RECREATING
THE HORRORS OF THE PAST

DURING WORLD WAR II, MORE THAN 110,000 JAPANESE-AMERICANS WERE FORCIBLY INTERNED IN 10 CAMPS ACROSS THE US. AFTER THREE YEARS, THE CAMPS WERE UNCEREMONIOUSLY ABANDONED – AND FORGOTTEN. ONE MAN IS TRYING TO CHANGE THAT WITH HISTORICAL RECORDS, UAVS, GPS, GIS, AND AUGMENTED REALITY.
EMMA HARDY AND SARAH ALBAN REPORT

On December 7 1941, Japan bombed the US naval base in Pearl Harbor, Hawaii. Three months later, US president Franklin D Roosevelt signed Executive Order 9066, authorising the forcible internment of more than 110,000 people of Japanese ancestry. They were relocated to 10 internment camps across the country. Colorado's Granada Relocation Center, better known as Amache Internment Camp, was one of them.

More than 10,000 people ultimately stayed at Amache Internment Camp between 1943 and 1945. Each family was assigned a 6m x 6m living unit in a barrack, each of which contained only a coal stove, folding cots with mattresses, blankets, a semi-finished closet, and a 60W light bulb.

Amache lacked private kitchens and bathrooms, favouring public mess halls and bathhouses instead, and there was a makeshift hospital and school. Internees lived under the constant watch of an armed guard tower, surrounded by barbed-wire fencing.

In December 1944, the US War Department rescinded exclusion orders and announced that confinement sites would be closed within one year. Amache's final detainees left on October 15 1945 and the site closed. Its barracks were sold for profit and the few historical records that survived were either archived or dispersed.

The 10 relocation centres quickly fell out of sight and mind.

Preserving the memory of Amache
Staring at the vast, empty fields of south-eastern Colorado today, it can be difficult to picture the community of more than 7,500 that once lived at Amache. Only fragments remain: the old cemetery, a reconstructed barrack, a water tower 'recreated to spec' by the Amache Historic Preservation Society, and half the 11F recreation hall, which was found on a farm nearby.

"They found the farmer who had it," says Jim Casey, creator of the Mapping Amache GIS website.

Mapping Amache is a website passion project dedicated to bringing Amache back to modern memory through emerging technology, including GIS and drone imagery. Developments to the website occur in conjunction with the

University of Denver (UD) and related non-profit organisations, which maintain Amache and perform research.

Casey's path to Amache started more than a decade ago, when he worked as grants manager at The Denver Foundation. He realised spatial analysis could help him better understand where to direct philanthropic giving, which led him to pursue a master's degree in GIS at UD. This is how Jim Casey became the GIS specialist for the Department of Anthropology and Archaeology's own Amache project.

"I've been mapping Amache ever since 2010," he says.

His graduate research aligned with an early interest in Japanese internment camps, stemming from the four years he lived in Japan. But now, Casey saw a way to combine his interests in GIS and this part of history.

"I was convinced I could tell this story better with maps," he says.

Independent of his UD research, Casey set a personal priority to completely map Amache.

Mapping Amache

In 2010, Casey created the first highly accurate map of Amache in Esri ArcMap. By 2016, he had begun using ArcGIS Online to develop a web version. UD provided Casey with the Esri licensing, ArcGIS Online resources, and hosting for his archaeological research and the public-facing web maps on Mapping Amache.

Indeed, Casey provided or donated most of the resources himself. When asked how he funds his work, he quips "What funding?"

With access to GIS software through the university, Casey started to acquire historical data. UD provided him with a traditional (terrestrial) handmade survey of Amache created in the 1990s. These files, which were in AutoCAD, contained detailed locations of barracks, the guard tower, vegetation, contours, building footprints and anything else that could be mapped. "Anything that was found was included in the survey," Casey says.

Casey converted the AutoCAD files to shapefiles and layered them into ArcGIS Online as base layers.

He also got the camp's original water-supply plans, which he found almost by accident. The hand-drawn plans had been hanging on a wall at the university.

"I asked for a digitised copy, and the archaeology department scanned it and gave it to me," Casey said. This way, he could add it as another GIS layer.

To capture the facilities as they exist today, Casey knew he needed UAV imagery to overlay onto the historical survey. At first, he used his personal DJI Phantom 4 Pro UAV to collect imagery. He soon realised he needed a higher resolution.

Amache from above

Swiss company senseFly sent Casey a pilot and an eBee X UAV with eMotion flight-planning software. To set ground control points (GCPs), Casey used an Arrow Gold GNSS receiver, donated by Canadian GNSS manufacturer Eos Positioning Systems. Using the Arrow Gold with Esri Collector for ArcGIS, Casey collected the corner points of the building foundations' remains to serve as GCPs, which he used to georectify the drone imagery. Ultimately, this helped him create a highly accurate map of Amache in ArcGIS Online.

"The basic online map of Amache has been developed over the last few years," Casey says. "There are layers for things like roads, boundary, housing blocks, barracks and so forth."

Casey creates web maps with specific purposes. In one case, he used original census data to link internees to the barracks they lived in. Two handwritten censuses had been taken in 1943 and 1945 at the request of the government's War Relocation Authority. This was a direct result of the exclusion of internment-camp residents from the official US censuses.

"The university had the handwritten records," Casey said. "It hadn't been connected to anything spatial. So we had a grad student transcribe it and I was able to connect the digital spreadsheet to locations on the map."

The result is a public web map that allows anyone to search a geospatial database of internees and their living units. Today, anyone can enter a name and see where an internee lived. There is also a tool called "Near Me" that lets you drop a pin anywhere at Amache and identify neighbours who would have lived close by. It has already been used by researchers and descendants.
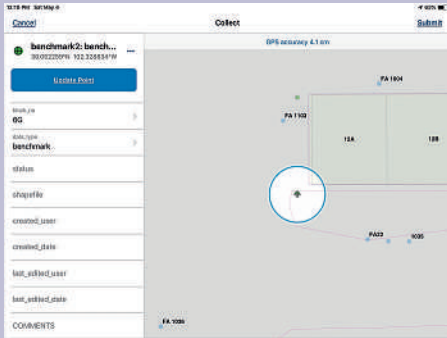
"My goal is to hopefully give people an ability to find one another," Casey said.

The baby born at Barrack 10E_6A

According to Amache.org, there were 199 births at Amache by January 31 1944. More than 70 years later, one of those babies came back.

In 2018, Dennis Otsuji visited – or rather returned to – Amache.

Esri Collector for ArcGIS was used to capture points for imagery ground control and also to map existing or found features (© Jim Casey)

At 75 years old, Otsuji wanted to visit the place he was born. He and his wife, Elaine, drove into the abandoned remains of Amache and were initially surprised to find a man flying a drone. It was, of course, Jim Casey.

It had become customary for Casey to meet people who had come looking for answers about their parents, other loved ones or even themselves. So he greeted the Otsujis with ease. After small talk, Otsuji showed Casey a handwritten sketch with the location "Block 10E, Barrack 6A" written on it. He asked Casey if he knew where that was. Casey knew the exact spot.

"Of all the people in the world, I'm the guy who made the map!" Casey said. "Follow me."

Casey led Otsuji to the foundational remains of Barrack 10E_6A. He snapped a photo of Otsuji and his wife. That's when Otsuji told him this was more than just the place his parents had lived.

"He explained that this was the place he was born," Casey said.

With help from Casey's searchable ArcGIS Online map, people like Otsuji can find the exact living unit where they and their family had lived. But there is one limitation to the web maps: they don't let people experience what life was really like at Amache.

Casey has plans to augment Amache further, in 3D and augmented reality (AR).

"I'm going to make it so you can stand here, point that iPad in that direction, and see what the buildings were like, what was underground, what grew here," he says.

Augmenting Amache

Thanks to a donation from Safe Software and Pix4D, Casey has access to 3D modelling, augmented reality, and other 3D tools. He can now recreate Amache virtually, using his high-fidelity GIS data and UAV imagery in FME-AR, Unreal Engine, Cesium and other 3D platforms.

With the help of donated time from Safe Software engineer Dmitri Bagh, Casey has already been able to recreate parts of Amache in the Unreal Engine gaming platform.

"This is a game-changer," he says. "You could be standing at the site, looking at nothing but sagebrush and weeds. Then you can point your smartphone at the view and see what was once there."

The project is expected to take more time to complete, because there is a considerably more data collection, research and data processing to be done. Casey says once he is done mapping Amache, he plans to repeat the project for the other nine internment camps.

"There's a demand for this," he says. "People want to see what this was like."

Casey is already talking with the US National Park Service (NPS), which expressed interest in a similar effort at the Tule Lake Internment Camp in California.

Doing so will require additional help from others who believe in Casey's work. Otsuji, for instance, has joined Casey's project as a consultant. The idea of viewing his birthplace in AR is important to him personally and historically.

"I think it will give a real, impactful, visual experience to anybody who watches it and understands the story behind it," he says.

Emma Hardy is the multimedia producer and Sarah Alban is the director of marketing at Eos Positioning Systems (www.eos-gnss.com)

SEE AMACHE AS IT WAS

Casey is already making augmented versions of Amache public. To see some of the results of his work, for more information or to donate to his project, visit **www.mappingamache.com**

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