Fish of the Great Lakes
Wisconsin Sea Grant

Why are the alewives dying?

There are several factors involved in the recent alewife die-of and the apparently large numbers that are washing up on the beaches. These factors are origin and life history of the fish, population abundance, and weather.

Origin

The alewife (*Alosa pseudoharengus*) is native to the Atlantic Coast; alewives entered the Great Lakes through the Welland Canal and made their way to Lake Michigan by 1949.

Alewives are not well adapted to the osmotic stress associatec with life in fresh water. Freshwater fish must constantly 'pum water out of their bodies; fish that are well adapted to a freshwater environment have larger kidneys than their saltwat counterparts. Because of this physiological stress, alewives ar rather sensitive to disturbances in their Great Lakes environm

Life History

Alewives spend most of the year in the deeper waters of the o lake, but come into near shore waters in the summer when the are ready to spawn. Alewives begin to spawn when the water temperatures reach about 55-60^{o} F. In their native habitat alewives are anadromous, swimming upstream to spawn in th spring. In the Great Lakes, the fish congregate near the outlet rivers or streams or near harbors that occur at the outlet of a r Generally, alewives begin reproducing at about two years of a Alewives do not necessarily die after they spawn, but when th fish move from the deeper water to near shore areas they are exposed to fluctuating temperatures. A severe change in wate temperature, such as can occur with upwelling, can cause the to die.

The best use for dead alewives?

Compost them!

Our brochure shows how.
Send an email to Linda,
include your postal mailing address,
and ask for "The Compost Solution."

So, we see there are two underlying factors that relate to alew mortality in the spring: their fragile condition due to poor osn balance and being exposed to environmental changes when th enter near shore waters to spawn. This year, two other factors involved: age and abundance.

Abundance

The spawning run of 1995 produced a strong year class of alewives. In addition to being abundant, these fish were robus larger than fish produced in other years. These fish are now fo years old, getting towards the end of their life. The spawn of produced a strong year class as well, however, these fish, thou numerous, were not as robust. Though these were relatively strong year classes, the population is not considered to be 'ove abundant' and the numbers of alewife in the lake are much lov than they were in the 1960's.

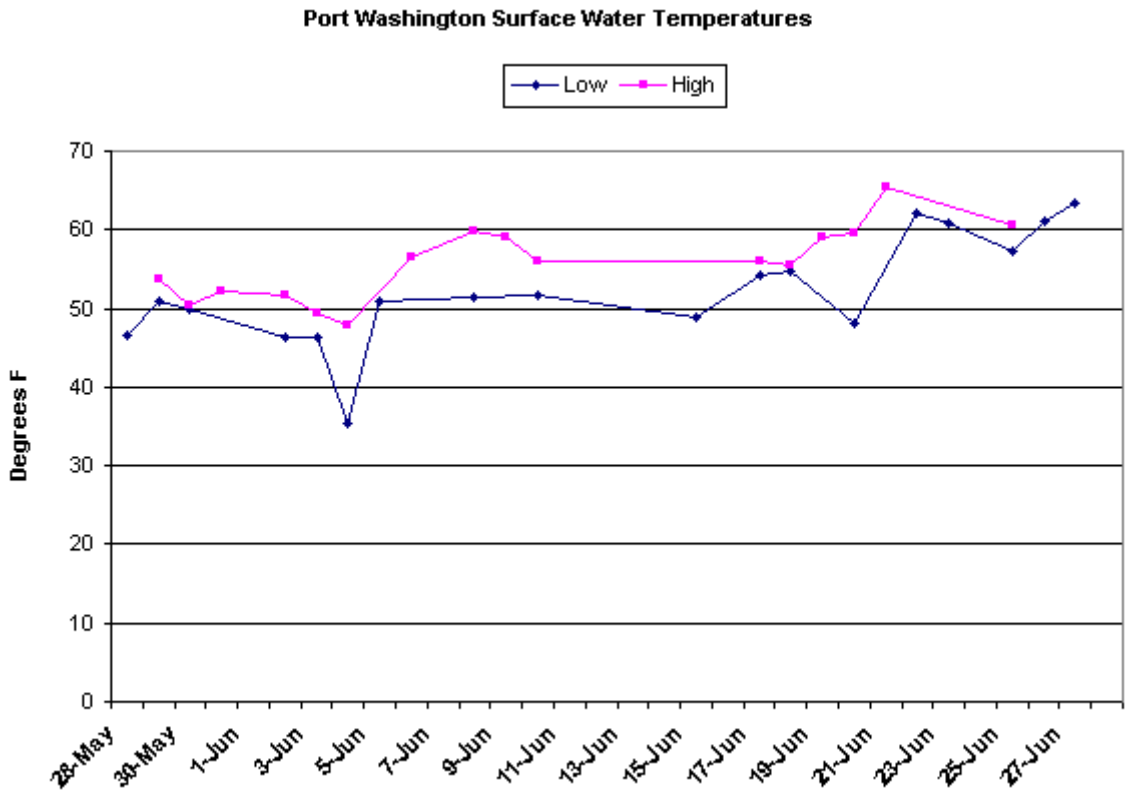
Weather

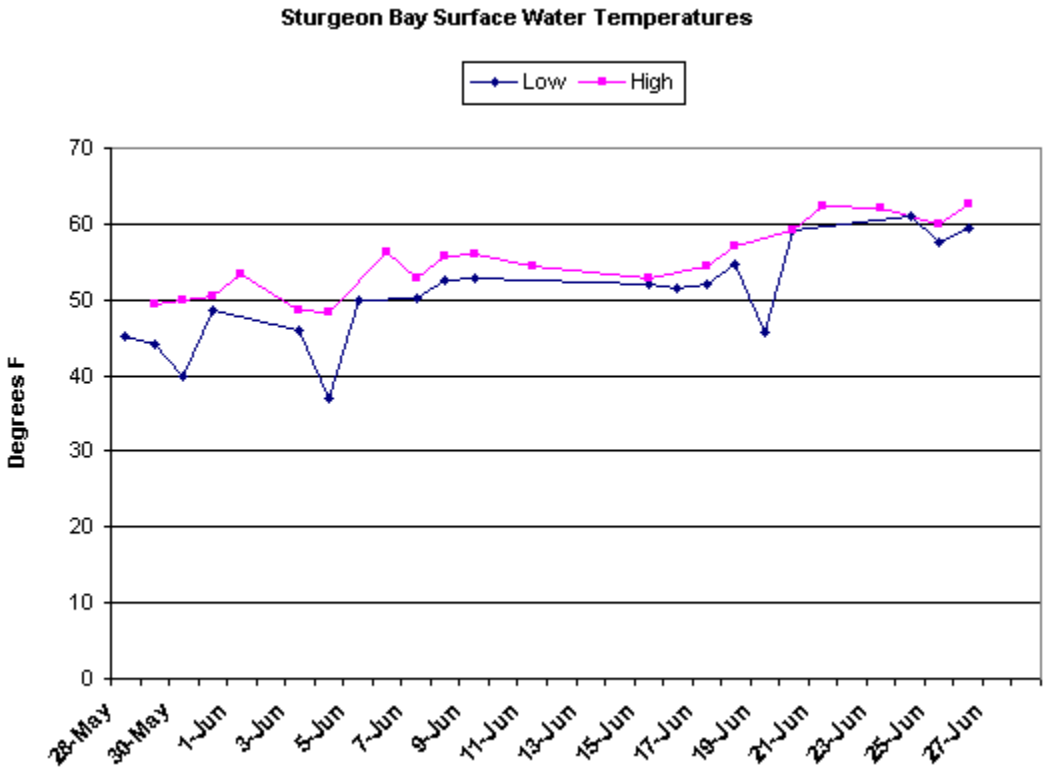
As these two strong year classes, and other smaller year class moved from the deeper waters to near shore areas this spring, they were exposed to temperature fluctuations. These fluctuat probably contributed to the die off and the large numbers of d fish that subsequently washed upon the beach. The graphs bel (see end of story) illustrate the daily high and low Lake Mich surface water temperatures from areas near Port Washington Sturgeon Bay.

Notice that the water temperature generally increased through June, but that on at least two occasions, there was a sharp dro temperature with a 24-hour period, probably related to upwell events. The effect of this temperature change on the alewives would likely have been most profound in the latter part of the month, around the 19^{th} or 20^{th}. By this time, the water temperature had reached about 55^{o}F and the fish had probabl begun to spawn. As indicated by the mid-lake buoy, wind direction in the two days preceding the temperature drop, was predominantly south, southwest. For about two days after the upwelling event, the wind was from as easterly direction. Fish that became weak or died during the rapid temperature chang would have been blown into windrows close to shore or wash onto the beaches.

Thus, in addition to the normal, die-off of alewives, this year had large two relatively abundant year classes, one of older fi and one with small, weaker fish near shore during an upwelli event. The upwelling of cold water occurring during the spaw season probably weakened or killed many of these fragile, saltwater-adapted fish. East winds following the upwelling ev contributed to the large numbers of fish accumulating on the shoreline. The number of fish washing up on the beaches sho begin to diminish as water temperatures rise, spawning ends, the fish move out to deeper water.

--Philip Moy, UW Sea Grant Fisheries Spec





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Last updated 05 February 2002 by Seaman