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AQUATIC TAPHONOMY: AN ANALYSIS OF HUMAN DECOMPOSITION IN NATURAL WATERWAYS OF NEW YORK CITY

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Abstract

Between the years 2013 -2017, 201 decedents were recovered from natural waterways of New York City's five boroughs (Manhattan, Bronx, Brooklyn, Queens, and Staten Island). Using case-related documents from the New York City's Office of Chief Medical Examiner's Case Management System (CMS) software, decomposition and demographic were carefully observed and recorded. I examined case photographs, supplementary reports, investigation reports, autopsy reports, family identification forms, and police story reports. I used the photographs to analyze patterns of decomposition via a scoring system that correlates the presence and absence of skin slippage, skin marbling/discoloration, subcutaneous skin exposure, as well as bone exposure, to a specific stage in the decomposition process. Eleven anatomical regions were assigned individual scores that appropriately represented the extent of decomposition that occurred at the time the photographs were taken. These scores were then used in combination with case related reports and forms to assess the trends/patterns of decomposition from the human remains discovered in an aquatic (brackish) environment. In terms of decomposition, this study revealed that the cranium skeletonized the fastest, followed by the mandible, hands, and tibiae. Evidence of the skeletonization process occurring at a minimum of 22 days. Additionally, the hands, forearms, and feet are the most inclined to be disarticulated upon discovery. When possible, an estimated postmortem submersion interval (PMSI) was also established for each case. Cases from the dataset that had documented "last known location", "location discovered", and an estimated PMSI (33) were used to create a provisional model of fluvial transport of human remains in the natural waterways of NYC. This model provides a visual of estimated distance traveled and highlights common "last known locations" as well as "locations discovered". Results suggest that a majority of suicide cases came from the George Washington Bridge (68%; n=17) and were found within a 2.5-mile radius of the bridge. Moreover, there were areas in Manhattan (West, Harlem Piers, Dyckman St. Marina, Pier 16, and Brooklyn Bridge Park) that served as "hot spots" in which decedents are recovered from. As such, the information yielded from this model offers specific knowledge that when used in the appropriate context can provide law enforcement as well as other search and rescue organizations a better understanding of how submerged decedents move within the fluvial systems of NYC.