

UCL Institute for Sustainable Heritage

Response to National Research Infrastructure Roadmap – Progress Report

UCL Institute for Sustainable Heritage delivers sustainable solutions to real-world cultural heritage problems through ground-breaking, cross-disciplinary research and innovative teaching for future heritage leaders. Our research is highly collaborative, which resulted in leading roles in two major national heritage science initiatives: we coordinate the UK Research Infrastructure for Heritage Science (<https://e-rihs.ac.uk>) with currently 14 partners, and we are a founding partner of the UK National Heritage Science Forum (<http://www.heritagescienceforum.org.uk/>), a membership organisation and registered charity committed to demonstrating the public benefit of heritage science, increasing public engagement with it and support for it.

As part of our efforts to establish the UK Research Infrastructure for Heritage Science, we lead on the involvement of UK partners in the ESFRI-supported European Research Infrastructure for Heritage Science, meaning that our outlook and efforts are particularly international and aim to underpin UK's globally leading position within the field. We are pleased to see that the Progress Report considers heritage science as a field where support for a distributed infrastructure could lead to a transformational effect, however, we would like to put forward the argument for UK heritage science infrastructure being central to the delivery of a number Progress Report themes:

- (i) **21st century skills and future of mobility.** UK-RIHS will promote training of technical professionals and interdisciplinary skills, digital literacy skills, responding to the needs of jobs of the future, developing CPD opportunities through a comprehensive learning programme supported by the infrastructure.
- (ii) **Next generation public services.** UK-RIHS will work with companies and public bodies to develop new services in conservation, recording, sensing, visualisation, communication, engagement and other services related to better understanding and preservation of cultural heritage.
- (iii) **Changing world.** Open discovery UK-RIHS will support open science, piloting full accessibility to data and research, as well as developing new services to enable open access beyond publications, such as collections and data, supporting regional heritage institutions and local heritage assets.
- (iv) **Addressing environmental challenges.** Accessibility: UK-RIHS will make heritage data easily discoverable and thus accessible to users will different skillsets, of different socioeconomic backgrounds and will remove legal barriers to data use and reuse. It will make data collections at local and regional levels accessible, as well as multimedia and multidimensional data, with new search and visualisation techniques and applications. Interoperability: UK-RIHS will develop standards promoting data interoperability across institutions, local and national. The UK-RIHS DIGILAB will be a fully integrated, connected and interoperable e-infrastructure, supporting arts & humanities research, including the application of AI and data science.
- (v) **Creative economy.** Due to data challenges related to large datasets, UK-RIHS will develop new data storage archiving and access standards, e.g. for “born digital” collections, increase public confidence in ethical data management, innovate in AI tools, data preservation, and develop new methodologies to capture and analyse large datasets, as well as making them FAIR.

(vi) **Understanding and maintaining cultural heritage.** Diverse and inclusive, UK-RIHS will support inclusive bodies of knowledge, creating new models of participatory research, including citizen science. Through increased understanding, sensing and recording of local heritage, E-RIHS will support place-making and place-shaping and thus social cohesion and representation. UK-RIHS is a distributed capability with facilities in universities and heritage organisations providing opportunities to overcome the currently fragmented, dispersed, underused facilities in need of a technological update, extending nationally important facilities such as SCARF or the Portable Antiquities Scheme.

(vii) **International development.** UK-RIHS is part of E-RIHS and thus an ESFRI-supported infrastructure, soon to become a European Research Infrastructure Consortium (ERIC), and thus an established European infrastructure, with a plan to become a global infrastructure, with strong links to the US RIHS national node at the Smithsonian Institution. This will support trans-national access and interoperability; avoidance of duplication; development of capacities and capabilities; creation of opportunities for a global Britain; and forging global links and partnerships with the global South.

UK-RIHS will have a transformational effect on heritage science, as well as other cross-disciplinary fields, particularly in the moment when heritage and the broader human environment are becoming increasing more digital and data-driven. Through our distributed systems of LABs, we have ensured that there is no requirement for investment in a major new centralised, built infrastructure. We propose to organise the infrastructure as a distributed facility along four principal platforms: museum collections and libraries (ARCHLAB), fixed facilities and places (FIXLAB), mobile instrumentation and facilities (MOLAB), and datasets and databases (DIGILAB). The latter is exemplified by the Archaeology Data Service at University of York, a flagship data management, repository, research and reuse initiative, part of UK-RIHS.

The UK-RIHS infrastructure will significantly reinforce UK's position globally in the application of science to heritage research. However, investment is needed in two ways: (a) to create the optimal conditions for access by linking providers with facilities and users of facilities; and (b) to develop more effective links among infrastructures and to fill gaps to better tackle big cross-disciplinary societal questions related to heritage understanding, management and preservation.

This research has the potential to transform the way we shape our global and national futures, as well as inform how the past can help create innovation and how innovation becomes tradition, history or heritage. This addresses big societal questions from climate change to medicine, from space-based to molecular sensing, from structural to digital, as well as how we overcome conflicts in the society over resources, find what unites more than divides us: a mobile earth, through the strands of language and custom, place and wellbeing.



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29th April 2019

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