

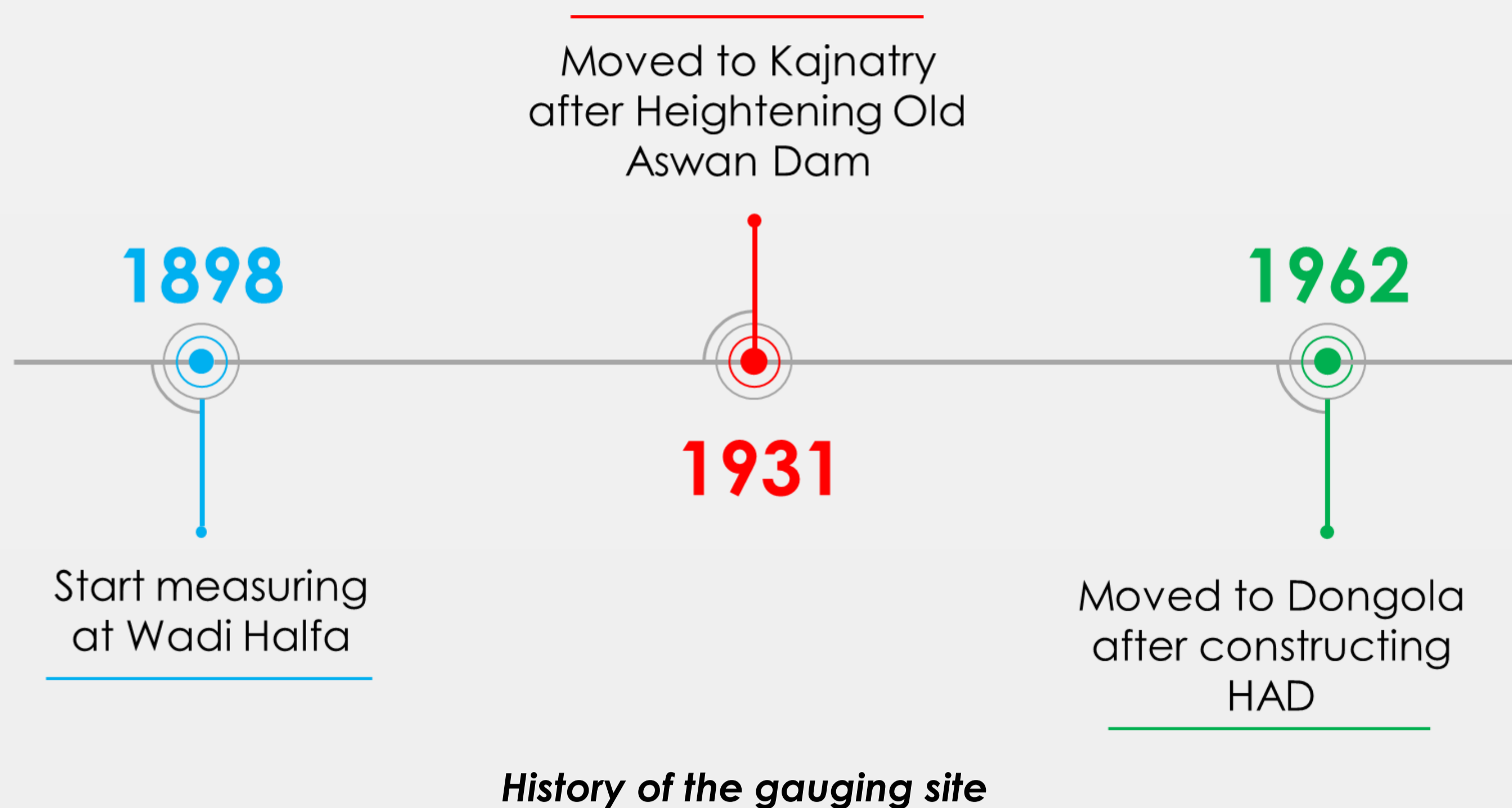
Selection of the Nile gauging site upstream High Aswan Dam



Hydraulics Research Center
مركز البحوث الهيدروليكية

BACKGROUND

This study is based on the contract agreement signed on 25 March 2018, between the Permanent Joint Technical Commission for Nile Waters (PJTC), and the Hydraulics Research Center (HRC)



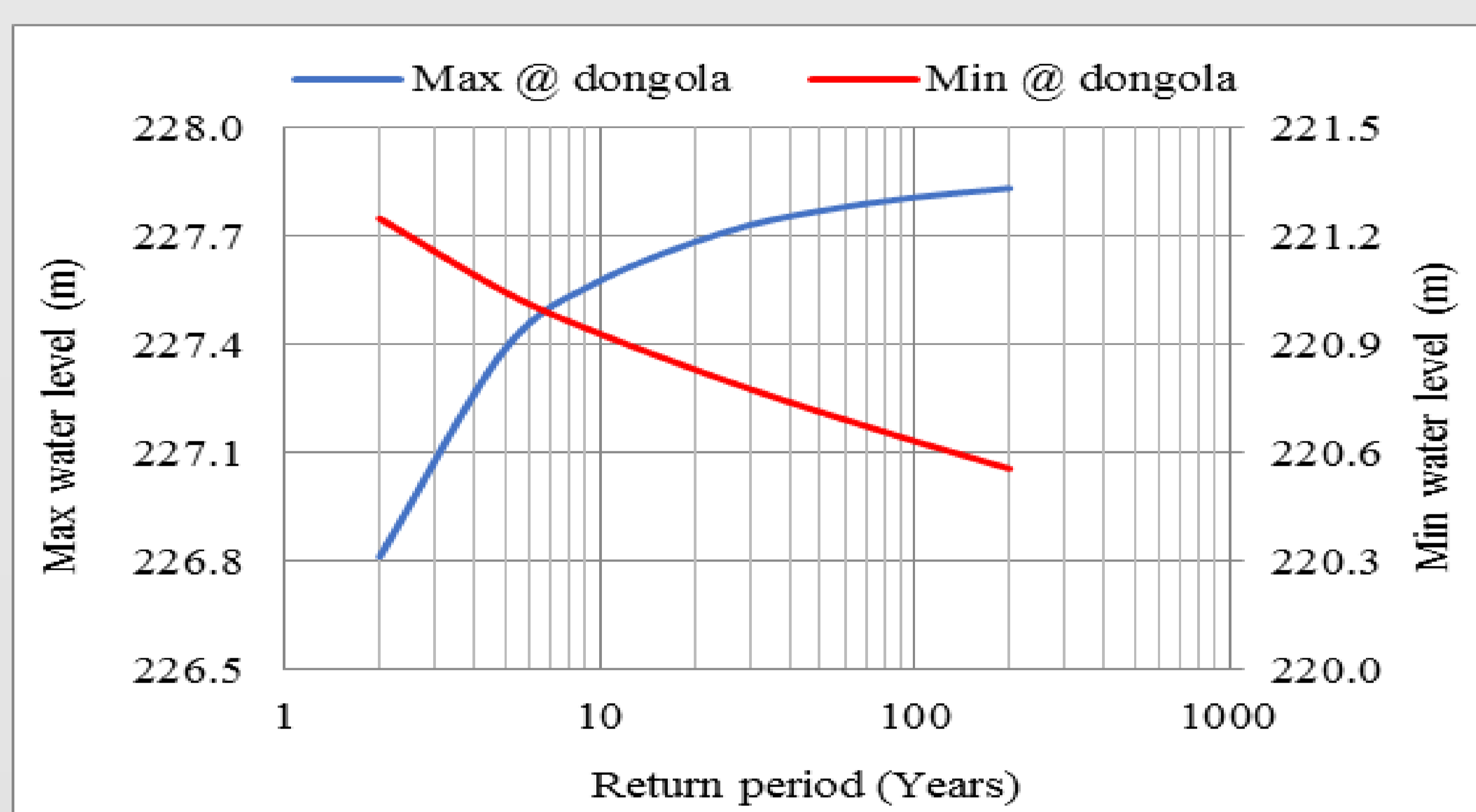
POTENTIAL SITES

As desk work and with the help of Google Earth, three potential sites as shown below, were identified for further investigation.



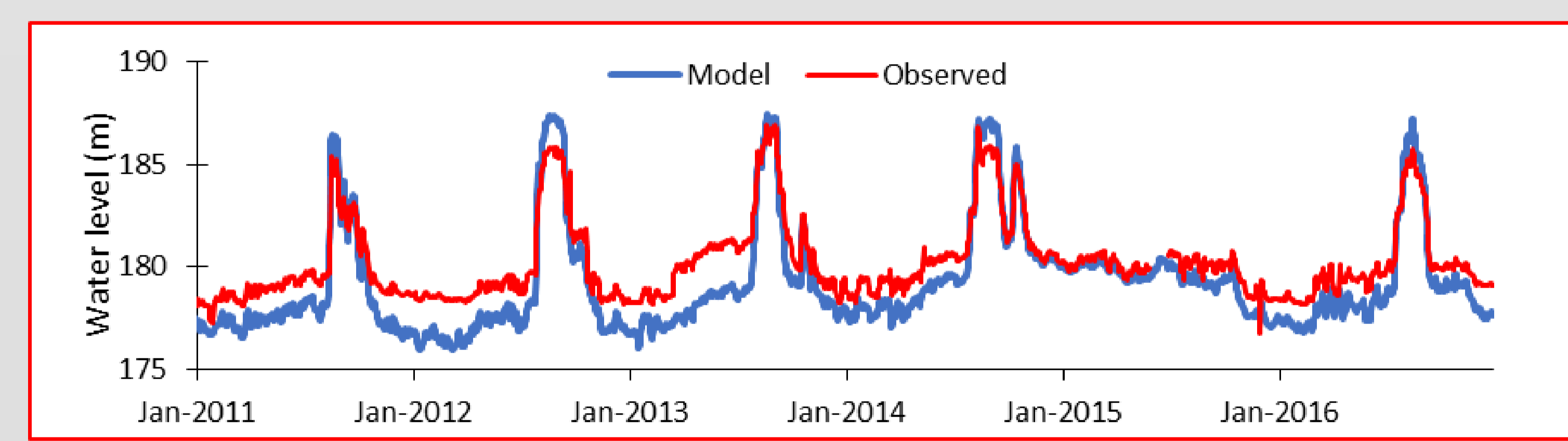
RESULTS

Frequency Analysis of Water Level (FA_WL)

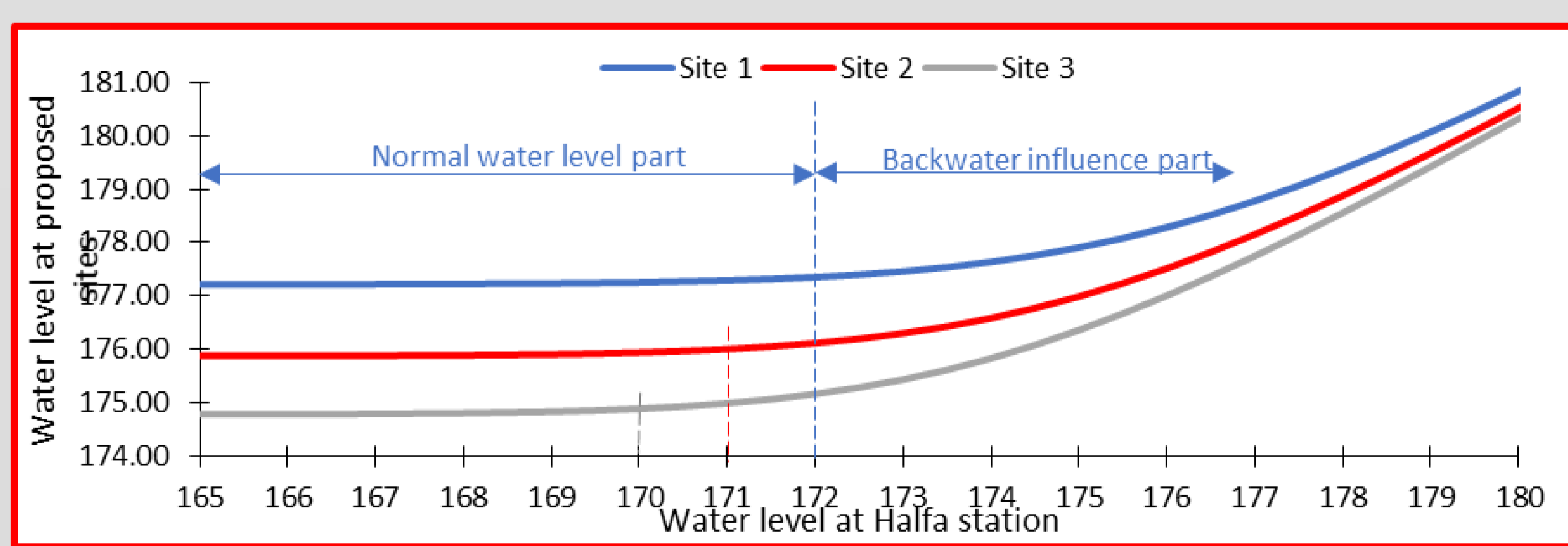


Simulation of Backwater Influences (SBI)

SOBEK 1D (Rural) program was employed to simulate the hydrodynamics of the river Nile in one-dimensional flow.



Simulated and observed water levels at Dal station during the validation period (2011-2016).

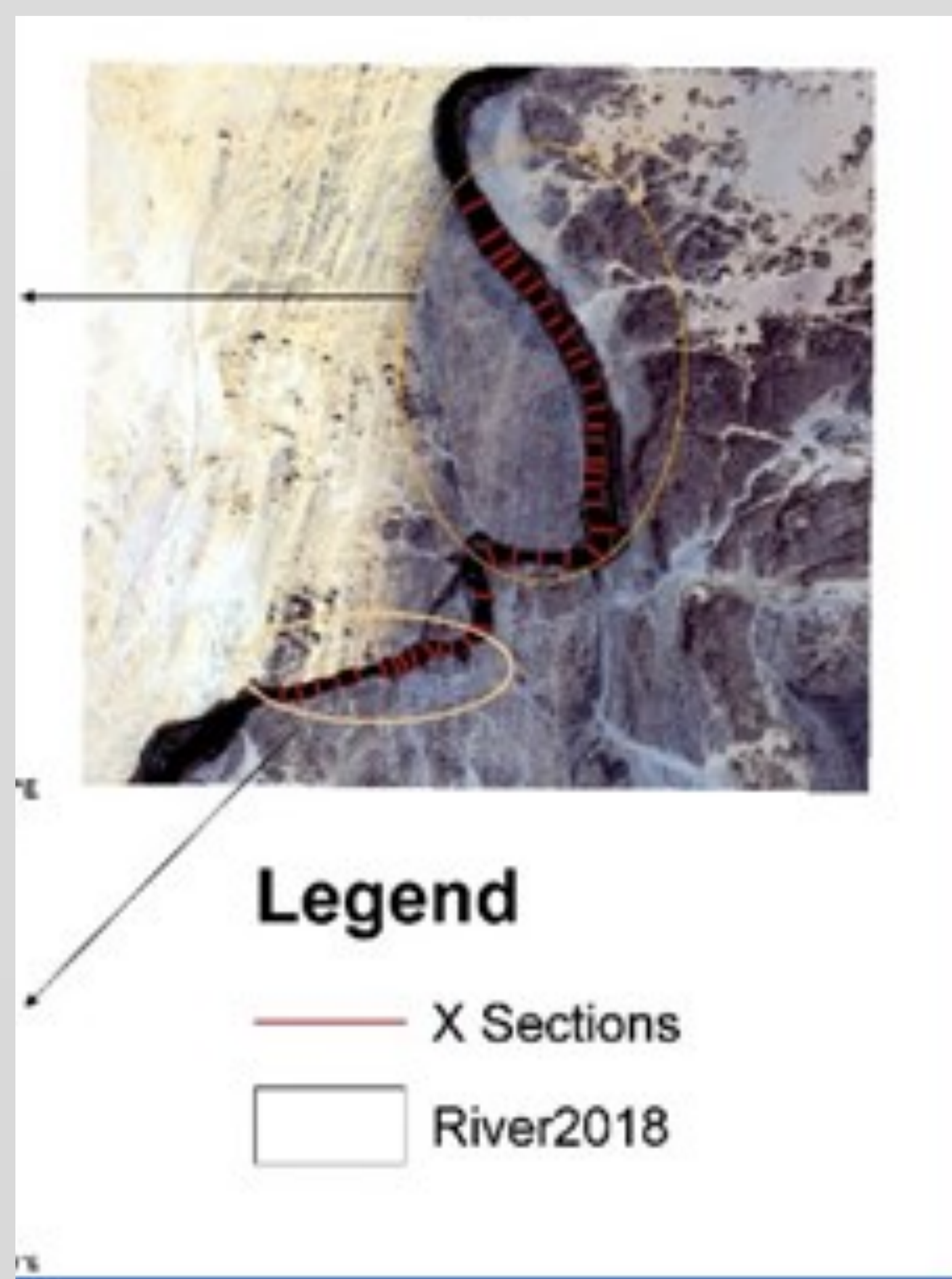


Visualization of water river changes at proposed gauging sites (site 1, site 2, and site 3) when the water level at HAD is increased (measured at Halfa station), while the discharge was set constant at 260 Mm³/d (average flow condition).

Field Survey

This includes:

- Land and bathymetric surveys;
- Collecting information on the elevation and location of high-water marks; and
- Exploring the access roads to the proposed gauging sites.



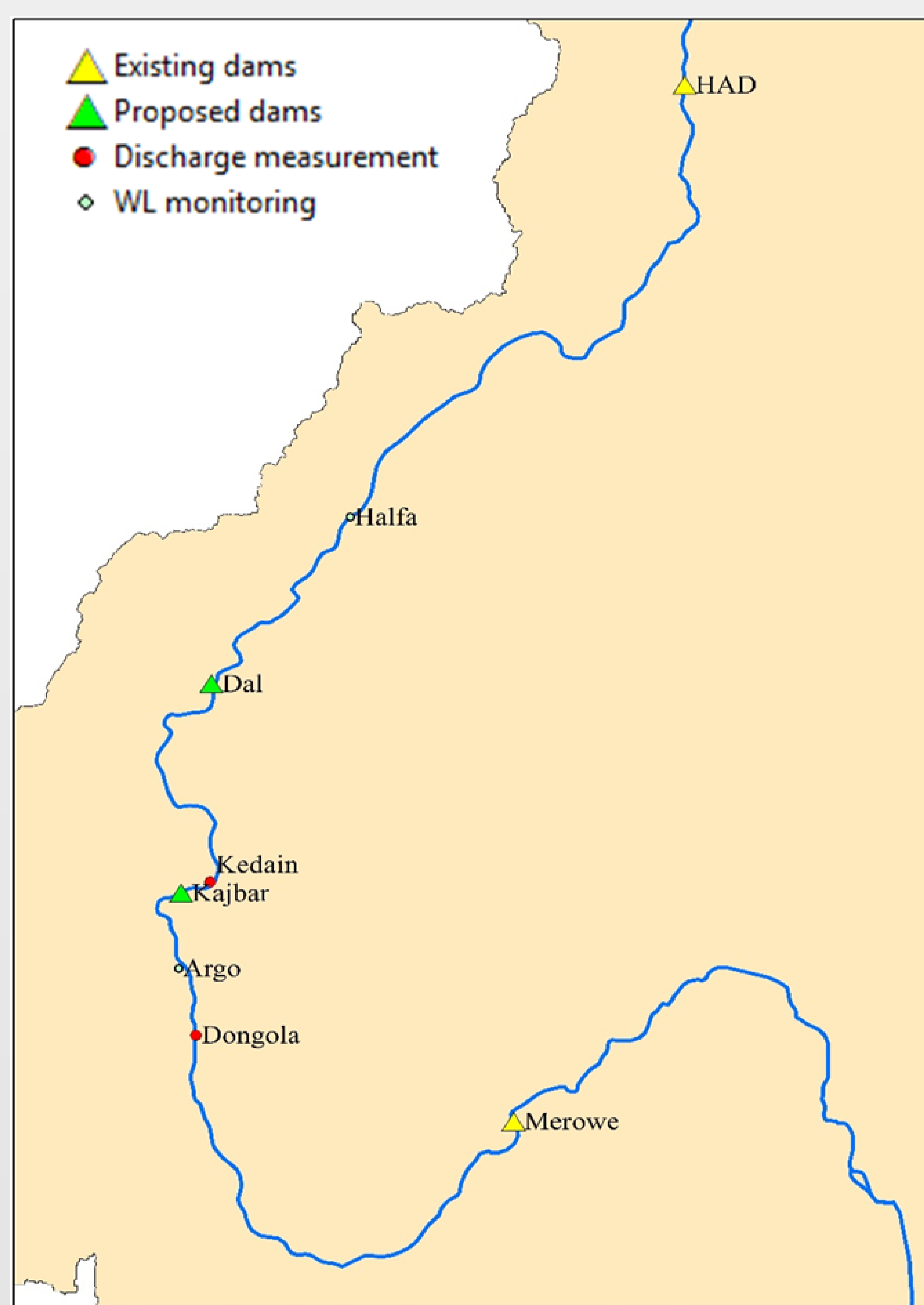
Location of the surveyed x-sections.

OBJECTIVE

The main objective is to give advice on selection of a discharge measuring location, within the reach upstream the reservoir of High Aswan Dam and downstream the proposed location of Dal dam.

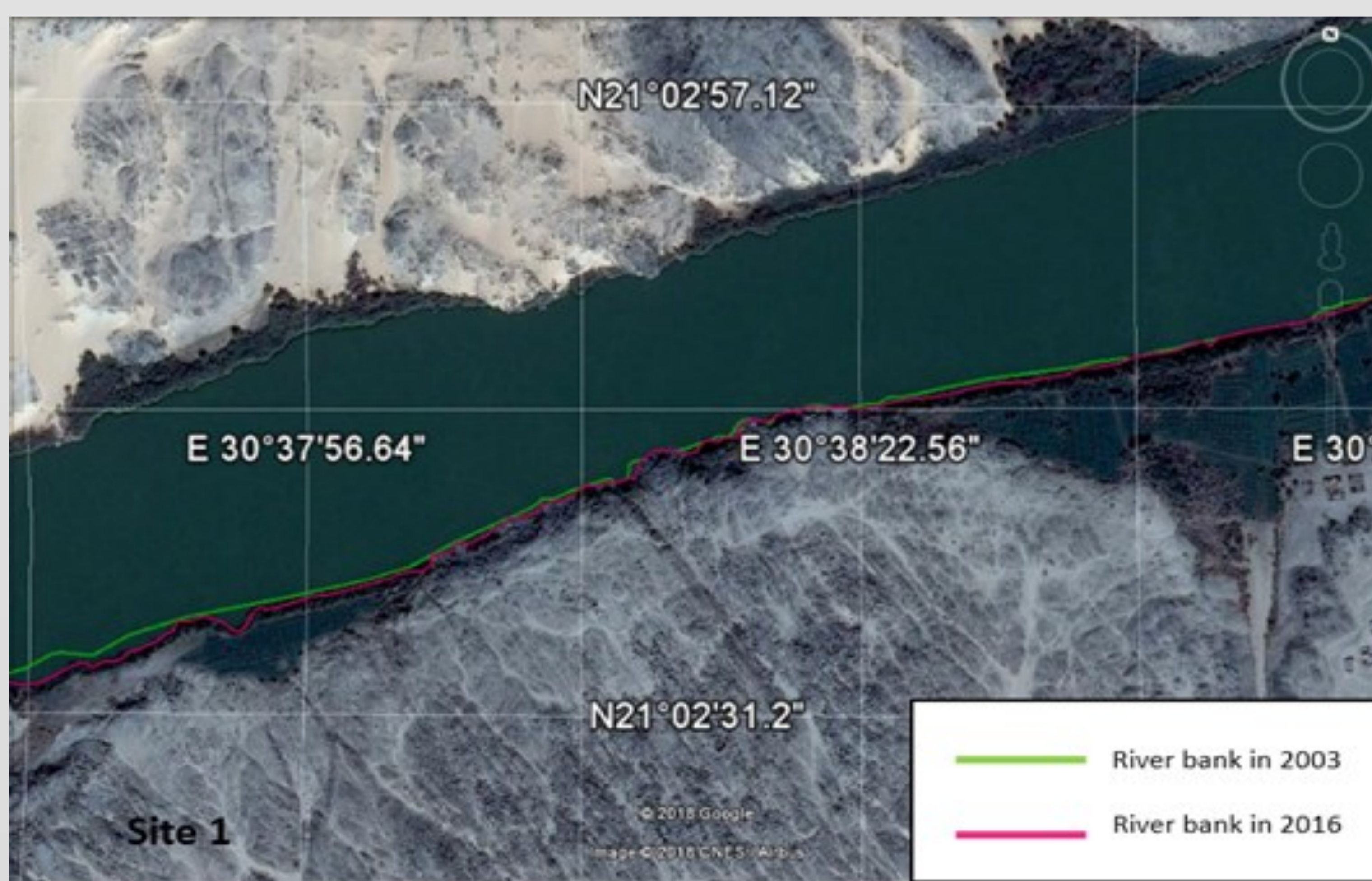
COMPONENTS OF THE STUDY

- Hydrological analysis (min/max, BW curve)
- Morphological analysis (stability of site)
- Fieldwork and bathymetric survey
- Conclusion of the study



Mapping shift along the River Bank

Multi-temporal Landsat data from the years 1990, 2003 and 2017, in addition to higher resolution data of Google Earth for the years 2003 and 2016 were freely downloaded for the mapping.



Comparison between the river boundaries in 2003 and 2016 for site 1 using Google Earth image.

CONCLUSION AND RECOMMENDATIONS

The study findings conclude the proposed reach (20 to 40 km) downstream Dal is already influenced by the backwater curve of HAD based on that, it is clear that within the reach of Dal – HAD there is no suitable location for discharge measurement beyond the effect of the backwater curve. Therefore, it is not recommended to establish a discharge measurement station within the reach downstream Dal.