



# Using GIS to Reconstruct the History of the Siege at Khe Sanh, Vietnam

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## Abstract

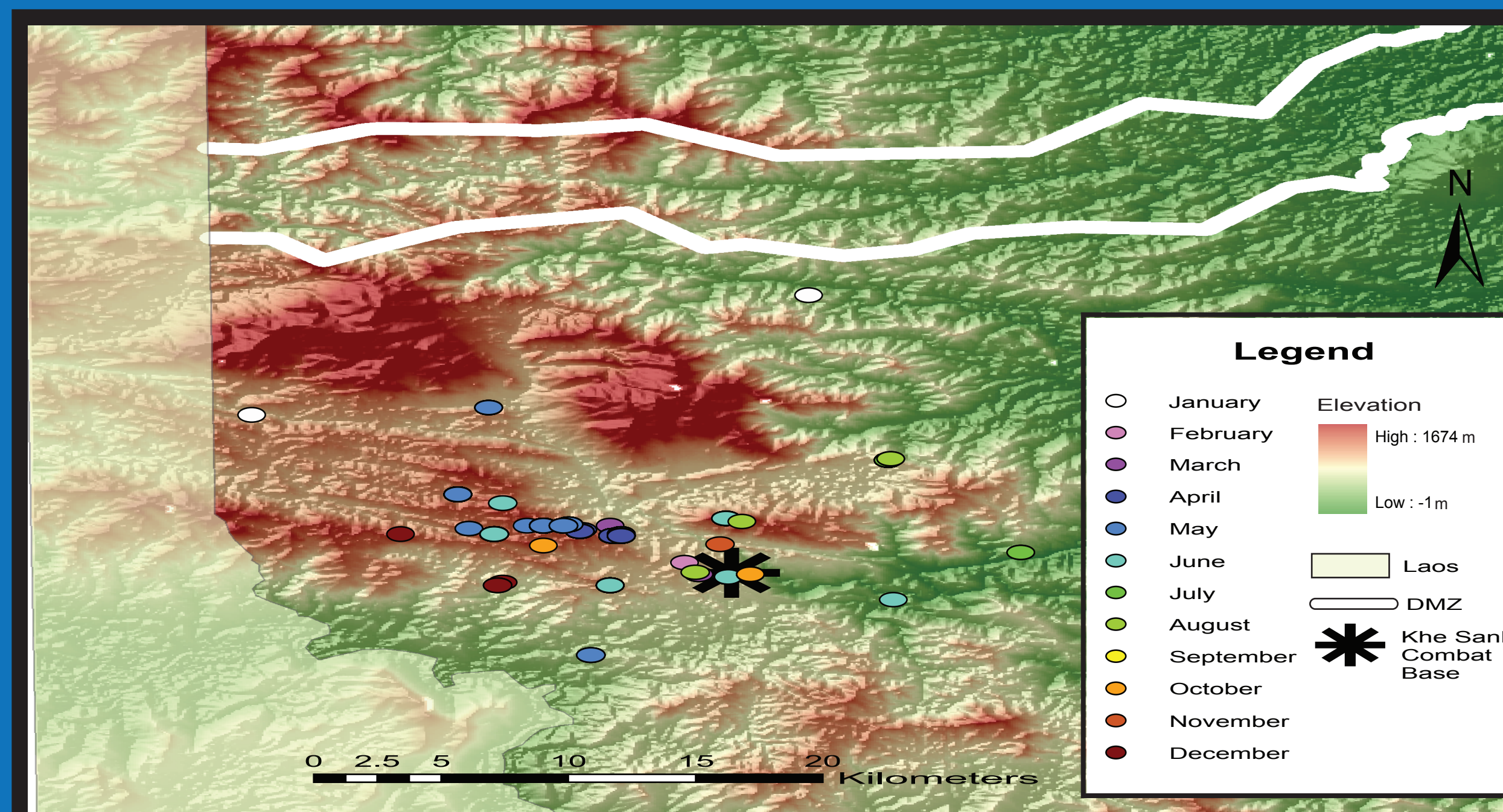
In order to understand geography, one needs to know history, and in order to understand history, one needs to know geography. Modern geographic information science via geographic information systems (GIS) links the two in ways never before capable. Using a GIS database containing both tabular and spatial information allows for both the creation of cartographic displays, and for spatial analysis. This research project led to the creation of a GIS about the battlefield of Khe Sanh, Vietnam. A place of military significance throughout the Vietnam War, Khe Sanh has been addressed by historians and cartographers, but it has been overlooked modern geographic analysis. The GIS created from this project has addressed this dearth of research. Some features of this Khe Sanh GIS include, but are not limited to, tabular listings of fatality points on the battlefield from Khe Sanh veterans organized by day, a database to query events by location such as certain hills or coordinates, and a record of the cause of deaths, such as plane crash, gun shot, or wounds, for further analysis of the battlefield. This unprecedented geographic analysis of the Khe Sanh battlefield promises to open a large venue of future research paths.

## Key Events Regarding Khe Sanh

Year -- Date	Event
1962 - July	American Special Forces arrive at Khe Sanh
1964 - March 26	Capt. Whitesides becomes first KIA at Khe Sanh
- August 2	USS Maddox destroyed; Johnson retaliates
1965 -	Khe Sanh Combat Base built next to airstrip
1967 - April 24	The "Battle of the Hills" begins after B/1/9 encounters NVA on Hill 861
May 3rd	End of the Hill Fights
1968 - January 20 9am	1/3/26 engages with NVA to precipitate the Siege of Khe Sanh
2pm	Lt. La Than Tonc defects & provides information
January 21	Khe Sanh village becomes NVA controlled, 98% of ammunition lost, Hill 861 nearly overrun
January 30	Largest air strike of Vietnam War occurs by B-52s bombing Laos
February 23	1,307 shells fired at Khe Sanh Combat Base - the most shells yet
March 6	General Westmoreland claims NVA turned their attention away from Khe Sanh
March 10	Reports show that NVA are not repairing their trench systems
April 9	No enemy shells are fired at Khe Sanh - the first time in 45 days
April 14 2:28pm	Hill 881-North is declared officially in 'friendly hands'
April 15 8am	US Command announces that the Siege of Khe Sanh is over
April 18	26th Marine Regiment is airlifted from Khe Sanh
June 11	General Westmoreland is replaced by General Creighton W. Abrams as the commander of US forces in Vietnam
June 17	Khe Sanh Combat Base is shut down, dismantled, and bulldozed

## Discussion and Results

### Fatality Locations in 1967

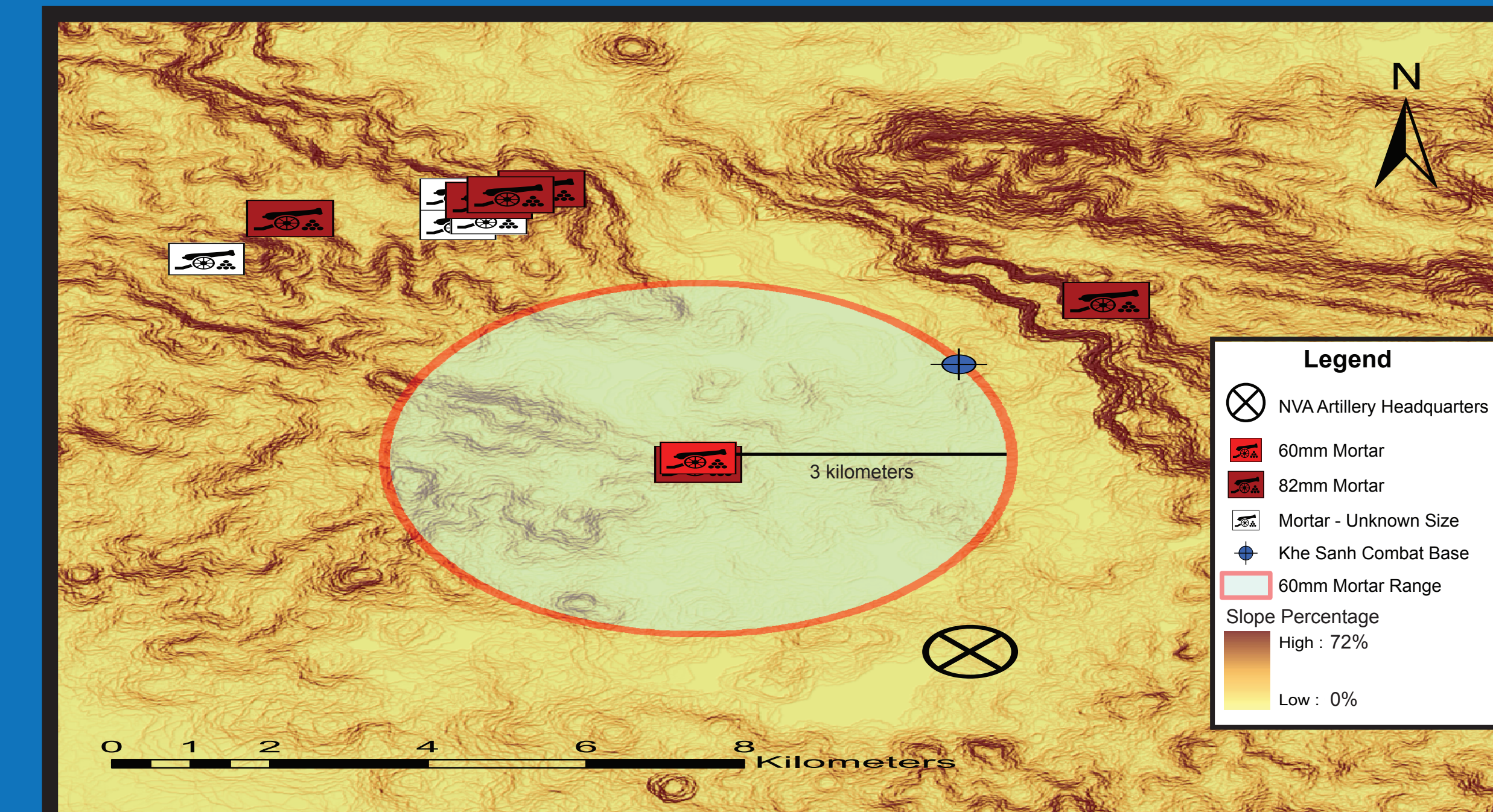


Fatality locations around the Khe Sanh area in 1967 - the year before the Siege of Khe Sanh. Mapping these locations are important for a number of reasons: veterans can return to the spot where they lost a friend, families can locate where loved ones lost their lives, and patterns can be seen in terms of where fatalities happened in order to further analyze North Vietnamese Army (NVA) movement before and during the Siege of Khe Sanh. It is important to note the locations of the demilitarized zone (DMZ) and neighboring country of Laos, both of which were to remain neutral during the Vietnam War. The relative closeness of fatalities during January 1967 would show that perhaps these rules were not obeyed by either army.

Person	Rank	Unit	Lat	Long	Death Date	Death
Samuel Arthur A	Lance Corporal	Alpha Recon	16°17'50"N	106°34'00"E	1967	01/01/67
James Neil	Sergeant	Alpha Recon	16°17'50"N	106°34'00"E	1967	01/01/67
Paul Thomas	Captain	Hill 861	16°17'50"N	106°34'00"E	1967	01/01/67
Thomas Edward	Private First Class	Alpha Recon	16°17'50"N	106°34'00"E	1967	01/01/67
Robert Michael	Lance Corporal	Alpha Recon	16°17'50"N	106°34'00"E	1967	01/01/67
Franklin Roy	Master Sergeant	Hill 861	16°17'50"N	106°34'00"E	1967	01/01/67
John Gerald	Captain	Hill 861	16°17'50"N	106°34'00"E	1967	01/01/67
Stephen Paul	Major	Hill 861	16°17'50"N	106°34'00"E	1967	01/01/67
Donald James	Sergeant Major	FOB 1	16°17'50"N	106°34'00"E	1967	01/01/67
Neil Ray	Sergeant Major	FOB 1	16°17'50"N	106°34'00"E	1967	01/01/67
Clayton	Sergeant	Alpha Recon	16°17'50"N	106°34'00"E	1967	01/01/67
Clayton	Sergeant	Alpha Recon	16°17'50"N	106°34'00"E	1967	01/01/67
Lance Corporal	Lance Corporal	Alpha Recon	16°17'50"N	106°34'00"E	1967	01/01/67

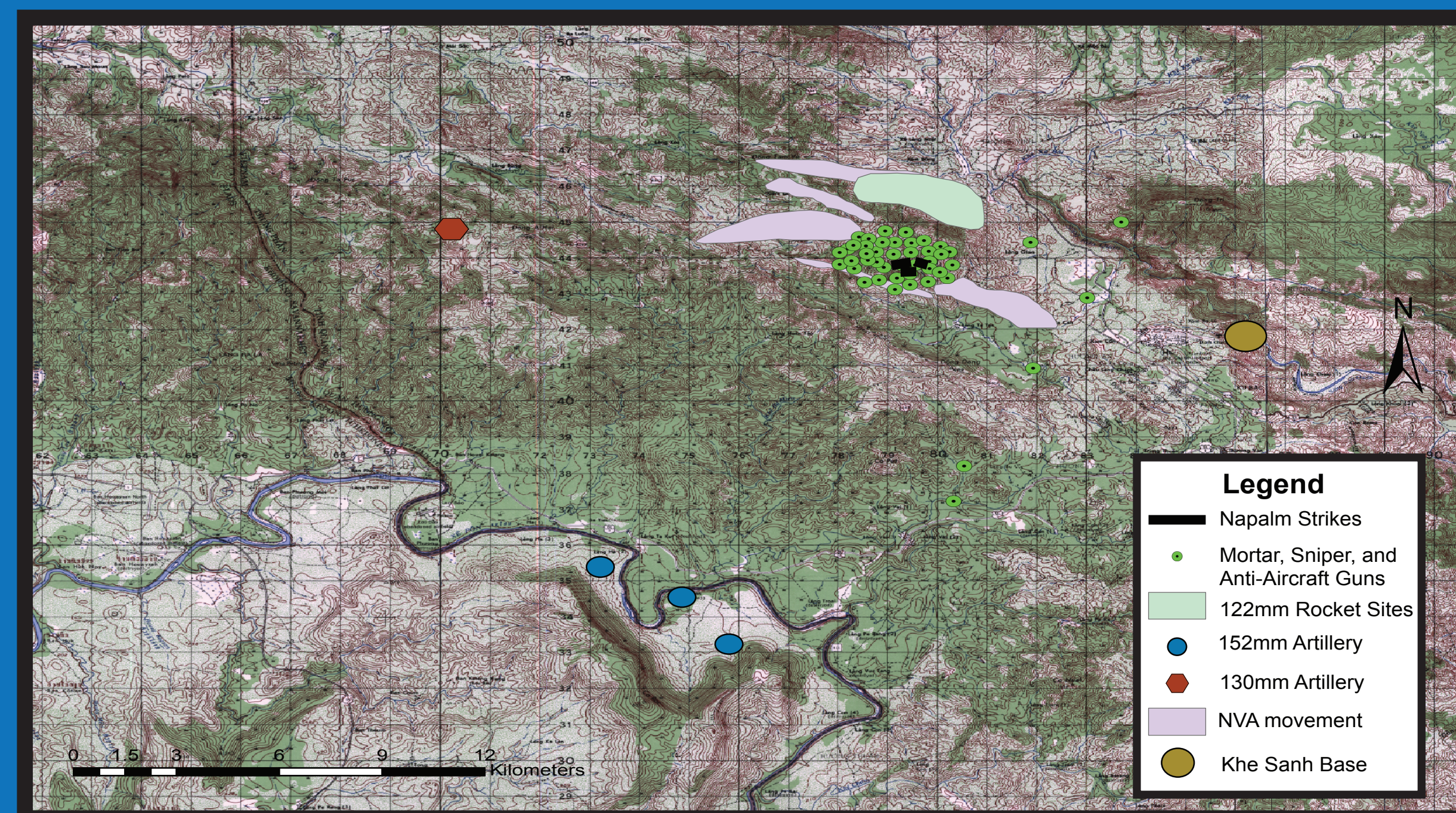
Above: This is a small example of the attribute table created for this map. The last names have been blacked out in respect for the soldiers.

### Artillery Locations during Siege of Khe Sanh



Locations of artillery in the close vicinity of the Khe Sanh Combat Base during the siege. The circle in the middle represents the range a 60mm mortar could fire. Considering it would be on the high ground, it would be able to target and successfully hit Khe Sanh Combat Base with ease. Needless to say, the 82mm artillery range circles would have covered this entire map and would have been able to hit the base with no difficulty, since an 82mm mortar has comparably greater firepower than a 60mm mortar.

### Digitization of handdrawn map from Forward Air Controller Robert Arrotta



Digitization of a map which Forward Air Controller Robert Arrotta filled out and sent back to me. The process began by sending the exact topological map as a hardcopy to veterans such as Robert Arrotta, asking them to write and draw whatever they can remember about enemy locations, artillery sites, and any other important places one should know about, and send it back to the university when they were done. These maps are then manually digitized into the Khe Sanh geographic information system, becoming an extremely valuable resource for information. Once enough maps are gathered, they will all be cross-referenced: not only with the other recollection maps from other veterans, but also with published secondary sources about the Siege of Khe Sanh in order to obtain the most accurate spatial representation and information that is possible.

## Acknowledgements

First and foremost, I would like to thank the Office of Research and Sponsored Programs for allowing me to partake in such a great opportunity. I would also like to thank the Geography and Anthropology Department, with a special thanks to Dr. Garry Running for providing the facilities needed, Professor Jeff DeGrave for first showing a history major the incredible world of geography, and Dr. Christina Hupy for teaching me the necessary tools to succeed. I would also like to thank Sarah and my parents for their extraordinary patience, love, and support throughout this process. I would also like to acknowledge the brave soldiers who bravely fought at Khe Sanh, some of whom gave the ultimate sacrifice for their country. Finally, I would like to thank Dr. Joseph Hupy. Dr. Hupy not only introduced me to the topic of Khe Sanh and the discipline of military geography, but he displayed incredible passion for both and instilled that very passion within me. He pushed me farther than I ever thought I could accomplish, and genuinely believed I could do great work. Without his constant guidance and support, this project would be nothing. Thank you, Dr. Hupy.

## Methods

Information for this GIS has been primarily obtained from two sources: Chaplain Ray William Stubbe's "Battalion of Kings: A Tribute to our Fallen Brothers who Died Because of the Battlefield of Khe Sanh, Vietnam", and topographic maps of the Khe Sanh area containing hand-drawn battlefield recollections from the veterans of Khe Sanh. Adding casualty data from "Battalion of Kings" involved extracting attributes such as soldier names, units, date, and x-y coordinates into an Excel spreadsheet. These coordinates were then imported with the spreadsheet into the GIS, and thus a spatial format. However, the process of adding the information from the veterans' maps was entirely different. This process is described in the section titled "Digitization of handdrawn map from Forward Air Controller Robert Arrotta (see left)."

Numerous reports of detections of NVA units during June, 1967, ominously reflected portending battle. A SOG unit operating just west of the DMZ (near the location of the future site of the NVA's headquarters for the 1968 Siege battle) on 10-11 June heard equipment and an estimated 150 troops moving into a bivouac near XD297667 and 17 trucks moving to a second bivouac area. In the area just west of Hill 881-North to the area of Hill 918 (XD226444) numerous NVA positions were discovered and destroyed by air rather than infantry as had been the case in the Battle of the Hills. A JTR report of 15 June indicated that just west of the Co Roc massif, on 13 June there was a large unit of NVA located in a triangular area (XD798308, XD740317, XD799228). In the same area a large tunnel was discovered with entrances at XD208308, XD740317, XD709328, and XD704314. Large quantities of food were stored in the area and there were about 1800 men armed with many heavy weapons, anti-aircraft weapons, machineguns, and individual rifles. On 23 June 1967, the S-2 of 26<sup>th</sup> Marines reported two NVA battalions operating near Hill 918 (XD726444), and the ridgeline (XD740510 to XD780500). A prisoner and captured documents indicated this to be the 4<sup>th</sup> and 6<sup>th</sup> battalions, 95C Regiment, 252C Division. Recon patrols had made numerous contacts in this area and discovered numerous well camouflaged and well fortified bunkers, tunnels, and foxholes through the area of Hill 918. The majority of the positions are unmanned but could be occupied at any time.

Left: This is an excerpt from Stubbe's "Battalion of Kings." Information was derived from passages similar to these. The UTM coordinates, highlighted in yellow, were drawn from the source material, placed in a tabular format, translated to x and y coordinates, and added to the Khe Sanh geographic information system.

## Future Research Goals

Through further summer research due to gracious funding provided by OSRP, the Khe Sanh GIS will continue to grow. Products will include the digitization and subsequent mapping of fatalities from the year 1968, a larger digitized elevation model (DEM) than is currently available for the area, more digitization of veterans' maps as they come in, and a website in order to better share my findings with the veterans and the public. By continually adding information to the Khe Sanh GIS, the problem facing Khe Sanh, clearly stated by John Prados and Ray W. Stubbe in *Valley of Decision: The Siege of Khe Sanh*, will become resolved. In their book, Prados and Stubbe wrote that they were "concerned that Khe Sanh receive fresh cartographic treatment" since the discipline of history has done "repeated reuse of a few official maps (Prados and Stubbe 1991, xvii)." The Khe Sanh GIS will not only be able to help with the creation of new cartographic representation and aid with deeper analysis concerning the Siege of Khe Sanh, but it will also begin to give well-deserved recognition to the veterans who fought and died at Khe Sanh.



Above: Viewpoint from Hill 881-South during the Vietnam War at Khe Sanh. Picture printed with permission from Dennis Mannion.

## Bibliography

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