

## **Prequel to Killer from Across the Sea**

**Reference-** Chesapeake Bay Quarterly, Maryland Sea Grant College, Volume 5, Number 2, The MSX Story

The reference is a detailed 16-page story well worth reading. This is a shorter version, compiled by Vic Spain.

### To make a long story shorter-

On Labor Day 1958, “Doc” Thurlow C. Nelson, a famous and highly respected biologist and oyster researcher, was sampling the oyster density in the Delaware Bay. His Graduate Assistant kept pulling up dredges full of “boxes” and “gapers”, connected shells with no or dead oysters inside.

Later, at the microscope, Nelson was seeing blobs of single-cell plasmodia, and the dots seemed to be nuclei, but Nelson could not identify the mystery killer, and neither could his protégé, Harold Haskin. Since the new parasite needed a name, lab director Haskin gave it one. “Well, it’s obvious,” he told the scientists gathered around the microscope. “This is multi-nucleated sphere X. Or MSX.” The X stood for origin unknown, and the name stuck because the mystery stuck. It was later given the scientific name, *Haplosporidium nelsoni*, in honor of Nelson.

In 1958-1959, MSX killed approximately 90% of the oysters in the Delaware Bay and 70% in the Chesapeake Bay. The public oyster fishery in Virginia collapsed. Sadly, Doc Nelson died in a boating accident in 1960. He never knew where MSX came from.

Decades earlier, Nelson and other researchers experimented with the Asian oyster, *Crassostrea gigas*. Some brought them into the Bay. They had good reason, the *gigas* has become the most popular and successful aquaculture oyster in the world. But it did not do well in the Chesapeake Bay. And researchers are now sure it brought in the MSX parasite.

Read on...

[Subscribe](#)[Magazine](#)[Online Only](#)[About](#)[Support Us](#)

## [Killer from across the Sea](#)

[Contents](#)

---

SKEPTICS QUESTION whether an invasive species has ever really caused significant ecological damage in the Chesapeake Bay. The answer is yes. We called it MSX. It was like the plague for oysters, and it came from somewhere else. In 1959, when MSX showed up in Virginia's Mobjack Bay, one million oysters died. In a single year. If oysters were once hailed as "white gold," then MSX was the White Death.

More than a nuisance, when this exotic parasite appeared in Chesapeake and Delaware bays in the late 1950s, it destroyed the richest oyster fisheries in the world. It also killed the region's best reef builder and filter feeder.

### [What about Overharvesting?](#)

Some might argue that the Bay's oystermen had — through decades of aggressive harvesting — already destroyed their golden goose. And there is some truth in that. By knocking down the old bars, watermen not only removed bargeloads of oysters from the Bay, but they left the remaining oysters lying on the bottom. Increasing clouds of sediment covered them. Boring sponges and other predators attacked them.

But it's also true that during the middle of the 20th century, the Chesapeake oyster fishery had reached something of an equilibrium. Though down from the reckless white gold rush of the 19th century, for much of the mid-20th century, Bay-wide oyster harvests fluctuated roughly between 20 to 30 to 40 million pounds, year after year. In 1980, in the Maryland portion of the Bay, watermen entering the fishery saw about the same oyster harvest their parents had seen when World War II ended in 1945. About the same harvest Maryland watermen had pulled in as far back as the late 1920s. Baywide, the oyster harvest — though at a reduced level and constrained by gear restrictions and other rules — found a kind of sustainability. In the 1950s, the Bay was in decent shape. Underwater grasses still lined the shallows. Oysters, crabs, and fish were still in good supply.

Then one day as the 1950s came to a close, a foreign parasite showed up. And that changed everything. [Where Did It Come From?](#)

When oysters began dying in droves in the Delaware and Chesapeake bays, oyster scientists rushed in from around the country. It was not white gold that brought them, but the White Death. They looked at slides beneath their microscopes and found a profusion of round cells (plasmodia), filled with multiple nuclei. They compared these with oyster parasites they'd seen before — but they found no match. Stumped, they named the unfamiliar organism "Multinucleated Sphere Unknown," or MSX.

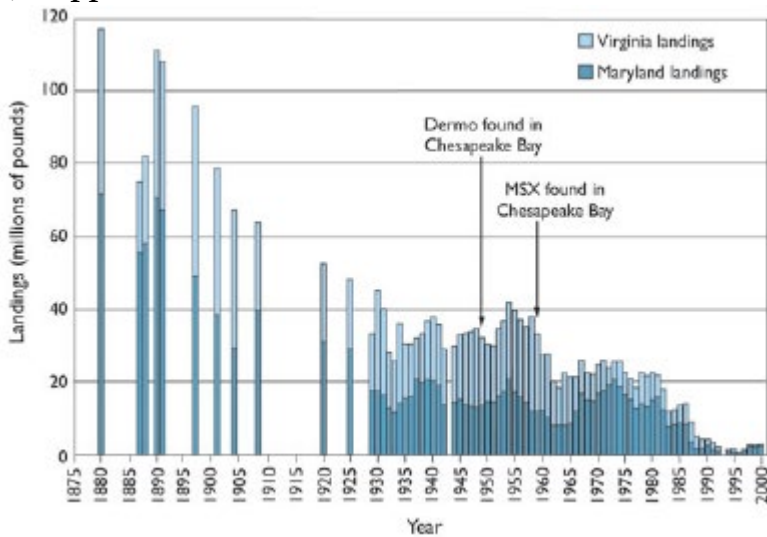
Forty years passed before tools turned up that could pull MSX from a global lineup of oyster parasites. Thanks to genetic detective work by researcher Eugene Burreson and his colleague Nancy Stokes at the Virginia Institute of Marine Science (VIMS), we now know that this oyster killer came from Asia, almost certainly from Japan and Korea, after World War II and the Korean War.

The parasite lives in the Japanese oyster, *Crassostrea gigas*, used for aquaculture in many places around the world, including the northwest U.S. Records show that scientists and oyster growers also brought the Japanese oyster to the east coast, to see how it would do. Ships returning from duty in Japan and Korea may also have unwittingly brought back nonnative organisms, including the oyster parasite. Exactly how MSX got here makes for a fascinating story and some intriguing speculation (see [Who Killed Crassostrea virginica?](#)).

But wouldn't Bay oysters have fought off this foreign invader if decades of overharvesting and habitat destruction hadn't already weakened them? Burreson doesn't think so. Based on the way MSX swept through healthy oyster bars when it first showed up here, he thinks that oysters would have succumbed anyway. Their immune systems simply had not evolved to handle this invading parasite. Like other diseases — the chestnut blight, Dutch elm disease, small pox — when this parasite from the Old World reached America it found little resistance.

After MSX invaded Delaware, Virginia, and Maryland, it marched up and down the Atlantic coast. In the 1980s, it appeared as far south as Florida and as far north as Maine. In 2000, MSX killed a large number of oysters in Nova Scotia, Canada.

***Ghosts of a bygone fishery**, abandoned Bay workboats (top of article) bear witness to the passing of what was once the world's richest oyster industry. On the oyster landings graph above, the*



*high harvests of the nineteenth century trace the dismantling of the Bay's virgin oyster reefs. Only after the 1959 when an exotic parasite called MSX hit. The Virginia oyster harvest plummeted first. Maryland's fishery hung on until the early 1980s, then several years of drought brought disease riding up the Bay on a wedge of saltwater. The Bay's oyster populations have still not recovered. Credits: photo by Michael W. Fincham and graph adapted from a NOAA Chesapeake Bay Office Graph.*

3/6/26, 4:44 PM Chesapeake Quarterly Volume 8, Number 2: Killer from across the Sea <https://>

**MSX Today** As the Bay moves into the 21st century, MSX is "everywhere" in the saltier reaches, according to Burrenson.

But even so, it may be that the shadow of MSX is finally lifting. At least in the lower Bay. "It's still killing first-year spat [baby oysters]," says Burrenson, "but not so much adults." In Virginia, he's seen that once oysters reach their second year, they seem to do okay. It's a similar story in Delaware Bay. Veteran oyster researcher Susan Ford at Rutgers University tells him she's seeing the same pattern.

In both Virginia and Delaware, where MSX has hammered away relentlessly for decades, oysters have developed an apparent resistance.

Says Burrenson, "It's taken fifty years."

But the saga of MSX is far from over. In Maryland, where it takes a drought to bring salty water up the Bay, oysters see MSX only at intervals. Burrenson thinks they haven't had time to develop the same tolerance as oysters in the lower Bay.

Researcher Chris Dungan agrees. He's at the Cooperative Oxford Laboratory, a research facility on the Eastern Shore created in 1960 expressly to take on the mystery of the new oyster killers. He says that a second oyster disease, known as Dermo (Perkinsus

marinus), is now more prevalent in Maryland. But ongoing sampling shows that MSX still crops up in dry years when salinity rises.

And it still kills.

And yet Dungan, too, sees a possible ray of hope. The diseases are still out there, but despite dry weather over the last couple of years they haven't killed as many oysters as in the past. Are Maryland's oysters developing some natural resistance? Maybe, he says. We won't know until we have "empirical evidence." "The best thing we can do now, he says, is to leave the large survivors in the Bay. He argues that we need sanctuary areas where surviving oysters can reproduce and pass on their ability to resist disease. And then we have to wait.

---

Still a Mystery Despite all we've learned about this devastating parasite, there's good reason to keep the Xin MSX.

Though scientists long ago characterized the single-celled organism — first naming it *Minchina nelsoni* in 1966 and then *Haplosporidium nelsoni* in 1980 — they still haven't figured out its lifecycle. Or even how it infects its oyster victims.

Burreson still puzzles over this and has devoted endless hours in the search for an intermediate host — an organism that he believes plays a key role in how oysters become infected and how MSX manages to move around so fast and so far. He says it's hard to find continued funding for this work, though, and next year he plans to retire. "Someone will get lucky one day and just stumble on it," he says. "They'll say, 'Gee, what's this doing here?'" He goes on to say, "I hope this happens before I drop dead. I want to know what it is."

What's the future for oysters and MSX in the Bay? Burreson actually feels "some optimism" — since oysters in high salinity areas now appear to show signs of resistance. The bigger problem now, in Virginia as in Maryland, is that other oyster parasite, Dermo.

This leads Burreson to ask another question. Is there some as yet undiscovered connection between Dermo and MSX? Some hidden relationship? We know that Dermo was already in the Bay before MSX showed up. Researchers found it in 1949, the first time they went looking for it. But it wasn't until MSX appeared ten years later that Dermo became a real problem. Cause and effect? Or just coincidence?

That's a hot topic for his younger colleagues to take on, Burreson says. For now he'll have to be satisfied with being part of the team that figured out where MSX came from. That will go down as a pivotal discovery — especially for those who want to know just what kind of damage a nonnative parasite can do to a major fishery, and to a national treasure like the Chesapeake Bay.

---