

REPORTER



C. Dalpra

The usual large stand of submerged vegetation around the Woodrow Wilson Bridge was stunted by the spring weather, and is only now becoming established for the season. This picture, with Alexandria, Va., in the background, was taken several years ago.

When it Rains, it Pours—Nutrients

Extended Wet Weather Affects Potomac

The Potomac basin's multi-year drought ended last fall with snowfall and frequent rains that have continued right through this summer. The onset of the extremely wet weather had many people—those who were under water restrictions, along with personnel from water supply utilities and ICPRB's drought management staff—dancing in the rain.

The continuing rains that have provided welcome relief from the extended drought are now creating other issues in the basin. The cool spring and summer have been very wet and quite cloudy. Combined, these conditions have hindered the growth of aquatic plants in many

waterways. Clouds of sediment carried by storm water from the land have accompanied heavy loads of nutrients—nitrogen and phosphorus—which can fuel the growth of algae and reduce oxygen levels.

These conditions also have caused concern for the Chesapeake Bay, which is experiencing severely depleted oxygen levels in the bottom waters. Bay scientists who surveyed the bay in late June and early July reported the largest zone of oxygen-deprived waters observed during 20 years of data collection. Comprising about 40 percent of the bay's mainstem waters, the zone of low oxygen runs along the bottom of the bay's main channel from

Our mission is to enhance, protect and conserve the water and associated land resources of the Potomac River and its tributaries through regional and interstate cooperation.

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D. Loveland

A researcher's hand is coated with blue-green algae from the river's surface. The picture is from the early 1980s, when these conditions were a yearly summer occurrence.

Baltimore down to the York River. The cool temperatures have stratified bay waters, keeping the heavier, saltier water with very little oxygen trapped at the bottom. The low dissolved oxygen levels affect the fish and other aquatic animals, seen in the fish kills and "crab jubilees" being reported in some areas of the bay. Crab jubilees are the whimsical-sounding events when crabs are observed walking onto land to avoid suffocating in the oxygen-depleted water. The heavy nutrient loads also are resulting in dense algae blooms in some parts of the bay.

A quick look at the Potomac reveals that the river may have dodged a bullet, sending much of its nutrient load to the bay while leaving the river affected to a lesser degree. While dissolved oxygen levels at several Potomac monitoring stations are lower than the long-term average, the weather and high flows have conspired to limit the most-apparent damage, at least for now. Few algae blooms (from high nutrient loads) and fish kills (from low dissolved oxygen and algae) have been observed so far this year.

The blue-green algae *Microcystis*, which used to carpet most of the metropolitan portion of the river every summer through the early 1980s, has been absent despite the year's high nutrient loads. Some blooms of the algae are beginning to be noticed, although further downstream, according to Bruce Michael, the Maryland Department of Natural Resources chief of the Water and Habitat Quality Program. Michael noted that the algae also was not an issue last year, when the region was locked in a drought with lots of sun and warm water temperatures. In addition to lower nutrient loadings from the lack of storm runoff, Michael gave credit to management improvements, particularly the biological nutrient removal that is now part of treatment at Blue Plains regional wastewater treatment plant in the District of Columbia, as well as other treatment plants (see

November/December 2002 *Reporter*).

When the spring storms began washing several years worth of nutrient loads into the river, it quickly became clouded with sediment. Water temperatures were cool, and the weather remained unusually cloudy. These conditions limited the growth of phytoplankton, or algae, in the water. Because the algae populations were not present to use up the nutrients, much of the load was carried into the bay without producing algae blooms in the river. Those nutrients, however, have helped contribute to those same types of problems now being seen in the bay, noted several researchers.

Perhaps the most visible sign of the extended period of wet weather is the lack of submerged vegetation in the river. Areas that last year held huge stands of aquatic plants “are just now beginning to show up,” noted John Sisson, a professional bass fishing guide who frequents the area from

Piscataway Bay to the Woodrow Wilson Bridge. The area usually supports huge stands of grasses that didn’t start growing in the spring, victims of high sediment loads that muddied the cool water, along with a lack of sunlight. Largemouth bass fishing is “still very good this year,” Sisson said, because the fish are concentrating near hard structure—bridge pilings and other attracting features—in the river. It has been a poor season for submerged plants throughout the Potomac system.

“Fortunately, the Potomac remains a very resilient river system,” said ICPRB Executive Director Joseph Hoffman. “The bay’s large zone of low oxygen levels, as well as at the mouth of the Potomac, bears witness to the importance of reducing nutrients throughout the Potomac basin, both for our Potomac River environment and that of the bay, of which our river is the second-largest tributary.”

Potomac’s Wild Celery to Help Restore SAV Beds in Other Rivers

At the mouth of Nanjemoy Creek where it empties into the Potomac River, hearty beds of wild celery (*Vallisneria americana*) grow in the shallow water. This year, it has been hard to recognize that any vegetation is alive because of the heavy sediment that has clouded the water. The turbid waters have not stopped Bob Murphy of the Alliance for the Chesapeake Bay (ACB) and his team of volunteer divers from restoring populations of wild celery and other submerged aquatic vegetation (SAV) in the tributaries of the Chesapeake Bay.

The Potomac River harbors six different types of underwater grasses in the Nanjemoy Creek area, in the tidal Potomac several miles upstream of the Route 301 Bridge. “Wild celery is one of the most ecologically important to the freshwater environments of the river because it is a favorite of waterfowl,” said Murphy. The SAV is also important for the river’s stability and ecological balance. Bob Wardwell, Natural Resources Manager of Blossom Point Army Research Facility, recognizes the importance of the underwater grasses, yet also understands the need to stop the two foot per year shoreline erosion at the facility on the river. Though SAV does stabilize sediments and banks, there are not enough plants to counteract the amount of sediments coming from the river bank at the facility and from other sources so a structural barrier was planned. Wardwell collaborated a multi-agency effort to assess the ecological communities in their stretch of the Potomac River and Nanjemoy Creek before breakwaters are installed at the



J. Dotson

Bob Murphy prepares for a wild celery harvest in Nanjemoy Creek.

Army’s riverfront property. “The breakwaters have to be built directly over some SAV beds,” said Wardwell. “The army was not required to transplant or mitigate, but we chose to because we wanted to save the resource.” Rather than lose those plants, Wardwell and his team decided to enlist the help of ACB’s Bob Murphy and use the plants for restoration of other areas.

The project cooperators (the U.S. Geological Survey, Maryland Department of Natural Resources, Army Corps of Engineers, the University of Maryland Chesapeake Bay and Horn Point Labs, and Blossom Point Army Research Facility) meet annually to discuss progress. The environmental assessment for the area affected by the breakwaters, the major task for the group, is nearing completion. The team has been

working to create an ecological documentation for SAV presence, species abundance, water quality parameters, sediment and nutrient levels, wind and wave energy, and fish species over a five year period before construction. The goal of the project is to increase water clarity in the river by cutting down on sediment from the bank so that the native grasses will continue to grow. The grasses are an important link in bay ecology as they produce oxygen, serve as food and shelter for many aquatic animals, help baffle wave energy, curb erosion, and prevent sediments from moving further downstream.

Before diving, Murphy pulled out a small wild celery plant for volunteers to see. After a short boat ride to the harvest location, Murphy and his volunteer divers entered the water in search of wild celery beds. Sediment made the water so murky that divers had to crawl on hands and knees feeling the bottom for the plants. Every celery plant was identified underwater by touch because nothing could be seen. The plants with long blades similar to eel grass (*Zostera marina*) are wild celery. Skinny stems with bottle brush leaves are coontail (*Ceratophyllum demersum*) and SAV with small linear or ovate toothed leaves are common waterweed (*Egeria densa*). Wild celery was by far the most abundant in the area and the easiest to differentiate by touch. The celery was collected, roots and all, and placed in mesh bags to be taken back to the boat. Once on the boat, the plants were sorted, counted, and stored in a cooler.

Bill Kaminski, volunteer diver for the ACB, is an undergraduate at the University of Maryland's Chesapeake Bay Lab. He has been sampling and harvesting with Murphy several times to gain experience in the environmental sciences field, his focus of study. Kate Dowling, an Americorp Volunteer Coordinator for the ACB, helps to sort grasses on each dive and assists in monitoring underwater grass populations with Murphy each month.

In all, 2,200 wild celery plants were harvested from the murky water by three divers in two hours. Those plants were taken directly to the Harrison Lake Fish Hatchery in Charles City County, Va., to be grown as nursery stock. The high demand from local watershed groups to help restore grasses is higher than what can be produced commercially. This wild celery harvest will allow future restoration efforts to utilize nursery stock instead of wild plants for starting new stands. "They will need to grow out for at least one year, maybe two years. Then we'll propagate and use them as stock," said Murphy.

When asked what the historic population of SAV in the Chesapeake Bay was, Bob Murphy responded "There used to be 600,000 acres of SAV in John Smith's time,

based on records that indicate the amount of bay bottom that was two meters deep or less." SAV decreased in numbers because of high sedimentation, poor water clarity and quality, and inadequate salinities.

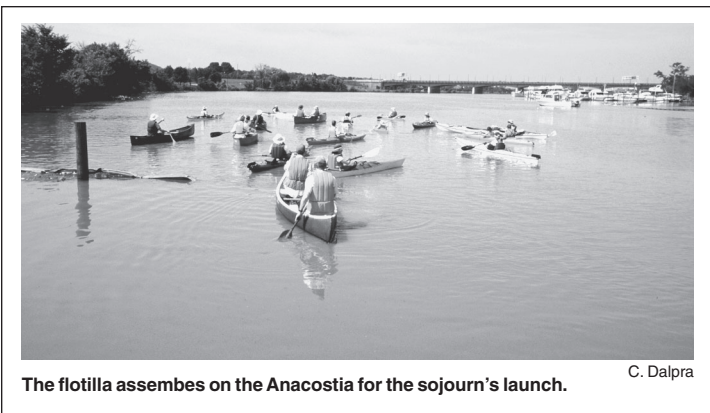
Wardwell commented that "habitat for SAV changes from year to year" because of water quality, precipitation, and sediment levels. Water quality improvements to the Bay's waters have boosted the grass populations in recent years, leading up to a population high of about 85,000 acres in 2002. The Chesapeake Bay Program goal for SAV restoration is 185,000 acres bay-wide, with 19,455 acres of SAV to be restored in the Potomac basin by 2010.

Sojourners Find Spirit of the Potomac

The group of travelers spent the morning preparing their canoes and kayaks along the bank of the Anacostia River in Washington, D.C. After some juice and donuts, they gathered for a safety briefing. The paddlers were already beginning to swelter in the morning heat. It would be a long day in the sun on the river, and the briefing stressed the importance of drinking lots of water. While they listened attentively, it was clear that this diverse group of people-young and old, river enthusiasts, environmentalists, park service personnel, some with their kids in tow-wanted to get started down the river.

So began, the annual Potomac River Sojourn, organized by the Alliance for the Chesapeake Bay (ACB) sponsored by Toyota Prius. The sojourn raises awareness of the river's ecology, history, and beauty while satisfying the need for adventure. For one week, beginning June 14, sojourners paddled their canoes and kayaks down the Potomac to experience nature from a different perspective.

Each day, sojourners participated in activities relating to the river. The ICPRB's Jim Cummins had an opportunity to teach the sojourners about the restoration of American shad in the Potomac by demonstrating his research methods. Cummins, the Associate Director of the Living Resources team at ICPRB, spends days and some nights studying the biological health of the Potomac and its tributaries. Drawing out the gill net from his canoe, he asked group members to hold the end while he walked it out into a shallow cove. The group was excited at what they might catch and after pulling it in, a blue catfish, some killifish, and a few other species were seen writhing in the net. Cummins reached in and pulled out the different fish, explaining



The flotilla assembles on the Anacostia for the sojourn's launch.

C. Dalpra

that they were all very important to the Potomac's ecological balance.

Fish were not the only animals that caught the group's attention. Spotting eagles and ospreys along the river was a treat for many who had never seen the birds up close. Youngsters in the group were eager to learn more about the hunting methods, nest size, and color patterns of the birds. Sojourn guides were on hand to explain the importance of these animals to the river's ecosystem and how they have recovered from near extinction. A fitting addition to the lesson about ospreys and eagles came on Tuesday at the Hallowing Point lunch stop. A large osprey nest was situated on a tower just next to Hallowing Point. After waiting quietly for several minutes, sojourners saw the Potomac food web in action with a magnificent osprey dive that yielded a fish for the osprey to take back to the nest.

Passion for the Potomac is what draws people to take a week of adventure instead of just a vacation. "Most people haven't done anything like it so they are really surprised to learn so much about the river," said ACB Sojourn Coordinator Bob Murphy. Sojourners spend days on the water and nights in a tent under the stars in the true essence of exploration. Because there are so many people dedicated to the preservation of the Potomac through their personal and professional lives, ACB accepts nominations to honor one person with the "Spirit of the Sojourn" Award. This year's recipient, Marvin "Lewis" Harley, has committed himself to the Potomac River. Harley was nominated by the ICPRB commissioners for his tremendous efforts to restore American shad to the river, to bring back the fish that helped shape American history. He and his sons are the last watermen based in Fairfax County, Va., remnants of a long list that started with George Washington. Remembering the river, Harley says, "I can look back and see 70 years, there have been many changes, I wouldn't trade it for anything."

Several of the participants were new to the sojourn experience, but were enjoying the excitement of being out on the river for a week. Each evening, sojourners came

together for a buffet style dinner, eager to talk about the next day's activities and to tell river stories. One experienced sojourner, Bruce Perrygo, said that completing this sojourn meant that he had paddled the entire Potomac except for a few miles in the middle. "Completing this sojourn gave me a sense of accomplishment" and a feeling that "I might be

able to finish those last few miles this year," said Perrygo of his Potomac experience.

Despite the cool temperatures, high winds, and heavy chop, the sojourners made it from Nanjemoy Creek to the final take-out in Morgantown, Md., on Saturday, June 21.

The end of the Potomac River Sojourn was marked with the Morgantown, Md., Wade-In, a tradition that started with Bernie Fowler, a Maryland State Senator on the Patuxent River. The Wade-In gages river clarity by how deep waders can go into the water and still see their sneakers. Because of the cold water and harsh currents, this year's wade-in was completed with a secchi disk. The disk is lowered into the water until it cannot be seen and the depth is marked on the string. This year's reading was 21 inches, lower than previous years. Because of the heavy spring rains, the visibility was expected to be poorer than in years past.

Though the weather was cool and rainy except for the first day, the Sojourners remained in good spirits and enjoyed their week on the Potomac.

Swimmers Quickly Cross Potomac

Swimmers, support boaters, other volunteers, and spectators were greeted with chilly temperatures, rain, and wind at the 10th annual Potomac River Swim for the Environment. The distance swim, about 7.5 miles across the Potomac near its mouth, benefits a number of organizations that work on Potomac River issues, including ICPRB. The 28 contestants each raised pledge money as part of their entry in the race.

As it turned out, the spectators may have gotten the worst of the conditions during the May 31 event, when winds gusting to 20 knots helped propel the swimmers across the river. While spectators shivered in a light drizzle, swimmer Bob Astheimer benefitted from favorable winds that helped him set a new record for the swim of 2 hours, 32 minutes. It was Astheimer's fifth win in the

event. "The waves got pretty big out there, but with the tailwind, it at times felt like I was surfing down them," Astheimer said. Other swimmers also noted the favorable conditions. Trish Lane, who finished third, commented that she had improved her time over last year, even though she had trained less.

While the swimmers sped from the start on the Virginia shore to the finish at Point



C. Dalpra

Bob Astheimer strokes to the finish under the eye of his support Kayaker.



Watching the River Flow

The Potomac is continuing its high-flow ways, according to the U.S. Geological Survey, with the river flowing at several times its normal level.

In June, the river's flow, measured near Washington, D.C., averaged about 27.1 billion gallons per day (bgd), or about 453 percent of the historical June average of 6.0 bgd. Daily extremes ranged from a high of about 52.5 bgd on June 5 to a low of about 8.7 bgd on June 30. The river never even got close to reaching the norm during the month. Water withdrawn for metropolitan area drinking use averaged about 389 million gallons per day (mgd), about 18 percent less than during the extreme drought conditions of June 2002. Total freshwater inflow to the Chesapeake Bay averaged about 123 bgd, or 297 percent of the historical average. The Potomac contributed about 26 percent of the total. Flow to the bay in June was the second largest on record, behind the flow of June 1972.

July flows, while lower, remained well above average. About 7.0 bgd flowed by Washington during the month, or 217 percent of the normal monthly flow of about 3.2 bgd. Daily extremes ranged from a high of about 11.8 bgd on July 12 to a low of about 3.7 bgd on July 31. Metropolitan area water withdrawals averaged about 418 mgd, about 18 percent less than July 2002. Freshwater inflow to the bay averaged about 45.1 bgd, or about 183 percent of average. The Potomac contributed about 20 percent. July 2003 bay inflows were the third-highest on record.

Lookout State Park, environmental groups and spectators discussed tidal Potomac issues while grilling a picnic lunch in the wind and drizzle.

Out on the water, 33 volunteer kayakers paddled along side the swimmers to ensure their safety. One of the kayakers, ICPRB staffer Jennifer Dotson, got an up-close perspective on what its like to swim miles in open water. "Before the event, I met with my swimmer, Mike Maier, to find out what his needs were and to set up a communication method for the race. It takes a lot to communicate with someone who's got water in their ears. He gave me snacks and drinks that he wanted for his journey. The deck of my kayak became a mobile snack bar, ready for Mike to grab something whenever he needed a boost. We had to deal with the incoming tide and storm off shore for the better part of the journey. Taking period breaks to stay hydrated was key to us both finishing the race. However, the water was choppy and stopping meant I was at higher risk of flipping my kayak. Because swimmers often get disoriented in the water, it helps if they have a focal point. Mike followed by bright orange kayak all the way across the mouth of the Potomac. After about three and a half hours we neared the beach at Point Lookout State Park. It was a good feeling to know that Mike made it safely to the other side and that I had been with him every stroke of the way."

Swimmers ranged in age from 23 to 56 years of age, and came from as far as Seattle, Wash., to participate. More than a quarter of the contestants were women. Times ranged from more than 2.5 hours to more than 4.5.

Together, the swimmers raised \$12,000 in pledges. After covering expenses, the funds are donated to the Chesapeake Bay Foundation, Potomac River Association, southern Maryland Sierra Club, Point Lookout State Park, and ICPRB.

Many individuals and groups support the event with services and volunteers, including the Chesapeake Paddlers Association, Chesapeake Boston Whalers

Club, the U.S. Coast Guard, Ridge, Md., Fire and Rescue, Hale House, Patuxent Friends, Patuxent Adventure Center, Shibley's Motel, Trinity Parish Hall Volunteers, Maryland Natural Resources Police, and many others.

Next year's swim will be held on June 5, 2004. Its not too early to volunteer as a support kayaker, power boater, or, for the brave, swimmer. For more information visit the swim website: www.crosslink.net/~cherylw/pr2004i.htm or contact swim organizer Cheryl Wagner at cherylw@crosslink.net or (202) 387-2361.

The top finishers included:

- 1.) Bob Astheimer, Alexandria, Va.; 2:32:30
- 2.) Allison Thomson, Takoma Park, Md.; 2:35:50
- 3.) Trish lane, Lusby, Md.; 2:39:30
- 4.) Alicia Watson, Newark, Del.; 2:42:50
- 5.) Chris Swensen, Crofton, Md.; 2:45:30
- 6.) Scott Lautman, Seattle, Wash.; 2:46:10 (no wetsuit)
- 7.) Steve Taylor, Springfield, Va.; 2:52:30
- 8.) Patrick Ryan, Richmond, Va.; 2: 53:00
- 9.) Gilles Chalandon, New York, N.Y.; 3:00:50 (no wetsuit)
- 10.) Neil Ashcroft, New York, N.Y.; 3:10:30 (no wetsuit)

Upper Potomac Tributary Team Takes Farm Tour

Agriculture continues to be a major land use in the Potomac River basin. Covering about 28 percent of the basin's land, agriculture is second in land use only to forest, which covers about 51 percent. Agriculture is the highest contributor of nutrients and sediment to the Potomac and its tributaries, according to models created by Chesapeake Bay Program staff. During the past ten years, farmers have been encouraged to participate in Best Management Practices (BMPs) to better capture the nutrients and sediment that would otherwise discharge into waterways. The Maryland Tributaries Strategies Program organized a public tour of seven farms in Frederick, Carroll, and Washington counties, with assistance from the Chesapeake Bay Trust and the Carroll, Frederick, and Washington Soil Conservation Districts. The tours highlighted Maryland's Conservation Reserve Enhancement Program (CREP) and other BMPs to illustrate efficient farm management that conserves valuable stream habitats.

"Frederick is the largest dairy county in the state and 80 percent of the county is planned to be in conservation or agriculture," said Carole Larsen of the Frederick County Department of Planning. Each of the farms visited have established some sort of mitigation to help control nutrient and sediment discharges to nearby waterways. More farms join the program each year.

Many streams lack bank vegetation to stabilize soil during regular storm events. Beaver Creek, located in Washington County, was experiencing severe bank erosion in several spots and overgrazing and development throughout the watershed. Creative approaches to curb erosion problems included redirecting stream flow and installing bank stabilization near the confluence of Beaver Creek and the

neighboring Powell Fish Hatchery channel. Livestock fencing was installed in other areas to keep animals out of streams. Bank vegetation provides shade and enhances water clarity, two important habitat necessities for trout. Boulders were strategically placed at the bends to bounce the water back to the center of the stream. Trees and shrubs were planted in the floodplain to stabilize the surrounding soil during periodic flooding events. The project was funded by Maryland Department of the Environment, Chesapeake Bay Trust, Maryland Department of Agriculture, Washington County Soil Conservation District, and many others.

Manure composting is one of the methods for controlling the amount of nutrients that reach waterways. Jon Reifsnider, a Frederick County dairy farmer, explained that manure is collected in one area and allowed to compost, after which it will be spread back on the fields to nourish cover crops or feed crops, saving the farmer from purchasing chemical fertilizers. Another major mitigation tactic is to fence livestock out of the streams and provide water troughs for animals in the fields to help curb erosion. Many of the farmers plant a buffer strip of trees next to their waterways to help capture nutrients and sediment that would otherwise pollute the streams. The CREP, a voluntary cash-incentive program, is a partnership between the U.S. Department of Agriculture and the State of Maryland that pays landowners rent to remove sensitive land from agricultural production and restore the area.

Other methods of controlling nutrients are being used in addition to tree plantings and manure composting. Phytase, an enzyme that helps animals absorb phosphorus, is being added to pig feed to reduce the amount of the nutrient in



manure. This approach is one way that Frederick County, Md., swine farmer, Steve Warehime, is recovering costs of his operation. Warehime explained that the liquefied manure is collected in a holding pond and emptied once per month onto the crop fields on a rotating schedule. By feeding the pigs food with phytase, Mr. Warehime has reduced the amount of phosphorus in the manure from about 40 to 4.5 pounds per 1000 gallons, a significant decrease that has allowed him to spread all his manure on his own fields instead of giving it to neighboring farmers.

Varied farming operations have spurred the development of restoration efforts tailored to each property. Through funding projects such as these, farmers can provide food for local residents with minimal pollution to water resources. For more information on protecting riparian areas, contact your local conservation district or your state's environmental agency, or visit our website at www.potomacriver.org.



Potomac Basin

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