

Appendix II

Neuse River Estuarine Fish Kill Log (1997-2006) and Basin Algal Bloom Report (2000-2006)

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
7/15/1997	WA97004	Mills Creek	near Bridgeton	Craven	030410	SF CATS WP CHP MQF	60
<i>Notes: pumpkinseed sent to ESB for pathology; sheen observed on water in area of kill; construction reported upstream; most affected fish were sunfish species; turtles in area appeared fine ATI; bloom identified by ESB</i>							
7/22/1997	WA97005	Neuse River	near Carolina Pines	Craven	030410	PCH LG FL CRK ATM	50000
<i>Notes: no sores observed on fish; fish had flared gills; kill occurred overnight; 90% of dead fish were croaker; low DO levels suspected as cause, Pfiestria-like cells identified by ESB = 320 cells/ml; NCSU reported positive identification of pfiestria-like organisms using scanning electron microscopy; bioassy results using sample water were also positive.</i>							
7/22/1997	WL97006	Adams Creek	near Merrimon	Carteret	030410	PCH CRK ATM	2000
<i>Notes: 50% of fish had flared and bloody gills; kill occurred overnight; trawlers were sighted in the area ATI; algal bloom identified by ESB; presumptive pfiestria cells counted by ESB = 111 cells/ml; cause unknown</i>							
8/9/1997	WA97006	Neuse River	Duck Creek	Craven	030410	CRK PCH ATM SF	80
<i>Notes: some fish had bulging eyes and had been dead for some time ATI; fish seen dead near Duck Creek Marina; DO levels were normal ATI; algal bloom identified by ESB</i>							
7/14/1998	WA98005	Neuse River	near Flanner's Beac	Craven	030410	CRK ATM	25
<i>Notes: dead fish found on beach very stiff but not decomposed; DO slightly supersaturated; Burkholder lab reported pfiestria cell levels of 250 /ml in water samples; cast net samples from area showed 10% of menhaden with lesions; 104 fish observed in cast net samples; most lesions seen in anal region; additional menhaden seen in distress with lesions in Slocum Creek on 7/15; 44% had lesions in Slocum Creek. Presumptive pfiestria- like cell counts from water samples taken in area by ESB numbered 122 cells/ml. NCSU reported no active toxicity from bioassays of water samples with test fish.</i>							

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Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
7/21/1998	WA98006	Neuse River	Seafarer Camp	Craven	030410	ATM	500
<i>Notes: Fish appeared dead for at least 12 hrs; lesions on 30% of the fish in the anal pore region; weather conditions around time of the kill included 90+ degree temps and strong SW winds; DO normal at time of investigation. Presumptive pfiesteria- like cell counts from water samples taken in area by ESB numbered 58 cells/ml.</i>							
7/28/1998	WA98007	Neuse Riiver	from Fisher Landing	Craven	030410	ATM	188000
<i>Notes: river monitors showed chronic hypoxia in lower third of water column during month prior from Trent River to Hancock Creek; possible large scale mixing in river on July 26-27. Pfiesteria- like cell counts from water samples taken in area by ESB ranged from 0 to 367 cells/ml; Pfiesteria- like cell counts by NCSU ranged from 260 to 1500 cells/ml (NCSU and ESB samples were taken at different locations); 40 to 50% of live fish in the area showed lesions; up to 90% of dead fish showed lesions. NCSU reported active toxicity confirmed from bioassays of water samples with test fish.</i>							
9/3/1998	WA98009	South River	near headwaters	Carteret	030410	CRK LMB CATS SF	300
<i>Notes: Hurrican Bonnie occurred days prior, low DO observed at time of investigation; investigators attributed DO depletion as cause for kill; fish appeared dead for 2-3 days at time of investigation</i>							
5/23/1999	WA99002	Upper Broad Creek		Craven	030410	MENHADEN GAR	1190
<i>Notes: Phytoplankton samples collected during the kill showed presumptive Pfiesteria-like dinoflagellate counts by ESB staff ranging from 210 to 413 cells/ml. Similar counts were observed by NCSU staff. DO readings taken at kill site at time of investigation were within acceptable ranges. Mixing of DO stratified layers at Neuse Marker 11 observed on the eveining of 5/23. NCSU fish bioassay performed with water samples was negative within a 21 day cutoff period.</i>							
6/1/1999	WA99004	Neuse River	near Carolina Pines	Craven	030410	MENHADEN	205
<i>Notes: Kill was composed of nearly all crabs. Investigators believe the kill took place 2-3 days earlier. Crabs and fish were severly decayed. Live crabs and fish were observed at the site showing no signs of distress. No lesions were present on dead crabs or fish. Dissolved oxygen was within acceptable range at time of investigation.</i>							
7/23/1999	WA99011	Neuse River	Neuse Harbor	Craven	030410	CROAKER FLOUNDER	3100
<i>Notes: Low dissolved oxygen reported around Neuse Harbor area. Greatest concentration of dead fish was observed in Neuse Harbor area. Most flounder were seen around Johnson Point. 400 blue crab affected in addition to fish.</i>							
8/4/1999	WA99019	Neuse River	Neuse River Campg	Craven	030410	SUNFISH FLOUNDER SPOT LARGEMOUTH BASS	300
<i>Notes: Low dissolved oxygen reported as cause. Fish were observed gasping at the surface and crabs were trying to leave the water.</i>							

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Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
8/5/1999	WA99017	Neuse River	New Bern (R.R. Tre	Craven	030410	GAR LARGEMOUTH BASS SPECKLED TROUT WHITE PERCH YELLOW PERCH BAY ANCHOVIES MENHADEN CROAKER FLOUNDER	114000
<p><i>Notes: Low dissolved oxygen suspected as factor. Phytoplankton samples examined by ESB revealed a dense bloom of photosynthetic dinoflagellates (Gymnodinium nelsonii, Glenodinium, Gyrodinium, Peridinium) and euglenoids. NRRT reported that they did not find lesioned fish and that dissolved oxygen levels were measured at 200% saturation at time of investigation. ESB identified Pfiesteria-like dinoflagellates in the preserved sample totaling 873 cells/mL. None of the Pfiesteria-like cells appeared to be of the toxic form.</i></p>							
4/18/2000	WA00002	South River	Southeast Creek	Craven	030410	PUMPKINSEED SUNFISH	65
<p><i>Notes: Recent rainfall and runoff from ditches in adjacent fields may have caused a drop in dissolved oxygen levels resulting in the kill. Fish ranged from 40 to 180 mm. More than 2 inches of rainfall were received in the area days prior.</i></p>							
4/20/2000	WA00004	Dawson Creek	at Deep Run	Pamlico	030410	PUMPKINSEED LONGNOSE GAR LARGEMOUTH BASS	750
<p><i>Notes: Investigation occurred 3-4 days after the event. Water quality measurements at the time of the investigation showed no problems. Heavy rains and runoff during days previous are suspected of playing a role. Rains may have washed stagnant, oxygen-poor water from a swamp that feeds into the creek.</i></p>							
6/11/2000	WA00009	Neuse River	Camp Seagull	Pamlico	030410	MENHADEN CROAKER FLOUNDER PINFISH	2500
<p><i>Notes: Fish first noticed by camp director at 0730. Camp personnel cleaned up fish before NRRT investigation. All fish reported as juveniles with no sores or disease. Dissolved oxygen readings at time of investigation were normal. Trawlers seen in area during the week - possible bycatch. Fish seen actively swimming and feeding at time of investigation.</i></p>							
6/12/2000	WA00013	Lake Clermont	James City	Craven	030410	LARGEMOUTH BASS SUNFISH	1130
<p><i>Notes: The lake was a large pond less than 2 meters deep and located in a residential community. Algae in the samples were not particularly dense and total sample biovolume was relatively low. The sample visually resembled a bloom of the filamentous blue green Anabaena spiroides. A few Euglena were seen, so if these euglena were concentrated at the surface, they might have contributed to the pea green color of the water. Cause not determined during investigation.</i></p>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
6/16/2000	WA00010	Neuse River	near mouth of Clubf	Craven	030410	CROAKER MENHADEN FLOUNDER	152000
<i>Notes: Kill was composed of mostly croaker (30-120mm). Very few lesions seen on fish and all appeared to be older lesions. Plenty of unstressed fish seen swimming in the shallows at time of investigation. Dissolved oxygen reading at time of investigation was 1.9 mg/L. 2000 more fish attributed to the same kill event were discovered in the area on 6/17. Presumptive pfiesteria cell counts by ESB staff were 41 cells /ml.</i>							
6/21/2000	WA00011	Neuse River	near Flanner's Beach	Craven	030410	MENHADEN CROAKER	14500
<i>Notes: Conditions prior to the kill in the area of the kill were stratified with low oxygen on the bottom, after a change in wind direction from prevailing southwest to northeast, the water column mixed, possibly causing a net loss in dissolved oxygen long enough to kill fish, that may have already been stressed. Menhaden sampled showed 4% lesions in large schools. Lesions ranged from early stages to well developed. Presumptive pfiesteria cell counts by ESB staff ranged from 169-233 cells /ml. Presumptive Counts by NCSU Botany Lab staff ranged from 160-630 cells/ml. UNC Greensboro scientists reported samples negative for P. piscicida and P. shumwayae DNA. NCSU Botany Laboratory fish bioassays in progress. Both Labs reported possibly identifying heterotrophic pfiesteria-like cells in samples.</i>							
7/10/2000	WA00019	Camp Creek	Oriental	Pamlico	030410	MENHADEN SPECKLED TROUT PINFISH CROAKER	142
<i>Notes: Kill appeared to be a result of trawling in the area. The species killed, and the size of the fish found indicate a bycatch situation. The fish were found directly on the ramps at the Wildlife access in Oriental NC.</i>							
8/10/2000	WA00023	Neuse River	Flanner's Beach	Craven	030410	MENHADEN	260
<i>Notes: Oxygen levels had been low to nothing below approximately 2m in this area for the past several days. Investigators suspected that weaker fish had been dying off in small numbers in the area over the past several days. None of the menhaden observed showed lesions. 600 blue crab were also reported affected. The numbers derived for each species were based on direct counts.</i>							
9/1/2000	WA00025	Northwest Creek	near Fairfield Harbo	Craven	030410	MENHADEN PUMPKINSEED YELLOW PERCH CROAKER LARGEMOUTH BASS	1700
<i>Notes: 4 inches of rain had fallen in the days prior to NRRT notification. There was a significant amount of freshwater flowing out of the headwater wetlands into Northwest creek. Dissolved Oxygen levels at the headwaters of the creek were lower than those farther downstream in the creek. There were other outfalls from drainage ditches in the general area of the kill that could have held stagnant low dissolved oxygen water. No lesions were found on the fish, and by appearance of decomposition the fish appeared to be have been dead for over 36 hours. Phytoplankton samples showed a dense bloom of the dinoflagellate Peridinium trochoideum and Eutreptia (a euglenoid). ESB staff presumptively identified Gyrodinium galatheanum (a Pfiesteria-like) at 5590 cells/ml</i>							

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Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
9/12/2000	WA00026	Slocum Creek	near mouth	Craven	030410	MULLET MENHADEN PINFISH	60
<i>Notes: All fish were found very high on the beach and appeared to have been discarded by local recreational fisherman a day or two prior to the investigation. The species found are commonly used as bait in that area, and fishermen were observed doing so at the time of the investigation. There were many large schools of healthy mullet observed swimming in the creek and surrounding area. Water was highly tannic, characteristic red color. 90% of menhaden showed lesioned/sore areas.</i>							
9/13/2000	WA00027	Neuse river	near Kennel Beach	Pamlico	030410	MENHADEN	103
<i>Notes: Most of the menhaden appeared to be 12-24 hours old. Up to 100% of the affected fish were observed with lesions. There were a few singles in distress scattered throughout the area. Salinity levels were reported as low for that area for this time of year. Investigators reported environmental factors may have played a role. The fish with lesions appeared stressed. Investigators were also able to catch 668 menhaden in the castnet just upstream from the kill site with only 17% lesions. The lesions on these fish were not as advanced as the ones involved in the kill. ESB staff identified pfiesteria-like organisms in water samples numbering 82 cells/ml and appeared as photosynthetic (autotrophic) dinoflagellates. NCSU staff also reported pfiesteria-like organisms counts at <80 cells/ml.</i>							
9/13/2000	WA00028	Neuse River	mouth of Beard Cre	Pamlico	030410	MENHADEN	5000
<i>Notes: NRRRT observed menhaden with sores swimming irrationally and gasping, actively dying. Hydrolab readings showed no sign of a dissolved oxygen problem. Sea Gulls were noted actively scavenging the surface of the water. The dead menhaden appeared to be less than 24 hours old. Crabs and mullet were observed displaying normal behavior. ESB staff identified pfiesteria-like organisms in water samples numbering 23 cells/ml and appeared as photosynthetic (autotrophic) dinoflagellates. NCSU staff reported pfiesteria-like organisms counts as high as 355 cells/ml at mouth of Beard Creek. NCSU began algal and fish bioassays on water samples.</i>							
9/24/2000	WA00030	Neuse River	Kennel Beach	Pamlico	030410	MENHADEN	12500
<i>Notes: Nrrt team members discovered this fish kill after investigating another kill at Flanners Beach. There were no dead fish observed down river from Beard Creek or up river from Transect 15 (N35.0240, W76.9286). Numerous schools of menhaden were observed throughout the estuary. It is estimated that 50 - 80% of the menhaden in those schools had lesions on them. Also observed were single menhaden with lesions, displaced from the schools, swimming at the surface. There were a few fish observed actively dying.</i>							
9/24/2000	WA00031	Neuse River	Flanner's Beach	Craven	030410	MENHADEN	30000
<i>Notes: Dead menhaden were observed along the shore, there were none seen floating or dying in the water. There were extremely large schools of menhaden observed throughout this area, approx 80% had lesions. Physical measurements appeared to be within the normal ranges. The menhaden appeared to be dead about 12-36 hours.</i>							
9/28/2000	WA00032	Neuse River	Flanner's Beach to S	Craven	030410	MENHADEN	78200
<i>Notes: Based on the location where the fish were found it is highly probable that these are some of the fish that we observed with advanced lesions earlier in the week. The age of the fish was estimated to be between 12 and 48 hours old or more in some cases. The heaviest concentrations of fish were found closer to the Slocum Creek area. No samples were collected due to the fact that this area had been sampled the day before. Samples collected the day before included DWQ samples, Burkholder samples, and Rublee samples. confirmation tests negative for Pfiest. spp.</i>							
10/4/2000	WA00033	Goose Creek		Pamlico	030410	MENHADEN	320
<i>Notes: Fish that were found appeared to be between 2 and 3 days old. All fish were quite decayed, most were found rafted up into the marshgrass by wind and waves. The wind had been out of the same direction for two previous days. Prevailing winds and age of the fish indicate that they may have died outside of Goose creek and been blown in. Lesion percentage was 100.</i>							

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Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
10/25/2000	WA00034	Neuse River	Flanners Beach	Craven	030410	MENHADEN	14240
<i>Notes: At time of investigation the fish appeared to be 24 to 48 hours old. Investigators suspected an environmental stressor such as a shift in oxygen or salinity pushed already stressed fish over the edge. No shcools of fish were seen in the area of the kill and there were no dead fish observed in the water at the time of the investigation.</i>							
5/26/2001	WA01003	Duck Creek		Craven	030410	LONGNOSE GAR YELLOW BULLHEAD TREADFIN SHAD	68
<i>Notes: Fish were estimated 4 days old. Mainly catfish found with only two individuals of other species. An investigation several days after the initial investigation showed a mild algae bloom in the same area. Algal bloom samples were taken, and dissolved oxygen levels on the bottom of the basin were around 1.0. The area where the fish were found was a proposed marina that was never developed off of the main creek with one connection to the creek (low flushing capabilities). Dissolved oxygen was possible cause of the fishkill, but investigation was too long after the actual kill to truly determine the cause.</i>							
6/13/2001	WA01005	Neuse River	Flanner Beach to Ca	Craven	030410	SPOT FLOUNDER CROAKER MENHADEN GREY TROUT PINFISH	150000
<i>Notes: Dead fish (mixed species) were found along the beach in a 7 mile stretch from the Otter creek area to the Slocum creek area. Dead fish were also found in the water around the Carolina Pines area and in an area located in the middle of the Neuse River halfway between Carolina Pines and Kennels Beach. No lesions were found on any of the dead fish observed. Estimates made of dead fish in the water were difficult due to windy conditions which contunually moved fish which were being counted. Most fish appear to have died on the southern shore around the Carolina Pines/Slocum Creek area and were blown upstream and across the Neuse River by southeasterly winds. NRRT monitored stratified conditions exhibiting low dissolved oxygen levels close to the bottom layer of the water column for approximately two weeks prior to the event. Low dissolved oxygen levels throughout the water column caused by mixing is the suspected cause of this fishkill.</i>							
7/3/2001	WA01007	Neuse River	near Kennels Beach	Pamlico	030410	SPOT SKILLET FISH PINFISH SILVER PERCH RED DRUM CROAKER FLOUNDER	700
<i>Notes: Upon arrival NRRT found a mixed species fish kill spanning over a 0.2 mile stretch of Kennels Beach. Seven species of finfish and blue crabs were observed and none were observed with lesions. The total number of fish were estimated due to a large number of scavengers. Kill was attributed to low disolved oxygen levels caused by a mixing event during a change in wind direction on the afternoon of 7-02-01. Residents of Kennels Beach informed the NRRT during the investigation that fish and blue crabs were in distress around 4:00 pm. on 07-03-01.</i>							

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Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
7/7/2001	WA01009	Neuse River	Neuse Harbor	Craven	030410	MENHADEN	72
<i>Notes: Neuse River Response Team members received a call reporting approximately 100 menhaden dead on the beach at the Neuse Harbor subdivision. At the time of the investigation 72 fish were found and 40 crabs. Based on the appearance and decomposition of the fish it is likely that the fish kill occurred late in the evening on 7/4 or early 7/5. Given the approximate age of the fish no samples were collected and no physical measurements made as they would not have been relevant to the conditions during the kill.</i>							
7/8/2001	WA01010	Neuse River	Fisher's Landing Poi	Craven	030410	MENHADEN	1440
<i>Notes: Neuse Riverkeeper Tom Jones notified NRRT of dead fish at Fisher Pt Landing. The upstream end of the fishkill was determined to be at SR 1112, total distance included in the kill was 1 mile. Menhaden observed dead were greater than 48 hours old, and predation had occurred. No physical measurements were taken due to the age of the kill.</i>							
7/12/2001	WA01013	Neuse River	SR1112 to Fisher's	Craven	030410	MENHADEN	2280
<i>Notes: At the time of the investigation the fish appeared to be around 12 hours old. Water temperatures have been in the high 80s to low 90s in the shallows for the past several days. Menhaden caught by castnetting in the area looked good showing about 10% lesions. The prime factors for this event seem to be unfavorable environmental conditions (high temp and low DO the past few days) and compromised fish. Presumptive Pfiesteria-like cell counts from water samples taken in area by ESB numbered 140 cells/ml. None of the Pfiesteria-like cells appeared to be of the toxic form.</i>							
7/16/2001	WA01014	Goose Creek	near mouth	Craven	030410	MENHADEN	2900
<i>Notes: High surface temperature probably played a role in the death of the fish. The fish that were present in that area were subjected to water temperature over 30 degrees centigrade. Schools that were sampled in that area showed about 15 percent with lesions.</i>							
7/17/2001	WA01015	Neuse River	Flanner's Beach	Craven	030410	SILVER PERCH MENHADEN	50
<i>Notes: Fish were found along the shoreline at Flanners beach and had been out of the water for several hours. They appeared to be at least 24 hours old and were beginning to decay. Exact cause of death is unknown. High water temperatures were measured in vicinity of the dead fish.</i>							
7/18/2001	WA01019	Neuse River	near Carolina Pines	Craven	030410	MENHADEN CROAKER	510
<i>Notes: Dead fish were found along a windrow, which had collected the fish as well as dead plant material. Prevailing southerly winds for the days leading up to the investigation could have blown the fish away from the shoreline. The fish were at least 36 hours old and were severely decayed. All menhaden had lesions. Over 95 percent of the fish observed were juvenile, and the few menhaden that were found all showed lesions. Due to the age of the fish found, exact cause of death is not known although high water temperatures were suspected to have played a role.</i>							
7/19/2001	WA01017	Neuse River	River Bluffs	Craven	030410	MENHADEN	22000
<i>Notes: High water temperatures were measured in the areas close to shore where juvenile crabs were found. All of the crabs found at River Bluffs were juveniles. On 7/19 after a report of dead menhaden at the Flanner Beach area, investigations were made along the southern shore of the Neuse River. In a 3 mile area along the shoreline, 4 areas were visited and transects were made to estimate the number of dead menhaden. Along with menhaden, additional blue crabs were also counted and added to the estimates made on 7/18. All menhaden and crabs observed were juveniles. High water temperatures along with low dissolved oxygen levels were suspected as factors in the event.</i>							
8/6/2001	WA01024	Neuse River	Fisher Landing Poin	Craven	030410	NONE	60
<i>Notes: The crabs seemed to range in age from about 24 hours to several days or more. Data collected in the vicinity by the USGS platform indicates that there was a loss of bottom DO Saturday night into Sunday. Due to the age of the event no samples or physical readings were taken. At the time of investigation fish and crabs were seen acting normally in the area.</i>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
8/6/2001	WA01025	Neuse River	Flanners Beach	Craven	030410	NONE	136
<i>Notes: At the time of investigation the crabs involved in this kill range in age from 24 hours to several days old. Based on data from the USGS platform in the vicinity there was a loss of bottom DO that occurred Saturday night into Sunday. Due to the age of the crabs no samples or physical readings were taken.</i>							
8/6/2001	WA01026	Neuse River	River Bluffs	Craven	030410	NONE	220
<i>Notes: At the time of investigation the crabs ranged in age from about 24 hours old to several days old. Data from the USGS platform in the vicinity showed that bottom DO dropped out on Saturday night into Sunday morning. Due to the age of the event no samples or physical readings were taken. Fish and crabs were seen behaving normally at the time of investigation.</i>							
8/8/2001	WA01028	Neuse River	near Carolina Pines	Craven	030410	CROAKER SPOT SILVER PERCH MENHADEN FLOUNDER PINFISH BLUEFISH SKILLETFISH	146000
<i>Notes: All dead fish were found either washed up along shoreline, or close to shore. Most of the fish found were juveniles. Data from nearby platforms showed a total loss of oxygen during the previous night. Extremely high water temperatures at the surface, combined with hypoxic conditions close to the bottom are the suspected cause of this fishkill which contained over eight different species.</i>							
8/10/2001	WA01032	Neuse River	Flanners Beach/ Car	Craven	030410	CROAKER ATLANTIC SILVERSIDES PINFISH FLOUNDER MENHADEN SPOT	99285
<i>Notes: A mixed species fishkill resulting from high water temps and chronic hypoxic conditions. During certain weather patterns, the southern shore (Flanners Beach and Carolina Pines areas) are in the lee side of the prevailing winds from the southwest. This, combined with shallow water, allows for little or no circulation in these areas. High water temperatures result from daytime heating, and already low oxygen levels are further worsened by high water temperatures. The juvenile fish found schooling in these shallow water areas were extremely stressed during hot conditions. Total number of fish was obtained by counting fish along 1.4 miles of shoreline, and transects made through the open water fishkill area.</i>							
8/12/2001	WA01035	Neuse River	Cherry Branch Ferry	Craven	030410	FLOUNDER STRIPED MULLET	51
<i>Notes: NRRT received a call from Cherry Branch ferry that flounder had died in the basin. Ferry dock employees noticed flounder on the surface several days prior to notifying NRRT. The flounder that were found in the basin were about 1-2 days old and had started to decay. About 150 blue crabs were found along the shoreline adjacent to the ferry basin, and they also appeared to be about 1-2 days old. Hot water temperatures and low dissolved oxygen levels had been detected by USGS monitors at channel marker #9 (just outside the ferry basin) during the previous week.</i>							

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Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
9/17/2001	WA01041	Upper Broad Creek	near mouth	Craven	030410	MENHADEN	175
<i>Notes: Very large schools of Atlantic Menhaden seen congregating along the banks of Upper Broad Creek off the Neuse River. Low dissolved oxygen levels were measured by investigators in the vicinity of the schools. The menhaden that were observed dead or dying were found in areas adjacent to large schools. All other areas away from schooling fish within Broad Creek, showed significantly higher dissolved oxygen levels, and non stratified salinity levels. 5 to 10% of fish were observed with lesions.</i>							
9/21/2001	WA01036	Neuse River	New Bern	Craven	030410	STRIPED BASS CHAIN PICKEREL	175
<i>Notes: Investigators found 150 to 175 dead Striped Bass with gill net marks around their heads. One Chain Pickerel was also found. The fish were determined to be dead approx. 12 to 24 hours. No other water quality problems were found in the area. This kill appears to be bycatch resulting from gill netting activity in the area. No responsible party was identified.</i>							
9/25/2001	WA01038	Upper Broad Creek	near mouth	Craven	030410	MENHADEN	78
<i>Notes: Upon investigation approximately 70 dead Atlantic Menhaden were counted in and around the docks and bulkhead of the Blackbeard Sailing Club. 90-95 percent of fish counted showed lesions which were in late stages. Dissolved oxygen was in the normal range, as were salinity and Ph. Schools of menhaden were observed in the vicinity of the marina.</i>							
9/28/2001	WA01042	Upper Broad Creek		Craven	030410	MENHADEN	78000
<i>Notes: Neuse team discovered the fish kill during a routine fish sampling trip. The fish kill covered a distance of 3.2 miles. Fish were observed in dying, dead, and decaying stages and probably up to 48 hours old. The older dead fish have been moved around by wind and stream current and deposited in large numbers along the shoreline for the entire length of the kill. In one location fish were congregating in very high densities and hypoxic conditions occurred below 2 meters. Fish may have been in such high densities that they were depleting the oxygen. The Neuse Team has been observing high numbers of menhaden in this area for a couple of weeks.</i>							
10/3/2001	WA01044	Neuse River	Fairfield Harbor Can	Craven	030410	PUMPKINSEED AMERICAN EEL GOLDEN SHINER	309
<i>Notes: An apparent bacteria bloom in the head or end of a canal at Fairfield Harbor, which was stirred to the surface by strong winds, caused a net loss of oxygen throughout the water column. This mixing event distributed the bacteria from lower in the water column to the surface, which in turn created hypoxic conditions. This event lasted for approximately 24 hours and is believed to be the cause of the localized fishkill in that area. All fish appeared to have died about 48 hours before they were investigated, which coincides with the bloom event.</i>							
10/5/2001	WA01046	Upper Broad Creek	near Lees Landing	Craven	030410	MENHADEN	123650
<i>Notes: Upon arrival at Upper Broad Creek investigators found dead Menhaden about half way between Blackbeards Marina and Lee's Landing. Investigation showed that the kill spanned for 2.8 miles, with dead fish ranging from 24-48hrs old in the lower section to currently dying fish in the upper portion. Very large congregations of menhaden could be seen on the depth finder in schools 17 ft. deep and 50 ft. long. In the areas where the fish were dying, fish were observed hemorrhaging from the eyes to the point that their eyes came out of their sockets. In this area fish were in distress and swimming erratically at the surface. Fish were found piled on both sides of the creek and out in the waterway for the entire length of the kill area. Very low dissolved oxygen readings, (2.9mg/l at the surface to 0.4mg/l at the bottom) in the areas of the high concentrations of fish. Outside of these areas normal dissolved oxygen readings (6.0mg/l at the surface to 1.0mg/l at the bottom) were recorded. Less than 5% of fish were observed with lesions. Algal samples were analyzed by DWQ under fluorescence and all Pfiesteria-like dinoflagellates observed glowed as autotrophs and not as toxic Pfiesteria. Preliminary analyses conducted by NCSU indicate that samples were negative for toxic Pfiesteria.</i>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
10/6/2001	WA01047	Neuse River	near old 17 Bridge	Craven	030410	MENHADEN	31
<i>Notes: At the time of investigation on 31 fish were found which ranged in age from 12 to 48 hours old. Based on the observations made no samples or hydrolab data were collected. Very large numbers of menhaden were seen in this area earlier that week.</i>							
12/30/2001	WA01053	Duck Creek	Duck Creek Basin	Craven	030410	MENHADEN SHAD SPOTTED SEATROUT STRIPED BASS	34
<i>Notes: Mixed species kill which included non juvenile fish. Low temperatures slowed decay, kill was estimated at two days old. No evidence of net marks could be found. All physical water data appeared normal at time of investigation. Temperature shock could have resulted in the kill due to the area where the kill was. The kill occurred in a deep basin which may have been stratified (temperature), and due to a drop in temperature and increased wind, the water column mixed, stressing the fish.</i>							
6/17/2002	WA02008	Slocum Creek	Near Cherry Point	Craven	030410	CHANNEL CATFISH	62
<i>Notes: Approximately 62 Channel catfish were found severely decomposed in the upper reaches of navigable waters of Slocum Cr. Dissolved oxygen levels were found to be less than 1 mg/L from 1 meter down to the bottom in the area of the fishkill. Heavy rains two days prior most likely caused a flushing type event, which pushed stagnant water from upstream areas containing very little if any dissolved oxygen into the area of the fishkill. Persistent drought conditions have caused many creeks along the neuse River estuary to become highly saline which could also stress freshwater fish species. Salinity levels at the site of the fishkill were higher than expected, and were found throughout most of the water column. In the area of the fishkill thousands of healthy Atlantic Menhaden were observed swimming in the uppermost layer of the water column. No other species were found dead in this fishkill, although several other were observed in the area after the event.</i>							
7/3/2002	WA02009	Neuse River	near Fairfield Harbo	Craven	030410	ATLANTIC MENHADEN	400
<i>Notes: A small kill comprised of Atlantic Menhaden with all fish showing lesions. This kill is most likely a result of high temperatures stressing lesioned fish. Many healthy schools were sampled in the area of the kill and those fish that were sampled showed less than 1% lesions. No algae bloom activity was found at the kill area and most fish were found in a small very shallow bay.</i>							
7/4/2002	WA02010	Neuse River	Bridgeton	Craven	030410	ATLANTIC MENHADEN STRIPED BASS	6500
<i>Notes: Approximately 6500 dead Atlantic Menhaden were found along a stretch of the Neuse River at Bridgeton. Fish appeared to be around 12 hours old, and had died in the area offshore of Bridgeton and were blown onto the shoreline, and into grass beds along the eastern shoreline of the Neuse River. Conditions in the area of the fishkill were stratified for several days prior to this event and, several smaller similar kills had also occurred just downstream along the same shoreline. Hot conditions and a persistent salt wedge caused severe stratification in the Neuse River from Johnson Pt. to upstream of New Bern. These conditions most likely caused the death of lesioned fish swimming in that area due to added stress of high water temperatures, and low oxygen conditions.</i>							
7/30/2002	WA02013	Neuse River	between Stately and	Craven	030410	PINFISH MENHADEN SILVER PERCH CROAKER	25330
<i>Notes: It is likely that these fish did not die in the area where they were counted. Northwest winds were blowing them into the Stately Pines/Carolina Pines area. Just upriver at CM# 11 and Flanner's Beach the water column was very stratified with very little if any DO in the lower layers. Water temperatures were over 32° C (90° F) throughout the area where dead fish were found. Nearly all of the fish found were juvenile, and were most likely killed by stress related to extremely high water temperatures/low DO.</i>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
6/26/2003	WA03007	Beard Creek	near mouth	Pamlico	030410	ASIATIC CLAM	37000
<i>Notes: During routine sampling NRRT discovered dead clams in Beards Creek. Clams were found floating just inside the mouth of the creek. The kill was suspected of being caused by a combination high water temperature, low dissolved oxygen, and possible location of the clams. Large numbers of asiatic clams often die for several reasons, these clams appear to have been transported downstream by high flow from freshwater input in the area. Clams were relatively homogenous in size 30-40mm.</i>							
7/11/2003	WA03010	Neuse River	Minnesott Beach	Pamlico	030410	MENHADEN	800
<i>Notes: The kill consisted of approximately 800 juvenile to one year old Atlantic Menhaden washed on the beach at Minnesott. Fish were observed over an area of one mile starting at the DOT ferry basin moving west along the beach above Minnesott Country Club. The fish appear to be at least 48hours old with 95-100% lesions. The monitors in the area have recorded hypoxic conditions in the last few days which could be a contributing factor to the kill. No samples or measurements were taken due to the age and decomposition of the fish and the exact location of the kill is unknown.</i>							
7/15/2003	WA03011	Neuse River	Cherry Branch	Craven	030410	MENHADEN	288
<i>Notes: NRRT counted 288 Atlantic menhaden on the beach at Cherry Branch. This kill appears to have ocured during the morning of 7/15. 95-100% of the fish had lesions and were juvenile. The area where the fish were found was shallow and hot which may have caused severe stress. There was an algae bloom at the time of investigation. Since no fish were dying at the time of investigation it is not known if this bloom played a role.</i>							
7/17/2003	WA03014	Neuse River	Cheery Point MCAS	Craven	030410	MENHADEN	400
<i>Notes: Kill was reported at the waterfront along the seawall of Cherry Point. Team members tried to respond but could not due to weather and the investigation was carried over untill the morning of 7/18/03. Upon investigation 400. Menhaden were counted on the beach and wash zone over and area of a half mile. About 95-100% of the fish had lesions. There were other live fish in the area and physical readings were within range to sustain fish activity. No chemical samples were taken.</i>							
7/30/2003	WA03015	Neuse River	near moth of Hanco	Craven	030410	SPOT PINFISH FLOUNDER CROAKER MULLET MENHADEN	3500
<i>Notes: NRRT discovered deaf fish along the bank and water surrounding the mouth of Hancock Cr. All fish appeared to have been dead for at least 18 hours. Most fish were juveniles, and none showed any lesions. Conditions in the area had been stratified for several days, with very low dissolved oxygen levels near the bottom. Low oxygen levels and high temperatures are believed to have killed the fish that were found in the shallow water area surrounding the mouth of Hancock Cr.</i>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
7/30/2003	WA03016	Neuse River	Cherry Branch	Craven	030410	SPOT EEL MENHADEN PINFISH FLOUNDER	200
<p><i>Notes: NRRT investigated a fishkill at Cherry Branch Ferry Terminal basin upon report from the Neuse River Foundation. Investigation was made at first light due to the late hour of the first notification. NRRT observed approximately 200 dead fish of various species in the ferry basin and outside of the breakwater surrounding the basin. No lesions were observed on any of the fish. Very hypoxic conditions were present at the time of investigation, and ferry staff reported observing large and small fish swimming along the surface gasping. The basin is roughly 7-10 feet deep and has limited circulation. In situ monitors nearby showed signs of an algae bloom and a mixing event of the stratified water column the evening prior to the kill. Severely depressed dissolved oxygen levels caused by high temperatures, algal bloom activity, and poor mixing of the water column within the ferry basin are believed to have caused this event. ESB staff determined no algal bloom was present from phytoplankton samples submitted.</i></p>							
8/18/2003	WA03017	Neuse River	near Carolina Pines	Craven	030410	SPOT CROAKER PINFISH SILVER PERCH	74500
<p><i>Notes: Kill was reported at 0800 on 8-18-03 by a resident of Carolina Pines. Resident was on the beach the night of 8-17 and did not see anything, the next morning found fish along the beach and waters edge. Monitors in the area show a DO crash the night of 8-17-03. The fish were lesion free and the majority were spot (65%), with croaker (15%) and pinfish (10%). The balance of the total consisted of flounder, menhaden, crab, shad, silver perch and striped bass. Automated monitors in the area indicated that there had been a turnover event and a DO crash late the night before and in the early morning. Physical readings taken during the investigation were all within normal parameters and there were healthy fish in the area.</i></p>							
8/31/2003	WA03018	Neuse River	Carolina Pines	Craven	030410	SILVER PERCH SPOT CROAKER MENHADEN PINFISH MULLET CATFISH SHAD FLOUNDER	1300000
<p><i>Notes: Upon investigation DWQ staff found dead fish along a 5 mile stretch of the Neuse River and the adjacent southern shoreline. No lesions were visible on the dead fish which were 95% juvenile. Data from US Geological Survey monitors on Channel Marker 11 showed a severe drop in dissolved oxygen for that area on the evening of 8/30. This drop in dissolved oxygen matches an increase in wind speed which most likely caused the mixing or upwelling event. This phenomenon seems to have occurred over a extensive portion of the Neuse River from Flanners Beach to Slocum Creek and extended for a period of roughly 3 hours. This change in the dissolved oxygen levels in that area may have also been worsened by algal bloom activity. Estimates for the total mortality of this kill were made by shoreline transects over the entire distance of the kill as well as open water estimates which were then added together. Three preserved algal samples were collected on 8/31 and arrived at the Environmental Sciences Branch Lab on 9/3. All three samples contained a very diverse mix of algal species commonly seen in the Neuse. Algal concentrations indicated that a fairly dense algal bloom took place between Slocum and Hancock Creeks. No Pfiesteria-like dinoflagellates were seen in any of the samples.</i></p>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
9/5/2003	WA03019	Neuse River	Carolina Pines	Craven	030410	MENHADEN STRIPED MULLET PINFISH	1800000
<p><i>Notes: NRRT received a call from Mr Rick Dove on the evening of 9/4 concerning a massive fishkill in progress on the Neuse River. Investigation showed mostly dead menhaden from Carolina Pines to Hancock Creek (Including an area inside Slocum Creek). Estimates of dead fish were made using open water transects as well as beach transects throughout the 5 mile area of the kill. Profiles of the water column during the investigation showed mixed conditions. Data from NCSU monitors at the time of the fishkill showed an upwelling event which moved hypoxic water from the bottom into the shallow areas of the river along the southern shoreline. An increase in windspeed is believed to have created the upwelling current along the southern shoreline. Very low numbers of fish with lesions were observed. Samples were taken in the area of the kill for phytoplankton as well as unpreserved samples for analysis of bacteria. ESB staff analyses of phyto samples showed a very diverse mix of algal species commonly seen in the Neuse. Algal concentrations indicated that fairly dense algal blooms took place at both sites. Only insignificantly low concentrations of Pfiesteria-like dinoflagellates were found in the Kennel Beach sample, and no Pfiesteria-likes were found in the Slocum Creek sample.</i></p>							
9/5/2003	WA03020	Neuse River	Kennels Beach	Pamlico	030410	SUMMER FLOUNDER HOGCHOKER EEL PINFISH	3500
<p><i>Notes: NRRT discovered this fishkill while investigating a larger fishkill on the opposite side of the Neuse River. Upon making measurements on the northern side of the river and discovering that the estuary was in the process of an upwelling event, NRRT began looking for fish in distress. In the Kennels Beach/ Kendall Pt area Crabs and flounder were observed trying to leave the water. The strong smell of sulphur (anoxic water conditions) was present in the area. These conditions as well as fish in distress were found from Cooper Pt. to Myrtle Marsh Pt. At the time of investigation winds had switched 180° and were blowing from the north at around 12mph. This was moving surface water to the southern shoreline, and causing hypoxic bottom water to upwell on the northern shoreline. This event caused very low dissolved oxygen levels which stressed and killed the fish found along the shoreline. Samples were taken in the area of the fishkill and sent to ESB, NCSU, and UNCW. ESB staff analyses of phyto samples showed a very diverse mix of algal species commonly seen in the Neuse. Algal concentrations indicated that fairly dense algal blooms took place at both sites. Only insignificantly low concentrations of Pfiesteria-like dinoflagellates were found in the Kennel Beach sample, and no Pfiesteria-likes were found in the Slocum Creek sample.</i></p>							
10/4/2003	WA03024	Neuse River	Minnesott Beach	Pamlico	030410	MENHADEN	3921
<p><i>Notes: Fish appeared to be dying off from large schools which were swimming close to the bottom of the river. There were no obvious environmental changes in that area of the river which may have caused stressful conditions. Cause was undetermined at time of investigation.</i></p>							
10/4/2003	WA03025	Neuse River	Kennels Beach, Min	Pamlico	030410	MENHADEN	39109
<p><i>Notes: Fish appeared to be dying off from large schools which were swimming close to the bottom of the river. There were no obvious environmental changes in that area of the river which may have caused stressful conditions. Cause is undetermined at this time.</i></p>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
10/9/2003	WA03028	Neuse River	near Neuse Harbor	Craven	030410	PINFISH STRIPED BASS SILVER PERCH CHANNEL CATFISH MENHADEN SHAD	222
<p><i>Notes: NRRT received a call about a small fishkill in the Neuse Harbor neighborhood along the Neuse River. Dead fish were found along a stretch of shoreline approximately 1/4 mile long. The kill was comprised of mostly menhaden which appeared to be from 6 to 24 hours old. Adult gizzard shad were also found in the kill, as well as several larger striped bass. These larger fish were very decomposed and believed to be bycatch from a gill net in the area. The dead menhaden most likely washed ashore after dying in deeper water. NRRT was in the area several days prior to this event and observed lesioned fish swimming near the surface. Northerly winds would have pushed any dying fish onto the shoreline where the dead fish were found.</i></p>							
10/11/2003	WA03029	Neuse River	Long Creek	Craven	030410	MENHADEN	34000
<p><i>Notes: Fish were estimated to be dead for 24 - 48 hours. Investigators reported 100% of fish had lesions. No cause was specified.</i></p>							
10/11/2003	WA03031	Neuse River	Flanners Beach	Craven	030410	MENHADEN STRIPED BASS MULLET	1010
<p><i>Notes: NRRT investigated a kill which spanned the full length of Flanners Beach with species including menhaden, shad, mullet, and striped bass. The kill was predominantly menhaden at roughly 1000 fish that had been on the beach for more than 48 hrs with 85% lesions. The other fish involved in the kill appeared to be net bycatch and some had been filleted. There were fishermen in the area that were net fishing from the beach.</i></p>							
10/16/2003	WA03032	Neuse River	Cherry Branch Ferry	Craven	030410	MENHADEN	200
<p><i>Notes: Fish described as having lesions at time of investigation. Elevated dissolved oxygen levels measured at water surface.</i></p>							
5/16/2004	WA04009	Neuse River	Carolina Pines	Craven	030410	CROAKER	400
<p><i>Notes: NRRT recieved a report of a fishkill at Carolina Pines from Mr. Rick Dove. When DWQ arrived at the site of the kill, approximately 400 juvenile Croaker were found. The fish showed no signs of lesions, and had been dead for approximately 12-24 hours. No sign of algae bloom activity was found in the area, although samples were collected for analysis. USGS monitors at Channel Marker # 11 indicated a drop in surface dissolved oxygen on the evening of 5/15/04. This drop was most likely caused by an increase in windspeed which was measured at the same time. Weather patterns most likely caused a mixing or upwelling of water from the bottom, which had been anoxic for a week prior to this event. These type of circulation patterns which can create areas of low dissolved oxygen are usually short lived and spatially erratic. It was this kind of event which is believed to have caused the fishkill.</i></p>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
5/21/2004	WA04002	Neuse River	Carolina Pines	Craven	030410	MENHADEN SPOT SILVER PERCH CROAKER PINFISH	98954
<i>Notes: Kill was investigated on 5/21/04. Investigation covered a 2.2 mile span of the Neuse River in the Carolina Pines area. Species of fish included Spot, Pinfish, Croaker, Atlantic Menhaden, and Silver Perch. Fish were approximately 24hrs. old with no lesions. USGS monitors in the area recorded low readings of dissolved oxygen in the area at the time of the kill.</i>							
5/21/2004	WA04003	Neuse River	Carolina Pines	Craven	030410	CROAKER SILVER PERCH MENHADEN SPOT PINFISH	235000
<i>Notes: Kill was investigated on 5/21/04. Fish were observed on the beach along a 3.3 mile span of the Neuse River in the Carolina Pines area. Species of fish included Spot, Croaker, Pinfish, Atlantic Menhaden, Silver Perch, and Blue Crabs. Fish appeared to be 24-48 hrs. old with a size range of 30-90mm. A historical graph from USGS monitors shows periods of low dissolved oxygen in the area of the kill. No lesions were observed.</i>							
7/2/2004	WA04005	Neuse River	Carolina Pines	Craven	030410	MULLET NEEDLEFISH PINFISH MENHADEN SILVER PERCH CROAKER SPOT FLOUNDER	59500
<i>Notes: NRRT received a fish kill call approx 8:00 a.m. July 2nd. The kill was located near the Carolina Pines area towards Flanner's Beach. It was approximately 1.4 miles in length and was comprised of, in order of highest percent abundance, juvenile spot, croaker, menhaden, flounder, blue crabs and some pop-eye mullet. Data from the nearest USGS in situ monitor (channel marker 11) indicated a drop in dissolved oxygen (DO) for approximately 2 hours the previous evening. At the time of the investigation, there were no other physical or biological parameters found to be out of the ordinary. It is believed that a short-term drop in DO was responsible for the fish kill.</i>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
7/31/2004	WA04010	Neuse River	near Courts Creek	Craven	030410	FLOUNDER GIZZARD SHAD RED DRUM SILVER PERCH MENHADEN PINFISH EEL SPOT CROAKER LIZARDFISH	200000
<p><i>Notes: NRRT received a report of a fishkill on the Morning of July 31 regarding dead fish washed ashore near Courts Cr. Upon investigation, dead fish were found along a 0.5 mile stretch of beach between Courts Cr. and Long Cr. along the Neuse River. Residents in the area reported observing various species of fish trying to leave the water the previous evening, along with a strong hydrogen sulfide (rotten egg smell). Noting the behavior of the fish during the kill event, the hydrogen sulfide smell, and the wind conditions present at that time, the kill could most likely be attributed to an upwelling of anoxic water from the lower portion of the water column. Field staff experienced strong easterly winds in that area on the afternoon of July 30. This would have created a upwelling current along the shoreline where the fishkill occurred. All fish in the kill were either juvenile or bottom dwelling species which inhabit shoreline areas.</i></p>							
8/28/2004	WA04006	Neuse River	Flanners Beach	Craven	030410	MENHADEN	2180
<p><i>Notes: A fish kill call was received on Saturday evening at 6:43 from Lynn Gurganous, a campground supervisor at the Croatan National Forest. The arrival time of 7:43 did not allow much time for pictures or sonde readings. The kill consisted of only menhaden in the small size range near 100 mm. The dried condition of the fish and human activities on the beach indicated the kill may have occurred late morning. No lesions were observed. The extent of the kill was near 1759 feet (0.33 miles). Three 50 foot transects revealed an approximate total of 2,180 fish. There were two wind shifts, one early morning, and the other before noon that same day. The USGS channel marker monitors indicated a slight drop in DO found during these times, along with an overturn of surface and bottom waters. This data is not conclusive, as the kill may have resulted from a localized event.</i></p>							
9/7/2004	WA04007	Neuse River	Carolina Pines	Craven	030410	MENHADEN	131000
<p><i>Notes: Due to continued concern of lesioned and dead menhaden, NRRT investigated a fish kill in the Carolina Pines area. This concern was communicated on Tuesday of the following week. This kill extended for approximately 3.5 miles. Five 60 foot transects were performed, resulting in 131,000 dead menhaden. Prolonged exposure indicated time of death near the previous weekend. Schools of lesioned menhaden were evident in a large radius, extending from Slocum Creek to Flanner's Beach. Several cast nets indicated over 90% lesioned fish, some of which were in various stages of lesion development. Some of the lesioned fish were observed swimming lethargically and dying. Fish samples and ambient water samples were taken for NOAA, DWQ, NCSU, and UNCG to determine presence of other stressors. Other in situ parameters did not indicate any substantial drop in dissolved oxygen.</i></p>							
7/20/2005	WA05003	Neuse River	near Flanners Beach	Craven	030410	ATLANTIC MENHADEN SHAD	20970
<p><i>Notes: NRRT discovered a fishkill during regular ambient sampling. Investigation of the fish kill area showed primarily juvenile Atlantic Menhaden with approximately 10% lesions. The kill appeared to be 6-12 hours old, and was being transported across the river by wind to the east. USGS in-situ monitors at CM 11 showed a drop in dissolved oxygen throughout the water column the previous night. The age of the dead fish, and time of the drop in dissolved oxygen coincide enough to link this as a possible cause to the fish kill. Data from channel marker 11 is very close to the site of the fishkill investigation.</i></p>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
7/21/2005	WA05004	Neuse River	near Neuse Harbor	Craven	030410	ATLANTIC MENHADEN SPOT WHITE PERCH	201000
<i>Notes: A fish kill was called in to NRRT from a citizen at 5:00 pm July, 21st. NRRT staff responded to this kill near the Neuse Harbor community. The fish kill event extended approximately 1 mile north of the Flanner's Beach area, over a 3/4-mile stretch of beach with a total mortality of 201, 245. Over 95% of this kill consisted of Atlantic Menhaden, with the remaining abundance to be blue crab, spot, and white perch. No lesions were observed. Judging from the condition of the fish, this kill could have occurred within 6 to 12 hours prior to investigation. Real-time data from Channel Marker 11 indicated consistent hypoxic conditions for several days prior to the event, and an increase in wind strength and a directional shift in the early hours on the day of the kill. It is possible that these factors combined to cause localized upwelling, which may have exacerbated hypoxic conditions to already physiologically stressed fish.</i>							
9/17/2005	WA05007	Beard Creek	near Arapahoe	Pamlico	030410	MENHADEN	28500
<i>Notes: After Hurricane Ophelia, the winds shifted out of the southwest causing the receding flooded swamps to drain into Beard Creek. Swamp water drainage into the creek depleted dissolved oxygen, causing the fish kill.</i>							
6/7/2006	WA06002	Pembroke Lake	New Bern	Craven	030410	SHAD CARP SUNFISH LARGEMOUTH BASS CATFISH	3850
<i>Notes: Investigators suspected an algal bloom as a factor in kill event. ESS staff examined water samples and identified a bloom of euglenoid algae and diatoms. Green cloudy water and a dissolved oxygen level of < 2mg/L was observed during the investigation.</i>							
7/9/2006	WA06006	Dawson Creek	near Janeiro	Pamlico	030410	GIZZARD SHAD	51
<i>Notes: NRRT & PRRT team members responded to a fish kill in Dawson Creek. The kill was approximately 2-3 days old and extended for .725 miles. It affected gizzard shad of 254-304 mm in length and no lesions were observed. Physical water quality data showed no obvious reason for the event. Cause of event is unknown to due to the old age of the fish. An oily surface film was observed at the same time.</i>							
8/2/2006	WA06004	Neuse River	Johnson Point	Craven	030410	CROAKER FLOUNDER SILVER PERCH	5000
<i>Notes: The Neuse River Response Team investigated a fish kill in the Neuse River n the Johnson Pt. area along the south side of the river. The fish kill was reported by a local resident. The kill involved primarily silver perch, and other species including croaker, menhaden, flounder, blue crab, and spot. Most of the fish observed were juvenile from 3-8" in length, had no lesions, and appeared to be 24 hours old. The fish kill covered approximately 2 miles of shoreline from Johnson Pt. downstream and included approximately 5000 fish. The event coincided with a drop in dissolved oxygen levels measured at Channel Marker 11 located 3.5 miles downstream. Real-time monitoring equipment recorded hypoxic (less than 1.0 mg/L) conditions near the area for almost 4 hours on the morning of 8/2/06.</i>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
10/24/2006	WA06007	Upper Broad Creek		Craven	030410	SPECKLED TROUT S. FLOUNDER ATLANTIC MENHADEN SPOT LARGEMOUTH BASS PUMPKINSEED	502

Notes: The reporting source contacted NRRT to report a multi species fish kill in Broad Creek. They noted that fish were gulping at the surface on 10-23-06. Cause was not determined. Additional decomposed fish reported in Fairfield Harbor on 11/1/06. Investigators suspected Fairfield Harbor fish originated from this event and WA06008.

10/25/2006	WA06008	Northwest Creek		Craven	030410	ATLANTIC MENHADEN MULLET YELLOW PERCH CRAPPIE PUMPKINSEED S. FLOUNDER GIZZARD SHAD SPECKLED TROUT ANCHOVY SPOT LARGEMOUTH BASS	4720
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Notes: While NRRT members were responding to a fish kill in Broad Creek, a citizen reported a similar event occurring in neighboring, Northwest Creek. Upon investigation the following morning, team members found dead fish the entire stretch of the creek (2.17 miles) and estimated a total of 726 fish that included multiple species. Additional decomposed fish reported in Fairfield Harbor on 11/1/06. Investigators suspected Fairfield Harbor fish originated from this event and WA06007.

11/9/2006	WA06009	Long Creek	near Batchelor	Craven	030410	MENHADEN	50
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Notes: The Neuse River Response Team investigated a fish kill in Long Creek after a call from a resident from the area. Long Creek is located 1.5 miles east of Clubfoot Creek off the Neuse River. Approximately 50 Atlantic Menhaden were found along the eastern shoreline of the creek. The fish were 8-9 inches in length and had no lesions. They appeared to be 3-4 days old, and had what appeared to be net marks on them. Water quality measurements did not indicate anything unusual at the time of investigation, and healthy fish were observed swimming in the area. No exact cause could be determined due to the age of the fish, although bycatch is the most likely culprit.

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
7/20/2007	WA07006	Neuse River	Carolina Pines	Craven	030410	SPOT TROUT NEEDLEFISH FLOUNDER SILVER PERCH ATLANTIC MENHADEN CROAKER	6600

Notes: The investigation was prompted by NRRT staff review of water quality data from the channel marker 11 real-time water quality monitor. Data from the channel marker 11 monitor indicated an upwelling event had occurred during the early morning hours. The upwelling event was characterized by a considerable decrease in dissolved oxygen (DO) and increase in salinity in surface water at the monitor location. The observed drop in DO (down to 0.7 mg/L) created hypoxic conditions favorable for a fish kill. NRRT staff discovered the fish kill upon arrival to the Carolina Pines area at approximately 09:30. The fish kill extended approximately 3/4 of a mile and included spot, croaker, menhaden, silver perch, trout, flounder and needlefish. Team members estimated 6,666 fish were killed during the event. There was no indication of an algal bloom and no lesioned fish were observed. The fish kill appeared to have taken place approximately 12 hours prior to NRRT arrival, coinciding with the observed upwelling event. Physical parameters were measured with a Hydrolab MS-5 equipped with an optical DO probe. Additionally, water quality samples, including phytoplankton, nutrients, and chlorophyll, were collected during the investigation. Measured DO concentrations were 7.1 mg/L at the surface and multiple species of fish were observed swimming in the vicinity of the fish kill during the investigation. Data from the Carolina Pines NCSU real time water quality monitor was utilized by NRRT staff following the onsite fish kill investigation to corroborate data from the channel marker 11 real time water quality monitor. Samples showed algal assemblages typical for summer and resembles the Neuse River samples collected earlier in the month during the ambient monitoring run. The dominant taxa were the flagellated chrysophyte Paulinella, the filamentous bluegreen Cyndrospermopsis, and the flagellated raphidophyte Heterosigma.

7/23/2007	WA07007	Private Pond	near Fairfield Harbo	Craven	030410	SHAD AMERICAN EEL CHANNEL CATFISH GRASS CARP LARGEMOUTH BASS YELLOW PERCH	52
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Notes: The groundskeeper at Fairfield Harbor contacted the Neuse River Rapid Response Team (NRRT) on July 23, 2007 regarding a fish kill in a private pond located at Fairfield Harbor. NRRT staff responded and counted 42 dead fish ranging in size from approximately 8" to 24". The fish kill consisted of multiple freshwater species including gizzard shad, grass carp, bluegill bream, yellow perch, largemouth bass, channel catfish, and american eel. During the investigation, pond water was blue/green in color and cloudy. Physical parameters were measured and did not indicate an algal bloom was in progress. Water samples were also collected for phytoplankton, chlorophyll, and nutrients. Fish appeared to have been dead at least 48 hours. It was difficult to establish the reason for the fish kill due to the state of decomposition and time lapse between the kill and the investigation.

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
7/29/2007	WA07008	Fairfield Harbor Canal		Craven	030410	CHANNEL CATFISH SUNFISH YELLOW PERCH	98
<p><i>Notes: Mr. Mark Klipinger, resident of Fairfield Harbor, reported a fish kill on July 29, 2007 in the canal system at Fairfield Harbor. NRRT staff responded and counted 98 dead fish ranging in size from approximately 8" to 24". The fish kill consisted of three freshwater species; channel catfish (accounting for 91 of 98 dead fish), bream, and yellow perch. Dead fish associated with this fish kill were observed throughout the canal system although the majority were located in the northwest portion of the canal system (winds were out of the Southeast). Several species of estuarine fish were observed swimming in the canals during the investigation. Physical parameters were measured and did not indicate an algal bloom was in progress. Water samples were also collected for phytoplankton, chlorophyll, and nutrients. Fish appeared to have been dead at least 48 hours as evidenced by the state of decomposition. The algal assemblage in water samples was typical for the lower Neuse River during summer. The dominant algal groups were small chrysophyte flagellates, chain forming diatoms (Aulocoseira, Chaetoceros), and dinoflagellates (Karlodinium, Scrippsiella).</i></p>							
8/13/2007	WA07014	Hancock Creek	above Cherry Point	Craven	030410	SUNFISH CATFISH	118
<p><i>Notes: The Neuse River Rapid Response Team received a report of a fishkill at the headwaters of Hancock Creek on Monday August 13, 2007. Upon investigation, team staff found 118 dead catfish and panfish in an area encompassing approximately 0.6 river miles. Fish appeared to be 48-72 hours old and highly decomposed. At the time of investigation, dissolved oxygen (DO) concentrations were low, measuring 1.0 mg/L at the surface and 0.2mg/L at 1 meter bottom depth while salinity was relatively high, measuring 4.7 ppt at the surface and 11.7 ppt at 1 meter bottom depth. Water color and clarity were indicative of an algae bloom although pH and DO measurements were not characteristic of an active bloom at the time of investigation. Weather may have contributed to this fish kill event as a period of strong north winds and heavy rains coincided with the estimated time of the fish kill. Physical measurements recorded at the real-time water quality monitor at Channel Marker 9 indicated an increase in water level that would likely have created a rise in salinity in the headwaters of Hancock Creek. High salinity combined with low DO concentrations and high water temperatures provided stressful conditions that likely led to the fish kill.</i></p>							
8/23/2007	WA07010	Neuse River	Marker 38	Craven	030410	LONGNOSE GAR SHAD	59
<p><i>Notes: During routine maintenance of the Neuse River CM38 continuous water quality monitors, Mr. Maverick Raber of the NRRT observed dead gar in the vicinity. Upon completion of maintenance activities, Mr. Raber and Mr. Ryan Rassmussen of the USGS investigated the area and discovered a total of 59 dead fish, primarily longnose gar, that had been dead 24-48 hours. Conditions at the CM38 water quality monitors did not indicate the presence of an algal bloom and several species of fish were observed swimming in the area. The kill area covered approximately 0.75 river miles.</i></p>							
8/30/2007	WA07012	Neuse River	Hwy 70 Bridge	Craven	030410	SHAD LONGNOSE GAR	36
<p><i>Notes: While commuting from the CM9 to CM38 continuous water quality monitors, Mr. Maverick Raber of the NRRT and Mr. Ryan Rasmussen of the USGS observed a total of 33 dead gizzard shad and 3 dead longnose gar just downstream of the Highway 70 Bridge in the Neuse River. Fish had been dead approximately 24 hours as noted by the state of degradation. The fish kill appeared to be the result of net fishing activities as net marks were observed on several of the fish.</i></p>							

Neuse River Estuarine Fish Kill Log

Date	Kill Number	Waterbody	Location	County	Subbasin	Species	Mortality
9/3/2007	WA07013	Upper Broad Creek	near Lee's Landing	Craven	030410	CHAIN PICKEREL YELLOW PERCH LARGEMOUTH BASS BLUEGILL SUNFISH CHANNEL CATFISH BLUE CATFISH SHAD	2200
<p><i>Notes: Live fish observed in the fish kill area appeared lethargic and a few may have been dying. None of the fish observed in the fish kill had lesions. Algal bloom samples were collected in the area of the fish kill although there were no signs of an active bloom. Recent drought conditions combined with strong northeast winds during the previous few days has resulted in relatively high salinity concentrations in the headwaters of Broad Creek. The drought has caused higher salinity waters to move farther upstream than normal. The northeast winds created a wind-generated tide that "pushed" higher salinity waters even farther upstream. NRRT team staff measured salinities in the fish kill area as high as 13 ppt, or nearly half the strength of sea water. Additionally, measured dissolved oxygen concentrations in the fish kill area were low, ranging from 0.4 mg/L to 1.6 mg/L. High salinity concentrations combined with low DO concentrations created highly stressful conditions to freshwater fish species and are the likely cause of this fish kill event.</i></p>							
10/23/2007	WA07015	Slocum Creek	near mouth	Craven	030410	LONGNOSE GAR GIZZARD SHAD STRIPED BASS STRIPED MULLET BLUEGILL SUNFISH FLOUNDER	183
<p><i>Notes: The Neuse Rapid Response Team (NRRT) responded to a report of several dead longnose gar and other species in a pile at the mouth of Slocum Creek on October 23, 2007. Upon investigation, NRRT staff counted 183 dead fish, primarily longnose gar. The fish were located above the high water mark on a 15 square meter area of beach and appeared to have been dead less than 24 hours. This fish kill is apparently the result of gill net fishing activities as net marks were apparent on several fish. Several gill nets were observed set just outside the mouth of Slocum Creek on the Neuse River. Water quality samples were not collected for this fish kill event.</i></p>							
12/20/2007	WA07018	Mortens Millpond		Craven	030410	FLOUNDER BLACK DRUM STRIPED MULLET CROAKER	134
<p><i>Notes: The Neuse River Response Team (NRRT) responded to a report of several dead black drum and other species in a pile near the SR 1715 bridge at Morten Mill Pond, a tributary to Clubfoot Creek. Upon investigation, NRRT staff observed 134 dead fish, primarily black drum, in an approximate 1 square meter area approximately 3 meters from the water's edge. The initial report to the NRRT indicated the presence of net marks on the dead fish. The fish had been dead approximately seven days at the time of investigation and it was difficult to confirm the presence of net marks due to the state of degradation. A local citizen that drove by during the investigation stated he frequently fishes at the SR 1715 bridge and had observed net fishing activities upstream of the bridge during the time the fish appeared on the bank. Water conditions appeared normal during the investigation and fish activity was observed in the creek. Water quality samples were not collected for this fish kill event.</i></p>							

Neuse River Basin - Algal Bloom Report, 2000-2006

Subbasin/ Waterbody/ Station	Date	Density (units/ml)	Algal Groups	Dominant Algae	Comments
Subbasin 03-04-01					
Corporation Lake					
NEU00C1	08/09/00	NQ	CHL		
NEU00C	08/09/00	2,000	CHL		
Lake Michie					
NEU0061J	06/14/00	8,000	PRY		
NEU0061L	08/14/00	44,000	CHL,CYA	<i>Cylindrospermopsis</i>	
NEU0061G	08/14/00	40,000	BAC,CYA	<i>Cylindrospermopsis</i>	
Lake Rodgers					
NEU017A	07/20/00	12,000	CHL	<i>Sphaerocystis</i>	
NEU017A	08/14/00	7,000	CHL		
Little River Reservoir					
NEU006T	06/14/00	3,000	BAC		
Subbasin 03-04-02					
Apex pond					
pond	11/30/06	NQ	CHR	<i>Chromulina</i>	fish kill
Big Lake					
NEU035H	08/07/00	12,000	CHL	<i>Anabaena</i>	
Brentwood Lake					
lake	06/29/05	NQ	CHL	<i>Oedogonium</i>	discolored water,fish kill
Garner Pond					
pond	02/11/05	NQ			taste and odor
Grantham Pond					
pond	07/21/02	NQ	CYA	<i>Oscillatoria</i>	discolored water
Hayes Farm Pond					
Hayes pond	03/01/00	3,384,000	CHL	<i>Chlorella</i>	fish kill
Honeycutt Creek					
creek	01/09/06	NQ	NQ		biofilm
creek	08/23/06	NQ	BAC	periphyton	
Johnston Pond					
pond	06/12/01	104,000	CHL	<i>Gleocystis</i>	discolored water
Knights Columbus pond					
New Hope Road	08/02/02	376,000	CYA,EUG	<i>Cylindrospermopsis</i>	discolored water
Lake Apex					
NEU055A	07/12/00	1,016,000	CYA	<i>Cylindrospermopsis</i>	
Lake Benson					
NEU055A4	06/07/00	28,000	CYA,PRY	<i>Chrysochromulina</i>	
Swift Creek	06/30/00	44,000	CYA	<i>Cylindrospermopsis</i>	
NEU055A3	07/18/00	40,000	CHL,CYA	<i>Cylindrospermopsis</i>	
NEU055A3	08/09/00	24,000	CHL,CYA	<i>Cylindrospermopsis</i>	
Lake Crabtree					
NEUCL3	08/07/00	NQ	BAC,CRY		
Swift Creek					
Swift Creek	04/10/01	NQ	CHL	<i>Pithophora</i>	discolored water
Lake Wheeler					
NEU055A01	07/18/00	27,000	CHL,CYA	<i>Cylindrospermopsis</i>	
NEU055A01	08/09/00	34,000	CHL,CYA,EUG	<i>Gleocystis</i>	
NEU055A02	08/09/00	28,000	CHL,CYA	<i>Anabaena</i>	

Neuse River Basin - Algal Bloom Report, 2000-2006

Subbasin/ Waterbody/ Station	Date	Density (units/ml)	Algal Groups	Dominant Algae	Comments
Perry Creek					
country club	11/02/04	NQ	CYA	<i>Microcystis</i>	discolored water
Prarie Ridge					
museum pond	09/09/05	NQ	CYA	<i>Anabaena</i>	discolored water
Raleigh WWTP					
UT Honeycutt Creek	09/26/02	NQ	NQ	no algae	discolored water
Reedy Creek Lake					
NEU035A7	08/07/00	6,000	CHL		
Turner Pond					
Spence Farm Road	08/22/02	NQ	CYA	<i>Microcystis</i>	discolored water
Yates Mill Pond					
ATU site	08/02/02	54,600	CYA	<i>Cylindrospermopsis</i>	discolored water
<u>Subbasin 03-04-05</u>					
Cliffs of Neuse Lake					
NEU07113A	07/11/00	4,000	CHL,PRY		
NEU07113A	05/31/02	NQ	CHL, plant	<i>Zygnema, Juncas</i>	discolored water
Mill Creek	09/05/02	NQ	CHL	<i>Oedogonium</i>	discolored water
Goldboro Pond					
pond	04/20/01	128,500	CHR		fish kill
Hog Lagoon					
hog lagoon	07/12/00	NQ	CHL,EUG	<i>Euglena</i>	
Kinston Private Pond					
Kinston pond	07/05/00	29,000	CHL	<i>Scenedesmus</i>	fish kill
Lake Toisnot					
NEU096E	06/28/00	3,000	BAC,EUG	<i>Gonyostomum</i>	
Lake Wilson					
NEU096B4	07/11/00	8,000	CHL,CYA	<i>Cylindrospermopsis</i>	
Wayne Pond					
pond	08/01/01	13,900	CHL,CHR	<i>Oocystis</i>	fish kill
Wiggins Mill Reservoir					
NEU084D	06/28/00	4,000	BAC,CHL		
NEU084F	08/16/00	15,000	CHL,PRY	<i>Chrysochromulina</i>	
<u>Subbasin 03-04-06</u>					
Girl Scout Camp Pond					
Girl Scout pond	06/21/00	NQ	CYA	<i>Oscillatoria</i>	floating mat
<u>Subbasin 03-04-07</u>					
Toisnot Swamp					
US 264	08/30/01	NQ	RHO	<i>Compsopogon</i>	discolored water
Silver Lake					
lake	05/15/02	NQ	CHL	<i>Spirogyra</i>	discolored water
<u>Subbasin 03-04-08</u>					
Ayden Pond					
pond	08/02/01	28,800	DIN,CHL,CRY	<i>Peridinium</i>	fish kill
Craven Creek					
Jimmie's creek	01/22/04	NQ	NQ	no algae	discolored water
Jimmie's creek	02/05/04	NQ	CHL,BAC	<i>Mougeotia</i>	discolored water
Craven Ditch					
ditch	01/22/04	NQ	NQ	no algae	discolored water
Craven Pond					

Neuse River Basin - Algal Bloom Report, 2000-2006

Subbasin/ Waterbody/ Station	Date	Density (units/ml)	Algal Groups	Dominant Algae	Comments
pond	06/16/03	11,800	BAC,CYA	<i>Aphanizomenon</i>	green water
pond	06/23/05	NQ	EUG	<i>Euglena</i>	green water
Duck Creek					
Duck Creek	05/30/01	74,800	RPH,CHR,DIN	<i>Heterosigma</i>	fish kill
Hunter's Landing pond					
pond	05/02/01	63,800	CRY,EUG,CHR	<i>Cryptomonas</i>	discolored water
Jonaquin Creek					
near Neuse River	08/15/05	29,300	CHR,CYA	<i>Heterosigma</i>	fish kill
Lake Clermont					
lake	05/10/04	NQ	CHL	<i>Spirogyra</i>	algal mat
Neuse River					
J7860000	02/06/01	4,700	BAC		
J7860000	06/27/02	9,100	BAC,CHR	<i>Aulocoseira</i>	green water
J7930000	04/24/06	15,000	BAC	round diatoms	
Pembroke Lake					
PL	06/07/06	14,000	EUG,BAC	<i>Euglena</i>	fish kill
Trent River					
Old Town canal	01/16/01	76,300	DIN,CRY	<i>Katodinium</i>	
J8210000	06/25/02	64,400	BAC,CHL,CRY	<i>Aulocoseira</i>	
J8210000	07/02/02	11,700	RPH,CHR,CRY	<i>Heterosigma</i>	green water
Trent River	08/01/02	15,700	RPH,CHR	<i>Chattonella</i>	
Subbasin 03-04-10					
Alligator Creek					
Alligator-1	04/14/02	22,400	DIN,CHR	<i>Gyrodinium</i>	
Back Creek					
J9690000	10/03/00	69,000	CRY,CHR		
J9690000	06/19/01	200,000	BAC,CHL,CHR	round diatoms	
J9690000	07/09/02	40,200	RPH,CHR,BAC	<i>Chattonella</i>	
J9690000	04/21/04	34,900	CRY,BAC	<i>Rhodomonas</i>	
J9690000	03/23/06	143,000	BAC	round diatoms	
J9690000	07/19/06	124,000	BAC	<i>Chaetoceros</i>	
Beard Creek					
Beard Creek	09/17/05	NQ	NQ	not algae	fish kill
Broad Creek					
Broad-1	09/25/01	NQ	only Pf-likes counted		fish kill
Lee's Landing	10/05/01	NQ	only Pf-likes counted		fish kill
Dawson Creek					
Shine Landing	04/30/04	NQ	DIN	<i>Gyrodinium</i>	discolored water
DC	01/04/06	89,000	DIN	<i>Katodinium</i>	discolored water
B3	03/21/06	219,000	DIN	<i>Prorocentrum</i>	discolored water
B5	03/21/06	247,000	DIN	<i>Prorocentrum</i>	discolored water
Fairfield Harbor Canal					
Fairfield-1	10/01/01	NQ		not algae	fish kill
Fairfield-2	10/01/01	NQ		not algae	green water
Green Creek					
boat landing	04/30/04	NQ	CRY	<i>Rhodomonas</i>	discolored water
Lake Clermont					
Lake Clermont	06/12/00	11,000	CYA	<i>Anabaena</i>	fish kill
Lake Clermont	07/28/00	NQ	CHL,CYA	<i>Botryococcus</i>	surface film

Neuse River Basin - Algal Bloom Report, 2000-2006

Subbasin/ Waterbody/ Station	Date	Density (units/ml)	Algal Groups	Dominant Algae	Comments
Lake Clermont	09/14/00	6,000	CYA	<i>Anacystis</i>	
Neuse River					
J8910000	03/07/00	45,000	BAC,CHL		
J8920000	05/04/00	91,000	BAC,CHR		
Clubfoot Creek	06/16/00	NQ	only Pf-likes counted		fish kill
J8910000	06/21/00	NQ	only Pf-likes counted		fish kill
Carolina Pines	06/21/00	NQ	only Pf-likes counted		fish kill
J8903500	07/25/00	101,000	DIN,CHR,CRY	<i>Gyrodinium</i>	
J8925000	08/22/00	34,000	DIN,CHR		
Slocum Creek	09/12/00	NQ			tannic water
Kennel Beach	09/13/00	NQ	only Pf-likes counted		fish kill
Beard Creek	09/13/00	46,000	DIN,CHR	<i>Peridinium</i>	fish kill
Carolina Pines	09/14/00	56,000	CHR,CHL		fish kill
J8910000	09/24/00	NQ	only Pf-likes counted		fish kill
Transect 15	09/24/00	NQ	only Pf-likes counted		fish kill
J8910000	09/25/00	NQ	only Pf-likes counted		fish kill
Beard Creek	09/25/00	NQ	only Pf-likes counted		fish kill
Carolina Pines	09/25/00	NQ	only Pf-likes counted		fish kill
Carolina Pines	09/27/00	NQ	only Pf-likes counted		fish kill
Beard Creek	09/27/00	NQ	only Pf-likes counted		fish kill
J8910000	09/27/00	NQ	only Pf-likes counted		fish kill
Hancock Creek	09/27/00	NQ	only Pf-likes counted		fish kill
Kennel Beach	09/27/00	NQ	only Pf-likes counted		fish kill
Greens Creek	09/28/00	NQ	only Pf-likes counted		fish kill
Spice Creek	09/29/00	NQ	only Pf-likes counted		fish kill
Goose Creek	10/04/00	NQ	only Pf-likes counted		fish kill
J8925000	10/19/00	38,000	DIN,CHR,BAC	<i>Gyrodinium</i>	
J9590000	10/19/00	35,000	DIN,CHR	<i>Peridinium</i>	
J8910000	10/25/00	NQ	only Pf-likes counted		fish kill
J8903600	11/14/00	110,000	DIN,CRY,CHR	<i>Gyrodinium</i>	
J9810000	11/14/00	14,000	DIN,CRY		
Union Point	11/16/00	NQ	CHL		surface film
J8570000	12/13/00	5,000	DIN,BAC		
J8902500	12/13/00	7,000	DIN,BAC	<i>Gyrodinium</i>	
J9590000	12/13/00	19,000	BAC	<i>Skeletonema</i>	
J8903600	01/10/01	40,200	BAC,DIN	<i>Chaetoceros</i>	
J9530000	01/10/01	36,700	BAC	<i>Chaetoceros</i>	
J9680000	01/10/01	24,300	BAC	<i>Chaetoceros</i>	
J8902500	02/06/01	67,700	BAC,DIN	<i>Chaetoceros</i>	
J8910000	05/01/01	62,800	BAC,DIN	<i>Gyrodinium</i>	
J8903500	05/01/01	90,400	BAC,DIN	<i>Gyrodinium</i>	
J9431500	05/01/01	33,700	BAC,DIN	<i>Gyrodinium</i>	
J8910000	05/10/01	18,000	BAC		sick fish
Carolina Beach	06/12/01	36,700	DIN	<i>Peridinium</i>	
Kennel Beach	06/12/01	53,700	DIN,CHR	<i>Peridinium</i>	
Flanners Beach	06/13/01	NQ	only Pf-likes counted		fish kill
Carolina Beach	06/13/01	NQ	only Pf-likes counted		fish kill
Broad Creek	06/19/01	68,620	DIN	<i>Gyrodinium</i>	
Goose Creek	06/19/01	45,400	DIN	<i>Gyrodinium</i>	

Neuse River Basin - Algal Bloom Report, 2000-2006

Subbasin/ Waterbody/ Station	Date	Density (units/ml)	Algal Groups	Dominant Algae	Comments
Slocum Creek	07/10/01	NQ	only Pf-likes counted		sick fish
Beard Creek	07/10/01	NQ	only Pf-likes counted		sick fish
J8910000	07/10/01	NQ	only Pf-likes counted		sick fish
J8910000	07/12/01	65,400	DIN,EUG	<i>Peridinium</i>	
Fisher Landing Point	07/12/01	NQ	only Pf-likes counted		fish kill
Goose Creek-1	07/16/01	60,800	DIN	<i>Gyrodinium</i>	fish kill
Goose Creek-2	07/16/01	79,900	DIN	<i>Gyrodinium</i>	fish kill
Hancock Creek	07/16/01	55,200	DIN	<i>Polykrikos</i>	bloom
Carolina Pines	07/18/01	NQ	only Pf-likes counted		fish kill
J8902500	08/03/01	75,000	DIN	<i>Peridinium</i>	
J8910000	08/06/01	64,000	DIN	<i>Peridinium</i>	
Green Springs	08/07/01	6,500	CHR,BAC		
J8902500	08/22/01	55,700	DIN	<i>Gyrodinium</i>	
Lawson Creek	08/30/01	75,500	EUG,CRY,DIN	<i>Trachelomonas</i>	
Green Springs	09/04/01	147,800	EUG,CHR,CRY	<i>Trachelomonas</i>	discolored water
Broad Creek-1	09/17/01	120,500	CHR		fish kill
Broad Creek-2	09/17/01	121,000	BAC,CHR,DIN	<i>Leptocylindrus</i>	fish kill
J8910000	09/19/01	126,700	DIN,CHR	<i>Gyrodinium</i>	
J8920000	09/19/01	100,600	DIN,BAC,CHR	<i>Peridinium</i>	
J8570000	10/16/01	20,600	DIN	<i>Gyrodinium</i>	
Broad Creek	10/23/01	47,300	DIN	<i>Gyrodinium</i>	cloudy water
J8570000	11/14/01	32,800	DIN,CRY	<i>Prorocentrum</i>	
J8900800	11/14/01	18,100	DIN		
NB	11/19/01	96,000	DIN	<i>Prorocentrum</i>	orange water
J8920000	04/03/02	19,800	CHR,DIN	<i>Prorocentrum</i>	
J8900800	04/30/02	10,000	DIN,BAC,CHR	<i>Gyrodinium</i>	
Broad Creek	05/09/02	75,700	BAC,DIN,CHR	<i>Closterium</i>	
Goose Creek	05/09/02	53,400	BAC,DIN,CHR	<i>Scripsiella</i>	
Slocum Creek	06/17/02	31,600	RPH,CHR	<i>Heterosigma</i>	fish kill
Wilson Creek	06/24/02	NQ	RPH,BAC,CHR	<i>Heterosigma</i>	
J8900800	06/25/02	21,000	PRY,BAC,CHR	<i>Pyramimonas</i>	
Bay Point	06/25/02	37,300	PRY,BAC,CHL	<i>Pyramimonas</i>	fish kill
Duck Creek	06/25/02	44,700	CHL,BAC,PRY	<i>Pyramimonas</i>	fish kill
J8910000	07/02/02	NQ	BAC,CHR	<i>Closterium</i>	
Union Point	07/02/02	NQ	only Pf-likes counted		fish kill
Bridgeton	07/04/02	NQ	BAC,DIN,CHL	<i>Gyrodinium</i>	
Carolina Pines	07/30/02	26,400	RPH,CHR,BAC	<i>Chattonella</i>	fish kill
Hancock Creek	07/31/02	NQ	only Pf-likes counted		fish kill
Goose Creek	07/31/02	NQ	only Pf-likes counted		fish kill
J8570000	10/17/02	7,400	DIN,CHR	<i>Gyrodinium</i>	
J8902500	01/06/03	21,500	DIN,BAC	<i>Prorocentrum</i>	
J9530000	01/06/03	17,600	DIN,BAC	<i>Prorocentrum</i>	
J9530000	03/03/03	37,600	BAC,DIN	<i>Thalassiosira</i>	
J9590000	03/03/03	42,300	BAC,DIN	<i>Thalassiosira</i>	
J9810000	03/03/03	38,200	BAC	<i>Thalassiosira</i>	
J9810000	04/28/03	32,800	BAC,DIN	<i>Chaetoceros</i>	discolored water
J9930000	04/28/03	9,600	DIN,BAC	<i>Prorocentrum</i>	discolored water
J8925000	05/28/03	43,800	BAC,DIN	<i>Closterium</i>	
J8910000	06/25/03	146,300	BAC,CRY	round diatoms	

Neuse River Basin - Algal Bloom Report, 2000-2006

Subbasin/ Waterbody/ Station	Date	Density (units/ml)	Algal Groups	Dominant Algae	Comments
J9530000	06/25/03	100,000	BAC,CYA	round diatoms	
J9810000	06/25/03	77,300	BAC,DIN	round diatoms	
J9930000	06/25/03	18,100	CRY,CHR	<i>Rhodomonas</i>	
J8910000	06/30/03	101,300	BAC,CRY	round diatoms	
J8910000	07/08/03	18,600	BAC,DIN	round diatoms	
Cherry Branch	07/15/03	160,100	BAC,CHL	round diatoms	fish kill
1	07/18/03	56,800	BAC,CRY	round diatoms	
J8910000	07/21/03	48,800	BAC,CRY	round diatoms	
J9530000	07/21/03	174,600	BAC,CHL	round diatoms	
J9810000	07/21/03	80,100	BAC,CHL	round diatoms	
Cherry Branch	07/30/03	18,100	RPH,BAC,CHR	<i>Heterosigma</i>	fish kill
Carolina Pines	08/18/03	8,600	BAC,CHR	round diatoms	fish kill
Stately Pines	08/31/03	25,800	RPH,CHR,BAC	<i>Heterosigma</i>	fish kill
Slocum Creek	08/31/03	39,000	BAC,CYA	round diatoms	fish kill
Hancock Creek	08/31/03	87,100	RPH,CHR,BAC	<i>Heterosigma</i>	fish kill
Kennel Beach	09/05/03	38,700	BAC,CYA	round diatoms	fish kill
Slocum Creek	09/05/03	44,200	RPH,CHR,BAC	<i>Heterosigma</i>	fish kill
J8903500	09/16/03	40,200	BAC,EUG	round diatoms	
J9431500	09/24/03	165,600	BAC,DIN	round diatoms	
Kennel Beach	10/04/03	134,700	BAC,CYA	round diatoms	fish kill
Slocum Creek	10/06/03	68,400	BAC,DIN	round diatoms	fish kill
J9530000	10/16/03	150,000	BAC,CHL	round diatoms	
J9540000	10/16/03	160,100	BAC,CYA	round diatoms	
J8910000	02/04/04	77,200	DIN,CRY	<i>Katodinium</i>	
Station 100	02/04/04	33,600	DIN,CRY	<i>Katodinium</i>	
J8910000	04/28/04	115,800	BAC	round diatoms	
Carolina Pines	05/16/04	85,000	BAC	round diatoms	fish kill
J9530000	05/17/04	89,000	BAC	round diatoms	discolored water
J8902500	05/26/04	28,100	BAC	round diatoms	discolored water
J8903500	05/26/04	27,700	BAC	round diatoms	discolored water
J8910000	05/26/04	28,200	BAC	<i>Thalassiosira</i>	discolored water
J8900800	06/23/04	40,900	BAC,CHR	round diatoms	
J8920000	06/23/04	74,100	BAC,CHR	round diatoms	
J8570000	07/20/04	25,400	CYA	<i>Chroococcus</i>	
J9810000	07/20/04	34,600	BAC	<i>Chroococcus</i>	
J9810000	08/17/04	42,600	CRY,BAC	<i>Rhodomonas</i>	
Kennel Beach	09/02/04	58,500	RPH	<i>Heterosigma</i>	fish kill
Slocum Creek	09/07/04	98,800	RPH,CYA,CHR	<i>Heterosigma</i>	sick fish,discolored water
Carolina Pines	09/07/04	67,900	RPH,CYA,CHR	<i>Heterosigma</i>	sick fish,discolored water
Minnesott Beach	09/13/04	82,100	RPH,CYA,CHR	<i>Heterosigma</i>	sick fish,discolored water
Carolina Pines	09/15/04	219,300	BAC,CYA	<i>Psuedanabaena</i>	sick fish,discolored water
Carolina Pines	09/16/04	80,400	CYA,BAC	<i>Psuedanabaena</i>	sick fish,discolored water
J8910000	09/22/04	75,300	RPH,CHR,CRY	<i>Heterosigma</i>	discolored water
J8910000	10/12/04	68,100	CYA,BAC	<i>Psuedanabaena</i>	
J9530000	10/12/04	112,600	CYA,BAC	<i>Psuedanabaena</i>	
J9810000	10/12/04	61,500	CYA,BAC	<i>Psuedanabaena</i>	
J9530000	12/06/04	29,400	DIN,BAC	<i>Prorocentrum</i>	
J9810000	12/06/04	37,600	BAC,DIN	round diatoms	
J9685000	01/04/05	41,200	DIN,BAC	<i>Prorocentrum</i>	

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Subbasin/ Waterbody/ Station	Date	Density (units/ml)	Algal Groups	Dominant Algae	Comments
J9810000	01/04/05	27,100	DIN,BAC	<i>Prorocentrum</i>	
J8910000	03/30/05	37,300	CYA,BAC	<i>Chroococcus</i>	
J9530000	03/30/05	44,700	CYA,BAC	<i>Chroococcus</i>	
J9810000	03/30/05	20,200	CYA,BAC	<i>Chroococcus</i>	
J8910000	04/27/05	72,300	BAC	round diatoms	
J8910000	05/11/05	34,700	BAC,DIN	round diatoms	
J8910000	05/24/05	68,300	BAC,DIN	round diatoms	
J8910000	06/08/05	80,600	BAC	round diatoms	
J8903500	06/21/05	40,700	BAC,DIN	round diatoms	
J8910000	07/20/05	29,300	CHR		
Fisher Landing	07/22/05	39,900	RPH,CHR,CYA	<i>Heterosigma</i>	fish kill
J8910000	07/27/05	45,800	RPH,CHR,CYA	<i>Heterosigma</i>	
J8910000	08/04/05	73,200	RPH,CHR,CYA	<i>Heterosigma</i>	
J9530000	08/04/05	56,100	CHR,CYA	<i>Aphanizomenon</i>	
J8910000	08/11/05	23,800	RPH,CHR,CYA	<i>Heterosigma</i>	
J8910000	08/16/05	34,300	CYA,BAC	<i>Psuedanabaena</i>	discolored water
J8925000	12/07/05	83,100	DIN	<i>Prorocentrum</i>	discolored water
J9530000	03/01/06	20,000	DIN,BAC	<i>Gyrodinium</i>	
J8903500	03/29/06	34,000	DIN	<i>Prorocentrum</i>	discolored water
J8910000	03/29/06	24,000	DIN	<i>Karlodinium</i>	discolored water
J8910000	05/24/06	65,000	BAC	round diatoms	discolored water
J8910000	05/31/06	65,000	CHR		
J9530000	05/31/06	35,000	BAC	<i>Skeletonema</i>	
J8903500	06/20/06	101,000	BAC,DIN	<i>Chaetoceros</i>	
J8902500	07/11/06	49,000	BAC,RPH	<i>Heterosigma</i>	discolored water
J8250000	07/18/06	100	CYA	<i>Anacystis</i>	discolored water
J8900800	07/18/06	43,000	BAC,RPH	<i>Heterosigma</i>	
J9860000	07/18/06	73,000	BAC,CYA	<i>Cylindrospermopsis</i>	
Station 68	08/03/06	48,000	BAC,RPH	<i>Heterosigma</i>	fish kill
J9530000	08/15/06	34,000	BAC	round diatoms	
NW Creek	10/25/06	120,000	BAC,DIN	<i>Leptocylindrus</i>	fish kill
Goose Creek	10/30/06	154,000	BAC,DIN	<i>Leptocylindrus</i>	fish kill
Fairfield Harbor	10/30/06	105,000	BAC,DIN	<i>Leptocylindrus</i>	fish kill
J8910000	11/08/06	42,000	BAC,RPH	<i>Heterosigma</i>	
Northwest Creek					
Northwest 1	09/01/00	57,000	DIN,EUG,CHR	<i>Peridinium</i>	fish kill
marina	11/30/05	81,300	DIN	<i>Prorocentrum</i>	discolored water
Pamlico Sound					
duck pond-1	03/03/01	NQ	CHR	<i>Chrysochromulina</i>	green water
duck pond-2	03/03/01	NQ	CHL	<i>Chlorella</i>	green water
Whitaker Creek					
Whitaker 1	07/18/00	55,000	DIN,CHR,BAC		
<u>Subbasin 03-04-11</u>					
Gum Swamp Creek					
creek	05/25/06	NQ	RHO	<i>Batrachospermum</i>	
Trent River					
J8770000	05/01/01	61,400	BAC,CHR	<i>Heteromastix</i>	
J8770000	06/27/00	105,000	CRY,BAC		
J8770000	08/22/00	27,000	BAC,DIN,CHR		

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Subbasin/ Waterbody/ Station	Date	Density (units/ml)	Algal Groups	Dominant Algae	Comments
Subbasin 03-04-13					
Bay River					
J9950000	01/29/01	24,600	BAC,DIN	<i>Chaetoceros</i>	
WWTP	02/15/01	1,600,000	CHL,CHR,EUG	<i>Selenastrum</i>	
J9950000	08/09/04	199,300	BAC	<i>Chaetoceros</i>	
J9950000	03/30/06	15,000	CHR		
Subbasin 03-04-14					
W. Thorofare Bay					
J9938000	04/24/00	26,000	BAC,DIN	<i>Chaetoceros</i>	

Abbreviations

- BAC - Bacillariophyceae (diatom)
- CHL - Chlorophyceae (green algae)
- CHR- Chrysophyceae (chrysophytes)
- CRY - Cryptophyceae (cryptomonads)
- CYA - Cyanophyceae (blue-green algae)
- DIN - Dinophyceae (dinoflagellates)
- EUG - Euglenophyceae (euglenoids)
- PRY- Prymnesiophyceae (golden algae)
- RHO- Rhodophyceae (red algae)
- RPH- Rhaphidophyceae (yellow-brown algae)
- NQ - not quantified (unit density not counted)