Survey 1958	Water chemistry	18 Feb, 9 Apr 54	2,6	2,4	
	Woodard and Thomas 1959	Water chemistry	17 July 57	2,6	2-4	
	U.S. Geological Survey 1960a	Water chemistry	2 Feb, 19 Sept 56	2,6	2,4	
	Chemerys and Phibbs 1962	Water chemistry	18 Aug 59	2,6	2-4	
	Bayless and Shannon 1965	General survey	16 June 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
			26 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Phibbs 1967	Water quality	1 Oct 65—30 Sept 66	2,5,6	2-4	
	Phibbs 1969	Water chemistry	Oct 66—Sept 67	2,5,6	2-4	
	Woodard 1970	Water temperature data	1943—1967	5		
	Crawford 1971	Uptake of amino acids	Jan—Dec 69 (monthly)	2		
	Wilder and Slack 1971	Water chemistry	Feb 54—Aug 67	2,6	2-4	
	Hobbie *et al.* 1972	Nutrient study	1969—1971 (biweekly)	5,6	1-3,5	
	Crawford *et al.* 1974	Amino acid flux study	1969	1,2,5,6,8	3,6	2-4
	Harding 1974	Trace elements in sediments		9	3,4,6	
	Hobbie 1974b	Nutrients, eutrophication	1969—1971	2		
	Harding and Brown 1975	Geochemistry of bottom sediments	1 Mar 73	9	4,6	

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Gray and Winkler 1977	*Rangia cuneata*	Jun—Aug 77	1,9		6
	Hartness 1977	Sediment analysis		1,9	6	
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	2-6	3,6	3,4
	Davis *et al.* 1978	Water chemistry	July 75—Sept 76		6	
	Reed 1979	Aquatic macrophytes	July 73			3,4
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	24 June 85			3
			24 Aug 85			3
Porter Creek	Bayless and Shannon 1965	General survey	26 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Ross and Epperly 1985	Community ecology	Mar—May, July—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Lee Creek	Bayless and Shannon 1965	General survey	17 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Hobbie *et al.* 1972	Nutrient study	1969—1971 (biweekly)	5,6	1-3,5	
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	2-6	3,6	3,4
	Benton 1979	Brackish marsh analysis		1,9		
Mixon Creek	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	13 May 1985			3
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Aurora Creek	Bayless and Shannon 1965	General survey	10 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Little Creek	Bayless and Shannon 1965	General survey	10 July 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
Jack's Creek	Bellis and Gaither 1985	Salt marsh plants	19821983 (monthly)	1,6,9		3,4
	Bradshaw *et al.* 1985	Sediment chemistry	Sept 81—Aug 82 (monthly)	1,5,6,8	1-4,6	4
	Davis *et al.* 1985 (1st ref)	Water quality	19 Oct 81—27 Oct 82 (biweekly)	5-8	1-3,5	
	Davis *et al.* 1985 (2nd ref)	Submersed macrophytes, benthic algae	19 Sept 81—9 Feb 83 (2-3 month intervals)			3,4
	Heath and Christian 1985	Sulfate reduction	Summer 83	6	4,7	2
	Otte and Bellis 1985	Edaphic diatoms	Aug—Oct 84 (monthly)	6		3
	Rulifson 1985	Fish ecology	1984—1985 (monthly)	5,6	1	8
	Stanley and Daniel 1985a	Phytoplankton study	1983—1984 (biweekly)			3,4
	West 1985	Ecology of benthic macrofauna	1984—1985 (monthly, bimonthly)	5,6	1	6,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
Jacobs Creek	Bayless and Shannon 1965	General survey	10 July 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
	Gray and Wrinkler 1977	*Rangia cuneata*	June—Aug 77	1,9		6
	Benton 1979	Brackish marsh analysis		1,9		
	Bellis and Gaither 1985	Salt marsh plants	1982—1983 (monthly)			3,4
	Bradshaw *et al.* 1985	Sediment chemistry	Sept 81—Aug 82 (monthly)	1,5,6,8	1-4,6	4
	Davis *et al.* 1985 (1st ref)	Water quality	19 Oct 81—27 Oct 82 (biweekly)	5-8	1-3,5	
	Davis *et al.* 1985 (2nd ref)	Submersed macrophytes, benthic algae	19 Sept 81—9 Feb 83 (2-3 month intervals)			3,4
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	30 Apr 85			3
			11 June 85			3
			6 Aug 85			3
	Otte and Bellis 1985	Edaphic diatoms	Aug—Oct 84 (monthly)	6		3
	Rulifson 1985	Fish ecology	1984—1985 (monthly)	5,6	1	8
	Stanley and Daniel 1985a	Phytoplankton study	1983—1984 (biweekly)			3,4
	West 1985	Ecology of benthic macrofauna	1984—1985 (monthly, bimonthly)	5,6	1	6,8
Drinkwater Creek	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	30 Apr 85			3
			11 June 85			3
			6 Aug 85			3
	Rulifson 1985	Fish ecology	1984—1985 (monthly)	5,6	1	8
	Stanley and Daniel 1985a	Phytoplankton study	1983—1984 (biweekly)			3,4
	West 1985	Ecology of benthic macrofauna	1984—1985 (monthly, bimonthly)	5,6	1	6,8
Tooley Creek	Rulifson 1985	Fish ecology	1984—1985 (monthly)	5,6	1	8
	West 1985	Ecology of benthic macrofauna	1984—1985 (monthly, bimonthly)	5,6	1	6,8
Short Creek	ICMR 1981 b	Nursery area survey	1 Feb 80—31 Jan 81 (monthly)	1,5,6	1	7,8
	ICMR 1982b	Nursery area survey	1 Feb 81—31 Jan 82 (monthly)	1,5,6	1	7,8
	West 1985	Ecology of benthic macrofauna	1984—1985 (monthly, bimonthly)	5,6	1	6,8
Long Creek	ICMR 1981b	Nursery area survey	1 Feb 80—31 Jan 81 (monthly)	1,5,6	1	7,8
	ICMR 1982b	Nursery area survey	1 Feb 81—31 Jan 82 (monthly)	1,5,6	1	7,8
	West 1985	Ecology of benthic macrofauna	1984—1985 (monthly, bimonthly)	5,6	1	6,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
South Creek	Jurgensen (undated)	Sediment analysis		9		
	NC State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	11
	Bayless and Shannon 1965	General survey	30 June 64 (single sample at each of two locations)	1,2,5-7,9	1,2	3,6-9
			1 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Benson 1965	Sediment analysis		9		
	Crawford 1967	Uptake of amino acids	Summer 67			2
	McElroy 1967	Nutrient study	Summer 66	8	2,3	
	Tenore 1967; TenoreÈ1968	Bivalvae experiments	1966	9	3,6,7	5,6
	Davis 1968	Water-sediment exchange of phosphorus			9	3
	Dreyer 1969	Pollution assimilative capacity		4,5	1,4	1
	Hobbie and Crawford 1969	Bacterial uptake kinetics	28 July, 6 Nov 66			2
	Sherk 1969	Plankton settlement experiment	Aug—Nov 68	1,5,6	2,3,5-7	3,4,6
	Carpenter 1970	Microorganism experiments	July—Sept 68; Jan—Feb 69	1,5,6		2-4
	Dillon and Woods 1970	Primary productivity		5,7		4
	Reid 1970	Meiobenthos	June 68	9		5,6
	Wood 1970	Uptake kinetics of benthic microorganisms	Aug 68—May 69 (monthly)	5,6,9	6,7	1,2
	Bellis 1971	Phytoplankton survey and model	Aug 66—July 67			3
	Carpenter 1971	Phytoplankton experiments	July—Sept 68; Jan—Feb 69		3	3,4
	Crawford 1971	Uptake of amino acids	Jan—Dec 69 (monthly)	1,2,5,6,8	3,6,7	2-4
	Moore 1971	Fluoride uptake	June—Dec 67; June—Sept 68	6	4	6
	Stanley 1971	Primary productivity of bottom algae	Mar—Apr	1,6,7	5,7	4
	Tarplee *et al.* 1971	Effects of stream channelization	8 July 70	1,5,9		9
	Copeland and Davis 1972	Experimental: plankton, benthos	Feb—Aug 70; Dec 70—Mar 71; Aug—Oct 71	5	3,5	3,4,6-8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Crawford et al. 1973	Microorganism experiments	1966, 1969			2,4
	Crawford *et al.* 1974	Amino acid flux study	1969	1,2,5,6,8	3,6	2-4
	Hobbie 1974a	Nutrient wastes	July 67; Jan 68	1,6	2-4,7	3,4,6
	Hobbie *et al.* 1975	Nutrient study	Aug 71—Aug 72 (biweekly)	6	3,5	3,4
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Gray and Winkler 1977	*Rangia cuneata*	June—Aug 77	1,9		6
	Hartness 1977	Sediment analysis		1,9	6	
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	12-6	3,6	3,4
	Reid 1978	Plankton survey: harpacticoids	Apr 68—Dec 69	1		6
	Reed 1979	Aquatic macrophytes	July 73			3
	Green 1980	Bacteria, *Rangia*	July—Oct 79	1-6,8,9,	6	1,6
	Brinson and Matson 1983	Carbon isotope distribution			6,7	
	Chamblee *et al.* 1984	Fluoride study	Spring and Summer 77	5,6	2,4	
	Bradshaw *et al.* 1985	Sediment chemistry	Sept 81—Aug 82 (monthly)	1,5,6,8	1-4,6	4
	Davis *et al.* 1985 (1st ref)	Water quality	19 Oct 81—27 Oct 82 (biweekly)	5-8	1-3,5	
	Otte and Bellis 1985	Edaphic diatoms	Aug—Oct 84 (monthly)	6		3
	Stanley and Daniel 1985a	Phytoplankton study	1983—1984 (biweekly)			3,4
	West 1987	Benthic macroinvertebrates	May, Aug, Dec 86; Feb, May 87	1,5,6,9	1,6	6
Bond Creek	Bayless and Shannon 1965	General survey	3 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Bellis 1971	Phytoplankton survey and model	Aug 66—July 67			3
	ICMR 1981b	Nursery area survey	1 Feb 80—31 Jan 81 (monthly)	1,5,6	1	7,8
	ICMR 1982b	Nursery area survey	1 Feb 81—31 Jan 82 (monthly)	1,5,6	1	7,8
Muddy Creek	Bayless and Shannon 1965	General survey	3 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
St. Claire Creek	Bayless and Shannon 1965	General survey	3 June 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
North Creek	Bayless and Shannon1965	General survey	7 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Hartness 1977	Sediment analysis		1,9	6	
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	13 May 85			3
			24 May 85			3
Frying Pan Creek	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	10 Aug 85			3
			20 Aug 85			3

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
Strawhorn Creek	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	20 Aug 85			3
East Fork	Bayless and Shannon 1965	General survey	7 July 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
East Prong	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Middle Pamlico River proper	Jurgensen (undated)	Sediment analysis		9		
	Grossman 1961	Survey: rhizopods ostracods		1,5-9		6
	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	2,5,8	1,2,4	1
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Allen 1964	Sediment analysis		1,9		
	Duane 1964	Sediment petrology		1,3,6,9		
	Bayless and Shannon 1965	General survey	22 June 64 (single sample)	1,2,5-7,9	1,2	3,6,8,9
	Chynoweth 1965	Survey: benthic macroinvertebrates	June, Aug, Dec 64; Mar 65	5,6,9	1	6
	Hill 1966	Fluoride, aluminum, iron, phosphate analyses	Oct 64—Aug 65		3,4	
	Jarrett 1966	Hydrology		2		
	Weiss 1966	Survey: benthic macroinvertebrates and phytoplankton	June 64—Mar 66			3,6
		Plankton settlement/ epifauna	Aug 64—Mar 66		4	3,6
	Crawford 1967	Experimental: bacteria	Summer 67	5		2
	Dobbins 1967	Water, sediment geochemistry	1965	6,9	4,6	
	Grossman 1967	Survey: rhizopods, ostracods	1961	1,7,9		6
	Horton 1967	Water flow	Summer 66	1,2,6		
	Horton *et al.* 1967	Water flow model	Summer 67	2,6		
	Magnuson 1967	Hydrology		6	4	
	Wilder 1967	General hydrology		6		
	Williams *et al.* 1967, 1973	Hydrography	1957—1966 (monthly)	5,6		

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Woods 1967	Hydrography	June 63—Dec 66 (monthly)	2,5,6	1,3	
	Johnson and Daugherty 1968	Analyses of fluoride, other salts and metals	1967	1,5,6	2-4	
	Peters 1968	Zooplankton ecology	Oct 65—June 67 (monthly)	5-8	1,5,6	6
	Pevear 1968, 1972	Sediment analysis		9		
	Williams and Deubler 1968a	Crustacean macroplankton, ichthyoplankton	Dec 65—Oct 67 (biweekly)	5,6		6,8
	Williams and Deubler 1968b	Crustacean macroplankton, ichthyoplankton	1957—1967	5,6		6-8
	Dreyer 1969	Pollution assimilative capacity		1,2,5	1,4	1
	Hobbie and Crawford 1969	Bacterial uptake kinetics	28 July, Nov 66			2
	Dobbins *et al.* 1970	Water-clay interactions	14—16 Nov 65	6,9	4	
	Hobbie 1970a	Hydrography	1965—1969	5,6	1	
	Hobbie 1970b	Phosphorus levels	Mar 67—Jan 70 (biweekly)	6	3	
	Miller 1970, 1974	Ctenophores, jellyfish	Mar 67—Oct 68	1,5,6		6
	Reid 1970	Meiobenthos	Summer 68	5,6,9	1	5,6
	Tenore 1970a,b, 1972	Macrobenthic ecology	June 68—Sept 69 (biweekly, seasonally)	1,5,6,9	1,6	6
	Bellis 1971	Phytoplankton survey and model	Aug 66—July 67			3
	Hathaway 1971	Cruise data file	1963—1970	5,7,9	3,4,6	
	Hobbie 1971	Phytoplankton survey	Aug 66—Aug 67; Mar 67—Apr 68			3,4
	Park 1971	Sediment analysis		9		
	Peters 1971	Planktonic harpacticoids	1966—68	7		6
	Copeland and Hobbie 1972	Eutrophication study	1966—1969	2,5,6,9	1,3	3-5
	Edzwald 1972	Coagulation of sediments		9	3	
	Hathaway 1972	Bottom sediments		9		
	Hobbie *et al.* 1972	Nutrient study	1969—1971 (biweekly)	5,6	1-3,5	
	Upchurch 1972	Sediment analysis	2 Oct 71; 20—22 July 71		4	
	Williams 1972a	Meroplankton survey: *Ogyrides*	Dec 65—Oct 67 (biweekly)			6
	Williams 1972b	Meroplankton survey: mysid	1963—1967			6
	Williams and Bynum 1972	Meroplankton survey: amphipods	Feb 65—Oct 67 (monthly, semimonthly)			6

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Dean 1973	Ecology of epifauna	Mar 72—Feb 73 (monthly, seasonally)	5,6	1	5,6
	Harrison 1973	Phytoplankton nitrate reductase activity	15 Dec 70—14 Apr 71 (biweekly, monthly)	5,6	3,6	3,4
	Custer and Ingram 1974	Sediment analysis	Summer 72	9		
	Edzwald *et al.* 1974	Sediment analysis, coagulation kinetics		1,6,9		
	Harding 1974	Trace elemets in sediments		9	3,4,6	
	Harrison 1974	Nitrogen budget	Aug 71—Aug 72 (biweekly)	2,5,6	1-3,6	
	Harrison and Hobbie 1974	Nitrogen budget	Aug 71—Aug 72 (biweekly)	5,6	3,5	
	Hobbie 1974a	Nutrient wastes	July 67—Jan 68	1,6	2-4,7	3,4,6
	Hobbie 1974b	Nutrients, eutrophication	Aug 71—Aug 73	5,6	1-3,5	
	Katuna and Ingram 1974	Sediment analysis		1,9		6
	Upchurch *et al.* 1974	Sediment phosphates and iron		1,6,9	1,3,4	
	Dean and Bellis 1975	Epifaunal survey	Mar 72—Feb 73 (monthly)	1,5,6	1	6
	Edzwald and O'Melia 1975	Clay distributions		6,9		
	Fox and Bynum 1975	Amphipods				6
	Harding and Brown 1975	Geochemistry of bottom sediments	1 Mar 73	9	4,6	
	Harwood 1975	Submersed macrophytes: direct, remote sensing	5—21 Aug 73	1,7		3
	Hobbie *et al.* 1975	Nutrient study	Aug 71—Aug 72 (biweekly)	6	3,5	3,4
	Stephenson *et al.* 1975	Hydrography, water chemistry	Jan—June 75 (biweekly)	5,6	1-3,5	
	Davis and Brinson 1976	Macrophytes	Summer 73—Summer 75		3	3,4
	ICMR 1976	Hydrography, water chemistry	July 75—Oct 76 (biweekly)	5,6	1-3,5	
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Vicars 1976	Aquatic macrophytes: direct, remote sensing	1974—1975	5-8	3,6	3,4
	Zamuda 1976	*Vallisneria americana*	Mar—Nov 75 (bimonthly)	5,6	3,4	3,4
	Burke *et al.* 1977 (1st ref)	Deoxygenation	Summer 76		1	3

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Burke *et al.* 1977 (2nd ref)	Nutrient study	26—28 Jan 77		3,5	4
	Gray and Winkler 1977	*Rangia cuneata*	June—Aug 77	1,9		6
	Hartness 1977	Sediment analysis		1,9	6	
	ICMR 1977	Hydrography, water chemistry	Nov 76—Aug 77 (biweekly)	5,6	1-3,5	
	Kirby *et al.* 1977	Planktonic respiration	July—Aug 75		1	2,6
	Kornegay and Brinson 1977	Oxygen uptake by sediment communities			1,6	
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	2-6	3,6	3,4
	Burke 1978	Organic carbon: sources and sinks	1975—1977	5,6	1-7	3,4
	Davis *et al.* 1978	Water chemistry, primary productivity	12 Aug 75 (4-h intervals)	5-7	1	
			12 Mar 77 (4-h intervals)	5-7	1,2	4
			Aug 76—July 77 (bimonthly)	5-7	1-3,5,6	3,4
			Aug 75—July 76 (monthly)	5-7	1,6	
	ICMR 1978	Hydrography, water chemistry	Sept 77—Aug 78 (biweekly)	5,6	1-3,5	
	Reid 1978	Meiobenthos	July 68—July 69 (seasonally)	1,5,6,9	1	5,6
	Stanley 1978	Nitrogen uptake by phytoplankton	July 68—July 69 (seasonally)	6	3,7	4
	Kuenzler *et al.* 1979	Phytoplankton/nutrient kinetics	Oct 75—July 77 (monthly)	1,5-7	1,3,5	3,4
	Reed 1979	Aquatic macrophytes	1973—1974 (monthly, bimonthly)	1,5-7	1,3,5	3,4
	Green 1980	Bacteria, *Rangia*	July—Oct 79	1-6,8,9	6	1,6
	ICMR 1980	Hydrography, water chemistry	1979 (biweekly)	5,6	1-3,5	
	ICMR 1981a	Hydrography, water chemistry	1980 (biweekly)	5,6	1-3,5	
	Cabaniss 1982	Benthic nutrient fluxes	Summer 81	5,6	1,3	
	Civils 1982	Macrobenthic ecology	1976—1977 (monthly)	1,5,6,9	1,6	3,6
	ICMR 1982a	Hydrography, water chemistry	1981 (biweekly)	5,6	1-3,5	

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Brinson and Matson 1983	Carbon isotope distribution		6	3,6,7	
	ICMR 1983	Hydrography, water chemistry	1982 (biweekly)	5,6	1-3,5	
	Matson *et al.* 1983 (1st ref)	Biogeochemistry	1981—1982 (monthly)	5,6,9	1,3,4,6,7	2,4
	Matson *et al.* 1983 (2nd ref)	Benthic metabolism	Aug 82		3	
	Chamblee *et al.* 1984	Fluoride study	Spring and Summer 77	5,6	2,4	
	Kuenzler *et al.* 1984	Benthic nutrient cycling	Apr 81—July 83 (bimonthly)	5,6,9	1,3,6	
	Stanley 1984a	Phytoplankton	1983 (biweekly)			3
	Stanley 1984b	Hydrography, water chemistry	1983 (biweekly)	5,6	1-3,5	
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	June 85; Aug 85			3
	Matson and Brinson 1985	Sulfate enrichment study	1981 (monthly)	6	1,3,4	
	Stanley 1985	Oxygen depletion	1975—1977	3,5,6	1	
	Stanley and Daniel 1985b	Phytoplankton	1984 (biweekly)			3
	Stanley 1986a	Hydrography, water chemistry	1984 (biweekly)	5,6	1-3,5	
	Stanley 1986b	Hydrography, water chemistry	1985 (biweekly)	5,6	1-3,5	
	Stanley and Daniel 1986	Phytoplankton	1985 (biweekly)			3
	Stanley 1987	Hydrography, water chemistry	1986 (biweekly)	5,6	1-3,5	
Area M in general	Wilson 1962	Wetlands	Aug 57—July 59			3
	Davis 1971	Community metabolism, heated experimental ecosystems	Feb 70—Feb 71	5,6	1-6	3,4,6,8
	Copeland *et al.* 1974	Review		1,2,6,8	1,5,6	3,4,6
	Chang 1977	Nutrient modeling			3	
	Giese *et al.* 1979, 1985	Review: hydrology		6		
	Lauria and O'Melia 1980	Nutrient model using data from other sources		1,5,6	3	
	Sholar 1980	Salinity analysis	1949—1989			
	Copeland *et al.* 1984	Review: estuarine profile		1,2,4-6,9	3,5,6	1-4,6-8
	NOAA National Ocean Service 1985	Review: physical and hydrologic data		1,2,6		

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Stanley 1985	Review: oxygen depletion		1,6	1,3	
Area N: Lower Pamlico River						
Campbell Creek	Bayless and Shannon 1965	General survey	1 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
			30 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Upper Spring Creek	Bayless and Shannon 1965	General survey	21 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
Eastham Creek	Bayless and Shannon 1965	General survey	20 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Snode Creek	Bayless and Shannon 1965	General survey	1 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	21 May 85			3
Lower Spring Creek	Bayless and Shannon 1965	General survey	23 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Mallard Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82	1,6,9	3,6	7,8
Betty Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Goose Creek	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	23 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Stanley 1985	Review: oxygen depletion			1	
Dixon Creek	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	21 May 85			3
Oyster Creek	Bayless and Shannon 1965	General survey	24 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
James Creek	Bayless and Shannon 1965	General survey	21 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	21 May 85			3
Middle Prong	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Davis *et al.* 1985 (3rd ref)	Submersed macrophytes	21 May 85			3

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
Clark Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Davis et al. 1985 (3rd ref)	Submersed macrophytes	21 May 85			3
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Long Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Cedar Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Mouse Harbor Bay	Bayless and Shannon 1965	General survey	30 July 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Pickett 1965	Sediment analysis		1,9	6	
	Pickett and Ingram 1969	Sediment analysis		9		
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Lower Pamlico River proper	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Roelofs 1950	Hydrography	1948—1950	1,5,6		
	Marshall 1951	Hydrography		1,6,9		
	Roelofs and Bumpus 1953	Hydrography		2,3,6		
	Grossman 1961	Survey: rhizopods ostracods		1,5-9		6
	N.C. State Stream Sanitation Committee 1961	Pollution survey	1958	5,8	1,2,4	1
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Allen 1964	Sediment analysis		1,9		
	Duane 1964	Sediment petrology		1,3,6,9		
	Bayless and Shannon 1965	General survey	30 July 64 (single sample)	1,2,5-7,9	1,2	6,8,9
	Benson 1965	Sediment analysis		9		
	Chynoweth 1965	Survey: benthic macroinvertebrates	June, Aug, Dec 64; Mar 65	5,6,9	1	6
	Pickett 1965	Sediment analysis		1,9	6	
	Hill 1966	Fluoride, aluminum, iron, phosphate analyses	Oct 64—Aug 65		3-4	
	Jarrett 1966	Hydrology		2		
	Weiss 1966	Survey: benthic macroinvertebrates & phytoplankton	June 64—Mar 66			3,6
		Plankton settlement epifauna	Aug 64—Jan 65		4	3,6

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Dobbins 1967	Water, sediment geochemistry	1965	6,9	4,6	
	Grossman 1967	Survey: rhizopods, ostracods	1961	1,7,9		6
	Horton 1967	Water flow	Summer 66	1,2,6		
	Horton *et al.* 1967	Water flow model	Summer 67	2,6		
	Magnuson 1967	Hydrology		6	4	
	Wilder 1967	General hydrology		6		
	Williams *et al.* 1967, 1973	Hydrography	1957—1966 (monthly)	5,6		
	Woods 1967	Hydrography	June 63—Dec 66 (monthly)	2,5,6	1,3	
	Johnson and Daugherty 1968	Analyses of fluoride, other salts and metals	1967	1,5,6	2-4	
	Peters 1968	Zooplankton ecology	Oct 65—June 67 (monthly)	5-8	1,5,6	6
	Williams and Deubler 1968a	Crustacean macroplankton, ichthyoplankton	Dec 65—Oct 67 (biweekly)	5,6		6,8
	Williams and Deubler 1968b	Crustacean macroplankton, ichthyoplankton	1957—1967	5,6		6-8
	Dreyer 1969	Pollution assimilative capacity		1,5	1,4	1
	Hobbie and Crawford 1969	Bacterial uptake kinetics	28 July, 6 Nov 66			2
	Pickett and Ingram 1969	Sediment analysis		9		
	Bue 1970	Stream flow	1931—1960	2		
	Dobbins *et al.* 1970	Water-clay interactions	14—16 Nov 65	6,9	4	
	Hobbie 1970a	Hydrography	1965—1969	5,6	1	
	Hobbie 1970b	Phosphorus levels	Mar 67—Jan 70 (biweekly)	6	3	
	Miller 1970, 1974	Ctenophores, jellyfish	Mar 67—Oct 68	1,5,6		6
	Reid 1970	Meiobenthos	Summer 68	5,6,9	1	5,6
	Tenore 1970 a,b, 1972	Macrobenthic ecology	June 68—Sept 69 (biweekly, seasonally)	1,5,6,9	1,6	6
	Bellis 1971	Phytoplankton survey and model	Aug 66—July 67			3
	Hathaway 1971	Cruise data file	1963—1970	5,7,9	3,4,6	6
	Hobbie 1971	Phytoplankton survey	Aug 66—Aug 67; Mar 67—Apr 68			3,4

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Park 1971	Sediment analysis		9		
	Peters 1971	Planktonic harpacticoids	1966—1968	7		6
	Copeland and Hobbie 1972	Eutrophication study	1966—1969	2,5,6,9	1,3	3-5
	Edzwald 1972	Coagulation of sediments		9	3	
	Folger 1972	Review: sediments		1,2,6,9	6	
	Hathaway 1972	Bottom sediments		9		
	Hobbie *et al.* 1972	Nutrient study	1969—1971 (biweekly)	5,6	1-3,5	
	Upchurch 1972	Sediment analysis	20—22 July 71		4	
	Williams 1972a	Meroplankton survey: *Ogyrides*	Dec 65—Oct 67 (biweekly)			6
	Williams and Bynum 1972	Meroplankton survey: amphipods	Feb 65—Oct 67 (monthly, semimonthly)			6
	Dean 1973	Ecology of epifauna	Mar 72—Feb 73 (monthly, seasonally)	5,6	1	5,6
	Harrison 1973	Phytoplankton nitrate reductase activity	15 Dec 70—14 Apr 71 (biweekly, monthly)	5,6	3,6	3,4
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Edzwald *et al.* 1974	Sediment analysis, coagulation kinetics		1,6,9		
	Harrison 1974	Nitrogen budget	Aug 71—Aug 72 (biweekly)	2,5,6	1-3,6	
	Harrison and Hobbie 1974	Nitrogen budget	Aug 71—Aug 72 (biweekly)	5,6	3,5	
	Hobbie 1974b	Nutrients, eutrophication	Aug 71—Aug 73	5,6	1-3,5	
	Katuna and Ingram 1974	Sediment analysis		1,9		
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Upchurch *et al.* 1974	Sediment phosphates and iron		1,6,9	1,3,4	
	Fox and Bynum 1975	Amphipods				6
	Dean and Bellis 1975	Epifaunal survey	Mar 72—Feb 73 (monthly)	1,5,6	1	6
	Edzwald and O'Melia 1975	Clay distributions		6,9		
	Hobbie *et al.* 1975	Nutrient study	Aug 71—Aug 72 (biweekly)	6	3,5	3,4
	Stephenson *et al.* 1975	Hydrography, water chemistry	Jan—June 75 (biweekly)	5,6	1-3,5	
	Davis and Brinson 1976	Macrophytes	Summer 73—Summer 75		3	3,4
	ICMR 1976	Hydrography, water chemistry	July 75—Oct 76 (biweekly)	5,6	1-3,5	

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Miller 1976	Fluoride study	Oct 73; Mar 74; May 75	5,6	2,4	
	Burke *et al.* 1977 (1st ref)	Deoxygenation	Summer 76		1	3
	Gray and Winkler 1977	*Rangia cuneata*	June—Aug 77	1,9		6
	ICMR 1977	Hydrography, water chemistry	Nov 76—Aug 77 (biweekly)	5,6	1-3,5	
	Kirby *et al.* 1977	Planktonic respiration	July—Aug 75		1	2,6
	Kornegay and Brinson 1977	Oxygen uptake by sediment communities			1,6	
	Sick 1977	Dissolved organic carbon	14 Dec 70—14 Apr 71 (biweekly)	2-6	3,6	3,4
	Burke 1978	Organic carbon: sources and sinks	1975—1977	5,6	1-7	3,4
	Davis *et al.* 1978	Water chemistry, primary productivity	Aug 76—July 77 (bimonthly)	5-7	1-3,5,6	3,4
			Aug 75—July 76 (monthly)	5-7	1,6	
	ICMR 1978	Hydrography, water chemistry	Sept 77—Aug 78 (biweekly)	5,6	1-3,5	
	Reid 1978	Meiobenthos	July 68—July 69 (seasonally)	1,5,6,9	1	5,6
	Stanley 1978	Nitrogen uptake by phytoplankton		6	3,7	4
	Kuenzler *et al.* 1979	Phytoplankton/nutrient kinetics	Oct 75—July 77 (monthly)	1,5-7	1,3,5	3,4
	Reed 1979	Aquatic macrophytes	1973—1974 (monthly, bimonthly)	1,5-7		3,4
	ICMR 1980	Hydrography, water chemistry	1979 (biweekly)	5,6	1-3,5	
	ICMR 1981a	Hydrography, water chemistry	1980 (biweekly)	5,6	1-3,5	
	ICMR 1982a	Hydrography, water chemistry	1981 (biweekly)	5,6	1-3,5	
	Brinson and Matson 1983	Carbon isotope distribution			6	3,6,7
	ICMR 1983	Hydrography, water chemistry	1982 (biweekly)	5,6	1-3,5	
	Matson *et al.* 1983 (1st ref)	Biogeochemistry	1981—1982 (monthly)	5,6,9	1,3,4,6,7	
	Matson *et al.* 1983 (2nd ref)	Benthic metabolism	Aug 82			3

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Chamblee *et al.* 1984	Fluoride study	Spring and Summer 77	5,6	2,4	
	Kuenzler *et al.* 1984	Benthic nutrient cycling	Apr 81—July 83 (bimonthly)	5,6,9	1,3,6	
	Stanley 1984a	Phytoplankton	1983 (biweekly)			3
	Stanley 1984b	Hydrography, water chemistry	1983 (biweekly)	5,6	1-3,5	
	Matson and Brinson 1985	Sulfate enrichment study	1981 (monthly)	6	1,3,4	
	Stanley 1985	Oxygen depletion	1975—1977	5,6	1	
	Stanley and Daniel 1985b	Phytoplankton	1984 (biweekly)			3
	Stanley 1986a	Hydrography, water chemistry	1984 (biweekly)	5,6	1-3,5	
	Stanley 1986b	Hydrography, water chemistry	1985 (biweekly)	5,6	1-3,5	
	Stanley and Daniel 1986	Phytoplankton	1985 (biweekly)			3
	Stanley 1987	Hydrography, water chemistry	1986 (biweekly)	5,6	1-3,5	
Area N in general	Wilson 1962	Wetlands	Aug 57—July 59			3
	Copeland *et al.* 1974	Review		1,2,6	1	3,4,6
	Chang 1977	Nutrient modeling			3	
	Giese *et al.* 1979, 1985	Review: hydrology		2,6		
	Lauria and O'Melia 1980	Nutrient model using data from other sources		1,5,6	3	
	Sholar 1980	Salinity analysis	1948—1980	6		
	Copeland *et al.* 1984	Review: estuarine profile		1,2,4-6,9	3,5,6	1-4,6-8
	NOAA, National Ocean Service 1985	Review: physical and hydrologic data		1,2,6		
	Stanley 1985	Review: oxygen depletion		1,6	1,3	
Area O: Big Porpoise, Middle and Jones Bays						
Porpoise Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9,	3,6	7,8
Big Porpoise Bay	Pickett 1965	Sediment analysis		1,9	6	

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Pickett and Ingram 1969	Sediment analysis		9		
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Capp Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	,6,9	6-9	
Little Oyster Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Middle Bay	Bayless and Shannon 1965	General survey	24 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Pickett 1965	Sediment analysis		1,9	6	
	Pickett and Ingram 1969	Sediment analysis		9		
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Ditch Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Drum Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Jones Bay	Chestnut 1956	Oyster drill distribution	Mar—June 55			6
	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	5,8	1,2,4	1
	Bayless and Shannon 1965	General survey	24 June 64 (single sample)	1,2,5-7,9	1,2	3,6-9
	Pickett 1965	Sediment analysis		1,9	6	
	Pickett and Ingram 1969	Sediment analysis		9		
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Area O in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Wilson 1962	Wetlands	Aug 57—July 59			3
	Sholar 1980	Salinity analysis	1972—1980	6		
Area P: Bay River						
Bay Creek	Keup and Bayless 1964	Fish survey	29 June 60 (single sample)	5,6	1,2	8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Trent Creek	Bayless and Smith 1962	General survey	30 June 60 (single sample)	1,2,5-7,9	1,2	3,6,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Keup and Bayless 1964	Fish survey	30 June 60 (single sample)	5,6	1,2	8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Chapel Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Moore Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Smith Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—June, Aug—Oct 82 (monthly)	1,6,9	3,6	7,8
Vandemere Creek	Bayless and Smith 1962	General survey	28 June 60 (single sample)	1,2,5-7,9	1,2	3,6-8
	Keup and Bayless 1964	Fish survey	28 June 60 (single sample)	5,6	1,2	8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Rice Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Ball Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Cabin Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Simpson Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Riggs Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Bryan Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,,6	7,8
Spring Creek	Bayless and Smith 1962	General survey	30 June 60 (single sample)	1,2,5-7,9	1,2	3,8
	Keup and Bayless 1964	Fish survey	30 June 60	5,6	1,2	8
	Spitsbergen and Wolf 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Dipping Vat Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Long Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Bonner Bay	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Little Bear Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Bear Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Gale Creek	Bayless and Smith 1962	General survey	27 June 60 (single sample)	2,5-7,9	1,2	3,8
	Keup and Bayless 1964	Fish survey	28 June 60 (single sample)	5,6	1,2	8
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
Bay River proper	U.S. Army Corps of Engineers 1910	River survey		1,2		
	Roelofs 1950	Hydrography	1948—1950	1,5,6		
	Roelofs and Bumpus 1953	Hydrography		1-3,5,6		
	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	5,8	1,2,4	1
	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Bayless and Smith 1962	General survey	29 June 60 (single sample)	1,2,5-7,9	1,2	3,8
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Duane 1964	Sediment petrology		1,3,6,9		
	Benson 1965	Sediment analysis		9		
	Pickett 1965	Sediment analysis		1,9	6	
	Hill 1966	Fluoride and aluminum analyses	Oct 64—Aug 65		3,4	
	Weiss 1966	Phytoplankton survey	30 Nov—1 Dec 65; 28 Feb—1 Mar 66		4	3
	Williams *et al.* 1967, 1973	Hydrography	1948—1966 (monthly)	5,6		
	Woods 1967	Hydrography	June 63—Dec 66 (monthly)	5,6		
	Sheets *et al.* 1970	Pesticides	Aug 67—Sept 68 (monthly)		8	
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Horton and Bridges 1974	Hydrography	1967—1968 (monthly)	1,5,6	1	
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
Bonner Bay	Benton 1979	Brackish marsh analysis		1,9		
Area P in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Wilson 1962	Wetlands	Aug 57—July 59			3
	Sholar 1980	Salinity analysis	1948—1980	6		
Area Q: Upper Neuse River						
Bachelor Creek	McAvoy and Harris 1956	Water chemistry	1954—55	6	2,4	

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	U.S. Geological Survey 1959	Water chemistry	15 Sept 54—18 Feb 55	6	2,4	
	Woodard and Thomas 1959	Water chemistry	13 Aug 57	2,6	2-4	
	Bayless and Smith 1962	General survey	20 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
			21 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
	Keup and Bayless 1964	Fish survey	20 July 60 (single sample)	5,6	1,2	8
			21 July 60 (single sample)	5,6	1,2	8
	Woodard 1970	Water temperature data	1943—1967	5		
	Wilder and Slack 1971	Water chemistry	Oct 57—Sept 62 (monthly)	2,6	2-4	
	Williams 1972a	Meroplankton survey: *Ogyrides*	Nov 63—Oct 67 (biweekly)			6
Mill Creek	Bayless and Smith 1962	General survey	12 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
	Keup and Bayless 1964	Fish survey	14 July 60 (single sample)	5,6	1,2	8
	Noltemeier 1984	Water quality	Sept 78—Aug 79	6	1-3,6	
Island Creek	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
	Noltemeier 1984	Water quality	Sept 78—Aug 79	6	1-3,6	
Wilson Creek	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	2,5,8	1,2,4	1
	Wolfe 1967b	*Rangia* accumulation of fallout isotopes	Sept 65—Feb 67	6	7	6
	Wolfe and Petteway 1968	Bivalve growth	9 Nov 65—6 July 67	5,6		5,6
	Wolfe *et al.* 1969	*Rangia* accumulation of cesium-137		6	7	6
	Wolfe 1971	*Rangia* accumulation of cesium-137	1965—1967	6	4,7	6
Brice Creek	Bayless and Smith 1962	General survey	12 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
	Keup and Bayless 1964	Fish survey	12 July 60 (single sample)	5,6	1,2	8
	Wolfe 1967b	*Rangia* accumulation of fallout isotopes	Sept 65—Feb 67	6	7	6
	Wolfe *et al.* 1969	*Rangia* accumulation of cesium-13		6	7	6
	Wolfe 1971	*Rangia* accumulation of cesium-137	1965—1967	6	4,7	6
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	3,6

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Noltemeier 1984	Water quality	Sept 78—Aug 79	6	1-3,6	
Trent River	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	2,5,8	1,2,4	1
	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Bayless and Smith 1962	General survey	13 July 60 (single sample)	1,2,5-7,9	1,2	3,6-8
	Chemerys and Phibbs 1962	Water chemistry	Oct 58—Sept 59	5,6	2-4	
	Woodard 1962	Water chemistry	Oct 59—Sept 60	5,6	2-4	
	Phibbs and Midgett 1963	Water chemistry	Oct 60—Sept 61	5,6	2-4	
	Keup and Bayless 1964	Fish survey	13 July 60 (single sample)	5,6	1,2	8
	Wolfe 1967a	Mollusks			7	6
	Wolfe 1967b	*Rangia* accumulation of isotopes	Sept 65—Feb 67	6	7	6
	Wolfe and Petteway 1969	Growth of *Rangia*	Nov 65—July 67	5,6		5,6
	Wolfe and Schelske 1969	Bivalve accumulation of fallout isotopes	Sept 65—Feb 67	5,6,9	7	6
	Woodard 1970	Water temperature data	1943—1967	5		
	Wilder and Slack 1971	Water chemistry	Jan 55—Sept 67 (daily)	2,6	2-4	
	Wolfe 1971	*Rangia* accumulation of cesium-137	1965—1967	6	4,7	6
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Wolfe and Jennings 1973	*Rangia* accumulation of fallout isotopes	Sept 65—Sept 67	6	7	6
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
	Wilder *et al.* 1978	Hydrology		6	4	
Northwest Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Upper Broad Creek	Billingsley and Joyner 1953	Water physics, chemistry	27 May 50	2,6	2-4	
			26 Oct 51	2,6	2,4	
	Billingsley and Joyner 1954	Water physics, chemistry	27 May 50	2,6	2-4	
			28 Apr 53	2,6	2,4	
	Harris and Joyner 1955	Water physics, chemistry	28 Apr 53; 18 Feb 54	2,6	2,4	
	McAvoy and Harris 1956	Water chemistry	1955	6	2,4	

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	McAvoy 1957	Water physics, chemistry	1 Feb, 20 Sept 56	2,6	2-4	
	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	5,8	1,2,4	1
	U.S. Geological Survey 1959	Water chemistry	15 Sept 54—18 Feb 55	6	2,4	
	Woodard and Thomas 1960	Water chemistry	9 Aug 58	2,6	2-4	
	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Bayless and Smith 1962	General survey	8 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
			28 July 60 (single sample)	1,2,5-7,9	1,2	3,6-8
	Keup and Bayless 1964	Fish survey	8 July 60 (single sample)	5,6	1,2	8
			28 July 60 (single sample)	5,6	1,2	8
	Porter 1967	Survey: mollusks		9		
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
Goose Creek	McAvoy and Harris 1956	Water chemistry	1954—1955	6	2,4	
	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	5,8	1,2,4	1
	U.S. Geological Survey 1959	Water chemistry	15 Sept 54—18 Feb 55	6	2,4	
	Bayless and Smith 1962	General survey	7 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
	Keup and Bayless 1964	Fish survey	7 July 60 (single sample)	5,6	1,2	8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
Beard Creek	Bayless and Smith 1962	General survey	6 July 60 (single sample)	1,2,5-7,9	1,2	3,6-8
	Keup and Bayless 1964	Fish survey	6 July 60 (single sample)	5,6	1,2	8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
Upper Neuse River proper	N.C. Dept. of Conservation and Development, Div. of Water Resources and Engineering 1947	Hydrologic data	1872—1945	4		
	Lamar and Joyner 1949	Water chemistry	1946—1947		2-4	
	Pauszek 1952	Water chemistry	1950—1951	6	2,4	
	U.S. Geological Survey 1952	Water chemistry	11 Feb 47		2-4	
	Brown and Ingram 1954	Sediment analysis		9		
	Griffin and Ingram 1955	Sediment analysis		9		
	Billingsley *et al.* 1957	Precipitation	1901—1953	4		

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	2,5,8	1,2,4	1
	Woodard and Thomas 1959	Water chemistry	Oct 56—Sept 57	5	4	
	U.S. Geological Survey 1960b	Water chemistry	Oct 56—Sept 57	5	4	
	U.S. Geological Survey 1960c	Water chemistry	Oct 57—Sept 58	5,6	2-4	
	Woodard and Thomas 1960	Water chemistry	Oct 57—Sept 58	5,6	2-4	
	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Tagatz and Dudley 1961	Fish survey	Mar 57—Feb 60			8
	Bayless and Smith 1962	General survey	18 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
			21 Aug 61 (single sample)	1,2,5-7,9	1,2	3,6,8
	Chemerys and Phibbs 1962	Water chemistry	Oct 58—Sept 59	5,6	2-4	
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Woodard 1962	Water chemistry	Oct 59—Sept 60	5,6	2-4	
	Phibbs and Midgett 1963	Water chemistry	Oct 60—Sept 61	5,6	2-4	
	Duane 1964	Sediment petrology		1,3,6,9		
	Phibbs 1964	Water chemistry	Oct 61—Sept 62	5,6	2-4	
	U.S. Geological Survey 1964	Water chemistry	Oct 61—Sept 62	5,6		
	U.S. Geological Survey 1965	Water chemistry	Oct 58—Sept 59	5,6	2-4	
	Woodard and Phibbs 1965	Water chemistry	Oct 62—Sept 63	5,6	2-4	
	Jarrett 1966	Hydrology		2,6		
	Phibbs 1966	Water chemistry	Oct 64—Sept 65	5,6	2-4	
	Phibbs and Chemerys 1966	Water chemistry	Oct 63—Sept 64	5,6	2-4	
	Grossman 1967	Survey: rhizopods, ostracods	1961	1,7,9		6
	Phibbs 1967	Water quality	1 Oct 65—30 Sept 66	5,6	2-4	
	Porter 1967	Survey: mollusks		9		6
	Wilder 1967	General hydrology		6		
	Williams *et al.* 1967, 1973	Hydrography	1958—1966 (monthly)	5,6		
	Wolfe 1967a	Mollusks			7	6
	Wolfe 1967b	*Rangia* accumulation of fallout isotopes	Sept 65—Feb 67	6		6
	Pevear 1968, 1972	Sediment analysis		9		

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Williams and Deubler 1968a	Crustacean macroplankton, ichthyoplankton	Dec 65—Oct 67(biweekly)	5,6		6,8
	Williams and Deubler 1968b	Crustacean macroplankton, ichthyoplankton	1957—1967	5,6		6-8
	Phibbs 1969	Water chemistry	Oct 66—Sept 67	2,5,6	2-4	
	Porter 1969	Mollusks	1967—1969			6
	Wolfe and Schelske 1969	Bivalve accumulation of fallout isotopes	Sept 65—Feb 67	5,6,9	7	6
	Woods 1969	Circulation patterns	Summer 67	2		
	Woodard 1970	Water temperature data	1943—1967	5		
	Hathaway 1971	Cruise data file	1963—1970	5,7,9	3,4,6	3
	Park 1971	Sediment analysis		9		
	Williams 1971	Meroplankton survey: brachyurans	Nov 63—Dec 65 (monthly)			6
	Wolfe 1971	*Rangia* accumulation of cesium-137	1965—1967	6	4,7	6
	Hathaway 1972	Bottom sediments		9		
	Porter and Tyler 1972	Mollusk survey				6
	Williams and Bynum 1972	Meroplankton survey: amphipods	Nov 63—Oct 67 (monthly)			6
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Wolfe and Jennings 1973	*Rangia* accumulation of fallout isotopes	Sept 65—Sept 67	6	7	6
	Katuna and Ingram 1974	Sediment analysis		1,9		
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Amein and Wardak 1975	Dynamic water quality model		1,2,5	1,3	
	Fox and Bynum 1975	Amphipods				6
	Hester and Copeland 1975	Nekton population dynamics	Aug 72—Aug 73 (monthly)	5,6	1,5	6-8
	Hobbie and Smith 1975	Nutrient study	20 Sept 70—24 Jan 74	5,6	1-3,5	3
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	3,6
	Wilder *et al.* 1978	Hydrology		4,6	4	
	Grimes and Hassler 1979	Zooplankton survey	17—18 July 78; 1—2 Aug 78			6

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Kirby-Smith and Van Dover 1979	Benthic ecology	13—15 Sept 78; 4—5 Oct 78	1,5,6,9	1	5,6
	Powell 1979	Water chemistry	Apr—July	5,6	2,4	
	N.C. Dept. of Natural Resources and Community Development, Div. of Environmental Management, Operations Section 1980	Community ecology	1976—1978 (biweekly, monthly, quarterly)	1,2,4-7	1-5	1-3,6
	N.C. Dept. of Natural Resources and Community Development, Div. of Environmental Management 1982	Phytoplankton, nutrient study	1979—1981 (monthly)	1,5	3,5	3
	Benninger and Martens 1983	Sediment chemistry	7 July 82	1,6,9	4,6,7	
	Khorram and Cheshire 1983	Water quality mapping	24 Sept 82	6,8	5	
	Matson *et al.* 1983 (1st ref)	Biogeochemistry	1981—1982 (monthly)	5,6,9	1,3,4,6,7	
	N.C. Dept. of Natural Resources and Community Development, Div. of Environmental Management, Water Quality Section 1983	Nutrient management		2	3,5	3
	Paerl 1983		June 81—Oct 82 (biweekly)	1,5,6	1,2,5,6	4
	Stanley 1983a	Nitrogen cycling; phytoplankton growth	1982 (weekly, biweekly)	2	3	1,3,4
	Stanley 1983b	Nutrient remineralization	Jan—Nov 81		1,2,3,6	1
	Christian *et al.* 1984	Hydrography, microbial and phytoplankton processes	Summer 82	1,5-7	1,3,5	1-4
	N.C. Dept. of Natural Resources and Community Development, Div. of Environmental Management,Water Quality Section 1984	Phytoplankton ecology	1983 (monthly)		3,5	3,4
	Paerl *et al.* 1984	Blue-green algal blooms	July, Aug 81	1,5-7	1-3,6	3,4
	Stanley and Christian 1984	Nutrient study	1979—1982		3	3
	Matson and Brinson 1985	Sulfate enrichment study	1981 (monthly)	6	1,3,4	
Area Q in general	Wilson 1962	Wetlands	Aug 57—July 59			3
	Giese *et al.* 1979, 1985	Review: hydrology		1,3,5,6	2-4	
	Sholar 1980	Salinity analysis	1956—1980	6		

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	NOAA, National Ocean Service 1985	Review: physical and hydrologic data		1,2,6		
	Stanley 1985	Review: oxygen depletion		1	1	
Area R: Middle Neuse River						
Tucker Creek	N.C. State Stream Sanitation Committe 1959	Pollution survey	1954—1958	5,8	1,2,4	1
	Bayless and Smith 1962	General survey	19 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
	Keup and Bayless 1964	Fish survey	17 July 60 (single sample)	5,6	1,2	8
Slocum Creek	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	5,8	1,2,4	1
	Bayless and Smith 1962	General survey	19 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
	Keup and Bayless 1964	Fish survey	19 July 60 (single sample)	5,6	1,2	8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Hancock Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
Cahoogue Creek	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
Mitchell Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
Clubfoot Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Gulden Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Great Neck Creek	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
Dawson Creek	Bayless and Smith 1962	General survey	6 July 60 (single sample)	1,2,5-7,9	1,2	3,6-8
	Keup and Bayless 1964	Fish survey	6 July 60 (single sample)	5,6	1,2	8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Tarkiln Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72-Dec 73 (monthly)	5,6,9		6-9
Jonaquin Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Cedar Creek	Williams 1955b	Commercial shrimps	1948—1953	1,5,6,9		7
Adams Creek	Williams 1955a	*Ogyrides*		6,9		6
	Williams 1955b	Commercial shrimps	1948—1953	1,5,6,9		7
	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	5,8	1,2,4	1

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Williams *et al.* 1967, 1973	Hydrography	1951—1966	5,6		
	Porter 1967	Survey: mollusks		9		
	Williams and Deubler 1968a	Crustacean macroplankton, ichthyoplankton	Dec 65—Oct 67 (biweekly)	5,6		6,8
	Williams and Deubler 1968b	Crustacean macroplankton, ichthyoplankton	1957—1967	5,6		6
	Williams 1972a	Meroplankton survey: *Ogyrides*	Nov 63—Oct 67 (biweekly)			6
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	6
Greens Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Kershaw Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Smith Creek	Bayless and Smith 1962	General survey	5 July 60 (single sample)	1,2,5-7,9	1,2	3,6,8
	Keup and Bayless 1964	Fish survey	5 July 60 (single sample)	5,6	1,2	8
Whittaker Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Pierce Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Middle Neuse River proper	Griffin and Ingram 1955	Sediment analysis		9		
	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	5,8	1,2,4	1
	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Tagatz and Dudley 1961	Fish survey	Mar 57—Feb 60			8
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Duane 1964	Sediment petrology		1,3,6,9		
	Benson 1965	Sediment analysis		9		
	Jarrett 1966	Hydrology		2,6		
	Weiss 1966	Phytoplankton survey	30 Nov—1 Dec 65; 28 Feb—1 Mar 66		4	3
	Dexter 1967	Haustoriid amphipods				6
	Grossman 1967	Survey: rhizopods, ostracods	1961	1,7,9		6
	Porter 1967	Survey: mollusks		9		6
	Wilder 1967	General hydrology		6		

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Williams *et al.* 1967, 1973	Hydrography	1948—1966 (monthly)	5,6		
	Wolfe 1967a	Mollusks			7	6
	Wolfe 1967b	*Rangia* accumulation of fallout isotopes	Sept 65—Feb 67	6	7	6
	Woods 1967	Hydrology	June 63—Dec 66 (monthly)	2,5,6	1,3	
	Pevear 1968, 1972	Sediment analysis		9		
	Williams and Deubler 1968a	Crustacean macroplankton, ichthyoplankton	Dec 65—Oct 67 (biweekly)	5,6		6,8
	Williams and Deubler 1968b	Crustacean macroplankton, ichthyoplankton	1957—1967	5,6		6-8
	Porter 1969	Mollusks	1967—1969			6
	Wolfe *et al.* 1969	*Rangia* accumulation of cesium-137		6	7	6
	Wolfe and Schelske 1969	Bivalve accumulation of fallout isotopes	Sept 65—Feb 67	5,6,9	7	6
	Woods 1969	Circulation patterns	Summer 67	2		
	Sheets *et al.* 1970	Pesticides	Aug 67—Sept 68		8	
	Hathaway 1971	Cruise data file	1963—1970	5,7,9	3,4,6	
	Park 1971	Sediment analysis		9		
	Williams 1971	Meroplankton survey: brachyurans	Nov 63—Dec 65 (monthly)			6
	Wolfe 1971	*Rangia* accumulation of cesium-137	1965—1967	6	4,7	6
	Hathaway 1972	Bottom sediments		9		
	Williams and Bynum 1972	Meroplankton survey: amphipods	Nov 63—Oct 67 (monthly)			6
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Wolfe and Jennings 1973	*Rangia* accumulation of fallout isotopes	Sept 65—Sept 67	6	7	6
	Horton and Bridges 1974	Hydrography, macrobenthos, thermal tolerance	1967—1968	1,5,6,9	1	6-8
	Katuna and Ingram 1974	Sediment analysis		1,9		
	Powell 1974	Fish study	June 71—July 72 (monthly)	5,6	1	8,9

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Amein and Wardak 1975	Dynamic water quality model		1,2,5	1,3	
	Fox and Bynum 1975	Amphipods				6
	Hester and Copeland 1975	Nekton population dynamics	Aug 72—Aug 73 (monthly)	5,6	1,5	6-8
	Hobbie and Smith 1975	Nutrient study	20 Sept 70—24 Jan 74	5,6	1-3,5	3
	Knowles 1975	Flow dyanmics	7 Aug—14 Sept 73	2,5		
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	3,6
	Khorram and Cheshire 1983	Water quality mapping	24 Sept 82	6,8	5	
	Matson *et al.* 1983 (1st ref)	Biogeochemistry	1981—1982 (monthly)	5,6,9	1,3,4,6,7	
	Christian *et al.* 1984	Hydrography, microbial and phytoplankton processes	Summer 82	1,5-7	1,3,5	1-4
	N.C. Dept. of Natural Resources and Community Development, Div. of Environmental Management, Water Quality Section 1984	Phytoplankton ecology	1983 (monthly)		3,5	3,4
	Paerl *et al.* 1984	Blue-green algal blooms	July, Aug 81	1,5-7	1-3,6	3,4
	Stanley and Christian 1984	Nutrient study	1979—1982		3	
	Matson and Brinson 1985	Sulfate enrichment study	1981 (monthly)	6	1,3,4	
	Pietrafesa *et al.* 1986	Hydrography	Winter 78/79	2		
Area R in general	Wilson 1962	Wetlands	Aug 57—July 59			3
	Giese *et al.* 1979, 1985	Review: hydrology		6		
	Sholar 1980	Salinity analysis	1956—1980	6		
	NOAA, National Ocean Service 1985	Review: physical and hydrologic data		1,2,6		
	Stanley 1985	Review: oxygen depletion		1	1	
Area S: Lower Neuse River						
Orchard Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Broad Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
Pittman Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Green Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Swan Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Parson's Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Broad Creek (Turnagain Bay)	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Turnagain Bay	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
Lower Neuse River proper	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Roelofs 1950	Hydrography	1948—1950	1,5,6		
	Marshall 1951	Hydrography		1,6,9		
	Roelofs and Bumpus 1953	Hydrography		2,3,6		
	Griffin and Ingram 1955	Sediment analysis		9		
	Chestnut 1956	Oyster drill distribution	Mar—June 55	6		6
	N.C. State Stream Sanitation Committee 1959	Pollution survey	1954—1958	5,8	1,2,4	1
	Posner 1959	Hydrography, water chemistry, zooplankton		6	1,3,5	6
	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Duane 1964	Sediment petrology		1,3,6,9		
	Pickett 1965	Sediment analysis		1,9	6	
	Hill 1966	Fluoride analysis	Oct 64—Aug 65		3,4	
	Jarrett 1966	Hydrology		2,6		
	Weiss 1966	Phytoplankton survey	30 Nov—1 Dec 65; 28 Feb—1 Mar 66		4	3
	Dexter 1967	Haustoriid amphipods				6
	Grossman 1967	Survey: rhizopods, ostracods	1961	1,7,9		6

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Wilder 1967	General hydrology		6		
	Williams *et al.* 1967, 1973	Hydrography	1948—1966 (monthly)	5,6		
	Woods 1967	Hydrography	June 63—Dec 66 (monthly)	2,5,6	1,3	
	Williams and Deubler 1968a	Crustacean macroplankton, ichthyoplankton	Dec 65—Oct 67 (biweekly)	5,6		6,8
	Williams and Deubler 1968b	Crustacean macroplankton, ichthyoplankton	1957—1967	5,6		6-8
	Pickett and Ingram 1969	Sediment analysis		9		
	Porter 1969	Mollusks	1967—1969			6
	Wolfe *et al.* 1969	*Rangia* accumulation of cesium-137		6	7	6
	Woods 1969	Circulation patterns	Summer 67	2		
	Bue 1970	Stream flow	1931—1960	2		
	Hathaway 1971	Cruise data file	1963—1970	5,7,9	3,4,6	
	Park 1971	Sediment analysis		9		
	Williams 1971	Meroplankton survey: brachyurans	Nov 63—Dec 65 (monthly)			6
	Folger 1972	Review: sediments		1,2,6,9	6	
	Hathaway 1972	Bottom sediments		9		
	Williams 1972a	Meroplankton survey: *Ogyrides*	Nov 63—Oct 67 (biweekly)			6
	Williams and Bynum 1972	Meroplankton survey: amphipods	Nov 63—Oct 67 (monthly)			6
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Horton and Bridges 1974	Hydrography, macro-benthos, thermal tolerance	1967—1968	1,5,6,9	1	8,9
	Katuna and Ingram 1974	Sediment analysis		1,9		
	Powell 1974	Fish study	June 71—July 72 (monthly)	5,6	1	8,9
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Amein and Wardak 1975	Dynamic water quality model		1,2,5	1,3	
	Fox and Bynum 1975	Amphipods				6
	Hester and Copeland 1975	Nekton population dynamics	Aug 72—Aug 73 (monthly)	5,6	1,5	6-8
	Hobbie and Smith 1975	Nutrient study	20 Sept 70—24 Jan 74	5,6	1-3,5	3

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
	Knowles 1975	Flow dynamics	7 Aug—14 Sept 73	2,5		
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	3,6
	Fisher *et al.* 1982a	Sediment nutrient regeneration		1	1,3	
	Fisher *et al.* 1982b	Primary productivity	Sept 77—Dec 78	5,7	3,5	4
	Benninger and Martens 1983	Sediment chemistry	7 July 82	1,6,9	4,6,7	
	Khorram and Cheshire 1983	Water quality mapping	24 Sept 82	6,8	5	
	Matson *et al.* 1983 (1st ref)	Biogeochemistry	1981—1982 (monthly)	5,6,9	1,3,4	
	Stanley and Christian 1984	Nutrient study	1979—1982		3	
	Matson and Brinson 1985	Sulfate enrichment study	1981 (monthly)	6	1,3,4	
Area S in general	Wilson 1962	Wetlands	Aug 57—July 59			3
	Giese *et al.* 1979, 1985	Review: hydrology		1,2,6	2-4	
	Sholar 1980	Salinity analysis	1970—1980	6		
	NOAA, National Ocean Survey 1985	Review: physical and hydrologic data		1,2,6		
	Stanley 1985	Review: oxygen depletion		1	1	
Area T: South River						
West Fork	Kirby-Smith and Barber 1979	Water quality study	1974—1978 (biweekly)	1,5-8	1-3,5,6	
Southwest Creek	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Kirby-Smith and Barber 1979	Water quality study	Oct 77—Nov 78 (biweekly)	1,5-8	1-3,5,6	
	Kirby-Smith 1987	Herbicide and pesticide effects	1986—1987	1,4,8,9	4,6,8	6-8
Eastman Creek	Berryhill *et al.* 1972	Bottom sediments	July 66	1,9	6	
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Kirby-Smith and Barber 1979	Water quality study	1974—1978 (biweekly)	1,5-8	1-3,5,6	
	Kirby-Smith 1987	Herbicide and pesticide effects	1986—1987	9	6	6-8
Big Creek	Williams 1955b	Commercial shrimps	1948—1953	1,5,6,9		7
	Williams *et al.* 1967, 1973	Hydrographic survey	1951—1952 (monthly)	5,6		
	Berryhill *et al.* 1972	Bottom sediments	July 66	1,9	6	
	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data P	C	B
South River proper	Williams 1955a	*Ogyrides*		6,9		6
	Williams 1955b	Commercial shrimps	1948—1953	1,5,6,9		7
	Berryhill *et al.* 1972	Bottom sediments	July 66	1,9	6	
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
	Van Maren 1978	Amphipod ecology	Summer 1977	5,6,9	2	3,6
	Kirby-Smith and Barber 1979	Water quality study	1974—1978 (biweekly)	1,5-8	1-3,5,6	
	Lapennas 1980	Phytoplankton study	July 74—Oct 78 (monthly, biweekly)	5-7	3,5	3,4
	Fisher *et al.* 1982a	Sediment nutrient regeneration		1	1,3	
	Fisher *et al.* 1982b	Primary productivity	Sept 77—Dec 78	5,7	3,5	4
	Homziak 1985	Benthic colonization	Oct 79—Oct 80	5,6,9	5,6	6
Area T in general	Wilson 1962	Wetlands	Aug 57—July 59			3
	Berryhill *et al.* 1972	Bottom sediments	July 66	1,6,9	6	6
	Sholar 1980	Salinity analysis	1970—1975	6		
	NOAA, National Ocean Service 1985	Review: physical and hydrologic data		1,2,6		
Area U: Long and West Bays						
Golden Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Fur Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Cudduggen Creek	Ross and Epperly 1985	Community ecology	Mar—Oct 81; Mar—Oct 82 (monthly)	1,6,9	3,6	7,8
Long Bay	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
West Thorofare Bay	Spitsbergen and Wolff 1974	Nursery area survey	Apr 72—Dec 73 (monthly)	5,6,9		6-9
West Bay	Grossman 1961	Survey: rhizopods, ostracods		1,5-9		6
	Duane 1962	Sediment petrology	1959—1962	1,3,6,9		
	Duane 1964	Sediment petrology		1,3,6,9		

Location	Reference	Type of Study	Sampling Date (Frequency)	Type of Data		
				P	C	B
	Pickett 1965	Sediment analysis		1,9	6	
	Williams *et al.* 1967, 1973	Hydrographic survey	1949—1961 (monthly)	5,6		
	Woods 1967	Hydrography	June 63—Dec 66 (monthly)	6		
	Pickett and Ingram 1969	Sediment analysis		9		
	Sheets *et al.* 1970	Pesticides	Aug 67—Sept 68		8	
	Schwartz and Chestnut 1973	Hydrography	1972 (monthly)	5,6		
	Schwartz and Chestnut 1974	Ctenophores, jellyfish	1972 (monthly)	5,6	1	6-8
	Spitsbergen and Wolff 1974	Nursery area survey	Apr 73—Dec 73 (monthly)	5,6,9		6-9
	Pietrafesa *et al.* 1986	Hydrography	Summer 78; Winter 78/79	2		
Area U in general	Winslow 1886, 1889	Hydrography		2,3,6,9		7
	Wilson 1962	Wetlands	Aug 57—July 59			3
	Sheets *et al.* 1970	Pesticides	Aug 67—Sept 68 (monthly)		8	
	Sholar 1980	Salinity analysis	1949—1980	6		

Table 4. **Phylogenetic list of noncommercial invertebrates reported in western Pamlico Sound, N.C. (Areas A-U of Fig. 1), compiled from references cited in Table 3. The second column refers to specific areas where animals were found. The third column was derived from investigations of larger regions composed of several of these specific areas. Animals reported in such studies may have been found in several unspecified areas within these regions. These possible areas are shown in this column.**

	Reported Areas	Possible Areas
Kingdom Protista		
Phylum Sarcodina		
Ammoastuta inepta	J,K,N,R,S	L,M,Q,T
Ammobaculites bensoni	K,L,M,N,P,Q,R,S	
Ammobaculites crassus	J,K,L,M,N,P,Q,R,S	T
Ammobaculites dilitatus	I,Q,R,S	T
Ammobaculites exilis	I,K,L,M,N,P,Q,R,S	J,T
Ammobaculites neusensis	J,K,L,M,N,P,Q,R,S	T
Ammobaculites pamlicoensis	J,K	L,M,N,Q,R,S,T
Ammonia tepida		Q,R,S,T
Ammotumium salsum	I,J,K,L,M,N,P,Q,R,S	T
Arenoparella mexicana	S	Q,R,T
Centropyxis	M	
Difflugia capriolata	L,Q	
Difflugia oblonga	L,Q	
Difflugia urceolata	L	
Elphidium incertum	N,R	
Elphidium tumidum	R	
Haplophragmoides wilberti	I,S	Q,R,T
Miliammina fusca	J,K,L,M,N,P,Q,R,S	T
Streblus limbatobeccarii	I,S	
Streblus tepidus	Q,R,S	
Trochammina inflata	S	
Trochammina macrescens	K	Q,R,S,T
Phylum Ciliophora		
Acineta	M	
Climacostomum	M	
Chilodonella	M	
Condylostoma	M	
Dileptus	M	
Ephelota	M	
Ephelota gemmipara	M	
Epistylis plicatilis	Q	
Folliculina gigantea	M	
Lionotus	M	
Opercularia microdiscum	Q	
Oxytricha	M	
Paradileptus	M	
Parafolliculina mirabilis	M	

	Reported Areas	Possible Areas
Vorticella	M,N	
Zoothamnium	M	
Kingdom Metazoa		
Phylum Porifera		
Anheteromyenia	Q	
Ephydatia	Q	
Eunapius fragilis	Q	
Phylum Cnidaria		
Class Hydrozoa		
Clytia hemisphaerica	N	
Cordylophora caspia	L,M	
Cordylophora lacustris	Q	
Filellum expansum	N	
Garveia cerulea	N	
Hydra	Q	
Nemopsis bachei	A,M,N	
Class Scyphozoa		
Chrysaora quinquecirrha	A,H,I,L,M,N,P,Q,R,S,U	
Rhopilema verrillii	E	
Class Anthozoa		
Diadumene leucolena	N	
Phylum Ctenophora		
Beroe ovata	E,M,N	L
Mnemiopsis leidyi	A,L,M,N,Q,R,S	
Phylum Platyhelminthes		
Class Turbellaria		
Leptoplana	N,R,S	
Stylochus	T	
Stylochus ellipticus	L,M,N	
Phylum Rhynchocoela		
Carinoma tremephorus		M,N
Cerebratulus	T	
Micrura		R,S
Micrura leidyi	M,N	
Phylum Rotifera		
Filinia		L,M,N
Keratella		L,M,N
Sinantherina	Q	
Synchaeta		L,M,N
Phylum Nematoda		
Mylonchulus	Q	

	Reported Areas	Possible Areas
Phylum Mollusca		
Class Gastropoda		
Acteon punctostriatus		Q,R,S
Campeloma	L,M	
Doridella obscura	N	
Elysia chlorotica	T	
Epitonium rupicola	N	Q,R,S
Ercolania vanellus	M,N	
Gyraulus	Q	
Haminoea solitaria	N,R,S	Q
Hydrobia	T	
Littorina irrorata		Q,R,S
Mitrella lunata	N	Q,R,S
Nassarius vibex	N,R,S	Q
Retusa canaliculata	M,N,R,S	
Retusa sulcata	T	
Sayella chesapeakea	M,N	Q,R,S
Urosalpinx cinerea	O,S	
Class Bivalvia		
Amygdalum papyria		Q,R,S
Anadara ovalis		Q,R,S
Anodonta cataracta	Q	
Anodonta cowperiana	Q	
Anodonta imbecilis	Q	
Brachiodontes recurvus	A,N	Q,R,S
Congeria leucophaeta	L,M,Q	
Elliptio complanatus	Q	
Gemma gemma	N,S	
Lampsilis cariosa	Q	
Lucina multilineata	S	Q,R
Lyonsia hyalina	N	
Macoma balthica	A,H,I,L,M,N,R,S,T	
Macoma mitchelli	H,I,T	
Macoma phenax	I,M,N,Q,R,S	
Macoma tenta	T	
Modiolus	Q,T	
Modiolus demissus	M,N,Q	
Mulinia lateralis	A,H,I,M,N,R,S,T	
Musculium	Q	
Mya arenaria	M,N,T	Q,R,S
Mytilopsis leucophaeata		Q,R,S
Petricola pholadiformis	N	Q,R,S
Polymesoda caroliniana	Q	
Rangia	Q	
Rangia cuneata	A,K,L,M,N,Q,R,T	
Sphaerium	Q	
Tagelus plebeius		Q,R,S
Tellina agilis		Q,R,S

	Reported Areas	Possible Areas
Class Scaphopoda		
Cadulus quadridentatus		Q,R,S
Phylum Annelida		
Class Polychaeta		
Branchioasychis americana	Q	
Capitella capitata	A,T	M,N
Ceratonereis irritabilis		M,N
Diopatra	N	
Eteone alba	M,R,S	
Eteone heteropoda	M	
Glycera	M	
Glycera dibranchiata	A,M,N	
Haploscoloplos fragilis	M,N,R,S	
Heteromastus filiformis	L,M,N,R,S,T	
Hobsonia florida	M,T	
Hypaniola florida	L,M	
Laeonereis culveri	L,M,T	N
Loimia medusa	N,S	
Mediomastus	M	
Mediomastus californiensis	T	
Melinna	T	
Melinna cristata	Q	
Myzobdella	L,M	
Myzobdella lugubrius	M	
Nereis	M,N	
Nereis succinea	A,L,M,N,Q,R,S,T	
Notomastus hemipodus	M,N	
Onuphis	F,M	
Pectinaria gouldii	M,N,R,S	
Phyllodoce fragilis	T	
Polydora	L,M	
Polydora ligni	M	
Polydora socialis	T	
Polydora websteri	L,M,N	
Scolecolepides viridis	A,L,M,T	
Scoloplos rubra		M,N
Spiophanes bombyx	N	
Streblospio benedicti	M,T	
Class Oligochaeta		
Allonais	Q	
Aulophorus	Q	
Chaetogaster	Q	
Paranais	Q	
Peloscolex	Q	
Pristina	Q	
Specaria	Q	
Stylaria	Q	

	Reported Areas	Possible Areas
Phylum Arthropoda		
Subphylum Chelicerata		
Limulus polyphemus	B	
Subphylum Crustacea		
Class Branchiopoda		
Daphnia pulex	Q	
Evadne		M,N
Podon	M,N	
Class Ostracoda		
Cushmanidea echlosae	R	
Cushmanidea seminuda	R	
Cyprideis torosa	N,R	
Cythermorpha curta	P,R	
Cytherura elongata	R	
Perrissocytheridea	R	
Class Copepoda		
Order Calanoida		
Acartia tonsa	I,M	L,N
Eurytemora	I	L,M,N
Order Cyclopoida		
Ergasilus		L,M,N
Ergasilus versicolor	M	
Oithona		L,M,
Order Harpacticoida		
Arenosetella fissilis	N	
Canuella		L,M,N
D'Arcythompsonia inopinata	L	
Ectinosoma	N	
Enhydrosoma lacunae	M	
Euterpina acutifrons	M	
Halectinosoma	N	
Heteropsyllus nunni	L,M,N	
Leptocaris	M	
Leptomesochra tenuicornis	L,M,N	
Mesochra	L,M	
Mesochra parva	L,M	

	Reported Areas	Possible Areas
Metis natans	M	
Microsetella		L,M,N
Nitocra dubia	L	
Nitocra lacustris	L	
Paraleptastacus katamensis	L,M,N	
Paronychocamptus huntsmani	L,N	
Paronychocamptus wilsoni	L,M,N	
Pseudobradya brevicornis	L,M,N	
Rhizothrix	N	
Rhizothrix tenella	N	
Schizopera	L,N	
Schizopera variseta	L,M,N	
Scottolana canadensis	L,M,N	
Tachidius incisipes	M	
Thompsonula hyaenae	N	
Zausodes arenicolus	M	
Order Caligoida		
Caligus	M	
Class Branchiura		
Argulus	Q	
Argulus alosae	L,M,Q,R,S	
Lathonura rectirostris	Q	
Pseudosida bidentata	Q	
Class Cirripedia		
Balanus	M	L,N
Balanus amphitrite	L,M,N	
Balanus balanoides	K,M,N	
Balanus eburneus	N	
Balanus improvisus	M,N	
Balanus subalbidus	L,M,N	
Class Malacostraca		
Subclass Phyllocarida		
Order Leptostraca		
Nebalia		M
Subclass Eumalacostraca		
Order Decapoda		
Acetes americanus	L,N,R,S	
Callinectes similis	R	
Crangon septemspinosa	N,Q,R,S	
Lucifer faxoni	L,M,N,Q,R,S	
Ogyrides limicola	D,E,L,M,N,Q,R,S,T	
Palaemonetes	L,M,N,Q,R,S	
Palaemonetes pugio	I,L,M,N,Q,R,S	T

	Reported Areas	Possible Areas
Palaemonetes vulgaris		Q,R,S,T
Pinnixa sayana	N,Q,R,S	
Pinnotheres	M,N,R,S	
Pinnotheres ostreum	A	
Rhithropanopeus harrisii	H,I,L,M,N,Q,R,S,T	
Trachypeneus constrictus	R	
Uca pugilator	A	
Upogoebia	Q	
Order Mysidacea		
Mysidopsis bigelowi	L,M,N,Q,R,S	
Neomysis americana	I,L,M,N,Q,R,S	
Order Cumacea		
Leptocuma minor	L,N,Q,R,S	
Oxyurostylis smithi	L,N,Q,R,S	
Order Tanaidacea		
Hargeria rapax	M	
Leptochelia savignyi	A	
Order Isopoda		
Aega psora	M	
Aegathoa oculata		L,M,N
Cassidinidea lunifrons	L,M,T	
Chiridotea	M	
Chiridotea nigrescens	A	
Cyathura		I
Cyathura carinata		M,N
Cyathura polita	A,L,M,N,Q,R,S,T	
Edotea	M	
Edotea triloba	L,M,N,Q,R,S,T	
Idotea savigny	T	
Erichsonella attenuata	L,M,N,Q,R,S	
Lironeca ovalis	L,M,N,Q,R,S	
Sphaeroma quadridentatum	M	
Order Amphipoda		
Acanthohaustorius intermedius		Q,R,S,T
Ampelisca vadorum		Q,R,S,T
Ampelisca verrilli		Q,R,S,T
Ampithoe longimana		Q,R,S,T
Batea catharinensis		L,M,N,Q,R,S,T
Caprella equilibra		L,M,N,Q,R,S,T
Caprella penantis		L,M,N,Q,R,S,T
Corophium	A,T	
Corophium acutum	T	
Corophium aquafuscum	Q	
Corophium cylindricum	L,M,N,Q,R,S	
Corophium lacustre	L,M,N,R	Q,S,T

	Reported Areas	Possible Areas
Crangonyx pseudogracilis	R	
Crangonyx serratus	Q,R	
Cymadusa compta		L,M,N,Q,R,S,T
Elasmopus levis		L,M,N,Q,R,S,T
Erichthonius brasiliensis		L,M,N
Gammarus	A,M	L,N,Q,R,S,T
Gammarus daiberi	P,Q	
Gammarus fasciatus	Q,R	
Gammarus mucronatus	M,T	L,N,Q,R,S
Gammarus palustris	P,Q,R,T	S
Gammarus tigrinus	L,M,N,P,Q,R,T	S
Hyale	Q	
Hyalella azteca	Q	R,S,T
Jassa falcata		L,M,N
Lembos smithi		Q,R,S,T
Lepidactylus dytiscus	C,E,L,M,N,R,S	Q,T
Leptocheirus plumulosus	L,M	N,Q,R,S,T
Melita appendiculata		Q,R,S,T
Melita nitida	P,R,T	L,M,N,Q,S
Monoculodes edwardsi	L,M,N,Q,R,S,T	
Mucrogammarus mucronatus	R,T	
Parahaustorius logimerus	M,N,R,S	
Pleusymtes		Q,R,S,T
Stenothoe gallensis		L,M,N
Subphylum Uniramia		
Class Insecta		
Chaoborus	Q	
Chaoborus punctipennis	Q	
Chironomus	L,M,Q,T	
Chironomus crassicaudatus	Q	
Coelotanypus	Q	
Conchapelopia	Q	
Cryptochironomus	Q,T	
Cryptochironomus fulvus	Q	
Hydaticus	M	
Hydropsyche	L	
Nectopsyche	Q	
Oecetis cinarascens	L	
Parachironomus alatus	Q	
Parachironomus pectinatellae	Q	
Parachironomus sublettei	Q	
Paracladopelma	Q	
Pentaneura	M	
Polypedilum	Q	
Polypedilum fallax	Q	
Procladius	Q	
Procladius culiciformis	Q	
Pseudochironomus	Q	
Rheotanytarsus	Q	
Tanytarsini	Q	
Trichocorixa	M	

	Reported Areas	Possible Areas
Phylum Bryozoa		
Christatella	Q	
Electra crustulenta	N	
Membranipora lineata	K,M,N	
Membranipora tenuis	M,N	
Pectatinella	Q	
Plumatella	Q	
Victorella pavida	L,M,N	
Phylum Entoprocta		
Urnatella gracilis	Q	
Phylum Echinodermata		
Class Holothuroidea		
Leptosynapta inhaerens	M,N,R,S	
Phylum Hemichordata		
Balanoglossus	N	
Phylum Chordata		
Class Ascidiacea		
Molgula manhattenis	N	

LITERATURE CITED

Allen, D.W. 1964. Clay minerals of Tar-Pamlico River sediments. MS Thesis, Department of Geology, University of North Carolina, Chapel Hill, N. C. 34 p.

Amein, M. and S.G. Wardak. 1975. A dynamic water quality model for the Neuse estuary, N.C., University of North Carolina Sea Grant Publication No. UNC- SG-75-28. Raleigh, N. C. 62 p.

Bayless, J. and E.H. Shannon. 1965. Survey and classification of the Pamlico River and tributaries, North Carolina. Final Report, Federal Aid in Fish Restoration, Job I-K, Project F-14-R, Division of Inland Fisheries, North Carolina Wildlife Resources Commission, Raleigh, N. C.

Bayless, J.D. and W.B. Smith. 1962. Survey and classification of the Neuse River and tributaries, North Carolina. Final Report, Federal Aid in Fish Restoration, Job I-A, Project F-14-R, Division of Inland Fisheries, North Carolina Wildlife Resources Commission, Raleigh, N. C. 33 p.

Bellis, V.J. 1971. A computer-based floristic analysis of Pamlico River phytoplankton. University of North Carolina Water Resources Research Institute Report No. 46. Raleigh, N. C. 28 p.

Bellis, V.J. and A.C. Gaither. 1985. Seasonality of above-ground and below-ground biomass for six salt marsh plant species. J. Elisha Mitchell Sci. Soc. 101: 95-109.

Benninger, L.K. and C.S. Martens. 1983. Sources and fates of sedimentary organic matter in the White Oak and Neuse River estuaries. University of North Carolina Water Resources Research Institute Report No. 194. Raleigh, N. C. 60 p.

Benson, P.H. III. 1965. A comparison of the clay mineralogy of marsh and adjacent non-marsh environments along the North Carolina coast. MS Thesis, Department of Geology, University of North Carolina, Chapel Hill, N. C. 31 p.

Benton, S.B. 1979. Halocene evolution of a nanotidal brackish marsh--protected bay system Roanoke Island, North Carolina. MS Thesis, Department of Geology, East Carolina University, Greenville, N. C. 176 p.

Berryhill, H.L., Jr., V.E. Swanson and A.H. Love. 1972. Organic and trace-element content of Holocene sediments in two estuarine bays, Pamlico Sound area, North Carolina. Contributions to Geochemistry, Geological Survey Bulletin 1314-E:E1-E32.

Billingsley, G.A., R.E. Fish and R.G. Schipf. 1957. Water resources of the Neuse River basin, North Carolina. United States Geological Survey Water-Supply Paper 1414. United States Government Printing Office, Washington, D.C. 89 p.

Billingsley, G.A. and B.F. Joyner. 1953. Chemical and physical character of surface waters of North Carolina 1951-1952. N. C. Department of Conservation and Development, Division of Water Resources and Engineering in cooperation with the United States Geological Survey, Raleigh, N.C. Bulletin 52, Vol. 8. 62 p.

Billingsley, G.A. and B.F. Joyner. 1954. Chemical and physical character of surface waters of North Carolina 1952-53. North Carolina Department of Conservation and Development, Division of Water Resources, Inlets and Coastal Waterways in cooperation with the United States Geological Survey, Raleigh, N. C. Bulletin 52, Vol. 9. 68 p.

Bradshaw, H.D., M.M. Brinson, E.A. Matson and G.J. Davis. 1985. Composition and metabolism of sediments in irregularly flushed estuarine creeks in North Carolina. J. Elisha Mitchell Sci. Soc. 101: 52-75.

Brinson, M.M. and E.A. Matson. 1983. Carbon isotope distribution in the Pamlico River estuary, North Carolina and tributaries. Estuaries 6: 306 [abstract].

Brown, C.Q. and R.L. Ingram. 1954. The clay minerals of the Neuse River sediments. J. Sed. Petrol. 24: 196-199.

Bue, C.D. 1970. Streamflow from the United States into the Atlantic Ocean during 1931-60. United States Geological Survey Water-Supply Paper 1899-I. United States Government Printing Office, Washington, D.C. 36 p.

Burke, W.A. 1978. Organic carbon and deoxygenation in the Pamlico River estuary. MS Thesis, Department of Biology, East Carolina University, Greenville, N. C. 141 p.

Burke, W.A., G.J. Davis and M.M. Brinson. 1977. Deoxygenation on the Pamlico River. J. Elisha Mitchell Sci. Soc. 93: 81 [abstract].

Burke, W.A., G.J. Davis and M.N. Jones. 1977. A winter inorganic nutrient enrichment study in the middle reach of the Pamlico River estuary, North Carolina. J. Elisha Mitchell Sci. Soc. 93: 82-83 [abstract].

Cabaniss, S.E. 1982. The effects of bottom water anoxia on benthic nutrient flux rates in the Pamlico River. MS Thesis, Department of Environmental Sciences and Engineering, School of Public Health, University of North Carolina, Chapel Hill, N. C. 58 p.

Carpenter, E.J. 1970. Effects of phosphorus mining wastes on microorganisms of the Pamlico River estuary, North Carolina. PhD Dissertation, Department of Zoology, North Carolina State University, Raleigh, N. C. 69 p.

Carpenter, E.J. 1971. Effects of phosphorus mining wastes on the growth of phytoplankton in the Pamlico River estuary. Chesapeake Sci. 12: 85-94.

Chamblee, J.W., F.K. Arey and E. Heckel. 1984. Free fluoride of the Pamlico River in North Carolina. A new method to localize the discharge of polluted water into an estuary. Water Res. 18: 1225-1233.

Chang, S-Y. 1977. Non-steady state model of phosphorus and nitrogen for Pamlico River estuary, North Carolina. Technical Report No. 682, Department of Environmental Sciences and Engineering, School of Public Health, University of North Carolina, Chapel Hill, N.C. 88 p.

Chemerys, J.C. and E.J. Phibbs, Jr. 1962. Chemical and physical character of surface waters of North Carolina 1958-59. North Carolina Department of Water Resources, Division of Stream Sanitation and Hydrology in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. I, Vol. III. 180 p.

Chestnut, A.F. 1956. The distribution of oyster drills in North Carolina. Proc. Nat. Shellfish Ass. 46: 134-139.

Christian, R.R., D.W. Stanley and D.A. Daniel. 1984. Microbiological changes occurring at the freshwater-seawater interface of the Neuse River estuary, North Carolina, p. 349-365. *In* V.S. Kennedy [ed] The estuary as a filter. Academic Press, New York.

Chynoweth, D.P. 1965. Baseline survey of the benthic macroinvertebrates of the Pamlico River. Technical Report No. 264, Department of Environmental Sciences and Engineering, School of Public Health, University of North Carolina, Chapel Hill, N. C. 55 p.

Civils, M.F. 1982. A distributional study of estuarine macrobenthos in the sandy littoral of the Pamlico River, North Carolina. MS Thesis, Department of Biology, East Carolina University, Greenville, N. C. 102 p.

Copeland, B.J. and H.L. Davis. 1972. Estuarine ecosystems and high temperatures. University of North Carolina Water Resources Research Institute Report No. 68. Raleigh, N. C. 90 p.

Copeland, B.J. and J.E. Hobbie. 1972. Phosphorus and eutrophication in the Pamlico River estuary, N.C., 1966-1969--a summary. University of North Carolina Water Resources Research Institute Report No. 65. Raleigh, N.C. 86 p.

Copeland, B.J., R.G. Hodson and S.R. Riggs. 1984. The ecology of the Pamlico River, North Carolina: an estuarine profile. U.S. Fish and Wildlife Service, Division of Biological Services, FWS/OBS-82/06, Washington, D.C. 83 p.

Copeland, B.J., K.R. Tenore and D.B. Horton. 1974. Oligohaline regime, p. 315- 357. *In* H.T. Odum, B.J. Copeland and E.A. McMahan [eds] Coastal ecological systems of the United States. Vol. II. The Conservation Foundation, Washington, D.C.

Crawford, C.C. 1967. The heterotrophic uptake of dissolved amino acids by bacteria in natural waters. MS Thesis, Department of Zoology, North Carolina State University, Raleigh, N. C. 39 p.

Crawford, C.C. 1971. The utilization of dissolved free amino acids by estuarine microorganisms. PhD Dissertation, Department of Zoology, North Carolina State University, Raleigh, N. C. 59 p.

Crawford, C.C., J.E. Hobbie and K.L. Webb. 1973. Utilization of dissolved organic compounds by microorganisms in an estuary, p. 169-180. *In* L.H. Stevenson and R.R. Colwell [eds] Estuarine microbial ecology. University of South Carolina Press, Columbia, S. C.

Crawford, C.C., J.E. Hobbie and K.L. Webb. 1974. The utlization of dissolved free amino acids by estuarine microorganisms. Ecology 55: 551-563.

Crump, R.M. 1971. Population density and distribution of the estuarine clam *Rangia cuneata* in Croatan Sound, North Carolina. MA Thesis, Department of Biology, East Carolina University, Greenville, North Carolina. 68 p.

Currin, B.M. 1984. Food habits and food consumption of juvenile spot, *Leiostomus xanthurus*, and croaker, *Micropogonias undulatus*, in their nursery areas. MS Thesis, Department of Zoology, North Carolina State University, Raleigh, N. C. 103 p.

Currin, B.M., J.P. Reed and J.M. Miller. 1984. Growth, production, food consumption and mortality of juvenile spot and croaker: a comparison of tidal and nontidal nursery areas. Estuaries 7: 451-459.

Custer, E.S., Jr. and R.C. Ingram. 1974. Influence of the sedimentary processes on grain size distribution curves of bottom sediments in the sounds and estuaries of North Carolina. University of North Carolina Sea Grant Publication No. UNC-SG-74-13, Raleigh, N. C. 90 p.

Davis, G.J., H.D. Bradshaw, M.M. Brinson and G.M. Lekson. 1985. Salinity and nutrient dynamics in Jacks, Jacobs, and South Creeks in North Carolina, October 1981-November 1982. J. Elisha Mitchell Sci. Soc. 101: 37-51.

Davis, G.J., H.D. Bradshaw and S.M. Harlan. 1985. Submersed macrophytes in Jacks and Jacobs Creeks, September 1981-February 1983. J. Elisha Mitchell Sci. Soc. 101: 125-129.

Davis, G.J. and M.M. Brinson. 1976. The submersed macrophytes of the Pamlico River estuary, North Carolina. University of North Carolina Water Resources Research Institute Report No. 112. Raleigh, N.C. 202 p.

Davis, G.J., M.M. Brinson and W.A. Burke. 1978. Organic carbon and deoxygenation in the Pamlico River estuary. University of North Carolina Water Resources Research Institute Report No. 131. Raleigh, N. C. 123 p.

Davis, G.J., M.M. Brinson and J.R. Overton. 1985. The decline of submersed macrophytes in the Pamlico River, North Carolina. Final report to the University of North Carolina Water Resources Research Institute and the North Carolina Department of Natural Resources and Community Development, Division of Environmental Management, Raleigh, N. C. 18 p.

Davis, H.L., III. 1968. The net exchanges of phosphorus by estuarine sediments in flowing waters. MS Thesis, Department of Zoology, North Carolina State University, Raleigh, N. C. 41 p.

Davis, H.L., III. 1971. Evaluation and use of the partial pressure of carbon dioxide in studying community metabolism in heated experimental ecosystems. PhD Dissertation, Curriculum of Marine Sciences, North Carolina State University, Raleigh, N. C. 90 p.

Dean, T.A. 1973. Epifauna of the Pamlico River estuary, North Carolina. MA Thesis, Department of Biology, East Carolina University, Greenville, N. C. 114 p.

Dean, T.A. and V.J. Bellis. 1975. Seasonal and spatial distribution of epifauna in the Pamlico River estuary, North Carolina. J. Elisha Mitchell Sci. Soc. 91: 1-12.

DeSylva, D.P. 1975. Nektonic food webs in estuaries, p. 420-447. *In* L.E. Cronin [ed] Estuarine research, Vol. 1. Chemistry, biology, and the estuarine system. Academic Press, New York.

Dexter, D.M. 1967. Distribution and niche diversity of haustoriid amphipods in North Carolina. Chesapeake Sci. 8: 187-192.

Dillon, R. and W.J. Woods. 1970. Benthic productivity, p. 133-143. *In* H.T. Odum and A.F. Chestnut [eds] Studies of marine estuarine ecosystems developing with treated sewage wastes. Institute of Marine Sciences, University of North Carolina, Chapel Hill and Morehead City, N. C.

Dobbins, D.A. 1967. Sedimentary geochemistry and hydrogeochemistry of Pamlico River-Pamlico Sound estuary, North Carolina. PhD Dissertation, Department of Geology, University of North Carolina, Chapel Hill, N. C. 79 p.

Dobbins, D.A., P.C. Ragland and J.D. Johnson. 1970. Water-clay interactions in North Carolina Pamlico estuary. Environ. Sci. Technol. 4: 743-748.

Dreyer, P.C. 1969. An estimate of the pollutional assimilative capacity of the Pamlico River estuary. MS Thesis, Department of Civil Engineering, North Carolina State University, Raleigh, N. C. 86 p.

Duane, D.B. 1962. Petrology of Recent bottom sediments of the western Pamlico Sound region, North Carolina. PhD Dissertation, Department of Geology, University of Kansas, Lawrence, Kansas. 108 p.

Duane, D.B. 1964. Significance of skewness in Recent sediments, western Pamlico Sound, North Carolina. J. Sed. Petrol. 34: 864-874.

Edzwald, J.K. 1972. Coagulation in estuaries. University of North Carolina Sea Grant Publication No. UNC-SG-72-06. Chapel Hill, N. C. 204 p.

Edzwald, J.K. and C.R. O'Melia. 1975. Clay distributions in Recent estuarine sediments. Clays Clay Minerals 23: 39-44.

Edzwald, J.K., J.B. Upchurch and C.R. O'Melia. 1974. Coagulation in estuaries. Environ. Sci. Technol. 8: 58-63.

Epperly, S.P. 1984. Fishes of the Pamlico-Albemarle peninsula, N.C. Area utilization and potential impacts. Special Scientific Report No. 42. North Carolina Department of Natural Resources and Community Development, Division of Marine Fisheries, Morehead City, N. C. 129 p.

Epperly, S.P. and S.W. Ross. 1986. Characterization of the North Carolina Pamlico-Albemarle estuarine complex. NOAA Technical Memorandum NMFS-SEFC-175. 55 p.

Fisher, T.R., P.R. Carlson and R.T. Barber. 1982a. Sediment nutrient regeneration in three North Carolina estuaries. Estuar. Coast. Shelf Sci. 14: 101-116.

Fisher, T.R., P.R. Carlson and R.T. Barber. 1982b. Carbon and nitrogen primary productivity in three North Carolina estuaries. Estuar. Coast. Shelf Sci. 15: 621-644.

Folger, D.W. 1972. Characteristics of estuarine sediments of the United States. Geol. Sur. Prof. Paper 742. U.S. Government Printing Office, Washington, D.C. 94 p.

Fox, R.S. and K.H. Bynum. 1975. The amphipod crustaceans of North Carolina estuarine waters. Chesapeake Sci. 16: 223-237.

Gerry, L.R. 1981. The effects of salinity fluctuations and salinity gradients on the distribution of juvenile spot, *Leiostomus xanthurus*, and croaker, *Micropogonias undulatus*. MS Thesis, Department of Marine, Earth and Atmospheric Sciences, North Carolina State University, Raleigh, N. C. 57 p.

Giese, G.L., H.B. Wilder and G.G. Parker, Jr. 1979. Hydrology of major estuaries and sounds of North Carolina, p. 70-128. *In* United States Geological Survey Water Resources Investigations 79-46. North Carolina Department of Natural Resources and Community Devleopment. Raleigh, North Carolina.

Giese, G.L., H.B. Wilder and G.G. Parker, Jr. 1985. Hydrology of major estuaries and sounds of North Carolina. United States Geological Survey Water-Supply Paper 2221. United States Government Printing Office, Washington, D.C. 108 p.

Grave, C. 1905. Investigations for the promotion of the oyster industry of North Carolina, p. 247-315. *In* Report of the commissioner for the year ending June 30, 1903. United States Commission of Fish and Fisheries. Pt. 29. United States Government Printing Office, Washington, D.C.

Gray, S. and C. Winkler. 1977. Population density and distribution of *Rangia cuneata* in the Pamlico River, North Carolina. Unpublished report. Biology Department, East Carolina University, Greenville, N. C. 33 p.

Green, D.P. 1980. Environmental factors influencing bacterial levels associated with *Rangia cuneata* (Gray) in North Carolina. MS Thesis, Department of Biology, East Carolina University, Greenville, N. C. 88 p.

Griffin, G.M. and R.L. Ingram. 1955. Clay minerals of the Neuse River estuary. J. Sed. Petrol. 25: 194-200.

Grimes, B.H. and W.W. Hassler. 1979. Plankton studies in the vicinity of the Weyerhaeuser mills on the Roanoke and Neuse Rivers, North Carolina. Unpublished report.

Grossman, S. 1961. The ecology of the Rhizopodea and Ostracoda of the southern Pamlico Sound region, North Carolina. PhD Dissertation, Department of Geology, University of Kansas, Lawrence, Kan. 254 p.

Grossman, S. 1967. Living and subfossil rhizopod and ostracode populations, p. 7-82, Part 1. *In* S. Grossman and R.H. Benson. Ecology of Rhizopodea and Ostracoda of southern Pamlico Sound region, N. C. Univ. Kansas Paleontol. Contrib. 44: 1-90.

Harding, S.C. 1974. Distribution of selected trace elements in sediments of Pamlico River estuary, North Carolina. MS Thesis, Department of Geoscience, North Carolina State University, Raleigh, N. C. 40 p.

Harding, S.C. and H.S. Brown. 1975. Distribution of selected trace elements in sediments of Pamlico River estuary, North Carolina. Environ. Geol. 1 (1975-1976, winter-spring): 181-191.

Harris, K.F. and B.F. Joyner. 1955. Chemical and physical character of surface waters of North Carolina 1953-54. North Carolina Department of Conservation and Development, Division of Water Resources, Inlets and Coastal Waterways in cooperation with the United States Geological Survey, Raleigh, N. C. Bulletin 52, Vol. 10. 67 p.

Harrison, W.G. 1973. Nitrate reductase activity during a dinoflagellate bloom. Limnol. Oceanogr. 18: 457-465.

Harrison, W.G. 1974. Nitrogen budget of a North Carolina estuary. PhD Dissertation, Department of Zoology, North Carolina State University, Raleigh, N. C. 172 p.

Harrison, W.G. and J.E. Hobbie. 1974. Nitrogen budget of a North Carolina estuary. University of North Carolina Water Resources Research Institute Report No. 86. Raleigh, N. C. 172 p.

Hartness, T.S. 1977. Distribution and clay mineralogy of organic-rich mud sediments in the Pamlico River estuary, North Carolina. MS Thesis, Department of Geology, East Carolina University, Greenville, N. C. 45 p.

Harwood, J.E. 1975. The use of remote sensing in a study of submerged aquatic macrophytes of the Pamlico River estuary, N.C. MA Thesis, Department of Biology, East Carolina University, Greenville, N. C. 75 p.

Hathaway, J.C. [ed] 1971. Data file, Continental Margin Program, Atlantic coast of the United States, Vol. 2. Sample collection and analytical data. Woods Hole Oceanogr. Inst. Ref. 71-15, Woods Hole, Mass. 496 p.

Hathaway, J.C. 1972. Regional clay mineral facies in estuaries and continental margin of the United States East Coast, p. 293-316. *In* B.W. Nelson [ed] Environmental framework of coastal plain estuaries. Geological Society of America, Memoir 133, Boulder, Co.

Heath, J.K. and R.R. Christian. 1985. Sulfate reduction in oligohaline marsh soils. J. Elisha Mitchell Sci. Soc. 101: 110-115.

Hester, J.M., Jr. and B.J. Copeland. 1975. Nekton population dynamics in the Albemarle Sound and Neuse River estuaries. University of North Carolina Sea Grant Publication No. UNC-SG-75-02. Raleigh, N. C. 129 p.

Hill, L.O. 1966. Fluoride analysis in the Pamlicro [sic] estuary using lanthanum-alizarin complexone. MS technical report, Department of Environmental Sciences and Engineering, School of Public Health, University of North Carolina, Chapel Hill, N. C.

Hobbie, J.E. 1970a. Hydrography of the Pamlico River estuary, N.C. University of North Carolina Water Resources Research Institute Report No. 39. Raleigh, N. C. 69 p.

Hobbie, J.E. 1970b. Phosphorus concentrations in the Pamlico River estuary of North Carolina. University of North Carolina Water Resources Research Institute Report No. 33. Raleigh, N. C. 47 p.

Hobbie, J.E. 1971. Phytoplankton species and populations in the Pamlico River estuary of North Carolina. University of North Carolina Water Resources Research Institute Report No. 56. Raleigh, N. C. 147 p.

Hobbie, J.E. 1974a. Ecosystems receiving phosphate wastes, p. 252-270. *In* H.T. Odum, B.J. Copeland and E.A. McMahan [eds] Coastal ecological systems of the United States. The Conservation Foundation, Washington, D.C.

Hobbie, J.E. 1974b. Nutrients and eutrophication in the Pamlico River estuary, N.C., 1971-1973. University of North Carolina Water Resources Research Institute Report No. 100. Raleigh, N. C. 239 p.

Hobbie, J.E., B.J. Copeland and W.G. Harrison. 1972. Nutrients in the Pamlico River estuary, N.C. University of North Carolina Water Resources Research Institute Report No. 76. Raleigh, N. C. 242 p.

Hobbie, J.E., B.J. Copeland and W.G. Harrison. 1975. Sources and fates of nutrients of the Pamlico River estuary, North Carolina, p. 287-302. *In* L.E. Cronin [ed] Estuarine research, Vol. I. Chemistry, biology and the estuarine system. Academic Press, Inc., New York.

Hobbie, J.E. and C.C. Crawford. 1969. VIII. Ecology of freshwater organisms. 1. Aquatic bacteria. Bacterial uptake of organic substrate: new methods of study and application to eutrophication. Verh. Internat. Verein. Limnol. 17: 725-730.

Hobbie, J.E. and N.W. Smith. 1975. Nutrients in the Neuse River estuary. University of North Carolina Sea Grant Publication No. UNC-SG-75-21. Raleigh, N. C. 183 p.

Homziak, J. 1985. Does succession occur in estuarine soft substrates? Seasonal patterns of colonization and mechanisms of species replacement in experimentally defaunated sediments. PhD Dissertation, Curriculum in Marine Sciences, University of North Carolina, Chapel Hill, N.C. 349 p.

Horton, D.B. 1967. Water current studies in Pamlico River estuary, p. 95-103. *In* Proceedings Symposium on hydrology of the coastal waters of North Carolina, May 12, 1967. University of North Carolina Water Resources Research Institute Report No. 5. Chapel Hill, N. C.

Horton, D.B. and D.W. Bridges. 1974. A study to predict the effects of thermal additions in the Bay River and Neuse River area of North Carolina. Unpublished report of The Research Institute of the Gulf of Maine (TRIGOM). 45 p.

Horton, D.B., E.J. Kuenzler and W.J. Woods. 1967. Current studies in the Pamlico River and estuary of North Carolina. University of North Carolina Water Resources Research Institute Report No. 6. Raleigh, N. C. 21 p.

Institute for Coastal and Marine Resources. 1976. Interim report for research on the ecology of the Pamlico River estuary for the period 11 July, 1975, to 7 Oct., 1976. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 21 p.

Institute for Coastal and Marine Resources. 1977. Interim report for research on the ecology of the Pamlico River estuary for the period November 5, 1976, to August 10, 1977. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 22 p.

Institute for Coastal and Marine Resources. 1978. Annual report for research on the ecology of the Pamlico River estuary, North Carolina, for the period September 1, 1977, to August 31, 1978. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N.C. 19 p.

Institute for Coastal and Marine Resources. 1980. Annual report for research on the ecology of the Pamlico River estuary, 1979. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C.

Institute for Coastal and Marine Resources. 1981a. Annual report for research on the ecology of the Pamlico River estuary, 1980. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 23 p.

Institute for Coastal and Marine Resources. 1981b. Nursery area assessment of Bond, Long and Short Creeks, Beaufort County, North Carolina. Annual Report to Texasgulf, Inc. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 134 p.

Institute for Coastal and Marine Resources. 1982a. Annual report for research on the ecology of the Pamlico River estuary, 1981. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 26 p.

Institute for Coastal and Marine Resources. 1982b. Nursery area assessment of Bond, Long and Short Creeks, Beaufort County, North Carolina. Annual Report to Texasgulf, Inc. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 75 p.

Institute for Coastal and Marine Resources. 1983. Annual report for research on the ecology of the Pamlico River estuary, 1982. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C.

Jarrett, J.T. 1966. A study of the hydrology and hydraulics of Pamlico Sound and their relation to the concentration of substances in the Sound. MS Thesis, Department of Civil Engineering, North Carolina State University, Raleigh, N. C. 156 p.

Johnson, J.D. and E.D. Daugherty. 1968. Fluoride analysis in the Pamlico estuary using the selective ion electrode. Publication No. 177, Department of Environmental Sciences and Engineering, School of Public Health, University of North Carolina, Chapel Hill, N.C. 49 p.

Jones, R.A. and T.M. Sholar. 1981. Effects of freshwater discharge on estuarine nursery areas of Pamlico Sound. Completion Report, Project CEIP 79-11, North Carolina Department of Natural Resources and Community Development, Division of Marine Fisheries, Morehead City, N. C. 60 p.

Jurgensen, M. [undated] Soil analysis of Texas Gulf Sulfur effluent and Pamlico River bottom sediments. Unpublished Report. Pamlico Marine Laboratory, Aurora, N. C.

Kapetsky, J. M. 1984. Coastal Lagoon Fisheries Around the World: Some Perspectives on Fishery Yields and Other Comparative Fishery Characteristics. p. 97-139. *In* J.M. Kapetsky and G. Lasserre [ed.] Management of Coastal Lagoon Fisheries, Studies and Reviews. Vol. 1, No. 61. Food and Agriculture Organization of United Nations, Rome. 438 p.

Katuna, M.P. and R.L. Ingram. 1974. Sedimentary structures of a Modern lagoonal environment: Pamlico Sound, North Carolina. University of North Carolina Sea Grant Publication No. UNC-SG-74-14. Raleigh, N. C. 117 p.

Keup, L. and J. Bayless. 1964. Fish distribution at varying salinities in Neuse River basin, North Carolina. Chesapeake Sci. 5: 119-123.

Khorram, S. and H.M. Cheshire. 1983. The use of Landsat MSS digital data in water quality mapping of the Neuse River estuary, N.C. University of North Carolina Water Resources Research Institute Report No. 193. Raleigh, N. C. 29 p.

Kirby, S.C., M.A. Bailey and G.J. Davis. 1977. Summer planktonic respiration in the Pamlico River estuary, North Carolina. J. Elisha Mitchell Sci. Soc. 93: 80-81 [abstract].

Kirby-Smith, W.W. 1987. Fates and effects of herbicides and pesticides on estuaries. Progress report to the United States Environmental Protection Agency, Environmental Research Laboratory, Gulf Breeze, Fla. 81 p.

Kirby-Smith, W.W. and R.T. Barber. 1979. The water quality ramifications in estuaries of converting forest to intensive agriculture. University of North Carolina Water Resources Research Institute Report No. 148. Raleigh, N. C. 70 p.

Kirby-Smith, W. and C. van Dover. 1979. The distribution and abundance of animals comprising the benthic communities of the lower Neuse and Roanoke Rivers, North Carolina. Unpublished Technical Report to Weyerhaeuser Company. 64 p. (Copy available through W. Kirby-Smith, Duke University Marine Laboratory, Pivers Island, Beaufort, N.C.).

Knowles, C.E. 1975. Flow dynamics of the Neuse River estuary. University of North Carolina Sea Grant Publication No. UNC-SG-75-16. Raleigh, N. C. 18 p.

Kornegay, J.W. and M.M. Brinson. 1977. Consumption of oxygen by bottom sediment communities of the Pamlico River estuary. J. Elisha Mitchell Sci. Soc. 93: 79-80 [abstract].

Kuenzler, E.J., D.B. Albert, G.S. Allgood, S.E. Cabaniss and C.G. Wanat. 1984. Benthic nutrient cycling in the Pamlico River. University of North Carolina Water Resources Research Institute Report No. 215. Raleigh, N.C. 148 p.

Kuenzler, E.J., D.W. Stanley and J.P. Koenings. 1979. Nutrient kinetics of phytoplankton in the Pamlico River, N. C. University of North Carolina Water Resources Research Institute Report No. 139. Raleigh, N. C. 163 p.

Lamar, W.L. and B.F. Joyner. 1949. Chemical character of surface waters of North Carolina 1946-47. North Carolina Department of Conservation and Development, Division of Water Resources and Engineering in cooperation with the United States Geological Survey, Raleigh, N.C. Bull. 52, Vol. 3. 45 p.

Lapennas, P.P. 1980. Demographic patterns of phytoplankton species in a variable estuary. PhD Dissertation, Department of Botany, Duke University, Durham, N. C. 213 p.

Lauria, D.T. and C.R. O'Melia. 1980. Nutrient models for engineering management of Pamlico River, North Carolina. University of North Carolina Water Resources Research Institute Report No. 146. Raleigh, N. C. 120 p.

Lovvorn, J.R. 1987. Behavior, energetics, and habitat relations of canvasback ducks during winter and early spring migration. PhD Dissertation, Department of Zoology, University of Wisconsin, Madison, Wis. 173 p.

Magnuson, N.C. 1967. Hydrologic implications of a deepwater channel in Pamlico Sound, North Carolina, p. 130-141. *In* Proceedings Symposium on Hydrology of the Coastal Waters of North Carolina, May 12, 1967. University of North Carolina Water Resources Research Institute Report No. 5, Raleigh, N. C.

Marshall, N. 1951. Hydrography of North Carolina marine waters, p. 1-76. *In* H.F. Taylor [ed] Survey of marine fisheries of North Carolina. The University of North Carolina Press, Chapel Hill, N. C.

Matson, E.A. and M.M. Brinson. 1985. Sulfate enrichments in estuarine waters of North Carolina. Estuaries 8: 279-289.

Matson, E.A., M. Brinson, D.D. Cahoon and G.J. Davis. 1983. Biogeochemistry of the sediments of the Pamlico and Neuse River estuaries, North Carolina. University of North Carolina Water Resources Research Institute Report No. 191. Raleigh, N. C. 103 p.

Matson, E.A., J.K. Heath, M.M. Brinson and R.R. Christian. 1983. Benthic metabolism in the Pamlico River estuary, North Carolina. Estuaries 6: 294 [abstract].

McAvoy, R.L. 1957. Chemical and physical character of surface waters of North Carolina 1955-56. North Carolina Department of Conservation and Development, Division of Water Resources, Inlets and Coastal Waterways, in cooperation with the United States Geological Survey, Raleigh, N.C. Bulletin 52, Vol. 12. 104 p.

McAvoy, R.L. and K.F. Harris. 1956. Chemical and physical character of surface waters of North Carolina 1954-55. North Carolina Department of Conservation and Development, Division of Water Resources, Inlets and Coastal Waterways, in cooperation with the United States Geological Survey, Raleigh, N. C. Bulletin 52, Vol. 11. 120 p.

McClellan, P. and R. Stanzak. 1977. A survey study of macrobenthic organisms of the Pamlico River estuary. J. Elisha Mitchell Sci. Soc. 93: 60-61 [abstract].

McElroy, K.E., Jr. 1967. Predicted impact of phosphate mining on Pamlico River and Sound. MS Thesis, Department of Environmental Sciences and Engineering, School of Public Health, Publication No. 149, University of North Carolina, Chapel Hill, N. C. 97 p.

Miller, G.K. 1976. The distribution of fluoride in the Pamlico River estuary. MS Thesis, Curriculum in Marine Sciences, University of North Carolina, Chapel Hill, N. C. 59 p.

Miller, J.M., J.P. Reed and L.J. Pietrafesa. 1984. Patterns, mechanisms and approaches to the study of migrations of estuarine dependent fish larvae and juveniles, p. 209-225. *In* J.D. McCleave, G.P. Arnold, J.J. Dodson and W.H. Neill [eds] Mechanisms of migration in fishes. Plenum Press, New York.

Miller, R.J. 1970. Distribution and energetics of an estuarine population of the ctenophore, *Mnemiopsis leidyi*. PhD Dissertation, Department of Zoology, North Carolina State University, Raleigh, N. C. 78 p.

Miller, R.J. 1974. Distribution and biomass of an estuarine ctenophore population, *Mnemiopsis leidyi* (A. Agassiz). Chesapeake Sci. 15: 1-8.

Moore, D.J. 1971. The uptake and concentration of fluoride by the blue crab, *Callinectes sapidus*. Chesapeake Sci. 12: 1-13.

National Oceanic and Atmospheric Administration, National Ocean Survey. 1985. National estuarine inventory data atlas. Vol. 1: Physical and hydrologic characteristics. United States Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, Office of Oceanography and Marine Assessment, Ocean Assessments Division, Strategic Assessment Branch, Washington, D.C.

Noltemeier, D.D. 1984. Comparison of water quality in coastal plain streams of North Carolina. MS Thesis, Department of Biology, East Carolina University, Greenville, N. C. 139 p.

North Carolina Department of Conservation and Development, Division of Water Resources and Engineering. 1947. Hydrologic data on the Neuse River basin 1866-1945. North Carolina Department of Conservation and Development, Division of Water Resources and Engineering in cooperation with the United States Geological Survey and the United States Weather Bureau. 115 p.

North Carolina Department of Natural Resources and Community Development, Division of Environmental Management. 1982. Phytoplankton and nutrient study of the Neuse River 1980-1981. Working paper. North Carolina Department of Natural Resources and Community Development, Division of Environmental Management, Raleigh, N. C. 163 p.

North Carolina Department of Natural Resources and Community Development, Division of Environmental Management, Operations Section. 1980. Working paper: Neuse River investigation 1979. North Carolina Department of Natural Resources and Community Development, Division of Environmental Management, Raleigh, N. C. 214 p.

North Carolina Department of Natural Resources and Community Development, Division of Environmental Management, Water Quality Section. 1983. Nutrient management strategy for the Neuse River basin. Report No. 83-05. North Carolina Department of Natural Resources and Community Development, Raleigh, N. C. 29 p.

North Carolina Department of Natural Resources and Community Development, Division of Environmental Management, Water Quality Section. 1984. 1983 Neuse River phytoplankton summary. Report No. 84-06. North Carolina Department of Natural Resources and Community Development, Raleigh, N. C. 40 p.

North Carolina Department of Natural Resources and Community Development, Division of Marine Fisheries. 1978. North Carolina regulations for coastal waters, 1978. North Carolina Department of Natural Resources and Community Development, Division of Marine Fisheries, Morehead City, N. C.

North Carolina State Stream Sanitation Committee. 1959. The Neuse River basin. A study of existing pollution in the Neuse River basin together with recommended classification of its waters, 1954-1958. Pollution Survey Report No. 7. North Carolina State Board of Health, Division of Water Pollution Control, Raleigh, N. C. 343 p.

North Carolina State Stream Sanitation Committee. 1961. The Tar-Pamlico River basin. A survey of existing pollution in the Tar-Pamlico River basin together with recommended classifications of its waters. Pollution Survey Report No. 12. North Carolina State Department of Water Resources, Division of Stream Sanitation and Hydrology, Raleigh, N. C. 319 p.

Otte, A.M. and V.J. Bellis. 1985. Edaphic diatoms of a low salinity estuarine marsh system in North Carolina--a comparative floristic study. J. Elisha Mitchell Sci. Soc. 101: 116-124.

Paerl, H.W. 1983. Factors regulating nuisance blue-green algal bloom potentials in the lower Neuse River, N.C. University of North Carolina Water Resources Research Institute Report No. 188. Raleigh, N.C. 48 p.

Paerl, H.W., P.T. Bland, J.H. Blackwell and N.D. Bowles. 1984. The effects of salinity on the potential of a blue-green algal (*Microcystis aeruginosa*) bloom in the Neuse River estuary, University of North Carolina Sea Grant Working Paper No. 84-1. Raleigh, N. C. 34 p.

Park, B.-K. 1971. Mineralogy of Recent sediments of North Carolina sounds and estuaries. PhD Dissertation, Department of Geology, University of North Carolina, Chapel Hill, N. C. 157 p.

Pate, P.P., Jr. and R. Jones. 1981a. Effects of upland drainage on estuarine nursery areas of Pamlico Sound, North Carolina. University of North Carolina Sea Grant Working Paper Publication No. 81-10. Raleigh, N. C. 24 p.

Pate, P.P., Jr. and R. Jones. 1981b. Effects of upland drainage on estuarine nursery areas of Pamlico Sound, North Carolina, p. 402-418. *In* R.D. Cross and D.L. Williams [eds] Proceedings of the national symposium on freshwater inflow to estuaries. Vol. II. National Coastal Ecosystems Team, United States Fish and Wildlife Service, FWS/OBS-81/04, Washington, D.C.

Pauszek, F.H. 1950. Chemical character of surface waters of North Carolina 1948-1949. North Carolina Department of Conservation and Development, Division of Water Resources and Engineering in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. 52, Vol. 5. 50 p.

Pauszek, F.H. 1952. Chemical character of surface waters of North Carolina 1950-1951. North Carolina Department of Conservation and Development, Division of Water Resources and Engineering in cooperation with the United States Geological Survey, Raleigh, N. C. Bulletin 52, Vol. 7. 59 p.

Pauszek, F.H. and K.F. Harris. 1951. Chemical character of surface waters of North Carolina 1949-1950. North Carolina Department of Conservation and Development, Division of Water Resources and Engineering in cooperation with the United States Geological Survey, Raleigh, N.C. Bulletin 52, Vol. 6. 56 p.

Peters, D.S. 1968. A study of relationships between zooplankton abundance and selected environmental variables in the Pamlico River estuary of eastern North Carolina. MS Thesis, Department of Zoology, North Carolina State University, Raleigh, N. C. 38 p.

Peters, D.S. 1971. Planktonic copepod (Crustacea: Harpacticoida) distribution and regulating factors in the Pamlico River estuary. Ass. Southeastern Biologists Bull. 18: 50 [abstract].

Pevear, D.R. 1968. Clay mineral relationships in recent river, nearshore marine, continental shelf, and slope sediments of the southeastern United States. PhD Dissertation, University of Montana, Missoula, Mont. 164 p.

Pevear, D.R. 1972. Source of recent nearshore marine clays, southeastern United States, p. 317-335. *In* B.W. Nelson [ed] Environmental framework of coastal plain estuaries. Geological Society of America Memoir 133. Geological Society of America, Inc., Boulder, Co.

Phibbs, E.J., Jr. 1964. Chemical and physical character of surface waters of North Carolina 1961-62. North Carolina Department of Water Resources, Division of Stream Sanitation and Hydrology in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. I, Vol. VI. 219 p.

Phibbs, E.J., Jr. 1966. Chemical and physical character of surface waters of North Carolina 1964-65. North Carolina Department of Water Resources, Division of Stream Sanitation and Hydrology in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. I, Vol. IX. 222 p.

Phibbs, E.J., Jr. 1967. Chemical and physical character of surface waters of North Carolina 1965-1966. North Carolina Department of Water and Air Resources, Water Pollution Control Division in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. I, Vol. X. 243 p.

Phibbs, E.J., Jr. 1969. Chemical and physical character of surface waters of North Carolina 1966-67. North Carolina Department of Water and Air Resources, Water Pollution Control Division in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. I, Vol. XI. 237 p.

Phibbs, E.J., Jr. and J.C. Chemerys. 1966. Chemical and physical character of surface waters of North Carolina 1963-64. North Carolina Department of Water Resources, Division of Stream Sanitation and Hydrology in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. I, Vol. VIII. 194 p.

Phibbs, E.J., Jr. and M.R. Midgett. 1963. Chemical and physical character of surface waters of North Carolina 1960-61. North Carolina Department of Water Resources, Division of Stream Sanitation and Hydrology in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. I, Vol. V. 192 p.

Pickett, T.E. 1965. The Modern sediments of Pamlico Sound, North Carolina. PhD Dissertation, Department of Geology, University of North Carolina, Chapel Hill, N. C. 135 p.

Pickett, T.E. and R.L. Ingram. 1969. The Modern sediments of Pamlico Sound, North Carolina. Southeastern Geol. 11: 53-83.

Pietrafesa, L.J. 1985. Response of Rose Bay to freshwater inputs, p. 21-61. *In* W. Gilliam, J. Miller, L. Pietrafesa and W. Skaggs [eds] Water management and estuarine nurseries. University of North Carolina Sea Grant Working Paper Publication No. 85-2. Raleigh, N. C.

Pietrafesa, L.J., G.S. Janowitz, T. Chao, R.H. Weisberg, F. Askari and E. Noble. 1986. The physical oceanography of Pamlico Sound. University of North Carolina Sea Grant Working Paper Publication No. 86-5. Raleigh, N. C. 125 p.

Porter, H.J. 1967. A collecting trip on the Neuse River estuary. North Carolina Shell Club Bull. 4: 32-37.

Porter, H.J. 1969. The molluscan fauna in North Carolina's Neuse River estuary. Amer. Malacol. U. Annu. Rep. 1969: 39-40.

Porter, H.J. and J. Tyler. 1972. Sea shells common to North Carolina. North Carolina Department of Natural and Economic Resources, Division of Commercial and Sports Fisheries. University of North Carolina Sea Grant Publication No. UNC-SG-72-09. Raleigh, N. C. 36 p.

Posner, G.S. 1959. Preliminary oceanographic studies of the positive bar-built estuaries of North Carolina, U.S.A., p. 704-705. *In* M. Sears [ed] International Oceanographic Congress, 31 August-12 September 1959. Amer. Ass. Advan. Sci., Washington, D.C.

Powell, A.B. 1974. Biology of the summer flounder *Paralichthys dentatus*, in Pamlico Sound and adjacent waters, with comments on *P. lethostigma*, and *P. albigutta*. MS Thesis, Curriculum of Marine Science, University of North Carolina, Chapel Hill, N. C. 145 p.

Powell, J.W. 1979. Fluoride concentrations of the Tar and Neuse Rivers. MS Thesis, Department of Chemistry, East Carolina University, Greenville, N. C. 72 p.

Purvis, C.E. 1976. Nursery area survey of northern Pamlico Sound and tributaries. Completion Report for Project No. 2-230-R, North Carolina Department of Natural and Economic Resources, Division of Marine Fisheries, Raleigh, N. C. 62 p.

Reed, S.E. 1979. The distribution and seasonality of the benthic aquatic macrophytes of the Pamlico River estuary, North Carolina. MS Thesis, Department of Biology, East Carolina University, Greenville, N. C. 55 p.

Reid, J.W. 1970. The summer meiobenthos of the Pamlico River estuary, North Carolina, with special reference to the harpacticoid copepods. MS Thesis, Department of Zoology, North Carolina State University, Raleigh, N. C. 63 p.

Reid, J.W. 1978. Seasonal changes of the meiobenthos of the Pamlico River estuary, North Carolina. PhD Dissertation, Department of Zoology, North Carolina State University, Raleigh, N. C. 153 p.

Rice, E.B. 1957. Surface water supply of eastern and central North Carolina. Open-file report, United States Geological Survey, in cooperation with North Carolina Department of Conservation and Development, Division of Water Resources, Inlets and Coastal Waterways. 92 p.

Riggs, S.R. and M.P. O'Connor. 1974. Relict sediment deposits in a major transgressive coastal system. UNC Sea Grant Publication No. UNC-SG-74-04. Raleigh, N. C. 37 p.

Roelofs, E.W. 1950. Hydrographic observations in the Pamlico Sound area, Beaufort Inlet and Bogue Sound, p. 117-127. *In* Annual Report 1950-University of North Carolina Institute of Fisheries Research. Morehead City, N. C.

Roelofs, E.W. and D.F. Bumpus. 1953. The hydrography of Pamlico Sound. Bull. Mar. Sci. Gulf and Caribbean 3: 181-205.

Ross, S.W. and S.P. Epperly. 1985. Utilization of shallow estuarine nursery areas by fishes in Pamlico Sound and adjacent tributaries, North Carolina, Chapter 10, p. 207-232. *In* A. Yanez-Arancibia [ed] Fish community ecology in estuaries and coastal lagoons. Towards an ecosystem integration. Universidad Nacional Autonoma de Mexico Press, Mexico, D.F. 654 p.

Rulifson, R.A. 1985. Distribution and abundance of fishes in tributaries of South Creek estuary, North Carolina. J. Elisha Mitchell Sci. Soc. 101: 160-176.

Schwartz, F.J. 1973. Biological and environmental assessment of four navigation improvement areas in Croatan, Roanoke, and Pamlico Sounds, North Carolina. Final Report to the US Army Corps of Engineers, Contract DACW 54-72-C-0047, Wilmington, N. C. 31 p.

Schwartz, F.J. and A.F. Chestnut. 1973. Hydrographic atlas of North Carolina estuarine and sound waters, 1972. University of North Carolina Sea Grant Publication No. UNC-SG-73-12. Raleigh, N. C. 132 p.

Schwartz, F.J. and A.F. Chestnut. 1974. Biological investigations of noxious coelenterates and ctenophores in coastal North Carolina. Special Scientific Report No. 27, North Carolina Department of Natural and Economic Resources, Division of Commercial and Sports Fisheries, Raleigh, N. C. 59 p.

Sheets, T.J., M.D. Jackson and L.D. Phelps. 1970. A water monitoring system for pesticides in North Carolina. University of North Carolina Water Resources Research Institute Report No. 19. Raleigh, N. C. 59 p.

Sherk, J.A., Jr. 1969. Effects of low levels of phosphate mining effluent on periphyton in controlled, artificial estuaries. PhD Dissertation, Department of Zoology, North Carolina State University, Raleigh, N. C. 82 p.

Sholar, T.M. 1980. Preliminary analysis of salinity levels for the Pamlico Sound area, 1948-1980. North Carolina Division of Marine Fisheries, Morehead City, N. C. 11 p.

Sick, E.L. 1977. Dissolved organic carbon in a North Carolina estuary. MS Thesis, Department of Zoology, North Carolina State University, Raleigh, N. C. 80 p.

Singer, J.J. and C.E. Knowles. 1975. Hydrology and circulation patterns in the vicinity of Oregon Inlet and Roanoke Island, North Carolina. University of North Carolina Sea Grant Publication No. UNC-SG-75-15. Raleigh, N. C. 171 p.

Skaggs, R.W., J.W. Gilliam, T.J. Sheets and J.S. Barnes. 1980. Effect of agricultural land development on drainage waters in the North Carolina tidewater region. University of North Carolina Water Resources Research Institute Report No. 159. Raleigh, N. C. 164 p.

Spitsbergen, D.L. and M. Wolff. 1974. Survey of nursery areas in western Pamlico Sound, North Carolina. Completed Report, Project 2-175-R, North Carolina Department of Natural and Economic Resources, Division of Commercial and Sports Fisheries, Raleigh, N. C. 80 p.

Stanley, D.W. 1971. A method for measuring the productivity of benthic microalgae. MS Thesis, North Carolina State Unviersity, Raleigh, N. C. 34 p.

Stanley, D.W. 1978. Relationships between nitrogen assimilation and phytoplankton productivity in the Pamlico River, North Carolina. Virginia J. Sci. 29: 94 [abstract].

Stanley, D.W. 1983a. Nitrogen cycling and phytoplankton growth in the Neuse River, North Carolina. University of North Carolina Water Resources Research Institute Report No. 204. Raleigh, N. C. 85 p.

Stanley, D.W. 1983b. Nitrogen and phosphorus remineralization in pulp mill effluents. A report to Weyerhaeuser Company. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 75 p.

Stanley, D.W. 1984a. Phytoplankton in the Pamlico River estuary: 1983. A report to the North Carolina Phosphate Corporation. Institute for Coastal and Marine Resources Technical Report No. 84-01. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 335 p.

Stanley, D.W. 1984b. Water quality in the Pamlico River estuary 1983. Institute for Coastal and Marine Resources Technical Report No. 84-04. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 66 p.

Stanley, D.W. 1985. Nationwide review of oxygen depletion and eutrophication in estuarine and coastal waters: southeast region. A report to Brookhaven National Laboratory and NOAA. 354 p.

Stanley, D.W. 1986a. Water quality in the Pamlico River estuary 1984. Institute for Coastal and Marine Resources Technical Report No. 86-01. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 63 p.

Stanley, D.W. 1986b. Water quality in the Pamlico River estuary 1985. Institute for Coastal and Marine Resources Technical Report No. 86-04. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 70 p.

Stanley, D.W. 1987. Water quality in the Pamlico River estuary 1986. A report to Texasgulf, Inc. Institute for Coastal and Marine Resources Technical Report No. 87-01. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 77 p.

Stanley, D.W. and R.R. Christian. 1984. Nutrients in estuaries: research needs and priorities, p. 203-227. *In* B.J. Copeland, K. Hart, N. Davis and S. Friday [eds]. Research for managing the nation's estuaries: proceedings of a conference in Raleigh, North Carolina, March 13-15, 1984. University of North Carolina Sea Grant Publication No. UNC-SG-84-08. Raleigh, N. C.

Stanley, D.W. and D.A. Daniel. 1985a. Seasonal phytoplankton density and biomass changes in South Creek, North Carolina. J. Elisha Mitchell Sci. Soc. 101: 130-141.

Stanley, D.W. and D.A. Daniel. 1985b. Phytoplankton in the Pamlico River estuary: 1984. A report to the North Carolina Phosphate Corporation. Institute for Coastal and Marine Resources Technical Report No. 85-01. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N.C. 462 p.

Stanley, D.W. and D.A. Daniel. 1986. Phytoplankton in the Pamlico River estuary: 1985. A report to Texasgulf Chemicals, Inc. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 319 p.

Stephenson, R.A., C.W. O'Rear, Jr. and W.D. Kornegay, III. 1975. Hydrography and nutrients in the Pamlico estuary, January to June 1975. PEL File Report 75-1. Institute for Coastal and Marine Resources, East Carolina University, Greenville, N. C. 24 p.

Sutherland, W.C. 1982. Growth of two species of *Macoma* bivalves as affected by predation on their siphons by juvenile spot, *Leiostomus xanthurus* and croaker, *Micropogon undulatus*. MS Thesis, Department of Zoology, North Carolina State University, Raleigh, N. C. 39 p.

Tagatz, M.E. and D.L. Dudley. 1961. Seasonal occurrence of marine fishes in four shore habitats near Beaufort, N.C., 1957-60. United States Fish and Wildlife Service, Section of Sci. Rep. Fish. No. 390, Washington, D.C.

Tarplee, W.H., Jr., D.E. Louder and A.J. Weber. 1971. Evaluation of the effects of channelization on fish populations in North Carolina's coastal plain streams, p. 431-446. *In* Proceedings 25th Annual Conference Southeastern Association of Fish and Game Commission.

Tenore, K.R. 1967. Some effects of the bottom substrate on the ecology of *Rangia cuneata* in the Pamlico River estuary. MS Thesis, Department of Zoology, North Carolina State University, Raleigh, N. C. 54 p.

Tenore, K.R. 1970a. The macrobenthos of the Pamlico River estuary, North Carolina. PhD Dissertation, Department of Zoology, North Carolina State University, Raleigh, N. C. 113 p.

Tenore, K.R. 1970b. The macrobenthos of the Pamlico River estuary, North Carolina. University of North Carolina Water Resources Research Institute Report No. 40. Raleigh, N. C. 113 p.

Tenore, K.R. 1972. Macrobenthos of the Pamlico River estuary, North Carolina. Ecol. Monogr. 42: 51-69.

Tenore, K.R., D.B. Horton and T.W. Duke. 1968. Effects of bottom substrate on the brackish water bivalve *Rangia cuneata*. Chesapeake Sci. 9: 238-248.

United States Army Corps of Engineers. 1910. Bay River, North Carolina. United States 61st Congress, 2nd Session House Document 583, Washington, D.C. 7 p.

United States Geological Survey. 1952. Quality of surface waters of the United States 1947. United States Geological Survey Water-Supply Paper 1102. United States Government Printing Office, Washington, D.C. 651 p.

United States Geological Survey. 1954. Quality of surface waters of the United States 1949. Parts 1-6. United States Geological Survey Water-Supply Paper 1162. United States Government Printing Office, Washington, D.C. 662 p.

United States Geological Survey. 1956. Quality of surface waters of the United States 1952. Parts 1-4. North Atlantic slope basins to St. Lawrence River basin. United States Geological Survey Water-supply Paper 1250. United States Government Printing Office, Washington, D.C. 365 p.

United States Geological Survey. 1957. Quality of surface waters of the United States 1953. Parts 1-4. North Atlantic slope basins to St. Lawrence River basin. United States Geological Survey Water-Supply Paper 1290. United States Government Printing Office, Washington, D.C. 439 p.

United States Geological Survey. 1958. Quality of surface waters of the United States 1954. Parts 1-4. North Atlantic slope basins to St. Lawrence River basin. United States Geological Survey Water-Supply Paper 1350. United States Government Printing Office, Washington, D.C. 415 p.

United States Geological Survey. 1959. Quality of surface waters of the United States 1955. Parts 1-4. North Atlantic slope basins to St. Lawrence River basin. United States Geological Survey Water-Supply Paper 1400. United States Government Printing Office, Washington, D.C. 530 p.

United States Geological Survey. 1960a. Quality of surface waters of the United States 1956. Parts 1-4. North Atlantic slope basins to St. Lawrence River basin. United States Geological Survey Water-Supply Paper 1450. United States Government Printing Office, Washington, D.C. 603 p.

United States Geological Survey. 1960b. Quality of surface waters of the United States 1957. Parts 1-4. North Atlantic slope basins to St. Lawrence River basin. United States Geological Survey Water-Supply Paper 1520. United States Government Printing Office, Washington, D.C. 641 p.

United States Geological Survey. 1960c. Quality of surface waters of the United States 1958. Parts 1-4. North Atlantic slope basins to St. Lawrence River basin. United States Geological Survey Water-Supply Paper 1571. United States Government Printing Office, Washington, D.C. 773 p.

United States Geological Survey. 1964. Quality of surface waters of the United States 1962. Parts 1 and 2. North Atlantic slope basins and South Atlantic slope and Eastern Gulf of Mexico basins. United States Geological Survey Water-Supply Paper 1941. United States Government Printing Office, Washington, D.C. 434 p.

United States Geological Survey. 1965. Quality of surface waters of the United States 1959. Parts 1 and 2. North Atlantic slope basins and South Atlantic slope and Eastern Gulf of Mexico basins. United States Geological Survey Water-Supply Paper 1641. United States Government Printing Office, Washington, D.C. 460 p.

Upchurch, J.B. 1972. Sedimentary phosphorus in the Pamlico estuary of North Carolina. University of North Carolina Sea Grant Publication No. UNC-SG-72-03. Raleigh, N. C. 39 p.

Upchurch, J.B., J.K. Edzwald and C.R. O'Melia. 1974. Phosphates in sediments of Pamlico estuary. Environ. Sci. Technol. 8: 56-58.

Van Maren, M.J. 1978. Distribution and ecology of *Gammarus tigrinus* Sexton, 1939 and some other amphipod Crustacea near Beaufort (North Carolina, U.S.A.). Bijdragen tot de Dierkunde 48: 45-56.

Vicars, T.M., Jr. 1976. Biomass and remote sensing of aquatic macrophytes in the Pamlico River estuary. MA Thesis, Department of Biology, East Carolina University, Greenville, N. C. 108 p.

Weiss, C.M. 1966. Baseline investigations. The Pamlico River and Sound, 1964-1966, p. 75-98. *In* Proceedings Symposium on estuarine ecology of the coastal waters of North Carolina, May 12, 1966, Raleigh, North Carolina. University of North Carolina Water Resources Research Institute, Chapel Hill, N.C.

West, T.L. 1985. Abundance and diversity of benthic macrofauna in subtributaries of the Pamlico River estuary. J. Elisha Mitchell Sci. Soc. 101: 142-159.

West, T.L. 1987. Recovery of the benthic macroinvertebrate community of South Creek, Beaufort County, N.C., following dredging removal of clay solids. Completion report submitted to Texasgulf Chemicals Company. 149 p. (Copy available through T.L. West, Department of Biology, East Carolina University, Greenville, N.C.).

Wilder, H.B. 1967. Hydrology of sounds and estuaries in North Carolina, p. 115-129. *In* Proceedings Symposium on Hydrology of the Coastal Waters of North Carolina, May 12, 1967. University of North Carolina Water Resources Research Institute Report No. 5. Raleigh, N. C.

Wilder, H.B., T.M. Robison and K.L. Lindskov. 1978. Water resources of northeast North Carolina. United States Geological Survey Water-Resources Investigations 77-81. United States Geological Survey, Raleigh, N.C. 113 p.

Wilder, H.B. and L.J. Slack. 1971. Summary of data on chemical quality of streams of North Carolina, 1943-67. United States Geological Survey Water-Supply Paper 1895-B. United States Government Printing Office, Washington, D.C. 236 p.

Williams, A.B. 1955a. The genus *Ogyrides* (Crustacea: Caridea) in North Carolina. J. Washington Acad. Sci. 45: 56-59.

Williams, A.B. 1955b. A contribution to the life histories of commercial shrimps (Penaeidae) in North Carolina. Mar. Sci. Gulf and Caribbean Bull. 5: 116-146.

Williams, A.B. 1971. A ten-year study of meroplankton in North Carolina estuaries: annual occurrence of some brachyuran developmental stages. Chesapeake Sci. 12: 53-61.

Williams, A.B. 1972a. A ten-year study of meroplankton in North Carolina estuaries: juvenile and adult *Ogyrides* (Caridea: Ogyrididae). Chesapeake Sci. 13: 145-159.

Williams, A.B. 1972b. A ten-year study of meroplankton in North Carolina estuaries: mysid shrimps. Chesapeake Sci. 13: 254-262.

Williams, A.B. and K.H. Bynum. 1972. A ten-year study of meroplankton in North Carolina estuaries: amphipods. Chesapeake Sci. 13: 175-192.

Williams, A.B. and E.E. Deubler, Jr. 1968a. Studies on macroplanktonic crustaceans and ichthyoplankton of the Pamlico Sound complex. Special Report No. 13, North Carolina Department of Conservation and Development, Division of Commercial and Sports Fisheries, Raleigh, N. C. 103 p.

Williams, A.B. and E.E. Deubler, Jr. 1968b. A ten-year study of meroplankton in North Carolina estuaries: assessment of environmental factors and sampling success among bothid flounders and penaeid shrimps. Chesapeake Sci. 9: 27-41.

Williams, A.B., G.S. Posner, W.J. Woods and E.E. Deubler, Jr. 1967. A hydrographic atlas of larger North Carolina sounds. United States Fish and Wildlife Service Data Report 20. United States Department of Commerce, Washington, D.C. 130 p.

Williams, A.B., G.S. Posner, W.J. Woods and E.E. Deubler, Jr. 1973. A hydrographic atlas of larger North Carolina sounds. University of North Carolina Sea Grant Publication No. UNC-SG-73-02. Raleigh, N. C. 129 p.

Wilson, K.A. 1962. North Carolina wetlands: Their distribution and management. Federal Aid in Wildlife Restoration Project W-6-R, Game Division, North Carolina Wildlife Resources Commission, Raleigh, N. C. 169 p.

Winslow, F. 1886. Report on the waters of North Carolina with reference to their possibilities for oyster culture, together with the results obtained by the surveys directed by the resolution of the General Assembly, ratified March 11, 1885. Document No. 7. North Carolina State Printer and Binder, Raleigh, N. C. 151 p.

Winslow, F. 1889. Report on the sounds and estuaries of North Carolina with reference to oyster culture. U.S. Coast Geod. Surv. Bull. 10: 52-136.

Wolfe, D.A. 1967a. Molluscs in radiobiology and radioecology. Bull. North Carolina Shell Club 4: 20-23.

Wolfe, D.A. 1967b. Seasonal variation of cesium-137 from fallout in a clam, *Rangia cuneata* Gray. Nature 215: 1270-1271.

Wolfe, D.A. 1971. Fallout cesium-137 in clams (*Rangia cuneata*) from the Neuse River estuary, North Carolina. Limnol. Oceanogr. 16: 797-805.

Wolfe, D.A. and C.D. Jennings. 1973. Iron-55 and ruthenium-103 and -106 in the brackish-water clam *Rangia cuneata*, p. 783-790. *In* D.J. Nelson [ed] Radionuclides in ecosystems. Proceedings of the Third National Symposium on Radioecology, May 10-12, 1971, Oak Ridge, Tenn. United States Atomic Energy Commission and the Ecological Society of America, CONF-710501-P2, Oak Ridge, Tenn.

Wolfe, D.A., J.-A. Lewis and J.H. Brooks. 1969. Estuarine biogeochemistry of cesium 137. U.S. Fish Wildlife Ser. Bur. Comm. Fish. Circular 309: 13-17.

Wolfe, D.A. and E.N. Petteway. 1968. Growth of *Rangia cuneata* Gray. Chesapeake Sci. 9: 99-102.

Wolfe, D.A. and E.N. Petteway. 1969. Growth of *Rangia cuneata* (Gray). U.S. Fish Wildlife Ser. Bur. Comm. Fish. Circular 309: 19-23.

Wolfe, D.A. and C.L. Schelske. 1969. Accumulation of fallout radioisotopes by bivalve molluscs from the lower Trent and Neuse rivers, p. 493-504. *In* D.J. Nelson and F.C. Evans [eds] Proceedings of the Second National Symposium on Radioecology, Ann Arbor, Michigan, May 15-17, 1967. United States Atomic Energy Commission CONF-670503, Oak Ridge, Tenn.

Wood, L.W. 1970. The role of estuarian sediment microorganisms in the uptake of organic solutes under aerobic conditions. PhD Dissertation, Department of Zoology, North Carolina State University, Raleigh, N.C. 75 p.

Woodard, T.H. 1962. Chemical and physical character of surface waters of North Carolina 1959-60. North Carolina Department of Water Resources, Division of Stream Sanitation and Hydrology in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. I, Vol. IV. 179 p.

Woodard, T.H. 1970. Summary of data on temperature of streams in North Carolina, 1943-67. United States Geological Survey Water-Supply Paper 1895-A. United States Government Printing Office, Washington, D.C. 39 p.

Woodard, T.H. and E.J. Phibbs, Jr. 1965. Chemical and physical character of surface waters of North Carolina 1962-63. North Carolina Department of Water Resources, Division of Stream Sanitation and Hydrology in cooperation with the United States Geological Survey, Raleigh, N. C. Bull. I, Vol. VII. 206 p.

Woodard, T.H. and J.D. Thomas. 1959. Chemical and physical character of surface waters of North Carolina 1956-1957. North Carolina Department of Water Resources, Division of Stream Sanitation and Hydrology in cooperation with the United States Geological Survey, Raleigh, N.C. Bull. I, Vol. I. 107 p.

Woodard, T.H. and J.D. Thomas. 1960. Chemical and physical character of surface waters of North Carolina 1957-1958. North Carolina Department of Water Resources, Division of Stream Sanitation and Hydrology in cooperation with the United States Geological Survey, Raleigh, N.C. Bull. I, Vol. II. 191 p.

Woods, W.J. 1967. Hydrographic studies in Pamlico Sound, p. 104-114. *In* Proceedings Symposium on Hydrology of the Coastal waters of North Carolina, May 12,1967. Unviersity of North Carolina Water Resources Research Institute Report No. 5. Raleigh, N. C.

Woods, W.J. 1969. Current study in the Neuse River and estuary of North Carolina. University of North Carolina Water Resources Research Institute Report No. 13. Raleigh, N. C. 35 p.

Woodward, J.L. 1981. Enclosure studies of food resource partitioning between juvenile spot and croaker. MS Thesis, Department of Zoology, North Carolina State University, Raleigh, N. C. 42 p.

Wright, S.L., Sr. 1972. A preliminary survey of benthic macroinvertebrates in Croatan Sound, North Carolina, during the summer of 1970. MA Thesis, Department of Biology, East Carolina University, Greenville, N. C. 85 p.

Zamuda, C.D. 1976. Seasonal growth and decomposition of *Vallisneria americana* in the Pamlico River estuary. MS Thesis, Department of Biology, East Carolina University, Greenville, N.C. 72 p.