



## Physical Anthropology Section – 2005

### H6 Human Decomposition in the Detroit River

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After attending this presentation, attendees will understand how taphonomic variables specifically associated with the Detroit River affect decomposition. A decomposition model for this unique riverine environment will be established for the future application to similar environments.

This presentation will impact the forensic community and/or humanity by assisting in the understanding of decomposition rates in a unique riverine environment and identify factors that affect tissue breakdown in order to develop a model that will aid forensic personnel in establishing the postmortem interval.

The Detroit River is an international channel that links Lake St. Clair and the Upper Great Lakes to Lake Erie and is often the site of fatal accidents and suicides. The Detroit River contains dangerous levels of pollutants and organic waste products and as a result of industry, very little natural shore bank remains, preventing: fish spawning; vegetation growth; wildlife feeding, and natural sediment transfer. Because the environment surrounding the Detroit River and the waters themselves are extremely unique, it is necessary to identify the variables that influence decomposition rates in the Detroit River and study their affects on tissue breakdown in order to develop a model that will aid medical examiners in establishing the postmortem interval.

Sixty-nine case files of human remains recovered from the Detroit River from over the past nineteen years were studied. Cases included 55 males and 14 females ranging from aged six to eighty-five years. Submersion intervals were known in all cases and ranged from two hours to one hundred and twenty-nine days. Decomposition was recorded for each case in order to determine a progression of soft tissue loss in a freshwater, riverine environment.

Of the sixty-nine cases examined; 30.4% (n= 21) were classified as stage 1 decay, 11.6% (n= 8) as stage 2 decay, 31.9% (n= 22) as stage 3 decay, 23.2% (n= 16) as stage 4 decay and 2.9% (n= 2) as stage 5 decay.

In the Detroit River, stage 1 remains lack discoloration or bloating, rigor or livor mortis may be present and are recovered between zero to two days. Stage 2 decomposition is observed between two to nine days and consists of early discoloration, bloating and marbling, with minimal skin slippage. Stage 3 remains show advanced skin slippage and significant discoloration and bloating, and are found between nine to twenty-four days. Stage 4 is observed between twenty-four to fifty-eight days and displays tissue erosion and the purging of fluids. Stage 5 is characterized by the exposure of skeletal elements and is seen in remains that have been in the Detroit River for over fifty-eight days.

When compared to models of tissue decay developed by previous research, it was found that decomposition in the Detroit River follows a similar sequence, but the rate of decay is slower. Contributing factors are low water temperatures and the absence of postmortem feeding by aquatic organisms.

Further analysis showed that within the Detroit River, body weight and pollution affect decomposition with heavier individuals and higher levels of pollution in the water speed the rate of decay.

**Detroit River, Decomposition, Postmortem Interval**