

Delaware Valley Eagle Alliance

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Warships on the Jersey Shore?

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During June of this year there were media reports of warships arriving on the Jersey shore at Harvey Cedars, not real ships of course but Portuguese Man-o-War (PMOW), also known by the scientific name *Physalia physalis*. Often erroneously called 'jellyfish', they are actually a related animal termed a siphonophore or hydrozoan. Following the initial sighting, several reports of new individuals washed-up on a few New Jersey beaches quickly hit social media, newspapers and even television.

So, why so much fuss and excitement? These animals are normally found in tropical and subtropical oceans and sometimes in groups of 1,000 or more. Seeing several PMOWs on a New Jersey beach is a somewhat unusual, but not extraordinary event. Structurally, these animals consist of four polyps including a gas-filled bladder that floats on the surface of water, giving it its name due to its rough resemblance to an old warship sail. The remaining portion of this animal consists of tentacles, and digestive and reproductive polyps.

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© Jeff Cole, Photographer, USGS
These five mussels represent four of the 12 species found in the Delaware River.

HIDDEN TREASURES of the Delaware River

By Don Hamilton
(Resource Management Chief, National Park Service, Upper Delaware Scenic and Recreational River)

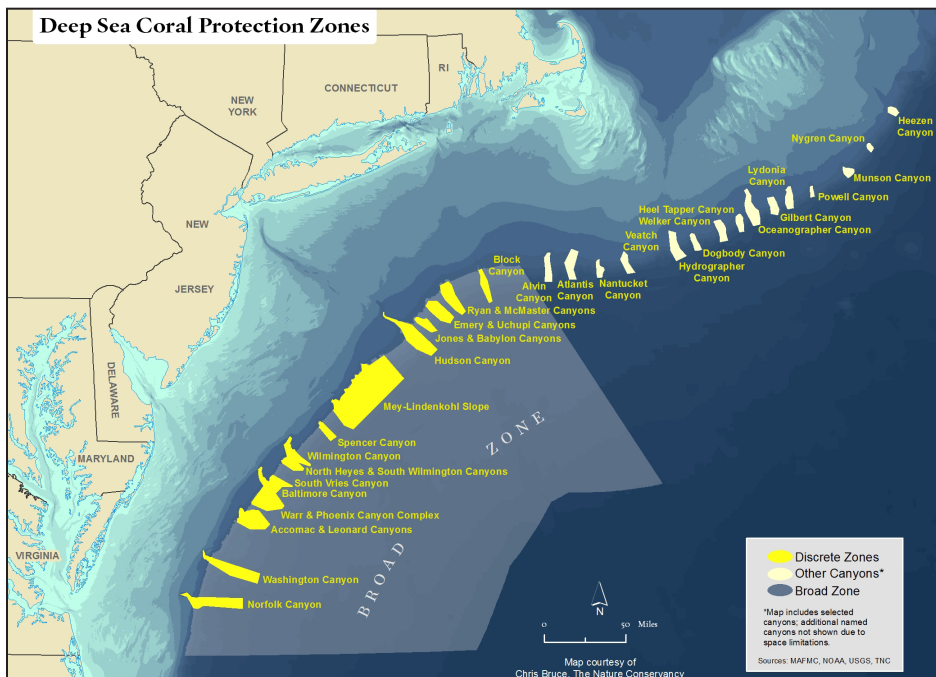
Whether floating or wading the Delaware River, swimming in or just gazing at its waters, the most compelling scenery, for me, has always been the view beneath the surface. The riverbed itself and all the engaging aquatic life there and within the flow have been what's held my attention. And the picture is usually clear and captivating.

When the Delaware flows high and muddy, as it sometimes does temporarily after rains and runoff events, my interest in being on the river drop off dramatically, though the scenery above the surface is plenty pleasing in its own right. But even a turbid Delaware clears up faster than most rivers under these circumstances, thanks in large part to an extensive and well developed natural system that

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Map Courtesy of Chris Bruce, The Nature Conservancy
using data from Mid-Atlantic Fishery Management Council, NOAA and USGS

OCEAN VICTORY: Mid-Atlantic Deep Sea Coral Canyons Protected

In June of this year, the Mid-Atlantic Fishery Management Council voted to protect the vast majority of the Mid-Atlantic region's fragile and pristine deep-sea coral habitat by creating the largest ocean area in the U.S. Atlantic Ocean protected from destructive "bottom-fishing gear".

From New York to Virginia, 15 discrete zones that include canyons and inter-canyon areas, as well as the surrounding deep sea habitat off the region's coast, were identified for protection. These areas are home to rare, ecologically-important and highly vulnerable coldwater coral communities as well as a range of other remarkable sea life. More than 38,000 square miles (nearly the size of Virginia) and from the edge of the continental shelf and extending from a depth of approximately 1,500 feet seaward to the boundary of the Exclusive Economic Zone (The EEZ line is 200 miles offshore, defining the ocean area where the United States has exclusive rights for marine resources and energy production.), this will be the largest ocean area in the U.S. Atlantic and Gulf of Mexico protected from destructive bottom fishing.

It has taken three years of development,

multiple stakeholders and science workshops, collaborations between fishing and diverse conservation organizations, and several rounds of public comment - including one that generated over 120,000 letters, nearly all of which supported strong deep-sea coral protections.

The Wildlife Conservation Society (WCS) and its supporters, as part of a broad coalition, submitted earlier this year, 13,000 letters, petitions, and drawings asking the Council to consider protecting coral ecosystems in the region, including those found in the Hudson Canyon. The Hudson Canyon is the east coast's largest submarine canyon and is located just 100 miles off the coast of NYC.

The Council, together with the National Oceanic and Atmospheric Administration (NOAA), manages U.S. fisheries resources in the region. The Council's historic action helps to safeguard deep sea corals - which grow very slowly and can be hundreds or thousands of years old - against bottom trawling and other destructive bottom fishing. The protection plan is the first to rely on special legal authority to protect deep sea corals

that was added to the federal fisheries management law in 2006.

Brad Sewell, Fisheries Policy Director of the Natural Resources Defense Council stated that:

"History was made today. Protecting this series of exquisite coral canyons and other vulnerable deep sea habitats marks a milestone in ocean protection efforts. It is the most sweeping move to date to protect ocean habitat off our most populous coastline."

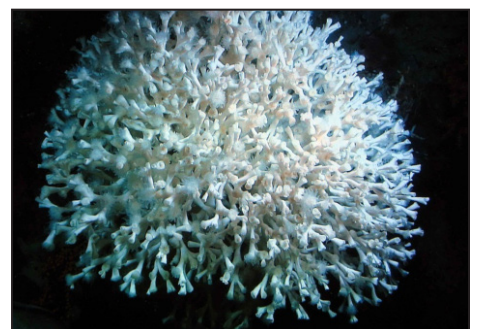
"These precious coral communities are highly vulnerable to harm from fishing gear. One pass of bottom-trawling gear can destroy corals that have been growing for thousands of years."

"At a time when our oceans are under tremendous stress from overfishing, acidification, and pollution, it's critically important that we seize opportunities to preserve some of the most valuable, pristine, and vulnerable parts of our living ocean."

The plan, which is one of the most exciting and precedent-setting marine habitat protection initiatives in the country, now goes to NOAA, where approval is expected.

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Lophelia pertusa was found for the first time in the Mid-Atlantic Baltimore Canyon. © Image courtesy of Deepwater Canyons 2013 Expedition, NOAA-OER/BOEM/USGS.

SUBMARINE CANYONS AND DEEP-SEA CORALS

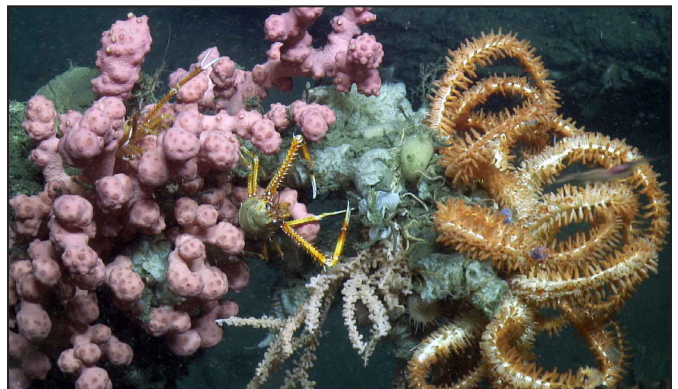
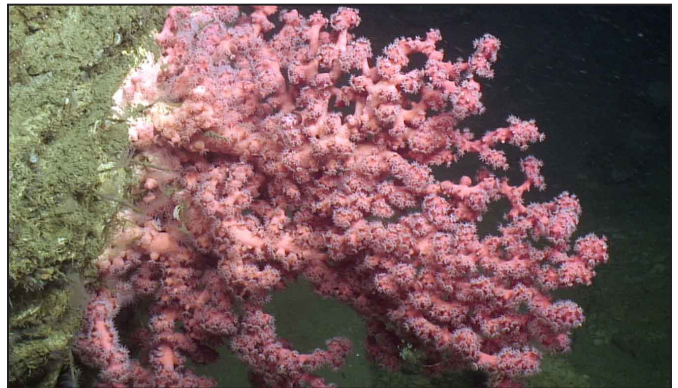
Deep-sea corals come in a rainbow of colors and, unlike like their tropical reef cousins, their graceful shapes rise up from the hard ocean bottom and walls of submarine canyons deep underwater in the pitch-black depths of 50 meters or more. These corals - and associated species like sponges and anemones - are particularly abundant in the Mid-Atlantic's submarine canyons. More than two dozen undersea canyons cut into the continental shelf off the Mid-Atlantic coast of the United States (part of a series of such canyons that stretches up to the Canadian border). The canyons can extend more than 100 miles long and plunge as deep as the Grand Canyon. The canyons' steep walls are excellent habitat for a rich array of coral species that thrive in cold Atlantic waters thousands of feet below the ocean surface.

Submarine canyons are deep-sea coral hotspots and provide important habitat for diverse concentrations of marine life, including sperm whales, tunas, and sharks. They also provide food, foraging, breeding habitat, and shelter for a range of fish, crustacean, and other deep-sea creatures. Although deep-sea coral communities form the foundation of deep-sea ecosystems, they are highly vulnerable, growing just millimeters a year. One pass of a fishing trawl net can in seconds scrape away corals that are thousands of years old. While offshore corals have largely been sheltered by the rugged terrain where they live, new fisheries can develop rapidly and today's vote protects these habitats now, before they are lost for centuries.

We are still learning about the deep ocean life supported by the Mid-Atlantic's coral communities. Since 2011, U.S. National Oceanic and Atmospheric Administration (NOAA) has led a series of dives into the Atlantic canyons to research, map and characterize the undersea canyons. The result has been a steady stream of discovery and revelation: new and rare species, new understandings about ecological relationships and the diversity of ecological settings in the canyons and seamounts, and new appreciation of how special these deep-sea ecosystems are. More than 40 coral species have been identified, at least three of which are believed to be brand new to science. Some are so abundant that scientists described them as coral "forests." Species of red, black, bubblegum, stony, and soft corals have all been found, a number of which were never before known to exist in this region. In the Baltimore Canyon, for example, offshore Maryland, scientists found a colony of bubblegum coral (so named for their bulbous, pink, branch ends) nearly 15 ft tall.

Coral and sponge communities have contributed to scientific and technological advances in cancer treatments, artificial synthesis of human bone, and more durable optic cables. It may well be that the ocean species being discovered - including two potentially new species found in the Block Canyon in 2013 - may lead to new medical treatments. Because deep-sea corals live so long, scientists can also learn about historic changes in global climate and ocean current systems through trace elements and isotopes incorporated into their coral skeletons.

"We take our oceans for granted. Perhaps it is because we cannot see the many wonders they hold under the surface as easily as we see the wonders of the forests or the wetlands or the savannas. But the oceans are wonderful, and we need them."



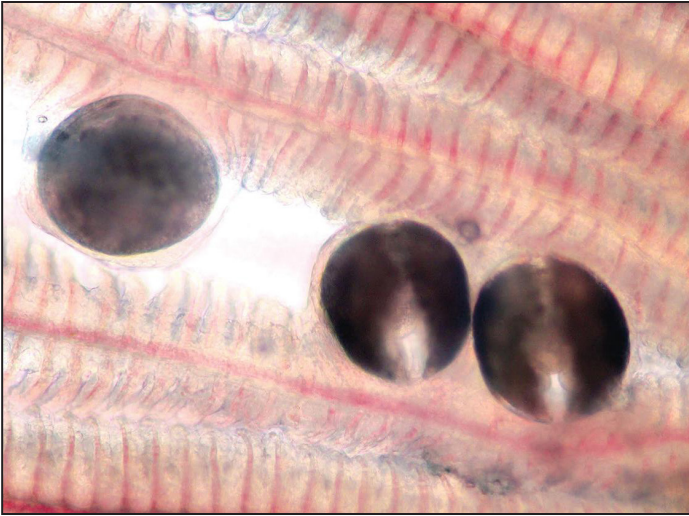
TOP: *Desmophyllum* and octopus on wall in Norfolk Canyon. © Image courtesy of Deepwater Canyons 2013 Expedition, NOAA-OER/BOEM/USGS.
CENTER: Giant *Paragorgia* or "bubblegum" coral colonies found in Baltimore Canyon were up to 15 feet tall. © Image courtesy of Deepwater Canyons 2013 Expedition, NOAA-OER/BOEM/USGS.

BOTTOM: A squat lobster moves among underwater corals in Norfolk Canyon, offshore Virginia. © Image courtesy of Deepwater Canyons 2013 Expedition, NOAA-OER/BOEM/USGS.

John F. Calvelli, EVP, Public Affairs, Wildlife Conservation Society (WCS) in a recent article - World Oceans Day Provides Chance to Reflect and Protect / Huff Post Green THE BLOG.

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© Chris Barnhart, Photographer

Microscopic mussel larvae must live temporarily on a specific fish host, typically attaching to the gills, as shown in this photo, prior to dropping off and growing on their own. This is not harmful to the fish, and the mussels later provide many ecosystem benefits to the river and all its aquatic life.

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HIDDEN TREASURES of the Delaware River

efficiently strains suspended particulate matter out of the water column. This powerful filtration system oftentimes helps to produce water of clarity equal to distilled water, as measured on a numerical scale (in Nephelometric Turbidity Units) and documented by the National Park Service's water quality monitoring program.

So how did we get so lucky to have a widespread, built-in filtration system in the Delaware River that enables this marvelous viewing, provides numerous additional ecosystem benefits and works for free with no carbon footprint?

Freshwater mussels are not the most charismatic animals found in the Delaware, nor the most celebrated, but in terms of ecological function and benefit, they're among the most important. They're simple creatures that do a few key things, and do them well.

Mussels filter water. They do this by ingesting suspended particulate matter through their incurrent siphon, and running it through internal gills that strain out food particles. They then expel the newly-cleansed, filtered water back to the river through their excurrent siphon.

Mussels subsist on a mixed diet of algae, detritus (decaying plant and animal matter) and microbes that are digested and assimilated into their body tissue. Undigested materials are excreted as bio-deposits—organic-rich materials full of nutrients—that enter the river's food chain to become incorporated into the bodies of aquatic insects, or swim back out into the ocean in the biomass of out-migrating fish. (These include immense numbers

of young-of-year American shad, or the still-significant numbers of mature American eels that manage to avoid the hazards of predators and eel weirs on their end-of-life journey back to the Sargasso Sea in the North Atlantic, where they will breed and begin a new generation.)

Biogeochemical cycles that have occurred for thousands of years are still relatively intact in the free-flowing Delaware, maintaining an age-old balance through biomass interchange with the ocean that benefits both systems. Freshwater mussels are central to sustaining this balance.

Freshwater mussels, like many bivalves, are regarded as "ecosystem engineers" for their ability to modify habitat complexity and improve water quality. Their bio-deposits enrich sediments with organic material and biochemical compounds, enabling enhanced river bottom algal growth and greater food resources for aquatic insects, fish, and other fauna.

Mussels also help stabilize substrates and stream channels and reduce streambed transport of sediments during high flow events. They are important links in aquatic food webs as well, feeding on microscopic matter at the base of the food chain, then themselves being eaten by secondary consumers.

The sheer numbers of freshwater mussels in the Delaware River magnify their positive influence here. Though little noticed, freshwater mussels make up the greatest animal biomass in the river. Quantitative sampling done here by scientists from the U.S. Geological Survey's Northern Appalachian Research Lab in 2002, and based on nearly 16,000 random sample plots, documented an average of 76 mussels per square meter of riverbed. Some sections of the river had over 634 mussels per square meter of substrate.

To the casual observer, these numbers may seem inconceivable, as most people only notice the shiny inner shells of dead mussels sparsely strewn across the bottom of the Delaware. But having worked alongside the dedicated USGS crew here during much of the sultry summer of 2002, I can attest to the astounding numbers of mussels found in the riverbed. The live mussels are much less visible, mostly buried in the substrate, oriented vertically, often with only the posterior end of their shells and their siphons exposed, and require an attuned eye to detect.

There are literally hundreds of millions of mussels in the Delaware River, each with the ability to filter multiple gallons of water a day. Collectively, they filter billions of gallons of water on a daily basis, greatly influencing and contributing to the superb water quality found here and on down through the entire non-tidal Delaware. The flow volume of the Delaware River is filtered many times over through the bodies of freshwater mussels on its way to the

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HIDDEN TREASURES of the Delaware River

ocean.

Connectivity with the ocean is key in maintaining the Delaware's robust mussel fauna, as well as the rest of its biodiversity and resilience. During most of the period of escalating dam-building in the last century, we weren't aware of important tradeoffs being made. Freshwater mussels, in order to reproduce, require a fish host for their larvae to live on briefly during the early stages of their development, without harm to the fish. This fish host is often specific for each species of mussel (the Delaware has 12 of the 14 species found on the Atlantic Slope), and is usually a fish species with which they've co-evolved over thousands of years. When they're decoupled from their fish hosts, mussels can't reproduce.

The most important fish host for Eastern Elliptio mussels (*Elliptio complanata*), which make up 98.7% of the Upper Delaware River's mussels, is the American eel, a sea-run migratory fish that is still able to access its important historic habitat here (all the more unique to this system, when 84% of historic stream habitat on the Atlantic Coast is blocked by dams). Consequently, we have hundreds of millions of eastern elliptio mussels each filtering multiple gallons of water per day and providing other important and economically valuable ecosystem services for free, just because we've kept the system healthy enough to sustain the native biota of the Delaware River.

In contrast, the numerous dams that exclude American eels from the upper reaches of the Susquehanna River have kept much of its aging population (some live over 100 years) of freshwater mussels from reproducing (and in decline), water quality is not all that it could be, excess nutrients and sediments are being flushed to Chesapeake Bay, and hundreds of



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TOP: The Delaware River supports the largest and healthiest population of alewife floater mussels (*Anodonta imbecilis*) in NYS. A population of an estimated 400 million of these mussels in the Hudson River estuary has declined precipitously in response to zebra mussel invasions. Fortunately, non-native zebra mussels are not likely to become established in the Delaware due to lower calcium concentrations in its water.

BOTTOM: This beautiful green-rayed specimen of an eastern elliptio mussel exhibits a color variation found in some juveniles from the Delaware and Neversink Rivers. Eastern elliptios make up the greatest animal biomass in the Delaware, and are the only mussel species here with consensus on their conservation status being "Secure."

millions of state and federal dollars are spent annually in an effort to clean up significant water quality problems there. Today's Chesapeake Bay has about 1% of the oysters it had historically. Those historic oyster populations could filter the entire volume of water in that vast bay in four days. If we'd done enough to sustain them, this natural capital would still be able to provide their numerous

valuable ecosystem services, for free.

The Delaware River is unique in that originates from a drainage that is relatively undeveloped, an upper basin that is still over 80% forested, and a landscape that retains its ability to produce clean water. It is the Delaware's high quality water, complemented by diverse habitats

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© Jacob Rash, Photographer, Virginia Tech

Mussels contribute to water quality and clarity through their filtering capacity. Clear water in the righthand tank containing mussels after less than an hour as compared to the original turbid water in the lefthand tank.

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HIDDEN TREASURES of the Delaware River

and connectivity with its flood plain, a complex food web, and an absence of dams on the main stem, that enables the superb aquatic resources we have here to flourish. These resources, such as freshwater mussels, in turn provide a positive feedback mechanism that further improves habitat and water quality and extends this water quality downriver for ecosystem, drinking water, industrial and other human needs.

In the face of now certain climate change, this Delaware River, because of all these features, will fare better than most rivers in their ability to continue to produce high-quality water, which will become an even more precious, and absolutely essential, resource for human and ecosystem needs into the future.

North America was once home to 297 species of freshwater mussels, by far the highest diversity in the world. Today, they're the most rapidly declining animal group in the U.S., over 70% of which are either extinct, endangered, threatened, or potentially justifying federal protection. The majority of the Delaware River's species (9 of 12 species) fall into the categories of critically imperiled/endangered (dwarf wedgemussel brook floater mussel); imperiled/threatened (eastern pearlshell, alewife floater, triangle floater, yellow lampmussel, and eastern lampmussel); or vulnerable/species of concern (eastern floater, squawfoot or creeper mussel) on either the state or federal levels, due to population declines range wide. Some species once found throughout the Delaware now only survive in certain sections. Only one species in the system (eastern elliptio) has consensus as being secure, though their numbers decline dramatically below some problematic tributaries in which water quality is known to be impaired.

There aren't many rivers left like the Delaware. As the last major river on the Atlantic Coast undammed the entire length of its main stem (330 miles), it provides unparalleled access to the full range of habitats for nearly all migratory fish species of this seaboard, and retains ecological integrity that is exceptional among the large river systems of the mid-Atlantic and Northeastern United States. It functions still as other rivers did prior to dams, with a pulse of life (in the form of searun migratory fish) that ascends its waters and nourishes its inhabitants, timed perfectly to provide for wildlife such as hungry bald eagles feeding their growing young. An accompanying downstream pulse later in the season benefits an array of marine species, balancing an age-old cycle of biomass interchange and completing an important ecological link.

The Delaware River possesses a super-efficient "operating system," which has an extraordinary ability to produce clean water and benefit numerous life forms, including ourselves. Such a system is not something we could easily or inexpensively re-engineer. Its wondrous function is largely influenced by simple mollusks that have been at work here in the Delaware for perhaps the past 15,000 years, since the river settled into its present form following the retreat of glaciers after the last ice age. They don't require a lot to survive. A landscape and stream network that sends them relatively clean, cool, well-oxygenated water that is free of pollutants and an overabundance of sediment, and that provides adequate food material and connectivity with their fish hosts will do just fine.

We would do well to maintain conditions that will keep their populations healthy here, ensuring that the yeoman's work they do, gratis, for the river and all its stakeholders, continues into the future.



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The Delaware is the longest un-dammed river in the US east of the Mississippi, extending 330 miles from its East and West branches at Hancock, N.Y. to the mouth of the Delaware Bay where it meets the Atlantic Ocean. Over 15 million people (approximately five percent of the nation's population) rely on the waters of the Delaware River Basin for drinking, agricultural, and industrial use. The Narrowsburg-Darbytown Bridge is one of 47 bridges that crosses the Delaware River, spanning between Narrowsburg, NY and Darbytown, PA.

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Warships on the Jersey Shore?

The 'sail' functions as its name implies, with the wind moving the PMOW across the water as they drift with the water currents (they are not physically capable of swimming on their own, but are at the mercy of the wind and ocean currents). When winds are blowing from the north or northeast, any objects in the ocean off our east coast will tend to travel to the west (Coriolis force pushes objects to the right). Winds out of the southwest will tend to keep them offshore. This past June, winds were blowing in the 'right' direction just prior to sightings of the PMOWs.

But you may be wondering, how did they get off the coast of NJ? The PMOWs that washed-up on our beaches are most likely individuals that were blown into shore from the Gulf Stream. The Gulf Stream is a warm-water current that comes up along the North American continental shelf from the Gulf of Mexico, moving around the tip of Florida and carrying tropical fish and other animals northward. Tropical fish can often be observed in the summer along NJ's coast and in deeper waters. New Jersey was not the only state with sightings; there were reports of PMOWs from Fire Island, NY and on a Delaware beach during the first week of July. In the past, PMOWs have been observed as far north as the Bay of Fundy in Canada.

The greatest concern with these animals is their tentacles, which provide a very painful sting if touched. The sting is caused by the release of neurotoxins from stinging cells called cnidocytes which are found on the animal's tentacles. The inflammatory response resulting from the stings is due to the release of histamines from mast cells within the person's skin. The visible result is often a lash-like welt, swelling, and/or rash-like response in the immediate area of contact. Pain is the most immediate physiological result from contact with the PMOW.

The New Jersey Department of Environmental Protection has posted a fact sheet on the PMOW at: https://njbeaches.org/njdep_public_files/Portuguese_ManOfWar_final.pdf. This will provide some additional information and tips on what to do if you are stung.

If you are interested in keeping track of conditions, the National Oceanic and Atmospheric Administration (NOAA) has a website that predicts the Gulf Stream current for the next 72 hours. Along with actual (real-time) or forecasts of wind direction, this site can be used to see if conditions favor the potential for tropical animals to be pushed towards the east coast. http://www.opc.ncep.noaa.gov/Loops/NCOM/currents/Ncom_Curr_UseastNorth_03_Day_flash.shtml

More Information: just search the web (e.g., pictures of Portuguese man of war) to see the vibrant colors, sizes and vast numbers that sometimes wash up on shore in tropical/subtropical areas.



Photo by Thomas Belton

Approximately 12 inch (30 cm) Portuguese Man-of-War washed up on the beach at Brigantine, NJ on June 28, 2015. Note purple bladder ('sail') with digestive and reproductive polyps and remaining tentacles below the bladder.

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FIGHT Against FRACKING

By Maya K. van Rossum, Delaware Riverkeeper

Reading about the ravages of gas drilling, or fracking, often leaves people feeling despair – helpless to act to protect themselves, their kids or their community. So before this blog jumps into another element of the drilling process, I want to begin on a positive. Across the nation communities are getting active and taking actions that are successfully protecting them from fracking. For example, in the Delaware River basin tens of thousands joined forces and secured a moratorium on drilling that has held for over 5 years; in New Jersey legislators are passing legislation to keep drilling waste and fracking out of that state, and while Governor Christie has vetoed legislation legislators keep trying; in New York citizen action was responsible for Governor Cuomo passing a statewide ban; and in Pennsylvania the Delaware Riverkeeper Network and seven townships joined forces in a legal action that struck down Pennsylvania's pro-drilling legislation called Act 13. The key is to take the your knowledge of the harms of fracking and to use it to strengthen your resolve and help embolden yourself and your community into action.

So here's a new piece of knowledge to help.

When people hear about the proliferation of gas drilling happening in the US the word "fracking" often comes to mind. But another word needs to join the drilling vocabulary – "pipelines". The spread of gas drilling and fracking also means more pipelines. Every gas well fracked and drilled requires approximately 1.6 miles of pipeline – and that is just to get the gas from the well pad to the interstate line that cuts its swath from community to community, linking all that potential harm together.

Pipelines are known to emit methane, Almost 1 percent, with some estimates being as high as 10 percent, of the gas drilled from a well is lost during the storage and transmission of extracted gas. And methane is the second largest contributor to climate change, and 86 times more powerful than carbon dioxide in warming the earth over a 20 time year time.

Every pipeline brings with it a cut across the landscape. Virgin forests, residential communities, pristine waterways, and productive wetlands all must give way when a pipeline comes through.

Forests cut or fragmented for a pipeline cannot sustain the sensitive wildlife that needs the deep, mature woods to survive. The cutting of forests means rainfall once captured by the leaves and soaked up by roots and soil now runs off contributing to pollution, erosion and flooding downstream. Streams are "open cut" to lay pipes across. Wetlands are drained and become lined with grass so they can no longer sustain the quantity and quality of life they once did.

To move the gas through pipeline requires compressors.



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And so communities are burdened with loud polluting compressors as often as every 40 to 100 miles, emitting a variety of air pollutants and lots of loud noise. In DISH Texas, high levels of carcinogenic and neurotoxic air pollutants were recorded near compressor stations.

And despite the messaging campaigns of the gas drilling companies that we need to undertake these extreme extraction practices in order to wean our country off of foreign sources of fossil fuels and to keep the price of gas low -- the truth is that many of these pipelines are, or will, take this gas to liquefied natural gas facilities that will take the gas overseas, to foreign countries where the drillers can sell it for as much as four times the price they can charge in the U.S.. In fact if all of the LNG proposals that are being advanced by the industry were approved, 60% of the gas produced in the U.S. in a given year would be shipped to foreign nations.

So even if you are spared the construction and drilling of gas wells in your community, don't be surprised if you find yourself faced with the proposal for a pipeline through your community or favorite forest or woods; neighbor to a 15,000 horsepower compressor; downstream of a wastewater plant discharging frack waste or dealing with drilling companies who want to suck their frack water out of your local creek, even if it means draining it close to dry.

So what can you do?

Raise your voice with communities from across the Country. We need a change of direction in our state capitols and in Washington if we are to succeed in protecting our communities from the gas drillers, the pipeline companies, and the liquefied natural gas facilities. Their voices are heard in the halls of Congress and state capitols, so let's make sure the voice of the people is heard even louder. Write a letter or pay a visit to your state or federal legislator.

And get connected with your local and regional water, air, and energy organizations so you can be immediately alerted when a gas drilling operation or activity is proposed for your community, and then join with others to speak out in defense of your kids and community. Grass roots efforts to stop these operations are working across the country.

Make sure your voice is heard.

NEED FOR ACTION: Protect Endangered Sturgeon

By Paul Gallay, President, Hudson Riverkeeper

Earlier this summer, Riverkeeper petitioned the National Marine Fisheries Service to investigate and take immediate action in response to a shocking spike in reported sturgeon mortalities in the Hudson River estuary since the 2012 start of the new Tappan Zee Bridge construction project.

In the 3-year period before construction began (2009 to 2011) a total of 6 sturgeon fatalities were reported throughout the estuary to the NYS DEC. In the 3-three year period after construction began (2012 to 2014) there were 76. In many cases the sturgeon were found cut in half, gashed or severed at the head or tail due to vessel strikes. Dozens more mortalities have been reported to the DEC in 2015, bringing the total to over 100.

The dramatic increases coincide with the start of pile installation testing in 2012; the massive dredging and pile driving work that began in 2013; and the ongoing bridge construction, involving close to 200 project vessels in and around the Tappan Zee.

Between Crotonville and Riverdale alone, 10 and 13 sturgeon mortalities were reported in 2013 and 2014, respectively. As Hudson River estuary is tidal, this means that a dead or injured fish could have been transported north or south of the project area on the tide. Moreover, a sturgeon injured as a result of project activity might travel some distance before it ultimately dies.

Riverkeeper, which is represented by Pace Environmental Litigation Clinic in this petition, seeks immediate, interim measures to protect endangered populations of shortnose and Atlantic sturgeon from the construction activity. We were promised an environmentally sensitive bridge replacement project that would not cause significant harm to the life in the river.

The National Marine Fisheries Service reviewed the bridge project as part of its responsibility to protect endangered species. It issued an opinion in 2013 that the Tappan Zee Bridge replacement project "is likely to adversely affect, but not likely to jeopardize the continued existence" of endangered populations of Atlantic and shortnose sturgeon. NMFS concluded that dredging or pile driving would likely cause the deaths of two shortnose sturgeon and two Atlantic sturgeon over the entire course of the project. That toll is deemed the project's "allowable take" permitted by NMFS and the DEC.

But even one sturgeon mortality caused by a project vessel strike would exceed the project's allowable take. Much of the project area north and south of the existing bridge is in very shallow water, putting sturgeon in close proximity to the vessels and propellers. Seeing that such a large percentage of dead sturgeon have been struck by a vessel,



TOP: © Daniel Wolff, Photographer, Upper Nyack.
BOTTOM: © John Lipscomb, Photographer, Sleepy Hollow.

slowing down all vessels in the construction zone would be a practical, immediate precaution which would give the sturgeon more time to detect and avoid the propellers. With data strongly suggesting that the permitted threshold has been grossly exceeded, Riverkeeper is petitioning the Fisheries Service to reinstitute consultation on the project, analyze the causes of death and take immediate steps to lower the risks of sturgeon fatalities.

Such steps might include enforcing the 5 mph speed limit in the Tappan Zee construction zone; requiring propeller cages on deeper draft tugs and pushboats; doubling the size of "bubble curtains" used to control damaging shock waves from pile-driving, and requiring that dredge buckets be lowered slowly to allow fish more time to escape.

The situation is urgent. Something is killing 10 times as many sturgeon as before the bridge project started, and nothing else has changed. Commercial and recreational boat traffic has held steady. The strong presumption has to be that the problem is the bridge. Statistics like these on sturgeon mortality have never been seen before in the Hudson, and they must not be ignored. These endangered species cannot be protected by a paper permit, only by action and enforcement.

The Atlantic Sturgeon is the longest-living fish in the river; some have been known to live past 60 years of age. They are also the largest, sometimes reaching 15 feet in length and up to 300 pounds. Most importantly, the Atlantic sturgeon is among the oldest of known fish species, dating back to the time of the dinosaurs. They are living fossils. And we can't be the generation that does them in.

DISCOVERING NATURE



Photograph from www.ocearch.org

Mary Lee, Where Will the Great White Shark Go Next?

In September, 2012 off the coast of Cape Cod, Massachusetts, five great white sharks were fitted with a satellite tag by OCEARCH scientists to track the predators' movements. Each satellite tag was bolted to the shark's dorsal fin and should last about four or five years. It is a real-time tracking device that sends location data ("pings") to satellites every time the tag breaks the ocean's surface. The satellites send the data to researchers who can then track the animals.

All five sharks got names, and Mary Lee (the 3,500-pound, 16-foot-long animal) was named for the mother of one of the researchers. One of Mary Lee's compatriots, Lydia, made history last year when she was the first great white observed to have crossed the Atlantic Ocean. But Mary Lee has been all over the map as well, traveling over 19,000 miles since she was tagged. She has also amassed a large following online through the Twitter account @MaryLeeShark, which was reported to have been started by an unnamed east coast daily reporter. Earlier this year, the account had just over 10,000 followers. But after her Jersey Shore vacation later this year, her following increased to more than 70,000.

New evidence indicates that white sharks live more than 70 years in the North Atlantic. They are considered an apex predator, the top predator in the food web. As such, great white sharks are the lions of the sea and help to maintain ecosystem balance. To remove top predators would result in disrupting the delicate balance of the food web.

Organizations such as Utah-based OCEARCH and NJ-based Shark Research Institute (SRI) are trying to change the conversation of great white sharks from being culturally construed as man-eaters. "Whenever people swim in the ocean, they are swimming with sharks. And we need sharks because they have a critical role in maintaining the health of the ocean ecosystem, the life support system of our planet," says Marie Levine, SRI Founder and Executive Director. SRI has collected the largest global shark attack database. The last fatal attack in New Jersey was almost 100 years ago.

RESOURCES:

<http://www.ocearch.org>
<http://www.sharks.org>
<http://news.nationalgeographic.com/2015/05/150507-great-white-shark-mary-lee-ocean-animal-tagging-science/>
<http://www.livescience.com/50814-mary-lee-great-white-shark.html>
http://www.nj.com/news/index.ssf/2015/06/great_white_shark_mary_lee_returns_to_nj_coastline.html
www.sharkattackfile.net (Global Shark Attack File)

THE DELAWARE VALLEY EAGLE ALLIANCE

*working towards the conservation of
our wildlife and natural resources*

ABOUT US

The Delaware Valley Eagle Alliance is a 501 (C)(3) not-for-profit organization; our mission: to increase awareness, understanding and promote conservation of our wildlife and the natural environment.

We believe that raising awareness and understanding will change attitudes toward conservation and our natural resources. We are committed to this because we believe that it essential to enabling all life to exist and prosper on Earth.

We are dedicated in our focus to bring awareness through our publications, educational programs and events and projects.

*John A. DiGiorgio, Chairman and President
Richard Crandall, Director and Vice President
Yoke B. DiGiorgio, Director and Treasurer
Debra Reimer, Secretary*

ABOUT OUR PROGRAMS AND EVENTS

We work with communities and other organizations on wildlife and environmental programs and events. Our focus, education and entertainment, is accomplished by providing enhanced programs with new speakers and presentations and providing all attending, young and old, opportunities to see and experience new and interesting programs.

ABOUT OUR PROJECTS

We are available to work closely with biologists and conservation groups to document ecological and wildlife research on rare, sensitive and endangered wildlife and environmental issues.

SUPPORT

The Delaware Valley Eagle Alliance grew out of a grassroots effort of individuals who want to help protect our wildlife and habitat. Our organization depends on responsible citizens and organizations who share our concern for the environment. Our educational publications, documentaries, programs and events would not be possible without the generosity of our sponsors and supporters.

For more information about having a project, program or event and/or to make a tax deductible donation contact:

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