

Project Proposal Form – 2022 entry

Project Title	OU11 - Written in stone: evaluating geodiversity as a natural, social and economic asset
University (where student will register)	The Open University
Which institution will the student be based at?	As above
If other	
Theme (Max. 2 selections)	Climate & Environmental Sustainability <input checked="" type="checkbox"/> Organisms & Ecosystems <input type="checkbox"/> Dynamic Earth <input checked="" type="checkbox"/>
Key words	Geology, natural capital, heritage, public engagement, National Trust, Natural England
Supervisory team (including institution & email address)	Prof Clare Warren, OU; clare.warren@open.ac.uk Dr Stewart Clarke, National Trust; stewart.clarke@nationaltrust.org.uk Dr Jonathan Larwood, Natural England; Jonathan.Larwood@naturalengland.org.uk Prof Richard Holliman, OU; Richard.holliman@open.ac.uk
Is the project co-designed by a student?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Is the PhD suitable for part time study?	Yes <input checked="" type="checkbox"/> This is a requirement of NERC

Project Highlights:

- Developing a transferable approach to the understanding the value of geodiversity as a natural, social and economic asset;
- Exploring the role of geodiversity as a holistic asset in relation to protected sites and the associated National Trust property portfolio through a combination of geological fieldwork and social research methods;
- Training in interdisciplinary scientific and social research techniques.

Overview

The UK's geological history has strongly influenced landscape development, ecological habitats and species, and human interaction with the natural world. Geological sites of specific conservation interest include a range of global to local designations. UNESCO World Heritage sites, which reflect both cultural and natural significance, and UNESCO Global Geoparks, which consider socioeconomic values, both recognise geodiversity of global significance. Sites of Special Scientific Interest are selected on the basis of their national significance for geological research and Local Geological Sites are identified for their scientific, educational, aesthetic and/or historical value.

This systematic approach and hierarchy (global, national, local) largely focuses on expert-led (geological) determination of value. Geodiversity, however, has a much wider ‘value’ that reflects its natural, social and economic significance, which may be interpreted differently by stakeholders, and may change over time. There is currently no consistent framework for assessing or assigning holistic ‘value’ to protected geological sites.

The National Trust owns land in England that includes World Heritage, SSSI and Local Geological Site designations, an extensive coastline, lowland and upland landscapes, and buildings with designed gardens and landscapes. An example is shown in Figure 1: the remains of an old tin-mining landscape in Cornwall. The geological heritage and significance of these sites is not always fully developed or utilised. This PhD project will:

1. Develop an approach to assessing geology as a natural, social and economic asset: operationalising natural capital in a geological context and exploring how a ‘geosystems services’ approach may be related to ideas about ‘public benefit’. Engagement with different stakeholders such as the National Trust, Natural England, local citizens, visitors, scientists working with these sites will be critical for identifying, testing and validating the approach.
2. Develop a transferable approach that allows the National Trust to understand and capitalise on its geological assets to benefit visitor experience.

This project will involve deployment of a range of tools and approaches to natural capital and ecosystem services and their application to geology. The results will demonstrate the value of geology as a natural, social and economic asset that frames our understanding of geological past and our more recent histories, connecting people to National Trust sites.



Figure 1: A view of the ruined engine houses, Wheal Edward and Wheal Owles, along the “Tin Coast” at Botallack, Cornwall. ©National Trust Images/John Miller

[ALT TEXT: A view of a grassy bank with ruined engine houses, used originally to extract tin from rock along the coastline in Cornwall.]

Methodology:

Review the National Trust (NT) sites that are also sites of special interest for geological conservation. Select sites for detailed focus, representing similarities and differences.

Review, develop and test a framework for geological value as a natural, social and economic asset (including 'natural capital' and 'geosystem services') analysis in the context of these sites.

Test the framework on the selected sites (and associated NT property) and additional sites to determine its adaptability to different contexts.

Through engagement with key stakeholders e.g. NT staff, exhibition designers and local geology groups, develop a new way of connecting and engaging NT audiences with our rich geological heritage.

Training and skills:

Students will be awarded CENTA2 Training Credits (CTCs) for participation in CENTA2-provided and 'free choice' external training. One CTC equates to 1/2 day session and students must accrue 100 CTCs across the three years of their PhD.

Full training in research design, methods and analysis will be provided. Depending on the background of the student, specific training in aspects of geology, natural capital/ecosystems service framework development and/or the social aspects of linking geological natural and social heritage will be provided. It is not expected that applicants would have experience in all of these methods prior to starting the PhD.

The School of Environment, Earth and Ecosystem Sciences has a thriving postgraduate community. Online teaching opportunities including teaching on OU undergraduate modules and Massive Open Online Courses (MOOCs) are available via the OU Virtual Learning Environment.

Additionally, our students can gain excellent skills in science engagement by contributing travel experiences to platforms such as:

Traveling Geologist (<http://www.travelinggeologist.com>);

The CENTA student research blog (<https://centaresearch.wordpress.com>);

The Earth Heritage magazine (<https://www.earthheritage.org.uk>); and

The National Trust magazine.

Partners and collaboration:

This project involves a partnership between geologists and social scientists at the Open University and researchers at the National Trust and Natural England. This project has CASE status with Natural England.

COVID-19 Resilience:

All fieldwork will be in the UK and will follow Government Guidelines on Covid-19 restrictions. The fieldwork can be conducted at any time of the year and specific fieldwork sites can be changed if local regulations change. Access to online archive/library resources will be facilitated as required. Interviews, supervisions and discussions can be conducted online. The Open University, Natural England and the National Trust have working Covid-19-safe working and operating procedures in place.

Possible timeline:

Year 1: Review the relationship between the National Trust and protected geological sites in England. Develop a sampling framework and select key sites for more detailed study. Present preliminary project outline/results to the School. Pass probation upgrade.

Year 2: Fieldwork at specified sites. Develop a framework for geological 'natural capital' and 'geosystem services' analysis. Work with sites to analyse and co-develop 'Spirit of Place' statements that represent relevant aspects of geology. Present preliminary results at a national conference and to the National Trust.

Years 3-4: Finalise the geological natural capital framework, return to the sites to test it works and test on a new site. Present results at an international conference and to the National Trust. Write thesis, prepare articles for publication.

Further reading:

Brilha, J., Gray, M., Pereira, D.I. and Pereira, P., 2018. Geodiversity: An integrative review as a contribution to the sustainable management of the whole of nature. *Environmental Science & Policy*, 86, pp.19-28.

Gray, M., Gordon, J.E., Brown, E.J., 2013. Geodiversity and the ecosystem approach: the contribution of geoscience in delivering integrated environmental management. *Proceedings of the Geologists' Association*, 124, 659-673.

Gray (2019) Geodiversity, Geoheritage and Geoconservation for society, *International Journal of Geoheritage and Parks*(2019), <https://doi.org/10.1016/j.ijgeop.2019.11.001>

Larwood, J., France, S., and Mahon C., (Eds) 2017. Culturally Natural or Naturally Cultural? Exploring the relationship between nature and culture through World Heritage. *United Kingdom: IUCN National Committee UK*. <https://iucnuk.wordpress.com/2017/10/19/culturally-natural-or-naturally-cultural/>

Stace, H, and Larwood, J.G., 2006. Natural foundations: geodiversity for people, places and nature. English Nature, Peterborough. <http://publications.naturalengland.org.uk/publication/60005>

Stewart, I.S. and Gill, J.C., 2017. Social geology—integrating sustainability concepts into Earth sciences. *Proceedings of the Geologists' Association*, 128(2), pp.165-172.

Further details:

Students should have a strong background in geology, physical geography, science and society, and/or science communication, and enthusiasm for interdisciplinary research and learning new approaches and techniques. Familiarity with at least one of the methodological approaches would be desirable but is not required. If you're not sure whether your academic background is suitable, please contact one of us. We'd love to hear from you.

The successful student will join well-established teams researching geological processes and science communication at the Open University and natural capital assessment at the National Trust and Natural England.

Please contact **Clare Warren**, clare.warren@open.ac.uk, **Stewart Clarke**, stewart.Clarke@nationaltrust.org.uk (**National Trust**) or **Jonathan Larwood Larwood**, Jonathan.Larwood@naturalengland.org.uk (**Natural England**) for further information.

Applications should include:

- an academic CV containing contact details of three academic references
- a CENTA application form, downloadable from: [CENTA application](#)
- and an Open University application form, downloadable from: [Home OU application form](#) (if you are resident in the UK) or an [Overseas OU application form](#) (if you are an international applicant).

Applications must be sent to STEM-EEES-PHD@open.ac.uk by Friday 7th January 2022 (12 pm, noon)