## Experts struggle to confirm archaeological damage in Iraq

Satellites offer clues to true scope of destruction by terrorist group ISIS.

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Video surfaced this month that appeared to show the terrorist group ISIS destroying antiquities at the Mosul Museum in Iraq.

Reports that the terrorist group ISIS has destroyed archaeological sites and museum collections in Iraq have raised alarm in recent weeks, but the full extent of the damage is hard to gauge. Despite satellite imagery, social-media reports from people in both countries and a video released by ISIS itself, experts say that it is difficult to know exactly how bad the situation is.

In early March, video began to circulate that seemed to show ISIS destroying antiquities at the Mosul Museum in Iraq. Government officials and others reported similar destruction in the ancient northern cities of Nimrud and Hatra around the same time.

"What is confirmed is that destruction has taken place, at religious shrines, museum objects, archaeological sites; the process of analysing the accuracy in terms of the extent and what elements were destroyed is ongoing, since monitoring on the ground is difficult, if not impossible," says Isabelle Le Fournis, a spokeswoman for the United Nations Educational, Scientific and Cultural Organization (UNESCO).

## Vertical view

Abdulamir al-Hamdani, an archaeologist at Stony Brook University in New York, says that his colleagues in Mosul have confirmed that ISIS damaged or destroyed important historical sites, including mosques, tombs, and even modern monuments and statues. But he sounds a cautionary note about media reports from the region: "Not all the news that shows the destruction of Iraq's heritage is reliable."

Satellites are a key tool for archaeologists attempting to assess the scale and degree of damage. Observations from orbit can reveal patterns of looting, earth moving, construction and similar activities, says Jesse Casana, an archaeologist at the University of Arkansas in Fayetteville who has directed archaeological projects in Syria and Iraqi Kurdistan. He is using satellite images to analyse the looting and destruction of sites in Syria as part of a joint project between the American School of Oriental Research at Boston University in Massachusetts and the US state department.

"We've analysed around 1,400 sites to date, and so I can say a lot about how widespread looting is, where it is taking place, when, under whose watch and what sorts of sites are being targeted," says Casana.

But satellite imagery has its limitations. "A vertical look at sculpture does not really show damage to the sculpture," says Elizabeth Stone, an archaeologist at Stony Brook. "You need horizontal rather than vertical imagery for that." Casana agrees: ground observation is necessary to determine who is at a site and whether they are destroying statuary.

## Museum destruction

ISIS has occupied Mosul since June 2014, and this month the group released a video showing some of its fighters smashing ancient statues at the Mosul Museum. Although lamenting the destruction, a number of news outlets reported that some of the items damaged by ISIS were probably replicas, because many of the museum's original statues had been moved to a museum in Baghdad years before the occupation. Some of the broken statues had metal bars inside, which can be a sign that a statue is a replica.

But Stone and other experts believe that ISIS has damaged original artwork. "The Mosul Museum was not filled with replicas," she says. "Yes, there are shots which show metal in some sculpture when it was smashed. Many sculptures are found partly broken, and the way to repair them is to use metal rods to stabilize the parts being restored."

Casana says that underreporting of archaeological destruction in the Middle East is a wider problem than just the most recent incidents in Iraq. "Something like 20% of all archaeological sites in Syria have been looted in the past four years," he notes, "and that is an astonishing number in a country with as rich an archaeological record."

UNESCO director-general Irina Bokova has called these attacks on cultural heritage war crimes. UNESCO is forming a coalition of partners to stop the trafficking and destruction of antiquities and other cultural objects.

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