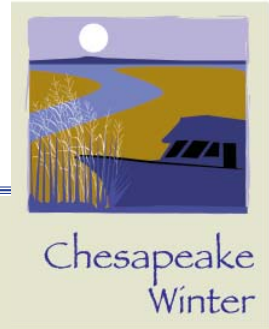




In Tide and Life, Spring Can Really Hang You Up *Visiting the Liveliest Zone in the Bay*

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Twice a day, a flying wedge of the Atlantic Ocean surges northward along the bottom of the Chesapeake. The volume of the tidal flood and ebb is nine times greater than the amount of rainwater that the Bay and all its rivers normally send to the sea.

These salt and fresh waters crash and mingle creating the estuary that is Chesapeake Bay. From aboard a research ship, we watched the merger.

Different water masses aren't eager to mix, as you know if you've seen a muddy creek join a clear river -- or a river join the Bay. Far downstream, a sharp division can remain.

So it goes with ocean and Bay. Seawater, heavy with salt, wants to stay low as the pull of the sun and moon lifts it up and over the Chesapeake's irregular bottom. Fresh water entering the Bay from rivers tries to stay near the surface and skid downhill toward the sea.

Mix they do, though. The collision happens several miles above the Bay Bridge. Exactly where depends on time of year, amount of river flow, state of tide. The process kicks up -- and suspends in the water -- sediment, detritus, tiny animals, and baby fish. Lots. Recent science suggests this transition zone is critical habitat for fish larvae, notably striped bass and white perch. Scientists have named the zone the estuarine turbidity maximum, or ETM.

Early one April morning a Zodiac inflatable boat zipped us from Betterton, Maryland, to a research ship, the 146-foot Hugh R. Sharp. Commissioned in 2006, the ship is described as the most advanced coastal research vessel in the country.

The day we spent on this amazing floating laboratory answered a nagging question: Why would a feature as basic as the ETM have escaped the attention of science until so recently? In 1971 marine biologist William Dovel had published "Fish eggs and larvae of the upper Chesapeake Bay," asserting the existence and the importance of the ETM. Science ignored the idea for over twenty years, not because it was unreasonable but because data did not exist to back up Dovel's claim.

Our cruise was getting a major data dump, much of it from overboard sensors wired directly to onboard computers. No more pencils and clipboards. Standard gear like sampling bottles and trawls was complemented by a device that used sound echoes to measure the size and number of zooplankton. A laser scoped out the size and location of particles. Measures of current speed and direction, salinity, water temperature, turbidity, and dissolved oxygen came in staggering amounts.



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Horn Point Laboratory biologist Elizabeth North



Chesapeake Winter

Fish figured out the estuarine turbidity maximum long ago. “Striped bass are stacked up in the deep channel,” where the early season water is warmer, “waiting for their temperature cue,” said University of Maryland scientist Byron Crump. When the water warms to about 54 degrees, they head for the zone to spawn.

We learned that the zone offers lots of zooplankton for food. It’s also a refuge from predators (little creatures can hide in the murk) and it has the best salinity and temperature for larvae to survive. The zone’s tendency to recirculate its contents like a washing machine may keep eggs and larvae from drifting to more stressful saltier waters.

Estuaries all over the world have these zones. Elizabeth North of the University of Maryland’s Horn Point lab told us the Chesapeake one is especially pronounced and productive. And she suspects the effect is stronger in a year with a lot of fresh water.

Ship’s crew and scientists worked in almost assembly line fashion -- around the clock -- but still the excitement of discovery showed through. David Kimmel of the U-Md Horn Point lab emptied a trawl brimming with small crustaceans called copepods. Marveling at the quantity, he said, “I’ve

fished thousands of trawls and have never seen anything like this!”

Zen moments happened, too. The ship was idle for some time, and finally we asked what was the matter. “All this machinery and all these people, and all we can do is sit still and wait for the ETM to arrive,” came the reply. Time and tide wait for no man, of course, but now man and woman waited for time and tide. Perhaps more to the point, the tardy zone recalled the Ella Fitzgerald jazz standard:

“Now it’s April, love is just a ghost
Spring arrived on time, only what became of you, dear?
Spring can really hang you up the most”



Research vessel Hugh R. Sharp

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