Introduction
The Dam-Debba archaeological survey project is sponsored by the Qatar-Sudan Archaeological project and the National Corporation for Antiquities and Museums, Sudan. The area of the project extends 190km, along the left bank of the Nile, between the town of ed-Debba upstream to the Merowe Dam site at the Fourth Cataract, and stretching 4km into the desert. The main physiographic features of the area are the Nile, with its seasonal water courses draining from the Bayuda desert hills, and its deposits of gravel, sand sheets and silt near the Nile. Sandstone is the dominant rock in the area between Debba and Nuri, while basement rock outcrops are present between Nuri and the Merowe Dam site. Recent windblown sands occupy the bottom of dry valleys, and form great sand sheets, particularly between Usli and Tangasi.

The following is a brief overview of the archaeological activities conducted by the project during 5 seasons of work. These activities included archaeological survey, archaeological excavation, protection and restoration, and site management.

Archaeological Survey
An area of 760km² was surveyed between ed-Debba and the Merowe Dam site. In total, 238 new archaeological sites were recorded between 2013-2018 (Table 1, Figure 1).

In general, local geology played an important role in the distribution and frequency of the archaeological sites. Kushite sites – mainly quarries, rock-cut graves and rock art sites – were concentrated between the town of Nuri and the Merowe Dam, where basement rocks (gneiss and granite) are dominant; whereas Meroitic/post-Meroitic burial sites were scattered on gravel sheets and sandstone on the margins of the Bayuda desert. Medieval and historic sites were situated on Nile banks and old flood plains, covered by Nile silts and clays.

<table>
<thead>
<tr>
<th>Year</th>
<th>First season</th>
<th>Second season</th>
<th>Third season</th>
<th>Fourth season</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of newly discovered sites</td>
<td>54</td>
<td>73</td>
<td>68</td>
<td>43</td>
<td>238</td>
</tr>
</tbody>
</table>

Table 1. Sites recorded between 2013-2018.

Archaeological Excavation
Site DS63 – Al-Kulud
An oval shaped gravel mound, 15km from al-Multaga, was partly excavated, with 400m² cleaned to a depth of 15m (Figure 2). This resulted in the discovery of highly contracted human remains, with Neolithic potsherds and lithic tools. These remains are comparable to Neolithic sites at al-Multaga excavated by SFDAS (Plate 1).

Site DS194 Zaglona – possible Kerma burials
In a courtyard of a house in the Zagalona quarter of ed-Debba, an area of 10x40m was excavated. This area contained empty pits, Christian potsherds, and two skeletons in a poor state of preservation associated with Kerma potsherds. This may suggest a Kerma presence in the area (Plate 2).

Usli Watat Site DS206 – Napatan building
On the eastern limits of Usli village, c. 38km from the town of Merowe, excavation of two squares 10x10m, to 350mm below the surface, uncovered a paved floor of grey sandstone blocks where numerous Christian and Napatan potsherds were collected (Figure 3). Some Christian graves were found in the western part of the site; excavations have been officially paused due to a problem with local citizens. This building, potentially of Napatan date, may be a temple that was reused during the Christian period; however, the site requires more excavation in a future season to determine this for certain (Plate 3).
Meroitic/Post Meroitic burial sites (Table 2)

Three cemeteries containing circular gravel mounds were partially excavated: DS2 in Mansourkuti, DS128 in Korti (Plate 4), and DS231 in Usli East (Plates 5-8).

Dating results

Dr Iwona Kozieradzka-Ogunmakin studied the human remains and obtained the following results from the DDASP sites of Mansourkuti, Korti, ed-Debba Zaglona, and Usli. Material from er-Roseiries was also studied as part of a project to examine environmental changes and the collapse of the Meroitic Kingdom in Sudan. Samples of human remains collected from several sites in Sudan were submitted for radiocarbon dating to the Radiocarbon Laboratory in Poznan, Poland. The results of the analysis are presented below. The sample from Usli (DS231 T6) was not viable as no collagen was preserved, and this was required for the analysis. The samples from Mansourkuti and Korti confirm a Meroitic date. The skeletal remains recovered from ed-Debba Zaglona are much earlier (94.8%: 2206 Cal BC - 2032 BC), whereas the remains recovered from er-Roseiries are much later (83.0%: Cal AD 857 - AD 986).
Figure 2. Contour map of Site DS63.

Figure 3. Site DS206, Usti, top level plan.


Plate 4. Site DS128, T16.
Table 2. Excavation results for the Meroitic/Post Meroitic cemeteries.

<table>
<thead>
<tr>
<th>No.</th>
<th>Site</th>
<th>Number of excavated tumuli</th>
<th>Grave goods</th>
<th>Dating</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DS2 Mansourkuti</td>
<td>20</td>
<td>Ceramic jars, ceramic bowls, iron tools, beads</td>
<td>post-Meroitic</td>
</tr>
<tr>
<td>2</td>
<td>DS128 Korti</td>
<td>8</td>
<td>Potsherds, beads and iron tools remains</td>
<td>Early to Late Meroitic</td>
</tr>
<tr>
<td>3</td>
<td>DS231 Udi East</td>
<td>8</td>
<td>Ceramic jars, ceramic bowls, iron tools, beads</td>
<td>post-Meroitic</td>
</tr>
</tbody>
</table>
Intervals of calendar age are given, where the true ages of the samples encompass the probability of c. 68% and c. 95%. The results were calibrated with OxCal software (see further https://c14.arch.ox.ac.uk/oxcal.html).

- **Mansourkuti DDASP DS2 T25** R Date (1935,30)
  - 68.2% probability: Cal AD 27-120
  - 95.4% probability: Cal AD 1-130

- **Mansourkuti DDASP DS2 T35** R Date (1835,30)
  - 68.2% probability: Cal AD 135-215
  - 95.4% probability: Cal AD 86-246

- **Korti DDASP DS128 T14** R Date (1855,30)
  - 68.2% probability: Cal AD 126-AD 217
  - 95.4% probability: Cal AD 82-234

**Restoration/conservation**

The following sites have been subject to restoration and conservation work:

- **Site DS74 – (Al-Hitana) fort**
  A medieval fort on the left bank of the Nile, located in the village of Husseinarti. The fort was constructed of sandstone and the south wall of the fort was restored to reinforce it.

- **Site DS189 – the former Merowe Museum (Dar Althar)**
  This building was constructed in 1923 and is one of the oldest museums in Sudan. The building was damaged by flooding, which destroyed Merowe town in the 1970s, and the antiquities collection was subsequently transported to the town of Kareima. After the end of the Merowe Dam Archaeological Salvage Project in 2008, the building was used to store rock art blocks belonging to the National Corporation for Antiquities and Museums. It is considered a historical site, together with the adjoining old office building, situated some 38m to the east. At this site, several restoration projects (Plates 9-11) were initiated including:
  1. Re-plastering of the exterior wall
  2. Cleaning of rock drawings stored within the building
  3. Fitting of a new entrance door
  4. Raising the level in the courtyard

**Protective work**

Protective work was carried out at 9 archaeological sites (Plates 12 and 13, Table 3). This included either the complete enclosure of the sites with wire fencing, or the erection of concrete posts (typically 0.6m in height, except at Nuri where they are 1m in height) along the site boundaries, with varying spacing between the posts. The distance between the posts was dependent on the degree and type of threat to various areas of the site. Other measures also included the creation and installation of warning signs or panels (Plate 13).

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1 This probability range breaks down as follows: 12.6%: AD 27-41; 45.2%: AD 48-87; 10.5%: AD 106-120.
Plate 11. Cleaning of antiquities inside the museum.

Plate 12. Protection work at DS192 Debieba.

Plate 13. Protection work at the Royal cemetery of Nuri.

<table>
<thead>
<tr>
<th>No.</th>
<th>Site</th>
<th>Protection type</th>
<th>No. of posts</th>
<th>Distance covered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DS192 Debieba</td>
<td>Concrete posts</td>
<td>206</td>
<td>3.5km</td>
</tr>
<tr>
<td>2</td>
<td>DS138 D.w.Haj</td>
<td>Concrete posts</td>
<td>112</td>
<td>2.7km</td>
</tr>
<tr>
<td>3</td>
<td>DS139 Al-Saggai</td>
<td>Concrete posts</td>
<td>51</td>
<td>2.33km</td>
</tr>
<tr>
<td>4</td>
<td>DS206 Usli</td>
<td>Concrete posts</td>
<td>19</td>
<td>0.452km</td>
</tr>
<tr>
<td>5</td>
<td>DS128 Korti</td>
<td>Wire fence</td>
<td>-</td>
<td>0.3km</td>
</tr>
<tr>
<td>6</td>
<td>DS173 Al-Kenesa</td>
<td>Wire fence</td>
<td>-</td>
<td>0.215km</td>
</tr>
<tr>
<td>7</td>
<td>DS189 Dar Althar</td>
<td>Wire fence</td>
<td>-</td>
<td>0.180km</td>
</tr>
<tr>
<td>8</td>
<td>DS7 Ganati church</td>
<td>Wire fence</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>9</td>
<td>R. cemetery of Nuri</td>
<td>Concrete posts</td>
<td>76</td>
<td>2km</td>
</tr>
</tbody>
</table>

Table 3. Protective work.