

# The River News

The Official Newsletter Of The Delaware River Fishermen's Association

Volume 13, No. 7

July, 2001

## Weather Conditions Test The Mettle Of Tournament Anglers

Participation was heavy, but results were light in the two most recent DRFA club tournaments.

Cloudy water and the potential for ugly weather threatened the 45 participants in the June 23 smallmouth tournament, and the river rose exactly one foot during the course of the six-hour event, due to overnight rains farther north. When all was said and done, only 17 anglers managed to bring a legal fish to the scales. The average entry for that day was 1.18 lbs. and 14".

A strong Canadian cold front during the second week of July also brought chilling evening temperatures to the area, and made things tough for contestants in the July 14 largemouth tournament held at the Frankford Arsenal. In that event, 54 club members managed to land only 8 legal fish, averaging 1.86 lbs. and 15".

**June 23 Dave Bryant Memorial Smallmouth Tournament:** 1st Place – Pete Antoniewicz, 1.63 lbs. and 15-1/8"; 2nd Place – John Turgyan, 1.62 lbs. and 15-1/4"; 3rd Place – Ray Kitson Jr., 1.39 and 15".

**July 14 Largemouth Tournament:** 1st Place – Rich Bryan, 3.69 lbs. and 19-1/2"; 2nd Place – Phil Bakanowsky, 2.02 lbs. and 16"; 3rd Place – Rob Cook, 1.90 lbs. and 15-1/2".

### Contents

Meeting Minutes	.....2
Member Profile	.....2
Circle Hook Study	.....2
Angler Of The Year Standings	.3
Fishing Reports	.....4
Tide Tables	.....6



Largemouth tournament winners from left to right are Rich Bryan (1st), Phil Bakanowsky (2nd), and Rob Cook (3rd).



The hard times experienced by so many other anglers that day, makes this 3.69-lb. fish for Rich Bryan all the more impressive. Congratulations to Rich and his "fishing guide" Steve Raulfs for solving the puzzle on such a tough fishing day.

### President's Message

Sorry I missed you all at the June meeting. Frank Kivler and I went to North Carolina for some bass fishing. Unfortunately, the weather wasn't very cooperative. The temperature neared 100 degrees for the whole time we were there and we could only fish in the early morning and late evening. The water was nearly 90 degrees and the fish were pretty much shut down. We did pick up two bass, but they were just average fish.

Meanwhile, back in New Jersey the Riversgate Ramn oned for



Smallmouth tournament winner Pete Antoniewicz holds his \$100 check and first-place trophy.

John Turgyan displays his \$50 check and trophy for taking second in the June 23 smallmouth tournament.



Third-place finisher Ray Kitson, Jr. received a \$25 check and trophy for his 1.39-lb., 15" fish entered in the smallmouth tournament.

### Important Dates

**Thursday, July 26:** 7:00 pm. Monthly meeting. Back upstairs meeting room of The Sportsmen's Center, Route 130 North, Bordentown, NJ.

**SUNDAY, August 5:** Catfish Tournament. (Please Note Special Summer Hours) Registration at 6:00 am. Weigh-in at 12:00 noon. Frankford Arsenal Ramp.

business on June 29th. I used the ramp on July 7th and was very pleased with it. Those of you who choose to go there will be pleasantly surprised. The ramp is open every day from 6 AM til 9 PM.

We have received our first entry for the Big Cat Shootout II which will be held on Saturday, September 15th. September is a great time to fish and I hope to see many of you at the tournament.

See you all at the meeting on July 26th. John Strada

## Minutes Of The June Meeting

The June meeting of the DRFA was called to order at 7:05 pm by club vice president Rich Bryan. 13 members were in attendance.

**Treasurer's Report:** The treasurer's report showed that \$5,773.41 was in the treasury.

**Environmental Report:** Members were warned of debris in the water from recent rains. Club members reported on a gas leak in the Neshaminy Creek area, and on good striper fishing while trolling plugs deep in the area of the Trenton Tunnel.

**Old Business:** Results from the June smallmouth tournament were recapped. Awards had already been presented at the tournament. Rich advised members of the Big Cat Shootout II tournament, to be held on September 15. A suggestion was made to mark "open" slips with red or yellow tape so that tournament participants would know where they could safely tie up during the weigh-in.

**New Business:** Pete Antoniewicz, Tom Zerumski and Ron Soto volunteered to help Rich Bryan with the weighmaster duties at the

July largemouth tournament. Members are still needed to help at the August catfish tournament. Rich reminded members that the new lighter colored hats and shirts would be available at future meetings and tournaments. The meeting adjourned at 7:45 pm

## Supporting Business Member Profile

Ron Ernst at Ron's Trigger and Reel is more than just a sponsoring business member for the club. Based on his own years of angling experience in local waters, he's also a knowledgeable resource for area anglers. "That's why I got into this business in the first place," he says. "Ironically, now that I'm doing this, I seem to have less time for fishing than ever before." Ron is particularly helpful to Delaware River fishermen chasing smallmouth in the area from Scudder's Falls up to Byram.

"We're an all-around tackle shop for any freshwater angler," says Ernst, "but I like to think that we give anglers better choices in the 'specialty lines' of lures, not easily found at other stores." These include favorites like Jersey Rigs and Gary Yamamoto soft baits. Ron's also carries a variety of live bait – including shiners, fathead minnows, worms and nightcrawlers – for local freshwater anglers.

In addition to the large variety of freshwater lures, tackle, and live baits, Trigger and Reel also serves firearms and bowhunting enthusiasts, as well as saltwater anglers for the major species like fluke, weakfish, blues, and strippers.

The store is closed on Mondays, but is open throughout the summer months until 8 pm Tues. through Fri., until 6:00 pm on Sat., and 4:00 pm on Sun.

## 1999 Striped Bass Circle Hook Study

By: MD DNR Fisheries Biologist  
Rudy Lukacovic

-----  
The following report was identified by club member Frank Kivler. The original report is posted at <http://www.dnr.state.md.us/fisheries/fishingreport/crsb.html>

For further information on this topic you can E-mail Rudy Lukacovic at

[mata-fish-2@dnr.state.md.us](mailto:mata-fish-2@dnr.state.md.us)

In the subject line type: Attn: Rudy Lukacovic Or call, 410-643-6785.

-----  
The popularity of catch-and-release fishing for striped bass has increased substantially in recent years. Along the Atlantic Coast from Maine to North Carolina, 14.2 million striped bass were caught in 1999 and 90% were released. An assumed constant 8% mortality rate for released striped bass is incorporated into state and federal management plans to set seasons and limits. Therefore, the mortality of released fish can be a significant component of overall fishing mortality.

Since 1996, the Fisheries Service of the Maryland Department of Natural Resources has been conducting studies that evaluate factors that influence the survival of fish that are caught and released by recreational anglers. Studies have included hickory and American shad, white perch, summer flounder and striped bass.

Physical injury and stress are the two main factors influencing survival of fish that are caught and released. Fish can be physically injured from hook wounds and during handling and release. They can be physiologically stressed by the exertion from the fight.

---

**DRFA Contacts:** **President** – John Strada, 856-845-5434; **Vice-President** – Rich Bryan, 609-261-6455; **Treasurer** – Frank Kivler, 856-848-1122, **Membership Secretary** – Linda Kivler, 856-848-1122; **Recording Secretary and Environmental Concerns** – Jeff Haba, (856) 722-1871; **Editor of The River News** – Pete Antoniewicz. 609-466-7719; **Tournament Hotline** – 609-261-6470

Numerous studies with a variety of species have shown that the location of the hook wound (*physical injury*) is the single most important factor influencing the survival of released fish. If the wound site is a vital organ, mortality is high. The wound site can be affected by hook size or configuration, bait size, the use of natural bait versus artificial lures (*natural baits tend to be swallowed more frequently*), angler experience or fish behavior.

Stress-related mortality can be affected by variations in the environment. Temperature, salinity and fish size are three important and interactive factors that affect survival of caught and released striped bass. High temperatures, low salinity and larger fish size have been shown to increase, individually or in combination, the mortality of released striped bass.

**Methods**

The Fisheries Service conducted a study last summer that evaluated the survival of striped bass caught on conventional hooks and circle hooks in different environmental conditions in the Chesapeake Bay. The study was conducted with the cooperation of the Maryland Charter Boat Association, the Maryland Coastal Conservation Association and the Maryland Saltwater Sportfisherman's Association.

Striped bass were caught by hook and line at Love Point at the mouth of the Chester River and at the Diamonds near the Choptank River. They were held in pens off Love Point and at the Cooperative Oxford Laboratory. Two 2-day trials were conducted at each location from June through October. Conventional bait hooks were used the first day and similar sized, non-offset circle hooks were used the second day. Fifty striped bass was the target number for each day. Striped bass were caught

by chumming and anglers were instructed to hook, play and land the fish in a normal manner.

The location of the hook wound was identified when each fish was landed. Fisheries Service biologists removed the hook if the fish was shallow hooked, but left the hook in place in deep hooked fish by cutting the line. Each fish was marked to identify hook location (*shallow or deep*) by hole punching the tail fin. The fish were placed in tanks on board DNR transport vessels. Oxygen, temperature and salinity measurements from surface, mid-water and bottom depths were taken at each site several times each day. The most optimal conditions for survival (*lowest temperature and highest oxygen*) found at each site were duplicated in the tank.

When 25 fish were captured, they were transported to the net-pens. The striped bass were held for 72 hours and checked daily for mortality. Temperature, dissolved oxygen and salinity were monitored in the pens each day. Dead fish were measured and had hook location recorded. All dead fish, marked as deep hooked, were dissected to determine the nature and extent of the internal damage that caused death.

All surviving fish were measured, had hook location recorded and were released after 72 hours.

**Results**

Anglers caught 476 striped bass with conventional bait hooks and 640 with non-offset circle hooks. The size of striped bass caught with bait hooks were similar (*16.7 in; 10.5 - 36.6 in*) to those fish caught with non-offset circle hooks (*16.4 in; 11.4 - 36.3 in*). The deep hooking rate for conventional bait hooks over the course of the entire study was 17.2% and was 3.4% for non-offset circle hooks. This large

decrease in deep hooking has been documented in several other Fisheries Service studies (*24% for conventional hooks vs. 4% for circle hooks in summer 1996 and 46% vs. 11% in spring 1997*).

The deep hooking mortality rate for striped bass caught with conventional bait hooks in this study was 53.1%. The deep hooking mortality rate with non-offset circle hooks was 23.5%. Studies done here in Maryland have consistently shown the deep hooking mortality rate of striped bass caught with conventional bait hooks to be about 50% regardless of temperature or salinity (*57.7% in 1995; 41.0% in 1996 and 56.3% in 1997*). Overall, 9.1% of the striped bass caught on conventional hooks died whereas only 0.8% of the fish caught on circle hooks died.

**Discussion**

Post mortem examinations of deep hooked striped bass caught with conventional bait hooks showed hook points penetrating heart and/or liver in most dead fish, and severe internal hemorrhage in all dead, deep hooked fish, even when major organs had not been

**Angler of the Year  
Top Ten Standings**

*Here are the leaders in the race for the 2001 Dave Bryant Angler of the Year award. Standings are current as of the July 14th largemouth tournament.*

#	Name	Points
1.	Phil Bakanowsky	264
2.	Hollis Laing	191
3.	Dana Rees	190
4.	Bob Kuntz	187
5.	Jim Wood	183
6.	Scott Ferral	179
7.	Rich Bryan	172
8.	Mike Brakoniecki	172
9.	John Turgyan	170
10.	Rick Mawson	169

penetrated. Post mortem dissections of fish deep hooked with circle hooks showed tears in the esophagus were caused by not the point, but by the outside bend of the hook. Non-offset circle hooks orient the point away from the direction of travel when the line is pulled tight. The point does not penetrate organs as a conventional bait hook with its point facing the direction of travel. Long term survival of deep hooked fish is not well documented.

Shallow hooking is defined as those fish hooked in the mouth. A profound effect on shallow hooking mortality was documented in relation to air temperature. When air temperatures were below 95 F, the mortality of shallow hooked striped bass, those fish only stressed by physical exertion not by lethal hook wounds, was 0.8%. When air temperatures ranged from 95 to 105 F in July, mortality rose to 17.2%. The mortality rate of all shallow hooked fish combined was 3.5% for the entire study period.

Death in these studies is rapid. More than 75% of the fish that die, die in less than 6 hours and 95% die in less than 24 hours. Other catch-and-release studies with striped bass, shad and white perch show the same mortality pattern. This strongly suggests that mortality of these fish reflects hooking injury or angling stress, not confinement because mortality is rapid and usually associated with severe internal damage from hook damage. Mortality from caging stress would be expressed over time as fish languished in confinement. All fish that survive in the net pens are extremely vigorous at release.

Catch-and-release mortality studies in Maryland have shown that under most circumstances catch and release fishing is a relatively conservative practice. However

there are circumstances under which release mortality can be high.

In the 1999 Study, we determined that 9.1% of the fish caught on conventional hooks died, but only 0.8% of the fish caught on circle hooks died. This dramatic difference in mortality should encourage anglers and fishery resource managers to strive to reduce deep hooking rates. Non-offset circle hooks not only reduce frequency of deep hooking, but deep hooking mortality is lower with non-offset circle hooks than conventional bait hooks.

When environmental conditions are stressful for released fish (*high temperature, both air and water, and low salinity*) anglers should minimize catch-and-release fishing.

When angling during periods of extreme air temperatures (>95°F) keep the fish in the water when releasing. In 1999 we had also intended to evaluate release mortality at two significantly different salinity levels. Drought conditions this summer prevented mortality trials from being conducted at low salinity sites. An identical study will be done in the summer of 2000 to evaluate striped bass catch-and-release mortality under a low salinity environment.

## Fishing Reports

*These reports were gathered on the weekend of July 14th and 15th.*

### **Tidal River**

At **Jim's Outdoor Sportsman** in Riverside, New Jersey (856-764-3474) Jim Davis reports things overall are relatively slow. Catfishing has been "decent" on all the typical cut baits, chicken livers, etc. although Jim thinks that anglers using clams might be doing a little better.

Some recent customers had a good day on the Rancocas Creek for largemouth bass, drifting shiners

along the edge of the pads on the falling tide. Small stripers abound, chasing small herring and shad, particularly around the Delanco car bridge at the end of the day. Jim also says you might find some bigger fish if you get out before day break.

The following fishing report was posted by Bill Brinkman on July 12th on the Web site of **Brinkman's Bait and Tackle** in Northeast Philly (215-632-0674) <<http://members.aol.com/wormpeople/>> A more detailed report is available on that site.

"I was up the Delaware River this past Tuesday and it was a little higher than I expected it and just a bit off color, but overall I thought the conditions would have produced a lot more fish than we caught. For the two of us that went up we managed to land 27 smallmouth, 7 bluegills, 4 catfish and one chub. Minnows were the only thing that I was able to catch the smallmouth and catfish on but I did catch all the bluegills on the Rebel crickhopper crankbait fishing the shore line while walking back to the car. But overall the smallmouth fishing has been pretty good in most of the regular spots on the Delaware. Jay was up the couple of days before and landed about 20 per day for a couple of hours. And Kevin told me that 20 to 30 fish per day has been the norm with most of the fish hitting the minnows and most of the fish are all on the small side. I had one fish 16 inches and one fish at 14 inches and the rest did not look to be up to ten inches each. I even talked to several guys that have been fishing from the Water Gap to the Hawley area of the river and have been doing real well on quantity of fish but the size is on the small side. And John went up to the Lackawaxen River just outside of Hawley and caught 45 smallmouth all on grubs, but again most of the fish were on the small side.

“Now the lower river has really been taken over by the small stripers. Most fisherman that take out bloodworms are catching all the stripers they want to fish for but the size of these fish are mostly about 10 inches. I just talked to a customer from Pennypack Street and he caught 4 stripers today all 10” or less. The catfish have been doing real well mostly at night or real really in the mornings. Some of the bigger fish have been hitting chicken livers and herring and for catching amounts of fish nightcrawlers are your best bet but the size of the fish will drop off. Now if you do want to use bloodworms in the lower river for the stripers you do have to deal with the millions of white perch that are also taking over the lower part of the river. And with the cost of bloodworms it is hard to feed these really small fish. But it does beat sitting home or being at work.

“The Perkiomen and Neshaminy Creeks are still doing well for smallmouth. These places will stay good for most of the summer months other than if we get any hard rains to muddy up the water. Minnows and leeches are my favorite baits, and grubs and small crankbaits are my choice for lures. Two really great things about these creeks are that they are both very wadeable and a great spot for fly fishing for smallmouth and bluegills. Small poppers are my choice to use but Clouser minnows work real well if the fish are hitting more toward the bottom.

“The carp action on the river has been fair with several fish taken off Pennypack Street and the Frankford Arsenal. Most of these fish are being picked up on either corn or packaged carp baits. Cornmeal is one of the best baits if you know how to make it yourself. Another really good place for carp has been up the Woodbine Creek right off Route 73 in New Jersey. I use to fish for these fish right behind the old Woodbine Inn

which has a new name now. Sorry but I'm not sure of the new name. But the creek comes up right behind the club. Here corn always worked the best for me.”

-----  
***Here are several reports that have been posted on the DRFA Web site this month by club members:***

July 8, Ray & Catherine Czymczak <[rs6948@aol.com](mailto:rs6948@aol.com)> My wife, son and I took a late afternoon fishing trip to Trenton Bridges. We fished the incoming tide. We only stayed out for about 2.5 hours. The trip was very successful with smallmouth on the surface around the pilings. Also caught a few small stripers on surface lures. One walleye caught upstream on a diving Bill Dance lure. The walleye was 19 inches and very fat. Over 3 lbs. The boat ramp at Trenton was empty, only one other boat fished under the bridges. Good luck Ray, Cookie, and Andy.

July 7, John and Ann Dell <[jwdell@millenianet.com](mailto:jwdell@millenianet.com)> Wife, son and I managed to get out late today. Fishing crankbaits on the main river around the dock pilings. Just below the turnpike bridge on the Pa. side in the pilings off the storm drain outlet, I landed a nice small mouth. It was about 17 to 18 inches and weighed between 3-4 pounds it was a nice fish. I caught it on a Mann's black with white under belly crankbait with rattle chamber. The fish were holding on the drop off in 8-10 feet of water. We caught several other largemouth off the pilings, nothing of any real size. Son got bored so we switched to live bait and landed some small stripers out of the channel in the river mouth just above bridge on NJ side. Turned out to be a good day all in all.

-----  
***Trenton/Yardley/Lambertville:***

Dan at ***HL Bait & Tackle*** in Morrisville, Pennsylvania (215-295-1400) says that just about the

only action being reported to his shop lately has been smallmouth bass. Club member Marty Marshall reported that smallies from 12” to 16” were taking shiners in the area from Scudder’s Falls to Trenton.

***At Ron's Trigger and Reel*** in Ewing, New Jersey (609-695-2818), owner Ron Ernst says that smallmouth fishing has picked up in the upper river (*north of Scudder’s Falls*) as water conditions stabilized over the past week. He has gotten good reports from fishermen using live bait (*shiners*) and lures, including chartreuse or white twister tails, yellow and white Rooster Tails, and “the old reliable” CP Swing. Ron adds that the only word from the Trenton area has been some catfish around the Trenton bridges, and one 6-lb. walleye taken on an 8” eel fished around the bridges.

***Easton/Phillipsburg Area:***

***Bill's Bait and Tackle*** (908-859-5729) Phillipsburg, NJ <<http://community.webtv.net/BILLSBAIT/FISHINGREPO>> RT> When asked about local river activity, Bill Pierce’s original response was, “Nothing.” In part, he attributes that to the “goofy weather” and frequent evening electrical storms that have kept fishermen off the river. Striper action has slowed down with the schoolies gone and just the little guys and an occasional big one still hanging around. There has been some catfish and some smallmouth action, although smallmouth fishermen have been spending more time at Merrill Creek Reservoir where some Brown and Lake Trout are also being caught.

***Belvidere Area:***

Smallmouth fishing has just started to improve for guide Gene Neiderlander (908-475-5493). “Water conditions really improved this past week,” he says. “Earlier, cloudy water had lots of catfish out stealing our hellgrammites.” Now

with clearer water, Gene is seeing more smallies in the 30+ fish they're catching per day. Water temps had peaked up to 82°F, but have recently dropped back to 73°F with the cool front that moved through. Gene also reports taking his first 6-lb. smallmouth from his stretch of the river on June 22.

**Water Gap Area:**

At Red Hawk Outfitters, in Blairstown, NJ (1-888-453-HAWK) [www.redhawkoutfitters.com](http://www.redhawkoutfitters.com) Vinnie says that hellgrammites are as "good as gold" for smallmouth if you can get your hands on them. Otherwise, fishermen have been switching and doing well on medium shiners. Water temps have intermittently risen into the upper 70s, but are lower recently with the cool front. Channel cat and bullhead fishing is better at night. And the schoolie stripers that were in the Phillipsburg area last month seem to have moved north to the Water Gap. That seems to be the focus of local fishermen who are scoring 12" to 16" fish on Rapala, Yo-Zuri, and the thin-profile Mega-Bait lures.

**Lackawaxen, PA Area:**

At the Angler's Roost, Lackawaxen, Pennsylvania, (570-685-2010) Charlie says the smallmouth are starting to hit pretty well with lots of undersized fish and a few keepers thrown in. Cool nights (down to 42°F) are keeping water temps under control. Leadhead jigs with a 2-1/2" twister tail, orange and brown Clouser minnow flies, and medium shiners, nightcrawlers, or salted minnows are the recommended baits. "Of course, hellgrammites are 'dynamite' if you can get them," Charlie adds. There is no striper action to speak of, while trout fishermen on the Lackawaxen are scoring with "terrestrials" as is typical for July – ants, gnats, and beetles.

**August Tide Predictions, NOAA National Ocean Service**

Readings taken at Municipal Pier 11, Philadelphia, Pennsylvania  
All listings are prevailing time (Daylight Savings Time).

Day	Time	Ht.	Time	Ht.	Time	Ht.	Time	Ht.
1 W	1214am H	7.0	720am L	0.4	1238pm H	5.9	724pm L	0.5
2 Th	100am H	7.1	809am L	0.4	126pm H	6.0	811pm L	0.6
3 F	145am H	7.1	855am L	0.5	211pm H	6.0	856pm L	0.7
4 Sa	227am H	7.1	938am L	0.6	255pm H	6.0	939pm L	0.8
5 Su	308am H	7.0	1019am L	0.6	337pm H	6.0	1022pm L	0.9
6 M	348am H	6.9	1059am L	0.7	418pm H	6.0	1104pm L	0.9
7 Tu	427am H	6.7	1138am L	0.7	458pm H	5.9	1146pm L	0.9
8 W	506am H	6.5	1216pm L	0.7	537pm H	5.9		
9 Th	1230am L	0.9	544am H	6.2	1255pm L	0.7	617pm H	5.8
10 F	117am L	0.9	626am H	5.9	136pm L	0.6	700pm H	5.8
11 Sa	208am L	0.9	715am H	5.6	220pm L	0.5	750pm H	5.9
12 Su	304am L	0.8	813am H	5.4	309pm L	0.5	847pm H	6.0
13 M	402am L	0.8	915am H	5.3	404pm L	0.5	945pm H	6.2
14 Tu	502am L	0.7	1016am H	5.3	504pm L	0.4	1042pm H	6.5
15 W	601am L	0.6	1113am H	5.5	604pm L	0.4	1137pm H	6.8
16 Th	659am L	0.5	1208pm H	5.8	703pm L	0.4		
17 F	1230am H	7.2	754am L	0.4	101pm H	6.1	800pm L	0.3
18 Sa	121am H	7.5	847am L	0.2	153pm H	6.4	856pm L	0.3
19 Su	212am H	7.7	938am L	0.1	244pm H	6.7	950pm L	0.3
20 M	303am H	7.7	1028am L	0.1	336pm H	6.9	1043pm L	0.3
21 Tu	354am H	7.6	1117am L	0.0	428pm H	7.0	1136pm L	0.3
22 W	446am H	7.4	1206pm L	0.0	522pm H	7.0		
23 Th	1229am L	0.4	541am H	7.0	1254pm L	0.1	617pm H	6.9
24 F	123am L	0.4	637am H	6.6	144pm L	0.1	714pm H	6.8
25 Sa	218am L	0.4	736am H	6.2	235pm L	0.2	811pm H	6.7
26 Su	313am L	0.5	836am H	5.9	326pm L	0.3	909pm H	6.6
27 M	409am L	0.5	934am H	5.8	419pm L	0.3	1004pm H	6.6
28 Tu	504am L	0.4	1030am H	5.7	512pm L	0.4	1057pm H	6.7
29 W	558am L	0.4	1124am H	5.8	604pm L	0.5	1148pm H	6.8
30 Th	650am L	0.4	1215pm H	5.9	654pm L	0.5		
31 F	1236am H	6.9	739am L	0.5	103pm H	6.1	743pm L	0.6

Station	Time Differential		Height Differential	
	High	Low	High	Low
Marcus Hook, Pa.	-1 29	-1 16	*0.90	*0.90
Bridgeport, Raccoon Creek, N.J.	-1 13	-0 55	*0.87	*0.87
Darby Creek, Pennsylvania				
Tincum National Wildlife Refuge	-0 26	+0 18	*0.71	*0.71
Paulsboro, Mantua Creek, N.J.	-0 25	-0 28	*0.90	*0.90
Woodbury Creek, N.J.	-0 19	-0 23	*0.93	*0.93
Schuylkill River, Pennsylvania				
Market Street Bridge	-0 26	-0 09	*0.97	*0.97
Westville, Rt 47 bridge, Big Timber Creek, NJ	0 04	-0 06	*0.94	*0.94
PHILADELPHIA, Municipal Pier 11	+0 00	+0 00	+0.00	+0.00
Bridesburg, Philadelphia, Pa.	+0 11	+0 13	*1.04	*1.04
Palmyra, Pennsauken Cr., Rt 73 bridge, N.J.	+0 49	+0 57	*0.84	*0.84
Pompeston Creek, N.J.	+0 19	+0 37	*1.02	*1.02
Bridgeboro, Rancocas Creek, N.J.	+1 09	+1 09	*1.03	*1.03
Cornwells Heights, Pa.	+0 40	+0 49	*1.14	*1.14
Burlington, N.J.	+0 41	+0 58	*1.17	*1.17
Edegely, Pa.	+1 02	+1 19	*1.24	*1.24
Fieldsboro, N.J.	+1 01	+1 30	*1.26	*1.16
Trenton, N.J.	+1 12	+1 48	*1.30	*1.05