A predictive model of Indigenous Ranger Groups' capacity for the adaptation of heritage sites to the impacts of climate change

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Keywords: climate change, adaptation, Indigenous, cultural heritage, ranger group, framework

Abstract

The threat posed by climate change to cultural heritage and archaeological sites began to ring alarm bells for heritage practitioners over two decades ago. Only very recently, however, has work progressed beyond hypothesising potential impacts. Four climate change risk analysis frameworks and prioritisation methodologies are considered. These are either professionally generated (top-down') or professionally generated but with stakeholder input ('middle path') approaches. This paper argues that in the Australian context a more stake-holder led approach ('bottom up') may be necessary. A predictive model is developed to explore propositions germane to a 'bottom up' planning process. Preliminary fieldwork suggests further testing of the model is warranted.

'Top-down' and 'middle' paths

Four climate change risk analysis frameworks and prioritisation methodologies are known to the author: the work of Bickler et al (2013) in New Zealand; Dupont et al (2013) in Belgium; Daire et al (2014) in France; and Dawson (2015) in Scotland. In the majority of these studies, applied, methodical approaches conducted by heritage professionals represent a 'top-down' approach. Of the four, only the work of Dawson contains an explicit phase that addresses the social context of heritage and engages stakeholders. Dawson has attempted to take what he calls a 'middle path' in such planning, and notably it is this work that has led to significant on-the-ground adaptation efforts. As with the other frameworks, Dawson has an initial 'top down' phase that involves professionals prioritising sites on the basis of both risk and value. It involves constructing a GIS with a layer comprising site registers over laid by one allocating an erosion class to stretches of coast. Proximity to hazard and site type derives a vulnerability rating. An archaeological 'value' rating further refines the vulnerability analysis. However, in Dawson's case, after this initial risk analysis and prioritisation, a subsequent phase is added in which local community members are recruited to both augment data collection and update the 'values' given to sites on the basis of any special meaning particular sites might hold for them.

Australian context

Even Dawson's framework, however, is likely to face special challenges in northern and central Australia where much archaeology and heritage sites exist on an expansive and diverse Indigenous estate. These sites continue to be used, valued and maintained in a traditional cultural context. Therefore, local community members will need to drive the process from the outset. Adapting Australia's Indigenous heritage will necessitate: (a) greater reliance on traditional knowledge about sites; (b) close collaboration with Traditional Owners; (c) the ascribing of Indigenous 'value' from the outset; and, (d) greater Indigenous input into the analysis of this data and the development and implementation of adaptation options. In north and central Australia, a distinctly 'bottom-up' approach may be more practical than a 'middle path' approach.

Something missing from the heritage literature addressing climate change is reference to a burgeoning scholarship on the theory and practice of climate change adaptation in general. A central tenet of adaptation science is that stakeholder-led planning will more effectively capture all risks, generate ownership of the problem and therefore the solutions, leading to greater success with the

implementation of planning goals. To further this, a host of adaptation planning frameworks has been developed to guide local scale, community-based climate change adaptation planning (Webb and Beh 2013). These stakeholder-led frameworks might be usefully synthesised with the heritage adaptation frameworks mentioned above to produce a bespoke framework for Indigenous heritage site climate change adaptation. But if so, who would use it?

Ninety Indigenous Ranger Groups exist across Australia and use traditional knowledge in natural resource management (NRM) on Indigenous owned and controlled lands and other forms of tenure. The well-documented planning experience of Indigenous Ranger Groups – some groups have a 30-year history of NRM on country – and their incorporation of traditional knowledge into this work (Altman and Kerins 2012) suggests that these groups would be strong candidates for Indigenous heritage site climate adaptation work: both capable of doing it but equally important, resourced and motivated to do it.

Predictive model

To research the potential of Indigenous Ranger Groups to undertake heritage climate change adaptation, a predictive model is presented that is amenable to being collaboratively tested in 'the field'.

A primary distinction between generic adaptation products and the limited number of heritage adaptation frameworks is that the latter do not have an explicit 'project framing' or 'scoping' phase. In a bottom-up planning process such a phase is fundamental. The scoping phase allows stakeholders to explore: the nature of the problem; what impacts are being observed and where; motivations for planning; appropriate methods; resource availability; and, project leadership – in other words, to design the project themselves.

Table 1. Predictive model: part 1 – scoping phase

- Indigenous Rangers are observing climate change impacts on cultural sites, which may include:
    - sea level rise and storm surge impacting coastal sites;
    - flooding inundating riparian sites;
    - more intense, extensive and frequent fire impacting woodland sites.
- Sites being impacted are rock art sites, coastal middens, Dreaming sites[1] and burial sites.
- Indigenous Rangers are interested in undertaking a climate change risk analysis and prioritisation process for sites in order to focus adaptation work on sites most in danger.
- Rangers have sufficient resources to do so, in the form of:
    - cultural authority;
    - traditional knowledge about sites and site maintenance;
    - planning skills;
    - mapping skills;
    - electronic data sets.
- Governance structures do not represent a barrier to this work.
- Existing management frameworks can accommodate this work.
- Within Ranger Groups, there are individual Rangers prepared to lead an adaptation project.

The first part of a predictive model therefore explores issues germane to a scoping phase (Table 1). Its propositions have been generated by synthesising common elements of the scoping phases in a discreet set of generic climate change adaptation frameworks. This discreet set was chosen on the basis of Webb et al's (2013) assessment and rating against explicit criteria of a larger set of such

[1] Sites of significance in Indigenous cosmology.

frameworks. This synthesis was then adapted for use in an Indigenous heritage climate change adaptation context on the basis of principles derived from the small Indigenous climate change adaptation literature (Bird, Govan et al. 2013). The first part of a predictive model also draws on climate change projections for central and northern Australia (CSIRO and Bureau of Meteorology 2015).

If the propositions in Table 1 are largely, or partly, confirmed, a second part of the predictive model (Table 2) might be tested. These derive from a synthesis of central elements of risk analyses for heritage climate change adaptation, as set out in the heritage climate change adaptation literature cited above.

Table 2. Predictive model: part 2 – risk assessment and option assessment phases

- Sites nominated by Indigenous Rangers as being in climate change danger zones can be practicably prioritised by them in terms of
    - relative vulnerability;
    - relative value.
- Adaptation options acceptable to and practical for Indigenous Rangers are, for example:
    - protective measures against fire;
    - bund protection from flooding;
    - monitoring;
    - detailed recording of sites rated as being at high risk of destruction.

Fieldwork

Initial fieldwork conducted in December 2014 with the Djelk Rangers, an Indigenous Ranger Group operating on an Indigenous Protected Area in north central Arnhem Land, Northern Territory suggests subjecting the predictive model to further testing is warranted. Interviews with 12 Indigenous Rangers, four non-Indigenous support staff and five Traditional Owners (TOs) were conducted. Three experienced, senior Rangers had an awareness of climate change concepts and held concerns about climate change impacts on sites, as did one of the TOs. One senior Indigenous Ranger related seeing riparian rock art inundated for the first time in his 30 years as a Ranger. Photographic records in the Group's rock art data base were subsequently accessed. One of these exhibited pre-contact rock art in an inland ravine that appeared to be dissected by what may have been a water mark. Below this mark, the art appeared to be significantly degraded. What looked like flood debris and logs appeared to be scattered in the vicinity. In 2015, the CSIRO reported that increased intensity of extreme rainfall events in the monsoonal north west are projected 'with high confidence' (McInnes, Abbs et al. 2015). Future fieldwork will aim to confirm that recent inundation and flood damage did in fact take place. The Rangers involved have suggested and discussed among themselves the need for monitoring such sites and a dedicated planning process.

A case study in Central Australia is also planned.

Acknowledgements

The author wishes to acknowledge the invaluable input of: the Djelk Rangers, especially Victor Rostron, Obed Namirriki, Alfie Galaminda, Daryl Redford, and William Dennis; Djelk support staff, Dominic Nicholls, Alys Stevens and Alex Earnst; and traditional owners, especially Wayne Campion, Helen Williams, and Matty Ryan.

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