Item number	Title/reference *(academic style) name initials (year) title, publisher, volume, pages*	Name of reviewer
14	Dawson, T., Hambly, J., Kelley, A., Lees, W. and Miller, S., 2020. Coastal heritage, global climate change, public engagement, and citizen science. *Proceedings of the National Academy of Sciences*, *117*(15), pp.8280-8286.	CESIE

Review of findings / main outcome

The paper identified the *citizen science approach* as a unique methodology to discuss climate change and the risk of heritage loss, providing communities with the tools to address climate change impact in the present time and in the future. To confirm this hypothesis, three projects from *Scotland*, *Florida* and *Maine* respectively are described and compared in relation to their level of innovation, challenges, and possible solutions. Particularly, the first common step in the three projects has been a survey and prioritization process, later applied to make action more manageable, with university-based staff working with communities and heritage agencies to implement solutions at a local level. In detail:

In Scotland, *SCAPE Trust* project (Scotland's Coastal Archaeology and the Problem of Erosion) proved to be particularly relevant in the prioritization of a larger number of vulnerable sites discovered, especially in the updating the priority status at a later stage, a process that required the participation of local volunteers in the project *Shorewatch*. It is also worth mentioning the project *Scotland's Coastal Heritage at Risk Project (SCHARP),* in which an app was developed, that contributed to make the participation more democratic, through the citizens' access to data by using familiar technology and the possibility for volunteers to record new sites and upload photographs assessing the condition records.
The strength of the *project SCHARP* lies in its ability to provide meaningful data for heritage management, which is the reason why similar projects were developed in other parts of the United Kingdom, Europe, and in the United States, and adapted to the legislation and management practices of reference.

In Florida*,* the Florida Public Archaeology Network (FPAN) developed the Heritage Monitoring Scout (HMS) Florida Program, that aims to address the climate emergency through education and outreach. The report underlines the challenges FPAN had to face, namely the development of a vetting and oversight process for the program's citizen scientists, and the ownership of sites and overlapping management jurisdictions.
The report indicated that the strength of the Coastal Heritage at Risk Taskforce (CHART) lies in its ability to build consensus and in the coordination of a plan to tackle issues of prioritization and response to the alarming situation. In addition, with this, it is worth noting that an outcome-based evaluation conducted in 2017 on HMS Florida program found that the participants benefited from the program, and that they feel that they are making the difference.

In Maine, the Midden Minders (MMs) program was developed in conjunction with the Maine Historic Preservation Commission (MHPC) to create a link between academic/governmental research at shell middens, local citizens and tribal members in order to monitor and document the erosion of the numerous recorded sites. In particular, volunteers collected data at midden sites, and this implied a shift in thinking for professional archaeologists in the state. Indeed, MM program valued volunteer's local knowledge of eroding middens, and allowed the access to the information database only to registered MMs.

However, the report found that the main challenge for this program is the lack of provision for continuing expenses, as well as the fact that MM is not run by an established program with dedicated staff and resources.

The paper also highlights the challenges of adopting a citizen science approach, that are more evident in some places rather than others. Among the challenges, it is possible to trace:

1) Access to visit coastal sites without limits;
2) Making location data accessible in terms of legal constraints, namely potential desecration of Native American sites;
3) Resourcing and funds allocation for cultural heritage management;
4) Continuity, guaranteed by reporting and appreciating feedback, as well as collecting records that are not moderated, and they might lead to lose interest in a project.
5) Long-term project sustainability.

Even though collecting data and stimulating action are priorities to help mitigate the loss of coastal heritage sites, recommendations must be put into action. With this purpose, the NPS traced a series of possible actions, namely improving resilience, offsetting stress, and relocating structures. E.g., moving the Cape Hatteras Lighthouse in North Carolina in 2000 in response to public outcry, although it is worth considering that the financial expenses required to relocate a monument are expensive.

Overall, it is worth noting that the three projects reported in this paper aim to demonstrate that archaeologists can no longer afford gradual or independent development of approach, but that they must, and they need to build local solutions, that proved to be effective even though there are challenges, and considerations to keep in mind.
The approaches as well as the study of coastal sites examined in this paper can be applied to help society prepare for climate change impacts to heritage everywhere at risk.

Quotes / very useful statements

"Loss should not happen by default"; as stated in the National Park Service (NPS) Cultural Resources Climate Change Strategy.
"Taking no action is a decision"

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