Making local pasts work in contemporary climate change communication: reflections from the EU Life-funded project Coast to Coast Climate Challenge

Felix Riede[1,2*] & Uffe Krogh[1]

1. Department of Archaeology and Heritage Studies, Aarhus University, Moesgård Allé 20, 8270 Højbjerg, Denmark
2. Centre for Environmental Humanities, School of Culture and Society, Aarhus University, Denmark
3. Sarah Kerr, The Trinity Long Room Hub, Trinity College Dublin, Ireland

*corresponding author: f.riede@cas.au.dk

Abstract *Climate change is a hotly debated topic in contemporary politics. The dominate trope of how to tackle these challenges point towards technocractic solutions vis-à-vis a transition to renewable energy, cleaner production or changes in hydrological regimes. It has also been pointed out, that with more comprehensive cross-sectorial transformations, genuinely sustainable social constellations cannot be configured. Given the intimate relationship history has with the construction of local, regional, national and even international identities, and that such identities in turn give rise to values and hence action, historical narratives can play a vital role in bringing about the called-for societal transformations. Here, we report on a project embedded within a large regional EU Life-funded municipal climate change adaption initiative with particular focus on changes in inland and coastal waters. Specifically, we reflect on an initiative to meet local citizens in the landscape in order to unpack the temporal dimensions of cultural and natural environmental change in their immediate vicinity. We argue that this approach has the power to provide more intimate and relatable facets of climate change.*

Keywords: environmental history; climate change; Denmark; historical socio-hydrology; community archaeology

Introduction – history in times of climate change

The development of applied and environmental history occurred in tandem throughout the 1970s and 1980s primarily.[1] Conjoining the two approaches is gaining increasing traction due to contemporary and projected climate change.[2] This convergence is part and parcel of a wider environmental humanities movement that draws on developments not only in history but also in literature studies and the arts more general.[3] As argued powerfully by Dipesh Chakrabarty, economic, political and environmental histories can no longer be told separately[4] – with the implication that these strands will also be conjoined in the future. Indeed, Mike Hulme (2008:5) argued:

We are living in a climate of fear about our future climate. The language of the public discourse around global warming routinely uses a repertoire which includes words such as 'catastrophe', 'terror', 'danger', 'extinction' and 'collapse'. To help make sense of this phenomenon the story of the complex relationships between climates and cultures in different times and in different places is in urgent need of telling. If we can understand from the past something of this complex interweaving of our ideas of climate with their physical and cultural settings we may be better placed to prepare for different configurations of this relationship in the future.[5]

[1] See, for instance: Stearns, Peter N., and Joel A. Tarr. 1981. "Applied History: A New-Old Departure." The History Teacher 14(4):517–31.; Neustadt, Richard E., and Ernest R. May. 1986. *Thinking in Time: The Uses of History for Decision Makers*. New York, NY: Freedom Press; and Cronon, William. 1992. "A Place for Stories: Nature, History, and Narrative." *Journal of American History 78(4)*:1347–76.

[2] Carey, Mark, Philip Garone, Adrian Howkins, Georgina H. Endfield, Lawrence Culver, Sam White, Sherry Johnson, James Rodger Fleming, Philip Garone, and Mark Carey. 2014. "Forum: Climate Change and Environmental History." *Environmental History 19(2)*:281–364.

[3] Bergthaller, Hannes, Robert S. Emmett, Adeline Johns-Putra, Agnes Kneitz, Susanna Lidström, Shane McCorristine, Isabel Pérez Ramos, Dana Phillips, Kate Rigby, Libby Robin, and Peter Bindon. 2014. "Mapping Common Ground: Ecocriticism, Environmental History, and the Environmental Humanities." *Environmental Humanities 5*:261–76.; Robin, Libby. 2018. "Environmental Humanities and Climate Change: Understanding Humans Geologically and Other Life Forms Ethically." *Wiley Interdisciplinary Reviews: Climate Change 9(1)*:e499

[4] Chakrabarty, Dipesh. 2009. "The Climate of History: Four Theses." *Critical Inquiry 35(2):*197–222. Chakrabarty, Dipesh. 2014. "Climate and Capital: On Conjoined Histories." *Critical Enquiry 41*:1–23.

[5] Hulme, Mike. 2008. "The Conquering of Climate: Discourses of Fear and Their Dissolution." *Geographical Journal 174(1):5*.

Telling stories is, of course, the purview of history as a discipline. Cronon has eloquently shown how different narrative stances shape the way certain events or periods of history.[6] More recently and more broadly, Bergthaller and Mortensen have presented a collection of essays on the power framing in the environmental humanities.[7] Similarly the discipline of archaeology has also broadened its scope over the past two decades focusing on integrating climate, environment, and culture change over the long-term past.[8] This turn emphasizes how the environment impacted people[9] – and vice versa – in approaches that also converge with, for instance, critical physical geography.[10] In parallel, a rise in so-called critical heritage studies has influenced the discipline of archaeology. In combining heritage and archaeology, the link between the past, modern and future society is examined and emphasized.[11]

[6] Cronon, 1992

[7] Bergthaller, Hannes, and Peter Mortensen, eds. 2018. *Framing the Environmental Humanities*. Leiden: Brill Rodopi.

[8] ICOMOS Climate Change and Heritage Working Group. 2019. *The Future of Our Pasts: Engaging Cultural Heritage in Climate Action*. Paris: International Council on Monuments and Sites - ICOMOS; Länsstyrelsen i Västra Götaland. 2016. *Kulturarv För Framtida Generationer. Med Klimatperspektiv På Västsveriges Kulturarv - Klimatförändringarnas Påverkan På Kulturarvet i Västra Götalands Och Hallands Län*; Rockman, Marcy. 2015. "An NPS Framework for Addressing Climate Change with Cultural Resources." *The George Wright Forum 32(1)*:37–50.
Rockman, Marcy, Marissa Morgan, Sonya Ziaja, George Hambrecht, and Alison Meadow. 2016. *Cultural Resources Climate Change Strategy*. Washington, DC: National Park Service

[9] Carleton, W. Christopher, and Mark Collard. 2019. "Recent Major Themes and Research Areas in the Study of Human-Environment Interaction in Prehistory." *Environmental Archaeology 1–17*.; Contreras, Daniel A., ed. 2017. *The Archaeology of Human-environment Interactions: Strategies for Investigating Anthropogenic Landscapes, Dynamic Environments, and Climate Change in the Human Past*. London: Routledge; Davis, Dylan S. 2019. "Studying Human Responses to Environmental Change: Trends and Trajectories of Archaeological Research." *Environmental Archaeology 1–14*.

[10] Lave, Rebecca, Christine Biermann, and Stuart N. Lane, eds. 2018. *The Palgrave Handbook of Critical Physical Geography*. Cham: Palgrave Macmillan.

[11] E.g. Harrison, Rodney. 2013. *Heritage: Critical Approaches*. Abingdon: Routledge.; McAtackney, Laura. in press. "Contemporary Archaeology." Pp. xx–xx in Routledge Handbook of Historical *Archaeology*, edited by C. E. Orser Jr., S. Lawrence, and J. Symonds. London: Routledge, forthcoming.

Today, there are two prevailing narratives surrounding heritage and climate change. The first and dominant one surrounds heritage preservation and attendant methods[12] and is strongly enshrined in many European governments' response plans.[13]

However, it often overlooks the relationship with associated intangible heritages, such as collective memory and recreational activities, which the environment and landscape generate, support and nurture.[14] A second strand is emerging from academic study; that of loss[15], managed loss[16] and curated decay.[17]

Cultural identity is multi-faceted, dynamic, sometimes contested, and always created from experiences of our past, gender and age, amongst numerous other factors. Archaeology has developed to include cultural identities over the past three decades[18]; Sommer, for instance, has shown how different public actors selectively draw on their own regional (pre)history in the process of constructing contemporary regional

[12] For sites at risk see: E.g. Wang, Jieh-Jiuh. 2015. "Flood Risk Maps to Cultural Heritage: Measures and Process." *Journal of Cultural Heritage 16(2):*210–20.
For assessing vulnerabilities see: E.g. Reeder-Myers, Leslie A., and Torben C. Rick. 2019. "Kayak Surveys in Estuarine Environments: Addressing Sea-Level Rise and Climate Change." *Antiquity 93(370):*1040–51.; Reeder-Myers, Leslie A. 2015. "Cultural Heritage at Risk in the Twenty-First Century: A Vulnerability Assessment of Coastal Archaeological Sites in the United States." *The Journal of Island and Coastal Archaeology 10(3)*:436–45.
For physical impacts see: E.g. Daly, Cathy. 2016. "The Design of a Legacy Indicator Tool for Measuring Climate Change Related Impacts on Built Heritage." *Heritage Science 4(1):*19.
For sustainable preservation methods see: E.g. Sesana, E., C. Bertolin, A. S. Gagnon, and J. J. Hughes. 2019. "Mitigating Climate Change in the Cultural Built Heritage Sector." *Climate 7(7):*90.
For economic and touristic impacts, see: Hall, C. Michael, Tim Baird, Michael James, and Yael Ram. 2016. "Climate Change and Cultural Heritage: Conservation and Heritage Tourism in the Anthropocene." *Journal of Heritage Tourism 11(1):*10–24.
[13] E.g. Historic Environment Scotland. 2011. *A Climate Change Action Plan for Historic Scotland 2012-2017*, available here: https://www.historicenvironment.scot/media/2611/climate-change-plan-2012.pdf
[14] Colette, A. 2007. Climate Change and World Heritage. Report on Predicting and Managing the Impacts of Climate Change on World Heritage and Strategy to Assist States Parties to Implement Appropriate Management Responses. Paris: UNESCO World Heritage Centre.
[15] Graham, Ellie, Joanna Hambly, and Tom Dawson. 2017. "Learning from Loss: Eroding Coastal Heritage in Scotland." *Humanities 6(4).;* Holtorf, Cornelius. 2018. "Embracing Change: How Cultural Resilience Is Increased through Cultural Heritage." *World Archaeology 1–12.*; Marzeion, Ben, and Anders Levermann. 2014. "Loss of Cultural World Heritage and Currently Inhabited Places to Sea-Level Rise." *Environmental Research Letters 9(3):034001*.
[16] Harvey, David C., and Jim Perry. 2015. *The Future of Heritage as Climates Change: Loss, Adaptation and Creativity.* London: Routledge.
[17] De Silvey, Caitlin. 2017. *Curated Decay: Heritage Beyond Saving*. Minneapolis: University of Minnesota Press.
[18] Graves-Brown, P. M., Sian Jones, and Clive S. Gamble, eds. 1996. *Cultural Identiy and Archaeology*. London: Routledge.

identities.[19] There is consensus from a variety of disciplines that the past is part of the construction of modern cultural identities.[20] They can be considered 'historical reservoir[s]'[21], historically constituted yet fluid and permeable.

Therefore, when climate change affects – destroys, alters, creates – heritage, cultural identities are impacted. Identities, including cultural identities, can galvanise action, from building social movements to catalysing political change. Possible actions may be greater engagement with climate change mitigation, enhanced energy for preserving heritage, or forgetting what is partially lost.

In this paper, we present and discuss an effort to include aspects of applied environmental history – the cultural relationships between community and environment that have their roots in the past – in the context of a large, regionally focused, EU-funded climate change adaptation project. This collaborative environmental history effort diverges from those dealing with acute climate-related loss of sites and monuments in that it attempts to proactively integrate environmental history into the land-use planning process and as an instrument in citizen-near debate. We reflect on the challenges of integrating such a component in mega-projects of this managerial and technological nature. We present our methodology and collaborators in the process of co-creating understanding for contemporary environmental challenges as seen in light of nested local-to-global histories.

[19] Sommer, Ulrike. 2000. "Archaeology and Regional Identity in Saxony." *Public Archaeology 1(2):125–42.*
[20] Dawson, Thomas Christopher, Joanna Hambly, Graham Allsop, and Louise Elinor. 2017. "A Central Role for Communities: Climate Change and Coastal Heritage Management in Scotland." in *Public Archaeology and Climate Change:* 23–33 Oxbow.
[21] Pratt, Nicola. 2005. "Identity, Culture and Democratization: The Case of Egypt." *New Political Science 27(1)*:69–86.

The Coast to Coast Climate Challenge (C2CCC) project

The C2CCC project is a climate change adaptation programme hosted by the Region of Central Denmark, one of five such administrative units in Denmark.[22] Central Denmark Region covers 19 municipalities and an area of 13,000 km^2. With a population of 1.3 million people, the region is home to nearly a quarter of the country's population. Like the other four regions, the Central Denmark Region is a political as well as administrative unit; it is led by the Regional Council, consisting of 41 politicians elected every four years. The region's responsibilities are within the areas of health, psychiatry, social and regional development *senu lato* – and including concerns about climate and environmental change. C2C CC is a 6-year project (January 2017 to December 2022), supported by the EU LIFE programme with approximately 52 million DKK and a total budget of approximately 90 million DKK.[23] The project includes 31 core partners and 19 supportive partners; it consists of 24 sub-projects, collectively seeking to boost the resilience and adaptive capacity across the region to prepare for the climatic changes and challenges facing the area. Climate adaptation in the region deals with challenges relating to all aspects of the hydrological cycle: sea and sounds, rivers and lakes, groundwater and extreme rain.

The EU LIFE programme is the European Commission's flagship funding instrument for the environment and climate action. LIFE projects tend to be massive and are dominated by engineering, managerial and natural scientific approaches. During the lengthy application process, we nonetheless succeeded in including an environmental history project as one of the 24 constituent sub-projects. The task of this subproject is to provide both environmental and culture historical background to contemporary concerns of climate change adaptation in the region specifically. How have people related to changing climatic and hydrological regimes – at the coast and inland – previously? How can we frame such narratives in ways that articulate them with already existing narratives around local and regional identities? Can we use established platforms – digital and physical – in creating more robust contact with and dialogue between relevant stakeholders?

[22] Coast to Coast Climate Challenge: http://www.c2ccc.eu/english/
[23] EU LIFE: https://ec.europa.eu/easme/en/life

A pilot intervention: The future of coastal summer cottages with private dikes

The area for summer cottages As Vig north of Juelsminde on the east coast of Jutland is situated on low-lying ground (Figure 1). Surrounded by hills, with easy access to the beach and the sea, these recreational cottages are located at a seemingly ideal place. The idyllic picture is deceptive, however, because climate change has made the future of the summer cottages uncertain. The houses lie so low that they can be flooded already today, by storm-surge seas. For that reason, a 1.9-metre-high dyke has been built around the area. In addition, the creek Skjold Å that runs through the area, has a high tide barrier, preventing sea water from running in. The dyke and the high tide barrier secure the area in the years to come, but will most likely not be sufficient in the long run: in a recent report, the Danish Meteorological Institute suggests water levels up to 140 cm higher than today in 2100 for the inner Danish waters.[24] During a storm, water levels can rise additionally by 140 cm to almost 3 metres. Consequently, higher tidal stands will entail that the high-tide barrier will be closed more often, and for longer periods of time, meaning that additional water from streams leading into the cove will be trapped in the area behind the summer cottages. To municipal planners, it is evident that this particular area, much appreciated by cottage owners, will become uneconomical or even dangerous in the near- to medium-term future. Therefore, Hedensted Municipality, which is responsible for the area, has invited citizens to collaborate in the planning process for the area. With local identity so closely interlinked with the natural heritage and physical landscape the water not only threaten the physical assets but also community identity and social capital. Here, as everywhere else, increasing water levels are also a cultural problem. Any decisions for the future use of the area have to be made on stakeholder values that are intimately linked to these historical landscapes and their perception.

[24] Olesen, Martin, Kristine Skovgaard Madsen, Carsten Ankjær Ludwigsen, Frederik Boberg, Tina Christensen, John Cappelen, Ole Bøssing Christensen, Katrine Krogh Andersen, and Jens Hesselbjerg Christensen. 2014. F*remtidige Klimaforandringer i Danmark.* Copenhagen: Danmarks Meteorologiske Institut.

Figure 1. A contemporary topographic map of the area in question; the summer cottage area is marked up.

In the dialogue with the citizen stakeholders in the area, three different decision scenarios for the future of the area were considered:

1) Business and usual – no action.
2) Open the area, and let the water spread out, according to the development in precipitation and the sea level rise in the bay.
3) Secure the area further, and pump the water from the river into the cove.

Each of these scenarios is associated with a range of downstream future risks, likely costs and benefits that need to be negotiated. While scenario 1 simply delays major decisions until some future point, scenarios 2 and 3 would, respectively, entail the abandonment of many summer cottages or greatly increased costs in relation to evermore intensive technology-aided water management. It is crucial for the municipality that the citizens who either live permanently in the area, or have their summer cottages there, participate in the decision-making process. With this in mind, we (i) produced a report written jointly between environmental/climate historian and the biologists and landscape managers put in charge of climate change adaptation in this area. This report sketches out the coupled environmental *and* cultural historical setting of the area in question;

by using historical maps, for instance, the report lifts the lid on landscape change over previous centuries highlighting especially how water levels, technology and settlement patterns have changed over time. These maps demonstrate very plainly that the landscapes now used for summer houses are 'naturally' – that is, pre-industrially – wetlands (Figure 2). On this canvas, the issue of the future of water levels and land-use can be articulated and anchored in real places and with the personal stories attached to them. On the basis of this, we then (ii) initiated study tours to other areas with similar issues, community walking trips in the area in question, as well as follow-up stakeholder workshops.

Figure 2. (A) *Historical map of the project area. Published in in the last decades of the 19th century.* **(B)** *Historical map of the project area, published in 1846. Copyright: Agency for Data Supply and Efficiency.*

Framing community environmental history

With the report and the tours, we sought to create a common understanding of the C2CCC *Håb-til-håb sub*-project area, its challenges and possible solutions in relation to a demographically diverse group of citizen stakeholders. Here we drew on inspiration from the '*7 core principles for climate change communication*'[25] created by *Climate Visuals*, which stresses factors such as localizing, telling new stories and showing emotionally powerful images. Additional inspiration has come from recent reports concerned with climate change and cultural heritage by the International Council on Monuments and Sites[26] and the United States

[25] Climate Visuals: *The seven core principles for climate change communication*. https://climatevisuals.org/7-climate-visuals-principles

[26] ICOMOS Climate Change and Heritage Working Group 2019

National Parks Service[27], as well as more regionally focussed reports that address the intersection of cultural heritage and climate change.[28]

To underline how future climate changes could affect the area we chose to emphasize stories that stressed the way environmental variations had shaped the area throughout history – from late ice-age landscape changes and the first human settlements to changes in human utilization and exploitation of the area in industrial times. We focused on stories centred on climate and environmental developments and the locations potentially threatened by climatic changes and sea-level rise, with special attention to places of significant cultural value. While sometimes difficult to find, digging into the archaeological material and historical sources underlined the ICOMOS mantra that "*Every place has a climate story*".[29] This meant that we could saliently localize our narratives and highlight the uniqueness of the area and its cultural heritage. In the initial phase of the project engaging citizen stakeholders was prioritized, and decisions on what kind of solutions should be implemented was scheduled for later.

The informants were primarily citizens living in the area or using it for recreational purposes, our sample was conditioned by who decided to participate the in the activities offered by the municipality. The initial activities consisted of three field walks (Figure 3), two bus tours and two workshops. The field walks included many of the same stories as the report and focused on the area's cultural history, climatic challenges and natural heritage, while the bus tour's main emphasis was on possible solutions to the challenges facing the *Håb-til-håb* project area. In total approximately 165 people took part in the seven tours and workshops in a population of roughly 2500 people living in the two parishes in the project area.

For our part, we concentrated on stories that underlined the uniqueness of the area to excite, educate and make the attendees appreciate the area further, including elements that may have been unknown to some

[27] Rockman 2015; Rockman et al. 2016
[28] Länsstyrelsen i Västra Götaland 2016
[29] ICOMOS Climate Change and Heritage Working Group 2019:31

members of the public. We particularly honed in on vulnerable parts of the project-area. In the field walks and the bus tour, the set-up was a multivocal conversation between the municipality, the museum and university and the citizen stakeholders. Being situated in the landscape gave a sensation of having 'history beneath our feet', and it meant that it was possible to point to or touch important parts of the coupled climate/cultural history and to see changes in the landscape. It was straightforward, for instance, to show how the coastline and water levels had changed recently during past centuries or even millennia: Standing on the coast and pointing into the ocean, it was possible to point out where coastal settlements, now submerged, of the famous Stone Age Ertebølle Culture (5300 BC-3950 BCE) were located when the sea-levels fluctuated and rose rapidly in the Baltic Sea.

On more than a few occasions citizens participating in these activities added to our narratives with personal accounts of flooding or landscape changes they had experienced in their lifetime. These narratives added to further grounding and personalizing of hydrological changes that numbers and maps alone cannot readily achieve. This tacit local knowledge added an invaluable and, at times, unexpected dimension that can be situated somewhere between local ecological knowledge, personal accounts and citizen science.

These efforts had multiple effects, but most prominently the project gave participating citizen stakeholders a place to start the conversation on climate change. A conversation that can be notoriously hard. Social cohesion of the community – or of those who participated in our activities – was arguably improved through the shared understanding of history, heritage and landscape. This gave the citizen stakeholders a more robust platform from which to begin the discussion and reflection on how to protect the area from the climate challenges, and the insights from the tours were drawn on during the subsequent workshop, where different scenarios and solutions for the area were discussed and considered.

While discursive change is difficult to measure, let alone to quantify, we note that local citizens were highly engaged in the project, even pushing the municipality to do more and work faster on the project. The project

presented here occurred at a time when the discourse on climate change was arguably undergoing a transformation nationally and internationally. An increasing number of people are engaging with the climate crisis and are increasingly considering humanity's impact on the planet. We argue that localizing this issue through history-based stakeholder integration has contributed to creating a local discursive change that scaffolds change seen nationally.

In the later stage of the project, the cooperation between the municipality and citizen stakeholders and stakeholder collectives was formalized and a working group is now representing different citizens and groups such as landowners, farmers, cottage owners, regular households and miscellaneous users. This working group is now collaborating with the municipality on a recommendation for the city council to approve – and this recommendation will, we argue, be significantly informed by an environmental history perspective.

Figure 3. *Picture from one of the walking tours in the Håb-til-håb project area.*

Towards a historical socio-hydrology: Global issues, local narratives – glocal solutions

The need to make adaptation decisions in relation to contemporary climate change and associated alterations to hydrological regimes is becoming increasingly urgent today. Such measures are, however, often costly and contentious. In the hydrological sciences, the need to frame water-related planning and engineering solutions within their societal context has led to the development of the sub-field of 'socio-hydrology'.[30]

[30] Sivapalan, M., M. Konar, V. Srinivasan, A. Chhatre, A. Wutich, C. A. Scott, J. L. Wescoat, and I. Rodríguez-Iturbe. 2014. "Socio-Hydrology: Use-Inspired Water Sustainability Science for the Anthropocene." *Earth's Future 2(4):*225–

Within socio-hydrology, case-study approaches stand strongly and we have here extended these with a greater historical sensibility.[31] Fully in line with a recent Dutch study investigating the role of cultural heritage in climate action,[32] we have here proposed that an increasing focus on local and regional climate and environmental history can be used to build more robust and knowledge-led debates and decisions on these matters. We have drawn on the key insight of environmental history regarding the power of narrative vis-à-vis our perceptions of weather, climate and the environment, and have coupled this to the application principles of community archaeology[33] to chart a procedure that articulates the decision-making needs of the municipality with the ambition to include citizen stakeholders. In doing so and in developing this particular historical socio-hydrology approach, we have insisted on the value of local knowledge institutions – museums – as important loci and actors in this regard; not only can they act as curators and custodians of local knowledge against which global processes such as climate change can be measured but they can also act as important platforms for democratic debate.[34] Museums of cultural history are, we argue, especially important in this regard as the climate change that is occurring in our contemporary Anthropocene setting and the decisions required to face it, are by their essence cultural rather than natural scientific or technical. Moreover, we articulate this museal perspective with the notion that the landscape itself and its exploration through walking can facilitate new and different thinking and engagement.[35]

30.; Sivapalan, Murugesu, Hubert H. G. Savenije, and Günter Blöschl. 2012. "Socio-Hydrology: A New Science of People and Water." *Hydrological Processes 26(8)*:1270–76.

[31] Mondino, E., A. Scolobig, M. Borga, F. Albrecht, J. Mård, P. Weyrich, and G. Di Baldassarre. 2020. "Exploring Changes in Hydrogeological Risk Awareness and Preparedness over Time: A Case Study in Northeastern Italy." *Hydrological Sciences Journal 1–11*.; Mostert, E. 2018. "An Alternative Approach for Socio-Hydrology: Case Study Research." *Hydrology and Earth System Sciences 22(1)*:317–329.

[32] Fatorić, S. and L. Egberts. 2020. Realising the potential of cultural heritage to achieve climate change actions in the Netherlands. *Journal of Environmental Management* 274, 111107.

[33] E.g. Marshall, Yvonne. 2002. "What Is Community Archaeology?" *World Archaeology 34(2)*:211–19.; Moshenska, G., S. Dhanjal, and D. Cooper. 2011. "Building Sustainability in Community Archaeology: The Hendon School Archaeology Project." *Archaeology International 13*:94–100.; Moshenska, G., and S. Dhanjal. 2011. *Community Archaeology: Themes, Methods and Practices*. Oxford: Oxbow.

[34] Cameron, Fiona R., and Ann Deslandes. 2011. "Museums and Science Centres as Sites for Deliberative Democracy on Climate Change." *Museum and Society 9(2)*:136–53.; Salazar, Juan Francisco. 2011. "The Mediations of Climate Change: Museums as Citizens' Media." *Museum and Society 9(2):*123–35.

[35] E.g. Ingold, Tim. 2010. "Footprints through the Weather-World: Walking, Breathing, Knowing." *Journal of the Royal Anthropological Institute 16:S*121–39.; Macfarlane, Robert. 2012. *The Old Ways: A Journey on Foot*. London: Penguin Books. Macfarlane, Robert. 2019. *Underland: A Deep Time Journey*. London: Penguin Books.

Contemporary coasts in Europe have, over the last centuries, transformed from spaces of work to spaces of leisure, from Scandinavia to the Mediterranean and across the Atlantic.[36] Historical sources clearly attest to the temporal dimension of such changing values.[37] Similarly, we cannot expect that present-day attitudes and values associated with coastal areas change immediately. Instead, value changes must calculate with time-scales well beyond electoral cycles or even the time horizons of long-lived projects such as C2CCC – we must consider 'historical' time horizons of decades and centuries. By the same token, the shared notion of a glocal coast may mean that many features of the present project can be scaled to other projects in other countries or even other continents.

More than a year later, the local citizens are still highly engaged in the process and continuously pushing the municipality too move the project forward. This engagement was, at least in part, brought about by this unique approach relying heavily on utilizing cultural heritage to engage the citizens. Our historically-informed citizen stakeholder engagement offers a useful and useable blueprint for reaching out to municipal and citizen stakeholders within the framework of larger climate change adaptation measures and their implementation. Such efforts may complement activist engagements and higher-level political decision-making processes borne by election cycles. The decisions to be made regarding the future of the much-cherished summer cottages at Juelsminde are significant for local stakeholders. They are very local decisions relating to very global issues – the solutions may be sought in 'glocal' approach that deploys climate and environmental history to trace lines between the diverging perspectives.

[36] Löfgren, Orvar. 1999. *On Holiday: A History of Vacationing*. Berkeley: University of California Press.
[37] E.g. Byskov, Søren. 2007. *Dansk kystkultur under forandring*. Fiskeri- og Søfartsmuseets forlag.

References

Bergthaller, Hannes, Robert S. Emmett, Adeline Johns-Putra, Agnes Kneitz, Susanna Lidström, Shane McCorristine, Isabel Pérez Ramos, Dana Phillips, Kate Rigby, Libby Robin, and Peter Bindon. 2014. "Mapping Common Ground: Ecocriticism, Environmental History, and the Environmental Humanities." *Environmental Humanities* 5:261–76.

Bergthaller, Hannes, and Peter Mortensen, eds. 2018. *Framing the Environmental Humanities*. Leiden: Brill Rodopi.

Byskov, Søren. 2007. *Dansk Kystkultur under Forandring*, Fiskeri- og Søfartsmuseets forlag.

Cameron, Fiona R., and Ann Deslandes. 2011. "Museums and Science Centres as Sites for Deliberative Democracy on Climate Change." *Museum and Society* 9(2):136–53.

Carey, Mark, Philip Garone, Adrian Howkins, Georgina H. Endfield, Lawrence Culver, Sam White, Sherry Johnson, James Rodger Fleming, Philip Garone, and Mark Carey. 2014. "Forum: Climate Change and Environmental History." *Environmental History* 19(2):281–364.

Carleton, W. Christopher, and Mark Collard. 2019. "Recent Major Themes and Research Areas in the Study of Human-Environment Interaction in Prehistory." *Environmental Archaeology* 1–17.

Chakrabarty, Dipesh. 2009. "The Climate of History: Four Theses." *Critical Inquiry* 35(2):197–222.

Chakrabarty, Dipesh. 2014. "Climate and Capital: On Conjoined Histories." *Critical Enquiry* 41:1–23

Climate Visuals "*7 core principles for climate change communication"* *https://climatevisuals.org/7-climate-visuals-principles*.

Colette, A. 2007. *Climate Change and World Heritage. Report on Predicting and Managing the Impacts of Climate Change on World Heritage and Strategy to Assist States Parties to Implement Appropriate Management Responses*. Paris: UNESCO World Heritage Centre.

Contreras, Daniel A., ed. 2017. *The Archaeology of Human-environment Interactions: Strategies for Investigating Anthropogenic Landscapes, Dynamic Environments, and Climate Change in the Human Past*. London: Routledge.

Cronon, William. 1992. "A Place for Stories: Nature, History, and Narrative." *Journal of American History* 78(4):1347–76.

Daly, Cathy. 2016. "The Design of a Legacy Indicator Tool for Measuring Climate Change Related Impacts on Built Heritage." *Heritage Science* 4(1):19.

Davis, Dylan S. 2019. "Studying Human Responses to Environmental Change: Trends and Trajectories of Archaeological Research." *Environmental Archaeology* 1–14.

Dawson, Thomas Christopher, Joanna Hambly, Graham Allsop, and Louise Elinor. 2017. "A Central Role for Communities: Climate Change and Coastal Heritage Management in Scotland." Pp. 23–33 in *Public Archaeology and Climate Change*. Oxbow.

De Silvey, Caitlin. 2017. *Curated Decay: Heritage Beyond Saving*. Minneapolis: University of Minnesota Press.

Fatorić, S. and L. Egberts. 2020. Realising the potential of cultural heritage to achieve climate change actions in the Netherlands. *Journal of Environmental Management* 274, 111107.

Graham, Ellie, Joanna Hambly, and Tom Dawson. 2017. "Learning from Loss: Eroding Coastal Heritage in Scotland." *Humanities* 6(4).

Graves-Brown, P. M., Sian Jones, and Clive S. Gamble, eds. 1996. *Cultural Identiy and Archaeology*. London: Routledge.

Hall, C. Michael, Tim Baird, Michael James, and Yael Ram. 2016. "Climate Change and Cultural Heritage: Conservation and Heritage Tourism in the Anthropocene." *Journal of Heritage Tourism* 11(1):10–24.

Harrison, Rodney. 2013. *Heritage: Critical Approaches*. Abingdon: Routledge.

Harvey, David C., and Jim Perry. 2015. *The Future of Heritage as Climates Change: Loss, Adaptation and Creativity*. London: Routledge.

Historic Environment Scotland. 2011. *A Climate Change Action Plan for Historic Scotland 2012-2017*, available here: https://www.historicenvironment.scot/media/2611/climate-change-plan-2012.pdf

Holtorf, Cornelius. 2018. "Embracing Change: How Cultural Resilience Is Increased through Cultural Heritage." *World Archaeology* 1–12.

Hulme, Mike. 2008. "The Conquering of Climate: Discourses of Fear and Their Dissolution." *Geographical Journal* 174(1):5–16.

ICOMOS Climate Change and Heritage Working Group. 2019. *The Future of Our Pasts: Engaging Cultural Heritage in Climate Action*. Paris: International Council on Monuments and Sites - ICOMOS.

Ingold, Tim. 2010. "Footprints through the Weather-World: Walking, Breathing, Knowing." *Journal of the Royal Anthropological Institute* 16:S121–39.

Länsstyrelsen i Västra Götaland. 2016. *Kulturarv För Framtida Generationer. Med Klimatperspektiv På Västsveriges Kulturarv - Klimatförändringarnas Påverkan På Kulturarvet i Västra Götalands Och Hallands Län*.

Lave, Rebecca, Christine Biermann, and Stuart N. Lane, eds. 2018. *The Palgrave Handbook of Critical Physical Geography*. Cham: Palgrave Macmillan.

Löfgren, Orvar. 1999. *On Holiday: A History of Vacationing*. Berkeley: University of California Press.

Macfarlane, Robert. 2012. *The Old Ways: A Journey on Foot*. London: Penguin Books.

Macfarlane, Robert. 2019. *Underland: A Deep Time Journey*. London: Penguin Books.

Marshall, Yvonne. 2002. "What Is Community Archaeology?" *World Archaeology* 34(2):211–19.

Marzeion, Ben, and Anders Levermann. 2014. "Loss of Cultural World Heritage and Currently Inhabited Places to Sea-Level Rise." *Environmental Research Letters* 9(3):034001.

McAtackney, Laura. in press. "Contemporary Archaeology." Pp. xx–xx in *Routledge Handbook of Historical Archaeology*, edited by C. E. Orser Jr., S. Lawrence, and J. Symonds. London: Routledge.

Mondino, E., A. Scolobig, M. Borga, F. Albrecht, J. Mård, P. Weyrich, and G. Di Baldassarre. 2020. "Exploring Changes in Hydrogeological Risk Awareness and Preparedness over Time: A Case Study in Northeastern Italy." *Hydrological Sciences Journal* 1–11.

Moshenska, G., and S. Dhanjal. 2011. *Community Archaeology: Themes, Methods and Practices*. Oxford: Oxbow.

Moshenska, G., S. Dhanjal, and D. Cooper. 2011. "Building Sustainability in Community Archaeology: The Hendon School Archaeology Project." *Archaeology International* 13:94–100.

Mostert, E. 2018. "An Alternative Approach for Socio-Hydrology: Case Study Research." *Hydrology and Earth System Sciences* 22(1):317–329.

Neustadt, Richard E., and Ernest R. May. 1986. *Thinking in Time: The Uses of History for Decision Makers*. New York, NY: Freedom Press.

Olesen, Martin, Kristine Skovgaard Madsen, Carsten Ankjær Ludwigsen, Frederik Boberg, Tina Christensen, John Cappelen, Ole Bøssing Christensen, Katrine Krogh Andersen, and Jens Hesselbjerg Christensen. 2014. *Fremtidige Klimaforandringer i Danmark*. Copenhagen: Danmarks Meteorologiske Institut.

Pratt, Nicola. 2005. "Identity, Culture and Democratization: The Case of Egypt." *New Political Science* 27(1):69–86.

Reeder-Myers, Leslie A. 2015. "Cultural Heritage at Risk in the Twenty-First Century: A Vulnerability Assessment of Coastal Archaeological Sites in the United States." *The Journal of Island and Coastal Archaeology* 10(3):436–45.

Reeder-Myers, Leslie A., and Torben C. Rick. 2019. "Kayak Surveys in Estuarine Environments: Addressing Sea-Level Rise and Climate Change." *Antiquity* 93(370):1040–51.

Robin, Libby. 2018. "Environmental Humanities and Climate Change: Understanding Humans Geologically and Other Life Forms Ethically." *Wiley Interdisciplinary Reviews: Climate Change* 9(1):xx–xx.

Rockman, Marcy. 2015. "An NPS Framework for Addressing Climate Change with Cultural Resources." *The George Wright Forum* 32(1):37–50.

Rockman, Marcy, Marissa Morgan, Sonya Ziaja, George Hambrecht, and Alison Meadow. 2016. *Cultural Resources Climate Change Strategy*. Washington, DC: National Park Service.

Salazar, Juan Francisco. 2011. "The Mediations of Climate Change: Museums as Citizens' Media." *Museum and Society* 9(2):123–35.

Sesana, E., C. Bertolin, A. S. Gagnon, and J. J. Hughes. 2019. "Mitigating Climate Change in the Cultural Built Heritage Sector." *Climate* 7(7):90.

Sivapalan, M., M. Konar, V. Srinivasan, A. Chhatre, A. Wutich, C. A. Scott, J. L. Wescoat, and I. Rodríguez-Iturbe. 2014. "Socio-Hydrology: Use-Inspired Water Sustainability Science for the Anthropocene." *Earth's Future* 2(4):225–30.

Sivapalan, Murugesu, Hubert H. G. Savenije, and Günter Blöschl. 2012. "Socio-Hydrology: A New Science of People and Water." *Hydrological Processes* 26(8):1270–76.

Sommer, Ulrike. 2000. "Archaeology and Regional Identity in Saxony." *Public Archaeology* 1(2):125–42.

Stearns, Peter N., and Joel A. Tarr. 1981. "Applied History: A New-Old Departure." *The History Teacher* 14(4):517–31.

Wang, Jieh-Jiuh. 2015. "Flood Risk Maps to Cultural Heritage: Measures and Process." *Journal of Cultural Heritage* 16(2):210–20.