

# A sustainable future for world heritage?

## The need for more integrated approaches in heritage management.

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**Keywords:** *World Heritage — Historical landscapes — Heritage management and conservation — Historical Geographical Information Systems (HGIS) — Integrated research approaches.*

**CHNT Reference:** Van Lanen, R.J., Van Beek, R., and Kosian, M.C. (2021). 'A sustainable future for world heritage? The need for more integrated approaches in heritage management, in CHNT – ICOMOS Editorial board. *Proceedings of the 26th International Conference on Cultural Heritage and New Technologies*. Heidelberg: Propylaeum.

### Introduction<sup>1</sup>

The concept of 'cultural heritage' is traditionally mainly associated with the conservation of historical remnants (e.g. monumental objects or buildings, archaeological sites, and cultural landscapes). However, over the last decades the definition of 'heritage' slowly has moved away from mere preservation towards also contributing to shaping environments, identities, and community formation (e.g. Vecco, 2010). This reconceptualization is not without consequence and leads to amongst other an increasing need of heritage to become contextualized, integrated, and (digitally) accessible. These new goals present additional prerequisites for dealing with heritage and require the development of new methods and theories. To what extent various heritage sites meet these new criteria remains generally unclear.

In this paper we focus on world-heritage sites, which despite being the organisational pinnacle of cultural-heritage conservation do not always sufficiently meet these new prerequisites. We argue this is partly due to the complexity behind world-heritage classification and corresponding differentiations. First adopted by UNESCO in 1972, the World Heritage List presently differentiates between cultural, natural, and mixed sites. Cultural sites are appraised by ICOMOS (the International Council on Monuments and Sites), natural sites by IUCN (the International Union for Conservation of Nature), and mixed sites collaboratively. World-heritage sites require either cultural or natural characteristics of 'Outstanding Universal Value' (OUV) for mankind. Already in the 1980s the clear differentiation between 'culture' and 'nature' was questioned which eventually, besides mixed sites, led to the introduction of cultural landscapes to the list. Cultural landscapes represent an especially complex group because of their layeredness, path-dependended relations, and often long-term dynamic interplay between cultural and natural factors. Consequently, heritage conservation in these (often dynamic)

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<sup>1</sup> The research presented here in part has been derived from: Van Lanen et al. (in review).

areas is particularly complex. Despite containing intrinsic natural-heritage factors, cultural landscapes are classified as cultural sites and as a rule appraised by ICOMOS. Unravelling the layeredness of heritage sites in general (i.e. not only cultural landscapes), especially in dynamic environments, is thus challenging and in our view requires tailor-made research approaches and managing strategies. In turn, this requires pinpointed tooling facilitating i.a. diachronic mapping of heritage sites (landscapes, sites, and objects), contextualization, (digital) accessibility, trans- or multidisciplinary data integration, and multi-perspective data analyses.

In this contribution we present such a new tooling: a Historical Geographical Information System (HGIS) specifically designed to manage, study, and contextualize the world-heritage site of Schokland (NL; Fig. 1). This world-heritage site is characterized by a long-term history of human-landscape interaction within a highly dynamic landscape setting resulting in a complex layeredness of the landscape. We will show that (1) the HGIS and HGIS-methodology facilitates a flexible information management system which is essential for heritage conservation in dynamic areas, (2) the system greatly adds to the digital accessibility of the site, (3) allows to unravel the historical complexity of landscapes, and (4) supports integrated approaches towards mapping and analysing cultural and natural factors surrounding heritage sites. Based on our results we will argue that differentiating between culture and nature, even at a 'culturally-classified' world-heritage site, often only hampers sustainable preservation.



Figure 1: Left: The contours of the former island of Schokland are still clearly visible in the modern-day reclaimed landscape (viewed from the north. Aerial photograph by: Jan Willem Schoonhoven, Wikimedia). Right: the location of Schokland within the present-day Netherlands on two zoom levels.

### The world-heritage site of Schokland

The former island of Schokland is located just northeast of the centre of the Netherlands, and has become part of the Dutch mainland since the final reclamation of this area in 1942 (Fig. 1). The formation of the site started during the last Ice Age (ca. 150.000-8.000 BC) during which mainly ground-moraine and rivers-dune deposits created a slightly elevated platform. During the following Holocene period (starting ca. 8.000 BC) higher temperatures resulted in rising sea- and groundwater

levels and the formation of peat. The later formation of the *Zuiderzee* (12-13<sup>th</sup> century) combined with reoccurring storm events significantly increased erosion in the area which eventually led to deterioration of the last peat barrier connecting Schokland to the mainland (ca. 1446). During the following centuries erosion activity continued and kept reducing the size of the newly-formed island. This process was only halted in the mid-20<sup>th</sup> century with the transformation of the *Zuiderzee* to the *IJsselmeer* and the systematic reclamation of the area to the present-day *Noordoostpolder*.

Archaeology has shown that Schokland has a long-term cultural history with human occupation of the area starting around 10.000 BC (the late-Palaeolithic). The internationally renowned Neolithic burial site “*Kavel P14*” (Lot P14) is one of the most important Neolithic and Bronze Age sites of the north-western Europe. After 1900 BC the area of Schokland appears to have been abandoned, with the exception of some sparse and isolated finds dating to the Roman period. Repopulation of the area started again during the 9<sup>th</sup> century and from this moment onwards human impact on the area increased significantly. To cope with increasing wetter conditions and storms artificial dwelling mounds (*terpen*) were constructed, followed by embankments (e.g. dikes). Ongoing subsidence (mainly due to human exploitation and reclamation activities), storm surges, and erosion combined with general poverty and unsafe living conditions eventually led to the forced evacuation of the island in 1859. During the following decennia the deserted island functioned mainly as a navigational beacon.

In 1995, Schokland received the world-heritage status (i.e. cultural site), since the area symbolizes the heroic, age-old struggle of inhabitants of the Netherlands with water (ICOMOS, 1995). Its OUVs are mainly based on Schokland’s representation of the last surviving evidence of prehistoric and early-historic adaptations to wetland environments, and its integration in a newly reclaimed agricultural landscape. Consequently, the site became of interest to varying stakeholders dealing with the site’s cultural as well as natural values.

### **Integrated information management: the Schokland HGIS**

Due to its dynamic setting, sustainable management of a world-heritage site like Schokland especially requires an integrated management approach, capturing both the diachronic complexity and layeredness of the landscape and at the same time connect culture and nature. Against this background we developed the Schokland HGIS; a multi-layered GIS consisting of multiple folders and tables combining cultural and natural datasets. The HGIS is developed based on concepts derived from Historical Geographical Information Science (HGIScience) and Geographical Information Science (GIScience). The system is specifically designed to function not merely as an information-management tool but also a facilitator of tailor-made data analyses.

The HGIS combines a wide variety of cultural and natural datasets (e.g. archaeological, cultural-historical, palaeogeographical, topographical, cadastral, geomorphological, water-system related, elevation, and soil). Within the system these datasets are thematically divided in groups according to scientific domains. Each of these groups store a variety of datasets (tables and/or polygons). Data is stored based purely on spatial correspondence. Such an approach has three key advantages: (1) flexibility; data or thematic groups can easily be added, (2) multidisciplinary; the type and number of data sources is not predefined, and (3) full data integration (e.g. standardization, normalization, (inter)relationships) is not needed. Making the HGIS a very low-cost system.

The result is an extremely versatile system facilitating tailor-made management- and analytical purposes. The necessity of which is underlined by the study's outcome. Our results show that through the HGIS we were able to: (1) create five high-resolution reconstruction of the island of Schokland from the Middle Ages to modern times, (2) reconstruct professional distribution on the island on a household level, (3) explore the potential of the methodology for genealogical analyses, and (4) create high-resolution heritage-management maps (Fig. 2). The latter clearly proving its importance by showing that not all cultural-historical elements connected to the island are protected.

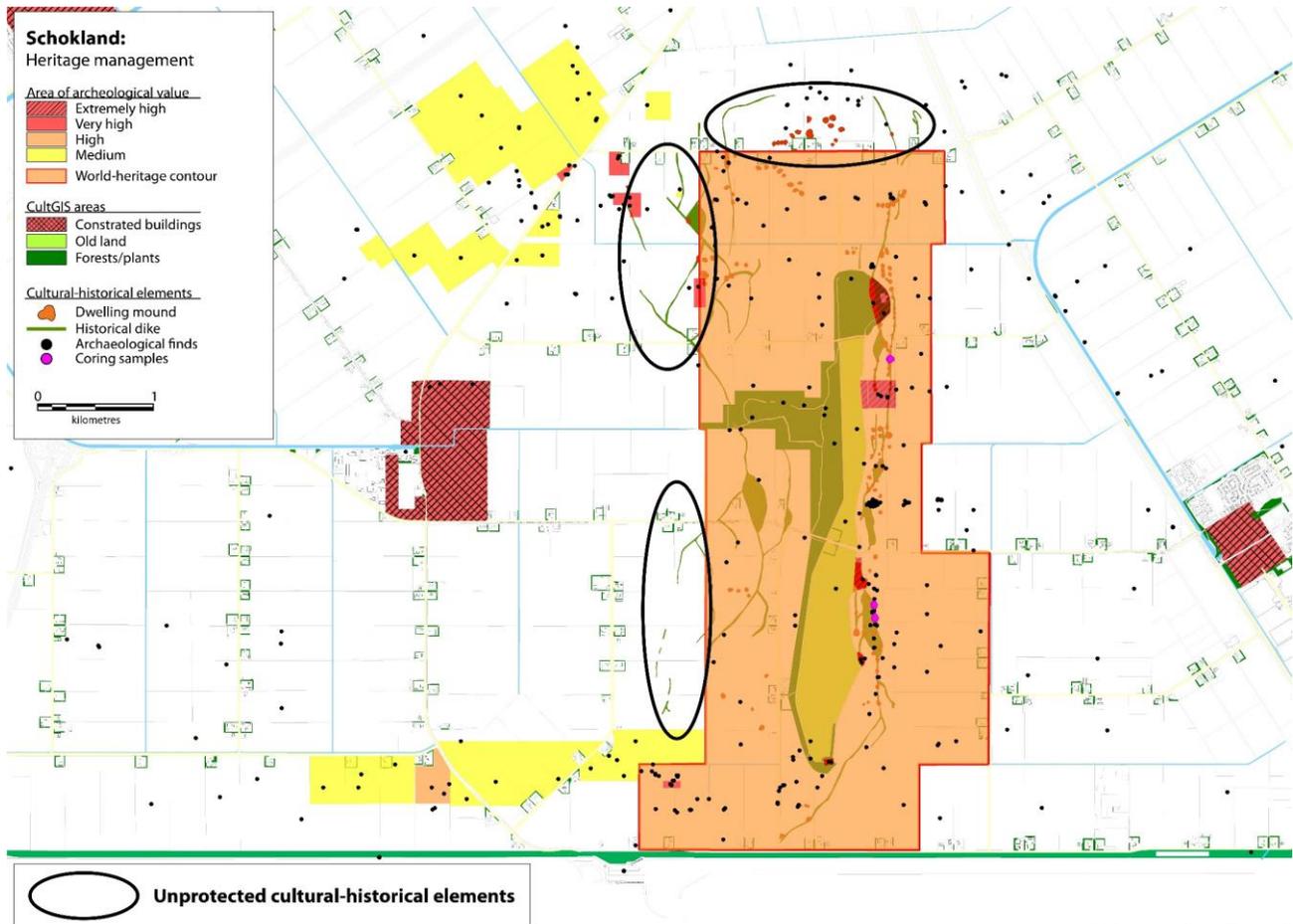


Figure 2: Heritage-management map for het world-heritage site of Schokland showing cultural-historical structures and elements. Circular shapes depict areas with cultural-historical elements without protection.

## Conclusion & outlook

The presented HGIS methodology shows great application potential for meeting the new prerequisites connected the reconceptualization of 'heritage'. The derived low-cost system facilitates the development and implementation of tailor-made heritage-management strategies and data analyses, crucial for sustainable heritage management in dynamic settings. The HGIS is flexible, open-ended, and low-cost, and can accommodate the full scope of site stakeholders. Additionally, our analyses of Schokland show that a rigid differentiation between culture and nature, at least in dynamic areas, greatly hampers sustainable-conservation strategies. The complex interplay between culture and nature has been, and still is, crucial for the site's development. We argue that understanding the full scope of this interplay is crucial for understanding the site, making informed choices, and preserving

its future. We need to move away from rigid differentiations and find methods that embrace the layering and path dependency of (world) heritage.

## Funding

The presented research was conducted as part of the JPI-CH (Call: Heritage in Changing Environments) funded project 'WETFUTURES' (Wetland Futures in Contested Environments: an inter- and transdisciplinary approach to wetland heritage in the Netherlands, United Kingdom and Ireland) project ([www.wetfutures.eu](http://www.wetfutures.eu)).

## Conflict of Interests Disclosure

The authors declare that there has been no conflict of interests.

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