A135 Visualizing Commingling in the Korean War Project Assemblage

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After attending this presentation, attendees will be able to visualize the distinct form of large-scale commingling represented by the Korean War Project.

This presentation will impact the forensic science community by providing a novel manner to comprehend extensive commingling and discern patterns within data. A greater understanding of the commingling represented by identified individuals will provide important information for future identification efforts.

Commingling is the intermixing of human remains from multiple individuals and is often seen with the mixing of graves and mass fatality incidents.[1] The inherent challenges of commingling are compounded as the number of individuals and the degree of fragmentation increase; additional actions that result in disarticulation of elements further complicate forensic analysis.[2] Current anthropological methods to resolve commingling include the use of DNA and osteometric sorting.[3-6] Additionally, spatial mapping has been used to visualize the relative proximity of remains to determine associated elements.[7] At the Defense POW/MIA Accounting Agency (DPAA), it is critical to accurately resolve commingling to fulfill the mission to provide the fullest possible accounting of service members to their families and the nation.

The Korean War (1950-1953) resulted in 103,284 wounded and 36,574 killed; as of July 2017, there are approximately 7,800 unaccounted-for servicemen.[8] The Korean War Project consists of 208 boxes unilaterally turned over by the North Korean government between 1990 and 1994 and a further 124 boxes from Joint Recovery Operations (JRO) obtained between 1996 to 2005. The North Koreans provided an original location of each of the K208 boxes. The majority of the accessions originated in four areas: two POW camps (Suan, 97 boxes, and Camp 5, 21 boxes) and two battlefield losses (East Chosin, 47 boxes, and Unsan, 23 boxes). The remaining 20 boxes were purported to be from the demilitarized zone (DMZ) and North Korean coastal locations.[4] The JRO boxes originated mainly from Unsan (84 boxes) and East Chosin (28 boxes) locations; 12 boxes were from other locations. Initially, it was believed that each K208 box represented a single serviceman, but early analysis revealed that the majority of the boxes contained multiple individuals. Of the identifications made to date, the most commingled box has a Minimum Number of Individuals (MNI) of 24; the average number of individuals per box is 8.28 for the K208 accessions and 3.05 for the JRO boxes. For the assemblage as a whole, it is estimated MNI is approximately 600.[4]

Although the commingling of the Korean War Project is extensive, it is hypothesized that patterns would be present. It was expected that most of the commingling would be seen within the village/location. Where commingling occurred between K208 boxes and JRO accessions, it was anticipated that this would follow along location lines.

Identified individuals from the Korean War Project were assessed to identify commingling. Accession numbers were noted and tallies were made by purported village. A table was created and input into Circos software package to produce a circular representation of the data.[9] Analysis revealed somewhat unexpected results. For the majority of locations, commingling was higher within the village as expected; however, Suan Mining Camp and Okchi-ri revealed higher levels of commingling with boxes reported as coming from other localities (although still within the general Suan POW camp system). The commingling between the K208 boxes and the JRO accessions was seen across all regions. With the Unsan JRO boxes, anticipated commingling was seen with the Unsan K208 accessions, but also with accessions from Suan POW camp, East Chosin, Camp 5, the DMZ, and coastal regions.

The commingling observed in the Korea War Project directly affects and complicates the DPAA's mission to identify and return United States service members to their families. This presentation reports on the application of Circos software to anthropological research, demonstrating it is a useful tool to visualize large-scale commingling. Gaining a greater understanding of commingling present in the Korea War Project assemblage will aid the DPAA with further identifications.

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