ARCHES

*PROTECTING THE WORLD'S
IRREPLACEABLE
CULTURAL SITES*

Taktsang Palphug Monastery
(also known as Paro Taktsang
or Tiger's Nest Monastery), a
seventeenth-century Buddhist
temple complex located at over
10,000 feet elevation in the
Himalayan mountains in Bhutan.

For organizations responsible for the safeguarding of cultural heritage places, inventories are the most important tool for making proactive, timely, and informed decisions. Afterall, the critical first step in protecting cultural heritage sites is knowing what and where they are. Inventories are most effective and reach their fullest potential when employed through modern information technologies that offer widespread and quick access to key information, and that allow records to be easily updated to reflect changing conditions. However, developing and maintaining effective digital inventory systems and sustaining related data is a costly and difficult undertaking that can be beyond the reach of many heritage organizations.

In an environment of diminishing resources for heritage organizations, the Getty Conservation Institute (GCI) and World Monuments Fund have created the Arches Heritage Inventory and Management System (Arches), a modern open source software platform designed for use by heritage institutions around the world. Arches, web-based and geospatially enabled, is purpose-built for managing inventories of all types of culture heritage places, including buildings, structures, archaeological sites, cultural landscapes, urban districts, and cultural routes.

View of ruins of the ancient city of Palmyra, Syria, prior to recent intentional destruction by the Islamic State.

Arches is freely available to be downloaded by large and small organizations, government entities, and nonprofit groups to be configured and customized without restrictions to meet their particular needs. Organizations may choose to provide unrestricted access to their Arches implementation and data or limit access. A number of organizations worldwide have already implemented Arches. The first large-scale implementation was launched in our hometown in February 2015, when the City of Los Angeles deployed Arches as HistoricPlacesLA, the official Los Angeles Historic Resources Inventory, to serve both as a tool to fulfill its obligations under federal, state, and local historic preservation laws and to make information publicly accessible. A Manila-based nonprofit has implemented Arches as

the Philippine Heritage Map in order to publish online information collected through an ongoing national-scale heritage survey of the Philippines. The Cane River National Heritage Area in Louisiana has implemented Arches as the Cane River Heritage Inventory and Map to both manage information on heritage resources and to promote public knowledge, appreciation, and interest in those resources. In addition, the Endangered Archaeology in the Middle East and North Africa project at Oxford University is using Arches to record archaeological sites and landscapes that are under threat across the Middle East and North Africa, from rapid population growth, urban expansion, agricultural development, warfare, and looting.

Since May 2015, the American Schools of Oriental Research's (ASOR)

Cultural Heritage Initiatives for Syria and Iraq has also been using Arches as part of its collaboration with the US Department of State to further its aims of documenting damage, promoting global awareness, sharing information with other organizations around the world, and planning emergency and post-war responses concerning the war-torn cultural heritage of Syria and areas of Islamic State activity within Iraq. In April 2016, the GCI and ASOR signed an agreement through which the GCI is more formally supporting ASOR's use of Arches in its initiatives for Syria and Iraq.

"The work of the GCI and ASOR demonstrates the role humanities play in the broader discussion of international relations and cultural security," said Andrew Vaughn, ASOR executive director. "Arches is the only software that serves the needs of the cultural heritage community when it comes to this kind of data gathering, organization, and analysis."

The GCI–ASOR collaboration and subsequent software enhancements will address the significant challenges associated with cultural heritage monitoring in conflict zones. Key enhancements to Arches due later this year will include the ability to capture and organize satellite imagery, rapid assessment capabilities for mobile data collection, and increased security for the submission of data.

"The ability to quickly and securely assess the condition of cultural heritage sites that are endangered by conflict is an absolute necessity, especially in the wake of the destruction of places of such significance as the ancient city of Palmyra in Syria," said Tim Whalen, director of the GCI. "This collaboration is yet another way in which the international community can work together to promote cultural security and protect the world's cultural heritage."

A number of other Arches implementations are currently under preparation worldwide, including for national-scale inventories in Asia and the Caribbean, as county- and city-scale inventories in the United States and Britain, as an inventory for the Armed Forces Retirement Home in Washington, DC, and for use in teaching in university-level heritage conservation programs in North America and Asia. Other implementations may exist, but given that the code is open source and freely available to download and install, it is unlikely we are aware of all of them. The Arches software code is being downloaded approximately 1,500 times per month.

A National Heritage Inventory for the Kingdom of Bhutan

One of the more recent adopters of Arches is Bhutan's Division for Conservation of Heritage Sites (DCHS), the national heritage authority. Until recently the Kingdom of Bhutan was lacking a modern digital heritage inventory. Tangible heritage in Bhutan is largely reflected in the monumental architecture of monasteries, *chortens* (stupas), and *dzongs* (fortified religious/administrative complexes). Any inventory system must be able to cope with these multifaceted structures, often revealing complex histories of rebuilding and renovation. Little archaeological research has taken place in Bhutan. Modern excavations and surveys are just beginning, raising issues as to how to encourage the protection of buried archaeology. Continued settlement, agriculture, and urban expansion pose significant threats to understanding pre-modern Bhutan, and predictive models of earlier settlement patterns and landscapes are being used to help target the investigation and protection of archaeological sites.

Since 2015, the DCHS has been working together with a team from University College London's Institute of Archaeology to develop a national heritage inventory system for this eastern Himalayan kingdom. As noted by Tim Williams, senior lecturer at the Institute of Archaeology, they chose Arches because it had the overwhelming advantage of delivering an explicit framework for organizing a wide range of monument types and documentation needs; is a web-enabled system that provides public access while providing security for sensitive information; is a low or no-cost system, which could be developed to meet local needs, without extensive additional costs; has the ability to document monument condition and change; paper-based records, photographs, and drawings can be attached as digital files; provides mapping functions, including legal and conceptual boundaries for monuments and landscapes; and has the functionality to enable interfaces in multiple languages—in Bhutan's case, English and Dzongkha.

With UNESCO/Korea Funds-in-Trust support, the project commenced in late 2015 when a United Kingdom team, led by Bryan Alvey of Cultural Heritage Information Consultants, customized Arches for Bhutan. The implementation of the system also provided capacity-building

opportunities for the DCHS staff in heritage management, specifically database and geographic information system (GIS) skills. Additional Bhutanese staff began gathering data and in February 2016 a workshop was held in Thimphu to provide training in the use of Arches. A live system is now operational and existing digital data is being cleaned and incorporated into the system.

Many challenges remain. Adding existing conventional records—and thereby delivering a reasonable body of data to the general public—depends upon the resources available for scanning and checking. This will be a long-term activity, prioritized against the expected urban, agricultural, and infrastructural development challenges facing Bhutan.

One of the new enhancements of Arches due to be completed by the end of the year is the ability to use mobile devices with no network access to capture data. This development will be of considerable value to a country as remote as Bhutan, as many sites cannot easily be visited by the DCHS staff and

the potential of visitors and locals to engage with documenting monuments is very exciting.

It will also be important to consider how intangible heritage (performance, dance, music, etc.) can be incorporated into the inventory, since the relationship between tangible and intangible heritage in Bhutan is often blurred: the management of *dzongs*, for example, must also encompass their social and religious use.

"Overall, we hope that the inventory will be an important step in collating and presenting a wide range of Bhutanese heritage to both international audiences and the people of the Kingdom," said Williams. "It will also underpin the work of the DCHS, developing links with other governmental agencies, enhancing strategic and holistic approaches to heritage management. We also hope that providing an inventory platform will promote discussion of the pre-seventeenth century archaeology of the country. The potential is considerable."

Members of a workshop, held in Thimphu, Bhutan, in August 2014, where the idea for a national inventory was first raised. Subsequent research by the workshop team selected the Arches system as the best fit for this project.
Photo: Tim Williams