Ministry of Culture and Information
National Corporation for Antiquities and Museums
State Party: Republic of Sudan
Name of Property: Gebel Barkal and the Sites of the Napatan Region
Ref No 1073

12.02.2023

EXECUTIVE SUMMARY

The 2021 World Heritage Committee decision for Gebel Barkal and the Sites of the Napatan Region (44 COM 7B.17) expressed concern for the state of conservation of the property for a wide variety of issues. Progress on addressing many of these issues continues to be made, particularly at the sites of Gebel Barkal, El-Kurru, and Nuri. At Barkal, concrete bollards continue to be installed around the site, active conservation has begun on smaller temples, spoil heaps from the Reisner excavations of 1916-1920 are being screened (a very long-term project), and community engagement is continuing. UNESCO has supported Dr. Abdelrahman Ali's work in drafting a site management plan, and that process is well underway. At El-Kurru, continuing renovation of a house next to the site for use as a community heritage center will be completed in winter 2023. At Nuri, a study on threats to the site from groundwater has been completed. New maps of all sites have been prepared with support from ALIPH.

It should be noted that this report is written as Sudan continues to struggle with national political and economic issues and with change in the National Corporation for Antiquities and Museums (NCAM). A new Director-General, Dr. Ibrahim Musa, was appointed in December 2022, and the longtime site manager for Gebel Barkal, Murtada Bushara, took a leave of absence beginning in November 2022. This report has been drafted by NCAM senior inspector Sami Elamin, who was appointed interim site manager for Gebel Barkal and head of Regional Antiquities Office – Northern State only in late January 2023.

STATE OF CONSERVATION REPORT

Gebel Barkal has received a great deal of attention from UNESCO since 2019, and the National Corporation for Antiquities and Museums of Sudan (NCAM) is grateful for the support. An extensive report of the Reactive Monitoring Mission to Sudan was issued in September 2019, and we are also aware of the 2021 decision of the World Heritage Committee (44 COM 7B.17). In addition, a draft report on Sustainable Tourism at Gebel Barkal was written in winter 2022 and the ongoing work of Dr. Abdelrahman Ali to create a management plan for the site also contains important suggestions. We are also mindful of the helpful response of WHC and ICOMOS to the proposed work plan for the 2023 NCAM-University of Michigan mission to Gebel Barkal. We list these resources to indicate our awareness of them and also to say that it has not been possible for a new site manager to read and absorb all these reports in the few days he has been in the position. This report therefore notes the work on conservation and site management at the various sites within the World Heritage area of Napata that has taken place from February 1, 2022, to January 31, 2023.

Gebel Barkal

One of the repeated concerns of the World Heritage Center has been requests for updated maps of Gebel Barkal that have been officially approved. With support from the ALIPH Foundation, a new map of the site and buffer zone was prepared in 2022. The new interim site manager will present this map to the governor of Northern State in Dongola in the coming months in hopes of getting official government approval of this map, which will prevent development in the buffer zone of the site.

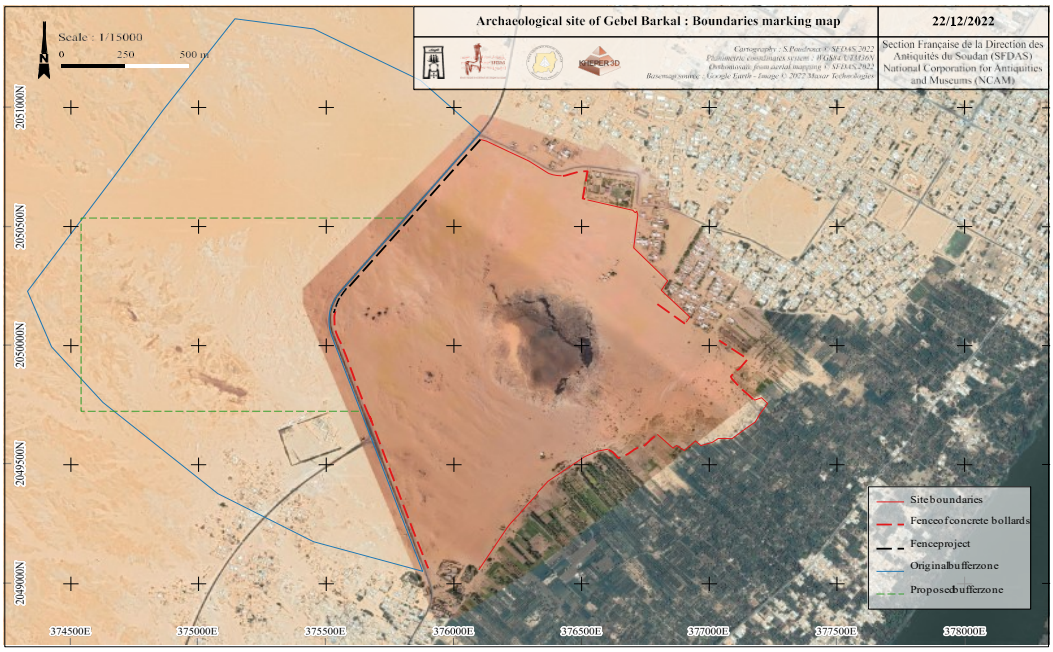


Figure 1: 2022 map of Jebel Barkal prepared by the ALIPH project grant

There are currently two active field projects working at Gebel Barkal: An NCAM-University of Michigan project and one from the University of Venice. Summaries of the work of both projects are provided in this report.

The NCAM-UM project submitted a workplan to UNESCO for comment in November 2022 that included conservation in the temple area, work clearing spoil heaps from the Reisner excavations of 1916-20, surface clearance and limited excavation on the East Mound, geomorphological coring, and community engagement in communities around Barkal. In addition, the project will be installing a number of additional concrete bollards (currently planned to be 125 bollards to close the tracks between the town of Karima and the museum. Two planned activities have been modified—a CyArk program for community heritage has been moved to El-Kurru and is discussed below, and the planned beginning of the regional archaeological survey has had to be postponed until next year because of last-minute changes in availability of staff.

For conservation of the temple area, we first consulted all available documentation on the temples in question (B 600 and B 700). These include the original field notes of Reisner (both as scanned copies of his field diaries, made available for research purposes courtesy of the Museum of Fine Arts, Boston) and a transcription of the notes; copies of all of Reisner's photos (also courtesy of the MFA); Reisner's 1918 preliminary report; the publication made by Reisner's field assistant and later curator at the MFA, Dows Dunham (1970, *The Barkal Temples*); and detailed documentation of the state of the temples in 2010 made by Timothy Kendall and Pawel Wolf.

A plan for conservation in the temple and disposition of the blocks in B 700 (a temple to a local Nubian form of the god Osiris known as Dedwen or Dedun) was made by the project conservation team: Muntasir Dafalla (NCAM), Suzanne Davis (UM), and David Flory (conservation architect). Stability of the temple's walls was assessed and documented. Areas with undercut masonry units were stabilized with brick support pillars installed with lime mortar and finished with a lime plaster. Lime mortar was also used to reset blocks, where possible, and infill areas where animals had been nesting. A previous repair campaign, in the 1960s, had used cement on two of the columns and this was causing visible damage. Where possible without causing additional damage, this was removed and replaced with lime mortar. Lastly, the current level of the ground surface is irregular and up to 40 cm below the original floor level (as indicated by unfinished wall blocks); the temple was excavated to bedrock under Reisner's direction and a large number of fallen blocks and column drums were left jumbled in the

temple rooms. All fallen blocks were numbered and documented in 3D models as well as in block-by-block photographs. Notes were made of condition issues in these blocks as well. We plan to rebury undecorated fallen blocks in the temple rooms where they are currently found by infilling with sand to the original floor levels (clean aeolian sand is abundantly available on site). In 2024, decorated blocks will be moved to open-air storage shelves within the temple itself; these will be installed to avoid obscuring preserved decoration on the standing walls of the temple (which is unfortunately not abundant). There are numerous column drums in the temple that are well-preserved despite a century of exposure. These are all inscribed with hieroglyphic texts and we propose to reset the column drums in our 2024 season using the inscriptions along with Reisner excavation photography as a guide to correct location. The state of conservation of the temple will be documented with 3D models by Sami Elamin (NCAM) and Nadejda Reshetnikova (project architect) at the end of the season.

Reisner spoil heaps have been documented in a dimensioned 3D model of the site surface made by Sami Elamin and Pawel Wolf (project archaeologist)—see below. Material from the spoil heaps is being screened (and has already produced a number of objects that could be displayed in the museum in addition to a number of scraps of gold foil, probably from Reisner's excavation of pits containing royal statues of the kings of Kush). The spoil heaps have a significantly higher silt content than we consider ideal for use in levelling in the temple, so we plan to remove it from the site entirely.

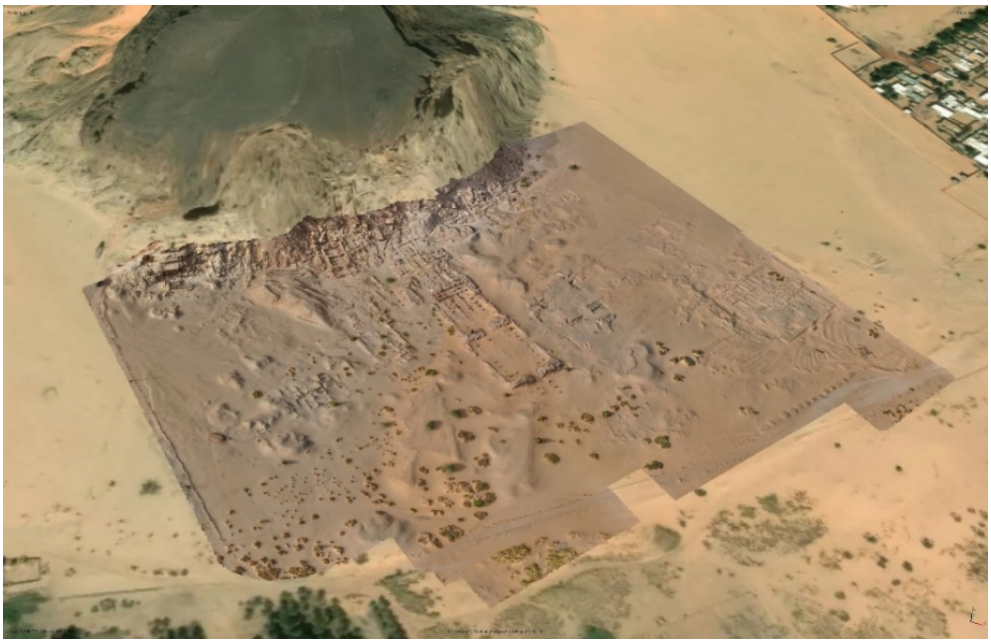


Figure 2: 3D model of Gebel Barkal including temple area and Reisner spoil heaps (model: Sami Elamin and Pawel Wolf)

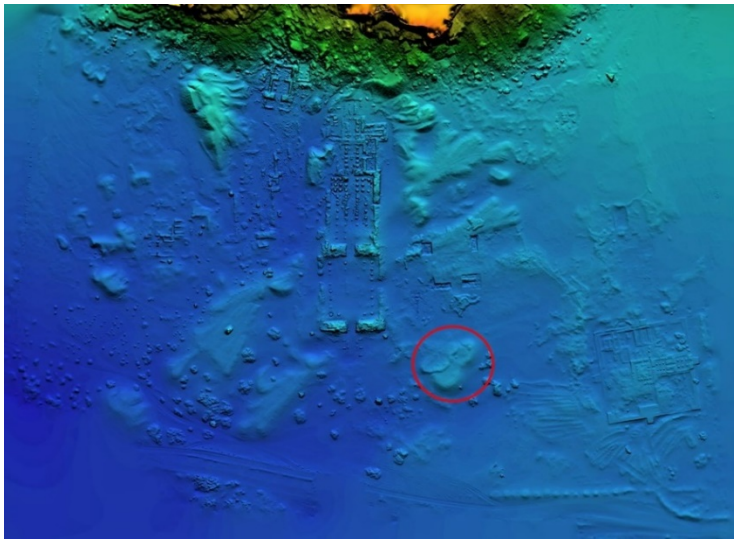


Figure 3: Elevation map – Reisner spoil heaps (Model: Sami Elamin and Maksim

Figure 4: Reisner backfill screening and removal – Season 2023 (Drone photo: Sami Elamin)

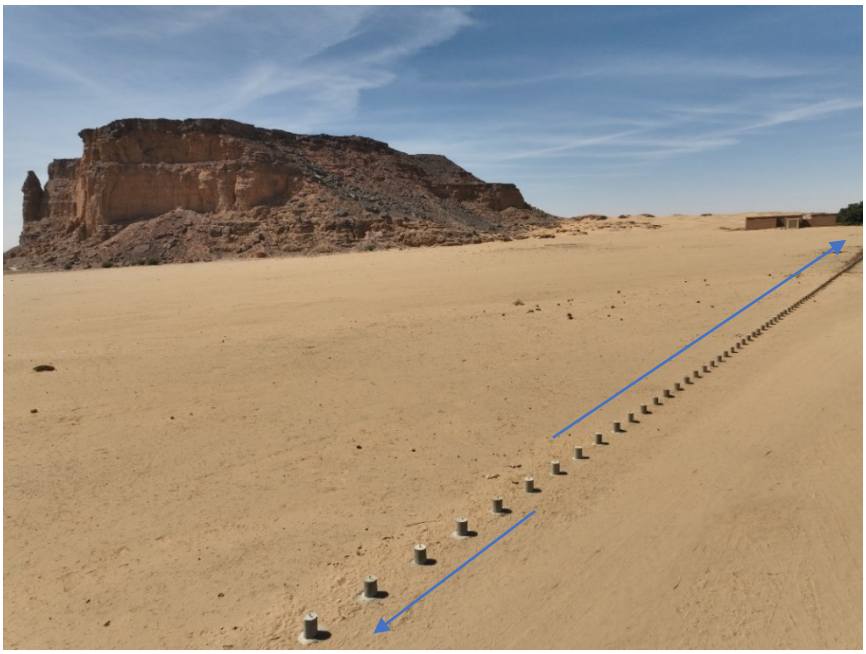


Figure 5: Concrete bollards continue to be installed around the site – 2023 (Drone photo: Sami Elamin)

Figure 6: excavation on the East Mound, Gebel Barkal (drone photo: Sami Elamin)

The surface clearance on the East Mound this season has focused on continuing to expose a long, wide street running across the ancient settlement that was first discovered in 2022. This season, the project has exposed about 30 meters of the street and adjacent buildings, all buried under 10-40 cm of aeolian sand. At the end of the 2022 season, the entire exposed area was reburied to a depth of 10 cm using the same sand that was removed in excavation, and the area was very well preserved. This surface clearance is proceeding on a very flat part of the mound, and rain that falls has not produced runoff channels, but rather is absorbed into the site itself.

Geomorphology is an extremely useful complement to excavation and geophysics to help us understand the geological and sedimentological environment of the site. One transect of core samples was taken from the temple area of the site to the Nile in 2022 and another is being taken across the East Mound and into the palm groves in 2023. The cores show a complex history of river deposits, terraces, and wadi gravel fans. OSL dates from samples taken in 2022 suggest two periods of river flow near the

temple area: one in early Holocene (ca. 8000 BCE), long before occupation of the site, and another much shallower channel that is approximately Meroitic in date (ca. 1st century CE) that may have been an artificial canal. The cores taken in 2023 show a depth of archaeological deposit of 2-4 meters (depending on location) and underlying gravels and river silts. The cores taken have a diameter of 10 cm and encountered only sparse archaeological remains even within cultural deposits.

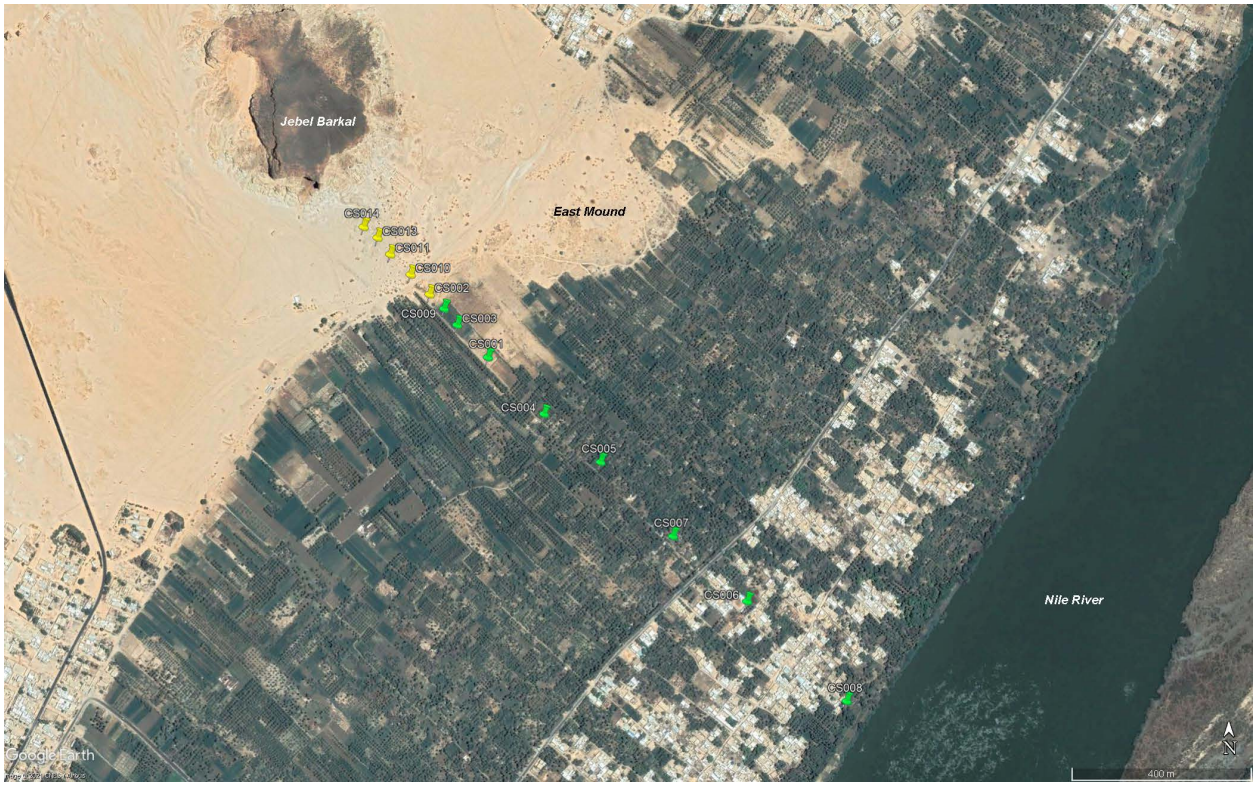


Figure 7: Geomorphological cores taken in 2022; yellow pins indicate location of ancient river channel or canal deposits

Community engagement around Barkal is a work in progress. Our community engagement team (Rebecca Bradshaw and Tohamy Abulgasim) found that this was the first effort by any archaeological project, whether Sudanese or foreign, to contact local communities to ask them about their interests and possible concerns about the site and archaeological excavation. There was, in fact, a degree of hostility to archaeologists due mainly to the fact that site boundaries were established by NCAM in 2014 and that local farmers felt that their lands had been unfairly taken from them. Community engagement work in 2022 primarily entailed making contact with people living in three communities next to the site (Abbassiya, Barkal Tahet, and Barkal Fouk) and inviting a large group of schoolchildren in a school next to the site to visit the museum and the excavation (conservation work not yet having begun). Work in 2023 will focus on beginning to address aspects of site management: trash dumping on the site and assisting with formation of an advisory board for the site. We will also host a community gathering in which we discuss our work and invite questions and discussions from community members.

The project of restricting vehicle access for driving across the site has continued in the past year through the generous support of UNESCO and through the NCAM-University of Michigan project through its grant from the United States Department of State Ambassadors Fund for Cultural Preservation. Altogether an additional 250 concrete pillars have been added to the site in the past year.

Regional archaeological survey around Barkal is primarily a research project designed to help us understand Barkal in the context of the local environment and other occupation. This season was intended to be a pilot project directed by two Sudanese and two American archaeologists, but in the end three of them were unable to attend. Ultimately the project hopes the survey can extend up to 25 km upstream and downstream of the site in order to connect with previous published surveys. It is currently anticipated that the survey will begin in 2024, that it will begin with remote sensing through satellite

images, and that it will include regular discussions with local communities about archaeological remains in their areas.

The University Ca' Foscari, Venice Project focuses on the royal district of Natakamani at Gebel Barkal. During the 2022 season, the project focused on the palace of Natakamani (B1500), with the goals of stabilizing the structure and improving its appearance and legibility for visitors. Conservation work had been undertaken in the south-west sector of the palace in previous seasons; this work was noted by the UNESCO report of 2020. That document gave a positive assessment of the interventions carried out, and at the same time noted the need to protect the column bases in the palace B1500. In 2022, the mission resumed work after a two year pause. Conservation work was supervised by architect Paolo Cannata, who had already supervised the restoration at the Sanam Abu Dom site (mission headed by Prof. Irene Vincentelli).

Work in 2022 focused on three steps in B1500. First, conservation and restoration in the monumental sector of the palace (northern entrance, courtyard, pillared hall, central peristyle). Two, study and restoration of the platform perimeter wall. Three, study of previous restoration carried out on the foundations of the casemates in the southwest sector of the platform, in order to adapt them to cotemporary methods now in use.

In the north rooms of the central peristyle, columns and pillar bases were reconstructed. This was done used a red brick protective sheathing around the base, with a layer of fine sand between the original base and the brick (see below, figs. 8-10).

Figure 8.

Figure 9.

Figure 10.

The upper part of each base was finished with a protective layer of *zibála*: a plaster consisting of clay, sand, water, with a small amount of gypsum and cement powder. The restoration work also had to adapt to some particular cases: near the first north base of the east colonnade of the hypostyle there was in fact a very thin column drum with an extremely fragile consistency; having verified the

impossibility of its removal to avoid damage and loss, it was decided to partially incorporate it into the restoration of the base, isolating it with a layer of fine sand. Other special cases are three bases of the north entrance courtyard that have lost their stone element and had already been restored in previous seasons by the Mission. In these cases, it was decided to outline the same profile of the bases with the original stone but leave them of a lower height to mark the structural difference.

Another action carried out in the monumental area of the palace, focusing on the peristyle, involved the north entrance (figs 11-12) and the passage between the courtyard and the hypostyle with a series of restorations of the masonry that delimits the internal profile of the rooms. Here too, the masonry intervention was completed with a covering of zibála.

Figure 11.

Figure 12.

At the end of the season, the result of the restoration work can also be appreciated thanks to a drone photograph (fig 13).

Figure 13

Work in 2023 will focus on the northern halls of the monumental sector of the palace, as shown in figures 16 and 17.

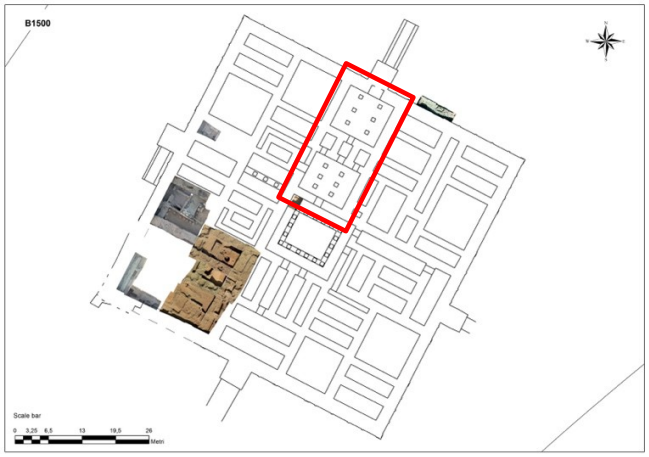


Figure 16

Figure 17

This area is in a condition of relative deterioration, due to the fragility of the stone elements (sandstone foundations), exposure to weathering and human action, and previous restoration work which had been carried out with an outdated methodology. In this sector, which is particularly significant for its monumentality and the cultural models it evokes, the priorities are to: update previous restoration work that had deteriorated over the years, use new masonry to restore ancient structures, conserve specific stone elements, and temporarily cover especially fragile areas with sand to preserve them.

Three methods will be used to restore and integrate missing parts of the structures: fills with new masonry—in order to fill in voids, ancient materials dispersed in the area (mainly fragments of fired bricks) will be used to create new masonry with a three leaf wall; protective filling using fine, uncontaminated sand, in direct contact with ancient elements; and restoration of masonry work, in which materials consistent with the old masonry structure will be used in order to restore a comprehensible profile. These reconstructed parts will comply with current restoration standards, including reversibility and compatibility, meaning the new materials will not react with or cause damage to the ancient masonry. Mud bricks, red bricks, and a mortar of clay, water, and sand will be used. A finishing and protective plaster consisting of clay, sand, water, and small proportions of gypsum and cementer powder will be used on top.

Although the 2023 season will focus primarily on the Palace of Natakamani, it will also involve the Building of the Basins (B2200), which—due to its structural and archaeological characteristics—requires conservation work. The basic program of work is as follows.

Natakamani Palace (B1500): 1) restoration of the perimeter walls of the access court and the pillared hall (fig. 18a); 2) restoration of the perimeter walls of the central peristyle (fig. 18b); 3) renovations of the of the southwest corner of the base platform (fig 18c); and 4) restoration and adaption of prior restorations of the perimeter base platform (fig 18d). Basins Building (B2200): 5) covering and securing the two sandstone basins, now at ground level, and 6) restoration and securing of the winding corridor north of the basins.

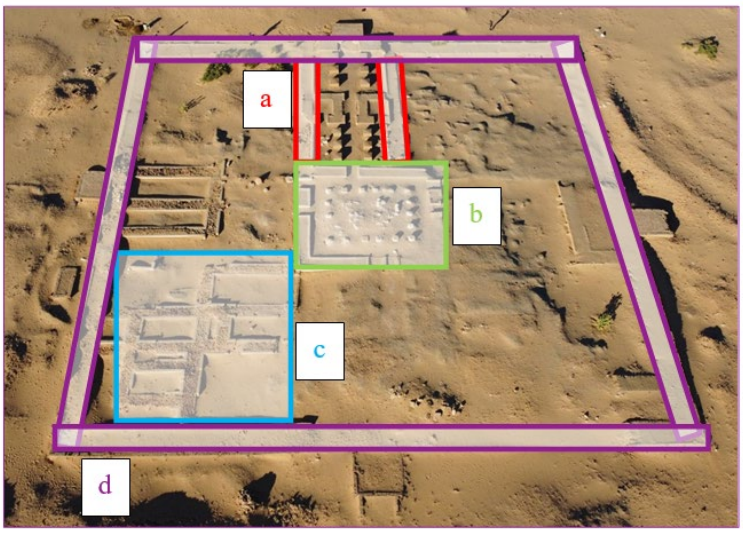


Figure 18: Program of work for 2023.

Finally, in order to complete the restoration and reconstruction of the architectural structures, the Mission intends to create an explanatory panel of the palace, with a series of synthetic data (plan and brief explanatory note in English and Arabic) that will help visitors understand the monument.

El-Kurru

The idea of creating a community heritage center in El-Kurru began in 2016 in discussions between NCAM, the archaeological team of the University of Michigan, and the local community. Our first plan was to build a new structure at the edge of the site—this plan was discussed during the Reactive Monitoring Mission in 2019. However, the project was not able to find any funders willing to support construction of a new building—only renovation of existing structures. As a result, we collectively identified an unoccupied house at the edge of the site, close to the site entrance used by visitors. This structure will be used both by visitors to the site (both Sudanese and international) and by the local community.

Figure 19: Location of Community Heritage Center (CHC) at El-Kurru

Current plans for the CHC include educational activities for local children, using worksheets and teacher training materials that were developed and tested with local teachers and children. We are also developing exhibits on archaeological heritage and on local culture.

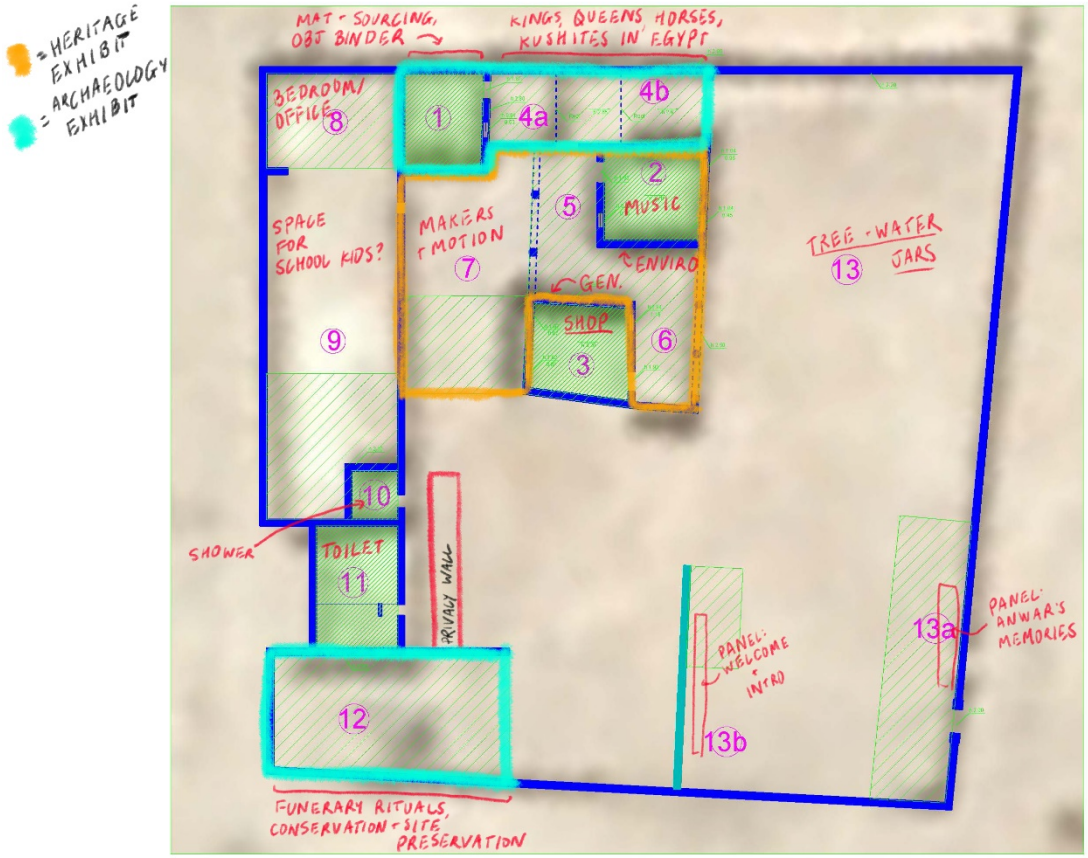


Figure 20: Draft plan for the Community Heritage Center in El-Kurru

Sustainable financial support for the center will come largely from foreign tourists through sales of locally produced goods in the shop and food and drinks (particularly local specialties) in a café (room 12 in the plan above). We have also discussed with tour companies in Sudan the possibility of arranging additional tour activities around the village, and they are enthusiastic.

Renovation was partially completed in 2022 and we aim to have the renovation work essentially completed by the end of the winter 2023 season. We also hope to have exhibition panels (funded by the University of Michigan Humanities Collaboratory project “Narrating Nubia”) installed by late Fall 2023.

Figure 21: State of the El-Kurru Community Heritage Center renovation at the end of March 2022 (Drone photo: Sami Elamin)

Nuri

In 2022 and 2023, several matters were undertaken at Nuri that directly contribute to the long-term protection of the site. This brief report informs of the most critical matters attended in 2022 and 2023 (so far), but is not an exhaustive study of all measures taken in the past (e.g., prior installation of barriers around the site) or considered for the future (e.g., Nuri was selected to the 2022 World Monuments Watch and the Nuri Archaeological Expedition has been working closely with the World Monuments Fund to marshal resources for conservation of the site and it monuments; see: https://www.wmf.org/project/nuri).

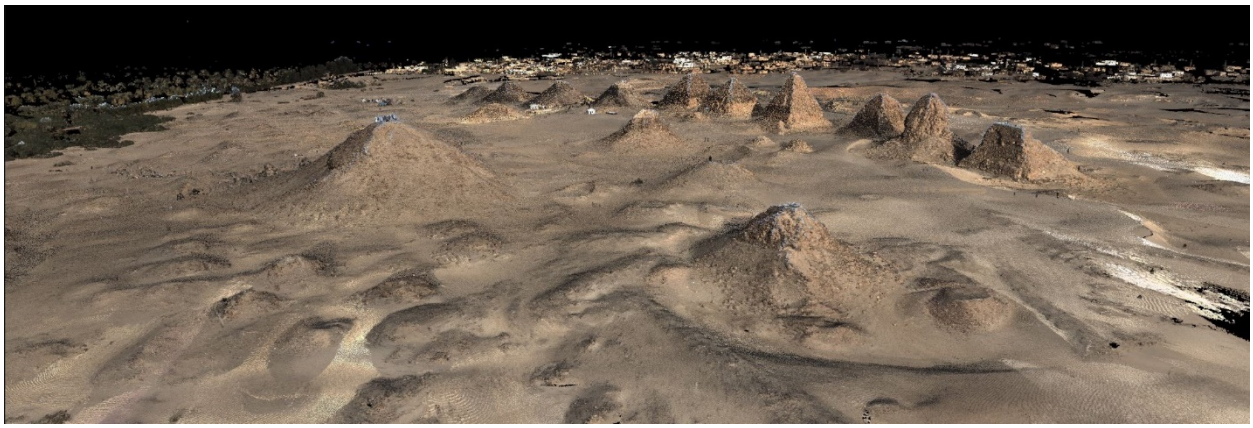
Site Border Mapping for Installation of Barriers

In November 2022, Sébastien Poudroux of the Sudan Archaeological Heritage Protection Project, funded by ALIPH and implemented by SFDAS, accompanied by Al-Samani Ezadeen Kara of NCAM, visited Nuri to begin drafting the implementation plan for installation of concrete post barriers around the remainder of the site (like those found at the remainder of the Napatan UNESCO sites; the highest risk portions of the site already have these barriers installed [work done in 2019-2020]). These two made a second trip to Nuri in January 2023 to complete data collection for aerial mapping and the final details to install the barriers. The implementation plan for this work is expected in February 2023, with implementation later in the year.

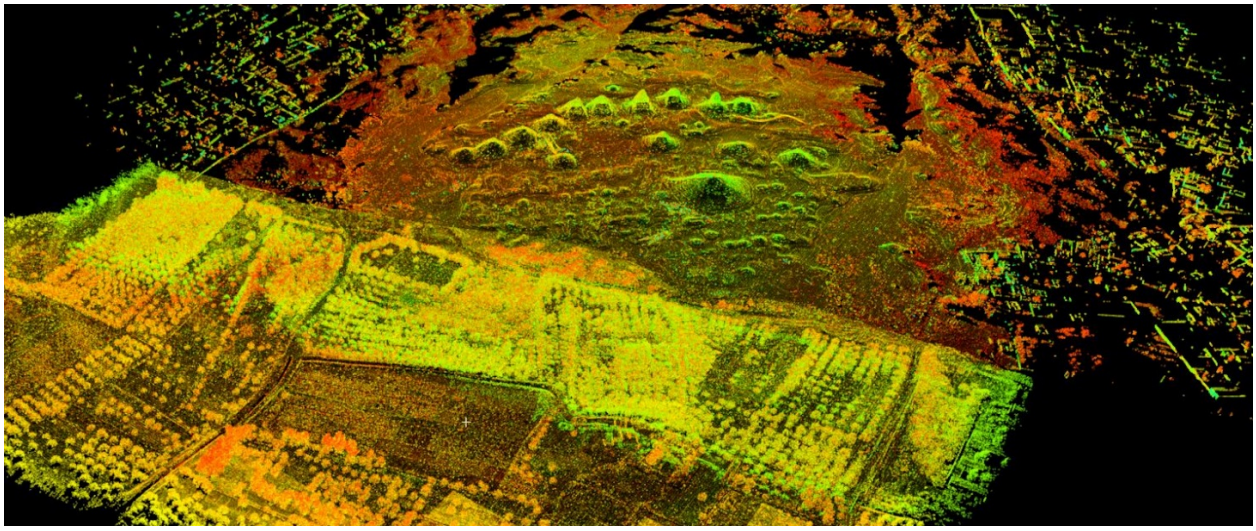
LiDAR Mapping of Nuri

In January 2023, the entire area of Nuri and its buffer zone as inscribed in the UNESCO nomination were subject to an intensive ground- and air-based LiDAR scan (see map below). The cameras used

were the Leica P50 and Leica RTC 360 for the ground-based scan, Geoslam Zeb Horizon for the aerial scan, and the Sony A7r4 for the aerial photogrammetry. This data is currently being processed, but once completed (expected in March 2023), will provide a centimeter-level rendering of all of Nuri, its monuments, features, and borders, at present. This scan will then be able to serve as a powerful tool for NCAM and the Sudanese government both monitor the site and enforce matters of encroachment.



Photogrammetric & LiDAR map of Nuri 2023 (Visualskies/Nuri Archaeological Expedition).

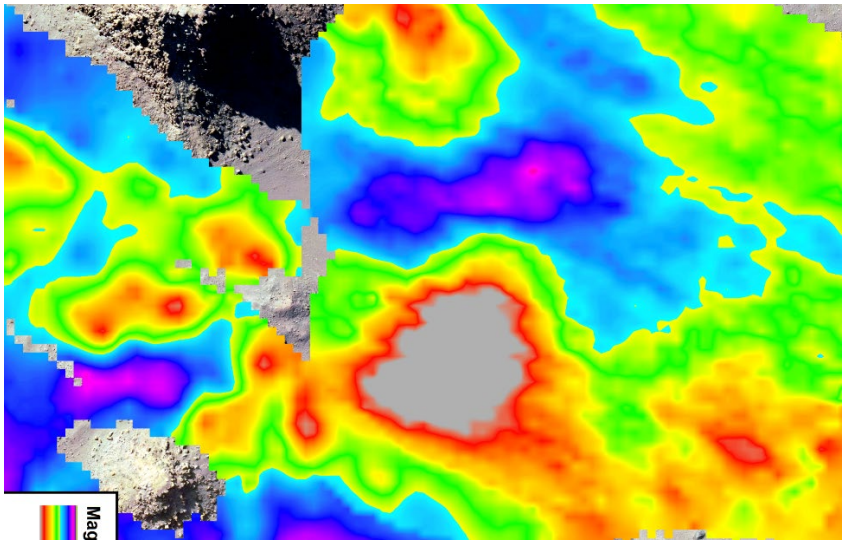


LiDAR map of Nuri, neighboring farms and towns, 2023 (Visualskies/Nuri Archaeological Expedition).

Map of areas subject to LiDAR and photogrammetry scans in January 2023 (inside yellow line).

Magnetometry, Ground-penetrating Radar, and Conductivity Remote Sensing

In January 2023, three forms of other, more localized remote sensing were applied to portions of Nuri. These tools were used to help map features that may not be visible on the surface (i.e. and would be visible in the LiDAR survey noted above). Understanding the hidden monuments at Nuri is as important as understanding the visible ones, especially in developing future plans for protection of the site. Of particular importance was a conductivity scan of Taharqa's pyramid (Nu.1), and magnetometer and GPR scans of several areas of Nuri that have never been previously excavated. The data is currently under review and in processing, but can be expected to play a major role in identifying future conservation needs and actions at the site.



Initial processing of some magnetometry data at Nuri in 2023 (R. Bates/Nuri Archaeological Expedition)

Reburial of Extant Features

Considerable effort was dedicated in the 2023 season to deep reburial of known features. That is, tons of windblown sand from the site were shifted to re-cover features or monuments at potential risk of degradation. By covering these features with more sand, they are far better protected from both mechanical and environmental factors, but the site itself has not been subject to any visual impairment or notable change, thus not adversely impacting its universal value, but preserving it.

Bringing International Attention to Nuri

In addition to our collaborations with WMF and SFDAS/ALIPH noted above, the mission to Nuri has worked diligently to help the international community understand its world heritage value. Already in 2023, the ambassadors to Sudan from the USA, France, Italy, and other missions visited Nuri, helping to open future doors for conservation and preservation resources. Furthermore, two major documentaries about the site and its importance were filmed.

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